New Vanity/Club Call Rules–See page 46

Amateur Radio

COMMUNICATIONS & TECHNOLOGY

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CQ

JANUARY 2011

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- *CQ* Reviews: Alinco DJ-G7T 3-Band HT, p. 28
- 2011 Propagation Predictions, p. 98

On the Cover: Bill Rinker, NE9Z, enjoys a sunny winter day in Wyoming. Details on page 66.

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Kenwood's dual-band transceiver with full APRS® and EchoLink® support. Featuring the SiRFstar III™ high-performance GPS receiver.

The TH-D72A is perhaps the most technology advanced, feature rich portable offered to the Amateur market. Easy to use, yet affordable. You be the judge!

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- Cross-tone

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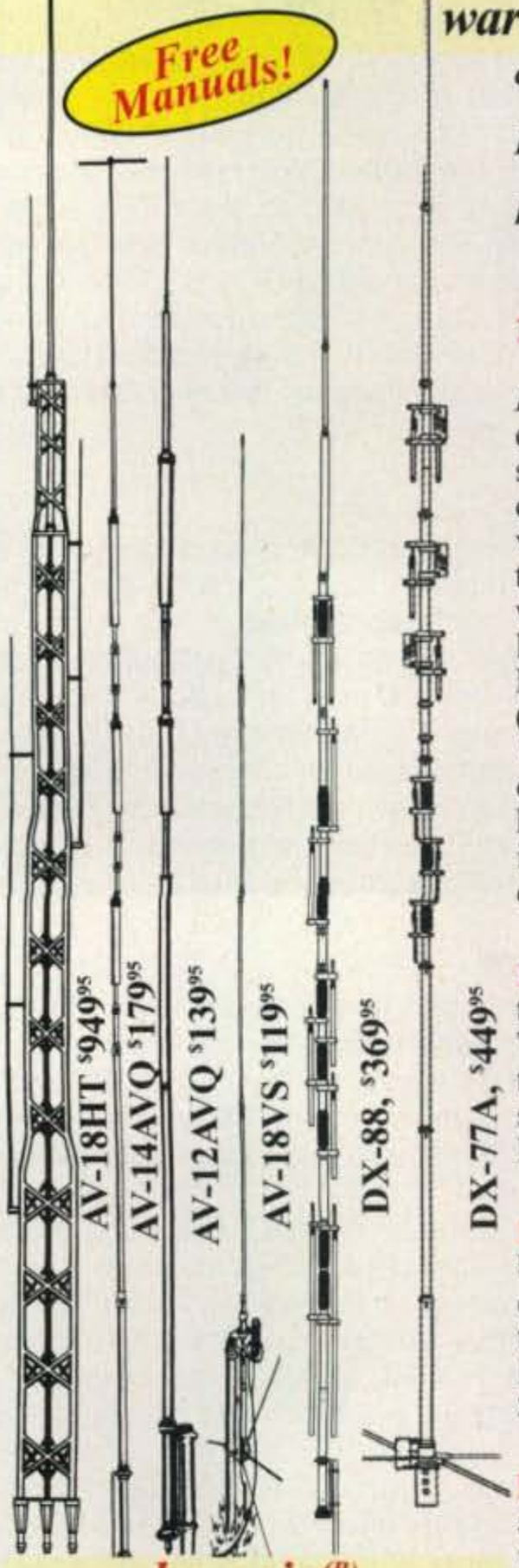

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All hy-gain multi-band vertical antennas are entirely self supporting -- no guys required.

They offer remarkable DX performance with their extremely low angle of radiation and omnidirectional pattern.

All handle 1500 Watts PEP SSB, have low SWR, automatic bandswitching (except AV-18VS) and include a 12-inch heavy duty mast support bracket (except AV-18HT).

Heavy duty, slotted, tapered swaged, aircraft quality aluminum tubing with full circumference compression clamps is used for radiators. Includes all stainless steel hardware. Recessed SO-239 prevents moisture damage. Hy-gain verticals go up easily with just hand tools and their cost is surprisingly low. Two year limited warranty.

AV-18HT, $949.95. (10,12,15,20,40,80 M, 160, 17 Meters optional). 53 ft., 114 lbs.

Standing 53 feet tall, the famous *Hy-Gain HyTower* is the world's best performing vertical! The AV-18HT features automatic band selection achieved through a unique stub-decoupling system which effectively isolates various sections of the antenna so that an electrical 1/4 wavelength (or odd multiple of a 1/4 wavelength) exists on all bands. Approximately 250 kHz bandwidth at 2:1 VSWR on 80 Meters. The addition of a base loading coil (**LC-160Q, $109.95**), provides exceptional 160 Meter performance. **MK-17, $89.95**. Add-on 17 Meter kit. 24 foot tower is all rugged, hot-dip galvanized steel and all hardware is iridited for corrosion resistance. Special tilt-over hinged base for easy raising & lowering.

AV-14AVQ, $179.95. (10,15,20,40 Meters). 18 ft., 9 lbs. **The** Hy-Gain AV-14AVQ uses the same trap design as the famous Hy-Gain Thunderbird beams. Three separate air dielectric Hy-Q traps with oversize coils give superb stability and 1/4 wave resonance on all bands. Roof mount with Hy-Gain AV-14RMQ kit, $89.95.

AV-12AVQ, $139.95. (10, 15, 20 Meters). 13 ft., 9 lbs. **AV-12AVQ** also uses Thunderbird beam design air dielectric traps for extremely Hy-Q performance. This is the way to go for inexpensive tri-band performance in limited space. Roof mount with AV-14RMQ kit, $89.95.

AV-18VS, $119.95 (10,12,15,17,20,30,40,80 Meters). 18 ft., 4 lbs. **High** quality construction and low cost make the AV-18VS an exceptional value. Easily tuned to any band by adjusting feed point at the base loading coil. Roof mount with Hy-Gain AV-14RMQ kit, $89.95.

DX-88, $369.95. (10, 12, 15,17,20,30,40,80 Meters, 160 Meters optional). 25 ft., 18 lbs.

All bands are *easily* tuned with the DX-88's *exclusive* adjustable capacitors. 80 and 40 Meters can even be tuned from the ground without having to lower the antenna. Super heavy-duty construction. DX-88 OPTIONS: 160 Meter add-on kit, KIT-160-88, $199.95. Ground Radial System, GRK-88, $99.95. Roof Radial System, RRK-88, $99.95.

DX-77A, $449.95. (10, 12, 15, 17, 20, 30, 40 Meters). 29 ft., 25 lbs.

No ground radials required! Off-center-fed Windom has 55% greater bandwidth than competitive verticals. Heavy-duty tiltable base. Each band independently tunable.

Model #	Price	Bands	Max Power	Height	Weight	Wind Surv.	Rec. Mast
AV-18HT	$949.95	10,15,20,40,80	1500 W PEP	53 feet	114 pounds	75 MPH	------
AV-14AVQ	**$179.95**	**10,15,20,40**	**1500 W PEP**	**18 feet**	**9 pounds**	**80 MPH**	**1.5-1.625"**
AV-12AVQ	$139.95	10/15/20 M	1500 W PEP	13 feet	9 pounds	80 MPH	1.5-1.625"
AV-18VS	**$119.95**	**10 - 80 M**	**1500 W PEP**	**18 feet**	**4 pounds**	**80 MPH**	**1.5-1.625"**
DX-88	$369.95	10 - 80 M	1500 W PEP	25 feet	18 pounds	75 mph no guy	1.5-1.625"
DX-77A	**$449.95**	**10 - 40 M**	**1500 W PEP**	**29 feet**	**25 pounds**	**60 mph no guy**	**1.5-1.625"**

hy-gain® PATRIOT

Hy-Gain's new PATRIOT HF verticals are the best built, best performing and best priced multiband verticals available today. For exciting DX make full use of your sunspot cycle with the PATRIOT's *low 17 degree angle* signal.

No ground or radials needed

Effective counterpoise replaces radials and ground.

Automatic bandswitching

Single coax cable feed. Each band is individually tunable. Extra wide VSWR bandwidth. End fed with broadband matching unit.

Sleek and low-profile

Low 2.5 sq. ft. wind surface area. Small area required for mounting. Mounts easily on decks, roofs and patios.

Full legal limit

Handles 1500 Watts key down continuous for two minutes.

Built-to-last

High wind survival of 80 mph. Broadband matching unit made from all *Teflon*® insulated wire. Aircraft quality aluminum tubing, stainless steel hardware.

hy-gain® warranty

Two year limited warranty. All replacement parts in stock.

AV-640, $399.95. (6,10,12, 15,17,20,30,40 Meters). 25.5 ft., 17.5 lbs. The AV-640 uses quarter wave stubs on 6, 10, 12 and 17 meters and efficient end loading coil and capacity hats on 15, 20, 30 and 40 meters -- no traps. Resonators are placed in parallel not in series. End loading of the lower HF bands allows efficient operation with a manageable antenna height.

AV-620, $299.95. (6,10,12,15,17,20 Meters). 22.5 ft., 10.5 lbs. The AV-620 covers all bands 6 through 20 Meters with no traps, no coils, no radials yielding an uncompromised signal across all bands.

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ham radio news

Chip Margelli, K7JA, Joins CQ Staff

Charles H. "Chip" Margelli, K7JA, has joined the staff of *CQ* magazine's parent company, CQ Communications, Inc., as Director of Advertising Sales and Marketing. He will be coordinating marketing activities for all of the company's products, as well as advertising sales for *CQ*, *CQ VHF*, and *Popular Communications* magazines. He succeeds Don Allen, W9CW, and Arnie Sposato, N2IQO, both of whom retired in December.

Chip is well-known in the amateur radio community as a contester, DXer, and DXpeditioner, as well as his nearly 30 years with Yaesu (now Vertex-Standard) and the past four years with Heil Sound. He and his wife, Janet, KL7MF, live in Garden Grove, California. Chip began working for CQ on December 1.

Dayton Award Nominations Sought

The Dayton Amateur Radio Association is seeking nominations for the three awards it bestows annually at the Dayton Hamvention®. The Radio Amateur of the Year, Special Achievement and Technical Excellence Awards are considered among the most prestigious honors in amateur radio. In addition, the association has decided to continue its new Radio Club of the Year Award, introduced last year, and make it a permanent part of the Hamvention awards program. Nominations must be submitted by *January 15, 2011*. Details and nominating forms are available on the DARA website at <www.hamvention.org>.

ARISSat-1 Due for Launch This Month

The ARISSat-1 satellite, originally designed to be orbited in a surplus Russian spacesuit hand-launched from the International Space Station (ISS), is slated to head to the space station this month aboard a Progress supply rocket. When the spacesuit launch became impossible, volunteers at AMSAT quickly reconfigured the design to create a stand-alone spacecraft that still could be hand-launched by ISS crew members during spacewalk. The AMSAT News Service reports that the satellite passed a NASA safety review in October, then was prepared for shipment to Russia for the January Progress launch and an anticipated launch into its own orbit in February.

Space Station to Sport Two Ham Stations

A second ham radio station is due to be installed on the International Space Station. According to the AMSAT News Service, NASA has approved the installation in the U.S. segment of the station the VHF and UHF handhelds originally used for ARISS (Amateur Radio on the International Space Station) contacts in the station's Russian segment. Those were replaced by a Kenwood D-700 transceiver, but still work fine. Installation in the US area would give crew members a choice of two operating positions for future ham contacts, with the possibility down the road of operating both stations simultaneously.

Spratly Island DXpedition Extended Through CQWW 160 Contest

The DXØDX expedition to the Spratly Islands has been extended by a week to include operations during the CW weekend of the 2011 CQ World-Wide 160-Meter DX Contest on January 28–30. According to a posting on the DXØDX.net website, the decision to extend operations from the originally-planned end date of January 24 in response to "strong interest from Top Band contesters and the 160m band being the highest sought after in the DX0DX website online survey." The DXpedition, now slated for January 6 through February 1, will involve more than three dozen operators from 15 countries. The Spratly Islands are located in the South China Sea and are administered by the Philippines, which issued the license for the operation.

New Chief for Air Force MARS

Richard Jenson is the new Chief of Air Force MARS, the U.S. Air Force's division of the Military Auxiliary Radio System. Jenson, who is not a ham, is a program manager at the Air Force Network Integration Center (AFNIC) at Scott Air Force Base in Illinois, according to the *ARRL Letter*. Jenson succeeds Tech. Sgt. Jason Sandifer, who served as Interim Chief after the retirement last May of former Chief Allen Eiermann, K3LSR. Jenson has provided training and communications support to units of the Air National Guard, and supported disaster relief efforts in Haiti after last year's massive earthquake there.

Report from GAREC

The earthquakes in Haiti and Chile shared top billing at the annual Global Amateur Radio Emergency Communications (GAREC) conference, held on the island of Curacao in early October. According to the South African Radio League, the conference also included a "tabletop exercise" simulating a massive earthquake off the Canary Islands and a resultant tsunami, as well as presentations on emergency response exercises in the Netherlands, Finland and South Africa. The 2011 GAREC conference is scheduled to be held in South Africa.

Hams Making News

A ham from Michigan has been named a Knight of the French Legion of Honor. Ken Kott, W8ROG, was honored for his actions in France during World War II. Kott, 90, is still active on the ham bands and an ardent CW enthusiast. He is the father of former *WorldRadio* and *WorldRadio Online* Editor Nancy Kott, WZ8C.

Milton "Buddy" Sullivan, Jr., ex-K8YDO, became a Silent Key in late October. Sullivan was the chief engineer for the R.L. Drake Company during its heyday. According to the *ARRL Letter*, Sullivan either designed or oversaw the design of virtually all significant Drake amateur radio products, including the 1A, 2B and 2NT, the 4 lines and the beginning of the 7 line.

The *ARRL Letter* also reports that John Soderberg, W1AKV, became a Silent Key in early November. He was a pioneer in designing sonar and related systems for U.S. Navy submarines. Two other notable hams who have passed away in the same timeframe are former CQ WPX Award Manager Norm Koch, WN5N, and *CQ VHF* High-Speed Multimedia Editor John Champa, K8OCL. Read more about Norm and John in this month's "Zero Bias" editorial on page 8.

Old "F7" QSL Cards Sought

A French ham radio website that posts old QSL cards online is looking for images of QSLs for "F7" calls, issued to U.S. amateurs in France between 1948 and 1962. The "LesNouvellesDX.fr" website has about 50 F7 cards in its collection but is looking for more, according to Jean-Michel Duthilleul, F6AJA. More information is available on the website at <http://LesNouvellesDX.fr> or via e-mail to <LesNouvellesDX@free.fr>.

Four New Cubesats Feature Ham Transponders

Four of seven tiny "cubesats" launched from Alaska on November 19 operate on amateur frequencies and/or

(Continued on page 10)

TOKYO HY-POWER

HC-1.5KAT

HF 1.5kW Auto Tuner

HL-2.5KFX *Auto Band Set and QSK*

Solid-state HF 1.5kW Linear Amplifier

Photo : From 1eft HC-1.5KAT (HF 1.5kW Tuner with Auto Band Set Feature), HL-2.5KFX (HF 1.5kW MOSFET Linear) and IC-7700 Transceiver

For DXpeditioners

HL-1.1KFX

HF 600W Linear

HL-1.2KFX

HF 750W Linear

HL-1.5KFX

HF / 50MHz 1kW Linear
(650W PEP on 50MHz Band)

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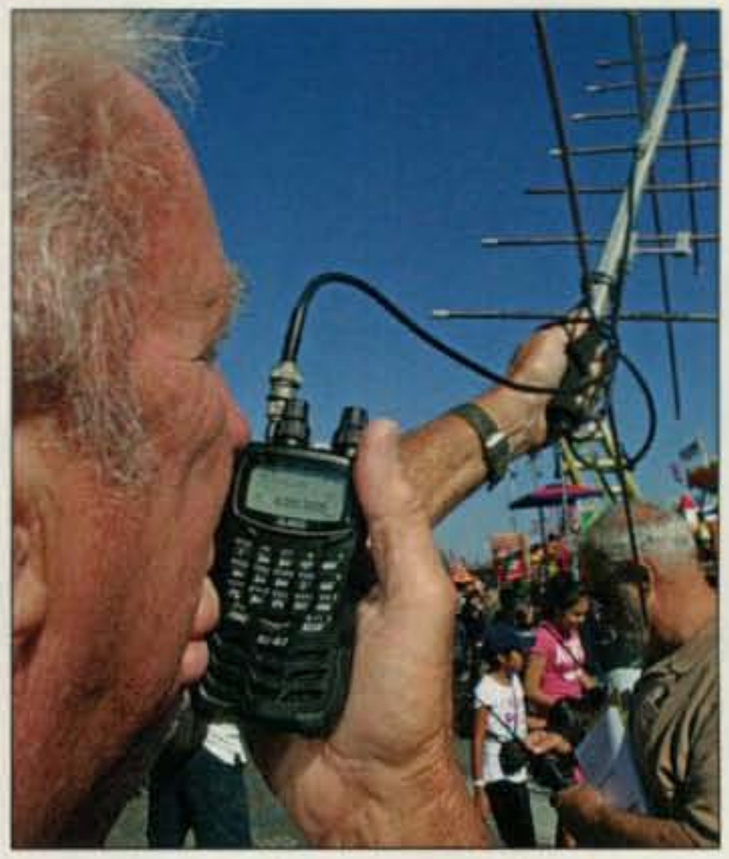

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departments

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The All New TS-590S

Kenwood has essentially redefined HF performance with the TS-590S compact HF transceiver. The TS-590S RX section sports IMD (intermodulation distortion) characteristics that are on par with those "top of the line" transceivers, not to mention having the best dynamic range in its class when handling unwanted, adjacent off-frequency signals.*

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* For 1.8/3.5/7/14/21 MHz Amateur bands, when receiving in CW/FSK/SSB modes, down conversion is automatically selected if the final passband is 2.7KHz or less.

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5.2" x 1.6" Large dot matrix (264 x 64 dots) LCD display
GPS / APRS® / Bluetooth® Features

NEW

144/(220)* /430 MHz 50 W
FM Dual Band Transceiver

FTM-350R

*220 MHz 1W (USA Version only)

NEW — Large (5.2" x 1.6"/130 x 40 mm) dot matrix (264 x 64 dots) LCD display for comfortable viewing for night and day. Choose your favorite LCD display from 8 vibrant color options

The Display Control Head is designed for easy separation from the main RF power unit built by tough aluminum die-cast;10ft control cable included (Optional 20ft control cable available) — NEW

NEW — Multi-purpose Global Positioning System display (with optional FGPS-1 GPS Receiver and Antenna. Optional FGPS-2 External GPS Receiver and Antenna is also available)

Compatible with the worldwide standard data-communications system, APRS®, and SmartBeaconing™ capabilities — NEW

NEW — Huge memory channel management capability! 500 Independent Memory channels + 9 Programmable Band Limit Memory Scan channels + 1 Rewritable Preferred channel for each L and R Band

3 Speaker System (including Built-in Dual Speakers on the rear of the Control Head for FM Broadcast in Stereo!) — NEW

Exclusive — Dual Band AF Monitor for listening to FM/AM broadcast and monitoring ham bands as well

Built-in Barometric Pressure Sensor — Exclusive

Screen Example

Dual Band (Spectrum Scope function)

Navigation (with GPS antenna unit attached)

Mono Band (Spectrum Scope function)

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5 W 2 m FM HANDHELD
TRANSCEIVER
FT-250R

Best Selling, Reliable Mobile

55 WATTS

ULTRA RUGGED 55 W 2 m FM TRANSCEIVER
new **FT-1900R** 2 m MONO BAND

VHF FM 5 W COMPACT
HANDHELD TRANSCEIVER
FT-270R

2 m MONO BAND
new

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– a CQ editorial

zero bias

BY RICH MOSESON,* W2VU

Transitions

Welcome to a new year and a new decade. Traditionally, a new year is a time to reflect on the year that has just ended and to look forward to what might be different in the year that is just beginning. It is a time of transition, and not always as simple as changing to a new calendar (speaking of which, I hope you all have your new CQ calendar on your shack wall!).

For most of us hams, the year just ended was a tough one, both in terms of the economy and the sunspot cycle, which are sharing the unfortunate feature of being much slower to recover than any of us would like. On the other hand, there were some encouraging signs on both fronts, and both promise to continue slowly improving in 2011 (see this month's "Propagation" column on page 98 for non-economic predictions).

We are in the process of a transition here at *CQ*, as well. While your editor is the "face" of this magazine to its readers and writers, and the general ham community, the advertising manager is the "face" of the magazine to the people who work in the ham radio industry. He or she is the person they hear from every month to make sure their company will be getting its message out to our readers, with whom they work on crafting the details of an ad, and whom they see at hamfests (usually along with me).

Since I joined CQ nearly 20 years ago, either Arnie Sposato, N2IQO, or Don Allen, W9CW, has occupied at least one chair in the advertising department here at CQ Communications. When I started, Arnie was ad manager for *CQ* and Don was ad manager for *Popular Communications* and *Communications Quarterly*. Over the years, each of them has left the company and later returned, and eventually ended up swapping hats, with Don in charge of advertising for *CQ* and *CQ VHF*, and Arnie running the show at *Pop'Comm*. But one or the other has always been here, willing to share decades of knowledge of the amateur industry and the people who work in it.

Therefore, it was quite a shock to the system last fall, when over the course of two weeks, both Arnie and Don informed publisher Dick Ross, K2MGA, that they planned to retire by the end of the year.

After a rocky start to looking for replacements (including one textbook case of how not to get hired), the stars finally came into alignment, a few flares popped off the sun, and we are extremely pleased to welcome a very well-known face in the ham radio hobby and industry—Chip Margelli, K7JA—to be our new "face" to the industry, as Director of Advertising Sales and Marketing for CQ Communications. Chip will be taking over the ad sales duties on *CQ*, *CQ VHF*, and *Pop'Comm*, as well as coordinating marketing efforts for all of our products.

Some of you may know Chip as a DXer, DXpeditioner, and contester extraordinaire, as the "public face" of Yaesu for nearly 30 years, or more recently, as VP of Marketing for Heil Sound. Chip brings with him a tremendous depth of knowledge of the inner workings of the amateur radio industry, which will be of great value as he helps both current and prospective advertisers communicate most effectively with our readers. We all look forward to working with Chip as a colleague.

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

Still, it's going to be quite strange for quite a while, not to be picking up the phone and calling Don or Arnie about this company or that product, and having a new roommate at hamfest hotels. Don and Arnie, it has been an honor and a privilege—and a pleasure—to work with both of you, and we will miss you greatly here in the "hallowed halls of Hicksville."

Additional Goodbyes

Speaking of hamfest hotels, one of my most lasting memories of Dayton is the year that I roomed with then-WPX Award Manager Norm Koch, WN5N. Norm was proudly from the southwest, and that year he brought along some jars of homebrew spicy salsa to give to certain staff members. We stored them in our hotel room until it was time to hand them out. Complication: When we came back from the show on Friday, we were greeted by a huge and unpleasant mess. It seems that one of his salsa jars, all by itself, had *exploded* while we were at Hara Arena. The cleanup was interesting, the housekeeper got an extra tip, and for some reason, everyone politely declined Norm's offer of a jar of homemade salsa! I am recounting this story because Norm became a Silent Key in November after several years of declining health. Because of that experience, though, thinking of Norm always brings a smile to my face. What better way to be remembered?

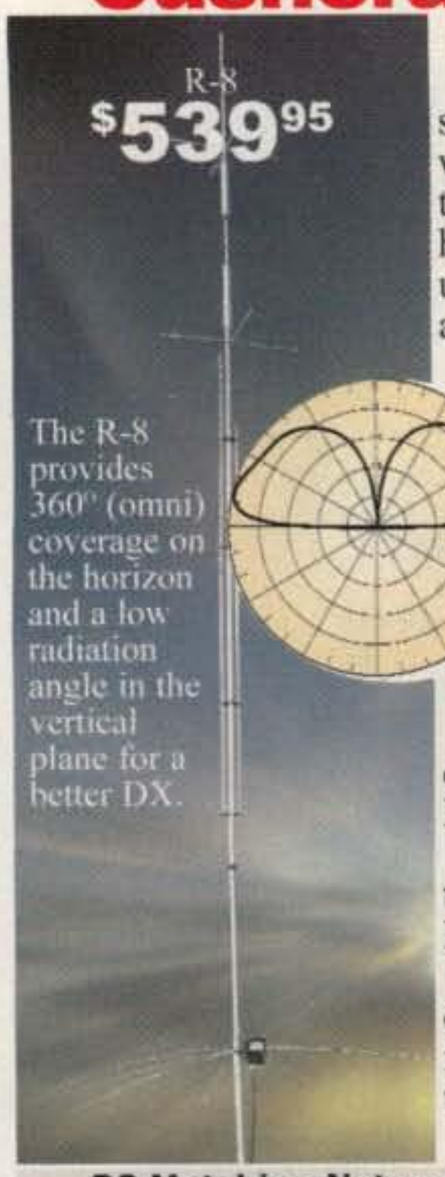
Also leaving us in November was John Champa, K8OCL, the High-Speed Multimedia (HSMM) editor for *CQ VHF* magazine, after a battle with cancer. I did not know John well, nor did anything of his ever blow up in my hotel room. But the few times that I did meet him, I was always impressed by his depth of knowledge about very complex technical topics as well as his ability to discuss them in plain English with folks like me who could only begin to scratch the surface. I was also impressed by his common-sense, no-nonsense approach to dealing with issues. His expertise and insight will be missed by the entire amateur community as we lose a leader at the leading edge of amateur radio technology.

Scaling Back

Finally, since this is January, and many of us make New Year's resolutions to promptly ignore, here is one to try to help more of us stick around on the planet a little longer (and you can credit/blame my wife for this one): How about if we collectively resolve to each lose about 30 pounds in 2011? Now some of you out there are skinny as rails, but we all know that the vast majority of us are not. Thirty pounds sounds like a lot (it sure does to me), but it works out to an average of $2\frac{1}{2}$ pounds a month, a goal that many of us can achieve simply by walking more and eating less. One approach my wife and I have taken is to either share a meal when we eat out, or immediately put half of each serving aside to take home and eat the following day. It is, pardon the pun, a "no-lose" resolution. Even if you simply manage to maintain your current weight, you'll be no worse off at the end of the year than you are right now. And every pound that you do manage to lose will pay off in both short- and long-term dividends. While we're on the topic, get regular colonoscopies as well. They can save your life.

On that happy note, may your health, wealth, and DX totals all improve in the new year! 73, W2VU

Cushcraft R8 *8-Band Vertical*



Covers 6, 10, 12, 15, 17, 20, 30, and 40 Meters!

The Cushcraft R8 is recognized as the industry gold standard for multi-band verticals, with thousands in use worldwide. Efficient, rugged, and built to withstand the test of time, the R8's unique ground-independent design has a well-earned reputation for delivering top DX results under tough conditions. Best of all, the R8 is easy to assemble, installs just about anywhere, and blends inconspicuously with urban and country settings alike.

Automatic Band Switching: The R8's famous "black box" matching network combines with traps and parallel resonators to cover 8 bands. You QSY instantly, without a tuner!

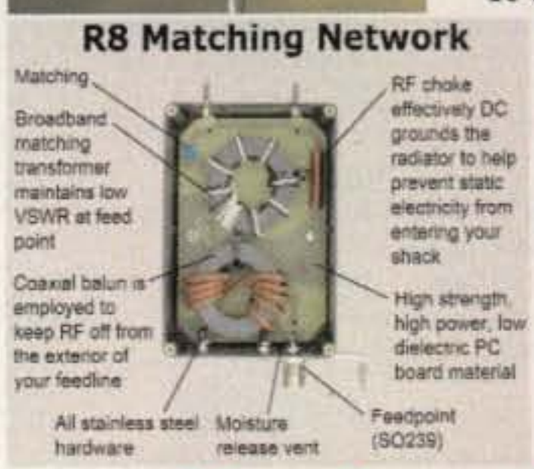
Rugged Construction: Thick fiberglass insulators, all-stainless hardware, and 6063 aircraft-aluminum tubing that is double or triple walled at key stress points handle anything Mother Nature can dish out.

Compact Footprint: Installs in an area about the size of a child's sandbox -- no ground radials to bury and all RF-energized surfaces safely out of reach.

Legal-Limit Power: Heavy-duty components are contest-proven to handle all the power your amplifier can legally deliver and radiating it as RF rather than heat.

The sunspot count is climbing and long-awaited band openings are finally becoming a reality. Now is the perfect time to discover why Cushcraft's R8 multi-band vertical is the premier choice of DX-wise hams everywhere!

R-8GK, $56.95. R-8 three-point guy kit for high winds.



MA-5B *5-Band* Beam

Small Footprint -- Big Signal

The MA-5B is one of Cushcraft's most popular HF antennas, delivering solid *signal-boosting directivity* in a bantam-weight package. Mounts on roof using standard TV hardware. Perfect for exploring exciting DX without the high cost and heavy lifting of installing a large tower and full-sized array. Its 7 foot 3-inch boom has less than 9 feet of turning radius. Contest tough -- handles 1500 Watts.

The unique MA-5B gives you 5-bands, automatic band switching and easy installation in a compact 26-pound package. On 10, 15 and 20 Meters the end elements become a two-element Yagi that delivers solid power-multiplying gain over a dipole on all three bands. On 12 and 17 Meters, the middle element is a highly efficient trap dipole. When working DX, what really matters are the interfering signals and noise you *don't hear*. That's where the MA-5B's impressive side rejection and front-to-back ratio really shines. *See* ***cushcraftamateur.com*** *for gain figures.*

Cushcraft 10, 15 & 20 Meter Tribander Beams

Only the best tri-band antennas become DX classics, which is why the Cushcraft World-Ranger A4S, A3S, and A3WS go to the head of the class. For more than 30 years, these pace-setting performers have taken on the world's most demanding operating conditions and proven themselves every time. The key to success comes from attention to basics. For example, element length and spacing has been carefully refined over time, and high-power traps are still hand-made and individually tuned using laboratory-grade instruments. All this attention to detail means low SWR, wide bandwidth, optimum directivity, and high efficiency -- important performance characteristics you rely on to maintain regular schedules, rack up impressive contest scores, and grow your collection of rare QSLs!

It goes without saying that the World-Ranger lineup is also famous for its rugged construction. In fact, the majority of these antennas sold years ago are still in service today! Conservative mechanical design, rugged over-sized components, stainless-steel hardware, and aircraft-grade 6063 make all the difference.

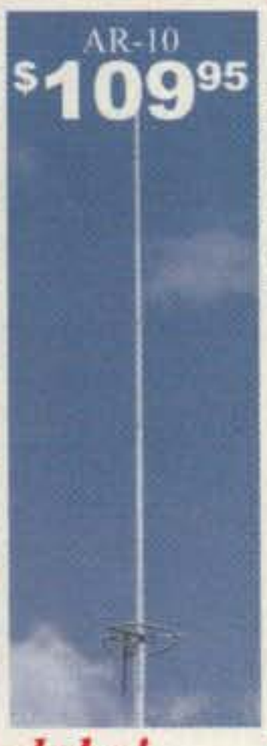
The 3-element A3S/A3WS and 4-element A4S are world-famous for powerhouse gain and super performance. **A-3WS, $499.95,** 12/17 M. **30/40 Meter** *add-on kits* available.

Cushcraft Dual Band Yagis

One Yagi for Dual-Band FM Radios

Dual-bander VHF rigs are the norm these days, so why not compliment your FM base station with a dual-band Yagi? Not only will you eliminate a costly feed line, you'll realize extra gain for digital modes like high-speed packet and D-Star! Cushcraft's A270-6S provides three elements per band and the A270-10S provides five for solid point-to-point performance. They're both pre-tuned and assembly is a snap using the fully illustrated manual.

Cushcraft Famous *Ringos* Compact FM Verticals



W1BX's famous *Ringo* antenna has been around for a long time and remains unbeaten for solid reliability. The Ringo is broad-banded, lighting protected, extremely rugged, economical, electrically bullet-proof, low-angle, and more -- but mainly, it just plain works! To discover why hams and commercial two-way installers around the world still love this antenna, order yours now!

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announcements

The following Special Event stations are scheduled for January:

K3Y, from The Straight Key Century Club (SKCC) celebration of five years of growth, to over 7200 members on CW; operation in all call areas from 0000Z Jan. 1 to 23:59Z Jan. 31 on 1.820, 3.550, 7.055, 10.120, 14.050, 18.080, 21.050, 24.910, 28.050, and 50.090 MHz (±10 kHz). Stations contacted may request a special K3Y QSL. Send name and address to: Dan Rhodes, KA3CTQ, 618 Seminole Dr, Erie, PA 16505. Contact: Roger Kepner, W6SQQ, SKCC PIO <w6sqq@sbcglobal.net>; <www.skccgroup.com>.

W9LY, from 2011 Boy Scout Klondike Derby Camp Topenebee, Michigan City, Indiana; Michigan City ARC; 1500–2100Z Jan. 8 on 14.240, 7.240, 3.940, 14.070 PSK. QSL to Michigan City ARC, P.O. Box 148, Michigan City, IN 46361.

WØJH, from Lake Mille Lacs Ice Fishing Shack Special Event, northern Minnesota; Stillwater (Minnesota) Amateur Radio Association; 2100–2100Z Jan. 14–16 SSB on 21.358, 14.258, 7.258, 3.858 MHz. QSL certificates will *only* be sent via e-mail. Complete "eQSL Request Form" at: <www.radioham.org>. You do *not* have to send a printed QSL card. Required QSO information includes: callsign, date, time, frequency, RST report, etc. A file with 8.5 × 11 color QSL certificate suitable for printing will be sent to you via e-mail.

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

Jan. 8, **FirstFest Swap Meet,** Summit School Athletic Center, Winston-Salem, North Carolina; Forsyth Amateur Radio Club. Free coffee and donuts, tailgating at no additional cost, free parking. Admission $5 at gate; coupon available through <http://www.worldradio.w4nc.org>. Tables must be reserved ahead of time. Information: <http://www.w4nc.org> or (336) 245-5740.

Jan. 9, **Ham Radio University 2011,** Briarcliffe College, Bethpage, Long Island, New York. Sponsored by the Kings County Repeater Association in conjunction with the ARRL New York City/Long Island Section. Complete details and fourm list: <http://www.HamRadioUniversity.org>.

Jan. 14–15, **Cowtown Hamfest**, Lockheed Martin Recreation Area, Fort Worth, Texas; Lockheed Martin ARC. Contact david Forbes, KC5UYR, e-mail: <KC5UYR@compuserve.com>; <www.cowtownhamfest.org>. (Talk-in 147.28 tone 110.9; exams Sat.)

Jan. 29, **2011 146.580 Group Albuquerque Winter Tailgate,** rear parking lot of the Transcore Amtech Technology Center, Albuquerque, New Mexico. For more information, contact Tom Ellis, K5TEE, at (505) 259-6281 or e-mail: <k5tee@arrl.net>.

Jan. 29, **Hamfest-Raffle-Winter Field Day,** Palm Springs, California; Desert Rats (WD6RAT) and Palm Springs DX Club. Info: <http://www.desertrats.am>. (Talk-in 146.940– PL 107.2)

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ham radio news

(from page 2)

include experiments of interest to hams. The AMSAT News Service reportst that FASTRAC, built by students at the University of Texas at Austin, includes a GPS experiment that will rely on participation by hams monitoring and relaying its transmissions; when the experiment is complete, the satellite will be reconfigured for general amateur packet radio use.

The RAX (Radio Aurora eXplorer) satellite will use a radar receiver to monitor select bandwidths in the 400-500 MHz range, including the 70cm. amateur satellite band, to study phenomena that affect space radar and ground-to-space communications; the amateur radio phase of the mission is still under development. RAX was built at the University of Michigan.

NanoSail-D is a NASA mission testing solar sail technology. It will transmit a beacon signal every five seconds on 437.270 MHz. O/ORES is another NASA mission, this one conducting research on microorganisms in space. It also has a ham-band beacon, on 437.305 MHz.

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.

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IC-V8000 2M Mobile Transceiver

• 75 watts • Dynamic Memory Scan (DMS) • CTCSS/DCS encode/decode w/tone scan • Weather alert • Weather channel scan • 200 alphanumeric memories

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IC-2820H Dual Band FM Transceiver

• D-STAR & GPS upgradeable 2M/70CM • 50/15/5W RF output levels • RX: 118-173.995, 375-549.995, 810-999.99 MHz** • Analog/digital voice with GPS (optional UT-123) • 500 alphanumeric memories

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IC-7800 All Mode Transceiver

• 160-6M @ 200W • Four 32 bit IF-DSPs+ 24 bit AD/DA converters • Two completely independent receivers • +40dBm 3rd order intercept point

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IC-7600 All Mode Transceiver

• 100W HF/6m Transceiver, gen cov. receiver • Dual DSP 32 bit • Three roofing filters- 3, 6, 15khz • 5.8 in WQVGA TFT display • Hi-res real time spectrum scope

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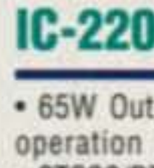

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• 2M/70CM @ 5W • Wide-band RX 495 kHz - 999.9 MHz** • 1304 alphanumeric memories • Dualwatch capability • IPX7 Submersible*** • Optional GPS speaker Mic HM-175GPS

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• 1.8-24MHz + 6M Amp • 1KW amplifier • 100% duty cycle • Compact body • Detachable controller • Automatic antenna tuner

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IC-7200 HF Transceiver

• 160-10M • 100W • Simple & tough with IF DSP • AGC Loop Management • Digital IF Filter • Digital Twin PBT • Digital Noise Reduction • Digital Noise Blanker • USB Port for PC Control

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• 2M @ 5.5W • Loud BTL audio output • Military rugged • Classic 2M operation

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$10 HRO COUPON!

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• D-STAR DV mode operation • DR (D-STAR repeater) mode • Free software download • GPS A mode for easy D-PRS operation

$5 HRO COUPON!

IC-T70A Dual Band FM Transceiver

2M + 70CM • 5/2.5/0.5 Watts Output Power • RX: 136-174, 400-479 MHz** • 302 Alphanumeric Memory Channels • 700mW Loud Audio • Ni-MH 7.2V/1400mAh Battery

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If you enjoy operating in CQ's WPX Contest (2010 SSB results in this issue), you might enjoy it even more once you know its 55-year history, and its role in promoting the use of single sideband on the amateur HF bands.

History of the CQ WPX Contest

BY JOHN PESCATORE,* K3TN

For many years in ham radio, phone meant *amplitude modulation* (AM). When single sideband (SSB) began to appear after World War II, it was nearly as exotic then as today's newer modes such as Olivia or JT65. In 1956, *CQ* magazine began a column dedicated to promoting SSB. There were awards for working stations via SSB and at about the same time, *CQ* announced a new certificate for working stations with different prefixes—the first WPX award.

In November 1956, Bob Adams W3SW, editor of the SSB column, said *CQ* was considering holding an SSB "test" (contest) to be held in January '57. The rules for the contest were published in the SSB column in December '56 and looked very different from the WPX Contest we know today; the contest was split over two weekends with 24 hours of operation each and there were no multipliers at all!

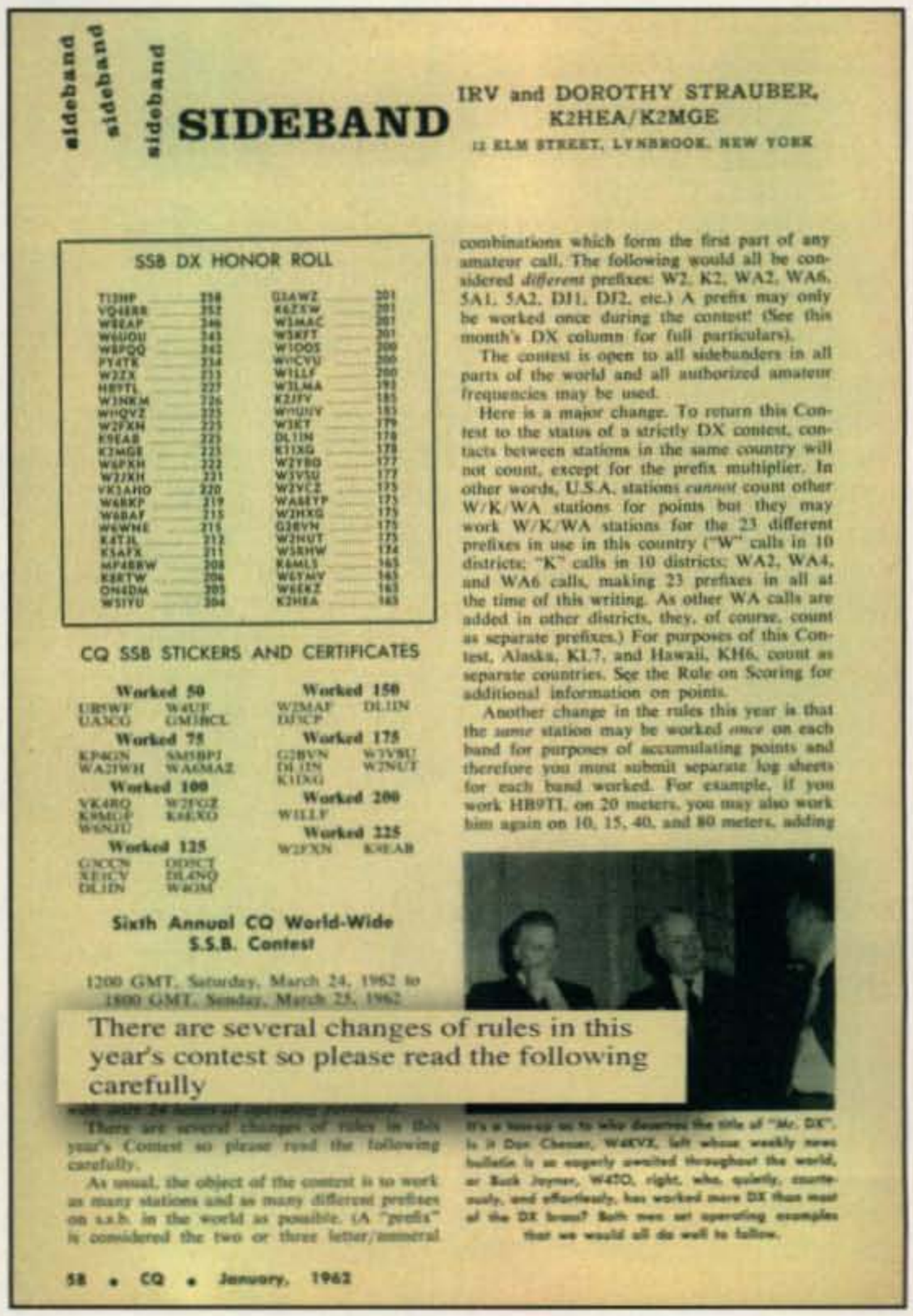
Approximately 500 logs were received, with the husband-and-wife team of Alex and Eva at CN8MM declared the winner. That first contest was deemed a success and another one was scheduled for 1958, this time using the same rules as the CQ World-Wide DX Contest. (Back then, CQ WW Phone meant CQ WW AM.) The second contest attracted only 400 logs, though scores were higher since there were now zone and country multipliers. The official results of the contest were never detailed, but the winner was once again CN8MM.

Adding Prefix Multipliers

To differentiate from the CQ WW contest, and since the WPX certificate program was proving to be popular, it was decided that the 1959 version of the contest (now called the CQ World-Wide Side-Band Contest) would use prefixes as the only multipliers. The contest ran for 24 hours in April with no rest period. HB9IE came in first with 612 QSOs. The 1960 contest once again was won from Morocco, this time by CN8JF with 751 Qs. The top U.S. score came from a call familiar to many contesters: Bill Leonard, W2SKE. Bill was later to drive many of the changes in the WPX contest rules that created the format we follow today.

In 1961, the husband-and-wife team of K2HEA and K2MGE took over both the SSB column and management of the contest. The 1961 contest was the first in which an off-time was required, with six consecutive hours of mandatory "quiet time" out of the now 30-hour contest period. It was won by ZS5JY with 712 contacts, but many complained about conditions for a contest in January and the lack of activity on the low bands. Back then, phone DXing and contesting on 40 and 80 meters were not common and the SSB contest rules were Sweepstakes-like; you could only work stations once per contest, which further discouraged low-band operation. Plus, the prefix multiplier meant U.S. stations could just work U.S. stations all contest long, taking away the DX flavor of the contest. For the 1962 contest, W2SKE came up with some familiar-sounding rules to address those issues:

- The contest was moved to the last full weekend in March.
- Contacts between stations in the same country would



sideband sideband sideband **SIDEBAND**

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VQ4ERR	252	K6ZXW	201
WB2AAP	246	W3MAC	201
W6UOU	243	W3KFT	201
WB2QQ	242	W1OOS	200
PY4TK	234	W1CVU	200
W2ZX	233	W1LLF	200
HB9TL	227	W3LMA	193
W3NKM	226	K2JFV	185
W1QVZ	225	W1QUV	183
W2FXN	223	W3KT	179
K9EAB	223	DL1IN	178
K2MGE	223	K1IXG	178
W6PXH	222	W2YBD	177
W2JXH	221	W3VSU	177
VK3AHO	220	W2VCZ	175
W6RKP	219	WA8ETP	175
W6BAF	215	W2HXG	175
W6WNE	215	G3BVN	175
K4TJL	212	W2NUT	175
K5AFX	211	W5RHW	174
MP4BBW	208	K6MLS	165
K8RTW	206	W6YMV	165
ON4DM	205	W6EKZ	163
W5IYU	204	K2HEA	163

CQ SSB STICKERS AND CERTIFICATES

Worked 50
UB5WF W4UF
UA3CG GM3BCL

Worked 75
KP4GN SM5BPJ
WA2IWH WA6MAZ

Worked 100
VK4RO W2FGZ
K9MUF K4EXO
W6NJU

Worked 125
G3CCN OD5CT
XE1CV DL4NQ
DL1IN W4OM

Worked 150
W2MAF DL1IN
DJ5CP

Worked 175
G2BVN W3VSU
DL1IN W2NUT
K1IXG

Worked 200
W1LLF

Worked 225
W2FXN K9EAB

Sixth Annual CQ World-Wide S.S.B. Contest

1200 GMT, Saturday, March 24, 1962 to 1800 GMT, Sunday, March 25, 1962

combinations which form the first part of any amateur call. The following would all be considered *different* prefixes: W2, K2, WA2, WA6, 5A1, 5A2, DJ1, DJ2, etc.) A prefix may only be worked once during the contest! (See this month's DX column for full particulars).

The contest is open to all sidebanders in all parts of the world and all authorized amateur frequencies may be used.

Here is a major change. To return this Contest to the status of a strictly DX contest, contacts between stations in the same country will not count, except for the prefix multiplier. In other words, U.S.A. stations *cannot* count other W/K/WA stations for points but they may work W/K/WA stations for the 23 different prefixes in use in this country ("W" calls in 10 districts; "K" calls in 10 districts; WA2, WA4, and WA6 calls, making 23 prefixes in all at the time of this writing. As other WA calls are added in other districts, they, of course, count as separate prefixes.) For purposes of this Contest, Alaska, KL7, and Hawaii, KH6, count as separate countries. See the Rule on Scoring for additional information on points.

Another change in the rules this year is that the *same* station may be worked *once* on each band for purposes of accumulating points and therefore you must submit separate log sheets for each band worked. For example, if you work HB9TL on 20 meters, you may also work him again on 10, 15, 40, and 80 meters, adding

There are several changes of rules in this year's contest so please read the following carefully

There are several changes of rules in this year's Contest so please read the following carefully.

As usual, the object of the contest is to work as many stations and as many different prefixes on s.s.b. in the world as possible. (A "prefix" is considered the two or three letter/numeral

It's a toss-up as to who deserves the title of "Mr. DX". Is it Don Chesser, W4KVX, left whose weekly news bulletin is so eagerly awaited throughout the world, or Buck Joyner, W4TO, right, who, quietly, courteously, and effortlessly, has worked more DX than most of the DX brass? Both men set operating examples that we would all do well to follow.

58 • CQ • January, 1962

Major changes came to the CQ SSB Contest (now the WPX Contest) in 1962, suggested by Bill Leonard, W2SKE, including moving the contest to March and allowing contacts with in one's own country to count only for multiplier credit.

**1515 Lost Creek Dr., Ashton, MD 20861*
e-mail: <jpescatore@aol.com>

count for zero points, but would count as prefix multipliers.

• Contacts on 40 and 80 meters would be worth twice as much as high-band contacts.

• Stations could now be worked once per band, although prefixes would only count once as multipliers.

The rule changes were a big success, with 4X4DK winning with a whopping 1774 QSOs. For the next several years the rules stayed fairly stable, with the addition of a multi-op category being the major change. A lot of operators began to chafe at the mandatory 6-hour off-time as solar Cycle 20 began to improve. The rules were tweaked to allow 30 hours of operating over a 48-hour period with multiple shorter off times. Over this period, DL3LL came in first for three years in a row and some familiar calls began to show up in the results: W4BVV, K3UDX (Rush Drake, later W7RM), W3MSK, W3AZD, W6AM, W3GRF, and K2HLB (Don Miller) among them. The first disqualification for dupes appeared in 1967.

The Middle Years

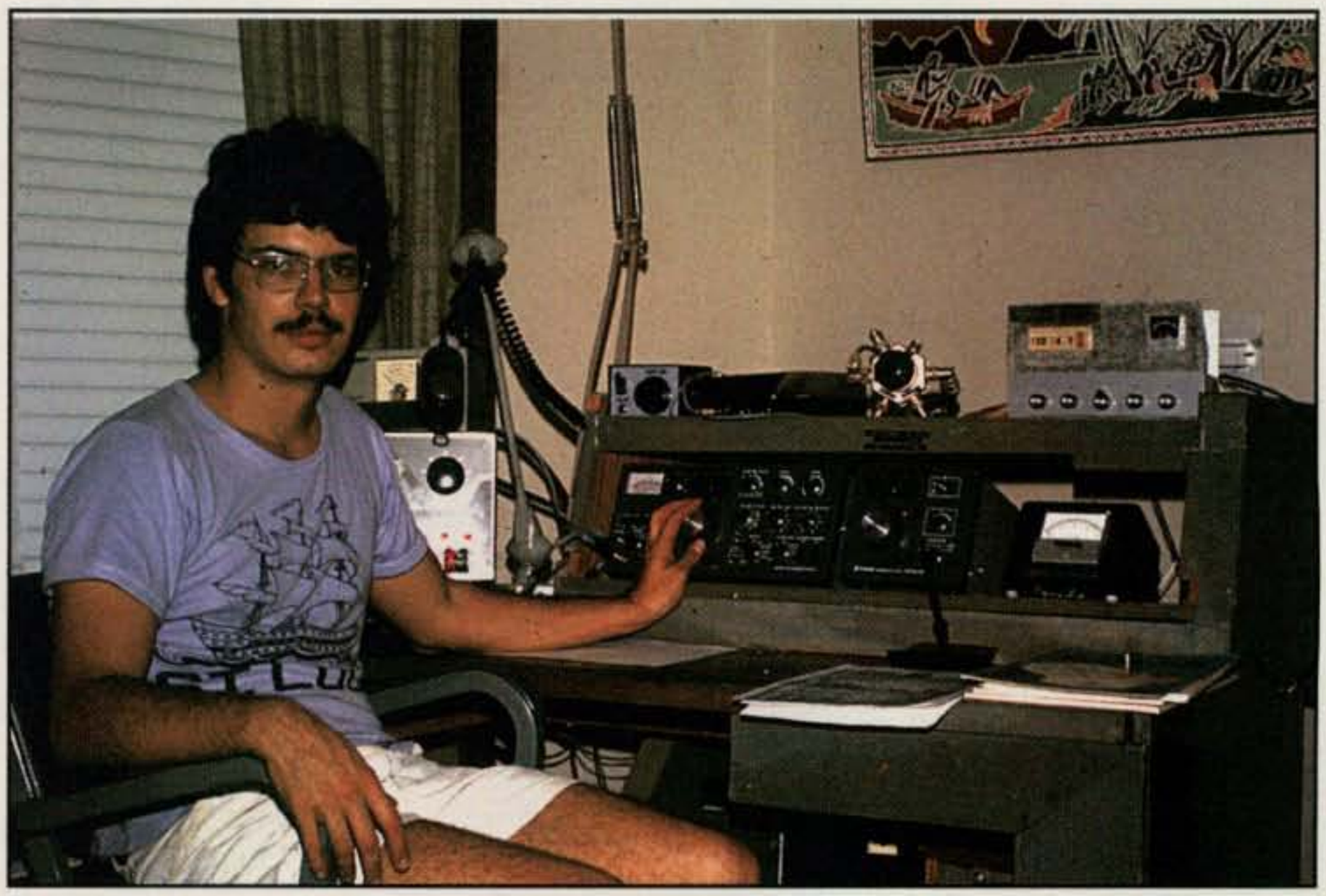
In 1968, the name of the contest was changed to "CQ WPX Phone," marking the first use of the WPX term in the name. K4FMA as ET3FMA won with 1870 contacts, and KH6IJ made an appearance in the top ten. Brazil began to allow many new prefixes, greatly increasing the available multipliers, while Cycle 20 opened up the high bands. In 1968, the multi-operator, multi-transmitter (multi-multi) category was added. In 1969, KV4FZ took the top position with a phenomenal 3144 QSOs, with Bob Cox, K3EST, at W3MSK taking fifth worldwide and top U.S. In 1970, Jack Reichert as PJ9JR took top honors, with OH2BH and K4BAI making appearances in the results.

CQ WPX SSB stayed pretty stable through the early 1970s with minor date changes and rule tweaks. W2PV, often operated by WB2SQN, began to consistently win top USA honors. W8IMZ took over contest management duties in 1974, while in 1976 the USA bicentennial prefixes doubled the number of available multipliers. In 1978 the QRP and club categories were added, and K3ZO, K7SS and W9LT made their first appearances in the results. Eric, K3NA, operated the old W3LPL station to first place USA (see sidebar.)

Adding CW

The growing popularity of the WPX test led to a CW version being added for the first time in 1979. K7JA at KG6SW took top worldwide in that inaugural WPX CW test (a rare win from Oceania), with AE4H taking top honors in the U.S. More familiar contesting calls began to show up in the results: G3FXB, G4BUE, ON4UN, K5RC, K5ZD/4, W9WI. In 1980, N4RV at PJ2CC took SSB worldwide, breaking the 4000 QSO barrier, while K1AR made his first appearance in the winners' box, taking top U.S. SSB with 2537 QSOs. N6CW at KP2D won worldwide CW, with K1GQ top U.S. WB4SGV (now KT3Y) made his first appearance in the results.

The controversial 10-minute rule for multi-single entries showed up for the Silver Anniversary version of the WPX



A very young-looking Chip Margelli, K7JA, won the first WPX CW contest in 1979, operating from Guam as KG6SW. (Photo courtesy K7JA)

K3NA on His WPX Experience from W3LPL

In 1977, Eric, K3NA, operated W3LPL to first place U.S. and followed up in 1978 with second place U.S. Here are some of Eric's reflections on the WPX Contest in the "old days":

These contests were done from Frank's station in Crownsville, Maryland, at just about the time Frank was contemplating switching to M/M. I had a chance to do some S/O SSB operations, as Frank was less interested in making a serious effort on phone. As a relatively new PVRC *(Potomac Valley Radio Club—ed.)* member, it was great experience to operate from a well-equipped single-op station. This was a chance to test some hypotheses on maximizing results as a single op. With the 36-hour limitation in effect, a major issue was juggling time-off periods. Another strategy trade-off was balancing the richer point value of low-band QSOs vs. the deeper volume available on the high bands. As I was accustomed to continuous (or close to continuous) 48-hour operations, it felt a little odd to be wandering around the yard on Sunday afternoon, killing time during a (hopefully) slow part of the contest.

Without voice keyers, I inevitably finished the weekends with a rather hoarse voice. My colleagues at the office on Monday sometimes wondered if I had been out on a binge weekend, as I was bleary-eyed, not entirely together mentally, and spoke in a deep, rough whisper. Perhaps contest abuse isn't much different from alcohol abuse in this respect.

Around this time Frank added another AB-105 tower and invited me to work with him to learn tower-construction skills. One afternoon we were adding pieces to the top, now well above the tree level, when we started hearing a steady buzzing sound. No, neither bees nor wasps were responsible. The sound was corona discharge off the sharp corners of steel and the bolts. No threatening clouds were nearby, but we elected caution and climbed down about 150 feet of tower as quickly as we could—much faster than my usual leisurely pace! About three minutes after we hit the ground there was a loud electrical "snap!" and a fraction of a second later a clap of thunder. Rain arrived a few minutes thereafter. We were glad not to be on the tower for the nearby strike!

Looking back at my paper WPX logs, my custom-designed DX dupe sheet, and multiplier check-off sheet, those pre-computer days seem rather like working with stone knives while clad in bear skins. Still fun, but today is even more fun! *—Eric, K3NA*

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contest in 1981. KC1F dominated the U.S. CW results in 1982–1984, while the worldwide results showed a different winner each year. N8BJQ took over running the WPX contest in 1983, and in 1986, N6KT at PJ2FR was the first to smash through the 4000 QSO and 800 mult barrier as he took the SSB worldwide title. More familiar calls in the results: W3BGN, KM3T, WN4KKN, K4PQL, KK9A, KRØY.

The KQ2M Years

When I was a kid, I used to think the World Series meant some team playing the New York Yankees. From 1987 to 2005, WPX SSB USA honors pretty much meant seeing who could come even close to KQ2M. Bob had a remarkable string over that period, winning WPX SSB 16 out of 19 years, including winning seven years in a row *twice*! (See sidebar.) Over nearly two decades, only WM2H, KM3T, and K4XS (at WK4R) beat KQ2M on SSB in the U.S. Bob even threw in four CW wins, with only KT3Y having as many U.S. CW wins over that period.

There was no single call dominating the worldwide scores to such an extent over that period, but from 2003 to 2005, 4L5A at D4B took top worldwide honors in both modes. YT1AD at 3V8BB was a frequent winner in both modes, while N6KT, AI6V, and KW8N won multiple times from various South American and southern Caribbean locations. Various rule changes were made over that period:

- 60-minute off-periods were standardized in 1987.
- In 1992, a low-power category was added and operating time was increased from 30 to 36 hours.
- The assisted category was added in 1993 after many complaints about packet cheating.
- In 1995, the "overlay" categories for rookie status and simple antenna configurations were added.
- In 1999, the rules were changed to make same-country QSOs worth 1 point each.

The rule changes and growing popularity of the WPX contest (along with Cycle 22) drove sharp increases in scores over this time. KW8N (at KP2A) broke the 5000 QSO barrier in 1989; AI6V (P40V) broke 1000 multipliers in 1990; N6KT (HC8A) reached 6887 Qs in 1992 and 1199 mults in 2001.

You could also call this period the "PC years." In 1990, N8BJQ said, "It is now OK to submit logs on disk" and by the next year more than 100 logs came in that way. The 1991 results showed the first mention of K1EA's CT logging software and the first complaints about packet clusters! This move to electronic logs facilitated deeper log checking and N8BJQ began to warn about uniques and busted calls in 1993. In 1995, 60 logs came in directly over the internet and the TR and NA programs were added to the mix. By 2000,

Reflections from Multi-WPX Champ KQ2M

I've always loved this contest. I first operated WPX back in 1975 when I was 14 as WB2SJG from a small low-power home station with low wire antennas. (*Even so, Bob came in third in the U.S., after W2PV and K3EST (at K4VX)—ed.*) Back then, some contesters looked down on WPX as a second-tier contest, but I always thought it was one of the most difficult and challenging contests because of the mandatory off-times and the need to work zero-point QSOs for multipliers. It was also the most fun, especially for a little station.

Years later, with the addition of the one-point U.S.-U.S. QSO rule and the increase of single-op operating time to 36 hours, scores and activity *exploded*! The combination of equinoctial propagation (WPX SSB is near the Spring Equinox) and the event's large international following has made it a great DX contest. The "everyone can work everyone" format means that you can find people to work at any time of day or night, and now with ability to work DX direct on 40 with the elimination of most of the broadcast stations, there are even more *fun* strategy decisions to make.

You don't really need a superstation to be competitive or even to win. My first win was in 1987 from KM1H, which was a single tower with mono-banders—nice, but not a superstation. Over the years, a lot of folks have guest-operated at big stations on the east coast and found that WPX is not a contest in which the loudest station who hits the F1 key on the computer the most often wins. Maximizing prefixes and points makes WPX a thinking contest.

Remembering 2001. Probably the year I remember most is the 2001 WPX SSB. It was at the top of the solar cycle and a big solar flare hit. The auroral oval was at 10 (the highest reading), and all I heard at the start was a weak W4MYA on 20. I worked him and turned off the radio. At 0530 I went back and operated 80 for 30 minutes, but conditions were still awful, so I turned off the radio and went to bed.

In the morning I spent time with my family, but at about 1500Z I turned on the radio. Fifteen was great and I had a 200+ Qs per hour! So I just had fun running people. Since I'd already been QRT more than the required off-time, I had no expectations of being competitive. Six hours later, my wife stuck her head in and said, "Hey, I thought you weren't going to operate," but the bands were wide open in every direction and I was rolling, running an endless stream of EU and U.S. on 15 followed by an all-night run on 20! The next time I looked up it was 0600 and I decided to just go for it. I ran continuously with no more off-time until the end of the contest, mostly ignoring 40 and 80. I ended up with only 33.5 hours of operating time, but I passed everyone on Sunday and won the contest!

It should be noted that propagation, and therefore operating strategies, are completely different for WPX CW compared to WPX SSB in the northeast USA. In fact, I can say that I have never operated WPX CW the same way twice. That simply adds to the challenge and the fun, along with the ever-increasing activity level and the number of prefixes to work. Now WPX is widely considered to be a major DX contest and I am pleased to see that the big single ops and the big multi-ops make it an annual operating event.

Strategy & Suggestions. The most important strategy is to maximize points per hour. I've operated SO2R from the very beginning. In WPX it is critical to be on multiple bands and target multiple geographic regions at all times. You can always work U.S. prefixes somewhere at the same time you are working DX stations for higher points. I always maintain a sense of urgency; since this is a contest, there is nothing casual about it. I try to treat each minute as if it was the last minute in the contest. If after 54 seconds have passed, I have worked five stations in that minute, and then I want to make it six! At 0 seconds, the next minute starts "fresh."

There are two things I would change about the WPX contest: (1) Removing the single-op. off times. Twelve more hours of operating would be 12 more hours of higher activity, bigger scores, and more fun! (2) Since the scoring system favors the rest of the world over the U.S. (2 points/Q for DX vs. 1 point/Q for U.S.-U.S. Qs), I would also like to see the plaque system changed so that U.S. stations can win North America and World plaques, since if you can overcome a large scoring disadvantage and win North America or the World, you should be rewarded with a plaque!

Having operated and actively contributed to the WPX contests for nearly 35 years, I am very pleased to see that WPX has a lot more cachet today. Over the years, a lot of big contesters have discovered WPX, and even more joined in when the WRTC *(World Radiosport Team Championship—ed.)* made WPX a scoring contest for WRTC qualification. What a great contest!

73 and thanks for the Qs! *—Bob, KQ2M*

Bob Shohet, KQ2M, dominated the WPX SSB Contest in the U.S. from 1987 to 2005. (Photo courtesy KQ2M)

disk or electronic logs were required if computer logging was used and the Cabrillo format made its debut in WPX.

The Modern Era

As solar Cycle 23 faded away after 2005 (and solar Cycle 24 looked like it was in no hurry to appear), the number of logs submitted and callsigns active in the contest continued to grow, despite weak band conditions. W2SC (at 8P1A/8P5A) started a KQ2M-like trend, winning SSB worldwide honors in 2006, 2007, and 2008. YT1AD took 3V back to worldwide dominance in the CW contest (see sidebar), until LY2CY brought back the title to D4. Various "ones" (K5ZD as AK1W, WC1M, K1TO, and K1ZM) took turns winning U.S. CW honors. In 2007, K5ZD took over management of the contest and began to use the latest communication media such as blogs and Twitter.

This year marks the 55th running of the CQ WPX Contest, far more complex, sophisticated, and popular today than at its start in the late 1950s. If you enjoy contesting, collecting prefixes, or just getting on and "working some new ones," this is a great way to spend all or part of a spring weekend (or two)!

Sources:

CQ magazine's HamCall archives
K1DG writeup
Phone discussion with N8BJQ

DX Perspective: Hrane Milosevic, YT1AD

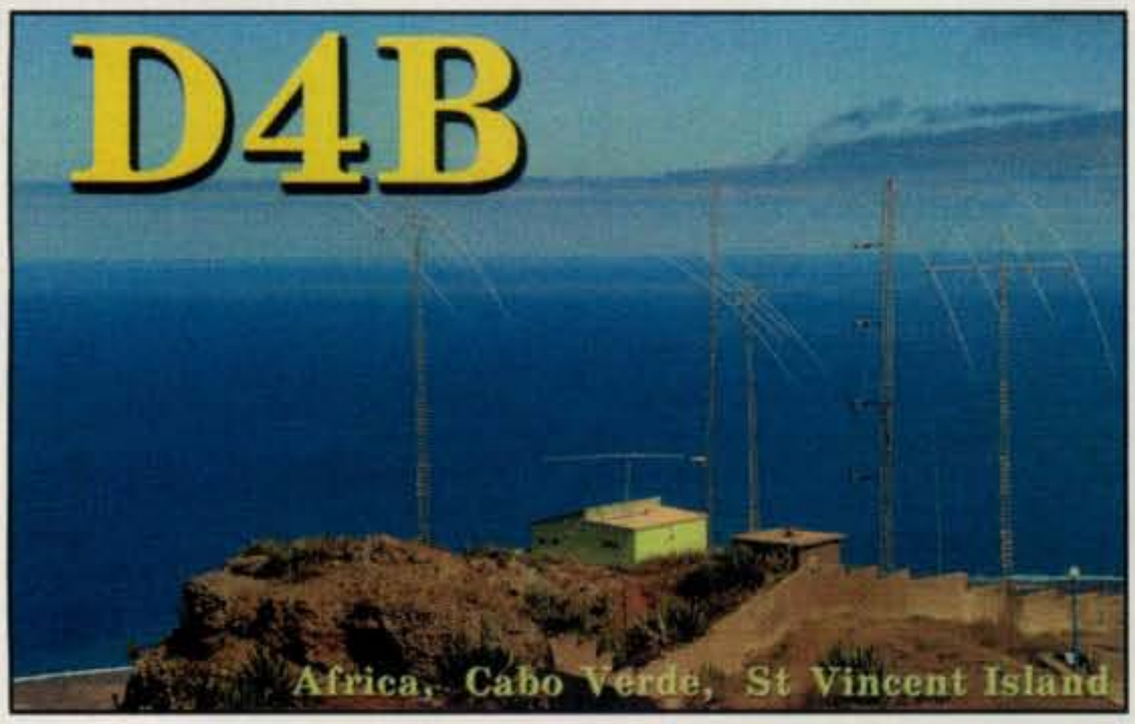
I've been operating CQ WW and CQ WPX contests for close to 40 years, doing more than 60 contests from 3V (Tunisia) over that time. I like all contests, but CQ WPX is a more humane contest; now that I am 50 years old I like the 12 hours of required off time!

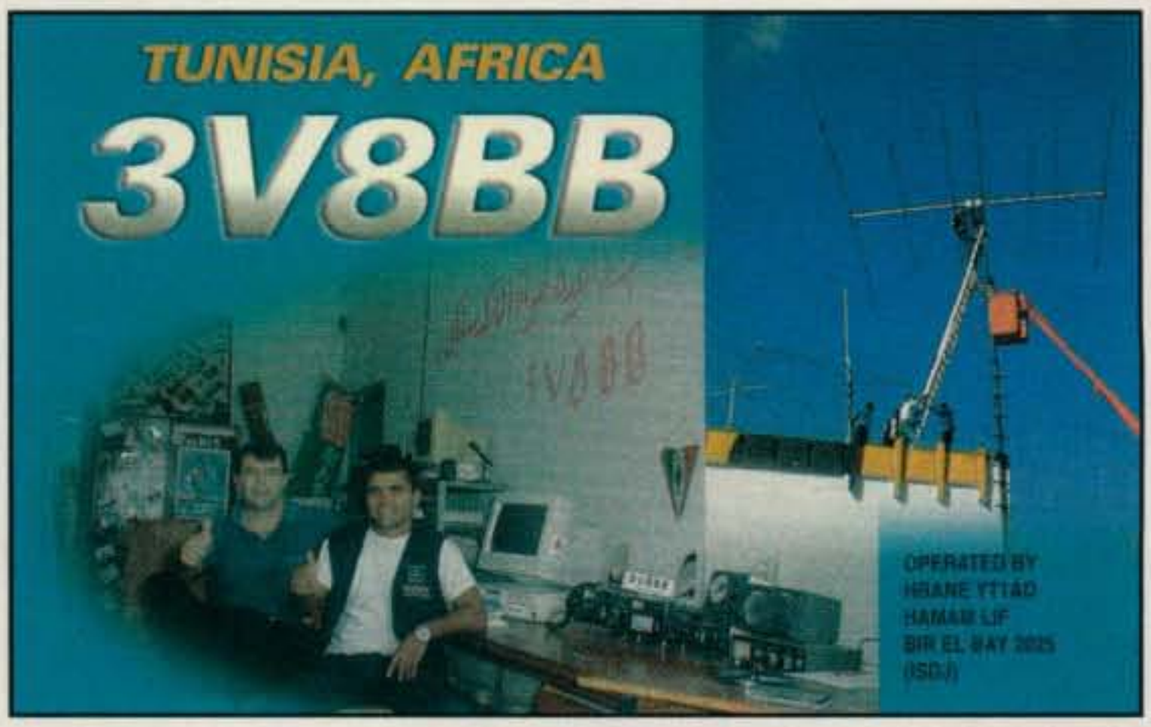
I have won both CQ WW and CQ WPX from 3V, and while the WW and the WPX are two very different contests, my strategies are not that much different. In all contests you have to run (*staying on one frequency and calling CQ—ed.*) as much as possible and not use up too much time searching for multipliers. In WW, you have to make decisions about which bands to be on to maximize those zone and country multipliers per band. In WPX, you have to make decisions about which bands to be on to maximize rates and the multipliers come to you. One year, I came in second because I spent too much time searching for multipliers.

The knowledge of propagation and conditions is very important. Knowing which bands will be open at what times under what conditions to which parts of the world is a very important strategy. I have been operating from 3V since 1995 and have much experience with the propagation paths to make the best choices. I have made over 350,000 QSOs from 3V by focusing on just maximizing rate at all times in all contests.

I love ham radio and contesting and have spent a lot of time and too many dollars not to have fun. Since Tunisia is a new DXCC country for many, I enjoy working everyone, especially in a "humane" contest such as WPX! There is always much discussion about the negative behaviors in contesting, but if everyone follows the spirit of ham radio and contesting, it is very enjoyable.

—73, Hrane YT1AD





In the mid-2000s, D4B (4L5A op.) and 3V8BB (YT1AD op.) generally ended up in the logbooks of even the most casual WPX contesters, as they dominated the worldwide competition. (QSLs courtesy W2VU, a most casual WPX contester)

Results of the 2010 CQ WW WPX SSB Contest

BY RANDY THOMPSON,* K5ZD

The sun came up on the new solar cycle and gave participants in the 52nd edition of the CQ WPX SSB Contest a taste of better conditions to come. Fred, K3ZO, put it this way: "Just when you think conditions couldn't possibly get any better, they do." Sunspot group 1057 helped keep the flux "elevated" at 86 to 88 and produced some excellent openings. Fred, KH7Y, commented, "15 meters was fantastic all weekend long, with long path into Europe both nights." Even 10 meters showed some life, with KU5B working three JAs and one European. Thirteen stations made over 1000 QSOs on 10 meters.

Some "cloudy" space weather moved in on Sunday to disrupt the bands for awhile, but many stations still reported unusual or interesting openings on 10 and 15 meters. Of course, as the high bands went down, the crowds on 20 and 40 meters returned. The QRM was fierce, with stations stacked three or four deep at times. There is little you can do but tighten up those filters and listen harder.

Log submissions were up for the sixth year in a row, with 4759 logs received. Single Operator Low Power remains the largest category, with 2160 entries. There were 900 entries in the Assisted category, showing the continuing integration of the internet and DX cluster into contesting and DX chasing. Having so many categories to choose from is part of what makes WPX so much fun.

You want special prefixes? We have them. The WPX SSB Contest had more prefixes active this year than ever before. The multi-multi operation at DR1A set a new prefix record with 1747—a big jump over the 10-year old record of 1528 held by OTØA. In the single-operator category, it was CN2R with 1373, followed closely by ZX5J (1369) and 8P5A (1358). Some of the more unusual callsigns that submitted logs included 3Z8ØPZK, 8N5A, BXØWPX, DR775TMG, HA1ØØKONE, L6ØDK, LY11MM, OF5ØRR, PI65BRD, SN5ØSPP, SP8ØPZK, TC2Ø1ØCCI, TM57M, VP5ØV, YP1WFF, YU4ØMM, and ZS1ØWCS.

Rytis, LY4U, and Gintaras, LY2NI, operating LY2W to over 10 million points in the Multi-Two category.

Single-Op All Band High Power

The top three scorers in the Single Operator All Band High Power category all finished in identical order as in 2009. The repeat winner and new world record holder was CN2R, operated by Jim, W7EJ. Jim now owns five world records in the WPX SSB contest. Tom, W2SC, operated 8P5A to a new North American record. Tom had a fantastic start with 332 contacts in the first hour! (Move 8P5A just 200 miles south into South America and it would have added 5-million points to Tom's final score. Such is the challenge of continent-based scoring.) In third place, and far from any continental boundary, was Bill, KH7XS, who increased his Oceania record by nearly 3-million points. Bill had some competition from Mike, KH6ND, operating as WH6V. John, VE3EJ, had a very impressive score in sixth place.

Kamal, N3KS, once again visited WY3P to take the top spot in the USA and set a new all-time record. Alex, LZ4AX, who piloted KC3R to second place, didn't intend to operate the whole contest, but changed his mind after the first million points were in the log. The next two spots belonged to the middle of the country, with Jerry, WB9Z, in Illinois just getting by George, NR5M, in Texas. Paul, K8PO, operated as AJ1I to round out the top five. John, N7TT, was the sole West Coast representative in the USA Top Ten.

Braco, E77DX, operated as E7DX to make the world Top Ten and break the European record set back in 2001. Braco did antenna repair work all day on Friday before the contest and it paid off with the win. Last year's European champion Chris, MIØLLL, operating GI5K, had his attempt to repeat fall short, despite increasing his score by 30%! Ranko, 4O3A, finished third just 100k points ahead of LX7I (op. DJ8OG).

Single-Op All Band Low Power

The P4ØA winning streak of six years ended with a new P4 station at the top of the low power standings. Andy, AE6Y, operated P49Y to a commanding lead while finding the switch to low power to be a humbling experience: "A big difference with low power is that it is harder to keep a frequency, particularly on 40 and 80." He enjoyed the improved conditions by starting the contest on 10 meters with 157 QSOs. Two North Americans were next. Ted, HI3TEJ, finished second, with most of his contacts on 20 and 15 meters. Dave, W5CW, operated VP5ØV to give everyone a multiplier. New contester JY5CC did a great job to finish fourth in only his third international contest.

Competition for top USA score was another episode in the low power rivalry between Art, K1BX, and Ed, N1UR. Art used KR5X for his first full WPX effort. Ed used NV1N and made his highest score ever, but it was not enough and he came in second. Third place came from out west, with John, K6AM, enjoying the good conditions from NX6T. Jere, KT4ZB, and Doug, WB8TLI, were first time visitors to the USA Top Ten.

As in 2009, the top two low power scores in Europe came from Gedas, LY9A, ahead of Vlad, RW1CW. Vlad was much closer

*e-mail: <k5zd@cqwpx.com>

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TROPHY WINNERS AND DONORS

SINGLE OPERATOR ALL BAND

WORLD: Stanley Cohen, W8QDQ Trophy. Won by: **CN2R operated by James P Sullivan, W7EJ**
WORLD Low Power: Caribbean Contesting Consortium Trophy. Won by: **P49Y operated by Andrew Faber, AE6Y**
WORLD QRP: Phil Krichbaum, NØKE Trophy. Won by: **YW2LV operated by Ymanol Caires Zubicaray, YV5YMA**
USA: Atilano de Oms, PY5EG Trophy. Won by: **WY3P operated by Kamal Sirageldin, N3KS**
USA Low Power: Terry Zivney, N4TZ Trophy. Won by: **KR5X/1 operated by Art Hambleton, K1BX**
USA QRP: Doug Zwiebel, KR2Q Trophy. Won by: **Randy Shirbroun, NDØC**
USA Zone 4 High Power: Society of Midwest Contesters Trophy. Won by: **Jerry Rosalius, WB9Z**
USA Zone 4 Low Power: Society of Midwest Contesters Trophy. Won by: **Doug Friend, WB8TLI**
USA Zone 3: Lauri "Mac" McCreary, KG7C Trophy. Won by: **John Gohndrone, N7TT**
EUROPE High Power: Jim Hoffman, N5FA Trophy. Won by: **E7DX operated by Emir Memic, E77DX**
EUROPE Low Power: Ed Sawyer, N1UR Trophy. Won by: **Gediminas Lucinskas, LY9A**
AFRICA: Peter Sprengel, PY5CC Trophy. Won by: **ST2AR operated by Robert Kasca, S53R**
ASIA: Chris Terkla, N1XS Trophy. Won by: **Masaki Okano, JH4UYB**
NORTH AMERICA: Albert Crespo, F5VHJ Trophy. Won by: **8P5A operated by Tom Georgens, W2SC**
NORTH AMERICA QRP: Phil Krichbaum, NØKE Trophy. Won by: **TI5N operated by Bill Parker, W8QZA**
OCEANIA: Phillip Frazier, K6ZM Memorial Trophy. Won by: **Bill Kollenbaum, KH7XS**
SOUTH AMERICA: Andrew Faber, AE6Y Trophy. Won by: **P41M operated by Stefan Giehle, DK1MM**
CANADA High Power: Todd Bendtsen, VE5MX Trophy. Won by: **John Sluymer, VE3EJ**
CANADA Low Power: Contest Club Ontario Trophy. Won by: **Yuri Onipko, VE3DZ**
JAPAN: Hamad Alnusif, 9K2HN Trophy. Won by: **Fumiaki Ogasawara, JA7BME**

SINGLE OPERATOR, SINGLE BAND

WORLD: Steve Merchant, K6AW Trophy. Won by: **ZX5J operated by Sergio Lima De Almeida, PP5JR**
WORLD 28 MHz: Jorge Taboada, EA9LZ Trophy. Won by: **PW5G operated by Walter Gomes Filho, PP5WG**
WORLD 21 MHz: Stuart Santelmann KC1F Memorial (W3UA/RA3AA sponsor) Trophy. Won by: **LP2F operated by Ezequiel Reinaldi, LU1FDU**
WORLD 14 MHz: Jorge Taboada, EA9LZ Trophy. Won by: **TM77M operated by Fontaine Laurent, F5MUX**
WORLD 7 MHz: Jorge Taboada, EA9LZ Trophy. Won by: **YT8A operated by Dusan Ceha, YU1EA**
WORLD 7 MHz Low Power: Neal Campbell, K3NC Trophy. Won by: **Slavko Celarc, S57DX**
WORLD 3.7 MHz: D4C Contest Team Trophy. Won by: **EI7M operated by Dmitrij Pavlov, LY3MM**
WORLD 1.8 MHz: UA2 Contest Club Trophy. Won by: **Dmitri Gorshkov, RW2F**
USA 28 MHz: Maurice Schietecatte, N4LZ Trophy. Won by: **Colin Jenkins, KU5B**
USA 21 MHz: Maurice Schietecatte, N4LZ Trophy. Won by: **WK5T operated by Steve London, N2IC**
USA 14 MHz: Charles Wooten, NF4A Trophy. Won by: **John Bayne, KK9A**
USA 7 MHz: Yankee Clipper Contest Club Trophy. Won by: **John F. Bagno, KD2RD**
USA 3.7 MHz: Bernie Welch, W8IMZ Memorial (WB8MRU sponsor) Trophy. Won by: **Larry Emery, K1UO**
EUROPE 28 MHz High Power: SKY Contest Club Trophy. Won by: **Aleksander Zagar, S57S**
EUROPE 21 MHz High Power: SKY Contest Club Trophy. Won by: **9A1P operated by Davor Kucelin, 9A1UN**
EUROPE 14 MHz High Power: SKY Contest Club Trophy. Won by: **SN7Q operated by Krzysztof Sobon, SP7GIQ**
EUROPE 7 MHz High Power: SKY Contest Club Trophy. Won by: **Remigijus Vaicius, LY8O**
EUROPE 3.7 MHz High Power: SKY Contest Club Trophy. Won by: **Emil Tafro, E71A**
EUROPE 1.8 MHz High Power: SKY Contest Club Trophy. Won by: **Fabio Piccinini, I4FYF**

SINGLE OPERATOR ASSISTED

WORLD: Emir-Braco Memic, OE1EMS Trophy. Won by: **CQ3L operated by Helmut Mueller, DF7ZS**
USA: Alabama Contest Group Trophy. Won by: **WU3A/1 operated by Gene Shablygin, W3UA**
EUROPE: Martin Huml, OL5Y Trophy. Won by: **OE3K operated by Ivan Dobrocky, OE3DIA**

OVERLAY CATEGORIES

WORLD Tribander/Single-Element: Helmut Mueller, DF7ZS Trophy. Won by: **Pál Vrbovszki, HA8JV**
USA Tribander/Single-Element: Paul Newberry, N4PN Trophy. Won by: **NXØX/4 operated by Paul H. Newberry, Jr., N4PN**
Europe Tribander/Single-Element: Roger Miner, K1DQV Trophy. Won by: **YLØY operated by Andris A. Blums, YL2GQT**
WORLD Rookie: Val Edwards W8KIC Memorial (K3LR sponsor) Trophy. Won by: **Abdalla Farmawi, JY5CC**

MULTI-OPERATOR, SINGLE-TRANSMITTER

WORLD: Latvian Contest Club Trophy. Won by: **5D5A operated by IK2QEI, IK2SGC**
USA: Steve Bolia, N8BJQ Trophy. Won by: **NG3R operated by AA5B, N3DXX, K9RS**
AFRICA: Rhein Ruhr DX Association Trophy. Won by: **6V7M operated by DL4JS, DL2JRM**
ASIA: W2MIG Memorial (NX7TT Sponsor) Trophy. Won by: **UPØL operated by UN9LW, RN4WA**
EUROPE: Tonno Vahk, ES5TV Trophy. Won by: **CQ8X operated by CU2CE, CU2DX, DL6LAU, N6RC, OH1TV, OH2BH, OH2UA, OH6KN, OH6RM, OH8NC**

MULTI-OPERATOR, TWO-TRANSMITTER

WORLD: Ken Adams, K5KA Memorial Trophy. Won by: **HC8GR operated by K1TO, K6NA**
USA: Florida Contest Group Trophy. Won by: **K1LZ operated by K1LZ, W1UE, K3JO, NU5Y, N8BO**
AFRICA: Walter Skudlarek, DJ6QT Trophy. Won by: **CR3A operated by CT3BD, CT3DL, CT3DZ, CT3EE, CT3EN, CT3KU, CT3KY**
EUROPE: Bernd Och, DL6FBL Trophy. Won by: **OL4A operated by OK1DO, OK1FFU, OK1RI, OK8WW, OM6NM**

MULTI-OPERATOR, MULTI-TRANSMITTER

WORLD: Gail M. Sheehan, K2RED Trophy. Won by: **EB8AH operated by EA5DFV, EA5DY, EA8AH, EA8CAC, EA8ZS, ES2RR, OH6RX**
USA: Dale Hoppe, K6UA Memorial Trophy. Won by: **NQ4I operated by W4SVO, W4LT, W4IX, K4NV, KD3P, K4PK, VE7ZO, KØEJ, I4LEC, K4BAI, K4TD, W4DD, WI4R, NQ4I, K4ST**
EUROPE: Rick Dougherty, NQ4I Trophy. Won by: **HG1S operated by HA1TJ, HA1DAC, HA1DAI, HA6NF, HA1DAE**

CONTEST EXPEDITION

WORLD: C6APR Memorial (PT7ZZ sponsor) Trophy. Won by: **V25Y operated by RV1CC, RA1AGL**

this year, but Gedas successfully defended his title. Cliff, SV1JG/SV8, was close behind in third. Fourth and fifth were almost a tie, with YO3CZW beating RV6LFE by only 220 points—that's 0.01%!

Single-Operator Single Band

Fifteen meters produced the world high score for a single band entry. Once again it was by ZX5J with Sergio, PP5JR, at the helm. Sergio's 4200 contacts and 1369 prefix multipliers helped set a new all-time record. The closest challenger was LP2F operated by Ezequiel, LU1FDU. In the USA, it was Steve, N2IC, operating as WK5T who outpaced Bob, KQ2M, for the top score on 15 meters. 9A1P (Davor, 9A1UN op.) finished well ahead of S53MM for European honors.

On 10 meters, LU1HF was unavailable to claim his sixth consecutive title. This left the door open for Walter, PP5WG, operating from the PP5JR super station and using his contest call PW5G, to grab the top spot. Victor, LU3HS, made a strong second-place effort from LQ5H. The top USA score was made by Colin, KU5B, in Texas, followed by Bob, WN1GIV (aka N4BP) in Florida. It was a very close race in Europe, with Aleksander, S57S, just getting by IR9W (Tommaso, IWØHBY).

Twenty meters offered the most QRM and some of the most interesting competition. The winner was TM77M, operated by Laurent, F5MUX, from the F6KHM club station. Laurent is now the proud owner of the European record. Second place was P33W operated by Harry, RA3AUU. It was Harry's first-ever single band entry. George, UN9LG, activated UP2L for third place. We may have missed John, KK9A, doing his usual P4ØA thing, but he was still a winner with the top USA score on 20 meters. It was quite an accomplishment to beat 20-meter ace Dan, W7WA, who finished only 40 contacts behind.

If you take away ZX5J and LP2F on 15 meters, the next highest single band score was on 40 meters by YT8A (Dusan, YU1EA op.). After two years of second-place finishes, Dusan finally has his chance to hold a trophy. Alexander, RW4WR, had to deal with the long call-sign of 5B/KC2TIZ for his second-place finish. Akira, JAØJHA, did a very nice job far from the population centers of Europe and North America to finish in third place. Two Canadians battled for fourth place, with Dave, VX3OI, just 200k points ahead of Tom, VX3CX. There was a race for second place in Europe between Remi, LY8O, and TMØT (Gildas, F/TU5KG). In the USA, it was John, KD2RD, with a big lead over Jeff, KU8E.

The closest race of all was on 80 meters, where EI7M (Dan, LY3MM op.), and Emil, E71A, fought for top world and European positions. Their claimed scores were very close and each had very accu-

rate logs. In the end, it was Dan who earned the victory and a new European record. Paris, 5B4XF, used the callsign H2T to finish third. Larry, K1UO, started the contest a few hours late, but finished fourth in the world and first (with a new record) in the USA.

The prior year's 80-meter champion moved down to 160 meters for the 2010 contest. RW2F, operated by Dmitri, UA2FB, made 667 contacts on Top band to win the world. Second place was captured by Fabio, I4FYF.

The top low power single band score was also on 15 meters and made by Peter, 6W2SC. He was followed closely by Seppo, PJ2/OH1VR, and Mauricio, ZV2C. CE2WZ got by HC2AQ for top low power score on 10 meters. VE1ZA battled the 20-meter QRM to break 1-million points. S57DX cruised to the win on 40 meters. S53EA took the 80-meter title ahead of T7ØA operated by IK7HZR. Low power can work on 160 meters, with E71GJK having the top score.

Single Operator QRP

Randy, NDØC, said it best: "You don't have to be crazy to run QRP ... but it helps!" There was a close three-way race across three continents for top QRP score in the all band category. Ymanol, YV5YMA, used the special call YW2LV to take first, followed by H22H (Spyros, 5B4MF op.) and QRP regular Bill, W8QZA, at TI5N. Each of them made more than 1000 QSOs running 5 watts or less—that's impressive! The top USA QRP score was made by Randy, NDØC, with Julius, N2WN, close behind. There was a close race in Europe with Milan, OK2BYW, just ahead of Dmitry, RX1CQ, and Antonin, OK7CM.

Scott, KP2/NE1RD, operated a suitcase station from the U.S. Virgin Islands to have the highest single band score (15 meters). Other noteworthy QRP efforts include Mario, TG9ADQ, winning 20 meters with 476 contacts in just 10 hours of operation. VR2ZQZ took advantage of his location south of Japan and China to make 295 contacts on 10 meters. The

Helmut, DF7ZS, driving CQ3L to World High in the Single Operator Assisted category.

WORLD TOP SCORES

SINGLE OPERATOR HIGH POWER ALL BAND

CN2R	27,059,084
8P5A (W2SC)	24,245,732
KH7XS	20,461,584
T07A (UT5UGR)	18,065,686
WH7V (KH6ND)	17,096,958

28 MHz

PW5G	4,673,802
LQ5H (LU3HS)	3,180,192
CX4DX	1,528,520

21 MHz

ZX5J (PP5JR)	16,746,977
LP2F (LU1FDU)	10,238,718
6W1SJ (E78A)	7,186,869

14 MHz

TM77M (F5MUX)	8,271,768
P33W (RA3AUU)	8,004,130
UP2L (UN9LG)	6,576,639

7 MHz

YT8A (YU1EA)	8,977,007
5B/KC2TIZ (RW4WR)	6,761,872
JAØJHA	5,204,060

3.7 MHz

EI7M (LY3MM)	3,527,075
E71A	3,501,450
H2T (5B4XF)	3,067,296

1.8 MHz

RW2F (UA2FB)	571,130
I4FYF	443,223
9A2EU	264,028

SINGLE OPERATOR LOW POWER ALL BAND

*P49Y (AE6Y)	13,037,382
*HI3TEJ	8,032,675
*VP5ØV (W5CW)	6,798,793
*JY5CC	5,322,240
*CN2BC (DL7BC)	4,416,000

28 MHz

*CE2WZ	1,295,442
*HC2AQ	1,145,700
*LU6FOV	988,189

21 MHz

*6W2SC (HA3AUI)	4,377,510
*PJ2/OH1VR	3,684,951
*ZV2C (PY2CX)	3,155,178

14 MHz

*VE1ZA	1,193,486
*NN5Z (K5PX)	802,602
*HI3CC	774,219

7 MHz

*S57DX	2,263,800
*HI3K	1,506,516
*SO6V (SP6DVP)	1,279,850

3.7 MHz

*S53EA	1,146,334
*T7ØA (IZ7KHR)	921,564
*HK1NK	579,348

1.8 MHz

*E71GJK	156,720
*DL1ET	82,593
*UT4EK	55,200

SINGLE OPERATOR QRP ALL BAND

YW2LV (YV5YMA)	1,647,512
H22H (5B4MF)	1,525,591
TI5N (W8QZA)	1,467,531
OK2BYW	984,966
RX1CQ	926,144

28 MHz

VR2ZQZ	71,749
PU5ATX	68,295
LU3HFA	17,928

21 MHz

KP2/NE1RD	639,086
JH7RTQ	233,104
IØUZF	167,124

14 MHz

TG9ADQ	254,430
YO8SSB	189,685
YT1CS	76,960

7 MHz

HA6IAM	255,187
S57T	177,840
N1TM	174,270

3.7 MHz

SP2QOT	151,765
SP8ØLM	51,491
OM7SM	17,978

1.8 MHz

DD9WG	1,400
OK1DF	703

SINGLE OPERATOR ASSISTED HIGH POWER ALL BAND

CQ3L (DF7ZS)	17,479,764
OE3K (OE3DIA)	13,587,608
UA9PC	13,462,592
ZX2B (PY2MNL)	11,664,450
E73M	9,583,980

28 MHz

LR2F (LU2FA)	3,776,384
S56P	101,516
9A2U (9A3ZA)	90,080

21 MHz

5B4KH	4,092,606
HQ2T (NP3D)	3,390,453
S5ØG (S57AW)	3,093,912

14 MHz

RZ9HG	6,680,100
EO3Q (UR3QCW)	4,942,887
DK2OY	3,960,455

7 MHz

IR1Y (IK1HJS)	5,720,400
EA7LL	5,195,448
YT2AAA	3,524,724

3.7 MHz

LY5W	1,258,075
G8DYT	1,176,240
KG1E	525,594

1.8 MHz

S57M	392,958
DFØUM (DL3BQA)	289,332
F6IIT	269,808

SINGLE OPERATOR ASSISTED LOW POWER ALL BAND

*LU5FF	5,415,475
*3V8SS (KF5EYY)	3,895,380
*PY2SEX	3,791,616
*PX2T (PY2DN)	2,542,869
*RN9CM	1,963,521

28 MHz

*PY2OE	1,276,941
*LU7YZ	485,716
*PP5BZ	303,255

21 MHz

*PW2B	3,015,375
*PY2TIM	1,563,704
*BA7IN	628,082

14 MHz

*RV9CP	2,331,758
*K4MDX	849,852
*DM2A (DH2UHF)	777,033

7 MHz

*SN3X	1,579,347
*IT9RWB	576,444
*YO5OHO	545,688

3.7 MHz

*SQ8ØUM (SQ9UM)	668,964
*SO5A (SP5LS)	505,422
*LY4Q	442,860

1.8 MHz

*SP8LBK	85,932
*DL3KZA	59,285
*AM1Q (EA1QA)	50,184

TRIBANDER/SINGLE ELEMENT HIGH POWER ALL BAND

ST2AR (S53R)	15,353,520
HA8JV	9,125,040
NXØX/4 (N4PN)	8,023,947
W5MX/4	6,147,336
YLØY (YL2GQT)	4,283,304

28 MHz

WN1GIV/4 (N4BP)	199,789
S56P	101,516
VK3DXI/6 (VK6DXI)	73,502

21 MHz

JN1NDY	1,174,380
UA9FGJ	1,074,964
WZ7ZR (W7ZR)	984,024

14 MHz

JH7XMO	1,343,760
WD5K	1,323,875
W6AEA/7	1,264,200

7 MHz

S51CK	2,259,406
ON6NL	690,986
KU8E/4	686,913

3.7 MHz

LY5W	1,258,075
EA4KD	993,446
KG1E	525,594

1.8 MHz

S57M	392,958
DFØUM (DL3BQA)	289,332

TRIBANDER/SINGLE ELEMENT LOW POWER ALL BAND

*LU5FF	5,415,475
*CN2BC (DL7BC)	4,416,000
*LO7H (LU7HW)	3,234,458
*SV8/SV1JG	2,012,680
*VE3DZ	1,974,378

28 MHz

*PP5BZ	303,255
*PU2KLM	140,805
*EA7GV	16,170

21 MHz

*UN4PG	444,705
*RA4WC	319,088
*IZ5CML	269,348

14 MHz

*NN5Z (K5PX)	802,602
*S57U	240,036
*N7FLT	223,852

7 MHz

*KG4W	599,060
*LY11MM (LY2MM)	385,776
*IZ1DGG	188,856

3.7 MHz

*SQ8ØUM (SQ9UM)	668,964
*HK1NK	579,348
*UA3LHL	113,955

1.8 MHz

*VE3EDY	49,068
*EA3AKA	35,178

ROOKIE ALL BAND

*JY5CC	5,322,240
KHØUA	3,368,263
E7/S56AA	2,248,248
EA4ETW	1,396,200
*EH2R (EA2AOO)	672,204

28 MHz

*WHØ/WH7ZJ	270,750
*PU2SDX	161,460
*PU8TEP	70,810

21 MHz

*EE1E (EA1GFP)	490,000
*PY2BRA	437,844
PY5RB	340,676

14 MHz

G2FM (2EØWKZ)	1,146,872
*ES5TF	421,514
*LA8NRA	32,568

7 MHz

IZ4MJP	495,520
*OK1LX	413,848
*S57LR	327,600

3.7 MHz

*DO6JAN	190

MULTI-OPERATOR SINGLE TRANSMITTER

5D5A	36,669,952
P4ØV	23,038,064
CQ8X	20,882,307
UPØL	19,925,262
RT4F	17,902,720

MULTI-OPERATOR TWO-TRANSMITTER

HC8GR	52,450,389
ZY7C	40,235,350
CR3A	39,914,050
PJ2T	38,322,900
OL4A	33,393,180

MULTI-OPERATOR MULTI-TRANSMITTER

EB8AH	62,470,800
DR1A	47,783,944
PY5GA	32,547,588
HG1S	26,977,131
LZ9W	24,780,945

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most intense competition was on 40 meters, with HA6IAM ending up just ahead of S57T and N1TM.

Single-Operator Assisted

Repeating as champion and setting a new world record for the Assisted all band category was Helmut, DF7ZS, operating as CQ3L. The race for second place was very close between OE3K (Ivan, OE3DIA op.) and Anatoly, UA9PC. They finished only 120k points apart. Wanderly, PY2MNL, once again operated ZX2B to finish in fourth place. Gene, W3UA (operating WU3A), repeated as the USA champion. Bryan, W5MX, and John, NY6DX, were right on his heels. Other impressive scores from Europe included E73M, OK4U, and HA8JV—all above 9-million points.

The low power competition was led by Javier, LU5FF, who set a new South American record for the category. Ashraf, 3V8SS, in second place did the same for Africa. NN4F and WW3S pointed and clicked it out for top USA low power score.

Overlay Categories

The WPX Contest has two overlay categories which act as separate contests within the contest. The tribander/single-element overlay category allows stations with similar equipment to compare and compete with each other. The top score this year went to Robert, S53R, operating from ST2AR in Sudan. Pali, HA8JV, repeated as European winner. Paul, N4PN, used the call NXØX in 2010 to take the top spot in the USA.

The Rookie overlay category is limited to operators who have been licensed for less than three years at the time of the contest. It was very exciting to see 159 entries in this category. Abdalla, JY5CC, had the top overall score. Nine-year-old Yoshiki, KHØUA, had the best high power score in

Log Checking Honor Roll

The goal of a contest is to make the highest score possible through a combination of contact points and multipliers. Some entrants carefully plan their strategy to maximize both. We certify the winners by cross-checking the logs and removing any contacts where the callsign or serial number is not copied correctly. The WPX Contest Committee takes this task very seriously.

There are a lot of factors that conspire against perfect logging—such as QRM, voice accents, fatigue, typing errors, and more. There is also random bad luck when the station you are working does not log the QSO correctly or makes a mistake when giving the exchange. With 2,437,406 contacts overall in the submitted logs, stuff is bound to happen.

That's why it is worth recognizing those stations that achieve the most contacts without an error. They may not have the highest scores in the contest, but they have demonstrated extraordinary skill.

The top accuracy logger was the Low Power, Single-Op Assisted entry of NV4B, with 527 perfect contacts. Second place went to S57M, who made 522 contacts without error while operating single band on 160 meters. Wow! Other accuracy experts included AB7E (235), SO9C (200), KB3IWV (199), KY7K (180), and N8BV (180). There were 266 logs with no reductions.

Contesting is a two-way game. You have to receive correctly, but it is important to send correctly as well. There were 290 entries that caused no errors in other logs. The top golden transmitters were KB1FRK (175), K5RX (163), W3GH (147), PDØHD (145), NW4V (142), and VE3EDY (142).

Congratulations to all the accuracy aces!

USA TOP SCORES

SINGLE OPERATOR HIGH POWER ALL BAND

WY3P (N3KS)	12,504,474
KC3R (LZ4AX)	11,092,200
WB9Z	9,505,685
NR5M	9,027,888
AJ1I (K8PO)	8,734,012

28 MHz

KU5B	294,304
WN1GIV/4 (N4BP)	199,789
W3EP/1	61,053

21 MHz

WK5T (N2IC)	3,189,312
KQ2M/1	2,901,948
KY5R/4	2,113,163

14 MHz

KK9A	6,245,664
W7WA	5,117,384
KGØF (WØUA)	4,058,835

7 MHz

KD2RD	2,093,750
KU8E/4	686,913
K9CJ	227,661

3.7 MHz

K1UO	2,161,782
W3BGN	1,650,060
KZ5MM (W5PR)	712,272

1.8 MHz

K5RX	36,252
W3GH	30,591
WO9S	4,635

SINGLE OPERATOR LOW POWER ALL BAND

*KR5X/1 (K1BX)	4,352,355
*NV1N (N1UR)	3,509,752
*NX6T (K6AM)	1,623,725
*KT4ZB	1,514,436
*WB8TLI	1,205,298

28 MHz

*NA4W (K4WI)	206,257
*K9OM/4	78,210
*W6SAI/4 (K4CWW)	11,020

21 MHz

*N5DO	598,970
*NX7TT	243,138
*W4UAL (K4CWW)	205,824

14 MHz

*NN5Z (K5PX)	802,602
*AD7J (W7FP)	452,640
*WB2TFM/4	160,446

7 MHz

*KG4W	599,060
*N4NX	582,435
*K1ZR	507,416

3.7 MHz

*KU4BP	409,344
*WA6WPG	42,799
*N4LS/7	20,097

1.8 MHz

*K4WI	20,544
*W6NF/7	5,148

SINGLE OPERATOR QRP ALL BAND

NDØC	620,610
N2WN/4	457,600
NAØCW	291,760
KT8K	210,926
WA8WV	75,632

28 MHz

W6GMT/5	3,924

21 MHz

WA6FGV	27,140
K4XD	17,680
KC9AMM	5,141

14 MHz

K3TW	41,667
WØNV/6	7,006
WØMRZ	5,270

7 MHz

N1TM	174,270
WB7OCV	65,331
KE4HUD	192

SINGLE OPERATOR ASSISTED HIGH POWER ALL BAND

WU3A/1 (W3UA)	6,674,940
W5MX/4	6,147,336
NY6DX/2	5,911,260
W8MJ	4,675,866
KI9A	4,306,338

28 MHz

K7MY	34,800

21 MHz

NX5M	2,338,378
W4QN	763,200
K7OX	51,100

14 MHz

KI7M	1,598,855
WR2G	584,706
N2RJ	513,258

7 MHz

W2IRT	840,336
K4KZZ	358,488
NØUU	93,784

3.7 MHz

KG1E	525,594
KK9V	80,676

1.8 MHz

W2MF	146,335
N4RA	4,012

SINGLE OPERATOR ASSISTED LOW POWER ALL BAND

*NN4F	1,425,363
*WW3S	1,084,192
*NR1I (W1NT)	928,715
*W4KTR	926,148
*K2PO/7	805,030

28 MHz

*WØANT	7,599

21 MHz

*WJ5DX (W5AJ)	204,351
*KØWHV	36,830
*KFØIQ	2,673

14 MHz

*K4MDX	849,852
*W5GZ	226,778
*N7FLT	223,852

7 MHz

*W1EQO	303,880
*WC2L	154,167
*N7MAL	2,070

TRIBANDER/SINGLE ELEMENT HIGH POWER ALL BAND

NXØX/4 (N4PN)	8,023,947
W5MX/4	6,147,336
AB3CX/2	3,451,350
WZ4F (K4AB)	3,229,096
W6TK	2,393,716

28 MHz

WN1GIV/4 (N4BP)	199,789
K7HP	35,700
K7MY	34,800

21 MHz

WZ7ZR (W7ZR)	984,024
KZ5J	393,484
NK6A	30,324

14 MHz

WD5K	1,323,875
W6AEA/7	1,264,200
KD8SQ	161,538

7 MHz

KU8E/4	686,913
KZ1A/4	90,825
AA4D	71,446

3.7 MHz

KG1E	525,594
WN2O (N2GC)	314,004
KK9V	80,676

TRIBANDER/SINGLE ELEMENT LOW POWER ALL BAND

*NX6T (K6AM)	1,623,725
*KT4ZB	1,514,436
*WB8TLI	1,205,298
*AC5O	1,142,270
*KØCN	950,915

21 MHz

*AE6YB	46,332
*N5DTT	33,988
*KN8D	15,456

14 MHz

*NN5Z (K5PX)	802,602
*N7FLT	223,852
*K5MSO	23,210

7 MHz

*KG4W	599,060
*WD3C	113,296
*K4KCS	4,000

3.7 MHz

*N2AET	1,344

ROOKIE ALL BAND

*AD2AM	553,875
*K2DSL	553,125
AD7YT	472,632
AB2ZY	253,916
KI6QDH	164,640

28 MHz

*WØANT	7,599
*KE1BYL/6	3,811
*KE5SNJ	243

14 MHz

*KE9YA	3,034
*K6UMO	1,551
*KE7PNF	144

7 MHz

*AB1JU	520

MULTI-OPERATOR SINGLE TRANSMITTER

NG3R	15,690,724
NN1N	11,843,685
WR3Z	10,086,180
KX7M/6	7,478,935
KVØK	6,619,538

MULTI-OPERATOR TWO-TRANSMITTER

K1LZ	30,393,480
KD4D/3	17,686,440
ND2T/6	13,174,813
WC6H	12,920,985
NK7U	12,708,572

MULTI-OPERATOR MULTI-TRANSMITTER

NQ4I	23,093,496
WX3B	16,588,290
NR6O	16,213,505
NE1C	11,532,892
KK7OO	7,781,580

his first attempt at single op all band. Third place finisher Vito, E7/S56AA, is only 14 years old. Adam, AD2AM, and David, K2DSL, were in a virtual tie for top USA score. Welcome to all of the new contesters in the Rookie category!

Multi-Operator

The rules for the **Multi-Operator Single-Transmitter** category were changed for the 2010 contest to remove the multiplier station and replace it with a limit of ten band changes per hour. There was some concern that this would invalidate the category records, but the two-man team at 5D5A in Morocco put that to rest by raising the all-time record from 33- to 36-million points! A three-op team pushed P4ØV to second place. A group of Finns drove CQ8X to a new European record while enjoying a warm-weather holiday. UPØL finished very close behind in fourth. NG3R had the top USA score while finishing in sixth place. That's five continents represented in the world's top six scores!

The **Multi-Operator Two-Transmitter** category saw some exciting scores and races. The champion was HC8GR operated by the two-man team of Dan, K1TO, and Glenn, K6NA. Even with a 6-hour power outage they were still able to lap the field and set a new all-time record. The ZY7C team, operating from the station of PT7CB, started the contest with a goal of 30-million points. Imagine their excitement when 10 meters opened and they were able to go over 40 million! Only a few points behind them was CR3A from Madeira, who claimed to be operating "without any special objective in mind besides that of having fun." Over 39-million points is a lot of fun! OL4A, operating from the OK1RI/OK1RF station, was fifth in the world and set a new European record. The gang at K1LZ doubled the USA score record while placing seventh. Congratulations on all the new records!

LW4EF intently passing out a rare multiplier from L60DK, one of the oldest ham radio clubs in Argentina.

The **Multi-Operator Multi-Transmitter** category saw a number of very serious efforts. EB8AH was everywhere on the bands to rack up 62-million points and set a new all-time record. The super-station of DR1A set a new prefix record and

EUROPE TOP SCORES

SINGLE OPERATOR HIGH POWER ALL BAND
E7DX (E77DX) 16,114,191
GI5K (MIØLLL) 13,141,446
4O3A 11,674,302
LX7I (DJ8OG) 11,576,092
IR4X (IZ3EYZ) 10,559,192

28 MHz
S57S 182,281
IR9W (IWØHBY) 176,170
E74A 77,562

21 MHz
9A1P (9A1UN) 5,190,038
S53MM 2,755,927
CR2T (CU2AF) 1,852,032

14 MHz
TM77M (F5MUX) 8,271,768
SN7Q 5,991,992
TM1W (F1HAR) 5,886,408

7 MHz
YT8A (YU1EA) 8,977,007
LY8O 4,662,028
TMØT 4,604,418

3.7 MHz
EI7M (LY3MM) 3,527,075
E71A 3,501,450
YL3FT 1,291,696

1.8 MHz
RW2F (UA2FB) 571,130
I4FYF 443,223
9A2EU 264,028

SINGLE OPERATOR LOW POWER ALL BAND
*LY9A 3,136,260
*RW1CW 2,398,574
*SV8/SV1JG 2,012,680
*YO3CZW 1,904,643
*RV6LFE 1,904,423

28 MHz
*SV9GPV 117,450
*9A5ST 35,020
*YO2AOB 22,244

21 MHz
*SV9DJO 687,000
*EE1E (EA1GFP) 490,000
*YO2RR 396,976

14 MHz
*UA1AQA 733,055
*YU7ZEX 389,856
*HG4F 352,899

7 MHz
*S57DX 2,263,800
*SO6V (SP6DVP) 1,279,850
*IO3B (IV3KFB) 892,736

3.7 MHz
*S53EA 1,146,334
*T7ØA (IZ7KHR) 921,564
*HA1FF 400,091

1.8 MHz
*E71GJK 156,720
*DL1ET 82,593
*UT4EK 55,200

SINGLE OPERATOR QRP ALL BAND
OK2BYW 984,966
RX1CQ 926,144
OK7CM 851,851
YO8WW 515,424
CT7/LZ3ND 483,612

28 MHz
I5KAP 15,276
YO4ATW 2,850
LZ2UW 2,610

21 MHz
IØUZF 167,124
YO8DDP 58,185
IV3AOL 53,975

14 MHz
YO8SSB 189,685
YT1CS 76,960
RC4AA (RW4AO) 69,696

7 MHz
HA6IAM 255,187
S57T 177,840
LY5G 147,941

3.7 MHz
SP2QOT 151,765
SP8ØLM 51,491
OM7SM 17,978

1.8 MHz
DD9WG 1,400
OK1DF 703

SINGLE OPERATOR ASSISTED HIGH POWER ALL BAND
OE3K (OE3DIA) 13,587,608
E73M 9,583,980
OK4U (OK1DIG) 9,288,364
HA8JV 9,125,040
DL3TD 7,803,639

28 MHz
S56P 101,516
9A2U (9A3ZA) 90,080
UR6F (UXØFF) 49,776

21 MHz
S5ØG (S57AW) 3,093,912
DF9ZP 2,645,760
IW2HAJ 2,494,247

14 MHz
EO3Q (UR3QCW) 4,942,887
DK2OY 3,960,455
IR2C (HB9DUR) 3,357,195

7 MHz
IR1Y (IK1HJS) 5,720,400
EA7LL 5,195,448
YT2AAA 3,524,724

3.7 MHz
LY5W 1,258,075
G8DYT 1,176,240

1.8 MHz
S57M 392,958
DFØUM (DL3BQA) 289,332
F6IIT 269,808

SINGLE OPERATOR ASSISTED LOW POWER ALL BAND
*EF1W (EA1WS) 1,825,968
*DJ3HW 1,297,296
*PD4DX 1,130,876
*UT2UU 1,023,555
*DD5M (DJØZY) 1,008,216

28 MHz
*IT9AUG 112,140
*IT9ACN 31,635
*F5BEG 27,720

21 MHz
*EI4CF 282,555
*IZ5CML 269,348
*HA7VK 150,096

14 MHz
*DM2A (DH2UHF) 777,033
*IW1QN 724,716
*YU1ARC (YT3PL) 444,308

7 MHz
*SN3X 1,579,347
*IT9RWB 576,444
*YO5OHO 545,688

3.7 MHz
*SQ8ØUM (SQ9UM) 668,964
*SO5A (SP5LS) 505,422
*LY4Q 442,860

1.8 MHz
*SP8LBK 85,932
*DL3KZA 59,285
*AM1Q (EA1QA) 50,184

TRIBANDER/SINGLE ELEMENT HIGH POWER ALL BAND
HA8JV 9,125,040
YLØY (YL2GQT) 4,283,304
DL4MCF 4,090,342
G4IIY 3,657,736
EW5A (EW2AA) 3,450,536

28 MHz
S56P 101,516
CT4NH 52,440
OE5UAL 37,128

21 MHz
EA5GS 546,056
EA4FSL 530,400
IWØBCF 256,960

14 MHz
OH6NJ 1,238,202
OQ4T (ON4TO) 871,728
EI/EA3BOX 714,525

7 MHz
S51CK 2,259,406
ON6NL 690,986
S51D 383,760

3.7 MHz
LY5W 1,258,075
EA4KD 993,446
G3YBY 241,660

1.8 MHz
S57M 392,958
DFØUM (DL3BQA) 289,332
SV1GRD 3,444

TRIBANDER/SINGLE ELEMENT LOW POWER ALL BAND
*SV8/SV1JG 2,012,680
*EJ8GQB (ON4EI) 1,819,375
*S51F 1,613,372
*YO3APJ 1,554,333
*PD4DX 1,130,876

28 MHz
*EA7GV 16,170
*SM1CXE 48

21 MHz
*RA4WC 319,088
*IZ5CML 269,348
*AO1B (EA1YB) 264,579

14 MHz
*S57U 240,036
*IW9FI 172,463
*IZ2JQP 127,626

7 MHz
*LY11MM (LY2MM) 385,776
*IZ1DGG 188,856
*DL7DZ 152,004

3.7 MHz
*SQ8ØUM (SQ9UM) 668,964
*UA3LHL 113,955
*SN5Q (SQ5RDX) 63,896

1.8 MHz
*EA3AKA 35,178

ROOKIE ALL BAND
E7/S56AA (S56AA) 2,248,248
EA4ETW 1,396,200
*EH2R (EA2AOO) 672,204
*OE6HLF 394,830
*PDØHM 311,259

28 MHz
*EA2CTB 1,044

21 MHz
*EE1E (EA1GFP) 490,000
*OH7FKV 84,960
*IT9IMJ 28,441

14 MHz
G2FM (2EØWKZ) 1,146,872
*ES5TF 421,514
*LA8NRA 32,568

7 MHz
IZ4MJP 495,520
*OK1LX 413,848
*S57LR 327,600

3.7 MHz
*DO6JAN 190

MULTI-OPERATOR SINGLE TRANSMITTER
CQ8X 20,882,307
RT4F 17,902,720
CT1JLZ 14,533,301
OM7M 13,036,875
SN3R 12,237,480

MULTI-OPERATOR TWO-TRANSMITTER
OL4A 33,393,180
OLØW 23,705,850
RL3A 21,080,700
OG7X 16,844,403
DQ8N 16,044,117

MULTI-OPERATOR MULTI-TRANSMITTER
DR1A 47,783,944
HG1S 26,977,131
LZ9W 24,780,945
OT5A 23,662,804
UU7J 19,526,832

a new European score record in finishing second. DR1A had more QSOs and multipliers than EB8AH, but couldn't overcome the Africa scoring advantage. PY5GA was a special effort from the station of Oms, PY5EG, to honor the memory of SK Olavo, PY5GA, "and to say one last time a great 'Thank You' for a great friend and ham radio operator."

Final Thoughts

The project to build an online database of all WPX SSB scores for the past 25+ years has been completed and is now available on the WPX Contest website: <www.cqwpx.com>. You can search by callsign, category, or geography to see how your score stacks up to past efforts. A number of entrants commented on how this increased their motivation to set a new record for their call area or country.

Nine-year-old Yoshiki, KHØUA, says contesting is more "Cooool than Nintendo-DS or Pokemon."!

We intend to follow the lead of the CQ WW DX Contest in making logs public on the website.

There are a growing number of entries and a large number of categories in the WPX Contest. Please check the 2011 rules in the February issue and on the CQ WPX and CQ websites for a full explanation of eligibility for awards.

It would be almost impossible to handle the record number of logs without the software development efforts of Ken, K1EA. All paper logs were converted to Cabrillo format by a team of 41 volunteers. Barry, W5GN, did a great job of producing the more than 1700 certificates that were earned in the 2010 contest. Doug, K1DG, coordinates the plaque sponsors and distribution.

The 2011 WPX SSB Contest will be held on March 26 and 27. Please read the rules carefully. Rules can be found in the February issue of *CQ*, on the *CQ* website <www.cq-amateur-radio.com>, and on the CQ WPX Contest website <www. cqwpx.com>. Keep up with the latest news on the CQ WPX Contest by joining our Facebook Fan page (search for wpx).

Let's hope for two days of great conditions in 2011 instead of only one!

73, Randy, K5ZD

CQ WW WPX SSB CONTEST
ALL-TIME RECORDS

The contest is held each year on the last full weekend of March. The All-Time Records will be updated and published annually. Data following the calls: year of operation, total score, and number of prefix multipliers.

WORLD RECORD HOLDERS

Single Operator

1.8	CN2R('07)	1,613,955	399
3.5	CN2R('06)	11,849,076	894
7.0	CN2R('05)	14,724,696	931
14	CN2R('08)	15,778,840	1199
21	ZD8Z('05)	17,129,112	1196
28	D44AC('02)	15,707,401	1123
AB	CN2R('10)	27,059,084	1373
QRP/p	HC8A('94)	7,520,562	714
Assisted	CQ3L ('10)	17,479,764	1206

Multi-Operator Single Transmitter

5D5A('10)		36,669,952	1532

Multi-Operator Two Transmitter

HC8GR('10)		52,450,389	1497

Multi-Operator Multi-Transmitter

EA8AH ('10)		66,077,858	1665

CLUB RECORD

Contest Club Finland ('00) 250,320,141

QRPp RECORD

HC8A('94) 7,520,562

WPX (Prefix) RECORD

DR1A('10) 1747

U.S.A. RECORD HOLDERS

Single Operator

1.8	K1ZM('95)	327,712	308
3.5	K1UO('10)	2,161,7820	602
7.0	NN5J('09)	2,936,156	692
14	KQ2M('09)	7,034,082	1082
21	KX8R('00)	7,556,250	930
28	NY4A('00)	6,006,573	877
AB	WY3P('10)	12,504,474	1179
QRPp	KR2Q('00)	2,688,158	649
Assisted	NB1B('01)	7,463,666	1022

Multi-Operator Single Transmitter

K1LZ('09)		16,007,975	1273

Multi-Operator Two Transmitter

K1LZ('10)		30,393,480	1560

Multi-Operator Multi-Transmitter

KM3T('00)		29,338,460	1355

CONTINENTAL RECORD HOLDERS

AFRICA

1.8	CN2R('07)	1,613,955	399
3.5	CN2R('06)	11,849,076	894
7.0	CN2R('05)	14,724,696	931
14	CN2R('08)	15,778,840	1199
21	ZD8Z('05)	17,129,112	1196
28	D44AC('02)	15,707,401	1123
AB	CN2R('10)	27,059,084	1373

ASIA

1.8	*YMØT('05)	486,846	222
3.5	H2T('10)	3,067,296	534
7.0	5B/KC2TIZ('10)	6,761,872	754
14	P33W('10)	8,004,130	1030
21	7L1GVE('92)	6,848,136	838
28	H22H('00)	9,092,146	931
AB	5B4AII('09)	17,320,771	1093

EUROPE

1.8	SN3R('07)	835,884	434
3.5	EI7M('10)	3,527,075	731
7.0	YT8A('10)	8,977,007	1027
14	TM77M('10)	8,271,768	1046
21	CQ1BOP('00)	6,989,997	1029
28	GM7V('00)	8,305,756	982
AB	E7DX('10)	16,114,191	1227

NORTH AMERICA

1.8	VA1A('99)	535,225	271
3.5	ZF1A('08)	2,269,344	462
7.0	TI4CF('05)	8,057,479	751
14	KP2A('95)	7,088,976	912
21	WP3R('98)	10,167,632	986
28	KP2A('00)	11,385,710	1046
AB	8P5A('10)	24,245,732	1358

OCEANIA

1.8	KH6ND('07)	26,432	59
3.5	WH7Z('03)	1,208,900	308
7.0	ZL3A('08)	8,200,800	816
14	KH6ND('03)	6,493,727	887
21	AH7DX('00)	7,645,990	890
28	TXØDX('00)	12,049,422	847
AB	KH7SX('10)	20,461,584	1084

SOUTH AMERICA

1.8	HK1KYR('10)	44,814	77
3.5	P4ØA('96)	1,715,076	426
7.0	ZX9A('97)	10,787,128	814
14	PYØFM('95)	9,660,432	939
21	ZX5J('10)	16,746,977	1369
28	ZX5J('99)	14,405,820	1095
AB	HC8A('01)	25,180,199	1199

MULTI-OPERATOR SINGLE TRANSMITTER

AF	5D5A('10)	36,669,952	1532
AS	5B/AJ2O('05)	28,966,272	1252
EU	CQ8X('10)	20.882,307	1343
NA	VP2EC('92)	24,409,580	1115
OC	T33RD('99)	17,778,372	998
SA	HC8A('93)	32,502,677	1107

MULTI-OPERATOR TWO TRANSMITTER

AF	AN8A('07)	47,019,528	1444
AS	A61AJ('04)	30,157,650	1255
EU	OL4A('10)	33,393,180	1590
NA	K1LZ('10)	30.393,480	15660
OC	KH7X('05)	20,910,656	1066
SA	HC8GR('10)	52,450,389	1497

MULTI-OPERATOR MULTI-TRANSMITTER

AF	EB8AH('10)	66,077,858	1665
AS	P3A('00)	53,554,592	1456
EU	DR1A('10)	47,783,944	1747
NA	WL7E('00)	42,013,215	1395
OC	KH7R('02)	32,806,032	1304
SA	HC8N('03)	60,703,452	1476

(Scores on page 103)

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FM amateur satellites are basically orbiting dual-band repeaters and have been dubbed "EasySats." But finding an HT designed to work them has not been easy—until now.

CQ Reviews:

Alinco DJ-G7T Handheld

A Full-Duplex Tri-Band HT for Working "EasySats"

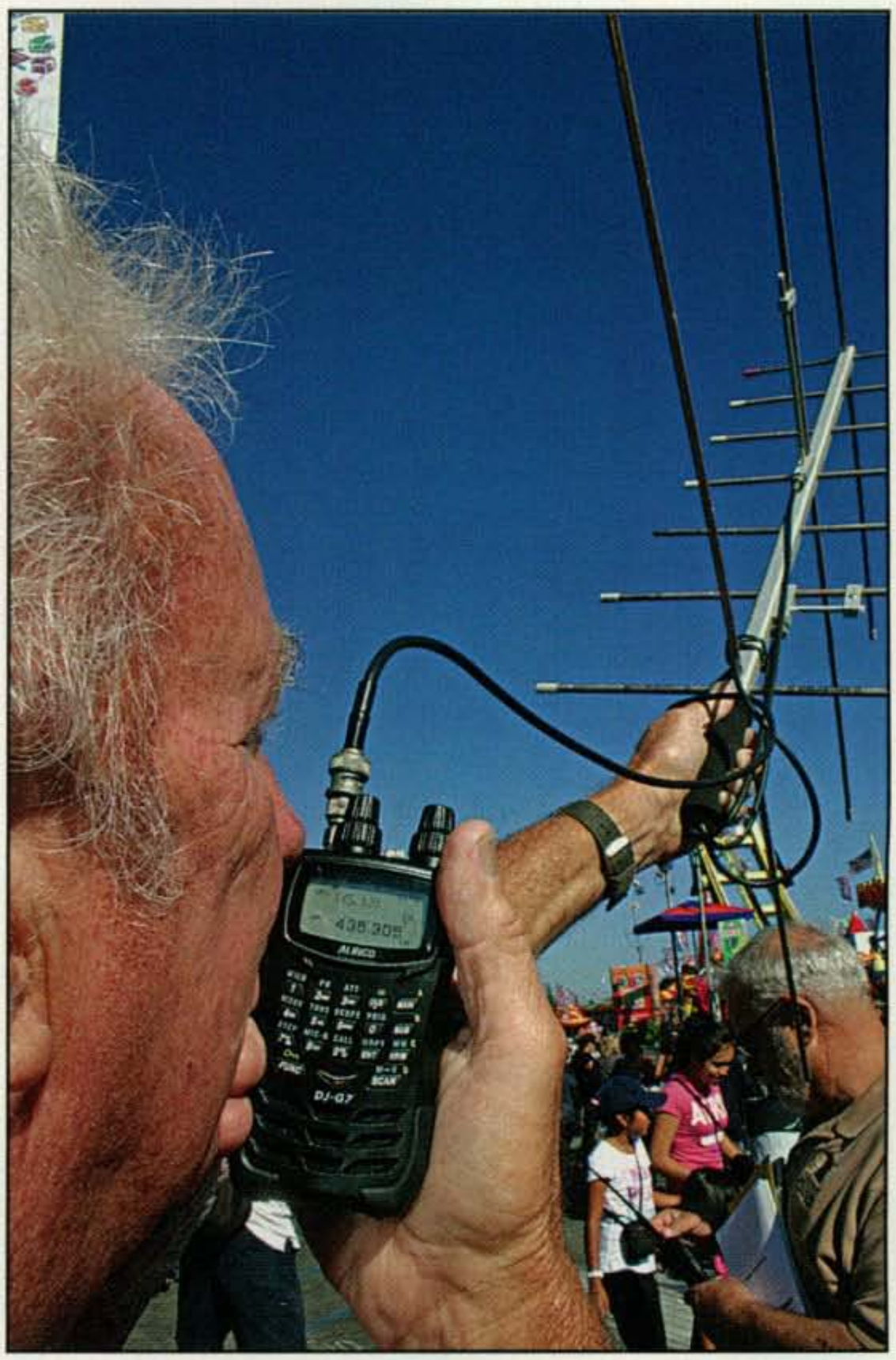
BY GORDON WEST,* WB6NOA

Of the many amateur radio satellites currently in orbit, three of them—AO-27, SO-50, and AO-51—are so-called "EasySats," orbiting FM repeaters with uplinks (where you transmit) on 2 meters and downlinks (where you listen) on 70 centimeters. AMSAT suggests using full-duplex when working these satellites with a handheld, but full-duplex dual-band HTs have been hard to come by. Alinco's DJ-G7T, a *tri-band* handheld, fills that bill. This radio is actually about a-year-and-a-half old, but the company (with a new U.S. distributor) is only now beginning to promote its unique capabilities as a satellite rig.

The DJ-G7T offers full-duplex transmit and receive on 2 meters, 70 cm, and 1270 MHz. (Full-duplex is like a phone call, with simultaneous transmit and receive, generally on different bands; typical ham QSOs are half-duplex, with the receiver muted while the transmitter is on). Transceive on these ham bands takes place on the VFO "A" MAIN band, with automatic repeater offsets as shown in Table I. You can overwrite these automatic offsets, if you wish. Transmissions are the current "wide" normal FM mode, with capabilities to transmit narrow-band FM when the Amateur Radio Service ultimately makes the migration!

Band	Freq. Range	Auto Rptr. Offset
2 m	145.200–145.495 MHz	– .6 MHz
2 m	146.610–146.995 MHz	– .6 MHz
2 m	147.000–147.395 MHz	+ .6 MHz
70 cm	442.000–444.995 MHz	+ 5 MHz
70 cm	447.000–449.995 MHz	– 5 MHz
23 cm	1270.000–1275.995 MHz	+ 12 MHz
23 cm	1282.000–1287.995 MHz	– 12 MHz
23 cm	1291.000–1292.995 MHz	– 20 MHz

Table I– Transmit/receive frequency ranges for the Alinco DJ-G7T handheld shown with default settings for automatic repeater offsets.



Gordo uses the Alinco DJ-G7T full-duplex, tri-band handheld and an Arrow antenna to work the OSCAR-51 FM satellite.

*CQ Contributing Editor, 2414 College Dr., Costa Mesa, CA 92626
e-mail: <wb6noa@cq-amateur-radio.com>

THE NEW 6M-1000 SOLID STATE AMP

The 6M-1000 represents the culmination of many years of solid state amplifiers designed by Ken Holladay, K6HCP (KLM, Mirage and RF Concepts). Physical size and weight are the smallest ever for this kW amp. When combined with a lightweight switching power supply at 7-10 lbs, the 6M-1000 is perfect for DXpeditions and field day operations. It will make a great addition to any home station as well. EME and Meteor scatter usage are capable with either CW or the very popular JT6M & JT65A. Full power output of 1 kW for 50 seconds using JT65A should be possible for hours. Two temperature controlled whisper fans cool the finned heat sink and will cycle on and off as needed. If external preamp and relays are used, the amp supplies 12VDC and also sequences a N.O. key line.

COMING SOON 2 METER 1KW AMPLIFIER !

THE NEW 10-30LP12 LOG PERIODIC

The 10-30LP12 removes the concern many share regarding the complexity and cost of other multiband antennas. This Higher Performance log periodic covers every frequency..instantly, from 10 to 30 MHz ! Just one feedline is all you need to access this flawless feature. From moments after it was installed at the M2 test facility on the West Coast, U.S.A., stations in Europe were contacted using just 100W on 17M, 15M and yes, 12M. This antenna is definitely a band opener.

M2 has done everything possible to keep cost down and performance up. This standard version is built for 80 plus MPH winds and years of no maintenance, trouble free performance. For those who don't need 30M, we designed it without the rear element and boom section. It becomes the 13-30LP11 with the same specifications, less 30M on a 37 ft. boom. An optional kit will add the boom and rear element if you need the full coverage.

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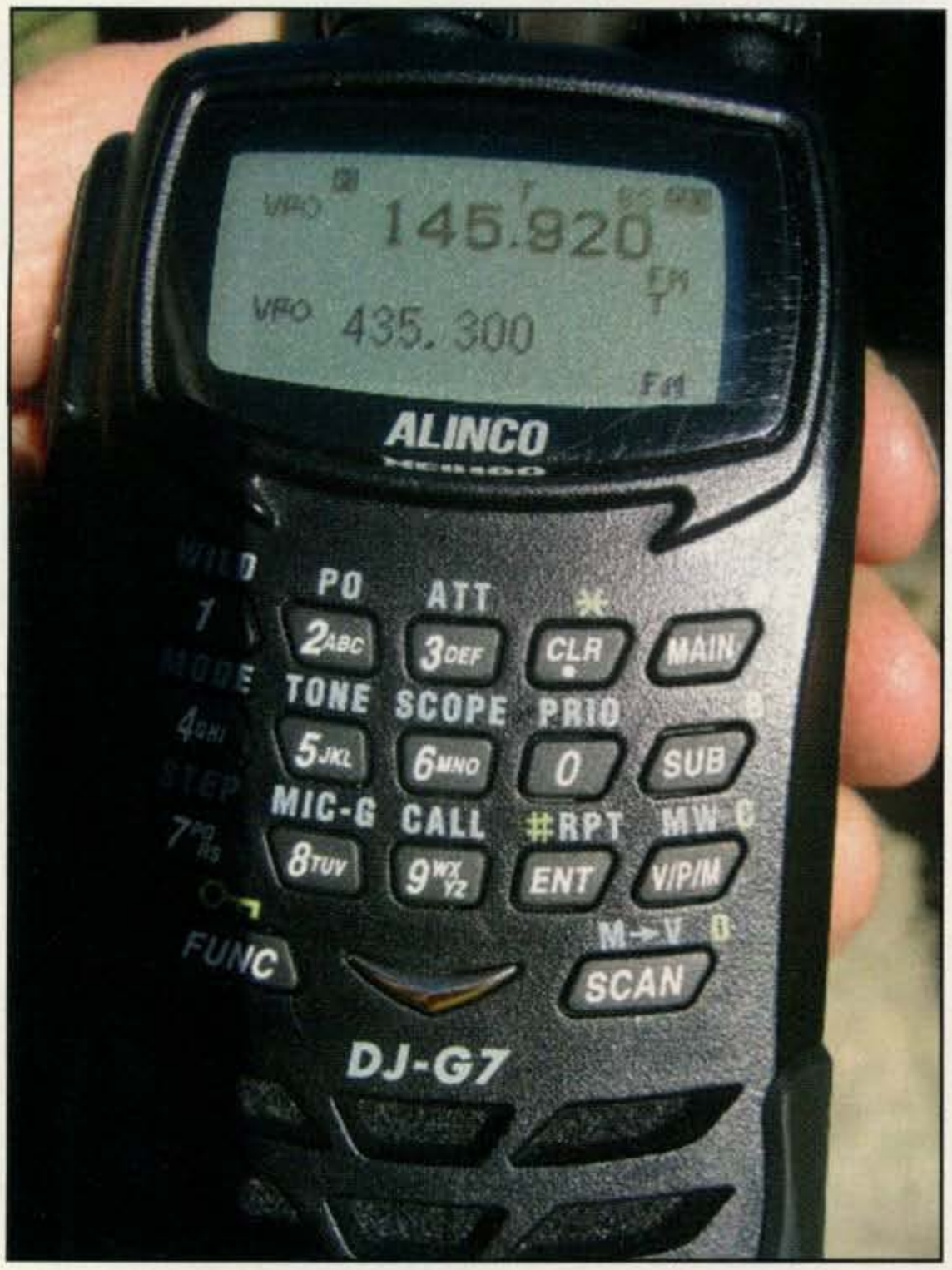
Freq. Range	Mode	Notes
530–1700 kHz	AM	AM broadcast reception, built-in ferrite bar antenna (with provision to switch to outside antenna
1700 kHz–29 MHz	AM	Shortwave reception (AM only)
29–50 MHz	Narrow FM	—
50–51 MHz	AM	—
51–60 MHz	Narrow FM	—
60–108 MHz	Wide FM	FM broadcast
108–143 MHz	AM	Aeronautical band
144–178 MHz	Narrow FM	—
180–215 MHz	Wide FM	Old TV
216–430 MHz	AM	—
430–475 MHz	Narrow FM	—
476–806 MHz	Wide FM	Old UHF TV
806–960 MHz	Narrow FM	—
960–1240 MHz	Wide FM	—
1240–1300 MHz	Narrow FM	—

Table II– Receive-only bands on the DJ-G7T. These bands are tunable only on the sub-VFO.

Satellite	Uplink/Downlink Frequency
AO-51	145.920 TX /435.300 RX
SO-50 and AO-27	145.850 TX/436.800 RX

Table III– The main purpose of the Alinco DJ-G7T is to work the FM "EasySats," whose downlinks are on 70 cm.



The DJ-G7T is a compact, yet feature-filled handheld covering 2 meters, 70 cm, and 23 cm (1270 MHz).

Receive-only takes place on the sub-band, VFO "B," as I will call it. The receive bands are shown in Table II. While there is capability to switch reception modes on the sub-band, wide FM assignments above 480 MHz seemed set, likely to receive any holdout analog TV audio.

We also noticed that, for an unknown reason, sub-band reception from 50 MHz to 136 MHz attenuated 2-meter reception on the main VFO by four S-units! If you're trying to tune in a weak repeater, just make sure your sub-band is not showing a frequency between 50 MHz and 136 MHz. Likely, some oscillator sharing takes place in this region. This was not a problem for us, because the main purpose of this tri-band full-duplex transceiver is to work the FM "EasySats" (see Table III), whose downlinks are on 70 cm.

Major Features

There are seven memory banks in the DJ-G7T, with the first bank holding up to 1000 channels! Other bank options include the following:

- Program scan
- Dual frequency memory (great for satellite work)
- Priority bank
- Call channel
- Search pass memory
- Transmitter detecting
- Bug-device detecting

I worked mainly with the bank for dual frequency memory, allowing me to recall the main band and sub-band simultaneously, with up to 100 frequency pairs in memory, ready for any kind of satellite pass!

You could also enter up to 16 characters per channel for memory names, but in our ham classes I encourage the students to identify their memory channels by frequency and keep character names off the display. There's nothing worse than asking a ham to switch over to 146.520, national simplex, but not remembering the name that stands for that particular frequency on the display.

This handheld is also ready for the inevitable narrow-band FM changeover, sometime late in my lifetime. It also offers DCS, channel scope, channel-step changes, priority, cross-band repeat, a gazillion scanning modes, and a set menu that can even let you choose the font size on the display. I tried the bold fonts and wished they had an extra, extra bold for my aging eyes!

The menu even has a bug detector, allowing you to scan and alert to frequencies that may be used by bugging devices. As I recall, Alinco had an earlier radio that boasted an ultrasonic mosquito repeller option, too. Drove my cats nuts!

However, it was the satellite mode that most interested me, and it did reasonably well on strong satellite passes. On the low-elevation passes, I tried several dual-band directional and non-directional antenna systems to minimize an approximate 3-dB drop in satellite receive signal strength I encountered as soon as I began to transmit. After much testing with an *external* antenna duplexer, the problem persisted, leading me to think that the desensitization was occurring inside the handheld RF stages, rather than within the antenna itself. Although the drop in satellite receive strength was not a huge deal, the low-level passes made my voice sound weak to our receiver, yet the other stations indicated I was coming through loud and clear.

My programming computer gurus are working up hundreds of channels for my enjoyment. They indicate they need to

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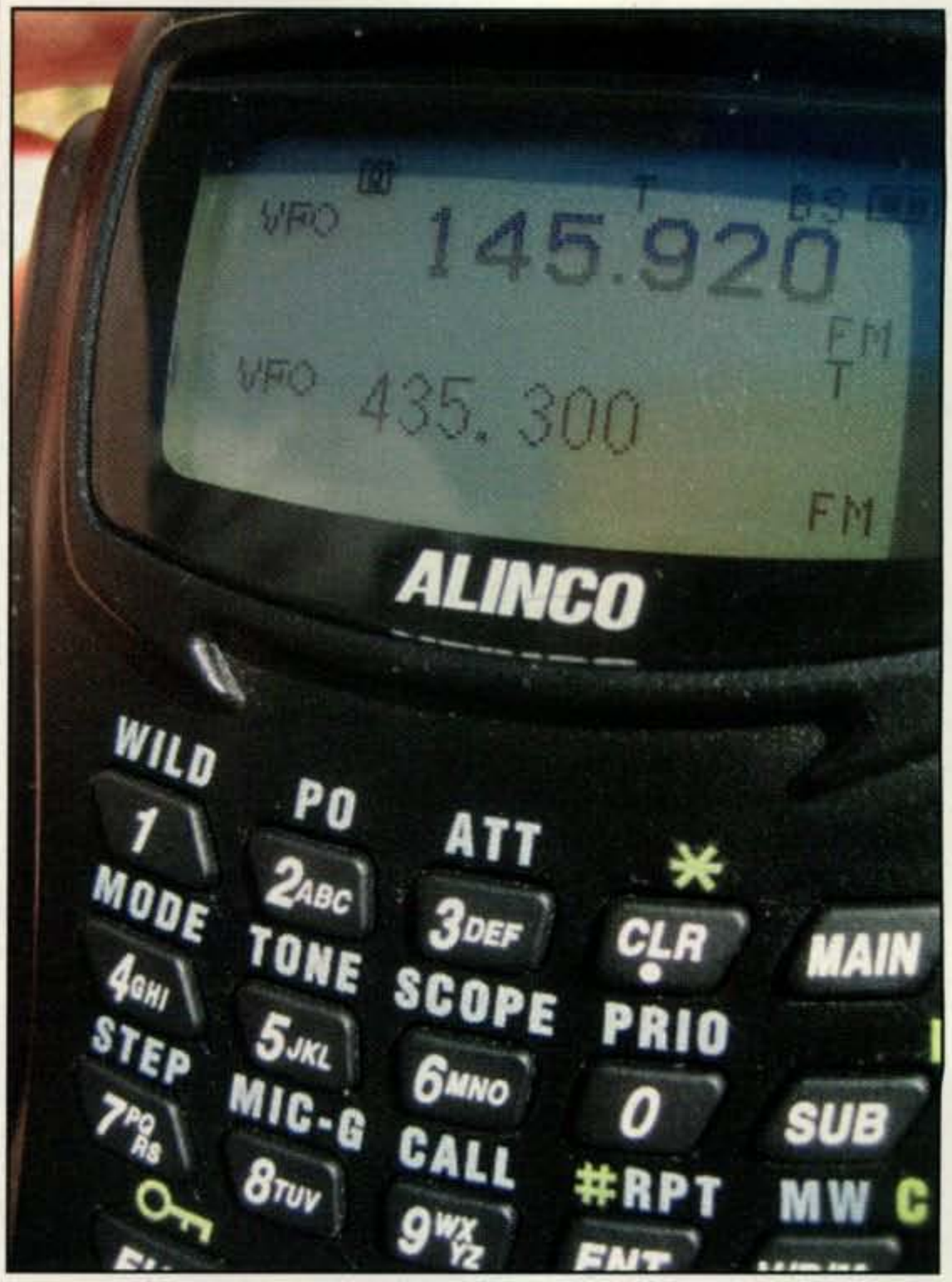

The LCD display shows the dual-frequency memory set up for making a full-duplex contact on the AO-51 FM satellite.

store them in short loads, rather than all the channels at once. They are continuing to uncover all the neat things that programming software from Alinco can do.

On a nearly overhead SO-50 satellite pass I barely noticed a drop in receiver sensitivity when I started calling through the satellite. Many of the operators hundreds of miles away commented on the clean, crisp audio on my transmit.

Working the EasySats

SO-50 may require a 74.4-Hz CTCSS tone to activate the repeater, if it comes up over your horizon non-activated. SO-50 also needs 67.0-Hz CTCSS for normal "repeater in the sky" operation.

"The (benefit) of operating a full-duplex handheld is hearing your own audio coming back down from the satellite," comments Clint Bradford, K6LCS, an active AMSAT "road show" volunteer who frequents many club meetings and conventions on the west coast, and *always* presents a lively 8-minute contact.

"It has been several years from the good old days of the ICOM 32 AT, and the Yaesu FT-470 with full-duplex ability, so I'm interested in how well the new full-duplex radio will work the FM 'EasySats,' " adds Clint, using an Arrow antenna and a small antenna-mounted amplified speaker for everyone around to hear the other stations coming back to his demo. (An external speaker or headphones is an absolute requirement for full-duplex operation or all you will hear is feedback howl!)

Since these satellites are in low Earth orbits (LEO), there is no noticeable delay or echo. However, there *is* Doppler shift. Your transmit frequency on the "A" band, on 2 meters, does not change during a pass. However, you will need to adjust the receive frequency on the Alinco's VFO or memory channels to compensate for Doppler shift. General practice is to begin receiving 10 kHz higher than the posted downlink frequency, and then 5 kHz higher as the satellite gets higher up in the sky approaching you, then on frequency as it passes overhead, and then 5 and 10 kHz lower, respectively, as the satellite moves away from you. This Doppler-shift compensation was easy to accomplish on the DJ-G7T and made a significant difference to keep reception clear.

Pre-setting the FM satellite uplink and downlink frequencies is straightforward *after* you have read the instruction book, and gotten the "feel" of some of the concentric knobs and buttons.

The DJ-G7T offers an incredible 13 optional speaker/ microphone arrangements, giving you lots of options on how to work the FM "easy satellites." I also discovered that several Yaesu audio port accessories are compatible with the Alinco, but the very common, inexpensive, Yaesu speaker/mic *with the earphone/speaker jack on the mic* won't work, because the Yaesu product terminates to a 90-degree bend, and the Alinco handheld can only accept the *straight* screw-in speaker/ microphone assembly.

Once I had the correct speaker/ microphone setup, I could rig the mic to transmit while picking off external speaker audio to hear my own signal coming back through the satellite. This makes it exciting for classroom demonstrations, with everyone listening to both sides of the conversation coming out of the separated external speaker.

One other benefit to full-duplex operation: If you do emergency work at a shelter with crossband repeaters, the rig's full-duplex capability can give you a positive indication that you are holding up the crossband link, because you can hear your own audio coming through your earphone and see the crossband repeat output S-unit display simultaneously as you are transmitting.

A New U.S. Home for Alinco

GRE America, in Belmont, California, is Alinco's new U.S. distributor. Well-respected ham radio operator and industry leader Wayne Wilson, WR5S, is its lead marketing man, widely knowledgeable from his many years at Heathkit and RadioShack. Wayne indicates a busy show schedule for Alinco, giving its technical staff a good chance to meet up with hams in the field, and better understand how this equipment is put through its paces.

"I actually owned the Alinco DJ-G7T tri-band handheld before I officially joined Alinco," comments Wayne.

"It was easy getting familiar with the radio—very intuitive. I hardly read the manual. I became quite proficient in making AO-51 contacts," adds Wayne, still able to stay in radio touch with the AMSAT repeaters in the sky.

"And a year later, GRE took over distributorship for Alinco in North America, so when anyone asks me about the DJ-G7T," says Wayne, "I can give them firsthand knowledge because I purchased mine before I started to work for GRE/Alinco!"

Wayne is correct. It doesn't take much manual reading to get proficient in working the FM satellites.

For more information on the DJ-G7T, go to: <http:// www.GREAmerica.com>. The "street price" for the DJ-G7T is around $350.

Announcing:

2011 Nominations Open for the *CQ* Amateur Radio, DX, and Contest Halls of Fame

Each year *CQ* recognizes those who have made significant contributions to amateur radio in general, and to DXing and contesting in particular, creating three categories of awards. Nominations are now open and will close on **March 1, 2011 for all three Halls of Fame**.

CQ Amateur Radio Hall of Fame

Amateur radio operators have been responsible for many advances in communications technology, and entire industries have been built on the foundation of amateur radio experimentation and activity. In an effort to recognize outstanding amateurs and their achievements, and help the public appreciate the far-reaching and long-standing value of amateur radio in our society, we have established the *CQ* Amateur Radio Hall of Fame. Nominations for the 2011 "class" are now open. Members of the 2010 "class" were announced last May and appeared in the July issue of *CQ*.

The *CQ* Amateur Radio Hall of Fame honors those whose technical or other accomplishments have helped propel amateur radio forward, or whose achievements in other areas of life have helped improve ham radio's reputation simply through association. Nominees for the *CQ* Amateur Radio Hall of Fame will be judged on the basis of qualifying in one of two broad areas: those individuals—whether licensed amateurs or not—who have made significant contributions to the amateur radio hobby; and those radio amateurs who have made significant contributions to society in general. Nominees must have made *significant* contributions of nationwide or worldwide impact.

In order to be consistent with the nomination deadline for the CQ Contest and DX Halls of Fame, the nomination deadline for the CQ Amateur Radio Hall of Fame has been backed up to **March 1**, effective this year. Nominations received after that date will be considered for future selection. Nominations for the Amateur Radio Hall of Fame may be made by clubs, organizations, or individuals. State your candidate's name, where to contact him/her if still living, for which category you are nominating him/her, and a brief one- to two-paragraph description of this person's accomplishments. Please include your name and contact information as well. E-mail to <hall-of-fame@cq-amateur-radio.com> or mail to *CQ* Amateur Radio Hall of Fame, 25 Newbridge Rd., Hicksville, NY 11801. The official nomination form is on the *CQ* website <www.cq-amateur-radio.com>. If you feel someone has earned this recognition, please submit a nomination. Please *don't* assume that someone else will nominate the person you may have in mind.

We will announce this year's selections at the Dayton Hamvention® in May 2011. Please help us recognize these "ham radio heroes" whose contributions have helped shape our hobby, our nation, or our world.

CQ DX and Contest Halls of Fame

Nominations for the CQ DX Hall of Fame and the CQ Contest Hall of Fame recognize those amateurs who have made major contributions to DXing and contesting, respectively. The activities and accomplishments that qualify one for membership in these elite groups involve considerable personal sacrifice and can usually be described by the phrase "above and beyond the call of duty." Nominations for the Contest and DX Halls of Fame are made **by contesting or DX clubs or national organizations**, and must be submitted by **March 1** of each year to be considered.

A maximum of two (2) people may be inducted into each hall of fame (DX and contest) each year. Nominations for the CQ Contest and DX Halls of Fame should be directed to Bob Cox, K3EST, c/o CQ Communications Inc., 25 Newbridge Rd., Hicksville, NY 11801; or via e-mail to <k3est@cqww.com>.

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Announcing:

The 2011 CQ World-Wide WPX Contest
RTTY: February 12–13

Starts: 0000 GMT Saturday Ends: 2359 GMT Sunday

I. Objective: For amateurs worldwide to contact as many amateurs and licensed prefixes as possible during the contest period.

II. Period of Operation: 48 hours. Single Operator stations may operate 30 of the 48 hours; **off times must be a minimum of 60 minutes**. Multi-Operator stations may operate the full 48 hours.

III. Bands: The 3.5, 7, 14, 21, and 28 MHz bands may be used. No 1.8 MHz or WARC bands allowed. *Observance of established band plans is strongly encouraged.*

IV. Terms of Competition for All Categories:

(a) All entrants must operate within the limits of their chosen category when performing any activity that could impact their submitted score. Only the entrant's callsign may be used to aid the entrant's score.

(b) A different callsign must be used for each entry.

(c) Entrants must not exceed 1500 watts total output power, or the maximum output power of their country, or the power limit of their entry category, whichever is less, on any band.

(d) Self-spotting or asking other stations to spot you is not allowed.

(e) QSO alerting assistance is permitted in ALL categories. QSO alerting assistance is the use of any technology or outside method that provides callsign and frequency information regarding any other station to the operator. It includes, but is not limited to, use of DX cluster, packet, local or remote call and frequency decoding technology (e.g., Skimmer), internet chat rooms or websites, operating arrangements involving other individuals.

(f) All operation must take place from one operating site. Transmitters and receivers must be located within a 500-meter diameter circle or within the property limits of the station licensee, whichever is greater. All antennas must be physically connected by wires to the transmitters and receivers used by the entrant.

(g) The entry location of a remote station is determined by the physical location of the transmitters, receivers, and antennas. A remote station must obey all station and category limitations.

V. Entry Categories

A. Single Operator Categories: All operating and logging functions are performed by one person (the operator). Only one transmitted signal is permitted at any time.

(a) Single Operator High (All Band or Single Band): Total output power must not exceed **1500 watts**.

(b) Single Operator Low (All Band or Single Band): Total output power must not exceed **100 watts.**

(c) Single Operator QRP (All Band or Single Band): Total output power must not exceed **5 watts.**

B. Single Operator Overlay Categories: Single Operator entrants may *also* submit their log for *one* of the categories shown below by adding an additional line in the Cabrillo log file header called CATEGORY-OVERLAY.

(a) Tribander/Single Element (TB-WIRES): During the contest an entrant shall use only one (1) tribander (any type, with a single feed line from the transmitter to the antenna) for 10, 15, and 20 meters and single-element antennas on 40 and 80 meters.

(b) Rookie (ROOKIE): To enter this category the operator must have been licensed as a radio amateur three (3) years or less on the date of the contest. Indicate the date first licensed in the SOAPBOX field.

C. Multi-Operator Categories (All Band, High power only): More than one person can contribute to the final score during the official contest period. Select category based on number of transmitted signals. **Total output power of each transmitted signal must not exceed 1500 watts.**

(a) Single-Transmitter (MULTI-ONE): Only one transmitted signal is permitted at any time. A maximum of 10 band changes may be made in any clock hour (00 through 59 minutes). For example, a change from 20 meters to 40 meters and then back to 20 meters counts as two band changes. Use a single serial number sequence for the entire log.

(b) Two-Transmitter (MULTI-TWO): A maximum of two transmitted signals at any time on different bands. Either transmitter may work any and all stations. A station may only be worked once per band regardless of which transmitter is used. **The log must indicate which transmitted signal made each QSO** (column 81 of Cabrillo QSO template for CQ contests). Each transmitted signal may make a maximum of 10 band changes in any clock hour (00 through 59 minutes). For example, a change from 20 meters to 40 meters and then back to 20 meters counts as two band changes. Use a separate serial number sequence for each band.

(c) Multi-Transmitter (MULTI-MULTI): No limit to transmitters, but only one transmitted signal (and running station) allowed per band at any time. Use a separate serial number sequence for each band.

VI. Exchange: RST report plus a progressive contact serial number starting with 001 for the first contact. Note: Multi-Two and Multi-Multi entrants use separate serial number sequences starting with serial number 001 on each band.

VII. Contact Points:

(a) Contacts between stations on different continents are worth three (3) points on 28, 21, and 14 MHz and six (6) points on 7 and 3.5 MHz.

(b) Contacts between stations on the same continent, but different countries, are worth two (2) points on 28, 21, and 14 MHz and four (4) points on 7 and 3.5 MHz.

(c) Contacts between stations in the same country are worth one (1) point on

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YAESU VR-5000

The **Yaesu VR-5000** provides sophisticated wideband reception. Coverage is from 100 kHz to 2600 MHz (2.6 GHz) less cellular, in AM, FM-N, FM-W, LSB, USB and CW. This radio features a real-time bandscope that can display: 0.1, 0.2, 0.3, 0.5, 1.0, 2.0, 2.5, 5.0 or 10.0 MHz of spectrum and you get 2000 alphanumeric memories grouped into 100 banks. Optional aids such as a DSP unit and digital voice recorder are available. Jacks on the back panel include: mute, 13.8 VDC input, external speaker, 10.7 MHz IF output, antenna input A (SO-239 50 ohm) & B (Hi Z 450 ohm), CAT interface jack (4800/9600/57600 bps). The VR-5000 comes with the PA28B 117 VAC adapter and a DC power cord. This radio is only 7.1 x 2.75 x 8 inches 4.2 Lbs.

Please visit **www.universal-radio.com** for specifications, color photos, accessories and price.

YAESU VX-8DR/GR

The **Yaesu VX-8DR** HT provides 5 watts FM on 50/144/430 MHz plus 1.5 watts on 222 MHz. It supports Blue Tooth hands-free operation with the optional BU-1 and BH-1A or BH-2A accessories. There is also an optional GPS unit and antenna with loads of features. This radio supports APRS® 1200/9600 bps data communication (B band only) and is WiRES compatible. In fact, this latest "D" version adds these APRS enhancements:

- ✔ Smart Beaconing™ Function,
- ✔ Station List memories raised from 40 to 50.
- ✔ APRS® Msg mems raised from 20 to 30.
- ✔ New DIGI-PATH route indication function.
- ✔ Heads up compass display.
- ✔ Msg LED flashing rate is selectable.
- ✔ DIGI-PATH route settings raised to 7.

The VX-8DR is submersible to IPX57 specs. A 7.4 V 1100 mAh Li-Ion battery is included. It supports simultaneous independent 2-signal dual receive function with both V+V or U+U. It has weather alert and a barometric sensor is included. The dot matrix LCD provides memory tags (to 16 characters). You even get a high-resolution spectrum analyzer with ±60 channels indication with wave monitoring of received/modulated signal! DCS and CTCSS encode/decode are standard. 2.36 x 3.74 x 0.92".

The **Yaesu VX-8GR** HT provides 5 watts FM on 144/430 MHz. Receive is 108-999 MHz in NFM/FM modes. Unlike the VX-8DR, this radio is not BlueTooth capable, does not have the SU-1 built in and is not submersible. It is however APRS capable (B band only) and even has a GPS built-in. Details at **www.RFfun.com**

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28, 21, and 14 MHz and two (2) points on 7 and 3.5 MHz.

VIII. Prefix Multipliers: The PREFIX multiplier is the number of valid prefixes worked. Each prefix is counted only once regardless of the band or number of times the same prefix is worked.

(a) A PREFIX is the letter/numeral combination which forms the first part of the amateur call. Examples: N8, W8, WD8, HG1, HG19, KC2, OE2, OE25, LY1000, etc. Any difference in the numbering, lettering, or order of same shall count as a separate prefix. A station operating from a DXCC country different from that indicated by its callsign is required to sign portable. The portable prefix must be an authorized prefix of the country/call area of operation. In cases of portable operation, the portable designator will then become the prefix. Example: N8BJQ operating from Wake Island would sign N8BJQ/KH9 or N8BJQ/NH9. KH6XXX operating from Ohio must use an authorized prefix for the U.S. 8th district (/W8, /AD8, etc.). Portable designators without numbers will be assigned a zero (Ø) after the second letter of the portable designator to form the prefix. Example: PA/N8BJQ would become PAØ. All calls without numbers will be assigned a zero (Ø) after the first two letters to form the prefix. Example: XEFTJW would count as XEØ. Maritime mobile, mobile, /A, /E, /J, /P, or interim license class identifiers do not count as prefixes.

(b) Special event, commemorative, and other unique prefix stations are encouraged to participate. Prefixes must be assigned by the licensing authority of the country of operation.

IX. Scoring: A station may be worked once on each band for QSO point credit. Prefix credit may be taken only once.

(a) Single Operator:

(i) All-Band score is total contact points from all bands multiplied by the number of different prefixes worked.

(ii) Single-Band score is total contact points on the band entered multiplied by the number of different prefixes worked on that band only.

(b) Multi Operator: Scoring is the same as Single Operator, All Band.

X. Awards: Only logs submitted in electronic format are eligible for awards. A single-band log will be eligible for a single-band award only.

(a) Plaques are awarded to recognize top performance in a number of categories. View the current list of plaques and sponsors at <http://www.cqwpxrtty.com/plaques.htm>.

A station winning a World plaque will not be considered for a sub-area award. That award will be given to the runner-up for that area if the number of entries justifies the award.

(b) Certificates will be awarded to the highest scoring station in each category listed under Section V . . .

(i) In every participating country.

(ii) In each call area of the United States, Canada, Australia, Russia, Spain, and Japan.

(iii) At the discretion of the contest director second- and third-place awards may be made.

XI. Club Competition: A plaque will be awarded each year to the club that has the highest aggregate score from logs submitted by its members. To be listed in the results, a minimum of three logs must be received from a club.

(a) The club must be a local group and not a national organization (e.g., ARRL or DARC).

(b) Participation is limited to members residing in or operating from a local geographic area defined as within a 275-km radius circle from center of club area (exception: DXpeditions specially organized for operation in the contest and manned by members).

(c) Single-operator entries can only contribute to one club. Multi-operator scores are allocated as indicated with the entry. Please spell out the full club name in your entry.

XII. Instructions for Submission of Logs: We would appreciate receiving all logs in electronic format. Electronic submission of logs is **required** for anyone competing for an award and for all who use a computer to log the contest or prepare contest logs.

(a) The log MUST show the following for each contact: Correct time in GMT, frequency (or band), call, serial number sent, and serial number received. A log without all required information may be reclassified to checklog.

(b) Single band entrants are required to include all contacts made during the contest period, even if on other bands. Only contacts made on the band specified in the Cabrillo header or summary sheet will be considered for scoring purposes.

(c) The CABRILLO file format is the standard for logs. For detailed instructions on filling out the CABRILLO file header, see the WPX RTTY Contest website <cqwpxrtty.com>. Failure to fill out the header correctly may result in your entry being placed in the wrong category or reclassified as a checklog. Note: U.S. stations must indicate the location of where you operated from in the CABRILLO header (e.g., LOCATION: OH).

(d) E-mail is the expected method of log submission. Logs in CABRILLO format should be sent to <cqwpxrtty.com>. Include only your callsign in the "Subject:" line of your e-mail. All logs received via e-mail will be confirmed via e-mail. A listing of logs received can be found on the CQ WPX RTTY website at <www.cqwpxrtty.com>.

(e) Instructions for NON-CABRILLO electronic logs: If you are not able to submit a CABRILLO format log, please contact the Contest Director for assistance with submitting another format.

(f) Instructions for paper logs: Paper logs may be mailed to CQ WPX RTTY Contest, P.O. Box 1877, Los Gatos, CA 95031-1877 USA. Each paper log entry must be accompanied by a Summary Sheet listing all scoring information, the category of competition, and the entrant's name and mailing address in BLOCK LETTERS. Indicate RTTY on your envelope.

XIII. Rule Violations: Violation of amateur radio regulations or the rules of the contest; unsportsmanlike conduct; taking credit for excessive unverifiable QSOs or multipliers; use of any non-amateur means of communication to SOLICIT, ARRANGE, or CONFIRM any contacts during or after the contest will be deemed sufficient cause for disqualification.

An entrant whose log is deemed by the Contest Committee to contain rule violations may be issued a Yellow or Red card depending on the seriousness of the infraction. If the entry is in a multi-operator category, all listed operators are so affected.

YELLOW card: Any entrant or operator issued a yellow card is not eligible for an award and will be listed at the end of the published results.

RED card: Any entrant or operator issued a red card is not eligible for an award, will be listed at the end of the published results, and will be ineligible for any CQ-sponsored contest award for a period of one year beginning with the publication of the violation in *CQ* magazine.

XV. Declaration: By submitting an entry in the CQ WPX RTTY Contest you agree that: (1) you have read and understood the rules of the contest and agree to be bound by them, (2) you have operated according to all rules and regulations of your country that pertain to amateur radio, (3) your log entry may be made open to the public, and (4) all actions and decisions of the WPX RTTY Contest Committee are official and final.

XVI. Deadline: All entries must be postmarked NO LATER than March 1, 2011. All logs, including e-mail entries, are subject to the deadline. Logs postmarked after the deadline may be ineligible for any awards.

E-mail logs to <rtty@cqwpx.com> and review the response e-mail from the robot. Make any corrections and resubmit the log.

Questions pertaining to the CQ WPX RTTY Contest may be e-mailed to the Contest Director, Ed Muns, WØYK, at <w0yk@cqwpxrtty.com>.

MFJ 160-6 Meter Antenna

Self-supporting 43 foot vertical -- no guy wires required . . . 1500 Watts . . . exceptional performance . . . low-profile . . . includes base mount and legal limit balun . . . assembles in an hour . . .

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Operate all bands 160 through 6 Meters at full 1500 Watt with this self-supporting, 43 feet high performance vertical! It assembles in less than an hour and its low-profile blends in with the sky and trees -- you can barely see it from across the street.

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With an automatic antenna tuner there's no fuss -- just talk!

A wide-range automatic or manual antenna tuner *at your rig* easily matches this antenna for all bands 160-6 Meters. There's no physical tuning adjustments on the antenna -- you simply put it up!

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thick walled tubing bottom section makes it incredibly strong -- it'll stay up!

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Assembles in an hour

You can easily assemble it in an hour! Ground mounting lets you completely hide its antenna base in shrubbery. Includes ATB-65 high-strength antenna mount. Requires ground system -- at least one radial. More extensive ground system will give much better performance.

Great for Stealth Operation in antenna restricted areas

This very low-profile antenna is perfect for stealth operation in antenna restricted areas. Hide it behind trees, fences, buildings, bushes. Use it as a flagpole. Telescope it down during the day. Put it up at night and take it down in the morning before the neighbors even notice!

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MFJ *Automatic* Tuners

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For legal limit 1500 Watt SSB/CW amplifiers. Auto-ranging LCD and Cross-Needle SWR/Wattmeter, antenna switch, amp bypass, matches 12-1600 Ohms, 1.8-30 MHz.

MFJ-993B
$259.95

Dual power range -- 300 Watt range matches 6-1600 Ohms. 150 Watt/6-3200 Ohms. Auto-ranging LCD and Cross-Needle SWR/Wattmeter, antenna switch, 1.8-30 MHz.

MFJ *Manual* Tuners

MFJ-989D
$389.95

1500 Watts SSB/CW, 1.8-30 MHz. Active peak-reading Cross-Needle SWR/Wattmeter, balun, dummy load, antenna switch, aircore roller inductor.

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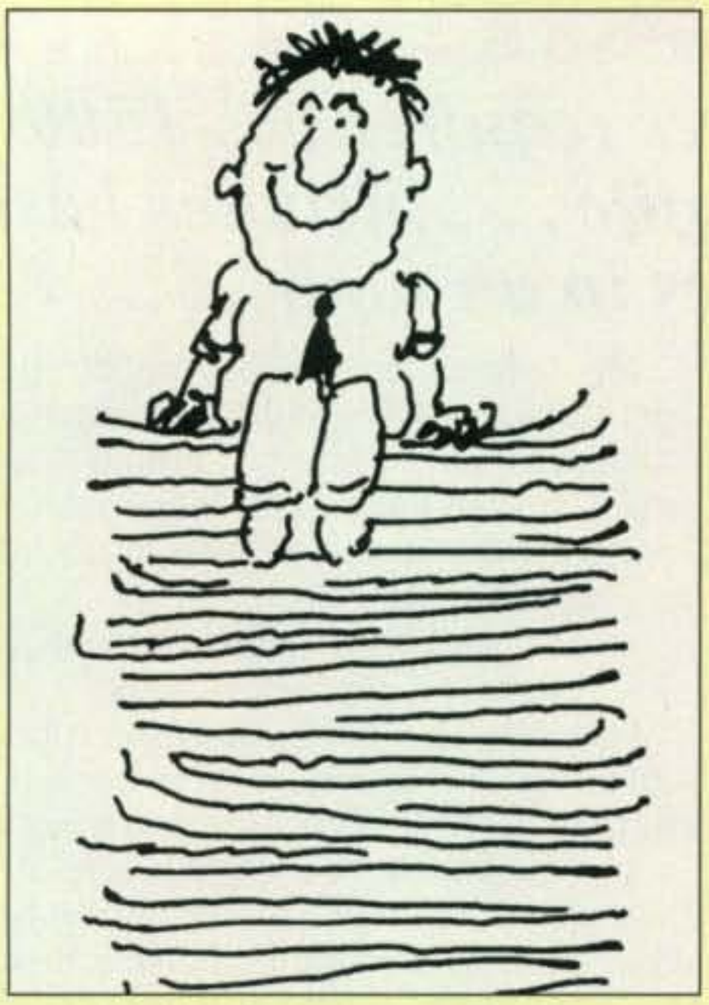

What You've Told Us...

Our August survey asked about your participation in CQ-sponsored contests and about our results reporting. Nearly 7 in 10 readers responding to the survey operate in CQ contests either regularly (30%) or occasionally (39%), even though only 46% of you identify yourselves as contesters in our demographic questions. Among those who do, nearly half (49%) say a major motivation for operating is fun and camaraderie, followed by building up DX totals (46%), competing with your own past performances (27%), competing with other hams (14%), and other (2%). Also among those who operate in CQ contests, the majority (57%) submit logs at least sometimes (30% always; 27% sometimes), while 41% say they do not send in logs even though they participate.

Nearly three quarters of the hams responding (72%) read the contest results published in *CQ*, with 36% always reading them, 33% sometimes and 3% only if they have submitted a log. Just more than one-third of you read the expanded results on our website, and among those, 68% read them sometimes, 14% always and 12% only if you've submitted a log. Among those who read the contest results, 33% say the main contest article is most important to them, followed by all segments (31%), line scores (16%), their own score (13%), top scores boxes (11%), participant comments (10%) and the trophies box (0%, 1 reply).

This month's free subscription winner is Pete Crasher, W9DRB, of Chrisney, Indiana.

Reader Survey January 2011

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*.

Since many respondents to last August's survey on contesting said their main motivation in contest operating was to build up their DX totals, we thought we'd ask some questions this month about operating awards and you.

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

1. Which statement most closely describes how you feel about amateur radio operating awards?

I actively chase awards 1
I track award progress but do not actively pursue them 2
I used to chase awards but do not anymore 3
I have no interest in operating awards 4

2. How familiar are you with the various operating awards offered by CQ (CQ DX Award, CQ DX Field Award, USA Counties Award, Worked All Zones, WPX)?

Very familiar with all 5
Familiar with some but not all 6
Know only a little bit about each 7
Don't know anything about any of them 8

3. Do you hold at least the basic level of any of these awards? Please circle the number of all that apply.

CQ DX Award 9
CQ DX Field Award 10
DX Century Club (DXCC) 11
Islands on the Air (IOTA) 12
USA Counties Award (USA-CA) 13
VHF/UHF Century Club (VUCC) 14
Worked All Continents (WAC) 15
Worked All States (WAS) 16
Worked All Zones (WAZ) 17
WPX Award 18

4. What is your typical course of action after qualifying for a new award or a new level of an award?

Apply immediately for the award/upgrade 19
Apply for the award/upgrade when I have time to deal with the paperwork 20
I often don't apply at all; the accomplishment is more important to me than the "wallpaper" 21

5. What sources do you use to exchange confirmations of on-air contacts (circle all that apply)?

eQSL.cc 22
Logbook of the World (LoTW) 23
Printed QSL cards 24
QRZ.com logbook 25
None 26

6. How good a job does CQ do of promoting its award programs?

Excellent 27
Good 28
Needs improvement 29
No opinion 30

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

AMERITRON *True Legal Limit*™ Tuner

Easily handles 1500 Watts continuous carrier even on 160 Meters . . . High-current edge-wound silver plated Roller Inductor . . . Two 500 pf high capacitance tuning capacitors with 6:1 vernier reduction drives . . . 3 core choke balun . . . Six position antenna switch . . . True peak reading Cross-Needle SWR/Wattmeter . . .

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It's perfect for Ameritron's most powerful amplifiers where the ATR-30 just loafs.

All band coverage lets you operate 1.8-30 MHz including all MARS and WARC bands.

Super High Current Roller Inductor

You'll see Ameritron's new *super high current* air core roller inductor. It's *edge wound* from a thick solid copper strip and silver plated. This produces a large surface area and a massive conductor. It can carry huge circulating RF currents and withstand tremendous heat that'll melt or burn ordinary roller inductors.

A gear driven turns counter and crank knob gives you precise inductance control.

Two 500 pf Tuning Capacitors

Two 500 pf -- *the highest of any antenna tuner* -- variable transmitting capacitors give you no-arc wide range impedance matching for true high power performance.

6:1 vernier reduction drives makes capacitor tuning smooth and easy.

Super Balun, 6 position Antenna Switch

Super heavy duty three core choke balun lets you match virtually any balanced feedline antenna without core saturation.

A 6 position antenna switch lets you select your desired operating antenna.

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Ameritron's active electronic *true* peak reading meter accurately reads forward and reflected power and SWR *simultaneously* on a lighted Cross-Needle meter.

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Roomy extra-strong .080 inch thick aluminum cabinet gives highest efficiency and lowest loss. 13¼Wx5⅝Hx17½D inches.

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AMERITRON's legal limit amplifiers use super heavy duty Peter Dahl Hypersil® power transformer capable of 2500 Watts!

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with 3CX1500/8877 ceramic tube

AL-1500

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Eimac® tube

AL-1500F

$3195

Imported tube

TrueLegalLimit™

Ameritron's *most powerful* amplifier uses the *herculean* 3CX1500/8877 ceramic tube. 65 Watts drive gives you full output power -- and it's just loafing because the power supply is capable of 2500 Watts PEP. All HF bands, all modes. 77 lbs., 17Wx10Hx18½ in.

Ameritron's *toughest* Amp

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AL-1200

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Get ham radio's *toughest* tube with AL-1200. The *Eimac*® 3CX1200A7 has a 50 Watt control grid dissipation and the lowest history of field replacement of any modern transmitting tube that we use. 90 Watts in gives you full power out. All HF bands, all modes. 76 pounds, 17Wx18½Dx10H in.

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Most linears using 3-500Gs *can't* give you 1500 Watts because their lightweight power supplies *can't* use these tubes to their full potential. AL-82 is ham radio's *only* super 3-500G amp! 100 Watts in gives you full power out. All HF bands, all modes. Hefty 76 pounds, 17Wx10Hx18½D inches.

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600 Watt FET Amp

ALS-600, $1499. ***No tuning****, no fuss, no worries -- just turn on and operate.* 600 Watts PEP/500W CW, 1.5-22 MHz, instant bandswitching, SWR protected, extremely quiet, SWR/Wattmeter, ALC control. 120/220 VAC. Inrush protected. 9½Wx6Hx12D in. **ALS-600S, $1599,** ALS-600 with 10 lb., very low RF noise switching power supply.

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Gordo uncovers a common problem with Anderson Powerpole® connectors, and finds a product that solves it!

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Keeping Your Contacts in Contact

BY GORDON WEST, * WB6NOA

One of my well-seasoned students dropped by with a mobile transceiver mystery. On receive the 40-watt dual-band mobile worked great, but on transmit the radio growled through its mobile speaker, with the display intermittently dimming. On low power, the problem was not as bad, but on high power, it was easy to see the brown-out conditions.

First check was of the wiring directly to the 12-volt battery. I expected to see a corroded battery connection, but it was squeaky clean! I carefully inspected the wiring run, including a great job of getting the wiring through the firewall, and everything looked shipshape.

The next step was the bench check. I unplugged the ARES®-ready radio system from his multi-Anderson Powerpole® outlet and took the equipment to the test bench. When connected to my 12-volt Andersons, there was absolutely no problem of low voltage.

Then it was back to the vehicle, with a close inspection of the 12-volt DC supply output Anderson Powerpoles. I found the problem!

The red and black pair of Andersons was not perfectly aligned, and the red battery-positive Anderson Powerpole was recessed so slightly that a quick glance would miss the misalignment (see photo). The red Powerpole had slid back just enough to create an intermittent connection on high-power transmit and the radio would cut out. Sound familiar, Powerpole users?

As soon as I aligned the red and black Andersons, the problem was solved.

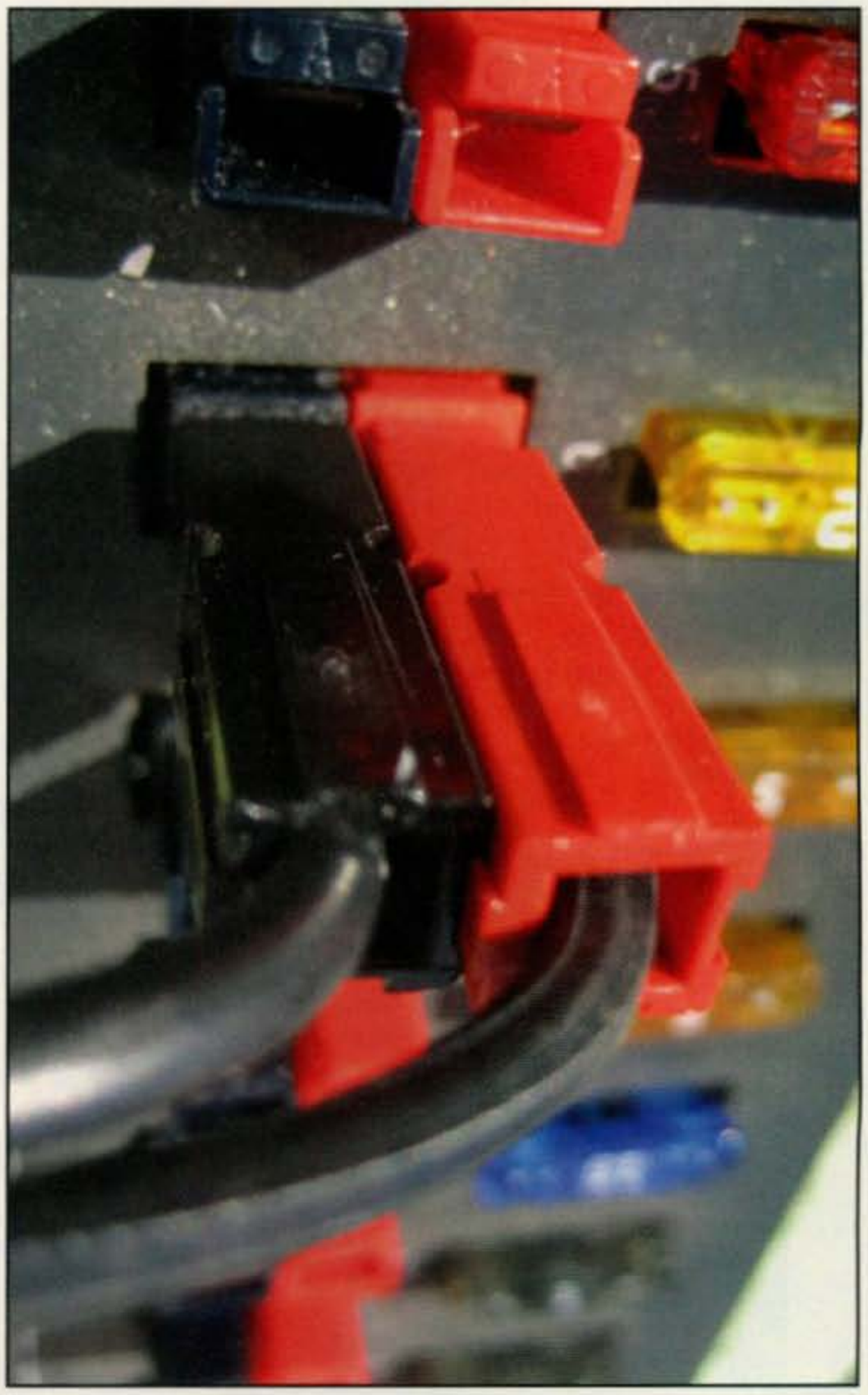
How many times have we had red and black paired Andersons wiggle out of perfect alignment? Sure, the little black pin initially may achieve perfect alignment, but sometimes that pin drops out, or sometimes the pin is not included with the connectors and just pressure alone, on red and black Andersons, may alter alignment.

Problem Solved!

PowerWerx now offers permanently bonded red/black Anderson Powerpole sets. "Our bonded PowerPole sets are ultrasonically welded to guarantee correct configuration and the elimination of the need of that roll pin to keep them perfectly aligned," was the comment from PowerWerx. I can put away my hot-glue gun!

Just remember to keep **R**ed on the **R**ight when viewed from the **R**ear (RRR), and you are set to go!

The PowerWerx bonded connectors start at $11.99 for a set of 10. See <http://www.powerwerx.com>.



A typical pair of Anderson Powerpole® connectors. However, note that the positive (red) plug is slightly out of alignment, enough to cause problems at high current levels.

**CQ Contributing Editor, 2414 College Dr., Costa Mesa, CA 92626*
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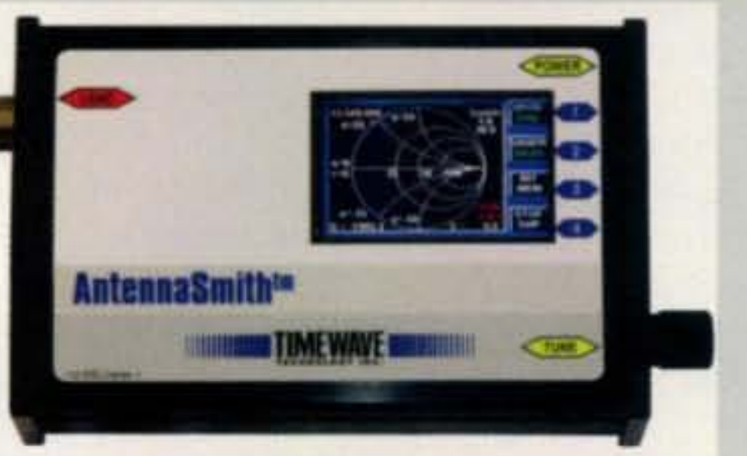

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BY FREDERICK O. MAIA,* W5YI

FCC Adopts New Vanity and Club Call Sign Rules

The Federal Communications Commission released a 20-page Report and Order (R&O) on November 8, 2010, entitled "Amendment of the Amateur Service Rules Governing Vanity and Club Station Call Signs." A vanity call sign is a specific available station call sign selected by the licensee.

The R&O, which makes both major and minor changes to the vanity and club call sign programs, finalized a Notice of Proposed Rulemaking (WT Docket 09-209) issued a year ago.

The primary objective of the NPRM was to amend and clarify the vanity call sign application and assignment procedures and to make them more fair, equitable, and transparent to individual radio amateurs and clubs wishing to change their station call signs.

The NPRM made recommendations on and asked for comments on:

- A proposal to make the knowledge and availability of call signs issued to deceased hams more readily available to the general amateur community.
- A redefinition of the term "close relative."
- Incorporating into the Part 97 rules certain longstanding vanity call sign policies.
- Limiting club stations to holding only one license grant and one station call sign.
- New club station trustee requirements, including allowing Novice Class licensees to serve as trustees.
- The FCC also invited additional proposals for other amendments to the rules applying to the vanity call sign system and club station licensing.

License Cancellation Procedure

The station call sign of a deceased radio amateur remains active in the FCC's amateur service database and unavailable for reassignment to another station until the FCC staff learns of the licensee's death and cancels the license.

When the FCC receives proper documentation of an amateur radio operator's death, the license is canceled as of the *date of death.* Acceptable documentation includes a copy of the death certificate, an obituary, or data from the Social Security Death Index. The SSDI is a database of death records created from the *S*ocial Security Administration 's Death Master File.

The FCC proposed in the NPRM to codify these longstanding cancellation procedures in the rules. A new Section §97.31 specifying the documentation needed to cancel a deceased amateur's license has now been added to Part 97.

Availability of a Deceased Licensee's Call Sign

Section §97.19(c)(3) provides that an expired or canceled call sign is routinely available for reassignment under the vanity call sign system two years plus one day after expiration or cancellation whichever is sooner.

The FCC proposed in the NPRM to provide that, for purposes of the availability of a deceased licensee's call sign, the cancellation of a license more than two years after the licensee's death (or within thirty days before the second anniversary of the licensee's death) should not take effect until thirty days after the licensing database is updated by the FCC staff.

This thirty-day waiting period is intended to prevent a person from submitting a cancellation request and then immediately filing an application for the deceased's call sign before other licensees know that the call sign is about to become available for reassignment.

The FCC believes it is more equitable to provide a waiting period after the cancellation request is processed so that other interested licensees have an opportunity to apply for the call sign. Not all commenters agreed with the FCC proposal.

The FCC said it believed that establishing a thirty-day waiting period is warranted and disagreed with those who argued that the waiting period would eliminate the incentive to conduct the necessary research to inform the Commission that a licensee had passed away. The ARRL agreed with the FCC, saying that the waiting period "...creates a fair and transparent system for call sign assignment."

"Other licensees should have an opportunity to learn of the availability of a desirable call sign and the opportunity to apply for the call sign when we cancel a license," the FCC said. "Potential applicants already have this opportunity with respect to call signs associated with expired or surrendered licenses, because the relevant information is publicly available in our licensing database."

"We conclude, based on the above, that the call sign shown on a license that is canceled due to the death of a licensee more than two years earlier, or within thirty days before the second anniversary of the licensee's death, should remain unavailable to the vanity call sign system for thirty days following the date the staff takes action to cancel the license." Section §97.19 of the rules was amended accordingly.

Exceptions to the Two-Year Waiting Period

There are certain instances in which a licensee is exempt from the general rule that a call sign shown on an expired, surrendered, revoked, set aside, canceled, or voided license is unavailable to the vanity call sign system for two years. These exceptions allow certain licensees to apply for a call sign ahead of others. The policies appear on the FCC's amateur service website but have never been stated in the Part 97 Rules.

These exceptions apply to former holders of a call sign, close relatives of a deceased former hold-

*1020 Byron Lane, Arlington, TX 76012
e-mail: <w5yi@cq-amateur-radio.com>

er of a call sign, and club stations requesting the call sign of a deceased member when the club station trustee has the written consent of a close relative of the deceased.

The Commission had previously defined "close relatives" to include, among others, an "in-law" of the deceased former holder, but did not specifically define which in-laws were eligible under this exception. The FCC has amended Section §97.3(a)(27) to define the term "in-law" to include only a parent, stepparent, or sibling of a licensee's spouse; and the spouse of a licensee's sibling, child, or stepchild, or of a licensee's spouse's sibling. (A sibling is an individual having one or both parents in common—a brother or sister.)

The FCC said these exceptions have been in effect since 1996 and are supported by the amateur service community. New Section §97.19(c)(3)(i),(ii) and (iii) has been added to Part 97 to state them in the rules.

Ineligible Applicants

When a vanity call sign application is granted, the call sign currently assigned to the licensee's station is surrendered, and is not available to the vanity call sign system for two years plus one day. Three different exceptions apply:

There have been several instances where an applicant obtains a call sign by erroneously or fraudulently indicating that he or she is eligible under an exception to the two-year waiting period. Then, after a question is raised regarding the applicant's eligibility, he/she applies for and is assigned another call sign. Under the previous rules, the improperly obtained call sign would not be available to the vanity call sign system for another two years.

This additional delay is unfair to prospective applicants who expected the call sign to become assignable at the end of the original two-year waiting period. The FCC's policy has been, "Where a vanity call sign for which the most recent recipient was ineligible is surrendered, cancelled, revoked, or voided, the two-year requirement does not apply."

This policy, however, has never been implemented or stated in the rules. New Section 97.19(c)(2)(i) has now been added to provide that a new two-year period does not begin when the most recent recipient acknowledges, or the Commission determines, that the recipient was not eligible to be assigned the call sign.

The improperly issued call sign will, however, not be available to the vanity

call sign system for thirty days after information regarding the acknowledgment or determination of ineligibility is posted to the license data in the Commission's licensing system.

Club Station Trustees

A club, for purposes of obtaining an amateur service club station license, is defined by the FCC as a group of at least four persons that has a name, a document of organization, management, and a primary purpose devoted to amateur service activities consistent with Part §97.5(b)(2).

The club station license is granted to the person who is designated by an officer of the club to be the license trustee. At present, the trustee must be a person who holds an Amateur Extra, Advanced, General or Technician Class operator license.

Applications for new or modified club station licenses must be presented to a Club Station Call Sign Administrator (CSCSA), which then submits the information to the Commission. Currently, an application to modify a club station license to change the trustee can be submitted to the CSCSA without the knowledge or support of club officers or the current trustee.

Protests of improperly changing a club's trustee sometimes bring the dispute before the Commission to sort out the identity of a club's legitimate trustee. The FCC proposed in the NPRM an amendment to Section §95.21(b)(1) in order to avoid FCC involvement in internal club disputes, and to ensure that an application changing the trustee reflects the club's intent.

Applications requesting a change in a club 's trustee must now include documentation signed by an officer of the club when the application is submitted to the CSCSA. This will "prevent a departing trustee from making off with the club license and call sign, or refusing to agree to a change in trustee" and "address instances in which a trustee becomes incapacitated."

Section §97.21(a)(1) has also been amended to provide that other applications on behalf of the club may only be submitted to the CSCSA by the trustee listed in the FCC's licensing database. Amended Section §97.5(b)(2) now permits all licensees, including the Novice Class, to serve as club station trustees.

Limits on Club Station Licenses

Individual amateur radio operators may only hold one operator/primary station license grant and one station call sign. The FCC noted that club stations frequently have legitimate reasons for using multiple call signs. Thus, there is no similar limit on how many license grants or call signs a club may hold, or on the number of clubs for which a licensee may serve as trustee.

The downside to this policy is that it allows club station trustees to control multiple call signs, frequently reducing the pool of preferential vanity call signs available to individuals and other club stations.

The FCC initially proposed to limit club stations to one call sign, but not to limit the number of clubs for which a licensee may serve as trustee. Clubs currently holding more than one call sign would be permitted to renew or modify their existing station license grants, but would not be able to obtain any more call signs. The Commission has now concluded that its proposal in the NPRM was "both too broad and too narrow."

It has now decided to limit club stations to only one vanity call sign but with no limit on the number of sequentially assigned call signs. This will prevent club stations from obtaining an unfair share of desirable call signs. Club stations currently holding more than one vanity call sign may renew or modify their existing station license grants, but will not be able to obtain any additional vanity call signs.

The FCC acknowledged that some amateur radio operations do require more than one call sign. However, this need can also be addressed by appending self-assigned identifiers to the licensee's call sign to create multiple unique call signs.

A number of commenters argued that clubs with multiple call signs should be required to give up all but one. The FCC believes that requiring clubs to surrender call signs that they obtained properly under the rules at the time they were assigned would be inappropriate.

The Commission was persuaded by the comments to reconsider the question of whether to limit the number of clubs for which a licensee may serve as trustee. The commenters argued that limiting the number of vanity call signs that a club can obtain will accomplish nothing if an individual can bypass the rule simply by creating multiple clubs.

"There is little difference between one club with a dozen station call signs and a dozen 'ghost' clubs with the same or different trustees formed by the same management each with a different preferential call sign."

To prevent trustees from circumvent-

ing the intent of the rule change, an individual may now be trustee for only one club station. Individuals who currently serve as trustee for more than one club may continue to serve as trustee of those clubs, but may not be designated the trustee of any additional clubs.

Available Call Signs

Only call signs that are available in the sequential call sign system may be requested as vanity call signs. Approximately 15-million of these call signs are presently available. The ARRL asked that certain additional call signs available to, but not currently used by, the sequential call sign system be made available to the vanity call sign system, arguing that this would permit the assignment of additional desirable call signs.

Specifically, the League wanted to expand the pool of available Group A call signs. Group A call signs are call signs that start with the letter(s) K, N, W, or AA–AL, followed by a numeral and one or two letters. These call signs are generally available only to Amateur Extra Class licensees. There are approximately 43,000 Group A call signs, and over 120,000 Amateur Extra Class licensees eligible to request them.

The ARRL requested that the pool of available Group A call signs be increased "by permitting the first character of a two-character Group A call sign suffix to be a numeral as well as a letter (for example, W23A)." The ARRL also suggested that two-by-three call signs (i.e., two letters, followed by a numeral, followed by three letters) beginning with the letter N and three-letter suffix call signs with the prefixes WC, WK, WM, WR, and WT be made available. The sequential call sign system does not currently use these combinatons. The League also wanted call sign blocks assigned to offshore areas that do not have United States Postal Service mail delivery (specifically, the AH/KH/NH/WH and KP/NP/WP prefix call sign blocks) to be made available to licensees in other areas.

The Commission declined to make additional call signs available to the sequential call sign system, since millions of call signs are presently available to amateur stations. It believes that a sufficient number of call signs is available for an amateur service licensee to obtain a vanity call sign that is acceptable to him or her. Furthermore, these additions "would not substantially increase the availability of call signs of one-by-two call signs that experience has shown to be

most desired by amateur radio operators," the FCC said in the R&O.

Restrictions on Call Sign Availability

Under the sequential call sign system, the FCC assigns the station a call sign from an alphabetized list corresponding to the licensee's license class and the geographic region of the licensee's mailing address.

Some amateurs wanted to limit applicants for vanity call signs to requesting call signs assigned only to the applicant's region (i.e., W1 call signs would be issued only to stations in the first call area, New England). Also, the ARRL asked that Group A vanity call signs be assigned only to United States citizens.

The Commission noted that these same requests were made when the vanity call sign system was implemented. The proposal for geographic limits on call sign assignment was rejected because "the applicant's choice of vanity call signs would be reduced to ten percent or less of the call signs that would otherwise be assignable to the station," and "a limitation based upon the person's place of residence . . . could easily be circumvented by using a mailing address in another call sign region."

In addition, the FCC said, section §97.17(a) provides that any qualified person is eligible to apply for an operator/primary station license grant. U.S. citizenship is not a requirement to hold an FCC-issued amateur license or to be eligible for the privileges associated with such a license, including applying for a vanity call sign. Thus, the rule changes suggested by the ARRL were denied.

Fee for Renewing a Vanity Call Sign

Amateur licensees with sequentially assigned call signs are not assessed a fee to obtain or renew a license. However, the Commission does assess a fee when a licensee applies for a new vanity call sign or applies to renew a vanity call sign. Many radio amateurs wanted to eliminate the fee to renew a license with a vanity call sign.

The FCC addressed this request before. Section 9(g) of the Communications Act of 1934, as amended, requires that the Commission assess and collect a regulatory fee for a new or renewed vanity call sign. Therefore, "under the Communications Act, we cannot provide a one-time fee for processing vanity call sign applications," the FCC said.

Conforming Rule Changes

Some minor, non-substantive amendments to the amateur service rules were also included in the R&O. When the Commission simplified the amateur service's operator license structure in 2000, it decided to renew Technician Plus Class operator licenses as Technician Class operator licenses. All Technician Plus Class operator licenses have now either expired or been renewed as Technician Class operator licenses.

The FCC also decided in 2000 not to renew Radio Amateur Civil Emergency Service (RACES) station licenses and the last RACES station license has also expired. Part 97 has now been revised to remove references to Technician Plus Class operator licenses and RACES station licenses.

Section §97.21 was also revised to reference Section §1.949, which requires that renewal license applications be filed no sooner than ninety days prior to expiration of the license.

New rules are effective 60 days after publication in the Federal Register... about the end of January.73, Fred, W5YI

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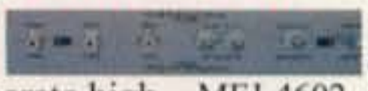

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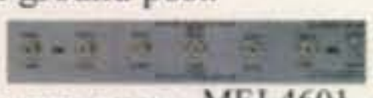
6 Coax



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math's notes

BY IRWIN MATH,* WA2NDM

ESD Considerations and Protection Methods

Many of us are aware (or should be aware) of the problems that can occur with our equipment from a nearby lightning strike, and as a result should always use some type of surge-suppression device, especially on antennas, antenna supports, and long outdoor transmission-line runs (including coax). These devices usually consist of various types of lightning arrestors, which are actually small spark gaps or gas discharge tubes that conduct very quickly and clamp the dangerous induced voltages to some manageable level. Other than a direct strike (the effects of which nothing can eliminate), when these surge suppressors are used properly there is usually very little, if any, resulting damage.

What we may not be so aware of, however, is the effect of so-called electro-static discharges (ESD) on delicate portions of our equipment caused by induced currents from even distant lightning strikes or, for that matter, locally induced discharges that may not be the result of lightning at all. For example, when a person rubs his or her feet on a rug during a dry winter day, it is fairly common to draw a spark from one's fingertips to a nearby grounded surface. This spark can have the potential of many thousands of volts but to a human being, a short, unpleasant "shock" is the only real result. This is a gross effect, to be sure, but equally dangerous ESD discharges can occur even in so-called "normal" (non-sparking) environments. That is why ESD workbench pads and grounded wrist straps are manufactured (and used), and why many semiconductors and ICs are shipped in conductive plastic bags with conductive foam inserts.

The following is a brief discussion as to why these ESD discharges are dangerous and what we can do to try to prevent or at least reduce their effects to less dangerous levels. Homebrewers who routinely handle semiconductor devices should pay particular attention. We will use the field effect transistor (FET) as an example in our discussion, but the same procedures apply to many other high-impedance devices.

As you may know the gate of most FETs is made of a tiny microscopic layer of material within the transistor. This results in an extremely high impedance that can be in the hundreds of megohms. As a result, it only takes microamperes of current to produce enough energy to damage this delicate structure. What is even worse, however, is when the gate is not destroyed but only damaged. This produces a long-term effect that can result in the failure of the device weeks, months, or in some cases even years later—just, of course, when you don't want it to happen!

A very simple solution is simply to connect a high-value resistor (100K to 1 megohm) from gate to ground as shown in fig. 1. This shunts the high impedance without affecting the rest of the circuit. As an alternative, a bias resistor network from gate to ground can perform the same task.

Another solution is shown in fig. 2. Here a zener diode, with a voltage rating somewhat above the normal gate voltage, is connected from the gate to ground. Negative voltages are clamped, and voltages above the zener threshold are also clamped.

*c/o CQ magazine

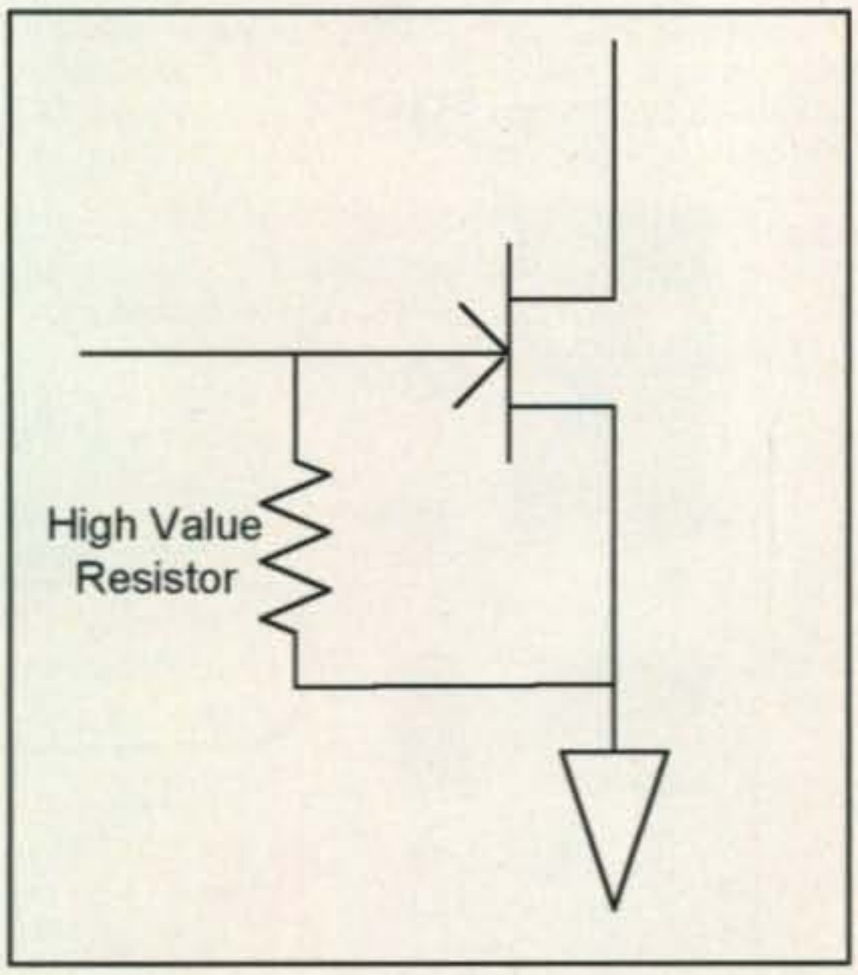

Fig. 1– Resistor protection.

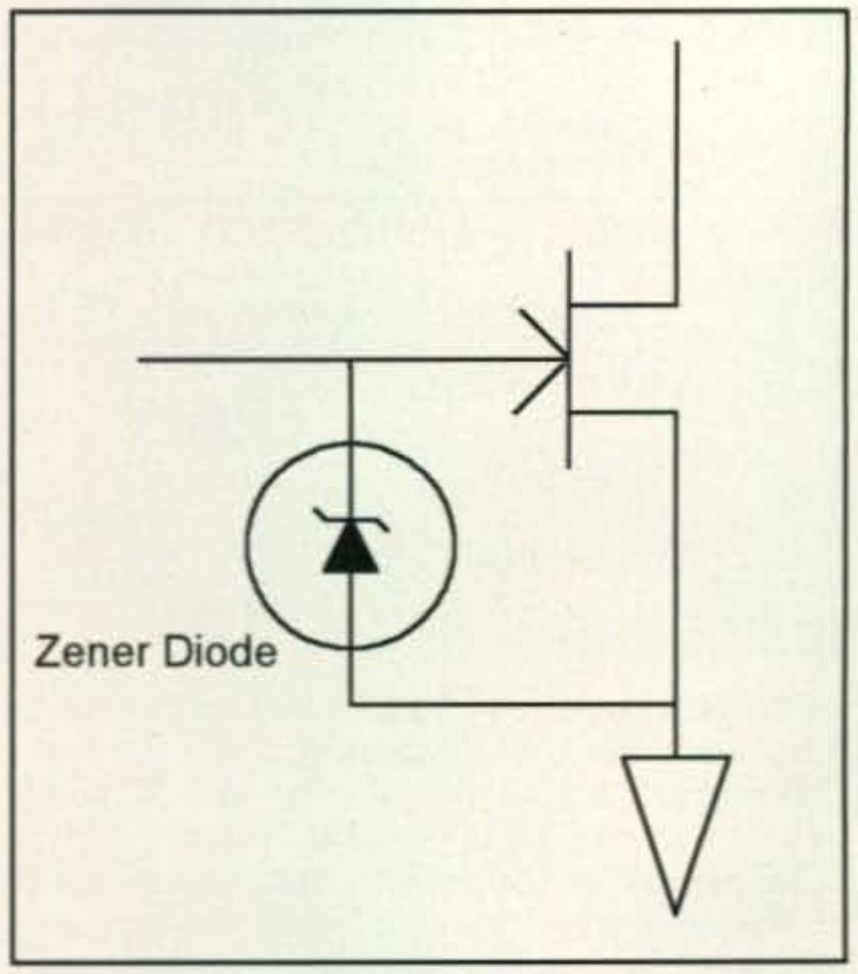

Fig. 2– Zener diode protection.

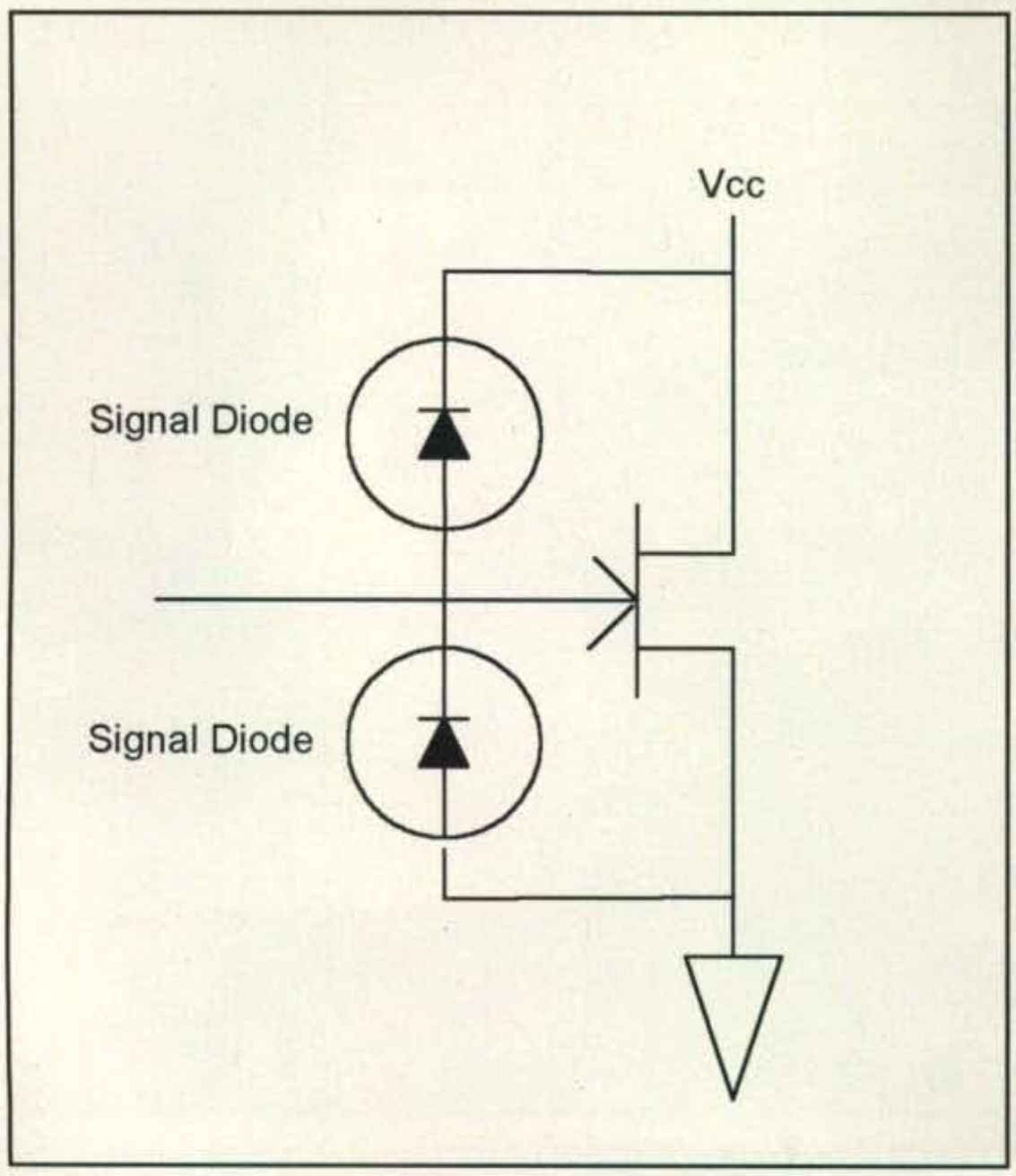

Fig. 3– Signal diode protection.

One drawback with this scheme, however, is the extra capacitance added by the diode.

Fig. 3 is another method using high-speed signal or switching diodes. Again, negative voltages are clamped by the lower diode, and voltages above the Vcc value are clamped by the upper diode. Diode capacitance is still there, however, but if you choose the diodes carefully you may be able to include this added capacitance in the tuned circuit capacitance required for an RF application.

There are other methods for protecting against ESD effects using MOVs, transorbs, etc., and a search through the data sheets and on the internet will turn up other methods that may directly apply to your application.

While FETs are particularly susceptible to ESD damage, many bi-polar transistors can also be affected. Keep in mind, too, that many ICs, especially CMOS and MOS devices, also have high-impedance inputs and should be treated carefully. To be really safe when handling any semiconductor devices you should always wear a wrist strap (available at low cost from many suppliers) that is grounded to a metallic panel on your workbench, or at the very least use the conductive foam that is provided with many components to hold the part. You also should always use a grounded soldering iron. These relatively simple steps can make a significant difference in your final results.

I want to wish all of you a very Happy New Year and hope that all of your hopes and dreams come true in 2011.

73, Irwin, WA2NDM

BY RICHARD FISHER,* KI6SN

In EmComm, Never Take *Being There* for Granted

Although there's probably lots of room for discussion, as Woody Allen said, "Eighty percent of success is showing up." In amateur radio public service, that's far from a given. As we know, effective EmComm requires a tremendous amount of recruiting, training, and planning. However, being able to count on our teams to *be there* when duty calls is where the proverbial rubber hits the road.

This month we have two examples underscoring how highly skilled and dedicated radio amateurs selflessly *showing up* has been a key ingredient in their resounding success. They add new meaning to "safety in numbers."

Superstorm: Connecting the Dots in Indiana

In late October 2010, hundreds of radio amateurs rushed to play a crucial communications role when a wave of extremely powerful storms ripped through a broad swath of the United States. According to published reports, the operators "were part of the NWS (National Weather Service) Skywarn® program and provided eyewitness reports of ground conditions and verification of radar assessments" and "quickly turned their hobby into radio networks allowing emergency responders to have accurate information of conditions."

"We were more than a little busy," said Mike Corey, W5MPC, Emergency Preparedness Manager for the American Radio Relay League. "There was great activity and need for the hams with Skywarn®, especially around Indiana," he said. "Giving the NWS real-time, ground-level confirmations is definitely appreciated."

Regional reports relayed to *CQ*'s "Public Service" columnist by ARRL Indiana Section Manager John Poindexter, W3ML, of Knox, illustrate the coordination and teamwork his state's EmComm operators exhibited in supporting local authorities and assessing damage from the massive and destructive system.

County-by-county snapshots from Indiana underscore the value of their work beginning October 26. Not only did they step forward in numbers, but provided vital communications in an exemplary manner, reflecting positively upon themselves and the entire amateur radio community. As you'll see, even when a weather system's bark exceeds its bite in some areas, having EmComm operators on the scene is vital. Here's a mosaic of how radio amateurs in Indiana took on their mission to help local authorities keep a lid on a dangerous and sometimes chaotic situation.

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e-mail: <ki6sn@cq-amateur-radio.com>

High winds and torrential downpours took their toll on a broad swath of Indiana farm country last fall as one of the most severe storms on record moved across the region. Amateur radio operators were out in force providing EmComm support to local agencies. (Courtesy of W9LW)

Monroe County. In Monroe County, ARES® and a Skywarn® net were activated from about 8:30 to 10:30 AM. There were 27 check-ins to the net—19 base stations and eight mobiles, according to Corey Shields, KB9JHU, of Bloomington, who served as National Weather Service liaison.

Christopher Rollins, KC9MTG, and Mike Enyeart, K9IUB, both of Bloomington, assisted with the EmComm coordination. Carl Zager, KB9RVB, is EMA RACES Radio Officer and ARES® Emergency Coordinator for Monroe County.

Power lines and utility poles teeter along a debris-strewn road in Wayne County, Indiana after "superstorms" pummeled the area last October. Radio amateurs from across the Indiana Section provided condition reports and disaster communications as the dangerous weather moved through. (Courtesy of W9LW)

"We covered a severe thunderstorm warning . . . and a tornado warning in the southern portion of the county," KB9JHU wrote. "Moderate, straight-line wind reports and one damage report, a small shed was blown over, were received. Thankfully, it was a pretty uneventful net weatherwise."

Shields noted, "One thing worth mentioning is that as the storm blew in, Bloomington South High School lost power. One of our check-ins, teacher Neil Rapp, WB9VPG, was able to keep track of things through the amateur radio net while the students and staff were secured.

"We had a similar check-in from a school staffer in northeast Lawrence County. Kevin Pauley, KB9WVI, of Bloomington, also mentioned that knowing what was coming, they were able to calmly get their preschool children secured long before the sirens came on, making it a less stressful situation for everyone involved there."

Adams County. "We activated a Skywarn® net for the storms," reported Derek Augsburger, AB9SO, Adams County ARES® Emergency Coordinator from Decatur. "We had seven amateurs check-in and do some spotting. The net lasted about an hour."

One incidence of 70-mph wind speed was reported. "Areas lost power, but there was no significant damage in Adams County, just small limbs down and one report of (damage to) an old grain bin in the middle of a field," AB9SO said.

Augsburger learned from the NWS that during the storms a "record was set for the lowest pressure in a non-tropical storm in the mainland U.S. According to the weather service, "The massive storm system barreling across the central U.S. had a minimum central pressure of 28.24," or 956 mb, equivalent to the minimum pressure of a Category 3 hurricane. This breaks the old record of 28.28" (958 mb), set on January 26, 1978 during the Blizzard of 1978. . . . This is also lower than the March 1993 'Storm of the Century,' or the 'Witch of November' storm that sank the *Edmund Fitzgerald* in 1975, or even the Columbus Day storm of October 1962."

Augsburger "recorded a low pressure of 28.21" in northwest Adams County."

Dearborn/Ohio Counties. "We had one sighting by a police officer of a tornado touchdown in Dearborn County, one mile north of Greendale near IN-1," Ken Courtney, W9BLA, wrote from Lawrenceburg. "I heard no further reports at all about this touchdown. We had several incidents of power lines down and trees into power lines, probably less than six."

The fire department was dispatched to help "a lady trapped in her underground shelter," he added. "There was no EMA, ARES® or Red Cross activity of any kind here and none reported in Ohio County." W9BLA relied on the Dearborn County fire frequency, the county EMA office, and the Ohio County Sheriff/911 dispatch to gather storm-damage information.

"W9YL (Chick Factor International) told me on the air only that there were similar and minor incidents in Ripley County," Courtney said.

A satellite image shows the massive "superstorm" moving across the United States on October 26, 2010. (Courtesy of NASA/GSFC)

Allen County. "Allen County Skywarn® for Quadrant 2 was active from 10 to 11:30 AM," said Brian Jenks, W9BGJ, of Fort Wayne. Reports of varying degrees of severe weather for Allen and some other counties in the quadrant were relayed to the National Weather Service Office at North Webster.

Harrison/Crawford Counties. "I activated the Skywarn® net today (following) severe thunderstorm and tornado warnings in Harrison/Crawford counties," reported David McKim, W9WXN, Harrison County ARES®/ Skywarn® Emergency Coordinator and Official Emergency Station. He lives in Corydon. "There was not much damage locally other than a few power outages, a few treetops snapped off, and 50- to 55-mph winds, McKim reported. The Skywarn® net had eight check-ins and lasted about two-and-one-half hours.

Starke County. Section Emergency Coordinator Tony Langer, W9AL, of North Judson, activated an EmComm net in Starke County. However, there were no reports of damage in the area.

ShakeOut: California Operators Drill Hard For "The Big One"

In preparation for the inevitable, "The Great California ShakeOut," has become an annual disaster drill across the state, believed to be the largest earthquake preparedness drill in the world. At 10:21 AM on October 21, 2010, millions of state residents "ducked and covered" as agencies dealt with simulated mass casualties, evacuations, and destroyed infrastructure, all prompting the need to rely on emergency communications.

The Hermosa Beach Amateur Radio Association, one of the ham organizations supporting the exercise, is an excellent example of how trained operators can play critical roles in plugging communications gaps during a disaster—even simulated ones. It's yet another example of the importance of *showing up.*

"Since the ShakeOut drill was on a weekday during business hours, not all of our members could participate," said HBARA's Ken Hartley, K6KAH. "(But) we did have eight radio operators participating in the drill, and one observer."

Hermosa Beach's participation was organized by Lt. Tom Thompson of Hermosa Beach Police Department and involved: Senior city staff; the chiefs of the police and fire departments; Public Works; View School; Valley School; Our Lady of Guadalupe School; the U.S. Coast Guard, and Lt. Cmdr. Liz

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radio not included

AT-897Plus

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-897Plus Autotuner mounts on the side of your FT-897 just like the original equipment and 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 Price$199.99***

- ***RF Sensing***
- ***Tunes Automatically***
- ***No Interface Cables Needed***

AT-100ProII

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 with LEDs, allowing you to switch instantly between two antennas. The AT-100ProII requires just 1 watt for operation, but will handle up to 125 watts. Includes Icom interface cable, DC power cable and coax jumper. ***Suggested Price $229.99***

Z-11ProII

Meet the Z-11ProII, 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. The Z-11ProII 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. Includes Icom interface cable, DC power cable and coax jumper.
Suggested Price $179.99

radio not included

Z-817

The ultimate autotuner for QRP radios including the Yaesu FT-817(D). Tuning is simple; one button push on the tuner is all that is needed - the Z-817 takes care of the rest. It will switch to PKT mode, transmit a carrier, tune the tuner, then restore the radio to the previous mode! 2000 memories cover 160 through 6 meters. The Z-817 will also function as a general purpose antenna tuner with other QRP radios. Just transmit a carrier and press the tune button on the tuner. Powered by four AA internal Alkaline batteries (not included), so there are no additional cables required. A coax jumper cable is also induced for fast hook up.
Suggested Price $129.99.

Z-100Plus

Small and simple to use, the Z-100Plus sports 2000 memories that store both frequency and tuning parameters. It will run on any voltage source from 7 to 18 volts; six AA batteries will run it for a year of normal use. Current draw while tuning is less than 100ma. The Z-100Plus now includes an internal frequency counter so the operating frequency is stored with tuning parameters to make memory tunes a blazingly fast 0.1 seconds; full tunes take an average of only 6 seconds. Includes Icom interface cable, DC power cable and coax jumper.
Suggested Price $159.99

*To receive your free SP-200, simply fill out the rebate form available at www.ldgelectronics.com and mail to LDG along with a copy of your dated sales receipt. All rebate forms must be received by LDG before March 31, 2011. Limit one per household, valid worldwide.

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

The #1 Line of Autotuners!

AT-1000Pro

The AT-1000Pro has an Automode that automatically starts a tuning cycle when the SWR exceeds a limit you set. Operates at any power level between 5 and 1,000 watts peak. RF Relay protection software prevents tuning at greater than 125 watts. Tunes from 1.8 to 54.0 MHz (inc. 6 meters), with tuning time usually under 4 seconds, transmitting near a frequency with stored tuning parameters, under 0.2 seconds. 2000 memories. 2 Antenna connections. Includes Icom interface cable, DC power cable and coax jumper. ***Suggested Price $599***

- ***RF Sensing***
- ***Tunes Automatically***
- ***No Interface Cables Needed***

AT-200Pro

The AT-200Pro 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. Includes Icom interface cable, DC power cable and coax jumper. ***Suggested Price $249***

NEW! YT-450

LDG's newest tuner is specially designed for Yaesu's newest 100 watt radios. The YT-450 interfaces directly with the Yaesu FT-450 and FT-950 radios, making integration easier than ever. Simply connect the tuner to the radio with the supplied cables and you are ready to operate. DC power and all control is done through the interface cable. Just press the tune button on the tuner and the rest happens automatically: mode and power are set, a tune cycle runs and the radio is returned to its original settings. It will quickly match nearly any kind of coax fed antenna with an SWR of up to 10:1. 2000 memories recall settings in an instant! An extra CAT port on the back allows seamless connection to a PC. You have the newest radio, now get the newest tuner to go with it!
Suggested Price $249.99

IT-100

Matched in size to the IC-7000 and IC-706, the new IT-100 sports a front panel push-button for either manual or automatic tunes, and status LEDs so you'll know what's going on inside. You can control the IT-100 and its 2000 memories from either its own button or the Tune button on your IC-7000 or other Icom rigs. It's the perfect complement to your Icom radio that is AH3 or AH-4 compatible.
Suggested Price $179.99

KT-100

LDG's first dedicated autotuner for Kenwood Amateur transceivers. Easy to use - just right for an AT-300 compatible Kenwood transceiver (except TS-480HX). The KT-100 actually allows you to use the Tune button on the radio. The LEDs on the front panel indicate tuning status, and will show a match in seconds, or even less of you've tuned on or near that frequency before. Has 2,000 memories for instant recall of the tuning parameters for your favorite bands and frequencies. If you have an AT-300 compatible Kenwood radio, you can simply plug the KT-100 into your transceiver with the provided cable; the interface powers the tuner, and the Tune button on the radio begins a tuning cycle. The supplied interface cable makes the KT-100 a dedicated tuner for most modern Kenwood transceivers.
Suggested Price $199.99

YT-100

An autotuner for several popular Yaesu Radios. An included cable interfaces with your FT-857, FT-897 and FT-100 (and all D models) making it an integrated tuner, powered by the interface. Just press the tune button on the tuner, and everything else happens automatically: mode and power are set, a tune cycle runs, and the radio is returned to its original settings. It's the perfect complement to your Yaesu radio.
Suggested Price $199.99

Meters!

FT Meter 2.5" face with calibrated scales for signal strength, discriminator reading on receive, and power output, SWR, modulation, ALC action and supply voltage on transmit, all selectable from the radio's menu. ***Still Only $49***

FTL Meter For Yaesu FT-857(D) and FT-897(D). 4.5" face with calibrated scales for signal strength, discriminator reading on receive, and power output, SWR, modulation, ALC action and supply voltage on transmit, all selectable from the radio's menu. ***Suggested Price $79.99***

NEW! M-7600 For IC-7600. It will display S-meter on receive, or power out, SWR, ALC level or supply voltages, all selectable from the radio's menu. What's more, the M-7700 and the virtual meter on your radio can work together.
Suggested Price $79.99

NEW! YT-847

YT-847 Autotuner is an integrated tuner for the Yaesu FT-847. An included CAT/Power cable interfaces with your FT-847. Just press the tune button on the tuner and everything else happens automatically! The mode is set to carrier and the RF power is reduced, a tune cycle runs and the radio is returned to the original settings. Also includes coax jumper cable. ***Suggested Price $249.99***

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LDG

Booker, Los Angeles County Lifeguard; Los Angeles County Disaster Communication Service (DCS, Lomita Station); Area G Disaster Coordinator Mike Martinet, Hermosa Beach Neighborhood Watch; communication consultant Joy Matlack; and Hermosa Beach Amateur Radio Association.

For a general interest You Tube video showing a part of 2010's "ShakeOut," visit: <http://bit.ly/9nRneF>.

Making It All Work. "We use the Palm Tree repeater on 440, which is owned by one of our members, and 220 from the EOC to county DCS EOC," Hartley said. "In the club room/EOC we have 2-meter, 220-MHz, 440-MHz, high-frequency, and PACTOR capabilities, as well as a 25-kw generator.

"Once our EOC was activated," he said, "we took roll call of who was on frequency and then, based on their location in the city, deployed a ham radio operator to each school to meet with the superintendent or principal and shadow them.

"Other ham radio operators passed traffic of what was happening in their immediate area and stood by for orders to deploy to area Neighborhood Watch block captains to get other updates from around the city," Hartley said.

"City staff then began to give us information to pass along to operators to share with residents, such as turning off their water because we had a (simulated) main break and sewer problem," he said. "City staff also gave us information to pass along to Los Angeles County, which we did via 220 to the Los Angeles County Disaster Communications Service out of the Lomita Station.

"The USCG did fly over the city twice and gave reports directly into the EOC. The HBARA has a great working relationship with Hermosa Beach staff, and it was very easy to work with them. That being said, There were some flaws."

Lessons Learned. K6KAH noted that "there was a lack of Incident Command System (ICS) forms which caused orders to be written on various sizes of regular paper.

"As the net control operator," he said, "I didn't know who handed me the message or where it was to be sent. This caused a delay, because we had to go back and find who gave us the message, where it was going, the time it was written, and so on. Since then, the EOC has been stocked with ICS forms and this will not happen again.

"This was the first time Hermosa Beach has had a drill to activate an EOC," Hartley said, "and overall it was *very* helpful. The Emergency Pre-

Florida Hams Support Two-Wheeled Riders in Lake County

The Lake County Amateur Radio Emergency Service (LCARES) provided radio communications for the 36th Annual Mount Dora Bicycle Festival in Central Florida last fall, a nationally-recognized event that attracts thousands of riders.

"The mobile communications trailer was set up in downtown Mount Dora adjacent to the Mount Dora Chamber of Commerce office," reported Ted Luebbers, K1AYZ. "The net control station, located in the trailer, maintains radio contact with 25 LCARES operator-volunteers at rest stops and in mobile communications vehicles patrolling the bike routes for the safety of the riders."

The team used the call sign N4FLA for the event. Strait Hollis, KT4YA, is LCARES director.

"Events such as these help the volunteer radio operators train for deployment during a time of natural disaster such as hurricanes or tornados, which are not uncommon in this area," Luebbers said. "These amateur radio operators get the experience of running radio communication nets and exercising their portable equipment to make sure everything will run smoothly if and when they are called upon during an emergency."

Stephen Flynn, WA2ENT, takes the net control microphone with other members in the Lake County Amateur Radio Emergency Service communications trailer for the 2010 Mount Dora Bicycle Festival in Central Florida. (Courtesy of LCARES)

Strait Hollis, KT4YA, LCARES director, opens the communications trailer in downtown Mount Dora for the city's 36th annual bicycle festival last fall. (Courtesy of LCARES)

paredness Advisory Commission has put forth a subcommittee that will help organize next year's drill, which will involve almost all city staffers, and be done at night on generator power."

HBARA was recently awarded the 2010 California Emergency Services Association (CESA) "Special Recognition" in outstanding service to the field of Emergency Management. "This was because the volunteers from HBARA were the driving force for getting an Emergency Operations Center (EOC) constructed in Hermosa Beach," Hartley said. "After three years of mostly volunteer efforts, the EOC had its grand opening on August 11, 2010 with about 75 people in attendance. The room is 28-by-48 (feet) and serves as the HBARA club room, training room for anything public-safety related, and the EOC."

(A comprehensive look at how HBARA initiated, planned, built, and supplied its new Emergency Operations Center will be the focus of an upcoming "Public Service" column—ed.)

Amateurs Help in Indonesian Disaster Relief Effort

An earthquake triggering a tsunami and a volcanic eruption prompted radio amateurs in the Indonesian archipelago to take a major role in relief efforts following the twin disasters.

According to ORARI (Organisasi Amatir Radio Indonesia) International Affairs Coordinator Wisnu Widjaja, YBØAZ, the organization's Communication and Rescue Task Force joined the team of the Disaster Management of Directorate General Post and Telecommunications, Ministry of Communication and Informatics Republic of Indonesia in the emergency response. The radio amateurs "have been operating in the field and providing communications support to the government and communities" in affected areas.

According to published reports, the death toll climbed into the hundreds, most as victims of the tsunami set off by a 7.7-magnitude offshore earthquake that struck the Mentawai Islands off the west coast of Sumatra. Many more people were missing.

Some distance away, on the island of Java, 29 were killed when "Mount Merapi erupted, releasing clouds of hot gas, rocks and lava into the air," according to reports from Jim Linton, VK3PC, Chairman of the IARU Region 3 Disaster Communications Committee, with help from CNN.

"Almost 42,000 people had fled to temporary shelters around the nearby city of Yogyakarta as the area (was) covered in volcanic ash. The remoteness of the affected areas, poor communications, and the ongoing disaster response and relief efforts are likely to see the ORARI Communication and Rescue Task Force involved for some time," the VK3PC report noted.

Zimpfer Memorial Fund Underwrites EmComm in Ohio

The Lancaster and Fairfield County (Ohio) Amateur Radio Club received a $5,219.86 grant from the George and Dollie L. Zimpfer Memorial Fund, administered through the Fairfield County Foundation, according to the Lancaster (Ohio) *Eagle-Gazette* newspaper. The grant allowed the organization to buy EmComm radios and accessories "that can be transported and used at all special needs community events, local emergencies, natural disasters, and during other times used for membership training and simulated emergency drills," the paper reported. "This equipment will also be used to supplement emergency responders and provide education and training to volunteers who will assist those responders."

73, Richard, KI6SN

magic in the sky

BY JEFF REINHARDT,* AA6JR

Happy New Year!

If you've recently earned your ham radio license, say in the last five years or so, chances are good that you see your operating privileges as part of the overall mix that electronic devices play in your everyday life. Just like the cordless phone, the TV, DVR, and PC, amateur radio has its place in your life.

If you've been licensed longer, up through 10, 20, or even more years of experience, you have seen a "coming of age" in consumer electronics that seems to continue, accelerating with no end in sight. In the consumer electronics world alone, the baby-boom generation has witnessed an astounding explosion in technology that graduated from AM radio and black-and-white TV to today's hi-def (and even 3D) video, digital audio, and evolving refinement in home audio. In the past, the latter would often take the form of a "component" stereo with monster speakers and a room full of records, tapes, or CDs. Now all that media can be stored in your shirt pocket; my iPhone currently carries just under 4,000 audio selections that would take over a week to play sequentially. That same device allows me to surf the web, make a phone call, check the financial markets, navigate via GPS, find a restaurant, and carry my "electronic Rolodex" wherever I travel. It does more, but you get the idea.

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Have We Created a New Age?

As electronics hobbyists, we have had a significant role in creating today's devices that keep information and communication in all its forms literally at our fingertips. It's relatively easy to "connect the dots" of ham radio's beginnings and advancements from demonstrating new technologies and modes up through popularizing FM, repeater operations, telephone patches, worldwide packet radio text messaging, satellite communications, APRS geolocation, and blending technologies to create new, exciting applications. Some of the advancements came directly from ham experimenters, while others came about from smart manufacturers who actually listened to imaginative hams at conferences and events such as the Dayton Hamvention®, where someone like you or me could start a sentence with those wonderful words, "What if . . . ?"

As a self-appointed observer of the human condition, I sometimes take the opportunity to watch how people interact with today's technology and wonder what—and where—the next advancement will be.

As this is written, Microsoft has commenced a clever advertising campaign promoting its "next greatest thing" by showing everyday people whose lives now revolve around their handheld communicator, including a bride walking down the aisle. While it may not have come to that yet, we're not very far away. I get to spend a lot of time at airports and it's amazing to watch the people walking, eating, and even (ahem), using the rest room while glued to the latest information on their 3-inch by 2-inch screen. A group of kids can be seated together but not an audible word is said; instead, fingers are busily texting away. The moment a plane lands, there's a rush for the pocket or purse to reactivate the device around which many lives now revolve.

To an extent, I'm guilty of some of the behavior listed above, but I have established some limits. This came about partially through the following experience: One evening I was enjoying a restaurant dinner with my XYL and noticed the couple seated at the next table. From the time they were seated, she was working her phone, he was working his iPad, and other than a quick comment when ordering from the waitress, I don't think they interacted with each other (verbally) through the whole

dining experience. Who knows? They may have been sending love poems to each other, but sadly, I'd be willing to bet they weren't.

I Know You're There; I Can Hear You Breathing

I have attended meetings in conference rooms large and small where the speaker must compete for the attention of those present. It is common to see folks working their electronics at houses of worship during services. (Perhaps they're paying unwitting tribute to the ancient gods, Hermes or Mercury?) Are there limits on fractionally dividing our attention? What happens to the missed details? How would you feel if your doctor was texting while discussing your prognosis in a serious medical situation?

A local school superintendent informed me that some of his teachers interact with their students using their cell phones. You can't beat 'em so why not join 'em?

Here's your homework assignment via text message. What's the answer to this question? Text me A, B, C, or D. That raises the ante on another problem, specifically the gap felt by those economically disadvantaged. What happens if you can't afford a high-tech phone?

Smelling the Roses

Recently while driving along California's magnificent coastal highway, I passed an SUV with the rear passenger kids glued to the cartoons showing on the screens in front of them. Meanwhile, just to their right, was a shoreline that people travel around the world to see. I'm not saying what they were doing was wrong, but I wonder if they may later lament the missed opportunity to take in nature's magnificence. Perhaps they can go home and someday Google some photos of California Highway 1 and see those images on a 2-inch by 3-inch screen, which begs the question, "Is the virtual reality the *new* reality?"

He Wrote the Book

Marshall McLuhan is best known for his prescient and enduring take on communications: *"the medium is the message."* You can read and re-read that quote and come up with many different interpretations, but after truncation, it brings you back to the original statement: genius. But let's dig a bit deeper. From that same paper, McLuhan went on . . . "the wheel is an extension of the foot, the book is an extension of the eye, clothing an extension of the skin, electric circuitry, an extension of the central nervous system."

The medium, or process, of our time—electric technology—is reshaping and restructuring patterns of social interdependence and every aspect of our personal life. It is forcing us to reconsider and re-evaluate practically every thought, every action, and every institution formerly taken for granted. Everything is changing—you, your family, your education, your neighborhood, your job, your government, your relation to 'the others.' And they're changing dramatically." (*Dear reader, this was written in the mid-1960s!—AA6JR)*

McLuhan's work was diverse but always stimulating. Perhaps his Canadian perch gave him a wry perspective on the frenetic activity south of his border. In the past, this column has paid homage to those scientists, experimenters, and technicians who made our communications hobby (and industry) what it is today. Against the cast of those pioneers, I might place Marshall McLuhan as the "Tesla" of his time; interweaving our human characteristics with the continuing advancements in communications technology.

McLuhan died on December 31, 1980, just prior to the introduction of the cell phone and many other devices that today we consider "necessities." It would be wonderful to get his take on how we find ourselves interacting with electronics in the intervening 30 years, not even an eye-blink against the backdrop of the cosmic time continuum.

Are You Ready to Write the Next Chapter?

As we embark on a new year, the point of this tome is to take some inspiration of the Roman god Janus, for whom the first month is named. If you recall your mythology, he had two faces, one looking ahead, one behind. He was often fittingly depicted at doorways. So here we are beginning a new year and establishing the tempo of this new decade, where a year-old communications device is considered "old-tech." Like Janus, I will choose to select those new, incoming elements that suit my purpose. I prefer items that have utility over those that are new just for the sake of being the "latest and greatest." I will also look back and keep those things I value: I like SSB, CW, analog FM, and the occasional item I can build or repair.

"What Hath God Wrought?"

Indeed! As Samuel F. B. Morse tapped those famous words across a few miles of wire, a new world opened and the old way of communicating began to slip away. He may not have foreseen geosynchronous satellites and the 24-hour news cycle, but he literally pressed the button that started the sequence.

This new year will offer you many opportunities to enjoy this magnificent calling in communications that we share. Be it the art of conversation with a new friend, a hurried contest contact, a commuter round table, or the rush of storm spotting, be sure to take a moment to reflect for just a moment on the true miracle that radio communications represents.

Remember, too, that behind all that technology there's a real, live human being; the same one you see in the mirror each morning.

Okay, I think I'm now ready for another year of adding to the "Magic In The Sky."

73, Jeff, AA6JR

learning curve

BY RICH ARLAND,* K7SZ

Hi-Ho, Hi-Ho, It's Off to Work I Go . . .

Over the last few weeks I have been ruminating about doing a column on setting up a ham radio workbench. To the uninitiated this might sound somewhat mundane. After all, what's to know? You get a bench and you pull up a chair and go to work, right? However, there is much more to assembling a good, ergonomically sound workbench area than first meets the eye. There are a lot of considerations: How much space do you need? What type of test gear do you need to procure? Ditto on tools. How about lighting? What's a workbench without a "junk box" of parts? How do you assemble a "junk box"? And you thought this was going to be simple, didn't you?

For most of us, choosing a work/test-bench surface is a matter of finding an old table and stuffing it into a corner of the basement or the shack, provided your shack has the necessary space. Over the years I have used a piece of 3/4-inch plywood suspended across a bunch of cement blocks acting as bench legs, a door from a closet set atop two pull-drawer filing cabinets, the same door affixed to a 2 × 4 frame with legs bolted to a wall of the shack, and about everything in between. It doesn't take all that much space to provide a good work area for troubleshooting and/or building electronic projects. What takes up the space is the myriad equipment that you will acquire to aid in your efforts to troubleshoot and build. This is something we'll cover a bit later. For now, suffice it to say that the cheapest part of your workbench will be your workbench!

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Your workbench will reflect your personality, much the same way as your shack operating position does. A military co-worker of mine was always fond of saying, "A clean desk is the sign of a sick mind!" That being the case, I am *very* well-adjusted! You will notice that in the pictures of my workbench there is some clutter; suffice it to say that I had cleaned up the mess before taking the photographs. Don't worry, it's back to being cluttered; I'm sane!

Hand Tools

The most common denominator in any workbench is a good selection of hand tools. We are talking about screwdrivers, nut drivers, needle-nose and chain-nose pliers, side-cutters (also called diagonal cutters or "dykes"), flush cutters, etc., etc. The list goes on, seemingly forever!

One thought I'd like to impart regarding hand tools: Buy the best grade of tools that you can afford. You won't be sorry. Case in point: Most of the Xcelite nut drivers, screw drivers, and pliers that I procured as a student in college I still have on my workbench. Putting this in perspective, I graduated college in 1967! In the long run, money spent on good hand tools will save you dollars and frustration later on down the road. (Photo A shows a very small portion of my hand tools; additional photos show other "bench" items that may or may not be discussed in the text.)

Meter, Meter on the Wall . . .

Many hams discount the hand tools and focus on the "goodies," more appropriately called the "fun

Photo A– This is an extremely small overview of the hand tools I have at K7SZ. Buy quality tools and you'll be dollars ahead. Keep them clean and well stored and you will be using them for years.

stuff," on the workbench. Meters certainly occupy a dominant place on the workbench. Since the market is flooded with all forms of both analog and digital meters, which ones do you procure?

To be truthful, there is a place for both styles of meters on today's workbench. A good digital multimeter (DMM) can cost between $35 and $150, depending upon brand and model. Alternatively, there are adequate, less-expensive digital meters for sale at places such as "The Shack," Frys, and Harbor Freight that will perform a multitude of functions at a fraction of the price of a high-end Fluke or HP. The choice is yours. Depending upon how deep your pockets are and how critical your voltage, current, and resistance measurements need to be, there is, quite literally, something out there for everyone.

The same goes for analog meters (photo B). There are hundreds of analog multimeters on the market, so it is a matter of finding one or two that fill your requirements and buying it/them. One word of warning regarding analog multimeters: There are some inexpensive units out there that, due to their construction, will "load down" the circuit under test (more on this below). These are normally labeled as a VOM (Volt/Ohm/ Milliammeter) and are inexpensive. However, even these cheapies have a place in your tool bag or on your test bench.

Meters 101

Let's take a minute and discuss how analog VOMs work. One thing to remember: Every analog meter functions in virtually the same way. A current is picked up via the probes, placed across the internal circuitry of the meter, and, depending upon the mode of operation (volts, current, or resistance), the proper internal circuitry is selected and the results are displayed on the meter. It's up to you, the technician, to read the proper scale on the meter and make sense of the reading. True, analog meters have a bit of a "guess factor" when it comes to a super-accurate reading, but the margin of error won't make any difference in about 99% of the work you are going to do on your test bench.

Problems arise when you use an inexpensive analog meter that does not have a high input impedance. These meters will "load down" the circuit under test, because the internal resistance of the test gear is relatively low compared to the circuit under test. Therefore, the meter becomes a part of the circuit as opposed to a piece of test gear that monitors the parameters of the circuit.

Virtually all of the digital meters have an extremely high ohms-per-volt rating, normally in the area of 10 meg-ohms per volt. Digital meters are easy to read. (You are reading actual numbers, not a needle swinging against a background of meter scales.)

It is easy to assume that a digital meter would be inherently more accurate than an analog VOM. This is not

Photo B– Analog test meters. I have an affinity for analog meters, especially when I can get HP meters for $5 each! The top meter is a HP Model 427A VOM and the lower meter is an HP Model 400 AC Voltmeter. These two meters, along with the Heathkit IM-5228 VTVM (Vacuum Tube Volt Meter, $15 at auction on the internet) give me a tremendous latitude in troubleshooting and building gear.

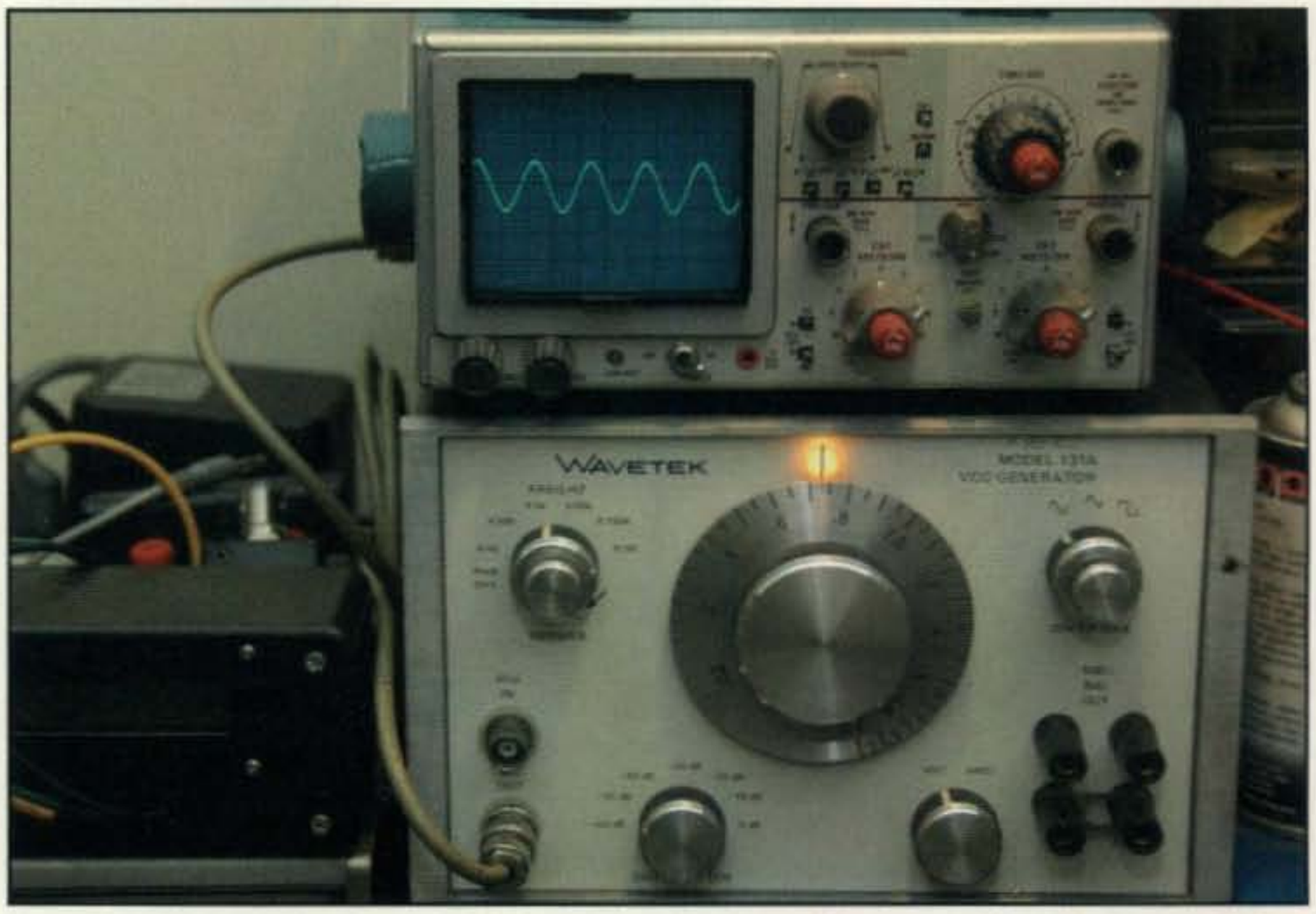

Photo C– This tiny Tektronix Model 326 5-MHz dual-trace oscilloscope (top) is a nice fit for my tiny workbench area ($115 from Bob Garcia, KD4JRT, "The Scope Man," at 770-977-5701). It replaces a full-size ,5-inch, 25-MHz dual-trace scope! The Wavetek Model 131A function generator provides sine, square, and triangle waveform outputs to aid in troubleshooting and aligning equipment ($18 at auction on the internet).

Photo D– One thing that you will end up with plenty of is patch cords, test leads, and coaxial jumpers. Pomona (http://www.pomonaelectronics.com/) makes various-size hangers (as well as all sorts of "tweenies" and connectors) that work well for keeping the tangle of these cords to a minimum.

On the Cover

Bill Rinker, NE9Z, of Moran, Wyoming is a big-time DXer with a big-time station. However, it hasn't always been that way. "Before buying my first (manufactured) transceiver," Bill tells us, "I had a Heathkit HW-8 QRP CW rig and made over 500 QSOs with it. … I remember on 15 CW, with two watts and a wire antenna outside my house in Fort Wayne, working my first DX, a guy in Brazil. That was the beginning of my chasing DX."

That HW-8 still sits in Bill's shack (top shelf in inside photo), but these days he most commonly uses his Yaesu FT-1000MP and Ameritron AL-1500 amp, along with an all-band Heathkit tuner, to feed the two antennas on his 72-foot tower, a Hy-Gain Explorer 14 with the 40-meter add-on and a Cushcraft A3WS 12/17-meter beam with the 30-meter add-on.

Bill's primary ham radio love is chasing DX, something he's done very well. He has worked all 338 countries on the 2010 DXCC list, as well as the four "new ones" created last October by the breakup of the Netherlands Antilles. He says he has qualified for DXCC on all nine HF bands, although he hasn't applied for the certificates. A ham since the end of 1979, he and his wife have lived in Wyoming since 1990, when he retired from a career as an electrical engineer in the motor division of General Electric in Fort Wayne, Indiana (the origin of the "9" call). Bill says he also tries to operate regularly in the CQ World-Wide SSB and CW contests, as well as the ARRL DX CW contest. And while he works both phone and code, Bill says, simply, "I like CW."

(Cover photo by Larry Mulvehill, WB2ZPI)

necessarily so, as the accuracy of the digital meter depends upon the input impedance of the unit along with its internal circuitry. What makes a Fluke digital multimeter outperform an inexpensive unit from "The Shack" or Harbor Freight is the internal circuitry and how the analog-to-digital (A/D) conversion is done within that circuitry.

The next hurdle to cross is where you are going to procure these meters. There are always retail sales at stores such as Frys, "The Shack," or Harbor Freight. However, the internet also offers some really great sites from which to choose. To get a feeling for just how many internet-based companies sell new and used analog and digital multimeters, do a search on those two topics and then stand back! I have successfully used an internet auction house to procure a Wavetek function generator, several analog meters, and a Heathkit frequency counter at well below market prices. All of these units work great, and I have managed to acquire some much-needed test gear at a fraction of the cost of buying new.

Another source is your local ham radio club. Members often have excess test gear that is gathering dust, so watch the club newsletter for a bargain. Let's not forget hamfest flea markets. This is another great avenue to explore. Often big-name test gear such as HP, Fluke, and Tektronics can be garnered for pennies on the dollar.

Photo E– I am at a total loss without these two pieces of test gear: the MFJ model 886 frequency counter and the Model 269B antenna analyzer/counter. These two devices, a quality digital multimeter, and some hand tools are a great start on work/test-bench equipment.

One thing that I need to stress at this point is to do your homework. Before you jump in and buy a piece of used test gear, be sure you know what you are buying! If possible, try it out beforehand, or, if that is not in the cards, get some kind of guarantee from the seller that if it does not work or is not accurately calibrated, you can either get a refund or return it for an exchange. The internet can provide a wealth of information on all sorts of test gear.

Scopes, Sig Gens, and Other "Stuff"

This is one area in which you really need to do your homework before you can make an intelligent decision about what to buy. Everybody wants an oscilloscope. Most people don't need one! A 'scope is your window into the AC world. It provides a real-time graphic display of what you are troubleshooting and can greatly speed up the process of fixing a piece of gear. However, unless you are doing a lot of troubleshooting or homebrewing, you will seldom need an oscilloscope.

There are a number of parameters surrounding scopes: bandwidth, single/dual trace, storage capability, DMM display, etc. The adage "go big or go home" does not apply to scopes. Most test benches do not need a 100-MHz oscilloscope. As a matter of fact, I traded in my 25-MHz scope for an ultra-small Tek 5-MHz dual-trace scope that works on batteries (photo C) simply because I didn't need the extra bandwidth *and* I had limited room on my bench to park a scope. The *ARRL Handbook* has featured a circuit to extend the range of any scope for the last 15 years or more. This simple add-on is nothing more than an oscillator and mixer circuit. Your signal is fed into the magic box and heterodyned against the internal oscillator, which has an output in the 5-MHz range, so your scope can accurately display the signal. It's a very inexpensive way to extend the limited range of an inexpensive scope!

Signal generators abound on the used market. An old Heathkit, Knightkit, Sencore, or a military unit (such as the URM-25D), and a used frequency counter will enable you to align about anything you can drag onto your test bench. The prices of these units are very reasonable. You can procure a used Heathkit sig-gen for around $25–35. Add a used counter (about $25–50) and you end up with a sig-gen that can serve you well for years without spending gobs of money.

It's a Wrap for This Month

Well, that is a wrap for this column. Remember, this is your column, so don't hesitate to drop me an e-mail or snail-mail with your comments and things you'd like me to cover. Until next time, have fun with our hobby and hope to work you on the bands. 73, Rich, K7SZ

kit-building

BY JOE EISENBERG,* KØNEB

Tools for Kit-Builders

Happy New Year! With the coming of the new year, it is probably a good idea to look again at some useful things for a kit-builder.

Multi-function Multimeters

I noticed that the cost of a simple digital multimeter has dropped dramatically. There's one on sale for $2.99 at Harbor Freight that even includes a transistor tester function. However, there is a whole new crop of meters that are affordable, yet have a number of extra functions that might be useful, including capacitance- and inductance-measuring ranges as well as even thermometer functions (photo A). Why would a thermometer-probe function be helpful? Measuring the heat produced by a component can be a window into how close you have reached to the operating limitations of that component.

Many semiconductors that require a heat sink have published specifications that often can be downloaded from the internet. These specifications include maximum frequency range, noise figures, voltage and current limitations, as well as operating-temperature ranges. Keep in mind that some components designed to use a heat sink can get too hot to touch and yet be working normally. Look in the component specifications to see what the nominal operating temperature range is. A good example would be an output amplifier transistor that is designed to run at no more than 120° Celsius and you observe it operating close to that level even when not under load. That would be a reason to look at the parts that connect in that section of the circuit to see if the proper values of resistors, diodes, and capacitors were used. If the part runs hot, you might be looking at a problem where it may be oscillating or biased or driven incorrectly, causing spurious signals and thus heating the part beyond normal.

A capacitance meter is also useful in identifying capacitors that for one reason or another have their value markings rubbed off or blurred. It can also identify capacitors that may not be suitable by being shorted or open, or not the right range of value. For the same reason, inductance-measuring capability is also useful to test chokes and coils. Check your local RadioShack and Sears stores for a variety of meters with these extra capabilities. My experience is that Sears has the largest variety of meters in all price ranges, including high-end models by Fluke.

Another useful meter is the M-Cubed LCRZ Meter kit. This kit measures a wide range of inductors, capacitors, and resistors, and calculates impedance as well. The kit has some SMD parts, but they are already mounted on the board, so all the builder has to assemble are the through-hole parts. This is by far the most comprehensive I have seen in kit form for measuring components and circuits. It is available at <http://www.m3electronix.com> . I have not built one yet, but it looks to be not a very difficult kit to assemble.

Soldering Tools

Soldering irons are essential to a kit-builder, and from time to time I have found that my work as a field engineer as well as in amateur radio places me in situations where AC power is not readily available, or the item to be soldered, such as antenna wire, is too heavy to be soldered with a small pencil-type iron. That is when I turn to a portable

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Photo A– This inexpensive multimeter has a transistor tester as well as a thermal probe and capacitance meter. It is sold by Tower Electronics at <http://www.pl-259.com>.

Photo B– RadioShack 64-2188 butane-powered soldering iron.

soldering tool powered by butane gas. This is the same fuel used for butane-powered cigarette lighters and is widely available in pressurized cans at most stores where they sell smoking needs.

These gas-powered irons often have the capability of rapidly producing large amounts of heat, enabling soldering outdoors on antenna wires. I recently used a RadioShack #64-2188 butane-powered iron (photo B) to solder the wire on my new 160-meter top-fed sloper. This iron can melt solder in as little as 20 seconds after it is lit and the catalytic converter glows red. I have also used this iron to activate heat-shrink tubing once the solder connection is made.

I did, however, experience a problem with this iron while using it. While soldering an antenna wire outdoors, I felt my hand getting ice cold, something unusual on a warm day. It turned out that my iron had a fuel leak, and the expansion of the leaking pressurized fuel resulted in a very frosty experience.

A call to RadioShack customer service resulted in the defective iron being replaced with a new one sent to me. I was assured that the original tool was deemed safe for them to continue selling, but was given a different tool to replace it (photo C). I no longer find this model in the RadioShack stores or on the website, but they do sell two other butane-powered irons only on the internet and not in stores.

Should your butane-powered iron of any type or source develop a fuel leak, discontinue using it at once and call the customer-service number provided with your product. I was assured by RadioShack customer service that if anyone has a safety issue with his/her tools that they would promptly take care of the problem.

Butane irons are wonderful tools and great to have on Field Day or a picnic-table kit-building session. and being vigilant about their safe use is recommended.

Photo C– Replacement butane soldering iron made by Weller, provided by RadioShack. This iron features a piezo ignition system and larger fuel capacity than the older RadioShack tool.

With this being the middle of the long winter season in North America, it is time to remind kit-builders to be sure to use something such as a cookie sheet to protect your building surface from soldering-iron burns and scratches. The cookie sheet will also help you keep parts from disappearing.

For those who like to wear a magnifying lens instead of using a desk-mounted one, Harbor Freight now sells one for $9.99 with a built-in LED light. It is stock number 95890. This type of magnifier is especially good when working on boards with higher component density or those that have SMD parts. Another good idea is to use a small fan, such as a PC chip cooler, to keep the solder smoke away from your eyes. The smoke can be very irritating if allowed to accumulate. I use a small 12-VDC fan fed with 6–9 VDC to move the air without causing parts and instruction sheets to fly away in the breeze! A variable-voltage power supply works best, or you can roll your own regulated supply using a 12-V source and a regulator IC, for example a 7809, for 9-VDC output. Since the room in which I build kits is shared by a clothes washer and dryer as well as my furnace, plenty of air gets circulated as well.

Winter is a great time to dig into that unbuilt kit box and have fun! I try to keep a variety of kits ready to build, with the kit chosen to fit the amount of time I have available to assemble it.

4-40 (Hardware, Not the Band)

I have previously addressed the subject of mounting your kits in custom-made or standard-sized cases, but neglected to mention the size of hardware needed to properly mount your boards. Most circuit boards in kits have the holes drilled for using 4-40 type hardware. It is a very good idea to buy 4-40 screws and nuts and washers as well as threaded and non-threaded standoffs in various sizes to allow for variations in case design as well as board placement. I have found that by using threaded standoffs, I am also able to stack boards in one case. When at the Dayton Hamvention®, I often have found this hardware very reasonably priced by the pound at the Mendelson's tent. Check your local hamfests for 4-40 hardware as well. If you are fortunate enough to be able to buy this in bulk, use a parts storage unit to sort them out by size and type so that you always have the right hardware when you are ready to mount the board in a case.

Until next time . . . 73 de KØNEB

Testing, Testing . . . Check Everything
Before Declaring the Death of Your Radio

BY WAYNE YOSHIDA,* KH6WZ

The story you are about to read is true. The names of the people and the companies involved in this story have been removed to protect the innocent and the inexperienced. This anecdote is not meant to make fun of anyone, but it is a good reminder that one should try to verify the basics before going through much confusion, stress,and frustration. And, as I always say, if you don't understand something, seek the advice of your "go-to" friend at your radio club!

I received a call for help from a friend having some trouble operating a newly purchased, used all-band transceiver. She did read through the operating manual and followed the directions step-by-step. However, the rig just did not work like the book said. Since I was not familiar with the particular rig in question, I did a quick internet search to see if I could find an operating manual for the unit.

On the Trail to Assist—and a Detour

During my search, I came across a YouTube video featuring a frustrated owner of the same make and model radio that my friend had. The poor chap said his rig had been sent back to the factory for service several times, and it still didn't work right, even though the service tag said the problem could not be duplicated. (That is a nice phrase service centers use when they cannot find anything wrong with the unit.) The general description of the problem—low power output.

In the video, the station owner describes what is happening, but does not show the complete station setup and does not describe the antenna nor any test instruments hooked up to show how he tested his rig. However, he does spend a lot of time describing for how long he was not able to use his brand-new radio, and how many times he sent it back to the factory for repairs. He really seems frustrated with this whole thing, and I know how he must feel.

Finally, after several minutes, he turns on the rig and shows the meter indicating about mid- or three-quarters of full scale steadily when he keys the microphone. He believes the meter should show 100 watts, which is the transmitter power output specification and is mentioned in the colorful brochure.

But wait. . . . I get this funny feeling at the back of my neck. You know, sort of like that creepy, tingly feeling you get (or at least I get) as the state

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If you have trouble operating a mobile rig, remove it from the vehicle and run it on a bench power supply in the house. In this case, the outside temperature was 80-plus degrees, with the full noon sun beating down on the car. Operating the rig in an air-conditioned house with refreshments made learning much more fun. The coax runs outside to the mobile antenna on the vehicle.

trooper approaches you from behind while you are exceeding the speed limit.

After about five seconds of watching the video, I think the radio manufacturer is correct, and the rig is functioning normally. I am only 99.999% sure of my assessment, but not 100% sure, so I am not able to accuse the video author of having a "short between the headphones," as a good friend sometimes says about people on the radio. This is my friend's way of saying the radio operator's brain is defective; he is not thinking correctly and does not know how to use his equipment.

I usually try to be a bit more polite, and have to ask some questions. By asking questions, I am forcing the confused radio operator to carefully examine every operational step. This helps the person, because this process eventually leads him or her to discover the path to correct something wrong. A psychologist might call this a path to "self-discovery."

Too bad the video is no longer posted (it was "removed by author"). It was a great example of how frustrated people can become if they don't go over the basics. I hope the fellow didn't sell the rig to someone at a discounted price. It was probably a perfectly working unit.

Back on the Track

Let's get back to my friend with her problem. It really helps—no, I must insist—that the radio in question is plugged into a power supply and turned on as these steps are performed. Also, if you are the "helper," make sure the person doing all the knob-twisting and button-pushing is the person having the problems. The "learner" must perform these steps in order for this process to work correctly.

If the transceiver is installed in a vehicle, take it out, bring it into the house, and plug it into a bench power supply. You will be much more comfortable learning the radio when you are in the house, since you can take frequent breaks and rest. Learning how to operate a rig requires some concentration (see photo). It's too late now, but you (or your friend) probably should have done all this testing before installing, right?

Here is what we did one afternoon:

1. Check the front-panel controls. What are the settings of each knob, button, and dial?

2. Check the frequency on the display and all the frequency-related controls and menu settings. Checking all menu functions is important, because just

about all modern transceivers have "soft buttons" that are software, rather than hardware, driven. This is where most people goof when setting up a new radio. Since this is an HF through UHF transceiver, look for something called "split operation" where the transmit frequency and the receive frequency are different. Make sure this feature is turned off, and make sure all variable frequency oscillators (there are usually two VFOs) are tuned to the same frequency.

3. Go through the set-up and operational sections of the manual. When I say "go through," I mean perform each step on the powered-up rig. This will take some time. Relax. Take frequent breaks when fatigue begins. Take a walk or enjoy a beverage. If this means taking another day, make the time to do it later.

As we did this, even I became frustrated, and we took a long break away from the radio. When we were relaxing, I asked some other questions about the rig, and how and why she obtained it. Among a lot of other things, I remembered something that became the key to solving the mystery called "This radio does not do what the book says."

I smiled because I knew I could resolve this whole mess in an instant, and I would be a hero, since she had been trying to understand how to operate the radio for several months.

I asked my friend to verify something.

Me: "This is a used radio, right?"

Her: "Yes. The guy I bought it from spent a lot of time on the HF bands. The radio was working perfectly for him for a long time."

Me: "Let me see the radio again. Look in the book for something for me."

Her: "What do you want me to look for?"

Me: "Something about microprocessor reset, or restore to factory default, something like that."

Her: "OK, here it is. . . ."

Me: "OK, before we do this, do you have any frequencies or settings stored in the radio's memory? Because if you do, and we do a 'reset,' all those settings will be erased."

Her: "Memory? Uh, no, I don't think so."

Me: "OK, now press and hold. . . ."

As she performed the microprocessor reset, the radio made some interesting noises and—did nothing. This was actually a good thing in this case. We went through the steps again, and the radio now behaved exactly like the book said. It turns out that the previous owner spent a lot of time on HF nets, and probably some time on 6-meter and 10-meter repeaters, and had many custom settings for frequency splits and all sorts of things that my friend did not want or need.

When all that "memorized junk" was deleted by resetting the radio's microprocessor, the rig worked exactly as expected. She now enjoys the HF bands on her daily commute to and from work.

Back to the Video Guy

I am sure you are wondering about that video guy. I still do, too. My first guess (remember, he did not show us any of the settings or operating conditions of his station) is that the rig is in either the FM or AM mode. Here are the clues that might lead our video guy to solve his mystery.

Most solid-state HF and HF/VHF multi-mode transceivers have reduced power on AM or FM. In fact, the following specifications of this transceiver indicate this, even though the rig is advertised as a 100-watt transceiver.

Power Output: 160–6m, 100 watts (25 watts AM carrier)
2 m: 50 watts (12.5 watts AM carrier)
70 cm: 20 watts (5 watts AM carrier)

Next, the needle on the front-panel meter goes to some point and holds steady when he clicks and holds the push-to-talk button on the microphone. This probably means the mode switch is not on SSB, because if it were, the needle would "dance" up and down with voice peaks. This is as far as I can go from the small amount of clues in the background of the video.

This is the point of this month's installment of "The Ham Notebook": Always verify and double-check everything against the operating manual before declaring something is wrong. Make sure your measurements or assessments follow any operating or testing conditions stated in the specifications table, such as operating temperatures, supply voltages, mode settings. Verify everything and do not assume anything. Is your power supply really supplying the required voltage? During both receive and transmit?

This can reduce the down time of the new radio to zero hours, and may also save money if a service center charges a fee to evaluate the unit. Perhaps most important, this can prevent you or your friends from selling or giving away a perfectly working rig at a discounted price.

73, Wayne, KH6WZ

antennas

BY KENT BRITAIN,* WA5VJB

The Benefits of Stainless-Steel Hardware

Last winter, I lost my 2-meter EME array after nearly 30 years of service (and a 2-meter Worked All States award). The array has been taken apart and put back up as a far more modest antenna. What I want to point out are the advantages of using stainless-steel hardware.

There is a big difference between taking off a tight nut and taking off a frozen nut, especially when hanging off the side of a tower. Yes, stainless-steel U-bolts are kind of hard to find. However, even putting stainless-steel nuts on a regular U-bolt is much better than the original steel nuts. In photo A, I have a stainless-steel U-bolt and a steel U-bolt with stainless-steel nuts. On the left side of the photo I have one of the 30-year-old steel U-bolts, but it has stainless-steel nuts and lock washers. A bit of a struggle and a few drops of penetrating oil helped, but the nuts came off. I'd like to show you the 30-year-old steel U-bolt with steel nuts, but we had to hacksaw off that one in pieces and the pieces are hiding in my grass!

Yes, stainless-steel hardware can be more difficult to find, and stainless steel costs a bit more, but years from now, you will be oh so glad you took the time to round up that stainless-steel hardware.

Letters, We Get Letters

From Ruddy, we have a question about a single 50-ohm feedline, dual-band antenna for 6 and 2 meters, and he mentions the dual-band antennas built by Finco and Hy-Gain in the 1960s.

Ruddy, you do bring back some memories for me. In my early VHF days, I had a Polycom 6N2 that ran both 6- and 2-meter AM and a Hy-Gain 6 and 2 beam. I may even be the only person to have stacked a pair of those antennas—a fun phasing harness, to put it mildly. The configuration of the antennas we are talking about is shown in fig. 1. Expanded out a bit, you can see in fig. 2 that on 6 meters you have a dipole-fed 4-element Yagi. On the Hy-Gain, the coax went directly to the driven element, but a noise balun, or choke on the coax at the feedpoint, was recommended to keep RF off the outside of the coax. The Finco used a folded driven-element design. On 2 meters, the driven

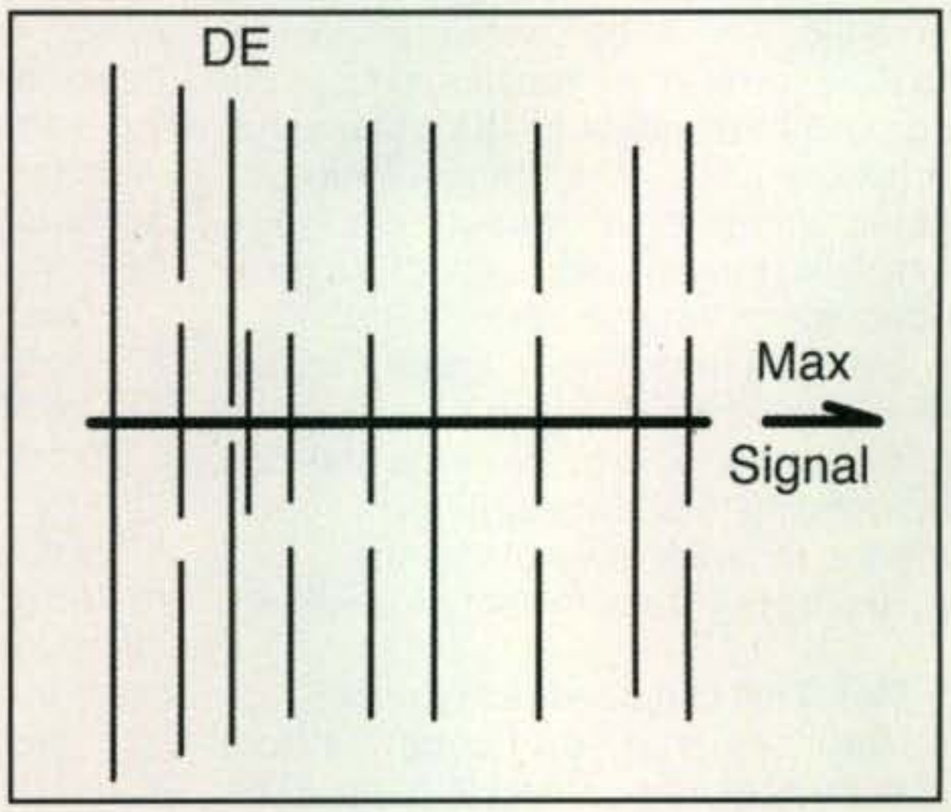

Fig. 1– Element layout of the old Hy-Gain 6- and 2-meter beam.

Photo A– Some 30-year-old steel and stainless steel hardware. See text for details.

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element is resonant in the 1 1/2 waves. With the decoupling stub, the driven element is exciting three close-spaced, 6-element Yagis on 2 meters. An interesting antenna, and using pieces of three of the Hy-Gains, I kept one in the air for many years, but the insulating spacers between the 2-meter elements kept breaking and I just ran out of pieces.

Now a question for our readers. I have several 6-meter antenna designs in the file folder, and even a way of making a 6N2 version. However, what has held me back is a good place to get 6-meter elements. That reflector element is going to be nearly 10 feet long, so welding rod for ground-rod wire is not going to work. Yes, many of us have some tubing in our junk pile, but what I need is something that almost anyone can easily pick up at one of the building-supply mega stores. Your suggestions are invited.

Also, the last column (November issue) really stirred up some issues on HF ground radials. There was some confusion between buried radials and elevated radials. RF-wise, elevated and buried radials have some very different electrical properties. Let's see what I can put together for the next column (March issue).

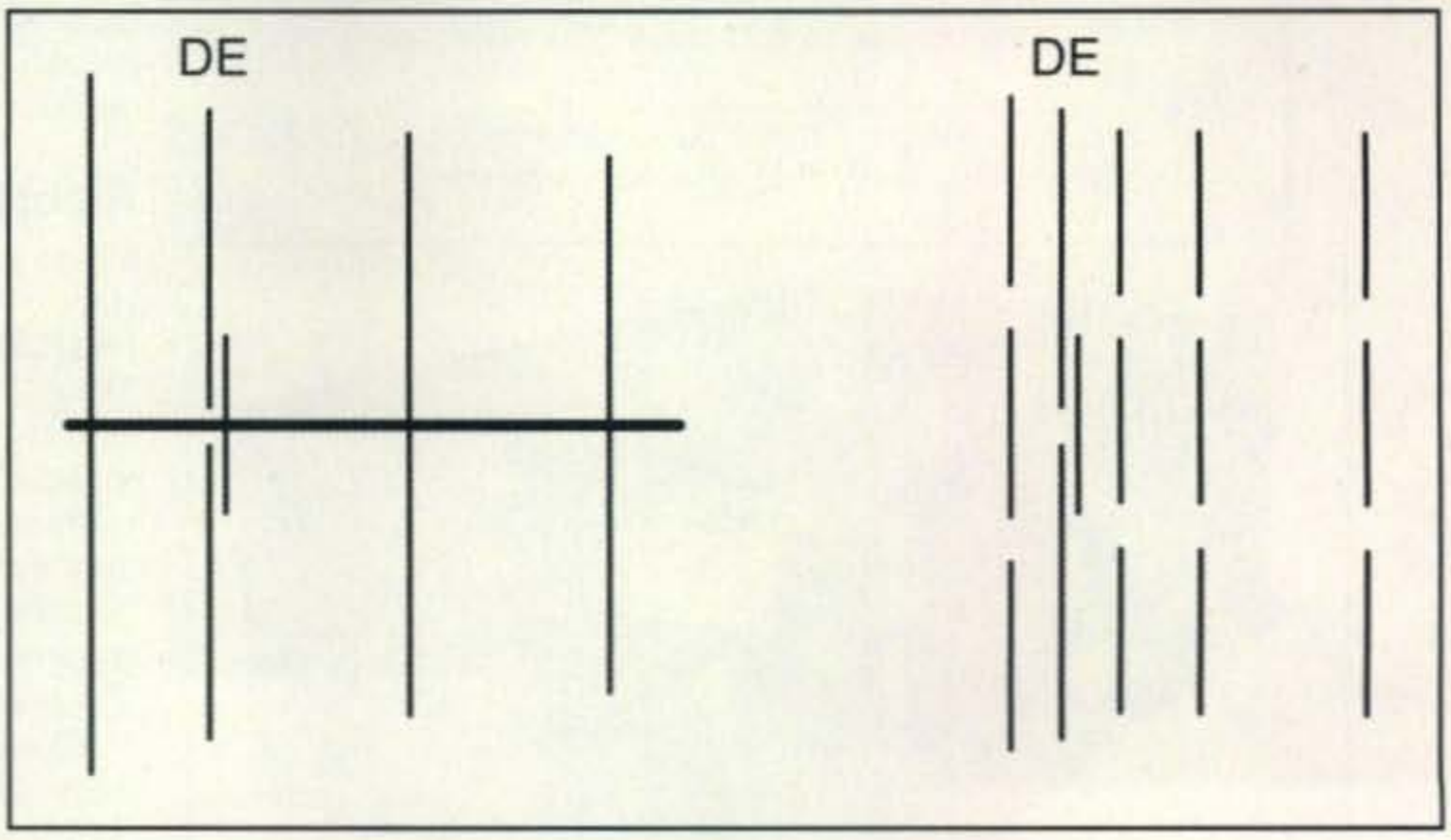

Fig. 2– Six- and 2-meter elements shown separately.

As always, we welcome your questions and topic suggestions. Just drop a snail mail to my QRZ.com address or an email to <wa5vjb@cq-amateur-radio.com>. As for that construction project suggestion we received from a ham in Washington State, it looks like we will need to wait until room-temperature super-conducting wire is available. For other antenna articles and projects, you are welcome to visit <www.wa5vjb.com>. 73, Kent, WA5VJB

what's new

BY JOHN WOOD,* WV5J

Post-Holiday Items for the Shack

Allow me to start off this edition of "What's New" by saying I hope everyone had a great holiday and a Happy New Year. I trust that for Christmas Santa and his elves brought you what you asked for and that maybe some of those items were ones you read about in "What's New." However, what if you didn't get everything that was on your list? Or maybe you received a gift card and are faced with the difficult decision of what to buy with the card. For me, that's always a tough one, so even though the gift-giving season for 2010 is over, let me make a few suggestions that could make excellent, albeit belated, presents for you, the ham who is still faced with finding the answer to the recurring question: What do I want to add to my great hobby of ham radio?

Tokyo Hy-Power HL-550FX

What if you could give yourself something that might enhance the capabilities of your trusty, reliable HF radio? Maybe your favorite rig could use some help when you're behind the microphone or key trying to get the attention of that rare DX station that seems to be just out of reach. I mean, you can hear him so well, and yet he seems deaf to your signal. Maybe some extra power could make the difference—the extra power that can be provided by Tokyo Hy-Power's newest solid-state linear amplifier, the HL-550FX (photo A).

Designed to be the perfect complement to your modern 100-watt HF and 6-meter transceiver, the HL-550FX from Tokyo Hy-Power can give you the extra power, in this case 550 watts extra or up to 1.2 kW input power, that can help you get the attention of those far-off stations that on many occasions simply seem to be ignoring your calls.

This lightweight (20.3 lbs.), compact unit from Tokyo Hy-Power seems to be ideal for home use, camping, Field Day, or for taking on your next DXpedition, since it uses four high-power MOSFET VRF-150s to send 550 watts to the antenna on HF or 6 meters and requires no additional tuning once the operating band has been chosen, thanks to its broadband characteristics.

Tokyo Hy-Power has a unique duct structure built into the HL-550FX amp to keep it running cool and has added a number of sophisticated protection circuits to keep things from getting too hot. The protection circuits can also tell you if your HF rig is overdriving the amp or if it getting too much current, too much reflected power, or receiving too much voltage. Another highlight is the Frequency Detector Unit, which senses the frequency of the drive power from the transceiver. Should a frequency beyond the operating band (26 to 28 MHz amateur bands) of the HL-550FX be detected, the amp protects itself by shutting down output.

The HL-550FX from Tokyo Hy-Power is an impressive package that can be of benefit to numerous hams, while also enhancing the capabilities of ham shacks everywhere. The HL-550FX is priced at approximately $2850 (please check the website) and is expected to be in stock at most ham stores by the end of January 2011. Also, if you'd like more information about Tokyo Hy-Power's HL-550FX, watch for a product review on this unit in a future issue of *CQ*, or visit the Tokyo Hy-Power website located at <www.tokyohypower.com>.

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Photo A– Just the right size for your next DXpedition to Madagascar or to your back-yard patio, Tokyo Hy-Power introduces its newest linear amplifier, the HL-550FX. Compact (9.2 kgs., or 20.3 lbs.) but ready for work, the HL-550FX can take the 100-watt output of your modern HF plus 6-meter rig and easily increase it to 550 watts, which can make the difference between a contact and no response.

Rigblaster Plus II

What sounds like an ideal addition to go with that new HF rig you got for the holidays? It's the new Rigblaster Plus II sound-card interface from West Mountain Radio (photo B).

West Mountain Radio tells us this new Rigblaster incorporates several user-requested enhancements—including a plug-and-play USB port for connection to PC and power, instant setup connectors for microphone configuration, front-panel-mounted transmit power-level knob, and a CAT/CI-V rig-control interface.

Those familiar with the original Rigblasters may appreciate the new plug-and-play USB port on the Rigblaster Plus II, since it eliminates the need for special USB-to-serial cables required to interface with today's computers. The Rigblaster Plus II also receives power through the USB port, which eliminates the need for an AC adapter.

West Mountain Radio also includes with the Rigblaster Plus II Microsoft® certified USB drivers on a CD that are also available on the West Mountain Radio website. The company uses rewired microphone jumper blocks called Instant Setup Connectors (ISCs) that let users universally match these different wiring schemes. Six ISCs are provided (for three round-metal and three RJ45

modular-mic connectors) to cover today's most popular HF radios from ICOM, Yaesu, Kenwood, JRC, Alinco, SGC, and Elecraft, while unusual or older radios can usually be wired up with individual jumpers.

Other improvements include the moving of the manual transmit-power-level adjustment from a potentiometer accessed through the rear panel to a front-panel-mounted knob to make it easier to adjust transmit power levels on the fly without having to adjust the output volume in the PC's sound-card software.

The CAT/CI-V rig control interface, a feature previously found only on West Mountain Radio's higher end Rigblaster Pro and Rigblaster Duo, has been added to the Rigblaster Plus II. It may be used with any CAT or CI-V controlled radio that requires an RS232-to-TTL level converter, including most ICOM, Ten-Tec (CIV), and smaller or older Yaesu (CAT) radios.

Best of all, all of these features have been added without passing the costs to customers. The Rigblaster Plus II is priced the same as the original Rigblaster Plus it replaces at $159.95. For that you get the Rigblaster Plus II package, which includes USB and microphone cables, audio cables, and a CD loaded with free sound-card software. It's available for immediate shipment from West Mountain Radio or may be ordered from any authorized West Mountain Radio dealer. For complete product details, go to <www.westmountainradio.com/PLUS2PR>.

Heil Sound Connection

In early November, Chip Margelli, K7JA, vice president of amateur radio sales and marketing for Heil Sound, Ltd., told us that Heil Sound now has live chat support available during business hours for anyone who may have a question about Heil Sound or its products.

You may reach the live chat link by going on the internet to <www.heilsound.com/amateur> and by clicking on the "Have A Question?" icon, which will connect you to the Heil Sound support line. According to Chip, "Heil Sound is pleased to provide this new service to our dealers and customers."

New GPS Module from Round Solutions

A new GPS module from Round Solutions seems to be offering what the electronics world is seeking these days—smaller dimensions, lighter weight, and longer battery running time.

Photo B– The Rigblaster Plus II from West Mountain Radio replaces serial connectors with USB connectors while including other upgrades that make for a simple interface of this new unit to your modern HF/VHF/UHF rig.

Based on the brand-new SiRF IV chipset, the ORG4472 GPS module (photo C) is now available as a fully automotive- and industrial-compliant module. Measuring only 7 × 7 × 1.4 mms, Round Solutions claims it's the smallest GPS module in the world. Round Solutions is an internationally active supplier of products, services, and concepts for industrial users of electronic components.

"This new SiRFstar IV chipset of the module provides higher sensitivity and consumes less power than previous GPS systems," explains Olaf Schaefer, technical director at Round Solutions. "This extends battery life is especially for small handhold devices, because now passive GPS antennas can be used without losing performance," he adds.

The ORG4472 uses surface-mount technology. There is no cost for RF connectors or cables, and no manual work is needed in production. Its integrated interface for accelerometers, gyrometers, or other sensors makes "Dead Reckoning" easy. Using "Dead Reckoning" tracking can be continued even without sight to satellites—for example, in tunnels.

Free access to the test server can be had at <www.track4less.com> and <www.track4free.com>, which facilitates the use of geodata.

"With these servers, working proof of concepts can be realized within days," explains Schaefer, with reference to features of public-domain software such as OpenStreetMaps and Openlayers.

Further information is available at <www.roundsolutions.com>.

Go-Baggage for Hams?

Still looking for a "Go Bag" for your radios and essentials? Skooba Design of Rochester, New York, has introduced the Checkthrough® Executive Brief (photo D), the latest addition to the company's collection of patent-pending checkpoint-friendly laptop bags that

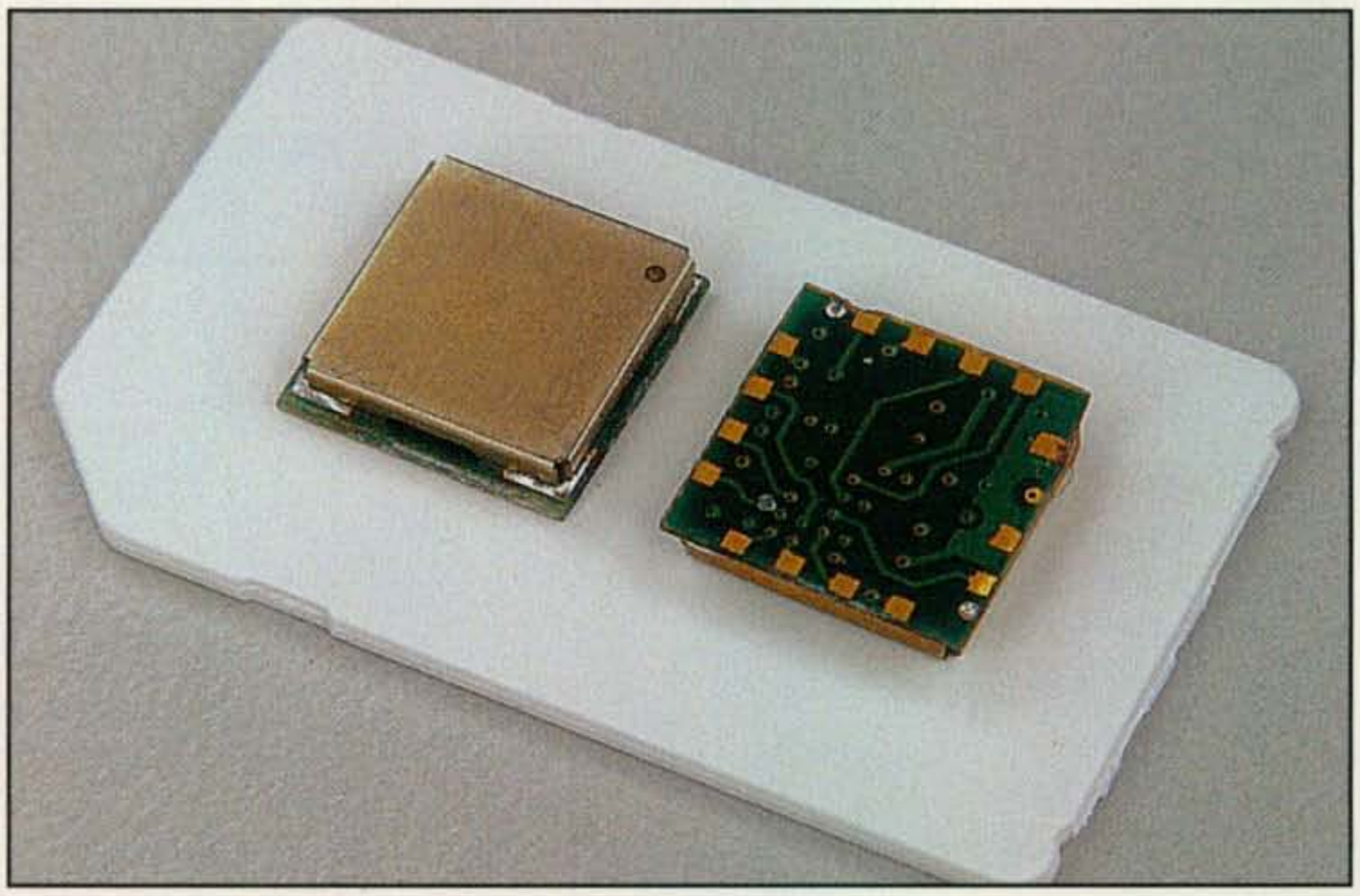

Photo C– Coming in a 7 × 7 × 1.4 mm, Round Solutions claims it makes the smallest GPS module in the world, and it's even automotive and industrial compliant. Watch for the ORG4472 coming soon to a PCB near you.

Photo D– Whether you call it a Grab Bag or a Go Bag, this new piece of luggage from Skooba Design of Rochester, NY, called the Checkthrough® Executive Brief, might be a good way to fill your needs for an easy way to carry all your essentials.

may be an option for travelling hams or hams who are packing Go-Bags for emergency purposes.

Checkpoint-friendly bags comply with TSA requirements and specifications which allow them to be sent through airport screening with the laptop left inside. Aside from the obvious convenience of not having to remove the laptop, checkpoint-friendly bags help prevent damage and minimize the chances that the laptop will be one of the tens of thousands lost or stolen in airports in a typical year.

The new Executive Brief is a sleek, smoothly contoured and tailored case that offers about two dozen pockets and compartments for storage, including a Doc Pocket™ ticket/passport organizer, divided file section, key ring, USB thumb drive caddy, and more. Despite the high capacity and abundance of compartments and features, the bags are ultra-lightweight and designed for serious-but-comfortable road-warrior travel. The Executive Brief is available in small (for typical 15-inch laptops and smaller) and large (up to 17-inch laptop) sizes.

The small and large Check-Through Executive Briefs list for $149.95 and $159.95, respectively. Full specs and dealer/ordering information are available at <www.skoobadesign.com>.

Website of the Month: HRO.com

HRO Inc., better known by amateur operators as Ham Radio Outlet and self-described as the world's largest retailer of amateur radio products and accessories, has removed the wraps on a new state-of-the-art E-commerce web presence at <www.hamradio.com>. The development and release of <www.hamradio.com> is predicted to change the way information, pricing, and technical details are delivered via the internet.

Steve Gilmore, national sales manager for HRO Inc., says, "The modification of Ham Radio Outlet's current web presence will geographically change the way our customers buy, research, and collect information concerning amateur radio products and accessories.

"Utilizing state-of-the-art technology and with the integration of our new web presence to our current point-of-sale application platform, we will deliver extremely expedient and accurate data concerning product availability, product pricing, and product information to our customers on a near real-time basis."

HRO Inc. is family owned and headquartered in Danville, California. Founded in 1971 by Bob Ferrero, W6RJ, today HRO has 12 retail stores located throughout the United States, as well as its newly enhanced website.

Book Corner

The ARRL Handbook for Radio Communications – 2011 Edition. If you've been looking for "the most comprehensive guide to radio electronics and experimentation," you need look no further than the *ARRL Handbook for Radio Communications – 2011 Edition* (photo E), available at <www.arrl.org>.

This nearly two-inch thick book that seems to weigh a ton (actually it comes in at a hefty 5 lbs.) is filled with the practical treatments of basic electronic fundamentals, RF design, digital and software radio technology, and antenna construction. It's also part reference book and part applied theory, delivering

time-tested material and the latest on the state-of-the-art in amateur radio.

And if the big book is not enough, the ARRL also includes a CD that makes this comprehensive RF engineering reference—along with companion software, PC board templates, and other support files—completely available through your PC.

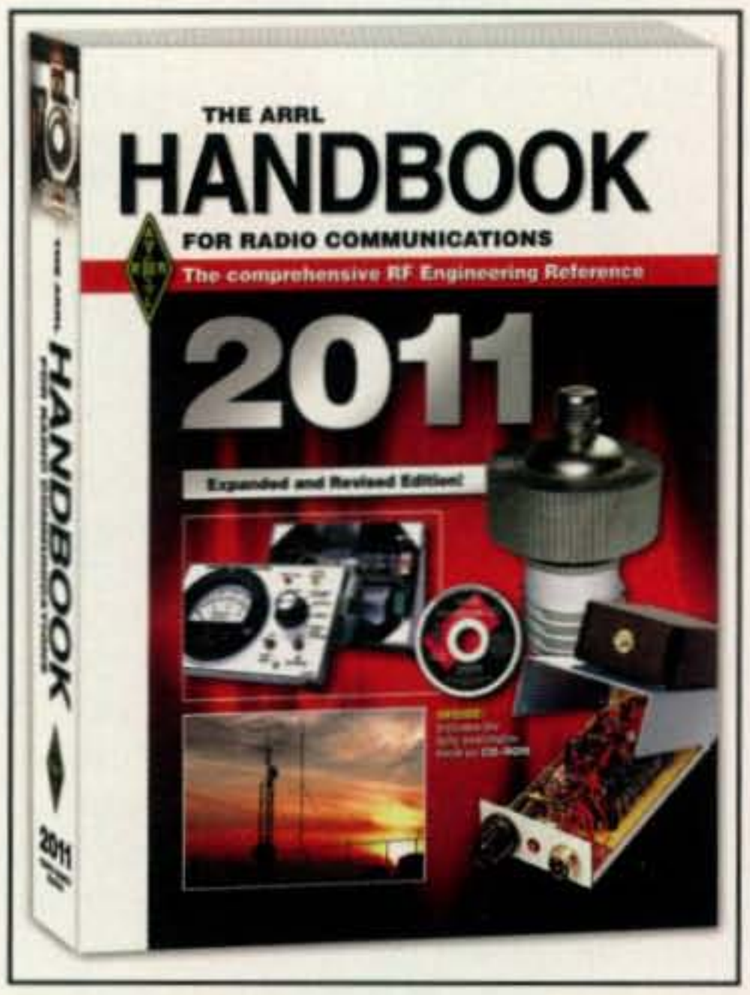

Photo E– The ARRL recently released its ARRL Handbook for Radio Communications – 2011 edition, *and considering its large size and weight, it must be crammed with almost everything you'll ever want to know about ham radio.*

For the latest in fundamental radio theory, practical design and principles, antenna systems and propagation, equipment construction and maintenance, and ham radio station assembly and management, order your copy of the 2011 edition of the *ARRL Handbook for Radio Communications,* the 88th edition in the series, from the ARRL website at <www.arrl.org>.

End Game: Irrational Acts, Tragic Consequences. Amateur radio operator and author Theodore (Ted) J. Cohen, has done it again—written yet another book that is entitled *End Game: Irrational Acts, Tragic Consequences* (photo F) in an effort to answer all of the questions raised in the first two books of his trilogy, *Frozen In Time: Murder at the Bottom of The World* and *Unfinished Business: Pursuit of an Antarctic Killer.*

Better known to the ham radio community as N4XX, Cohen tells me that this third book in the series should satisfy the curiosity of the readers of the first two books, even though he says that "Given that my novels are postmodern, there always will be something that the readers will have to figure out for themselves."

End Game: Irrational Acts, Tragic Consequences, as well as the other two books in this thriller trilogy are available for order at AuthorHouse.com, Borders. com, Amazon.com, Target.com, Books-a-million.com, and BarnesandNoble.com. Cohen's novels are also available in eBook format for Kindle® and for Nook® and other eReaders who take the EPUB format.

That's it for this month, so look forward to the February issue for more exciting products for the ham radio operator who just can't stay away from looking at an perhaps buying great products for our hobby. And by the way, if you ask questions of the company or order any of its products, remember to say you read about it in *CQ* magazine!

73, John, WV5J

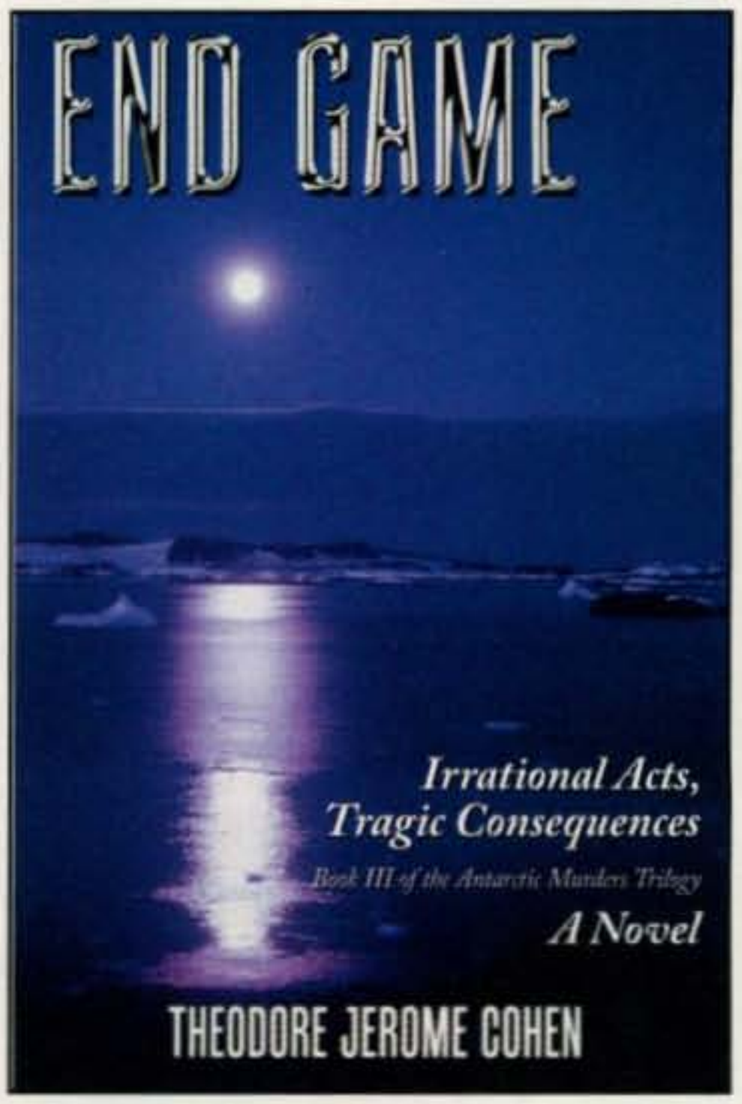

Photo F– Theodore J. Cohen, N4XX, has tied the ribbons on his thriller trilogy with the recent publication of End Game: Irrational Acts, Tragic Consequences, *which is now available at most book marts on the web and in eBook format for Kindle® and Nook® and other eReaders that take the EPUB format.*

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.*

SUCH A HAM

My resolution is to spend more time on the air.
As a matter a fact that's all I intend to do this year.

BY JOE LYNCH,* N6CL

The THEMIS and ARTEMIS Projects

In my September and October 2008 columns, I wrote the third and fourth installments of a series about my hypothesis concerning dust storms on the Moon. I also reported on the THEMIS Project, a mission that was tasked with studying space weather. The mission began with the launch of five identical satellites on February 15, 2007. Among the mission's discoveries was how aurora substorms (known as the Northern Lights in the northern latitudes) are powered.

I have since published the essence of my first two articles in the Fall 2010 issue of *CQ VHF* magazine. In this issue of *CQ* I will recap the results of the February 26, 2008 aurora substorm observation and report on the beginning of the subsequent ARTEMIS project.

The THEMIS Project's Aurora Discovery

Given the acronym THEMIS (which stands for Time History of Events and Macroscale Interactions during Substorms), the project was named after the Greek goddess Themis, who embodied divine order, law, and custom. Essentially, the project's mission was to find the trigger point of geomagnetic substorms.

After launch, each of the satellites was placed into an elliptical orbit according to the five stages of the mission. See <http://themis.ssl.berkeley.edu/orbits.html> for an explanation of each of the stages. In mid-October 2008 the mission concluded Stage 5, which was the Dayside Science Phase.

A little more than a year after the project's launch, the five identical washing-machine-size satellites were used to observe the February 26, 2008 aurora substorm, with profound results. The satellites

e-mail: <n6cl@sbcglobal.net>

VHF Plus Calendar

Jan. 4	*Quadrantids* meteor shower. New Moon. Partial eclipse of the Sun.
Jan. 10	Moon apogee.
Jan. 12	First quarter Moon.
Jan. 19	Full Moon.
Jan. 22	Moon perigee.
Jan. 22–24	ARRL VHF Sweepstakes.
Jan. 26	Last quarter Moon.

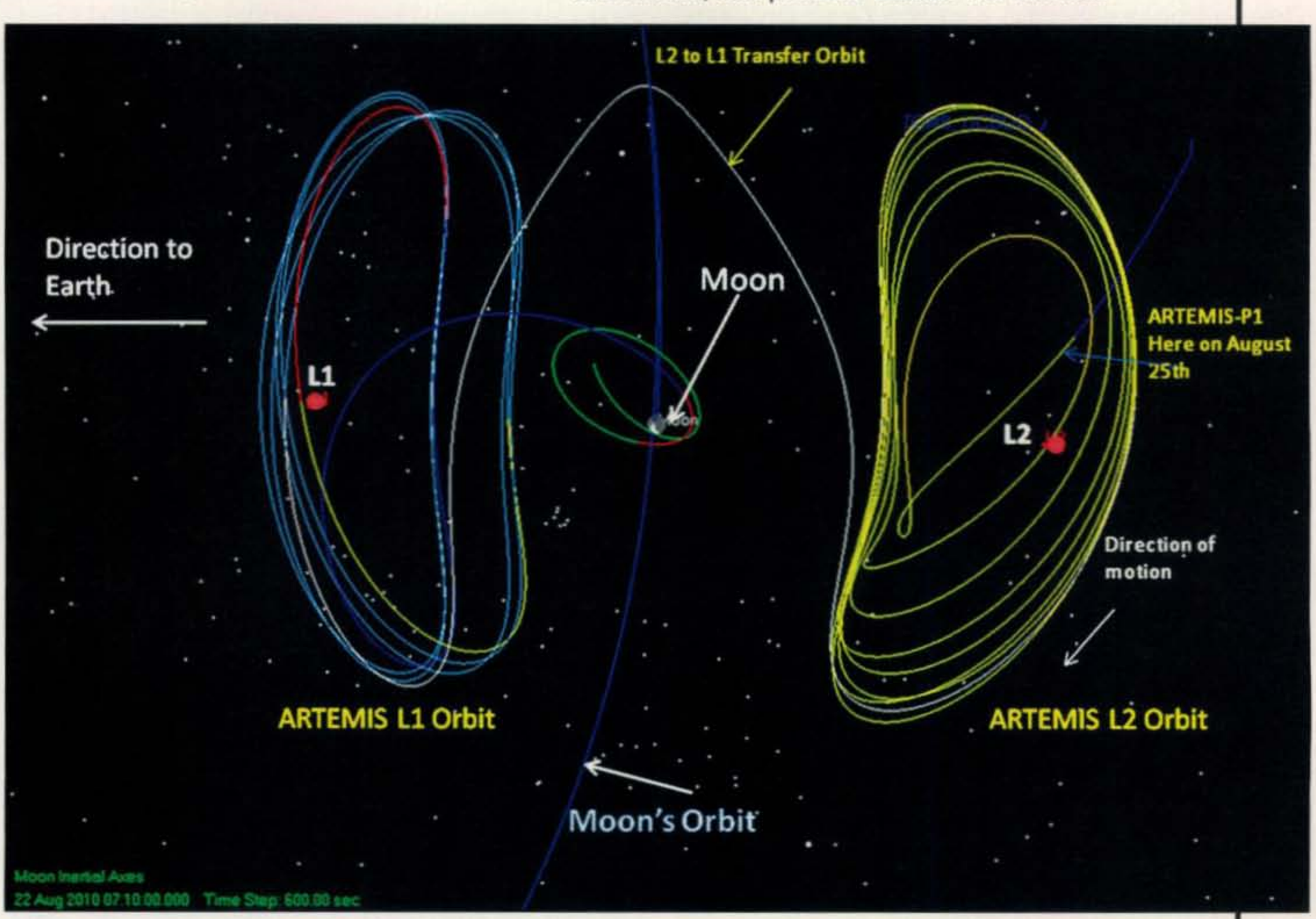

Fig. 1– Illustration of ARTEMIS-P1 librations orbit. (Credit: NASA/Goddard Space Center)

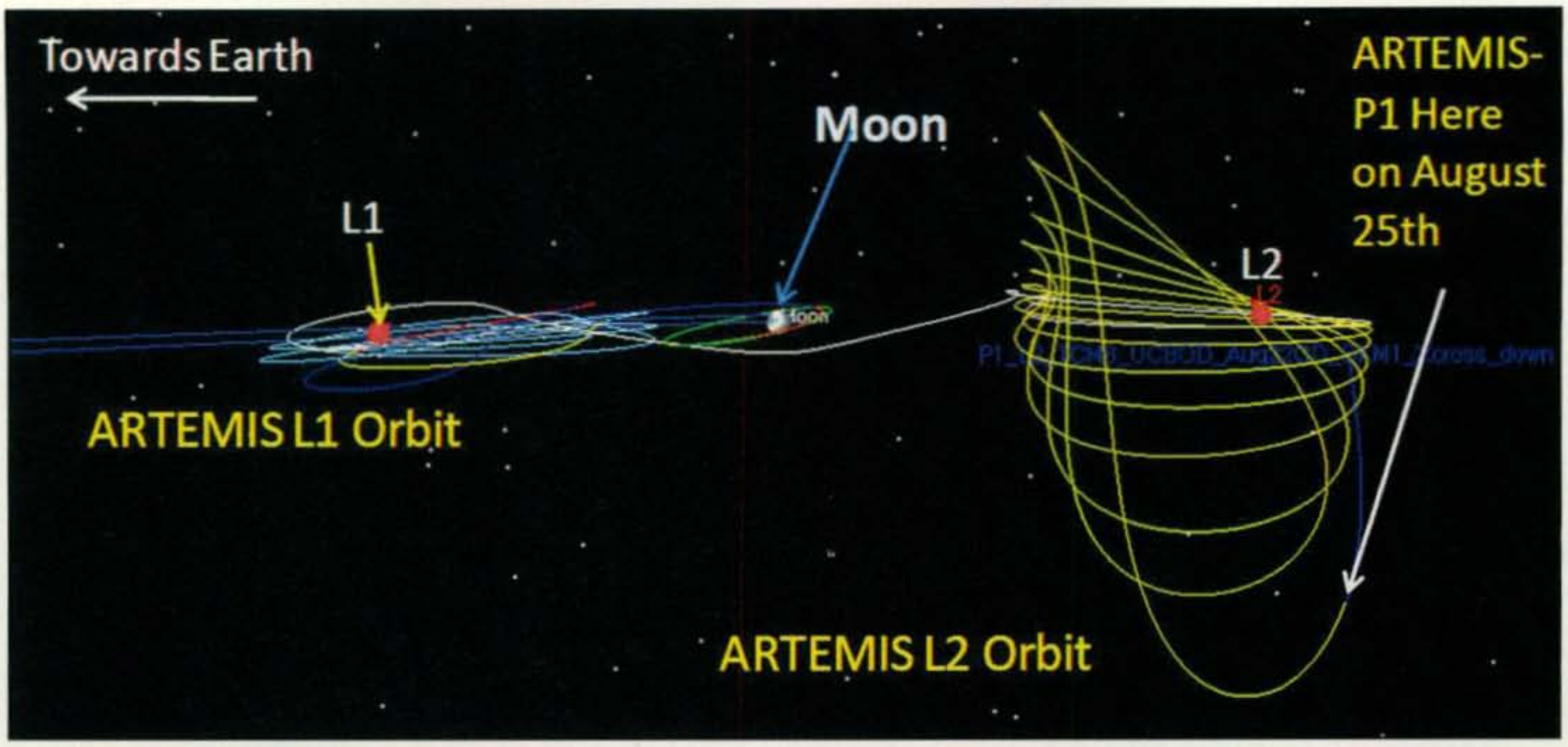

Fig. 2– Illustration of ARTEMIS-P1 librations, side, or ecliptic, view. (Credit: NASA/Goddard Space Center)

were positioned to test a theory concerning the onset of aurora substorms. The theory was that when two of the magnetic field lines of the Earth's magnetotail come close to each other, there is a moment when a critical limit is reached and they short together.

This shorting, or reconnecting, causes the magnetic energy to be transformed into kinetic energy and heat. The resultant energy is released, causing the plasma to be accelerated and thus producing accelerated electrons. The theory postulated that the reconnection takes place approximately one-third of the way from Earth to the Moonh. The sequential observations of the first three satellites, P1–P3, provided support for the theory that the effects of the reconnection on each satellite are in a sequential order, with auroral intensification

beginning between the registration of effects on P2 and P3.

The ARTEMIS Project: Mission to the Moon

In May 2008 NASA headquarters announced that because of the overall success of the mission, it would be extended until fiscal year 2012. Additionally, the principal researchers received approval to explore the possibility of using the remaining propellant of the two outermost satellites (see satellites 1 and 2 in fig. 1, and also fig. 2) to move them out to the Moon.

Named ARTEMIS (which stands for Acceleration, Reconnection, Turbulence, and Electrodynamics of the Moon's Interaction with the Sun), these two satellites have been peeled away from the other three THEMIS satellites and placed at Lagrange points on the Moon. One of the satellites, L2, was placed at the Lagrange point on the far side of the Moon on August 25, 2010. The other satellite, L1, was placed at the Lagrange point on the Earth side of the Moon. According to Vassilis Angelopoulos of the University of California, Los Angeles (UCLAS), principal investigator of the THEMIS mission, "ARTEMIS will provide a unique two-point view of the Moon's underexplored space environment." He ads, "These two spacecraft are headed for an incredible new adventure."

The Lagrange points are the five positions in an orbital configuration where a small object affected only by gravity theoretically can be stationary relative to two larger objects (in this case the former THEMIS satellites with respect to the Earth and Moon). The Lagrange points are positions where the combined gravitational pull of the two large masses provides the precise centripetal force required to rotate with them. They are analogous to geostationary orbits in that they allow an object to be in a "fixed" position in space rather than an orbit in which the relative position changes continuously. The purpose of using the Lagrange points to position the ARTEMIS satellites is to get them into lunar orbit while at the same time preserving the remaining fuel onboard the satellites. (Source: <http://en.wikipedia.org/wiki/Lagrange_point>)

Two very fascinating videos have been posted on the ARTEMIS Project website (http://www.nasa.gov/mission_pages/artemis/). The first video, "ARTEMIS Orbits Magnetic Moon" (http://www.nasa.gov/multimedia/videogallery/index.html?collection_id=21591&media_id=21969931), gives an explanation as to how the two satellites eventually settle into lunar orbit using the Lagrange points' gravitational influence. The second video, "ARTEMIS Orbiting Lagrange Point" (http://www.nasa.gov/multimedia/videogallery/index.html?media_id=21971251), illustrates how the lunar orbits eventually will be achieved. While these spacecraft are being positioned they will collect data on solar wind and the Earth's magnetosphere.

Once these satellites are in their lunar-orbit positions, they will study the vacuum that the Moon creates in the solar wind and what fills the lunar wake. They will also see how the solar wind affects the Moon's surface and the Earth's magnetotail. In particular, they will observe how particles are accelerated when magnetic field lines of the magnetotail reconnect. For more information concerning the proposed research, please see the paper entitled "The ARTEMIS Mission" that Angelopoulos (mentioned above) has prepared, which can be downloaded from this website: <http://www.igpp.ucla.edu/public/THEMIS/SCI/Pubs/artemis/The_ARTEMIS_Mission_SSR_accepted.pdf>.

I am very interested in the ionizing effects on the lunar dust because I believe that the ionization of the dust

may be the explanation for the incredible disturbances that the lunar seismometers detected during June 20–30, 1975. I believe that the instruments onboard the ARTEMIS could be useful in providing the final piece of the puzzle of my hypothesis that the lunar disturbances were dust storms and not meteoroid events.

Current research indicates a relationship exists between the Earth's magnetotail, substorms and some forms of *F2* propagation. I believe that the more we can learn about the magnetotail, the more that we will be able to understand and take advantage of *F2* propagation. I hope to have a more comprehensive article on the THEMIS and ARTEMIS projects published in a future issue of *CQ VHF* magazine.

FASTRAC in Orbit

Scheduled for launch on November 19, 2010 aboard a Minotaur IV rocket from Kodiak Island, Alaska, the FASTRAC (Formation Autonomy Spacecraft with Thrust, Relnav, Attitude, and Crosslink) is a pair of nanosatellites that were developed and built by students at the University of Texas, Austin. The project is part of a program sponsored by the Air Force Research Laboratory with the goal of leading the development of affordable space technology. It is the first student-developed satellite mission that incorporates an on-orbit, real-time-relative-navigation, on-orbit real-time attitude determination using a single GPS antenna and a micro-discharge plasma thruster. The mission is intended to demonstrate that reduced launch, hardware, and integration costs are a present-day reality.

Amateur radio involvement has been encouraged via the project's website: <http://fastrac.ae.utexas.edu/>. Once at this website click on the "for Radio Operators" link. Two phases of participation are requested. The first phase is the science portion. Amateur radio operators are encouraged to collect data that are generated by the firing of the micro-discharge plasma thruster. The second phase will begin when the satellites are reconfigured for use by the Amateur Radio Service after the primary mission has concluded. Using the Kantronics KPC9612-Plus TNC, the satellites will be reconfigured so that they can serve the APRS network.

Current Contests

The ARRL VHF Sweepstakes is scheduled for the weekend of January 22–24. For ARRL contest rules, see the issue of *QST* prior to the month of the contest or its URL: <http://www.arrl.org>.

Current Meteor Showers

The *Quadrantids*, or *Quads*, is a brief, but very active meteor shower. The expected peak is on 3–4 January, with up to 40 meteors per hour at its peak. The actual peak can occur three hours before or after the predicted peak. The best paths are north-south. Long-duration meteors can be expected about one hour after the predicted peak.

For more information on the above meteor shower prediction, see Tomas Hood, NW7US's "Propagation" column elsewhere in this issue. Also visit the International Meteor Organization's website: <http://www.imo.net>.

Silent Keys

John Champa, K8OCL: For a number of years John served on the ARRL's HSMM Working group, providing excellent input into HSMM applications to the amateur radio service. A few years ago I recruited John to write the "HSMM" column for *CQ VHF* magazine, which he did admirably for as long as his health held out. About a year ago John was diagnosed with cancer of the optic nerve. Knowing that he would not be able to recover from the cancer, John bravely faced its ultimate outcome. John valiantly continued his research work until the cancer prevented him from doing so. He succumbed to the effects of the cancer on November 12, 2010.

Bill Butler, W6BFA: The following is from Robert Russell, KD6JOU, as posted on QRZ.com: "William R. Butler, W6BFA, of Simi Valley, California has passed away of natural causes. Born in 1919, Bill was a pioneer of VLF communications for use with the submariner fleet; a veteran of WW II, United States Navy; and an avid designer and builder of high-gain VHF and UHF antenna arrays. He leaves a son, also a radio amateur, and a daughter, grandkids, and many loving friends, this writer fortunate to be among them. May God bless your new and continuing adventure, Bill."

And Finally . . .

As we begin a new year, I am very optimistic about the potential for advances in the understanding of some of the mysteries of our niche in the Amateur Radio Service. I believe that the work of the THEMIS and ARTEMIS missions could open the door to further understanding of the many effects of the Earth's magnetotail on Earth and the Moon. I also believe that there will be advances in cubesat and nanosat design and development that will make them more accessible to student involvement.

While I applaud the many college student projects around the world, it is my personal goal to see extensive student involvement take place at the common-school (K–12) level. We here in the U.S. are woefully behind in our training of our future engineers. With STEM (Science, Technology, Engineering, and Math) programs that incorporate aerospace becoming a part of the common-school curriculum, I believe that we have a fighting chance at holding on to our lead in worldwide technological development.

What do you think? If you have some thoughts about the future of our space program and our VHF niche in the hobby, please let me hear from you at: <n6cl@sbcglobal.net>.

My best wishes go to all of you for a healthy and prosperous New Year.

Until next month . . .

73 de Joe, N6CL

The Former Netherlands Antilles plus Exciting DXpeditions

Whoa . . . I'm writing this for the New Year! Time certainly does seem to fly by. Since you will be reading this column in early January, I'll just take a moment to wish you and your families a very happy New Year. For those who celebrate in a different way, my best wishes to you as well. Watch out for those New Year's resolutions, though, as many times they fall by the wayside within a few weeks. Try to keep to them!

More on the Former Netherlands Antilles

This is being written not long after all of the "PJ" activity from the former Netherlands Antilles. Right now, not totally officially, we can say that *four* new countries (entities) replace the two that were added to the "deleted" list. Thus, Curacao (PJ2) and St. Maarten (PJ6–8) are "gone," added to the deleted list and removed from the DXCC list, as of October 10, 2010 at 0359Z. As of 0400Z, October 10, 2010, Curacao (PJ2); Bonaire (PJ4); Saba & St. Eustatius (PJ5-PJ6), and St. Maarten (PJ7) were added to the DXCC list. October 10 is the effective date for all four of the new ones, although the ARRL will not be accepting cards or LoTW (Logbook of The World) for credit until January 1, 2011.

So, let's get this straight: The DXCC list of *current* countries count as of October 9, 2010 was 338. On October 10, *two* were deleted, but *four* were added. Doing the math, it now means that we have a *currrent* count of 340. I should also mention here that the *deleted* list count was 58, and now

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e-mail: <n4aa@cq-amateur-radio.com>

Team 1 of the PJ6A crew who brought us the new one, Saba. Left to right: KØIR, W4GKF, N4NX, W6IZT, K4SSU, K4UEE, VE7CT, N4HH (K8EAB was not available). (Photo courtesy of Bob Allphin, K4UEE)

If you worked PJ7E in late October, you worked one of the above ops. This is the entire crew of PJ7E. It isn't possible to ID each one in this space. Watch for the full story in The DX Magazine. *(Photo courtesy of Joe and Janet, W8GEX/W8CAA)*

The CQ DX Field Award Program

Mixed

113 .....KØABC
114 .....K8STX

SSB

69.....KØABC
70 .....AD2AM
71 .....NW3H

CW

60 .....KØABC

Digital

19 .....KØABC

Mixed Endorsements

200 .....K8SIX/209
100.....KØABC/113
3.5/7 MHz .....KØABC

SSB Endorsements

Mobile NW3H

CW Endorsements

150 .....N7WO/173

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. Please make all checks payable to the award manager.

The WPX Program

CW

3252.....OK5JM

SSB

3080 .....W8KNO

Mixed

2126.....K9ZW 2127 .....W1MNY

Digital

46.....JN3SAC 47 .....K4PBY

CW: 600 OK5JM. 700 JH6JMM. 2000 IZ3ETU. 2600 IØNNY. 5700 K2VV. 5950 WA2HZR.
SSB: 500 W8KNO. 750 KE6FQC. 4950 K2VV.
Mixed: 700 W1/E74OF. 1500 N3RC. 4050 ON4CAS. 6500 K2VV.
Digital: 450 JN3SAC.

160 meters: LY3BY
40 meters: JN3SAC
30 meters: JN3SAC
17 meters: JN3SAC
12 meters: JN3SAC
10 meters: LY3BY

Africa: LY3BY
Europe: OK5JM

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, N3XX, 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, NN1N, 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, WA5VGI, UT9FJ, UT4EK, K9UQN, UR5FEO, LY2MM, N3RC, OH3MKH, RA3CQ, UT3IZ, S55SL, RU3ZX, YO9HP, RA3DNC, K8ZT, KE5K, JH8BOE.

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, N3XX, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, NN1N, 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, WA5VGI, UR5FEO, N3RC, UT3IZ RU3ZX, YO9HP, RA3DNC, K8ZT, KE5K, JH8BOE.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage for airmail) to "CQ WPX Awards," P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will now accept prefixes/calls which have been confirmed by eQSL.cc. Other electronic QSL confirmation means are not accepted.

*Please Note: The price of the 160, 30, 17, 12, 6, and Digital bars for the Award of Excellence are $6.50 each.

CQ DX Awards Program

SSB

2556.....W5JBO 2559.....AD2AM
2557 .....KØABC 2560.....NW3H
2558.....N3KV

CW

1113.....W5JBO 1115.....N3KV
1114 .....KØABC 1116 .....K8ME

RTTY

50.....W5JBO 52.....N3KV
51 .....KØABC 53.....KW3W

SSB Endorsements

330.....CT1AHU/330 250.....N3KV/260
320.....KE4SCY/328 Mobile NW3H
310.....N2LM/312

CW Endorsements

300.....N2LM/300 150 .....KØABC/162
200 .....PP7LL/205

RTTY Endorsements

150.....N3KV/152

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. As of October 12, we recognize 337 active countries, pending a final decision on the former Netherlands Antilles. Please make all checks payable to the award manager. Photocopies of documentation issued by recognized national Amateur Radio associations that sponsor international awards may be acceptable for CQ DX award credit in lieu of having QSL cards checked. Documentation must list (itemize) countries that have been credited to an applicant. Screen printouts from eQSL.cc that list countries confirmed through their system are also acceptable. Screen printouts listing countries credited to an applicant through an electronic logging system offered by a national Amateur Radio organization also may be acceptable. Contact the CQ DX Award Manager for specific details.

becomes 60 with the *old* Curacao and St. Maarten being added to that list.

Is this confusing? A lot of folks seem to think so, and I can only hope I have explained it sufficiently. Some say: "I already worked Curacao and St. Maarten. Why should I have to work them again?" To put it simply, because that is the way the rules work when things like this happen. I could go on for pages and pages trying to explain all of the background and politics involved, but please just accept it as this is the way it works. These islands are popular vacation spots and there will be plenty of activity from them in the months and years ahead. You won't have any trouble working or confirming them.

CYØ – Sable Island

On again, off again! Randy, NØTG, and his group had Mr. Murphy on their backs in October. Just as they started to depart for the island, a major safety issue was discovered with the charter aircraft that required repair before it could fly. Parts were not readily available, and it was estimated that acquiring parts and completing the repairs would extend as much as three weeks or longer. Thus, the team returned home to "regroup" and reschedule a return for another try.

Whoa! No sooner had they gotten home when I got an e-mail from Randy saying: "As it has turned out, finalizing just yesterday (November 1), all details and coordination points have come together to permit us to reschedule. The new date is 6–13 December. We are *thrilled* and excited about this. Another wonderful matter is that Murray (WA4DAN) and Ron (AA4VK) have been able to rejoin the team. So ... Sable Lives!" Obviously at this writing in early November, I cannot know if it all worked out, but we certainly hope it does. I should have more to report on this next month.

There is also a silver lining to the Sable Island story. Randy apparently had been talking up ham radio with one of the employees on the island, and now Alan Wilson, VE1AWW, has set up a station on Sable. From QRZ.com, Alan tells us: "The rig is a Kenwood TS-690S with the AT running a maximum of 100W through a Hy-Gain AV-18VS vertical. I am a government employee at the Sable Island station and am on Sable Island (CYØ) until 29 December 2010 (more or less). I am on 80–6 meters SSB. I still have to cook up an antenna for 160 meters that doesn't need an external tuner (the tuner in my rig does not function on 160 or 6 meters). I am a new operator, licensed since July 2010. It was Randy, NØTG, of the CYØ DXpedition, who made the suggestion that I give amateur radio a try—my thanks to him! I work here on the island 5–6 days a week. I am not on the air 11–19Z (12–20Z once Canada switches from daylight savings to standard time) Mon.–Fri., and sometimes Mon.–Sat. As you might imagine, I don't stay up late, as I have to run the station and look out for my staff; medical care is measured in hours or days away. I will do my best to operate at different times on the weekends so as many different areas as possible get an opportunity.

"While I am a fan of the lower frequencies, there is a lightning hotspot southwest of Sable Island. I am often affected by static crashes and the like, especially on 80 meters."

Several stations have already reported working Alan. Special thanks to

5 Band WAZ

As of November 1, 2010, 830 stations have attained the 200 zone level and 1700 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:

9A2EU UR5EDU

The top contenders for 5 Band WAZ (zones needed, 80 or 40 meters):

N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40)
IK1AOD, 199 (1)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W3NO, 199 (26)
RU3FM, 199 (1)
N3UN, 199 (18)
W1JZ, 199 (24)
W1FZ, 199 (26)
SM7BIP, 199 (31)
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)
N5AW, 199 (17)
JH7CFX, 199 (2)
K7LJ, 199 (37)
RA6AX, 199 (6 on 10m)
RX4HZ, 199 (13)
KØGM, 199 (17)
S58Q, 199 (31)
KQØB, 199 (2 on 10)
K9OW, 199 (34 on 10)
G3NKC, 199 (31 on 10)
K8PT, 199 (26)
IN3ZNR, 199 (1)
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)
W9XY, 198 (22, 26)
KZ2I, 198 (24, 26)
W7VJ, 198 (34, 37)
W9RN, 198 (26, 19 on 40)
W5CWQ,198 (17, 18)
I5KKW, 198 (31&23 on 20)
IV3MUC, 198 (1&31 on 40)
UA4LY, 198 (6&2 on 10)
IK4CIE, 198 (1, 31)
JA7XBG, 198 (2 on 80&10)
HB9ALO, 198 (1, 31)
JA3GNN, 198 (2 on 80&40)

The following have qualified for the basic 5 Band WAZ Award:

AA4XA (150 zones)

5 Band WAZ updates:

ES1FB (200 zones)
ACØX (170 zones)
KJ6P (170 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, P.O. Box 449, Wiggins, MS 39577-0449. 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>.

The WAZ Program

10 Meters SSB

590 ..... UR5EDU

15 Meters SSB

645 ..... UR5EDU

20 Meters SSB

1196 ..... UR5EDU 1197 ..... W1JGS

40 Meters SSB

110 ..... UR5EDU

80 Meters SSB

96 ..... UR5EDU 97 ..... IT9PKO

10 Meters CW

200 ..... 9A2EU

15 Meters CW

340 ..... 9A2EU

20 Meters CW

600 ..... 9A2EU 601 ..... RA4UVK

160 Meters

358 ....RA4UVK (36 zones) 359..UR5EDU (40 zones)

All Band WAZ

Diamond Jubilee

063 ..... VK2MWG
064 ..... ON4CAS
065 ..... F6HMJ
066 ..... DL8CKL
067 ..... K2FL

Mixed

8746 ..... W7NP
8747 ..... JJ7SSI
8748 ..... LA9DFA
8749 ..... UR5EDU
8750 ..... N6VNI
8751 ..... K9BQL
8752 ..... KF7P
8753 ..... WA3GFB

SSB

5145 ..... HB9BOI

CW

613 ..... IT9KCD

RTTY

211 ..... IT9KCD

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, P.O. Box 449, Wiggins, MS 39577-0449. 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>.

Randy for his work in getting Alan licensed and on the air.

DXØDX – Spratly

January 6 to 24, 2011: Information is available on the website <http://www.dx0dx.net/>.

VK9 – Cocos Keeling

VK9 will see some action in February and March of 2011. Just announced by Phil, G3SWH, and Jim, G3RTE, they will be active February 22 to March 5. They will operate only CW on 80–10 meters. Propagation permitting, they plan to have two stations on the air as many hours of the day as possible. Phil did add this: "We are happy to meet the costs of transport to and from the islands, but we are seeking sponsorship and donations from individuals, DX clubs, and organizations towards our living expenses on the island, printing QSLs and the like." Further information can be found at the website: <http://www.g3swh.org.uk/vk9c-g6ay.html>."

VP8ORK – South Orkney

January 27 to February 8, 2011: A group is going to put a heavy effort in providing the low bands to all those who want/need it. Here are excerpts from Press Release #3, James Brooks, 9V1YC:

"Many have been asking about our low-band plans for the upcoming VP8ORK South Orkney DXpedition in

THE WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive.

MIXED

6315 .....9A2AA	4146 .....N6JV	3737 .WB2YQH	3003 ...JN3SAC	2440 .....K5UR	1891 .....VE9FX	1446 .....DF3JO	781 .....V51YJ	636 .....ZS2DL
5890 .....K2VV	4136 .....S53EO	3693 .....W9OP	3001 .....K1BV	2428 .....N6QQ	1820 .....KX1A	1337 ....K6UXO	726.....K5IC	600.....IK1RKN
5610 .....W1CU	4069 .....I2MQP	3474 .SM6DHU	2965 ..OZ1ACB	2378 .....W3LL	1761 .....AG4W	1322 .....AA4FU	723 .....KØDAN	600 ...KB9OWD
5012 .....9A2NA	4034 .....N9AF	3305...JH8BOE	2873.....W2ME	2338 .....I2EAY	1741 .....AB5C	1269 ....K5WAF	707 .W1/E74OF	
4989 ....W2FXA	4001 ....KØDEQ	3227 .....K9BG	2724.....W2OO	2233 .....AB1J	1705.....W2EZ	1116 ....YU7FW	682.....AI8P	
4758 .....EA2IA	3990 ..ON4CAS	3207 .....W9IL	2704.....K2XF	2116 .....AE5B	1662....SV1DPI	1016 ..RA1AOB	662.....JA7OXR	
4701.....N4NO	3964...WA5VGI	3175 .....N8BJQ	2530 ....YO9HP	2192 .....N2SS	1643.....N1KC	982 ....IWØHOU	653 .....KK3Q	
4414.....YU1AB	3908 .....KF2O	3104 ....K9UQN	2511....W6OUL	2001.....KØKG	1593.....S55SL	976 .....KM6HB	650 .....N3YZ	
4361.....VE3XN	3798.....IK2ILH	3091 .....9A4W	2499 ..KC9ARR	1930 ....W2FKF	1512 .WD9DZV	964 .....K8ZEE	649 .....RA9OO	
4211 .....I2PJA	3775 ..YU7BCD	3007 .....W2WC	2444 .....VE6BF	1905 .....W7CB	1463.....N3RC	815 .....KL7FAP	644 .....KWØH	

SSB

5122.....IØZV	3536.....N4NO	2761.....KF7RU	2333 .....W9IL	2093 .....W2WC	1879 .....K3IXD	1611.....W2ME	1377.....EA3NP	883.....WA5UA
4520 .....K2VV	3323 ...OE2EGL	2734 ...YU7BCD	2326.....CX6BZ	2076.....K2XF	1891 .....W2FKF	1505.....AG4W	1258.....N1KC	875 .....K7SAM
4505.....VE1YX	3229 ...CT1AHU	2711.....LU8ESU	2210....SV3AQR	2072.....K5UR	1844 .....YO9HP	1480 .....AB5C	1145 ...EA3EQT	826.....NW3H
4371 .....F6DZU	3196 .....KF2O	2662....WA5VGI	2209 ....IK2QPR	2007.....N8BJQ	1825.....KQ8D	1464 ...VE7SMP	1083 .....KX1A	741 ....WD9DZV
4307.....OZ5EV	3108 .....I4CSP	2595 .....EA1JG	2201.....NQ3A	1986....DL8AAV	1758.....W6OUL	1463 .....I2EAY	1042.....IZØBNR	717 .....KØDAN
4171 .....I2PJA	3022.....I8KCI	2471.....I3ZSX	2157.....W2OO	1945.....KI7AO	1719 .....K9UQN	1410.....S55SL	1031.....IK8OZP	637 .....K5WAF
4003 .....9A2NA	2957 .....KØDEQ	2451 ...EA3GHZ	2142 .....W3LL	1935 ...SV1EOS	1714.....IK2DZN	1395.....PT7ZT	1012.....KU4BP	600.....WA2BEV
3843 .....I2MQP	2903.....IN3QCI	2431 .....G4UOL	2107 .....N6FX	1927 .....AE5B	1711....JN3SAC	1386.....IK4HPU	978.....EA7HY	
3658 .....EA2IA	2857 .....4X6DK	2417 ..SM6DHU	2094 .....I8LEL	1889 .....N6QQ	1623 .....VE9FX	1385.....AE9DX	965 .....VE6BF	

CW

5413 .WA2HZR	3687 .....EA2IA	2838 .....I7PXV	2503.....IØNNY	2101 .....W9HR	1665 ....YO9HP	1223 .....KX1A	900 .....IT9ELD	608.....IK2SGV
5353.....K9QVB	3506 .....9A2NA	2723...EA7AZA	2502...JA9CWJ	2089.....K2XF	1445....EA2CIN	1220 .....AA4FU	824 .....VE9FX	
5242 .....K2VV	3427...WA5VGI	2721 ....K9UQN	2473 ....OZ5UR	1979.....K5UR	1429 .....WO3Z	1147 .WD9DZV	821 ....HB9DAX	
4215.....N4NO	3308 ....KØDEQ	2670.....KA7T	2434 .....W9IL	1961....W6OUL	1424 .....N6QQ	1125.....IØWOK	794 ....LA5MDA	
4146.....N6JV	2926 .....W8IQ	2632.....W2ME	2415 .....W2WC	1918.....W2OO	1403 .....AG4W	1109 .....VE1YX	753.....F5PBL	
4024 .....LZ1XL	2923 .....KF2O	2617...JN3SAC	2342 .....N6FX	1848 .....I2EAY	1344 .WA2VQV	1053 ....K5WAF	749 .....AE5B	
3918.....VE7DP	2923 ..YU7BCD	2588 .....N8BJQ	2278 .....VE6BF	1804..EA7AAW	1334 .....RUØLL	1030 .....AA5JG	695.....S55SL	
3750 ..VE7CNE	2914 .SM6DHU	2529 ...IK3GER	2101 .....I2MQP	1769 .....AC5K	1317 ....K6UXO	915 .....N1KC	615 ....JH6JMM	

DIGITAL

1284 .....W3LL	1258 .....N8BJQ	1133 .....N6QQ	1066 ....YO9HP	1009..GUØSUP	772 .....KØDEQ	769.....AG4W	692 ...WD9DZV	629.....W2OO

January 2011. With antennas to cover 75, 80, and 160 meters simultaneously from sunset to sunrise, dedicated receive systems and top-of-the-line radios, we will be active on all these bands, every night, for almost two solid weeks. Rest assured that we're giving the low bands a top priority.

"Of course, this doesn't mean we're ignoring 40 meters and up. It just means we're putting in a bigger effort than usual on those bands where the need is greatest.

"We realize that lone operators at remote polar science stations often have limited time and equipment to make an effort on every band, let alone 80 or 160. This is why the big Antarctic DXpeditions are there to fill in the gaps. These expeditions offer experienced DXers a chance at working some

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 listing 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	265	W6OAT	212	ON4CAS	191
HAØDU	240	VE3ZZ	207	HA9PP	190
VE7IG	237	HA5WA	206	BA4DW	188
W1CU	235	F6HMJ	206	HB9DDZ	188
VE3XN	234	JN3SAC	206	RW4NH	187
HA5AGS	228	KF8UN	205	IV3GOW	184
N8PR	223	OK1AOV	205	K2SHZ	182
HA1RW	220	N4MM	202	K1NU	180
9A5CY	219	W4UM	200	W5ODD	177
HA1AG	218	K8OOK	195	NØFW	176
KØDEQ	216	N4NX	192		

SSB

W1CU	213	VE7SMP	190	NØFW	176
W4ABW	202	N4MM	186	DL3DXX	175
KØDEQ	192	W4UM	183	JN3SAC	175

CW

DL6KVA	233	DL3DXX	203	HB9DZZ	186
W1CU	229	JN3SAC	200	OK2PO	184
DL2DXA	209	OK1AOV	196	N4MM	179
KØDEQ	207	W4UM	195	N4NX	177

QSL Information

CT/DL2MEK via DL2MEK
CT/LZ3ND via LZ3ND
CT1/DL1DA via DL1DA
CT1A via CT1GFK
CT1EGW via W3HNK
CT1FFF via CT1GFK
CT1HZE via DL8HCZ
CT1LHM via CT1GFK
CT2GLO via W3HNK
CT3/DJ6QT via DJ6QT
CT3/DJ8NK via DJ8NK
CT3/DL1DA via DL1DA
CT3/DL3KWF via DL3KWF
CT3/DL5AXX via DL5AXX
CT3/OM3RM via CT3EE
CT3AF via W3HNK
CT3E via CT3EE
CT3M via DJ6QT
CT3MAW via CT3EE
CT5YVY via CT1GFK
CT7/CU8AT via CT1GFK
CT7/DC2CT via DC2CT
CT7/DK1VI via DK1VI
CT7/DL4IAL via DL4IAL
CT7/DM3FG via DM3FG
CT7/G3SED via G3SED
CT7/G3ZAY via G3ZAY
CT7/IW2NVT via IW2NVT
CT7/LZ3ND via LZ1NK
CT7/MØBLF via MØBLF
CT7/MØHSW via MØHSW
CT7/MØRLM via MØRLM
CT7/MØTJH via MØTJH
CT7A via CT1GFK
CT7FFC via CT1GFK
CT7FFE via CT1IUA
CT7FFF via CT1GFK
CT7FFG via CT1GFK
CT7FFM via CT1IUA
CT7FFT via CT1GFK
CT7IOV via CT2IOV
CT7LHA via CT1GFK
CT7LHF via CT1GFK
CT7LHM via CT1GFK
CT7LHP via CT1GFK
CT7LHR via CT1GFK
CT7LHV via CT1GFK
CT7LHZ via CT1GFK
CT8/DK5FT via DK5FT

(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>; <http://golist.net/>.)

Don, W4TO (right) demonstrates how he controls his remote station to Ted, W4VHF (left) at the W4DXCC/SEDCO Convention in late September 2010. This is the way to go if you live in one of those antenna restricted areas. (Photo courtesy of David, K4PZT)

A surprise visitor to the dinner meeting of the North Carolina DX & Contesting Club the end of October. No, it isn't really Pierre. It's Carl, N4AA, displaying his ZS8M hat. Here's the story behind the hat: During the PJ frenzy a few weeks earlier I saw a late-night cluster spot for ZS8M on 40 meters. Upon checking, I heard Pierre, called him, and made the contact for country #300 on 40 meters. A special thanks to Dennis, ZS1AU, and Pierre for making it possible for me to have this souvenir of a milestone in my DXCC chase. (Photo courtesy of Dave, K4SV)

new band-modes, and newcomers a chance at climbing the Honor Roll.

"**Antennas** will consist of:

• The Battle Creek Special (160 main): 85-foot vertical wire supported by Spiderbeam telescoping pole (160; backup)

• 80 transmit: SteppIR vertical with 80-meter coil (CW, 80m); 60-foot vertical wire supported by Spiderbeam telescoping pole (75m); 60-foot vertical wire supported by second Spiderbeam telescoping pole (backup)

• 160/80 receive: DX Engineering 4-square with DX Engineering preamp and DX Engineering *160 transmit:* Splitters to feed three low-band radios. Two RX beverages as an option to 4-square dependent on circumstances encountered on site.

"**Team:** EY8MM, K9ZO, ND2T, 9V1YC, KØIR, N1DG, W3WL, K6AW, N6MZ, N4GRN, WB9Z, W7EW, and VE3EJ. I'm sure most of you recognize these calls. This team brings with it an unprecedented amount of experience in Antarctic DXpeditioning, contesting, and low-band knowledge to ensure that all bands are covered from start to finish.

"We're extremely grateful to have major DX foundations such as the NCDXF, INDEXA, and the ARRL funding us with large donations. We're also thankful to have support from many worldwide DX clubs and commercial equipment sponsors such as Elecraft, Acom, DX Engineering, and SteppIR. But even with all of that, and each team member contributing over $12,000, it still doesn't even come close to covering the massive expense of a polar expedition. We need financial support from all of you who can.

"If you haven't sent in a donation yet, we hope you will consider joining those who have already stepped up to help. Our website <www.vp8o.com> gives full details of our trip, and is where you can contribute at whatever level you feel comfortable.

"We look forward to working you on all bands!"

All in all, we have a very busy schedule of activities over the next few months: contests plus DXpeditions to some much needed, if not *most* needed, spots to keep our interest the end of 2010 and the beginning of this year.

Enjoy the chase, and Have Fun!

73, Carl, N4AA

Awards from Italy

BY TED MELINOSKY,* K1BV

This month's column features some of the many awards issued by Italian clubs and interest groups. Italians can draw on dramatic history going back over 2000 years—famous inventors such as Marconi, explorers such as Columbus, talented artists, thousands of castles and fortifications, and scenic mountains—all of which make Italian awards well worth collecting and displaying. Most operators should have a good collection of QSLs from Italy. Itlaian stations are quite active in just about every contest.

While the national organization ARI (Associazione Radiotecnica Italiana) sponsors an interesting series of certificates, the awards in this column are offered principally by ARI-affiliated clubs, not the national organization itself.

Alpine Flowers Award

This award is sponsored by the Dolomites Radio Club to promote the region. The Dolomites are a section of the Alps located primarily in northeastern Italy. The mountains are famous for skiing during the winter months and mountain-climbing and hiking during the summer. In August 2009 the Dolomites were declared a natural heritage site by UNESCO.

Europeans need seven confirmed QSOs, one QSO with a Dolomites Radio Club member plus six more contacts with different Alpine countries as shown in the list below. DX stations need six Alpine countries.

- Italian stations with the prefix of I1,2,3 IK1,2,3 IN3 IV3 IX1 IW1,2,3
- France
- Switzerland or Liechtenstein
- Germany DOK A, C, T or U (The DOK identifier is usually shown on DL QSL cards, for example: A01, C22, etc.)
- Austria OE2, OE3, OE6–9
- Slovenia

SWL OK. Contacts after 1 January 1966 count for the award. Send GCR list and fee of $US5, 5 Euros, or 10 IRCs to: Dolomites Radio Club, Galileio, Galileio Strasse 3, 39031 Bruneck (BZ) Italy (or directly to the manager: Josef Feichter, IN3ZWF, Beikircher-Allee, 4 I-39032 MÅhlen in Taufers SÅdtirol (BZ), Italy).

Cassino Peace Town Award (CDXA)

The Monte Cassino monastery dates back to the early 500s when it was first built as a temple to Apollo. Over the years it has been destroyed and rebuilt numerous times. The latest destruction took place in 1944, when German defenders occupied this ancient abbey which strategically blocked Allied troops from advancing northward toward

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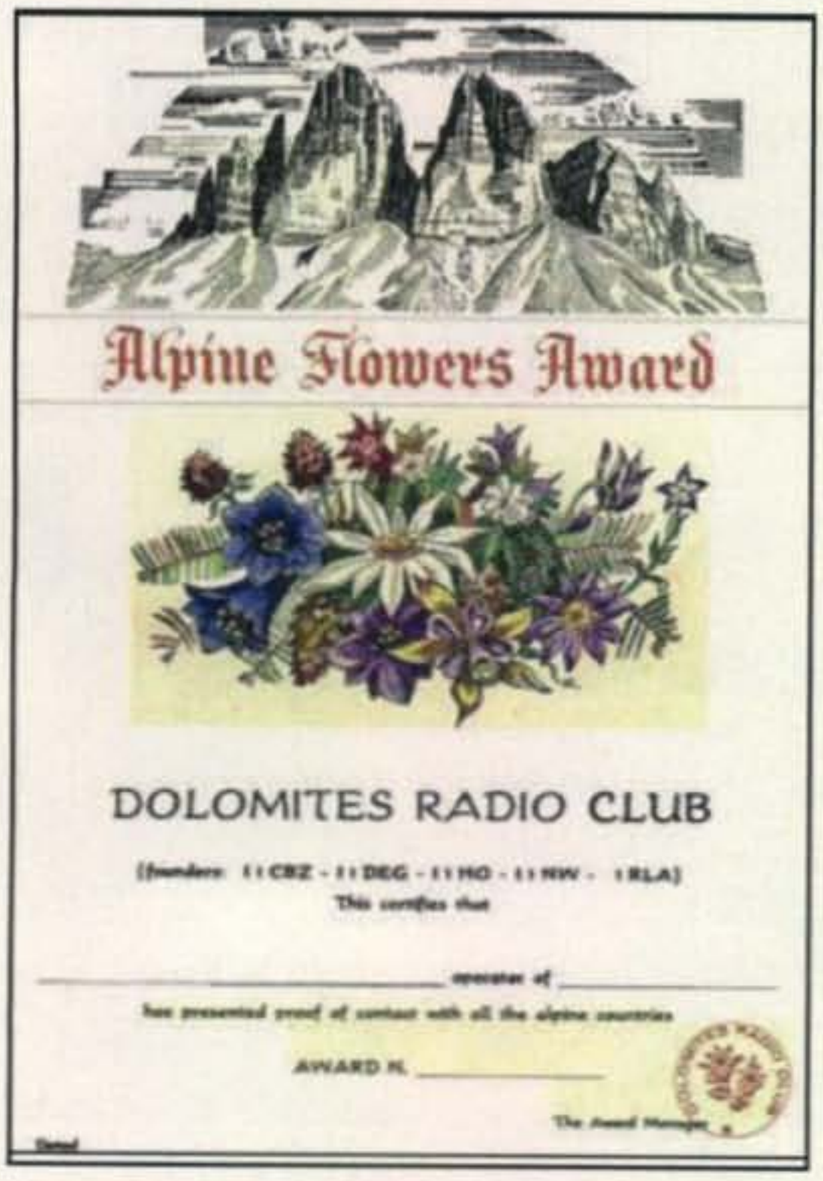

This award is sponsored by the Dolomites Radio Club to promote the region. The Dolomites are a section of the Alps located primarily in northeastern Italy.

USA-CA Special Honor Roll

Jim Watkins, VA3XOV/VO1SF
USA-CA All Counties #1204
September 29, 2010

Kerry Long, W4SIG
USA-CA All Counties #1205
October 11, 2010

Paul Milward. NU4C
USA-CA All Counties #1206
October 22, 2010

USA-CA Honor Roll

500

W4SIG.....3518
IK3GER.....3519
UR9IDX.....3520

1000

W4SIG.....1804

1500

W4SIG.....1515

2000

W4SIG.....1403
NU4C.....1404

2500

VA3XOV.....1319
W4SIG.....1320
NU4C.....1321

3000

VA3XOV.....1230
W4SIG.....1231
NU4C.....1232

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.

Sponsored by Radio Club of Cassino, this award commemorates the 50th anniversary of the WW II destruction of the town of Cassino and the famed Monte Cassino Abbey.

Replacement Certificate Policy for CQ Awards

There are two reasons why replacement certificates are requested for CQ's awards. One is that the original has been lost, damaged, or destroyed, such as in a fire or flood. (I've had two of these requests over the past ten years.) The second is because of a callsign change occasioned by license upgrade or acquisition of a vanity call.

In order to present a common procedure for such requests for all its awards, CQ has established a policy that permits replacement of those certificates that were lost, damaged, or destroyed, but not for those who have acquired a new callsign. The rationale is that the award was originally issued using the callsign held at the time the award was earned. Updates that result in a new certificate being issued may, of course, reflect the new callsign (the one held when the upgraded award was earned).

For USA-CA awards earned by USA and Canadian stations, the charge will be the cost of an endorsement ($1.25). For those located outside of the USA, the cost will vary according to postal rates.

For other CQ awards, specifics can be found in the award rules on the *CQ* website at: <www.cq-amateur-radio.com>.

Rome. A series of bombing strikes almost completely destroyed the abbey, which was rebuilt and reconsecrated in 1964.

The award is sponsored by Radio Club of Cassino to commemorate the 50th anniversary of the WW II destruction of the town and the famed Monte Cassino Abbey. Troops of 30 nations were involved in this famous battle. For the award you must contact stations from 20 of these countries plus one member of the Cassino RC since 1 January 1993 on HF. The countries are: I, F, ON, PY, TA, 6W, 4X, 4S, W, SP, VK, VU, 7X, EL, JA, S2, G, DL, ZL, UA, CN, TU, 9N, VE, OE, ZS, EI, SU, 5N, and SV. VHF and higher award—confirm 20 stations from Cassino, Anzio Nettuno, Caserta, Isernia, and Latina, where the German, English, Polish, American, Italian, and French war cemeteries are located. All HF bands and modes except repeater contacts allowed. SWL OK. The award may be endorsed for single band. (Honor Roll—contact all 30 plus Cassino RC).

Send GCR list and fee of 10 Euros or $US10 to: Umberto Picano, IØNZK, Via Montello 22, I-03043 Cassino (FR), Italy. E-mail: <umbertopicano@virgilio.it>; internet:<http://www.aricassino.it/diplomi>.

Looking Ahead in CQ

Here are some of the articles we're working on for upcoming issues of *CQ*:

- *CQ* Interviews: Dr. Bill Baker, W1BKR
- *CQ* Market Survey: HF Transceivers
- Using Propagation Prediction Programs
- Protecting Capacitors in Series

Do you have a ham radio story to tell? See our writers' guidelines on the *CQ* website at:
<http://www.cq-amateur-radio.com/guide.html>.

Diploma dei Castelli Campani

One official listing for the Diploma Castles of Italy (DCI) shows the highest endorsement for this award is for proving contact with an amazing 7000 castles and fortifications. Accordingly, it has become possible for many clubs to sponsor their own castle award.

Section Sezione A.R.I. di Salerno sponsores this award for contacts with castles in the region Campania after 1 January 2005. Campania includes several provinces, and the award sponsor provides a link to a master listing of castles that are valid for the award. By the way, this official listing of Italian

Section Sezione A.R.I. di Salerno sponsores this award for contacts with castles in the region Campania, which includes five provinces.

castles tells us that there are an amazing 549 of them in the 5 provinces! Wow!

Requirements: work castles in the Campania region. (SWL OK.)

On HF, Italians work 20 castles in at least 3 provinces. On VHF, 5 castles in at least 2 provinces. All others need 10 castles in at least 2 provinces.

Honor Roll—Italian stations need 100 castles on HF or 30 on VHF.

The provinces are: AV Avellino, BN Benevento, CE Caserta, NA Napoli, and SA Salerno. A list of valid castles is on the DCI web page (http://www.dcia.it/). All bands may be used. Valid modes are SSB, CW, RTTY, PSK31, and SSTV. Contacts via repeater, crossband, or crossmode are not valid. Cost for the award is 10 Euros, and for the Honor Roll 20 Euros. Send a GCR list with the reference number of the castles plus a copy of the QSLs and the listed fee to: Autilia Lenza, IZ8FFQ, Via J.F. Kennedy 69, I-84015 Nocera Superiore (SA), Italy. E-mail: <iz8ffq@arisa.it>; internet: <http://www.arisa.it/>.

Tridentum Award

Italy has 110 provinces which are roughly equivalent in size to a U.S. county, although typically with a larger population. Several Italian awards, such as this one, are based on contacts made with provinces, and when the rules provide a key as to the postal code for some required areas, your job becomes a lot easier. In Italy, the first two digits of the "zip" code are the code for the province, and the other three digits are for individual cities in the province.

Contact stations in the city and province of Trento since 1 January 1968 count for the award. SWL OK. Postal codes for the province start with 38XXX. City of Trento = 38100. No repeaters, e-link, or transponder contacts count. Stations of Trentino/Alto Adige need 25 different stations of which at least 5 are located in Trento city. Italians need 15 with 4 from Trento; other Europeans 10 with 3 in Trento City; and all others need 5, and 2 must be in Trento City. The same station can be counted only once.

The Tridentum Award is based on contacts made with stations in the city and province Trento.

Send GCR list and fee of 10 Euros or equivalent in $US or IRCs to: ARI Sezione di Trento, Casella Postale 286, I-38100 Trento, Italy. Internet: <http://www.aritn.it/>.

Find any interesting awards online, or does your club sponsor an award that can use some publicity? Let's hear from you at the e-mail address shown on the first page of this column.

73, Ted, K1BV

contesting

BY JOHN DORR,* K1AR

Improving Your Contest Operating

January's Contest Tip

When using SSB close to a band edge, it is important to keep all of your signal inside the band. The frequency displayed by your radio is the *carrier* frequency, so your sidebands extend above (USB) or below (LSB) that frequency. How far do they extend? The FCC considers an SSB signal's bandwidth to be between the points at which the sidebands are 26 dB below the signal's average power. For contest-grade signals, that is anywhere from 2.5 to 3 kHz—assuming your signal is clean and not distorted, which increases bandwidth. So let's just say it's safe to assume you have a 3-kHz-wide signal and should stay 3 kHz above the band edge on LSB and 3 kHz below the band edge on USB. For example, 14.347 kHz and 7.128 kHz would be the highest and lowest displayed frequencies Extra Class operators should use on 20 and 40 meters phone, respectively. Also, DX stations please call for U.S. stations inside our bands if you want to get the highest rate!

Let's be honest with ourselves and admit that nothing improves a contest score more than good old-fashioned experience and outstanding station hardware. Despite that reality, there is still hope for those of us who want to improve, with or without the above. Many of the ways we can enhance our results have nothing to do with the size of our antennas or the number of years we have been contesting. Hopefully, you will gain something from this month's suggestions.

I have broken down my thoughts into several categories that include preparation, physical considerations, operating, station design, food/drink, and other. As you read on, consider your own tricks that have been picked up over the years. At the risk of letting a few secrets out (even though we know there really aren't any!), your insight may help your fellow contester—if you only share!

Preparation

Being properly prepared for a contest is the single most important contribution to improving your contest score. Successful marathon runners don't just show up for a race. Rather, they prepare for months and years. A contest is not unlike a marathon. Although everyone isn't a winner, successful participants excel based on their mental *and* physical preparation. The contesters who strive to improve their scores can:

• Prepare so that all you need to do at the beginning of a contest is sit down and operate.

• Understand propagation before and during the contest.

• Work the bands vigorously during the week before the contest to understand who's on and their game plans. Review internet summaries of same.

• Have a plan for spare equipment (including PCs) if something fails during the contest.

• Plan the contest as if you were attempting to run the Boston Marathon.

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e-mail: <K1AR@contesting.com>

Calendar of Events

All year	**CQ DX Marathon**
Dec. 18	RAC Winter Contest
Dec. 18	OK DX RTTY Contest
Dec. 18–19	Stew Perry Topband Challenge
Dec. 18–19	Croatian CW Contest
Dec. 19	ARRL Rookie Roundup
Jan. 1	SARTG New Year RTTY Contest
Jan. 8–9	ARRL RTTY Roundup
Jan. 8–9	Hunting Lions in the Air
Jan. 8–9	North American CW QSO Party
Jan. 9	DARC 10 Meter Contest
Jan. 15	LZ Open Contest
Jan. 15–16	Hungarian DX Contest
Jan. 22–23	BARTG RTTY Sprint
Jan. 28–30	**CQ WW 160M CW Contest**
Jan. 29–30	REF CW Contest
Jan. 29–30	UBA SSB Contest
Feb. 5	Minnesota QSO Party
Feb. 5–6	Vermont QSO Party
Feb. 5–7	Delaware QSO Party
Feb. 6	North American CW Sprint
Feb. 12–13	**CQ WW RTTY WPX Contest**
Feb. 19–20	ARRL CW DX Contest
Feb. 25–27	**CQ WW 160M SSB Contest**
Mar. 26–27	**CQ WW WPX SSB Contest**

• Use two alarm clocks set 5 minutes apart as a backup during rest periods, especially if you are prone to oversleeping.

• Use alarms that are battery powered to avoid the impact from power disruptions.

• Have a good understanding of the prior year's efforts, especially when you made good band decisions.

• Set goals for yourself and try to exceed them. Remember, not everyone wins!

• Excel at band changing in your station.

• Know the rules inside and out (e.g., 10-minute rule, multiplier credits, etc.).

• Practice various operating scenarios with your radio (setting up a "quick" split on 80 meters, doing an A=B with your VFOs to tell ann operator the frequency is busy, etc.).

Physical

There are few specialties in amateur radio more physically grueling than slugging it out for 48 hours in a major DX contest. Serious contesters don't take physical preparation lightly and consider this aspect to be as important as the station itself. For example:

• Be sure to get a good nap on , for example, Friday afternoon before the contest starts.

• Try operating while standing for short stretches during the contest.

• Don't be afraid to take short breaks. Try going for a 5-minute walk to clear your head.

• Wear loose/comfortable clothing. Dress enough to stay warm, but *not* hot.

• Change into fresh clothes periodically.

• If practical, open the windows from time to time to get some fresh air.

• Take one or more showers during the weekend, which may revitalize you.

Operating

While there is some merit to the concept that operating ability is partly natural, the truth is that the majority of good operators have learned their skills through experience. Operating ability is more than being able to copy the information you are being asked to receive. It's also a function of aggressiveness and operating with common sense. For example:

• Don't listen to/worry about your competition.

• Transmit the minimum amount of data necessary to complete the QSO. Don't be a chatty contester!

• Use your RIT, especially on CW, but make sure that station you hear is calling/working *you*!

• Dig for weak signals; sometimes poor copy is just QSB.

• Split your operating into different parts of the band. Don't get stuck in a narrow frequency range for the entire contest.

• Consider special frequencies—slightly up from nets (while not QRM-ing them!), way up into bands, especially if you're not operating at a superstation.

• Don't get stuck trying to run guys when you can't. Search and pounce can produce good rates.

• Track your QSO/Mult ratios. This can be a guide in determining the time you should spend calling in pile-ups. Learn to cut your losses

• Be aggressive when operating without being obnoxious. Don't build a reputation as someone who calls without listening first, doesn't know when to stand-by, and is a generally a poor operator.

• Don't be caught "DXing" when you should be running guys.

• Never miss easy multipliers. Always be aware of what you have and what you need.

• Use your VFO memories and/or your logging software to store sked frequencies, pile-ups, etc.

• Operate where others aren't from time to time.

• Don't be afraid to start moving needed multipliers to other bands in the beginning of the contest. There is no perfect time to start.

Station Layout and Design

The old adage is that the internal layout of your station plays an incredible role in reducing Sunday afternoon fatigue. For example, why compromise the advantage of phased verticals by labeling them poorly? You should not have to hop into your car to get to your antenna switch. And, there are others:

• Label everything in your shack (e.g., antenna switches, remote switches, etc.)

• Label your amplifier settings per band.

• Review your station setup. Everything should be positioned for maximum comfort and reduced back strain.

• Use a comfortable operating chair (but not *too* comfortable!).

• Ensure good lighting.

• Evaluate your headphones before the contest. They can ruin the advantage of a good receiver.

• Use a boom microphone/headset.

• Clean up your shack for psychological advantages.

Food/Drink

The choice of food and drink during a contest is largely one of personal choice. The advantage comes from developing a plan. In most cases:

• Avoid a big meal right before the contest starts.

• Coffee, caffeinated energy drinks ... choose your weapon.

• Consider your meal plan for the weekend. Focus on high-energy foods.

• No alcohol!

• Drink lots of fluids during the contest.

• Consider food choices that are quick to prepare. Crockpot dishes (e.g., stew, soups) are good choices, as are microwave dinners and sandwiches. A handy box of munchies works well, too.

Other

There are countless other thoughts about improving your contest score, and some of them are:

• Record your operation and listen for areas of improvement for the next time.

• Operate in small contests during the year to develop your skills for the big ones.

• Try to find a friend to operate with; exchange ideas from time to time.

• Try to identify and fix potential TVI/RFI problems *before* the contest.

• Have a plan established to deal with possible problems (e.g., pre-made power cords with toroids).

• Answer QSL requests from all sources—paper and electronic. DX stations *really do* remember.

Final Comments

When you actually stop and think about it, it's amazing what you can do to prepare for a contest that has little to do with the size of your antennas or how much power you're running. Give it some thought. I guarantee it will make you an improved contester!

See you in the next contest!

73, John, K1AR

propagation

BY TOMAS HOOD,* NW7US

Good Conditions Predicted for 2011

Moderate 2010 CQ WW SSB Contest Conditions

The 2010 CQ World-Wide DX SSB Contest weekend of October 30–31 started off with great geomagnetic activity conditions. Geomagnetic activity was very quiet, making for a very stable ionosphere. Sunspot counts were incredible, though! On both contest days, the sunspot count was 32 (compared to a year ago when the count was 16 and 19). The 10.7-cm solar flux index was 85 and 81, compared to last year's 76. All of the HF contest bands were usable, including 10 meters! The contest yielded great results for almost every participant, compared with the last several years.

The new solar cycle, Cycle 24, is picking up energy. Sunspots are not little specks; sunspots are typically large, while not yet overly complex. Complex magnetic structures in a sunspot region tend to trigger strong X-ray flares and often release coronal mass ejections (CMEs). The recent sunspots are not that complex and only weak to moderate flaring is occurring. This will change, however, as the cycle continues forward.

Flux readings during November 2010 rose above 90. We are no longer seeing long periods without sunspots. While there are still days with zero spots, they are fewer and fewer.

Here is an overview of expected propagation conditions for each amateur band between 6 and 160 meters for 2011.

6 Meters: While we are seeing a slow and steady increase in solar activity, it is not yet enough to wake up 6 meters via *F*-layer propagation. We should see action on 6 meters during the summer season's troposcatter and sporadic-*E* activity. Aurora will play a minor role during spring and fall. Meteor-scatter propagation might offer an occasional peak in activity, as well. By the end of 2011, however, we may see occasional periods (short lived) when the *F*-region plays a role on this band.

10 and 12 Meters: These bands will be poor to good, except during times of sporadic-*E* activity. Expect most DX openings to be generally on north and south paths, although by fall, solar activity may well be high enough to support a great DX season on 10 meters. Most of the time the solar activity will not support propagation at higher bands, except for possible openings on paths between lower latitudes and locations on the other side of the equator (north-south paths).

15 Meters: This band will be fair during the first part of the year. Occasional worldwide openings will occur during the daylight hours of all seasons. Later in the year, as solar activity increases, this band will become a hot daytime activity center for most latitudes. Generally, though, openings during the first half of the year will be short, except for the strong and frequent north-south path openings. By the end of 2011, we should be in a more rapid climb in solar cycle activity, so this band will be open for worldwide DX more often.

17 Meters: This band should behave much like 15, but you will find it open more often, with it remaining open for DX an hour or two longer than 15 meters.

20 Meters: Twenty is again going to be the main player during the year. Expect good conditions during the daylight hours, with DX openings possible to limited areas throughout the year. DX conditions on this band tend to peak for a few hours after local sunrise and again during the sunset period. There will be moderate nighttime openings during the spring and fall seasons.

30 Meters: As Cycle 24 begins to offer more sunspot activity, conditions on this band will offer strong openings, especially a few hours before sunset until a few hours after sunrise. In 2011, 30 meters will be an exciting band for those low-power digital signals. Winter brings longer nights, providing the right mix for exceptional worldwide DX.

40, 60, 80, and 160 Meters: These are nighttime DX bands. Great worldwide DX should continue on 40 meters from about two hours before sunset to approximately two hours after sunrise during all seasons. Expect coast-to-coast DX on 60 meters. DX openings on 80 and 160 should

*e-mail: <nw7us@sunspotwatch.org>

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for January 2011

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 1-4, 8-12, 15, 17-31	A	A	B	C
High Normal: 7, 14, 16	A	B	C	C-D
Low Normal: 5-6	B	C-B	C-D	D-E
Below Normal: 13	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 2 will be good (B) on Jan. 1st through the 4th, poor (D) to fair (C) on the 5th and 6th, fair (C) on the 7th, 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.

peak during the early spring, late fall, and winter months. Expect somewhat stronger signals than those of last year.

January Propagation

It should be a toss-up between 17 and 20 meters for some great DX propagation openings during the daylight hours. These bands should open to most areas of the world, often with very strong signals. Seventeen meters may have a slight edge before noon, with 20 meters taking the lead after noon and becoming the optimum DX band during the late afternoon hours. Short-skip openings between distances of about 1200 and 2300 miles should be excellent during the daylight hours. Great short-skip openings are expected on 15 and 17 meters from shortly after sunrise through the early evening hours for distances between 1000 and 2300 miles.

A Quick Look at Current Cycle 24 Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, October 2010: 24
Twelve-month smoothed, April 2010: 14

10.7 cm Flux
Observed Monthly, October 2010: 82
Twelve-month smoothed, April 2010: 78

***Ap* Index**
Observed Monthly, October 2010: 6
Twelve-month smoothed, April 2010: 6

One Year Ago: A Quick Look at Solar Cycle Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, October 2009: 5
Twelve-month smoothed, April 2009: 2

10.7 cm Flux
Observed Monthly, October 2009: 72
Twelve-month smoothed, April 2009: 69

***Ap* Index**
Observed Monthly, October 2009: 3
Twelve-month smoothed, April 2009: 4

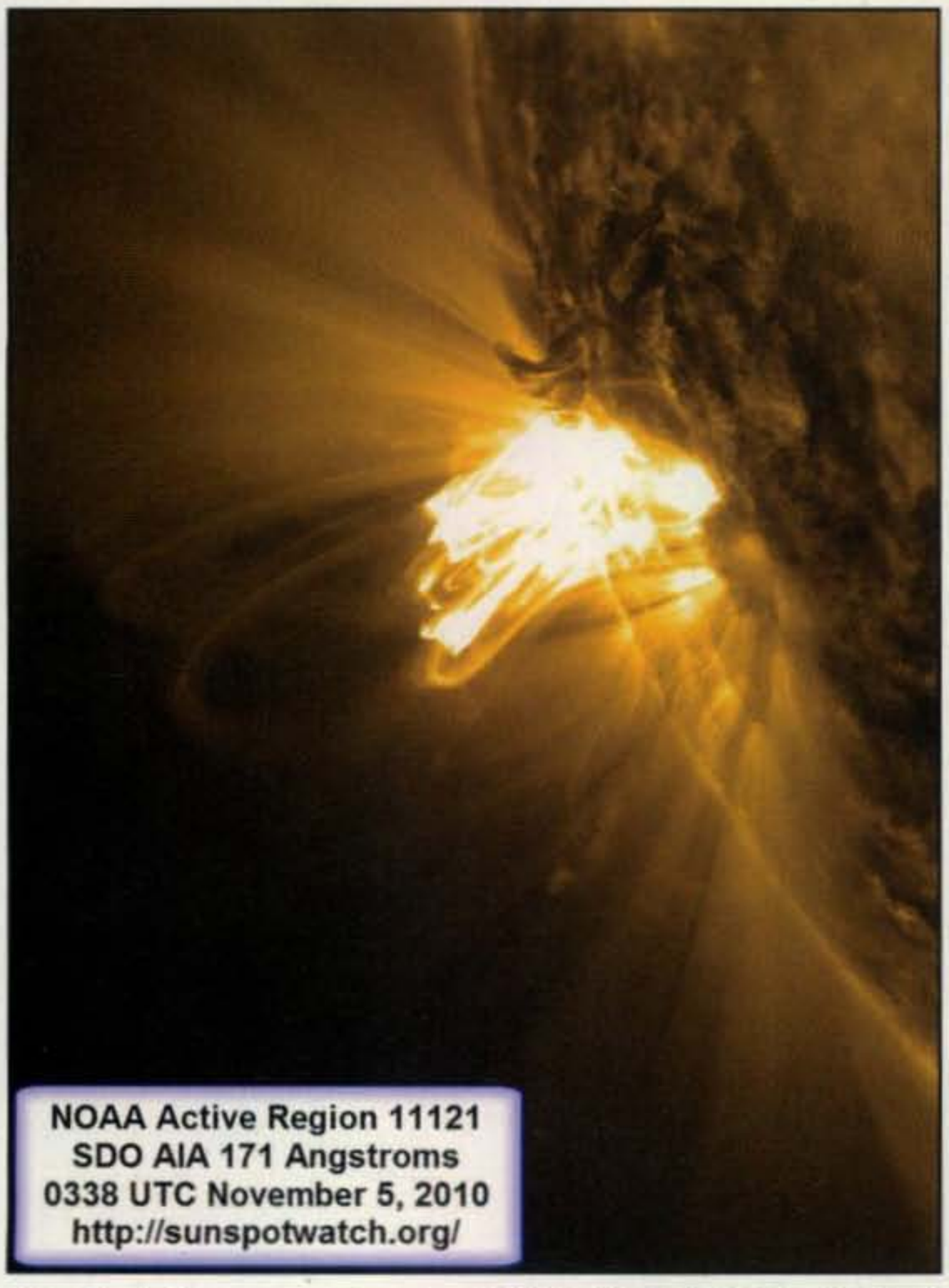

Fig. 1– Active sunspot region NOAA AR 11121 (short, 1121) rotating into view on November 5, 2010 (as seen at the 171-Angstrom wavelength). The sunspot region was very active, with moderately complex magnetic structures, seen by the bright yellow loops that indicate magnetic field lines as plasma is pulled out away from the Sun's corona above the sunspots. As the sunspot continued to rotate around the visable solar disc, it unleashed X-ray flares with energy levels ranging from tiny to moderate. (Source: NASA/Solar Dynamics Observatory [SDO])

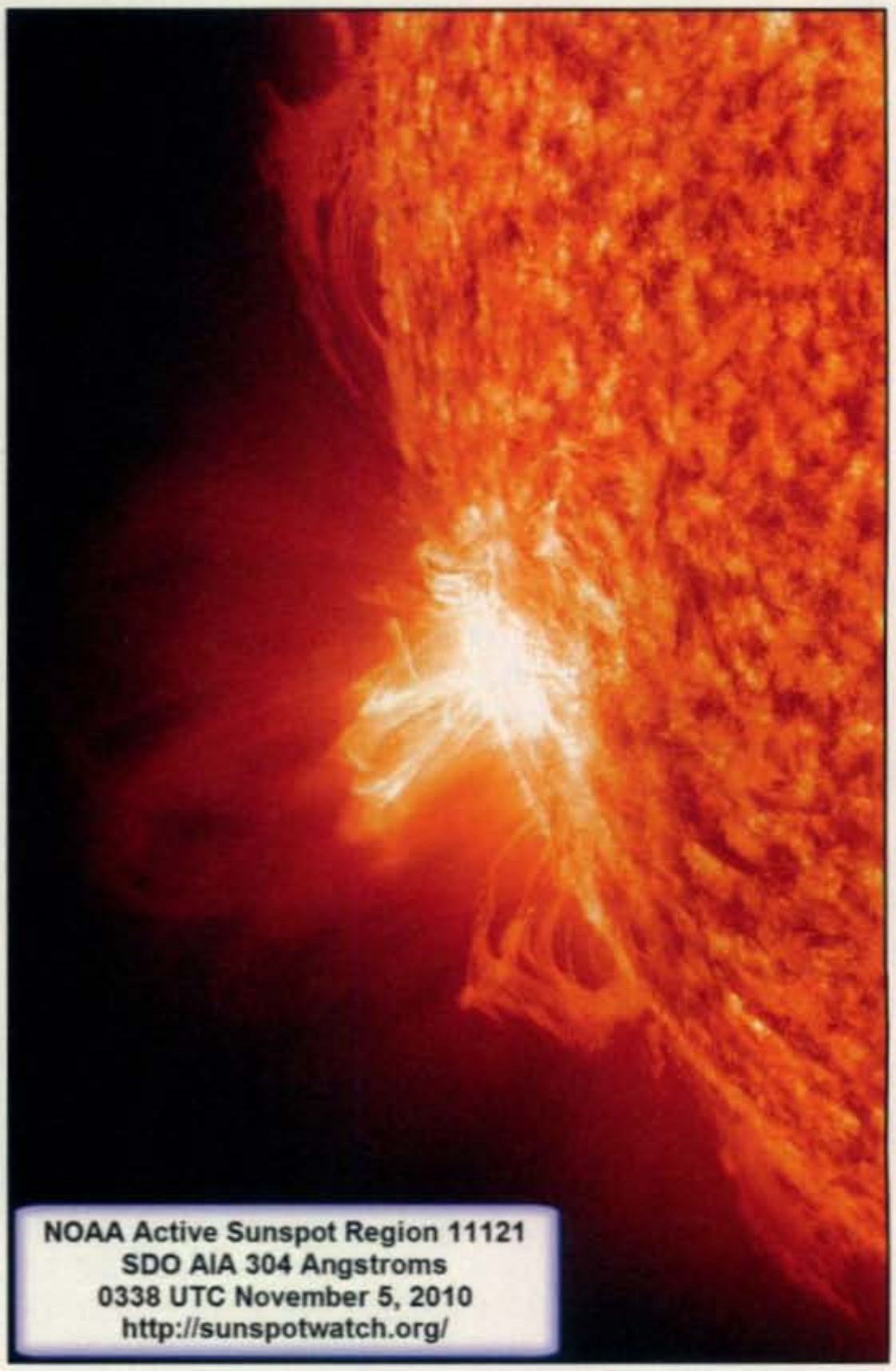

Fig. 2– NOAA Active Region 1121 unleashed many X-ray flares. This view at the 304-Angstrom wavelength on November 5, 2010 reveals the intense and huge plasma filaments (caused by the magnetic field lines punching through the sunspots, pulling the plasma out away from the Sun's corona). (Source: NASA/SDO)

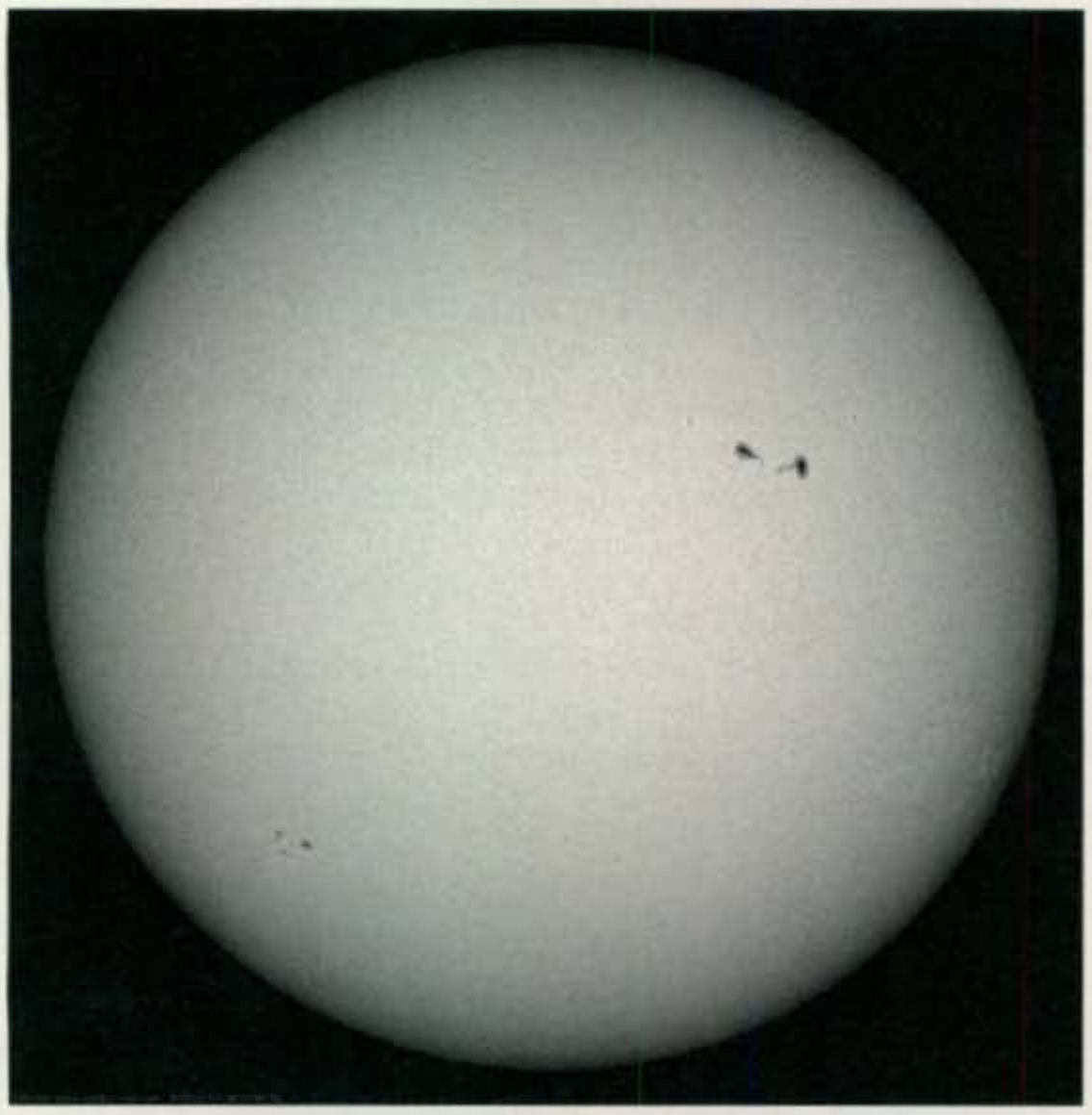

Fig. 3– As can be seen by this "Intensitygram" captured by SDO, there were several sunspot regions (the dark spots in this image, representing the cooler area on the Sun where sunspots have formed) during November. (Source: NASA/SDO)

Twenty meters is expected to be a solid band with openings for both DX and short-skip. DX conditions should peak during a window of an hour or so right after sunrise and again during the late afternoon and early evening hours. Short-skip openings between approximately 1300 and 2300 miles should be possible from just after sunrise to as late as midnight. Shorter distance openings should also be possible from mid-morning to mid-afternoon.

The optimum band for DX conditions during the hours of darkness should be 40 meters. Expect openings to most areas of the world from shortly before sundown, through the hours of darkness, and until shortly after sunrise. Signal levels may be exceptionally strong at times. During the daylight hours, short-skip conditions should be optimal for openings between approximately 100 and 600 miles. Skip will lengthen during the late afternoon, and by nightfall short-skip conditions should be optimal for openings between 800 and 2300 miles.

Expect 60 meters to play a significant role in nighttime DX across the United States. With very low noise levels this month, the weaker signals of 60 meters will be easy to copy.

Because atmospheric noise levels will be at seasonally minimum levels in the Northern Hemisphere during January, 80 and 160 meter bands should also be hot. Expect some good openings to many parts of the world on 80 meters during the hours of darkness and the sunrise period. Short-skip openings between distances of 50 and 250 miles should be optimal on 80 meters during the daylight hours. During the later afternoon and early evening hours short-skip openings should increase to between 250 and 1500 miles, and by nightfall openings up to and beyond 2300 miles should be possible.

Expect some DX openings on the 160-meter band during the hours of darkness. Openings toward Europe and the east should peak at about midnight. Openings toward the South Pacific and in a generally southerly direction, as well as openings into Asia and North Pacific, may be possible just before

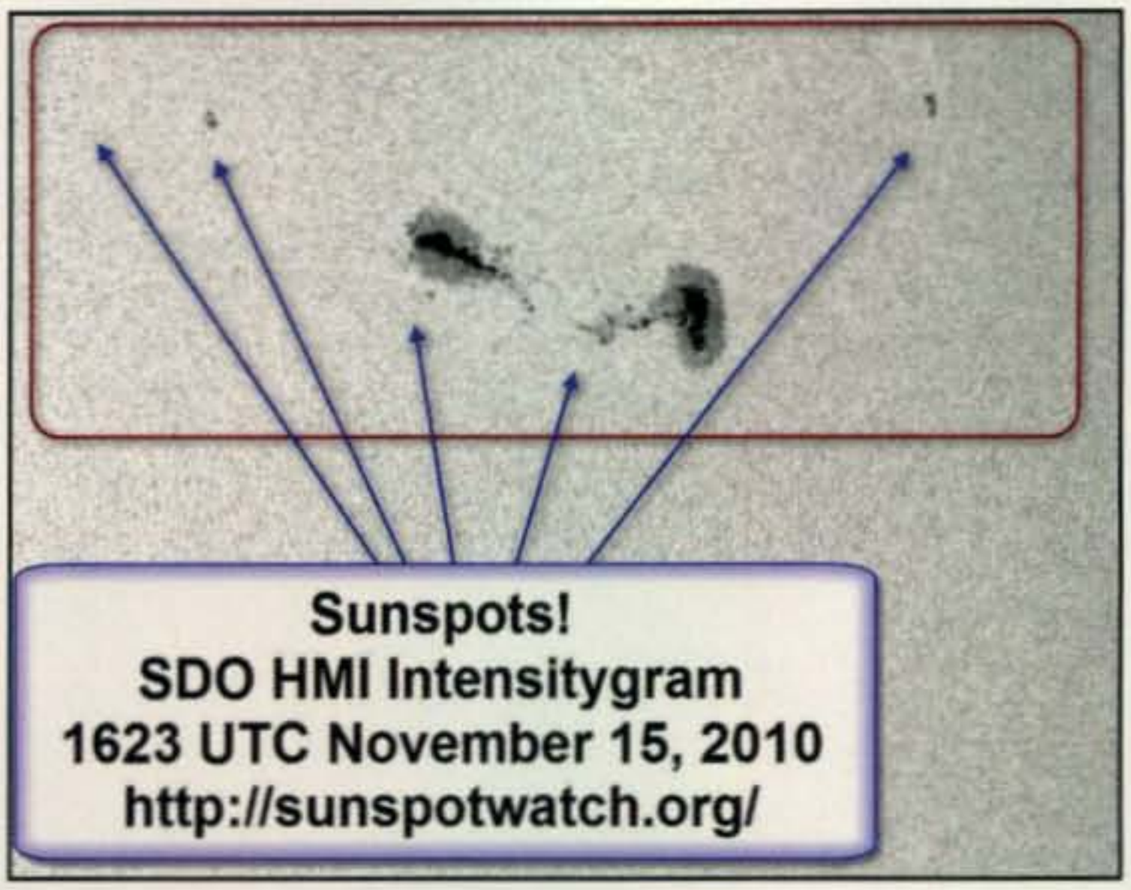

Fig. 4– A close-up of sunspot regions NOAA AR 1124 and 1125 showing large and well-formed sunspot groups. (Source: NASA/SDO)

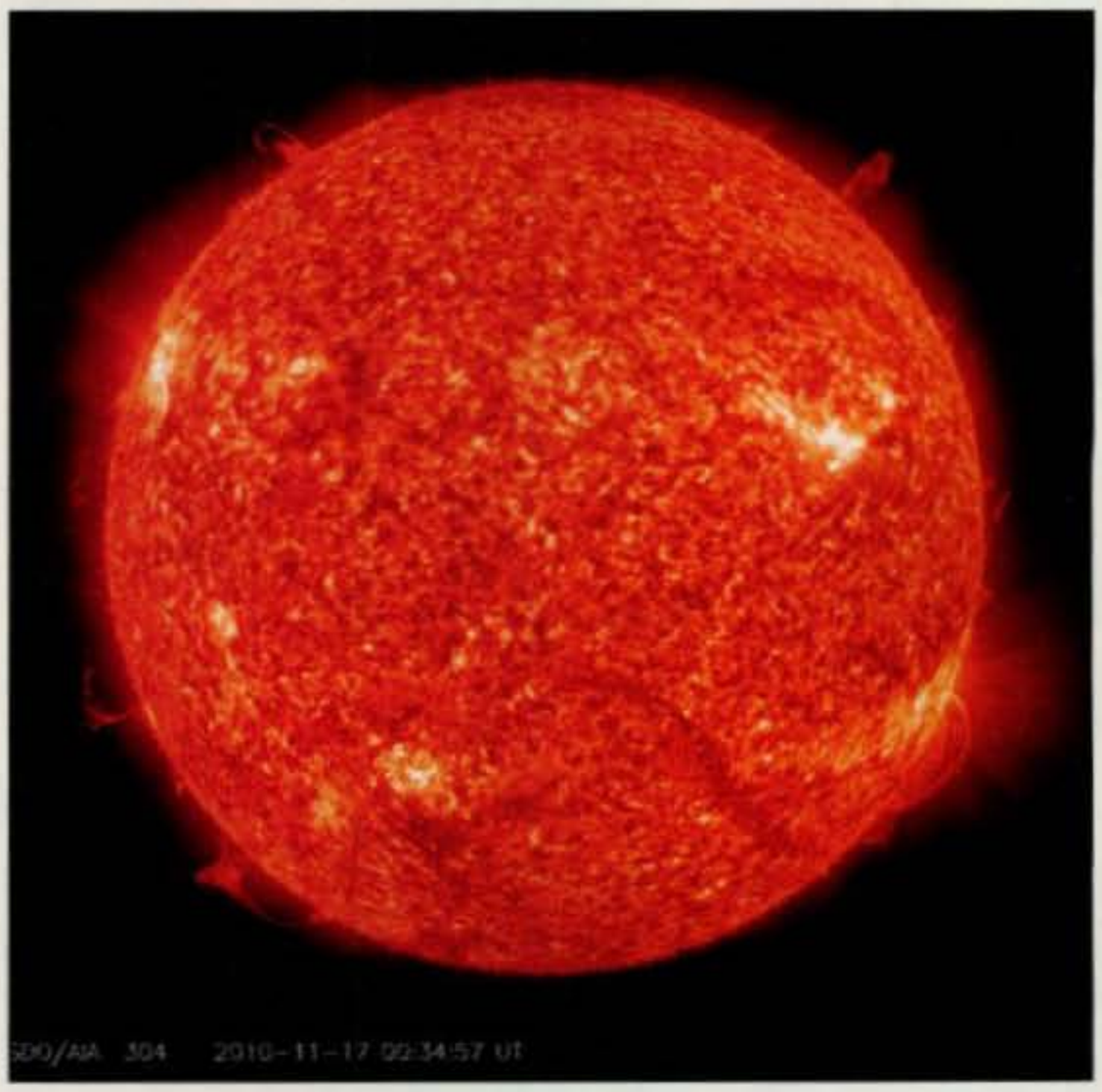

Fig. 5– A view of the Sun on November 17, 2010 at the 304-Angstrom wavelength. Notice in the lower right quarter of the solar disc, the long wavy "finger" (the darker curved line); this is a huge plasma filament stretching across the corona. Just to the right is the bright sunspot region. (Source: NASA/Solar SDO)

daybreak. Short-skip openings up to 1300 miles should be possible during the hours of darkness, and frequently the skip will extend out as far as 2300 miles. During the daylight hours intense ionospheric absorption will severely limit openings, although at times some may be possible up to 150 miles or so.

VHF Conditions

Sporadic-*E* can occur during January, so be on the lookout. This has happened right around New Year's Day and that week. After that, it is rare.

The *Quadrantids* meteor shower is the major meteor shower for January and appears from January 1 to January 5. The maximum should occur on January 3. This shower can sometimes be quite intense, so it may be a good idea to set up some 2- and 6-meter schedules. Morning meteor openings may be the best bet during this month.

Check out the *CQ VHF* magazine propagation column for an in-depth look at propagation on VHF and above.

Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for October 2010 is 23.5. The lowest daily sunspot value of zero (0) was recorded for October 6, 7, and 8. The highest daily sunspot count was 47 on October 25. The 12-month running smoothed sunspot number centered on April 2010 is 14.0. A smoothed sunspot count of 44, give or take about 9 points, is expected for January 2011.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 81.6 for October 2010. The 12-month smoothed 10.7-cm flux centered on April 2010 is 78.3. The predicted smoothed 10.7-cm solar flux for January 2011 is 99, give or take about 9 points.

The observed monthly mean planetary *A*-index (*Ap*) for October 2010 is 6, which is still very quiet. The 12-month smoothed *Ap* index centered on April 2010 is 5.5. Expect the overall geomagnetic activity to vary greatly between quiet to active during most days in January. Refer to the Last-Minute Forecast at the beginning of this column for the outlook on conditions during January.

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. You may e-mail me, write me a letter, or catch me on the HF amateur bands. Please come and participate in my online propagation discussion forum at <http://hfradio.org/forums/>. If you are on Facebook, check out <http://tinyurl.com/fbswx> and <http://tinyurl.com/fb-nw7us>. Speaking of Facebook, check out the CQ Amateur Radio Magazine fan page at <http://tinyurl.com/fb-cqm>.

Now that the new solar cycle is active, I'll be keeping my ears to the radio, hoping to hear you on the air. Happy DX!

73 de Tomas, NW7US

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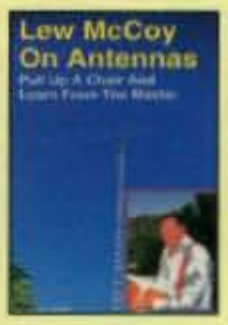

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2010 WPX SSB RESULTS
SINGLE OPERATOR
NORTH AMERICA
United States

AJ1I	**A**	**8,734,012**	**2987 (OP: K8PO)**	**1022**
AK1W	*	2,520,478	1241 (OP: K5ZD)	698
K1HI	*	1,794,824	1295	628
W1BYH	*	794,313	690	403
N1BCL	*	698,400	632	400
K1AR	*	626,868	598	396
K1DG	*	596,712	527	376
WX7T/1	*	471,680	498 (OP: K1RM)	335
AD1DX	*	459,918	544	334
N1KON	*	458,280	546	342
KO1G	*	307,904	426	283
W1FM	*	250,120	387	260
WA1Z	*	171,521	298	229
WA1YZN	*	100,400	293	200
K1SEZ	*	53,544	159	138
KM1W	*	51,975	151 (OP: W1KM)	135
WA1OUI	*	30,302	120	109
W1WEF	*	19,400	102	97
N1ZN	*	18,942	88	77
N1SXL	*	4,140	48	45
K1VSJ	*	2,480	32	31
K1GQ	*	1,672	24	22
W3EP/1	**28**	**61,053**	**188**	**141**
KQ2M/1	**21**	**2,901,948**	**1571**	**772**
KK1KW	**14**	**1,714,300**	**1156**	**700**
WJ1R	**7**	**52,704**	**131**	**122**
K1UO	**3.7**	**2,161,782**	**1118**	**602**
NX1T	**1.8**	**1,827**	**33**	**29**
***KR5X/1**	**A**	**4,352,355**	**1952 (OP: K1BX)**	**861**
*NV1N	*	3,509,752	1710 (OP: N1UR)	788
*NE1H	*	536,190	525	366
*W1CCE	*	449,190	529	345
*KA1GEU	*	376,295	471	323
*WA1DRQ	*	271,616	418	256
*W1WBB	*	259,347	392	271
*W1TO	*	133,700	239	191
*KB1JUF	*	108,297	217	191
*NJ1H	*	101,200	231	176
*K1MVM	*	90,650	203	175
*K1VU	*	80,135	209	155
*KA1VMG	*	77,854	193	166
*W1FA	*	68,034	174	138
*KB1TOC	*	58,672	163	152
*W2JU/1	*	58,658	174	139
*KB1FRK	*	51,830	175	146
*W1BJ	*	51,435	155	135
*AA1O	*	48,620	166	130
*K1WCC	*	39,176	141	118
*KB1NHV	*	35,256	138	113
*K1PU	*	27,772	122	106
*K5GMT/1	*	27,359	120	109
*NJ1Q	*	27,195	133	105
*KK1W	*	26,950	111	98
*K1NPT	*	23,324	115	98
*W1GXZ	*	22,962	99	86
*W1OHM	*	22,700	115	100
*KA1C	*	21,032	98	88
*KG1V	*	18,920	98	86
*W1SKB	*	18,576	95	86
*N1NN	*	18,530	96	85
*K1QK	*	10,269	69	63
*K1YM	*	8,468	58	58
*KF1D	*	7,930	69	61
*WW1N	*	7,020	56	52
*N7FYO/1	*	6,048	56	54
*W1MJ	*	3,168	39	36
*W1SRB	*	2,760	45	40
*NX1Y	*	1,728	25	24
*W1PLM	*	1,220	20	20
*K1QED	*	77	7	7
***N1WRK**	**21**	**32,340**	**118**	**110**
***K1ALL**	**14**	**280**	**10**	**10**
***K1ZR**	**7**	**507,416**	**655**	**354**
*AB1JU	*	520	14	13
KM2O	**A**	**1,496,820**	**929**	**570**
NT2A	*	1,461,834	935	621
WK1Q/2	*	763,000	652 (OP: K2WR)	436
N2NC	*	429,693	456	319
NJ1F/2	*	284,900	388	259
K2BBQ	*	267,655	397	269
N2NT	*	253,696	381	256
K2NV	*	120,508	225	188
W2FUI	*	118,695	228	193
KG2V	*	67,425	192	145
KM2L	*	37,089	123	117
K2XA	*	22,673	85	79
KC2TFI	*	5,292	49	49
KV2X	*	3,120	40	39
W2BSN	*	56	5	4
W2RR	**28**	**19,908**	**96 (OP: WA2AOG)**	**79**
KA2BXH	21	585	15	15
WB2KLD	**14**	**47,214**	**137**	**129**
KD2RD	**7**	**2,093,750**	**1506**	**625**
WN2O	**3.7**	**314,004**	**404 (OP: N2GC)**	**274**
***K2DSL**	**A**	**553,125**	**661**	**375**
*WD8CQB/2	*	405,806	481	331
*K2SZ	*	373,230	441	330
*WA2JQK	*	353,690	431	313
*AB2IO	*	303,303	346	273
*N2YB8	*	289,710	394	270
*W2OSR	*	282,000	410	300
*AB2TC	*	272,430	373	270
*WA2MCR	*	163,936	310	218
*K9CHP/2	*	141,668	301	214
*N2MTG	*	119,121	279	177
*K2JMY	*	104,910	231	195
*NC2T	*	87,096	208	152
*K2QY	*	83,880	203	180
*KC2QJB	*	82,995	204	165
*W2VU	*	73,625	204	155
*WA2FBN	*	47,388	174	132
*WB2SXY	*	33,108	150	124
*WB2ZEX	*	28,119	107	91
*K2DEN	*	24,786	115	102
*WA2NLL	*	23,230	104	101
*WA2CG	*	15,326	89	79
*W2HIY	*	10,640	77	70
*KC2SNW	*	9,060	64	60
*W2HCB	*	7,695	60	57
*K2PAL	*	5,453	42	41
*WY1H/2	*	5,040	47	45
*KD2MU	*	4,601	44	43
*WA2PNI	*	4,462	47	46
*WB2RIS	*	3,864	45	42
*N4NYY/2	*	2,607	33	33
*KC2VUP	*	2,479	39	37
*K2AMP	*	990	22	22
*K2DL	*	459	17	17
*W2ARP	*	36	4	4
*KC2AWX	28	32	4	4
***AA2DS**	**21**	**37,080**	**130**	**120**
*KC2JRQ	*	1,200	24	24
***WA2ZSK**	**14**	**38,481**	**145**	**127**
*N3CHX	*	85,280	209	164
*WO3P	*	82,593	195	171
*KB3IWV	*	76,858	199	166
*W3LL	*	64,678	172	146
*NV3V	*	55,890	176	138
*K3FS	*	38,164	146	116
*N3XUD	*	37,422	160	126
*K3GMT	*	33,411	129	111
*WA3ERQ	*	31,692	119	114
*N3CR	*	29,735	109	95
*N3XPD	*	28,280	112	101
*NØMS8/3	*	24,304	121	98
*KC5GTS/3	*	20,169	98	83
*KB3EOJ	*	16,380	97	90
*K3GEN	*	16,132	90	74
*N3JNX	*	5,472	51	48
*W3EDP	*	5,292	59	54
*N8NA/3	*	2,852	33	31
*WZ3K	*	406	16	14
*KA3JOI	*	338	13	13
***AD3PA**	**28**	**7,854**	**56 (OP: N3JDQ)**	**51**
***WA2VQV/3**	**14**	**14,220**	**83**	**79**
*K3LAB	*	4,320	51	48
***WD3C**	**7**	**113,296**	**236**	**194**
K4SKB	*	31,860	128	108
K4YMQ	*	24,453	111	99
N3KKM/4	*	23,920	101	92
WB2VSJ/4	*	23,422	108	98
N4DJ	*	14,342	78	71
AF4DX	*	11,346	70	61
K4FW	*	4,576	46	44
W4JHU	*	2,625	36	35
KG4CUY	*	2,592	35	32
K5TVT/4	*	2,550	30	30
W4ATL	*	2,108	41	34
W4RVN	*	1,830	30	30
WN1GIV/4	**28**	**199,789**	**453 (OP: N4BP)**	**241**
N3UA/4	*	20,020	95	77
W4CYS	*	1,403	23	23
KY5R/4	**21**	**2,113,163**	**1335**	**689**
KV4T	*	1,296,126	1111	573
WB4SLM	*	280,135	398	313
W4PV	*	236,640	482	272
KI4VWJ	**14**	**272,291**	**496**	**277**
W4YKF	*	2,848	32	32
KU8E/4	**7**	**686,913**	**792**	**401**
KZ1A/4	*	90,825	310	173
AA4D	*	71,446	160	139
*KJ4KNW	*	49,206	188	139
*NW4V	*	46,440	142	129
*NØRZT/4	*	45,720	146	127
*K4YYD	*	42,350	146	121
*KJ4JEY	*	42,312	175	123
*N4DTF	*	42,130	134	110
*NY4D	*	41,005	144	139
*NN4DF	*	39,078	123	117
*K4GOP	*	37,884	148	123
*AA4KD	*	32,200	143	115
*KQ4Y	*	30,858	124	111
*WØVOM/4	*	30,552	151	114
*N4LKE	*	27,819	117	99
*AK4NC	*	22,116	110	97
*N4RTD	*	21,182	101	89
*KJ4GDW	*	20,424	108	92
*KA4TEU	*	19,598	99	82
*N4APR	*	19,264	89	86
*KJ4WD	*	19,200	97	80
*K4DMH	*	18,868	94	89
*KX4O	*	18,444	101	87
*KØRRP/4	*	16,236	85	82
*WA2EAJ/4	*	14,823	86	81
*W4BK	*	14,678	107	82
*WA4JA	*	14,544	76	72
*AJ4GL	*	13,320	82	74
*KD5AKC/4	*	10,080	65	63
*N4VAN	*	9,720	56	54
*KI4KFW	*	7,923	65	57
*K4RAY	*	7,644	55	52
*NN1L/4	*	7,564	65	62
*KO4OL	*	6,985	61	55
*KE4RQ	*	5,148	53	52
*K4KAY	*	4,437	57	51
*KT4OO	*	4,142	43	38
*K2EUH/4	*	4,080	35	30
*KF4IRC	*	3,936	46	41
*KI4HHK	*	3,325	40	35
*AI4G	*	2,665	46	41
*KC4RSL	*	2,627	41	37
*KI4EEY	*	1,664	33	32
*KI4ZDR	*	1,620	32	27
*K4GRE	*	1,612	32	31
*K4GDW	*	1,566	28	27
*KS4L	*	1,536	24	24
*KJ4IWX	*	861	21	21
*KY2E/4	*	666	19	18
*K9JG/4	*	663	17	17
*KI4UCJ	*	324	12	12
*W1BP/4	*	294	14	14
*KE4VEK	*	228	12	12
*K4GDB	*	4	2	2
***NA4W**	**28**	**206,257**	**389 (OP: K4WI)**	**239**
*K9OM/4	*	78,210	244	158
*W8SAI/4	*	11,020	69	58
*K3MAF/4	*	2,688	33	32
*KI4LTO	*	494	13	13
***W4UAL**	**21**	**205,824**	**388 (OP: K4CWW)**	**268**
*KM4HI	*	196,308	310	266
*NQ4K	*	21,168	112	98
*KV1P/4	*	14,025	80	75
*AJ4CU	*	8,732	61	59
***WB2TFM/4**	**14**	**160,446**	**295**	**242**
*KI4GIK	*	11,280	83	80
*N4MM	*	6,118	48	46
*WA2BKN/4	*	1,450	29	29
*K4MTX	*	126	9	9
*AJ4RI	*	104	9	8
***KG4W**	**7**	**599,060**	**777**	**389**
*N4NX	*	582,435	645	387
*KI3O/4	*	101,728	217	176
*KA8Q/4	*	72,136	157	142
*K4KDS	*	4,000	33	32
*K4YZ	*	2,618	34	34
***KU4BP**	**3.7**	**409,344**	**592**	**328**
***K4WI**	**1.8**	**20,544**	**152**	**96**
NR5M	**A**	**9,027,888**	**3654**	**1083**
N8OO/5	*	7,650,864	3221	1072
K5TR	*	6,050,630	3109	941
W5WZ	*	1,544,130	1497	602
K5ER	*	1,179,486	1144	506
AD5XD	*	1,023,350	1151	485
NK5O	*	879,980	1007	460
K5LAD	*	663,984	656	424
K5QEA	*	460,952	545	367
K5PI	*	430,881	772	363
AB5C	*	348,540	490	314
N7FF/5	*	317,775	474	285
N5VU	*	215,102	358	262
K5YM	*	148,392	310	229
AE5LQ	*	92,049	245	183
KX5RW	*	66,638	176	143
K7IA/5	*	37,177	141	113
K5EXX	*	6,477	55	51
NJ5DX	*	1,848	33 (OP: W5OV)	33
KU5B	**28**	**294,304**	**514**	**272**
W5MK	*	15,732	84	69
WK5T	**21**	**3,189,312**	**2143 (OP: N2IC)**	**784**
NO5K	*	606,112	817 (OP: W5ASP)	416
WA5ZUP	*	401,357	817	341
KZ5J	*	393,484	621	364
NA5TR	*	198,640	430	260
WD5K	**14**	**1,323,875**	**1177**	**623**
KZ5MM	**3.7**	**712,272**	**800 (OP: W5PR)**	**418**
W5WMU	*	530,100	650	372
K5RX	**1.8**	**36,252**	**163**	**114**
***AC5O**	**A**	**1,142,278**	**961**	**515**
*WA5SOG	*	270,215	406	289
*K5DHY	*	253,400	367	280
*AJ5C	*	209,969	372	257
*N5AW	*	191,675	277	205
*KE5LQ	*	174,192	348	228
*W5PUF	*	160,094	341	209
*WA5TRX	*	130,600	288	200
*WR1TX/5	*	120,972	317	204
*WA5ZKO	*	102,912	239	192
*N5THN	*	72,068	211	172
*W4WLF/5	*	58,756	195	148
*K7RB/5	*	56,980	208	148
*NE5D	*	56,682	178 (OP: K5RX)	134
*K5IID	*	53,108	192	142
*NK5G	*	52,128	195	144
*WA5RML	*	51,800	210	140
*N5RN	*	51,600	148	129
*K5STZ	*	38,913	145	119
*K5LBU	*	36,504	112	104
*KC2MBN	*	20,758	102	97
*K2HVE	*	8,052	66	61
*K2FY	*	6,215	57	55
*KC2FBV	*	3,731	43	41
*K2TV	*	855	19	19
***W2LP**	**7**	**25,752**	**92**	**87**
***N2AET**	**3.7**	**1,344**	**25**	**24**
WY3P	**A**	**12,504,474**	**3618 (OP: N3KS)**	**1179**
KC3R	*	11,092,200	3383 (OP: LZ4AX)	1112
K3ZO	*	7,682,096	2509	976
K3MD	*	2,186,330	1433	703
N1WR/3	*	2,006,320	1144	620
N3UM	*	1,376,204	846	538
KW3A	*	585,327	725	391
W2BZR/3	*	228,206	348	253
NA3F	*	146,510	328	230
K3RMB	*	92,543	213	179
4U1WB/3	*	14,691	104 (OP: AJ3M)	83
N3NZ	*	1,794	30	26
K3RWN	**21**	**30,552**	**139**	**114**
AD8J/3	**7**	**141,906**	**330**	**201**
AF3I	*	18,576	78	72
W3BGN	**3.7**	**1,650,060**	**977**	**534**
AA1K/3	*	2,520	40	36
W3GH	**1.8**	**30,591**	**147**	**99**
***KD3HN**	**A**	**648,576**	**594**	**384**
*KB3LIX	*	583,906	587	362
*KW3W	*	513,685	555	355
*ND3R	*	186,181	294	239
*WB3DOM	*	156,306	332	239
*WR3H	*	155,100	250	220
*NY3B	*	128,620	265	218
*KT3W	*	118,156	304 (OP: K1RY)	218
*W3DQN	*	108,000	217	200
*WA3EQJ	*	45,018	137	122
*AI3G	*	3,476	52	44
*KB3RKM	*	360	15	15
NXØX/4	**A**	**8,023,947**	**3077 (OP: N4PN)**	**1083**
WZ4F	*	3,229,096	1845 (OP: K4AB)	793
W82REM/4	*	1,544,400	1398	624
AB4GG	*	1,257,342	1069	571
W4KW	*	1,094,940	829	495
K2BQ/4	*	998,844	784	483
NJ2F/4	*	516,574	575	362
K4IE	*	497,673	533	363
K4JTT	*	281,358	517	294
K4CX	*	248,778	391	271
AI4WW	*	217,375	328	235
K4LQ	*	211,582	320	238
NE4M	*	197,496	337	234
AD4L	*	188,160	340	240
N4TL	*	151,656	283	213
KC4HW	*	134,442	258	198
K5KG/4	*	133,540	299	220
AE4EC	*	125,050	272	205
WY4Y	*	111,619	397 (OP: NS3Q)	211
NC4MI	*	103,592	220	184
W4MAY	*	101,280	211	160
W4TBB	*	92,496	197	164
WA4MAE	*	88,640	221	160
NV4A	*	84,624	188	164
KD4QMY	*	52,992	147	138
WD8RYC/4	*	47,880	134	133
AE4TE	*	47,376	157	141
AI4CJ	*	43,560	153	132
N6AR/4	*	39,816	93	79
KI4GGJ	*	38,875	133	125
KK9Q/4	*	33,335	123	113
KI4VCT	*	32,248	134	116
***KT4ZB**	**A**	**1,514,436**	**1119**	**596**
*N9CM/4	*	629,376	631	384
*W4YE	*	608,542	600	398
*WB4JFS	*	569,088	607	384
*KS4X	*	536,176	550	376
*NR3X/4	*	474,220	545 (OP: N4YDU)	362
*W4NBS	*	454,990	557	346
*W4SAR	*	442,000	532	340
*KK4RV	*	308,460	428	291
*N8MPX/4	*	256,424	393	266
*KD2JA/4	*	176,076	318	219
*N4PTC	*	174,492	344	222
*K4NAU	*	171,350	316	230
*KI4FIA	*	168,592	485	257
*N3TG/4	*	158,704	267	208
*WS9M/4	*	146,160	266	203
*KY4P	*	141,020	276	220
*W4TKI	*	139,965	306	217
*AB4G	*	139,520	283	218
*NG4L	*	125,200	262	200
*WI4T	*	111,720	242	190
*WA2UPK/4	*	90,480	209	174
*KF7CG/4	*	88,044	230	174
*K1SO/4	*	82,792	193	158
*NY4JB	*	78,489	226	153
*K4FTO	*	75,429	203	153
*AI4GR	*	68,847	223	159
*KJ4BIX	*	67,160	209	146
*KJ4KVC	*	64,680	217	168
*N4DE	*	58,740	167	132
*W4DAS	*	58,590	164	135
*W2OX/4	*	57,255	211	165
*AK4IK	*	56,541	192	141
*N4WJW	*	54,426	170	141
*AI4UN	*	53,582	211	146
*AJ4HZ	*	53,200	189	140
*KJ4ERZ	*	50,625	174	135

*AK5DX	*	32,860	153	106	NC6X/7	*	644,245	672	395	**KD8SQ**	**14**	**161,538**	**282**	**247**	WØYV	*	43,566	185	137	*VE3BVA	*	255,519	298	261
*NM5H	*	28,392	117	91	NR7DX	*	637,824	755	453	W8OHM	*	30,240	110	105	KBØL	*	5,194	55	53	*VE3RCN	*	205,110	303	215
			(OP: N5MT)					(OP: K7ABV)		**W8JMF**	**7**	**30,099**	**81**	**79**	NADBR	*	4,680	53	52	*VA3JWR	*	110,840	207	163
*AA5LA	*	12,040	83	70	W7PU	*	488,017	774	401	***W8TLI**	**A**	**1,205,298**	**851**	**522**	K8MCN/Ø	*	4,664	45	44	*VA3GD	*	75,300	179	150
*KI5F	*	7,552	69	64	AD7YT	*	472,632	804	376	*K8BL	*	461,153	564	371	KØPFZ	*	2,765	37	35	*VE3OM	*	63,140	165	140
*WA5RHG	*	7,203	52	49	WI7N	*	398,128	515	334	*NR8I	*	454,678	584	329	ABØYM	*	864	24	24	*VE3KKQ	*	31,710	115	105
*N5LTM	*	4,753	52	49	W7TSQ	*	370,818	466	327	*W8KNO	*	337,744	504	304	**KGØF**	**14**	**4,058,835**	**2228**	**935**	*VE3AJ	*	22,550	94	82
*K1JHS/5	*	3,680	46	46	KI7AO	*	339,586	354	353	*WT8E	*	311,535	489	315				(OP: WØUA)		***VA3WPV**	**28**	**8,466**	**58**	**51**
*KB5DRJ	*	1,829	36	31	NN7ZZ	*	335,524	596	322	*KB8OCP	*	296,460	425	270	K5VYT/Ø	*	115,577	232	209	***VE3RHD**	**14**	**102,627**	**210**	**189**
*AI5G	*	1,760	38	32				(OP: N5LZ)		*WS6K/8	*	281,688	451	291	WØPPF	*	32,469	148	137	*VA3GUY	*	50,141	146	133
*WM5R	*	858	28	26	AC7GP	*	332,304	435	322	*KB8UUZ	*	208,000	346	250	***KØCN**	**A**	**950,915**	**1024**	**505**	*VE3MCF	*	9,858	64	62
*W5RAW	*	760	21	19	NU7J	*	322,390	464	313	*N8OQQ	*	172,438	338	218	*NXØI	*	661,626	851	413	*VA3FN	*	336	12	12
*W4JHC/5	*	330	15	15	NG7Z	*	321,408	523	324	*WB8JUI	*	170,709	337	231	*WAØL	*	501,960	583	356	*VG3RJ	*	275	11	11
*WB5SGN	*	297	11	11	WG7X	*	261,370	522	295	*W8HMK	*	162,900	313	225	*AAØNK	*	401,984	505	352	***VE3IAE**	**7**	**36,312**	**98**	**89**
*AD5LU	*	253	13	11	KF7IQ	*	260,934	435	277	*W8GOC	*	151,368	300	212	*KØFX	*	376,092	372	372	***VE3EDY**	**1.8**	**49,068**	**142**	**94**
*AE5NO	*	160	10	10	NF7E	*	248,270	505	305	*W8TM	*	143,472	246	168	*WBØTSR	*	274,800	441	300					
***KD5J**	**28**	**8,619**	**59**	**51**	KE2VB/7	*	247,896	507	264	*N8DE	*	129,116	222	169	*WYØB	*	263,520	511	270	***VE4YU**	**A**	**84,545**	**200**	**155**
*KE5SNJ	*	243	9	9	KG7C	*	247,355	538	305	*KD8HHG	*	103,296	274	192	*KKØSO	*	167,760	354	233	*VE4RA	*	66,893	158	151
***N5DO**	**21**	**598,970**	**708**	**445**	KD7MSC	*	231,540	442	255	*KJ8O	*	100,902	284	201	*WAØL/M	*	139,725	300	225	**VE5FX**	**14**	**1,387,200**	**934**	**578**
*N5DTT	*	33,988	120	116	WR5G/7	*	201,676	378	254	*N8HP	*	98,604	218	198	*WØYJT	*	101,871	221	189	VE5ZC	*	1,377	28	27
*K3TD/5	*	28,997	127	107	KG7P	*	199,810	376	265	*N8JRL/8	*	87,039	227	171	*W7KU/Ø	*	98,208	262	176	***VE5ZX**	**A**	**592,264**	**561**	**404**
*NM5M	*	1,484	30	28	N6TW/7	*	194,034	301	219	*N2OPW/8	*	62,468	161	161	*KØLAF	*	81,950	215	149	*VE5BCS	*	44,608	151	136
***NN5Z**	**14**	**802,602**	**916**	**501**	K7UN	*	150,280	296	221	*W8DW	*	42,757	171	143	*KØSIX	*	73,616	217	172	*VA5LF	*	30,883	111	89
			(OP: K5PX)		W7CAR	*	120,224	321	208	*WJ8E	*	32,660	140	115	*KKØA	*	53,376	186	128	*VE5DLM	*	2,550	34	34
*AE5MM	*	48,216	166	147	K6PJ/7	*	107,198	235	182	*WC5B/8	*	32,568	154	118	*WØETT	*	52,852	167	146					
*K5KVN	*	324	12	12	N7NJO	*	100,425	212	195	*N3TOU/8	*	29,046	122	103	*NØGOS	*	52,850	207	151	**VA6UK**	**A**	**560,058**	**572**	**347**
					W7VJ	*	97,344	293	208	*NA8SA	*	23,275	119	95	*KØHNC	*	47,730	170	129	**VE6SF**	**14**	**698,400**	**683**	**450**
W6TK	**A**	**2,393,716**	**1654**	**676**	KN7K	*	89,094	264	186				(OP: AF8C)		*KCØJFY	*	42,636	163	132	***VE6DJT**	**A**	**77,280**	**212**	**140**
KC6X	*	1,625,472	1202	576	W7ABC	*	86,152	221	178	*W8ASA	*	21,620	120	94	*KDØCVZ	*	38,822	144	118	*VE6LE	*	50,344	144	124
WA6KHK	*	1,058,904	1018	504	AB7E	*	66,744	234	162	*W8IDM	*	18,343	99	83	*NØUY	*	36,400	125	112					
KE1B/6	*	506,196	705	387	K7DNH	*	45,260	150	124	*NF8M	*	17,424	107	88	*NØEOP	*	34,884	149	114	**VX7CC**	**A**	**8,397,108**	**2861**	**972**
K6TU	*	474,720	633	368	WA7LK	*	42,051	163	131	*NX8G	*	17,202	104	94	*AGØA	*	31,510	137	115				(OP: VE7CC)	
N6NF	*	326,922	620	309	N7LR	*	19,090	109	83	*KA8NJW	*	16,716	88	84	*AJØW	*	30,580	132	110	VA7ST	*	1,971,944	1162	566
K6LRN	*	322,452	445	318	WY7LL	*	18,060	99	86	*KB8UEY	*	12,264	88	73	*KØAIZ	*	29,274	109	102	VA7IR	*	630,763	767	359
WT6G	*	310,170	484	294	KK7CG	*	12,798	99	79	*KD8FDO	*	8,910	82	66	*NØGMT	*	22,155	133	105	VA7DZ	*	54,900	174	150
WT6TT	*	287,938	416	314	K7HPT	*	10,868	91	76	*W3GEG/8	*	7,434	67	59	*KC7CPM/Ø	*	19,236	105	84	VA7RN	*	29,561	118	103
			(OP: N6NZ)		KF7P	*	9,342	60	54	*KD8GRG	*	6,328	61	56	*WBØGAG	*	18,444	98	87	**VE7XF**	**21**	**640,683**	**758**	**389**
KT6YL	*	262,704	525	312	N6SS/7	*	6,578	47	46	*AE8U	*	5,618	54	53	*WØNFS	*	14,141	90	79	VA7JW	*	253,470	536	238
KJ6RA	*	221,925	354	269	AD7XZ	*	4,784	49	46	*KD8JAM	*	5,016	44	44	*ABØTO	*	10,570	77	70	***VA7BEC**	**A**	**1,094,930**	**986**	**446**
WA8ST	*	189,750	444	253	AD7HL	*	3,458	38	38	*AB8DF	*	4,050	53	45	*NØKK	*	9,145	67	59	*VX7BC	*	610,218	668	334
AD6KA	*	166,980	347	230	**K7HP**	**28**	**35,700**	**147**	**102**	*N8NX	*	3,034	39	37	*KBØUBZ	*	8,190	78	70				(OP: VE7BC)	
KI6QDH	*	164,640	355	224	K7XC	*	8,635	58	55	*N8RLG	*	1,975	26	25	*KCØUUT	*	4,840	50	44	*VA7CRZ	*	420,444	459	306
N5KO/6	*	132,310	259	202	**N7RO**	**21**	**1,207,810**	**1354**	**538**	*AF8C	*	1,953	39	31	*KBØNHW	*	2,886	43	37	*VE7AX	*	170,178	307	226
K6RJP	*	127,635	281	201	WZ7ZR	*	984,024	1136	519	*W8RID	*	720	20	20	*KD5JAG/Ø	*	2,812	40	38	*VE7YJ	*	61,908	178	132
WW6O	*	122,640	280	210				(OP: W7ZR)		*WB8LCD	*	442	13	13	*KIØF	*	2,625	36	35	*VE7BSM	*	646	18	17
K6KAL	*	106,191	284	207	KZ7X	*	313,938	672	321	*KB8BMR	*	117	9	9	*WØDHB	*	2,407	31	29	***VE7NS**	**21**	**59,360**	**170**	**140**
K6SGH	*	101,094	226	174				(OP: W7WW)		*W8IDW	*	35	5	5	*KCØGLA	*	2,079	35	33					
K6UD	*	100,419	286	179	WE7K	*	85,842	195	171	***KN8D**	**21**	**15,456**	**92**	**84**	*WØGUY	*	1,620	31	30	**VY1EI**	**14**	**700,128**	**743**	**416**
WT6K	*	60,632	218	143	K7ZD	*	22,656	110	96	*NT8K	*	3	1	1	*KDØION	*	988	26	26	VE8DW	*	62,486	163	157
W7CB/6	*	44,912	154	112	**W7WA**	**14**	**5,117,384**	**2488**	**1028**	***KC8YLD**	**14**	**111,987**	**223**	**207**	*KØLDS	*	798	19	19	***VE8GER**	**A**	**136,107**	**244**	**213**
NO6X	*	42,693	147	133	W6AEA/7	*	1,264,200	989	602	*N8WAV	*	2,496	33	32	*W7THY/Ø	*	792	27	24			**Cayman Islands**		
W6BT	*	34,917	150	103	W7UT	*	853,830	638	537	*KB8MYC	*	1,632	24	24	*KCØFUE	*	144	9	9	**ZF2AH**	**3.7**	**1,812,645**	**896**	**463**
K6III	*	34,299	147	111	N7GTW	*	34,404	137	122	*KD8GRO	*	180	10	10	***KCØRQH**	**21**	**6,713**	**56**	**49**			**Costa Rica**		
W6RKC	*	28,583	136	101	**K7WP**	**7**	**6,254**	**55**	**53**	***WW8OH**	**7**	**134,400**	**361**	**210**	*NØAX	*	6,435	65	55	***TI8II**	**A**	**1,654,960**	**1385**	**548**
AC6DX	*	23,760	117	90	***K7JE**	**A**	**613,054**	**692**	**442**				(OP: NR8U)		***KCØYHU**	**14**	**5,600**	**65**	**60**	*TE2M	*	205,758	467	213
KB6A	*	18,225	105	81	*W7FYW	*	319,370	449	293	*N8BV	*	56,032	167	136	*WASSWN/Ø	*	4,717	58	53				(OP: TI2KAC)	
W6ONV	*	14,760	88	82	*NQ7R	*	199,617	406	263						*KCØLFQ	*	99	10	9			**Cuba**		
WA6TLG	*	14,527	75	73	*WAØWWW/7	*	198,768	346	246	**WB9Z**	**A**	**9,505,685**	**3427**	**1085**	*KJØP	*	1	1	1	***CO7PH**	**A**	**855,104**	**775**	**431**
N6TCZ	*	12,462	79	67	*N7UR	*	189,728	362	242	W9OP	*	567,342	577	387	***NYØT**	**7**	**55,748**	**154**	**154**	*CM5FZ	*	140,264	268	178
KJ6CDF	*	11,232	79	72	*W7RV	*	175,791	299	231	N9WKW	*	282,296	413	284	*KBØEPY	*	16,468	130	92	***CM8WAL**	**28**	**7,290**	**57**	**45**
W6SX	*	5,356	61	52	*N7VM	*	173,038	347	241	ND9Z	*	182,250	333	243			**Alaska**			***CO8AW**	**21**	**39,552**	**160**	**128**
AF6NI	*	5,187	48	39	*K7AWB	*	162,624	370	231	NJ9Z	*	170,820	341	219	**AL1G**	**A**	**641,130**	**848**	**355**	***CO8CY**	**14**	**244,992**	**445**	**264**
KZ5OM/6	*	4,361	49	49	*W7KAM	*	132,220	297	220	K9JIG	*	109,265	253	205	***WL7BDO**	**A**	**168,090**	**327**	**195**			**Dominican Republic**		
			(OP: K6III)		*N7VS	*	121,790	270	190	K9WWT	*	97,000	293	194	*KL7R	*	35,640	130	99	**HI8PJP**	**28**	**26,576**	**112**	**88**
W6ELI	*	4,116	48	42	*NE7D	*	113,405	240	185	K9ZW	*	94,094	218	182	***KL1SF**	**14**	**2,905**	**40**	**35**	***HI3TEJ**	**A**	**8,832,675**	**2951**	**985**
NY6U	*	3,888	51	48	*WE6EZ/7	*	110,980	307	179	K9EN	*	72,478	174	167			**Barbados**			***HI3CC**	**14**	**774,219**	**841**	**421**
KN6OP	*	874	19	19	*N7QS	*	110,714	283	197	W9RE	*	45,000	133	120	**8P5A**	**A**	**24,245,732**	**6109**	**1358**	***HI3K**	**7**	**1,506,516**	**729**	**452**
W6AFA	**21**	**588,354**	**738**	**397**	*KE7XM	*	102,500	241	205	W3HDH/9	*	42,848	131	104				(OP: W2SC)		***HI3FVA**	**3.7**	**178,906**	**219**	**182**
N6AN	*	11,152	101	82	*KE7YF	*	101,520	273	188	K9OXL	*	42,316	160	142			**Bermuda**					**Greenland**		
K6HNZ	**14**	**1,010,218**	**1000**	**517**	*AA7DK	*	86,100	272	175	N9JZN	*	32,967	134	111	***VP9/K3TRM**	**A**	**415,702**	**531**	**322**	**OX2A**	**A**	**5,344,370**	**1947**	**830**
KT7F/6	*	12	4	3	*NF7T	*	66,893	236	151	NA9US	*	31,640	128	113									(OP: OX3KQ)	
***NX6T**	**A**	**1,623,725**	**1484**	**607**	*W7ASF	*	58,557	173	149	N9EP	*	24,104	108	92			**Canada**					**Haiti**		
			(OP: K6AM)		*NG7M	*	53,978	221	137	W9IL	*	19,598	84	82	**VO1KVT**	**A**	**1,490,016**	**879**	**544**	**HH4/K4QD**	**21**	**778,316**	**1060**	**361**
*AA6K	*	438,386	516	338	*WE7P	*	48,138	186	142	**KG9N**	**21**	**33,120**	**166**	**115**	VO2NS	*	597,370	584	410				(OP: K4QD)	
*K3FIV/6	*	307,190	480	278	*AD7MQ	*	47,799	216	141	**KK9A**	**14**	**6,245,664**	**2528**	**1032**	VE1MC	*	338,122	390	293			**Jamaica**		
*WN6K	*	286,650	591	315	*KY7K	*	37,375	179	125	K9DN	*	148,248	257	232	**VA1MM**	**7**	**68,742**	**160**	**114**	**6Y1X**	**A**	**121,638**	**269**	**194**
*WV6N	*	252,757	452	251	*W8BFX/7	*	32,775	154	115	KC9IL	*	10,465	67	65	***VX9HF**	**A**	**1,166,200**	**937**	**490**				(OP: KD8MJR)	
*K6RJ	*	215,110	405	245	*W7YVK	*	30,988	160	127	**K9CJ**	**7**	**227,661**	**393**	**259**				(OP: VE9HF)				**Martinique**		
*KE6SHL	*	173,092	398	218	*W3CP/7	*	29,561	115	103	KX9DX	*	129,744	357	212	*VO1DJT	*	439,890	458	330	**TO7A**	**A**	**18,065,686**	**4670**	**1301**
*N3RC/6	*	160,515	418	205	*K6UM/7	*	22,413	108	93	**WO9S**	**1.8**	**4,635**	**65**	**45**	*VO1TX	*	316,654	392	247				(OP: UT5UGR)	
*K6FI	*	152,292	345	222	*K7ACZ	*	17,700	87	75	***KG9G**	**A**	**560,790**	**739**	**402**	*VE1SQ	*	151,410	247	206	FM5AN	*	263,048	487	251
*K7XE/6	*	142,596	299	204	*AD7UP	*	16,725	82	75				(OP: NP2I)		***VE1ZA**	**14**	**1,193,486**	**965**	**523**			**Mexico**		
*AA6YX	*	125,628	360	228	*KJ4BQS/7	*	15,745	86	67	*K9JE	*	344,318	443	323	***VE1AOE**	**7**	**168,566**	**202**	**178**	**4B1KK**	**A**	**1,493,701**	**1179**	**541**
*N6AA	*	117,216	303	198	*W7JDE	*	15,744	105	82	*N9LYE	*	340,775	502	317	***VE9ZX**	**3.7**	**491,631**	**358**	**287**				(OP: XE1KK)	
*AC6E	*	86,697	249	171	*W7MTL	*	15,521	106	83	*K9QVB	*	244,160	320	320						XE2YOM	*	14,580	88	81
*N6ORB	*	80,688	243	164	*W7WOF	*	14,596	100	82	*W9VQ	*	99,502	207	178	**VE2DC**	**A**	**492,462**	**477**	**327**	**XE1L**	**21**	**3,686,553**	**2379**	**729**
*K6MEE	*	77,672	199	133	*KE7LOQ	*	12,870	81	78	*N5IE/9	*	62,640	195	144	VE2MAB	*	200,265	293	237	***XE1GZU**	**A**	**48,852**	**152**	**118**
*W6ZL	*	64,960	197	145	*KB1PWF/7	*	12,629	79	73	*KC9QQ	*	62,329	190	157				(OP: VA2UTC)		***XE3N**	**28**	**20,748**	**115**	**78**
*K9JM/6	*	57,132	194	138	*AD7XV	*	11,592	83	69	*WC9B	*	58,320	168	144	***VE2PZ**	**A**	**306,056**	**356**	**268**			**Panama**		
*KQ6X	*	44,649	197	121	*WA7SHP	*	10,850	84	62	*W9IKU	*	55,480	200	146	*VX2AWR	*	278,715	363	255	***HP3FTD**	**A**	**96,241**	**183**	**157**
*W6TAN	*	38,592	202	134	*KE7WVZ	*	9,455	66	61	*KC9LQS	*	42,900	161	130				(OP: VE2AWR)		***HP1RIS**	**28**	**110,124**	**283**	**171**
*W17F/6	*	36,630	150	110	*W7DRO	*	8,710	83	67	*K9GY	*	42,244	151	118	*VA2WDQ	*	38,872	128	113					
*W6FB	*	35,211	157	121	*KE7ZZO	*	8,094	81	71	*W9LW	*	39,325	168	121	*VE2EZD	*	32,277	99	87			**Puerto Rico**		
*NA6G	*	24,252	118	94	*KD7RUS	*	7,095	64	55	*W9CPI	*	32,368	133	112	*VE2ARR	*	19,760	81	76	**KP3Z**	**A**	**15,463,008**	**4563**	**1188**
*K6CSL	*	24,024	110	77	*KD7SWL	*	6,604	58	52	*WB9LRK	*	28,980	129	115	*VX2GLA	*	3,626	38	37				(OP: NP4Z)	
*N6DIT	*	20,680	118	94	*KG7WZ	*	5,684	67	58	*KB9YGD	*	26,355	122	105				(OP: VE2GLA)		KP4JRS	*	380,528	554	272
*WB6QJB	*	20,646	106	93	*KB7HDX	*	4,982	54	53	*WA9LEY	*	20,646	104	93	***VE2JMK**	**3.7**	**28,798**	**94**	**77**	***WP3GW**	**A**	**325,759**	**386**	**269**
*AA6EE	*	20,646	106	93	*K7CAT	*	4,500	49	45	*WR9Y	*	19,698	121	98						*NP3CW	*	131,165	317	185
*WB6BET	*	19,436	109	86	*W7GT	*	3,344	53	44	*NV9X	*	17,510	108	85	**VE3EJ**	**A**	**16,227,512**	**3855**	**1172**	*NP3HM	*	45,936	141	116
*KD6MMU	*	19,278	119	102	*KC7MIQ	*	2,440	47	40	*N9BT	*	16,617	106	87	VX3AT	*	14,733,220	3809	1156	*KP4JFR	*	19,040	92	80
*AG6MB	*	19,170	105	90	*N7NSL	*	2,376	41	36	*N9VPV	*	14,904	81	69				(OP: VE3AT)		***NP3SI**	**28**	**8,632**	**59**	**52**
*N6OPR	*	18,720	97	90	*N7AM	*	1,100	27	22	*K9TCD	*	12,545	68	65	VX3AP	*	11,478,720	3173	1087	***NP4G**	**14**	**435,485**	**547**	**347**
*AF6VQ	*	16,915	100	85	*W4LSC/7	*	250	10	10	*KC9TS	*	10,952	79	74				(OP: LU7DW)		*NP3QE	*	3,003	33	33
*N6VDR	*	16,576	92	74	*W7SUR	*	240	12	12	*KJ9B	*	8,532	66	54	VG3CCO	*	4,390,620	1710	845					
*K6ACJ	*	16,356	104	87	*WU9B/7	*	168	8	8	*N9IZ	*	6,890	59	53				(OP: VE3KZ)				**Sint Maarten**		
*K6BIR	*	14,014	100	77	***KG9JP/7**	**28**	**1,260**	**22**	**21**	*N9FN	*	4,601	47	43	VE3CR	*	2,514,113	1123	629	**PJ7MF**	**7**	**110,400**	**164**	**138**
*KS6M	*	12,420	76	69	***NX7TT**	**21**	**243,138**	**555**	**294**	*K9AIH	*	4,100	47	41	VE3RZ	*	1,452,540	819	516					
*W6NWF	*	11,120	95	80	*NS7B	*	29,945	131	113	*KC9DFU	*	3,504	53	48	VE3TA	*	686,448	520	378			**Turks & Caicos**		
*KI6WCI	*	9,380	77	67	*AE7DB	*	6,741	70	63	*KB9OBF	*	760	22	19	VE3KPP	*	115,761	243	141	***VP5BV**	**A**	**6,798,793**	**3158**	**911**
*NC6PT	*	6,450	61	50	*W7EEI	*	105	7	7	***N9TGR**	**21**	**141,484**	**341**	**217**	VE3FSJ	*	32,560	113	110				(OP: W5CW)	
*W6OR	*	4,715	45	41	***AD7J**	**14**	**452,648**	**509**	**418**	*KC9IRQ	*	34,048	122	112	VE3FTM	*	27,720	105	99			**U.S. Virgin Islands**		
*N5ET	*	3,724	42	38				(OP: W7FP)		*W9ILY	*	3,116	43	38	**VA3PC**	**28**	**13,926**	**75**	**66**	**WP2Z**	**A**	**8,095,620**	**3266**	**970**
*KY6LA	*	3,120	45	39	*WØPAN/7	*	27,709	149	121	***KC9EIG**	**14**	**3,822**	**45**	**42**	**VA3FP**	**21**	**55,440**	**159**	**140**				(OP: K8MJZ)	
*WA2OOB/6	*	2,550	36	30	*N7BK	*	24,990	112	102	*KE9YA	*	3,034	42	41	**VE3TAZ**	**14**	**33,790**	**113**	**109**	**KP2/K8CC**	**28**	**236,700**	**494**	**225**
*KG6YPH	*	2,380	36	34	*K6TUJ/7	*	4,536	61	54	*KD9MS	*	78	6	6	VA3TTU	*	7,200	51	50	**KP2TM**	**21**	**4,104,179**	**2128**	**821**
*WX6O	*	1,104	25	24	*KC7H	*	2,880	41	40	***K2AAW/9**	**7**	**265,375**	**488**	**275**	VE3JOG	*	3,456	37	36				(OP: K9TM)	
*AC6SL	*	864	24	24	*KE7PNF	*	144	12	12						**VX3OI**	**7**	**4,924,560**	**1707**	**680**					
*W6RGS	*	70	8	7	***WA7NWL**	**7**	**103,400**	**296**	**188**	**KØRH**	**A**	**2,884,864**	**1908**	**764**				(OP: VE3OI)				**AFRICA**		
***ND6S**	**28**	**7,661**	**57**	**47**	*WB7FJG	*	4,587	35	33	KCØMO	*	1,882,041	1345	651	VX3CX	*	4,704,245	1821	637					
*KE1BYL/6	*	3,811	40	37	***N4LS/7**	**3.7**	**20,097**	**112**	**87**				(OP: KØOU)					(OP: VE3CX)				**African Italy**		
***AE6YB**	**21**	**46,332**	**234**	**143**	***W6NF/7**	**1.8**	**5,148**	**69**	**52**	NØGZ	*	491,392	591	352										
*NU6C	*	16,368	100	88						KØVXU	*	474,770	514	394	**VE3CUI**	**1.8**	**360**	**10**	**10**	**IG9/I2ADN**	**28**	**113,324**	**262**	**164**
***K6UMO**	**14**	**1,551**	**33**	**33**	**N8BJQ**	**A**	**3,097,468**	**1632**	**748**	KØDEQ	*	333,814	500	347	***VE3DZ**	**A**	**1,974,378**	**1031**	**609**			**Canary Islands**		
*KG6YMN	*	6	2	2	WN8R	*	879,112	825	428	WØBH	*	263,024	616	272	*VA3SWG	*	1,645,644	944	546	**EA8CDI**	**A**	**516,339**	**460**	**309**
***WA6WPG**	**3.7**	**42,799**	**155**	**127**	K8FL	*	763,552	644	428	KV6O/Ø	*	205,410	454	246	*VX3JAQ	*	1,617,100	947	515	EA8BMG	*	414,932	390	292
					K8KY	*	666,000	679	400	NY1H/Ø	*	200,123	357	253				(OP: VE3JAQ)		**EA8MT**	**21**	**2,781,436**	**1475**	**644**
N7TT	**A**	**3,309,390**	**2624**	**765**	W8GG	*	299,624	385	268	WAØVPJ	*	200,047	365	251	*VE3MGY	*	1,377,143	954	439	**EA8LS**	**14**	**730,184**	**509**	**413**
WQ7X	*	1,596,540	1223	615	K8MEG	*	289,575	399	297	WKØP	*	176,436	411	261	*VE3AD	*	925,120	680	472	***EA8OM**	**A**	**1,280,769**	**824**	**497**
WS7X	*	1,327,088	1484	574	NF8J	*	158,700	332	230	NØOST	*	157,320	309	230	*VE3TW	*	852,845	673	413	*EA8CDP	*	686,154	643	357
K7EDX	*	816,040	882	460	K8DD	*	106,977	211	211	KØGAS	*	152,250	339	250	*VX3FH	*	632,544	552	352	*EC8AFM	*	217,022	276	221
KV7DX	*	757,809	1108	459	N8DSG	*	52,644	165	123	WWØAL	*	151,194	306	226				(OP: VE3FH)		*EA8BQM	*	132,460	234	179
			(OP: KN5H)		W8EI	*	9,512	64	58	WBØYYE	*	137,088	416	224	*VA3GKO	*	507,100	496	275					
N87V	*	706,236	945	458	K8KXN	*	3,510	39	39	KØAP	*	68,886	152	129	*VE3TU	*	504,464	509	328					
WA7LT	*	693,532	897	434	**KC8ZMN**	**21**	**40,656**	**138**	**121**	KØXTR	*	45,632	181	124	*VE3OX	*	480,180	482	318					

*EA8AJO	*	57,486	150	134
*EA8DG	*	46,492	135	118
*EA8/DJ9AF	*	5,412	51	41
Djibouti				
***J28AA**	**A**	**91,200**	**193**	**152**
			(OP: E70A)	
Morocco				
CN2R	**A**	**27,059,084**	**5119**	**1373**
***CN2BC**	**A**	**4,416,000**	**1923**	**750**
			(OP: DL7BC)	
*5C2P	*	1,197,004	833	493
			(OP: IK2PZC)	
***5C5W**	**21**	**2,008,305**	**1165**	**585**
			(OP: CN8KD)	
Namibia				
***V55X**	**A**	**1,758,174**	**1069**	**561**
			(OP: V51YJ)	
Nigeria				
5N7M	**A**	**2,048,676**	**1151**	**609**
Reunion				
***FR/F4EGZ**	**A**	**538,272**	**570**	**336**
Senegal				
6W1SJ	**21**	**7,186,869**	**2523**	**963**
			(OP: E78A)	
***6W2SC**	**21**	**4,377,510**	**1779**	**837**
South Africa				
ZS6BRZ	**A**	**1,475,760**	**1013**	**520**
ZS2EC/3	*	6,600	52	50
ZS9Z	**21**	**1,110,938**	**836**	**454**
			(OP: ZS10IN)	
***ZS2I**	**A**	**306,152**	**367**	**284**
*ZS4JAN	*	103,797	216	171
*ZS2NF	*	99,680	196	160
*ZS1IL	*	41,796	132	108
*ZS1JY	*	6,660	48	45
***ZS6QDW**	**28**	**113,274**	**230**	**174**
***ZS6ELI**	**21**	**4,095**	**40**	**39**
Sudan				
ST2AR	**A**	**15,353,520**	**4233**	**1110**
			(OP: S53R)	

ASIA

Armenia				
EK3SA	**21**	**2,637,050**	**1497**	**650**
***EK3GM**	**14**	**30,906**	**105**	**102**
Asiatic Russia				
UA9QA	**A**	**3,036,132**	**1463**	**612**
UA9JDP	*	2,948,514	1392	633
RU9CK	*	2,435,335	1347	595
RA9AAA	*	1,788,486	1077	582
UA9XL	*	1,607,265	967	495
UA9TF	*	680,028	629	366
RX9KD	*	376,505	496	293
UA9CDV	*	371,645	463	311
UA9MD	*	253,291	342	241
UA9UPG	*	208,488	330	238
RV9WP	*	160,425	270	225
RG9A	*	132,502	236	194
			(OP: UA9AM)	
RA9JBA	*	122,615	251	179
UA9XHT/9	*	114,918	259	179
RX9FW	*	89,956	202	172
RX9LW	*	81,367	181	143
UA9MC	*	28,885	201	109
RZ9OW	*	27,714	121	93
RA9OR	*	25,284	95	84
RW9WW	*	13,845	69	65
UA9UR	**28**	**147,260**	**318**	**199**
RZ9UI	*	135,401	296	203
RA9AE	**21**	**1,355,046**	**940**	**539**
UA9FGJ	*	1,074,964	805	484
RA9CB	*	895,413	759	437
RZ9YF	*	566,262	585	386
RN9CWJ	*	185,724	320	201
			(OP: UA9CLB)	
UA9AB	*	139,000	271	200
RK9DM	**14**	**1,338,975**	**907**	**541**
RW9JE	*	461,719	517	361
RV9LM	*	186,874	294	223
UA9QQ	**7**	**370,080**	**294**	**240**
***RV9AZ**	**A**	**1,795,640**	**1060**	**530**
*RX9FR	*	681,414	556	337
*RX9CCJ	*	535,017	526	349
*RA9YAI	*	381,640	441	290
*RA9SC	*	268,800	379	280
*RZ9OQ	*	225,147	274	251
*UA9SAW	*	141,655	269	205
*RU9UN	*	119,757	227	209
*RX9DJ	*	99,186	233	183
*RW9RW	*	76,692	190	154
*UA9AX	*	61,612	168	146
*UA9ODE	*	52,440	145	138
*RZ9HA	*	47,302	155	134
*UA9UDR	*	31,428	119	108
*RU9UG	*	30,492	108	99
*UA9CBM	*	24,140	97	85
*RV9MA	*	3,696	46	42
*RK9QWZ	*	21	3	3
			(OP: RW9QA)	
***RA9FEL**	**21**	**802,644**	**685**	**422**
*RA9MC	*	234,640	346	280
*UA9WZ	*	211,400	331	280
*UB8XAB	*	98,832	216	174
*RW9DX	*	92,628	221	166
*RW9RA	*	34,989	126	109
*UA9QF	*	2,432	32	32
***RA9XU**	**14**	**414,534**	**462**	**354**
*UA9OMT	*	318,896	407	304
*UA9UNG	*	150,500	271	215
*RA9AP	*	126,429	242	201
*RA9HL	*	81,770	181	170
***RA9CNB**	**7**	**884**	**13**	**13**
RW0CN	**A**	**4,232,592**	**1960**	**819**
RU0AW	*	3,206,775	1506	759
UA0SR	*	1,603,608	1067	613
UA0DC	*	1,320,564	995	474
RW0UM	*	721,190	843	410
RA0AA	*	565,616	618	368
UA0IBX	*	459,940	685	305
UA0ANW	*	340,828	382	278
RW0UU	*	126,900	247	188
RW0LT	*	87,711	191	169
RD0C	*	74,351	196	149
			(OP: UA0CA)	
RU0LL	*	68,228	179	148
RX0AO	*	24,500	103	98
RW0CR	*	1,541	23	23
UA0WL	**28**	**55,430**	**184**	**115**
RW0CF	**21**	**415,679**	**476**	**341**
RA0QQ	**14**	**683,116**	**634**	**434**
RZ0SR	*	391,360	485	320
RK0UT	*	8,427	56	53
RA0BA	**3.7**	**6,864**	**43**	**39**
***UA0SJ**	**A**	**1,443,010**	**980**	**565**
*UA0IT	*	759,780	638	405
*UA0CNX	*	358,269	548	307
*RV0AL	*	95,760	218	171
*RA0AY	*	93,840	222	170
*RZ0S8	*	59,276	190	146
*RA0LE	*	52,116	161	129
*RA0WHE	*	22,659	98	83
*RZ0AO	*	16,119	90	81
*RZ0SW	*	4,646	57	46
*UA0ZC	*	70	6	5
***UA0OD**	**28**	**3,570**	**53**	**42**
***RA0ACM**	**14**	**190,662**	**298**	**258**
*RW0BM	*	156,110	258	233
*RW0CV	*	43,160	153	130
*RV0CD	*	19,201	98	91
Azerbaijan				
***4J7WMF**	**A**	**1,479,506**	**914**	**434**
*4K9W	*	154,126	268	202
Bahrain				
A92GR	**A**	**426,192**	**468**	**312**
Bangladesh				
S21RC	**A**	**7,685**	**66**	**53**
China				
BD1HW	**A**	**359,964**	**536**	**324**
BA1RB	*	20,424	107	92
BD4XX	*	16,832	82	64
BA7CK	**14**	**84,500**	**336**	**169**
BH1BCV	*	8,601	73	61
BD3EO/1	*	6,519	69	53
***BD1TCC**	**A**	**703,664**	**824**	**398**
*BD5BAJ	*	299,356	483	268
*BA1SN	*	216,176	416	236
*BD5HST	*	130,248	296	201
*BA5HAM	*	108,225	275	185
*BG4MCG	*	85,680	240	170
*BD2SH/7	*	69,768	279	153
*BD4TR	*	57,936	188	142
*BD7RDC	*	46,355	197	127
*BG4MR	*	43,776	148	128
*BH7MLY	*	41,595	191	141
*BG6AHU	*	41,019	182	113
*BG4TWS	*	34,153	165	119
*BD4JZY	*	33,060	142	114
*BH7MLZ	*	29,768	181	122
*BD4KYA	*	27,126	142	99
*BG1QEX	*	16,692	117	78
*BH4RDU	*	8,758	89	58
*BG5HSC	*	8,540	87	61
*BD5CGO	*	6,885	70	51
*BG4KLA	*	5,586	55	49
*BH1LEJ	*	3,663	42	37
*BH4RDB	*	3,402	50	42
*BA4SCP	*	2,870	47	41
*BG5CIC	*	2,730	49	42
*BH4SCF	*	2,244	37	33
*BG4LJW	*	1,972	40	34
*BG8GGT	*	1,664	36	32
*BH4RCI	*	1,140	33	30
*BG6ICL	*	1,008	25	24
*BG6IYS	*	779	19	19
*BG4KRB	*	666	23	18
*BH1IIA	*	442	20	17
*BG6KAD	*	440	24	22
*BG4LKZ	*	300	15	15
*BG5DOD	*	153	9	9
*BG5DLV	*	136	8	8
*BG5DML	*	110	10	10
*BD3OKK	*	84	7	7
*BG5DMO	*	70	7	7
*BG6QHV	*	56	7	7
*BG5HYM	*	50	5	5
*BG5DMN	*	44	4	4
*BG6QJG	*	40	8	8
***BG7IBS**	**28**	**62,208**	**313**	**144**
*BA5DX	*	14,982	105	66
*BG5FFK	*	4,752	53	44
***BG7IEU**	**21**	**76,464**	**243**	**177**
*BH7LMD	*	62,266	211	163
*BG6JEQ	*	46,800	175	144
*BD7KQT	*	44,936	182	137
*BD7LDM	*	16,434	99	83
*BG6JJX	*	10,950	92	75
*BA4IO	*	9,324	66	63
*BG7ANX	*	4,872	48	42
*BH1IIJ	*	4,320	52	48
*BD4EXL	*	1,643	33	31
*BD5CFY	*	319	11	11
*BH1HSX	*	4	2	2
***BD4WZH**	**14**	**60,060**	**201**	**154**
*BG6JNB	*	13,680	88	80
*BD3PCH	*	8,804	88	71
*BG6JIC	*	234	13	13
***BD1ISI**	**7**	**50,283**	**207**	**111**
Cyprus				
P33P	**A**	**82,460**	**151**	**133**
			(OP: 5B4ZN)	
5B/US8ITL	**21**	**4,503,492**	**2204**	**777**
			(OP: RX9TL)	
P33W	**14**	**8,004,130**	**2751**	**1030**
			(OP: RA3AUU)	
5B/KC2TIZ	**7**	**6,761,872**	**1580**	**754**
			(OP: RW4WR)	
H2T	**3.7**	**3,067,296**	**993**	**534**
			(OP: 5B4XF)	
C4M	**1.8**	**190,176**	**205**	**168**
			(OP: 5B4AGM)	
***C4Z**	**21**	**86,152**	**199**	**178**
			(OP: 5B4AIZ)	
Hong Kong				
VR2YYW	**A**	**1,772,931**	**1358**	**557**
VR2XMT	*	191,142	494	246
VR2PW	**28**	**656**	**22**	**16**
*VR2PX	3.7	6	2	2
India				
***VU2RCT**	**A**	**3,663**	**40**	**37**
***VU2ORO**	**21**	**12,627**	**70**	**69**
***VU3USJ**	**14**	**46,992**	**144**	**132**
***VU3DJQ**	**7**	**54,252**	**109**	**99**
Israel				
4X8A	**28**	**58,240**	**177**	**112**
			(OP: 4X1VF)	
***4Z5PJ**	**A**	**42,350**	**132**	**121**
*4Z5TZ	*	1,628	23	22
***4Z5QQ**	**21**	**86,022**	**198**	**162**
Japan				
JM1UTT	**A**	**846,945**	**740**	**435**
JF1SEK	*	790,482	728	406
JH1HIC	*	187,196	330	212
7J1ABD	*	46,343	158	121
JO1SIM	*	32,448	154	96
JA1IXY	*	19,968	76	64
JA1MJN	*	12,483	84	73
JO1NLN	*	612	18	17
JS1OYN	**28**	**15,610**	**112**	**70**
JN1NDY	**21**	**1,174,380**	**898**	**529**
JA1LZR	*	837,935	732	445
JH1ACA	*	585,861	602	401
JR1NHD	*	29,458	110	103
JH1APK	**3.7**	**560**	**10**	**10**
***JJ1VRO**	**A**	**1,167,256**	**830**	**472**
*JM1LRQ	*	395,945	538	313
*JA1GLE	*	208,896	350	204
*JA1BJI	*	179,990	315	205
*JA1FRQ	*	126,162	264	163
*JA1PJS	*	97,495	229	155
*JE1REU	*	67,326	198	147
*JA1CP	*	65,920	206	128
*JA1EMQ	*	56,511	175	117
*JA1AZR	*	45,084	171	102
*JK1NSR	*	43,344	167	112
*JG1WNO	*	41,184	127	96
*JA1BPN	*	39,528	147	108
*JA1KK	*	33,229	138	101
*JA1VGV	*	23,115	115	67
*JH1FNU	*	22,113	91	81
*JA1TBX	*	16,880	89	80
*JA1KEV	*	13,398	88	77
*JA1LBZ	*	8,800	59	50
*JI1UCL	*	4,554	58	46
*7N4CPT	*	4,340	42	35
*JR1AHP	*	1,584	23	22
*JI1FGG	*	1,577	21	19
*JA1BFN	*	1,056	22	22
*JA1LPQ	*	697	19	17
*JR1MRG	*	468	15	13
*JM1DSC	*	390	16	15
*JQ1KRT	*	230	10	10
*JI1DSU	*	180	10	10
*JI1UDD	*	160	8	8
*JN1DNV	*	55	5	5
***JN1IZR**	**28**	**20,016**	**138**	**72**
*7N2UQC	*	5,016	58	44
*JP1IXV	*	1,220	24	20
*JF1WQC	*	1,121	23	19
*JN1BBO	*	189	9	9
***JA1RYC**	**21**	**29,700**	**123**	**108**
*7K1PTO	*	17,415	95	81
*JA1RQT	*	16,068	80	78
*JF1GZZ	*	11,690	73	70
*JA1JLP	*	11,628	79	66
*JF1PYJ	*	8,160	65	60
*JK1BII	*	6,150	53	50
*JA1DBG	*	6,136	52	52
*JL7FBV/1	*	4,066	49	38
*JO1GRR	*	1,647	27	27
*JI1LAI	*	1,612	26	26
*JF1HJX	*	210	10	10
*JO1KVS	*	108	6	6
*7K1EQG	*	64	8	8
***JF1TEU**	**14**	**25,542**	**109**	**99**
*JI1FDF	*	25,536	107	96
*JG1GCO	*	2,074	35	34
***JA1XMS**	**7**	**286,230**	**275**	**210**
*JE1LDU	*	2,058	22	21
*JJ4NZO/1	*	1,054	17	17
*JH1RDU	*	216	6	6
***JE1SPY**	**3.7**	**780**	**15**	**15**
JF2QNM	**A**	**1,321,173**	**963**	**469**
JA2VHO	*	357,220	435	265
JR2PMT	*	330,328	391	263
JA2BNN	*	329,807	466	271
JR2ECF	*	192,647	324	203
JJ2CJB	*	169,644	291	211
JA2FSM	**14**	**2,706**	**34**	**33**
***JA2CUS**	**A**	**396,474**	**484**	**299**
*JA2PFO	*	200,560	347	218
*JA2KPW	*	49,720	161	110
*JA2GHP	*	39,710	148	110
*JQ2OUL	*	19,314	113	74
***JA2VSU**	**21**	**15,405**	**84**	**79**
*JR2AAN/2	*	7,452	57	54
*JP2MRD	*	6,480	58	54
*JF2OHQ	*	1,100	23	20
*JF2FKJ	*	135	9	9
***JG2KKG**	**14**	**286,650**	**380**	**294**
***JA2GTW**	**7**	**34,104**	**87**	**84**
JR3NZC	**A**	**356,316**	**438**	**276**
JN3SAC	*	130,500	275	174
JA3ETD	*	99,624	232	168
JR3UIC	*	34,316	119	92
JA3YBK	**21**	**3,585,896**	**1732**	**776**
			(OP: JS1PWV)	
JH3GCN	**7**	**133,036**	**175**	**158**
***JA3UWB**	**A**	**90,324**	**235**	**156**
*JK3GWT	*	59,409	161	123
*JM3PLL	*	57,072	169	123
*JA5UBW/3	*	44,574	174	114
*JS3EOE	*	14,272	92	64
*JR3NDM	*	3,360	53	35
*JG3EVM	*	3,168	43	36
*JR3SZZ/3	*	2,210	28	26
*JI3OGI	*	1,311	23	23
***JO3RCK**	**28**	**850**	**17**	**17**
***JR3RIY**	**21**	**75**	**5**	**5**
*JF3BFS	*	482,165	501	365
*JF3IYW	*	404,499	487	327
*JA3BBG	*	102,836	235	188
*JO3PSJ/3	*	33,060	127	116
*JI3FSI	*	32,760	139	117
*JR3KAH	*	28,764	121	102
*JA3PYH	*	7,344	69	51
*7L3ETZ/3	*	4,040	45	40
*JN3CSF	*	2,580	36	30
***JA3DAY**	**14**	**1**	**1**	**1**
***JL3MCM**	**7**	**15,111**	**80**	**73**
***JF3LOP**	**3.7**	**19,734**	**73**	**66**
JH4UYB	**A**	**3,330**	**32**	**30**
JA4NQD	*	6,909,195	2236	885
JM4WUZ	**21**	**64,588**	**207**	**134**
***JR4VEV**	**A**	**11,392**	**72**	**64**
*JE4MHL	*	301,644	461	266
*JR4PDP	*	123,120	265	180
		55,998	184	122
***JI4UEN/4**	**21**	**12,696**	**74**	**69**
*JA4CBX	*	3,822	46	39
***JR4GPA**	**14**	**161,364**	**283**	**238**
*JR4FLW	*	32,648	119	106
*JJ4CDW/4	*	4,746	47	42
***JR4URW**	**7**	**25,677**	**93**	**81**
JA5SUD	**A**	**188,044**	**307**	**212**
***JA5FBZ**	**A**	**18,340**	**80**	**70**
*JA5ND	21	3	1	1
JH6QFJ	**A**	**326,306**	**410**	**277**
JA6BWH	*	169,065	277	195
JE6HUR	*	24,024	109	84
JA6WJL	**28**	**68,715**	**235**	**135**
***JQ1AHZ/6**	**A**	**19,890**	**102**	**85**
***JA6WFM**	**21**	**258,509**	**380**	**269**
JA7BME	**A**	**1,404,830**	**912**	**490**
JA7COI	*	695,976	657	376
JH7DUM	*	1,342	26	22
JA7JH	**28**	**3,838**	**47**	**38**
JH7XMO	**14**	**1,343,760**	**966**	**528**
JA7BJS	*	325,594	440	263
***JG7PSJ**	**21**	**63,210**	**183**	**147**
JR8OXT	**A**	**626,470**	**554**	**395**
JA8ECS	*	605,364	569	366
JA8DIV	*	103,252	204	166
JH8SIT	**14**	**49,911**	**143**	**131**
JA8MXC	**7**	**192**	**6**	**6**
***JA8IJI**	**A**	**43,750**	**151**	**125**
*JI8BUR	14	27	3	3
JR9GMS	**A**	**10,773**	**65**	**63**
JA9CCG	**21**	**40,750**	**134**	**125**
***JA9TQY**	**A**	**113,405**	**248**	**185**
*JA9EJG	*	7,007	54	49
***JA9RDT**	**28**	**78**	**6**	**6**
***JE9MBV/9**	**21**	**13,706**	**90**	**77**
***JH9URT**	**7**	**96,740**	**180**	**140**
JH0NOS	**A**	**45,154**	**154**	**107**
JA0JHA	**7**	**5,204,060**	**1419**	**709**
***JA0NFP**	**A**	**29,280**	**103**	**80**
*JA0AVS	28	40	4	4
***JA0UPW**	**21**	**14,630**	**86**	**77**
***JH0EPI**	**14**	**69,003**	**182**	**153**
***JJ0HEN**	**7**	**14,036**	**65**	**58**
*JH0ZSM	*	1	1	1
Jordan				
***JY5CC**	**A**	**5,322,240**	**2006**	**768**
Kazakhstan				
UN9L	**A**	**3,075,599**	**1402**	**687**
UN2E	*	1,653,774	997	606
UN7QF	*	126,485	251	205
UN7FDP	*	42,250	140	125
UN8GV	**21**	**1,675,678**	**1224**	**610**
UP2L	**14**	**6,576,539**	**2403**	**993**
			(OP: UN9LG)	
UN7PL	*	1,261,458	870	506
UP6P	*	651,594	616	393
UN6GD	*	94,336	227	176
UN9GD	*	1,342	22	22
***UN6G**	**A**	**691,336**	**702**	**412**
*UN7GB	*	10,824	72	66
***UN4PG**	**21**	**444,705**	**533**	**345**
*UO6P	*	218,376	361	216
			(OP: UN7PBY)	
*UN7TW	*	850	17	17
***UN9PQ**	**14**	**168,012**	**279**	**234**
*UN7RL	*	162,132	281	229
*UN9LU	*	117	9	9
Kuwait				
9K2K	**14**	**2,678,592**	**1408**	**672**
Kyrgyzstan				
EX2X	**A**	**1,611,936**	**1093**	**579**
EX8MAT	*	991,859	715	407
***EX8MMM**	**A**	**24,929**	**112**	**97**
Lebanon				
***OD5WPX**	**A**	**3,463,658**	**1474**	**626**
			(OP: OD5NJ)	
Macau				
***XX9LT**	**A**	**198,531**	**430**	**243**
***XX9AU**	**21**	**5,150**	**69**	**50**
***XX9ET**	**14**	**1,032**	**27**	**24**
Ogasawara				
***JD1BIA**	**A**	**2,480**	**32**	**31**
Qatar				
A71EM	**A**	**1,364,574**	**951**	**467**
A71EL	**28**	**138,336**	**286**	**176**
A71CV	**21**	**4,289,264**	**1902**	**784**
***A71FJ**	**A**	**80,475**	**192**	**145**
Saudi Arabia				
***HZ1PS**	**A**	**673,360**	**579**	**380**
***7Z1SJ**	**21**	**209,496**	**341**	**232**
*7Z1HL	*	109,725	220	175
Singapore				
9V1YC	**A**	**2,236,080**	**1393**	**616**
South Korea				
DS5DNO	**A**	**6,116**	**49**	**44**
DS5QLJ	*	3,895	48	41
HL1/WX8C	**14**	**8,064**	**70**	**63**
***DS5DYM**	**A**	**36,960**	**129**	**105**
*HL5YI	*	1,377	29	27
***HL2/KF6RCP**	**21**	**22,204**	**106**	**91**
***DS5TOS**	**7**	**5,390**	**35**	**35**
Taiwan				
BX5AA	**21**	**2,402,801**	**1532**	**709**
***BV4VQ**	**A**	**21,576**	**137**	**93**
***BU2AE**	**21**	**81,540**	**248**	**180**
Tajikistan				
***EY8CC**	**A**	**546,208**	**586**	**338**
***EY7BA**	**21**	**90,472**	**234**	**172**
*EY8BJ	*	20,292	99	89
*EY8BG	*	9,240	63	56
*EY8BI	*	8,910	63	54
Thailand				
HS8ZCW	**A**	**1,600,356**	**1228**	**579**
***HS8ZCX**	**A**	**456,912**	**562**	**334**
***E20WXA**	**28**	**94,162**	**348**	**178**
*HS8JYX	*	990	27	22
***E20YLM/4**	**21**	**80,640**	**285**	**180**
Turkey				
TA2DS	**A**	**1,838,832**	**1025**	**464**
***TA4AU**	**21**	**36,358**	**134**	**106**
***TA7EB**	**14**	**31,185**	**109**	**99**
*TC20100CCI	*	5,203	44	43
			(OP: TA0U)	
*TA2JN	*	133	7	7
***TC2010CCE**	**7**	**24,750**	**69**	**66**
			(OP: TA1HZ)	
***TC2T**	**3.7**	**280,194**	**246**	**201**
UK Bases on Cyprus				
***ZC4LI**	**21**	**194,412**	**328**	**204**
Uzbekistan				
***UK8FAI**	**A**	**43,531**	**128**	**101**
***UK7F**	**21**	**567,644**	**605**	**388**
Vietnam				
***XV4TUJ**	**21**	**900**	**21**	**20**
West Malaysia				
9M2NNM	**A**	**556,006**	**675**	**398**
***9M2TO**	**A**	**353,100**	**511**	**321**
*9W2ESM	28	60	7	6
***9M2DRL**	**21**	**10,804**	**99**	**74**

EUROPE

Aland Islands				
OG0Z	**21**	**594,980**	**648**	**419**
			(OP: OH9MM)	
OH0Z	**14**	**812,520**	**900**	**488**
Andorra				
***C31CT**	**14**	**72**	**9**	**9**
Austria				
OE6MDF	**A**	**1,324,203**	**981**	**573**
OE8SKQ	*	497,251	563	347
OE2UJL	*	41,292	148	124
***OE6HLF**	**A**	**394,830**	**515**	**369**
*OE2XWL	*	112,736	249	208
			(OP: OE2UKL)	
*OE5VCO	*	2,304	37	36
***OE3DMA**	**21**	**17,253**	**91**	**71**
***OE2UKL**	**7**	**114,536**	**239**	**206**
Azores				
CR2T	**21**	**1,852,032**	**1578**	**728**
			(OP: CU2AF)	
***CU6AY**	**A**	**321,724**	**438**	**299**
*CR1Z	*	27,679	104	89
			(OP: SP5UAF)	
***CR1M**	**21**	**38,759**	**130**	**113**
***CT8/SP5ES**	**14**	**690**	**16**	**15**
Balearic Islands				
***EA6OM**	**28**	**4,758**	**42**	**39**
***EE6E**	**21**	**248,670**	**469**	**307**
			(OP: EA6DD)	
Belarus				
EW5A	**A**	**3,450,536**	**1873**	**856**
			(OP: EW2AA)	
EW8DD	*	1,283,604	1180	586
EW4MM	*	1,131,032	979	532
EW8DX	*	922,308	1037	509
EW4AA	*	748,960	698	496
EW7BR	*	98,959	219	211
EW3LN	*	26,924	124	106
EW2EO	**21**	**25,025**	**108**	**91**
EW6GF	**14**	**431,139**	**746**	**411**
EW8DJ	3.7	924	23	21
***EW1IP**	**A**	**726,077**	**760**	**443**
*EU6AA	*	276,379	496	313
*EU4AA	*	196,348	344	257
*EU2MM	*	127,612	332	244
*EW4PA	*	13,026	82	78
*EW4DX	*	3,698	47	43
***EW1EA**	**21**	**46,569**	**145**	**129**
*EW6EW	*	39,840	164	120
*EU6AF	*	1,770	32	30
***EW6AF**	**14**	**59,109**	**218**	**183**
*EV6M	*	50,880	193	160
***EW2BX**	**3.7**	**140,360**	**298**	**220**
Belgium				
OS8A	**A**	**3,678,804**	**1938**	**828**
OQ7T	*	1,286,831	1086	553
OR0A	**21**	**262,080**	**378**	**288**
OP1A	**14**	**152,576**	**303**	**298**
***OO40**	**A**	**472,464**	**544**	**408**
			(OP: ON4APU)	
*OO7W	*	463,344	635	394
*OR6C	*	407,880	524	364
*ON3AR	*	201,856	372	277
*ON3ND	*	156,195	358	267
*ON6FC	*	123,692	259	214
*ON6WP	*	17,360	89	80
*OR3R	*	12,835	93	85
*OT7X	*	9,417	81	73
*ON5WL	*	7,168	59	56
*ON3MT	*	6,565	72	65
***ON3HVH**	**14**	**1,247**	**29**	**29**
***OR2A**	**3.7**	**32,754**	**121**	**103**
			(OP: ON7YX)	
Bosnia-Herzegovina				
E7DX	**A**	**16,114,191**	**4126**	**1227**
			(OP: E77DX)	
E7/S56AA	*	2,248,248	1535	678
E74A	**28**	**77,562**	**215**	**139**
E750	**21**	**1,232**	**22**	**22**
E71A	**3.7**	**3,501,450**	**1656**	**753**
E72MM	**1.8**	**16,575**	**96**	**85**
***E77R**	**A**	**148,288**	**305**	**236**
*E74KM	*	86,996	230	182
*E73MJ	*	60,424	198	166
*E73XL	*	48,688	176	136
***E74AA**	**14**	**231,616**	**532**	**329**
***E79D**	**7**	**70,416**	**163**	**144**
***E71GJK**	**1.8**	**156,720**	**318**	**240**
Bulgaria				
LZ1BJ	**A**	**1,447,823**	**1294**	**659**
LZ2JR	*	477,171	609	411
LZ1ZF	*	130,560	319	240
LZ3IW	*	30,328	153	136
LZ8A	**21**	**107,501**	**252**	**193**
***LZ2FQ

*LZ1EP	14	5,200	71	65
*LZ17BSK	7	28,194	133	111
*LZ1MC	*	2,016	29	28
Crete				
SV9CVY	21	1,825,691	1613	783
*SY9A	A	497,517	690	433
			(OP: SV9COL)	
*SV9GPV	28	117,450	273	174
*SV9DJO	21	687,000	1049	500
Croatia				
9A3TA	A	300,144	403	296
9A1P	21	5,190,038	2166	953
			(OP: 9A1UN)	
9A8M	14	448,921	615	407
			(OP: 9A8DX)	
9A2EU	1.8	264,028	409	298
*9A6KTB	A	464,758	586	373
*9A7P	*	294,036	486	321
			(OP: 9A3BIM)	
*9A8A	*	101,291	235	199
*9A4VM	*	81,200	226	175
*9A3SM	*	45,870	165	139
*9A4WY	*	29,748	122	111
*9A7IUP	*	9,729	72	69
*9A4MF	*	4,326	43	42
*9A3IGY	*	36	5	4
*9A5ST	28	35,020	132	103
*9A1CFR	21	51,870	153	133
			(OP: 9A2NO)	
*9A3CWW	*	4,725	47	45
*9A4AA	14	36,031	159	137
*9A3AGS	7	174,517	285	233
*9A2GA	*	24,543	111	101
Czech Republic				
OK2SAR	A	457,368	631	354
OK6AB	*	311,508	400	306
OK2PCL	*	228,084	333	229
OK1DBE	*	211,475	367	275
OK8DD	*	191,232	335	249
OK1TFH	*	102,508	236	196
OK1FPS	21	713,912	685	383
OK2ABU	*	29,808	122	108
OK1GTH	14	1,544,832	1188	576
OK4AZ	*	23,836	141	118
OL3X	3.7	501,296	601	388
			(OP: OK1FC)	
*OK2BUT	A	579,180	615	394
*OK2WYK	*	312,939	496	319
*OK1MKU	*	283,824	404	292
*OK1CLD	*	269,280	405	288
*OK2SGY	*	268,974	450	293
*OK1HEH	*	258,426	438	294
*OK2BEN	*	219,605	359	263
*OK2BRX	*	211,500	379	282
*OK1MKI	*	151,032	328	248
*OK2KFK	*	138,866	301	218
*OK2KG	*	98,875	238	175
*OK2VX	*	56,885	201	155
*OK2SWD	*	50,382	189	162
*OK2BZE	*	47,040	150	140
*OK2PBG	*	40,544	149	112
*OK1VHV	*	32,560	128	110
*OK7N	*	29,400	113	100
*OL8M	*	4,223	45	41
*OK2QX	21	170,178	286	226
*OK2TBC	*	8,586	63	53
*OK4AS	*	1,113	21	21
*OK1ULE	*	264	11	11
*OK5SWL	14	1,848	36	33
			(OP: OK2SWD)	
*OK1LX	7	413,848	546	358
*OK6AY	*	119,757	247	209
			(OP: OK1AY)	
*OK2BRS	*	116,390	230	206
*OK2ILD	*	82,800	191	184
*OK5AD	*	23,136	104	96
*OK1WF	3.7	324,800	497	320
*OK1AXB	*	171,171	295	247
*OK1UGI	*	113,643	266	207
*OK1JOK	1.8	35,028	153	126
*OK6Y	*	30,245	136	115
			(OP: OK2PTZ)	
*OK1KZ	*	5,994	57	54
Denmark				
OZ5EV	A	594,864	575	459
OZ2BKK	*	272,866	401	314
5P5N	*	106,860	265	195
OZ5D	*	9,676	69	59
OZ1HHH	*	6,250	51	50
OZ7SG	21	8,060	64	52
OU7X	14	602,761	670	359
			(OP: OZ5KF)	
*OZ4NA	A	578,158	661	427
*OZ1ACB	*	539,965	636	395
*5P8O	*	278,460	461	315
*OZ1KVM	*	261,924	450	292
*OZ1JVX	*	198,588	356	268
*OU2P	*	53,946	197	162
*5P8W	*	11,120	85	80
*OZ1EDR	*	7,946	68	58
			(OP: OZ7DK)	
*OZ7DK	*	5,356	56	52
*OZ1DGQ	*	2,312	37	34
*OZ5HZ	*	1,914	36	33
*OZ4RT	*	1,210	23	22
*OZ5TL	*	820	20	20
*OZ1ELY	*	198	9	9
*OZ6OM	7	14,690	68	55
*OZ7AEI	*	12,250	77	70
England				
M0WLF	A	1,263,024	960	537
M5A	*	345,347	533	367
			(OP: G3WVG)	
G1MIE	*	186,930	332	279
G5G	*	145,285	326	245
G0AEV	28	26,226	123	93
G4IUF	21	26,235	111	99
G3VPW	*	24,442	112	101
M6Q	14	73,584	206	144
G3YBY	3.7	241,660	345	281
*M0MCV	A	1,184,193	1002	549
*G3ZQH	*	990,996	916	538
*G4DFI	*	366,417	523	369
*G4DBW	*	205,998	364	278
*M0SDY	*	154,495	290	265
*M1KMC	*	152,692	291	236
*G0TRB	*	122,484	284	236
*2E0PLA	*	118,574	266	202
*2E0CPT	*	111,612	275	213
*G7DDN	*	79,794	229	186
*G8ZRE	*	78,039	253	207
*G6UBM	*	66,259	204	173
*M6APA	*	63,135	215	183
*G8MIA	*	54,600	198	168
*2E0WAW	*	52,500	203	175
*G4VMX	*	42,795	162	135
*G4DDL	*	40,350	173	150
*M0MDR	*	28,363	136	113
*G7RTI	*	26,781	132	113
*G8NEO	*	20,680	125	94
*G4FFN	*	15,486	90	89
*2E0M8F	*	14,276	94	86
*G3RSD	*	11,492	74	68
*G8GBY	*	10,956	95	83
			(OP: M0GOY)	
*G7DPE	*	5,850	71	65
*M6JJK	*	4,720	64	59
*M1JJK	*	1,305	29	29
*M0PKZ	*	651	21	21
*2E0TQR	28	147	8	7
*M5T	21	8,601	72	61
			(OP: G7SKR)	
*G1FON	14	88,476	258	219
*G5XW	*	33,060	156	145
*G4XDD	*	18,128	110	103
*M0AAA	*	341	11	11
			(OP: G0VQR)	
*M/YO4RDW	7	181,890	306	258
*G7SKR	*	105,281	210	187
*M0DEG	3.7	325	13	13
Estonia				
ES2IPA	A	287,040	483	320
ES2MC	21	382,634	506	362
ES8TJM	7	195,835	318	265
*ES1LS	A	193,500	412	300
*ES3VI	*	12,480	86	80
*ES7NY	21	23,130	116	90
*ES2BH	14	23,816	113	104
*ES1TP/2	3.7	5,508	55	51
European Russia				
RU1AB	A	810,762	727	489
UA1ANA	*	351,400	478	350
RA1QD	*	65,626	197	157
RA1TV	*	41,230	140	133
RV1AC	*	66	6	6
RZ1ZZ	14	1,714,144	1568	736
RV2FW/1	3.7	489,984	603	384
*RW1CW	A	2,398,574	1509	778
*UA1CEI	*	1,215,200	1189	560
*UA1CUR	*	838,729	877	479
*U1BA	*	221,366	419	302
*RD1AW	*	135,090	299	237
*RW1AU	*	84,050	235	205
*RV1AE	*	72,168	238	186
*RV1CB	*	67,662	206	189
*UA1ZCT	*	42,125	138	125
*RN1NW	*	8,909	61	59
*RA1AOP	*	8,772	71	68
*RW1CX	28	340	12	10
*UA2FFX/1	21	78,323	209	167
*UA1AQA	14	733,055	888	541
*RA1ARJ	*	81,468	297	219
*RA1AKR	*	12,015	95	89
*RA1AEI	3.7	25,200	120	112
RM3F	A	8,358,840	3337	1116
			(OP: UA3DPX)	
RG3K	*	6,607,650	3108	1050
			(OP: UA3QDX)	
RA3DW	*	1,117,470	1095	579
RK3DH	*	1,003,520	863	560
RN3ZC	*	653,790	749	465
RA3AUM	*	395,200	603	416
RX3AGD	*	217,316	312	242
RU3UR	*	211,665	463	309
RA3NF	*	194,649	333	273
RA3XE	*	182,712	371	276
UA3KA	*	104,160	261	210
UA3DAM	*	94,050	248	209
UA3RAI	*	59,334	226	174
RU3KC	*	59,096	174	166
RL3AW	*	27,666	108	106
RZ3ARO	*	22,454	120	103
RU3DM	*	5,160	46	43
RL3AB	*	3,102	33	33
UA3LIA	*	2,784	33	32
RA3UT	*	60	5	4
UA3QOS	21	213,918	391	303
RL3DE	*	26,852	111	98
UA3AGW	14	1,238,745	1196	655
UA3QUP	*	24,198	125	109
RK3FQ	7	348,130	436	310
RX3FS	*	316,798	374	302
RX3OM	3.7	31,088	130	116
*UA3BL	A	1,331,988	1109	606
*RK3IM	*	1,180,108	998	614
*RA3NC	*	748,240	805	470
*RX3ZX	*	671,104	696	428
*RW3DW	*	611,847	638	459
*RU3SE	*	560,352	711	416
*RZ3XA	*	402,752	598	406
*UA3OQ	*	350,632	548	328
*RV3EAK	*	306,190	453	335
*RN3ZR	*	266,760	414	312
*UA3DW	*	235,865	366	293
*RW3WX	*	206,861	353	269
*RK3DU	*	191,065	400	265
*RZ3ABC	*	177,550	355	265
*RW3XZ	*	152,620	376	260
*UA3AIU	*	116,600	303	220
*RN3ZQ	*	108,547	248	197
*UA3RIN	*	104,796	251	213
*RA3DCT	*	104,650	204	182
*RA3VLD	*	103,282	274	226
*RA3VE	*	99,008	277	224
*RN3ARA	*	88,000	252	200
*RX3VF	*	87,568	228	208
*RV3DHC	*	87,493	260	203
*RN3ZJJ	*	84,656	249	176
*RZ3ATE	*	58,368	170	152
*RX3AU	*	53,339	164	143
*RV3MI	*	51,000	168	150
*RN3FS	*	46,506	150	138
*RN3ZIN	*	45,426	169	134
*RU3XY	*	43,225	150	133
*RA3ATE	*	36,830	170	145
*RX3MX	*	32,340	120	110
*UA3FDX	*	31,752	140	126
*RN3RF	*	29,744	113	104
*RN3DDR	*	29,041	124	113
*UA3DSS	*	28,416	126	111
*RZ3DA	*	26,500	115	100
*RA3DAD	*	26,448	128	116
*RX3MM	*	25,760	102	92
*RZ3DC	*	24,500	106	98
*RA3TYL	*	22,620	133	116
*RW3VA	*	21,931	99	91
*RN3FY	*	20,988	120	99
*RA3OO	*	14,880	84	80
*UA3DUJ	*	14,344	99	88
*RA3IS	*	14,300	77	65
*RA3TVL	*	13,680	94	76
*RU3DG	*	12,948	88	83
*RV3YM	*	11,424	71	68
*UA3IAR	*	11,220	81	66
*RV3DUT	*	9,828	67	63
*RW3TA	*	8,280	83	72
*RL3AJ	*	4,732	60	52
*RA3RGQ	*	1,512	21	21
*RA3TUT	*	512	16	16
*RN3DGI	*	40	6	5
*UA3VVB	21	164,472	335	267
*UA3YAA	*	32,376	134	114
*RU3WR	*	21,252	106	92
*RU3OO	*	9,176	66	62
*RA3DGH	14	57,720	223	185
*RA3QG	*	11,224	96	92
*UA3ACL	*	1,400	29	28
*RA3RBL	*	800	20	20
*UA3LQQ	*	77	7	7
*RV3ZN	7	135,473	237	221
*UA3FX	*	85,974	194	178
*UA3LHL	3.7	113,955	266	213
UA4WKW	A	4,363,389	2676	927
RM4HZ	*	2,514,372	1976	777
RW4HP	*	1,602,785	1368	655
UA4NC	*	197,965	397	289
UA4LA	*	167,005	307	263
RW4PK	*	1,495	23	23
UA4NW	3.7	9,802	59	58
*UA4CNZ	A	324,576	623	392
*RA4CSP	*	256,634	439	322
*RA4AAO	*	156,228	350	277
*UA4UT	*	138,243	305	227
*RA4WO	*	132,026	340	263
*RN4NF	*	108,400	241	200
*RW4AD	*	67,320	229	170
*RA4FUN	*	59,400	162	150
*RZ4HL	*	32,148	157	141
*UA4UAR	*	22,300	107	100
*RV4HV	*	21,185	104	95
*RK4YJ	*	17,360	88	80
*RV4CO	*	13,172	96	89
*UA4FUW	*	12,420	98	92
*UA4PCM	*	8,642	60	58
*RA4PX	*	5,005	56	55
*RV4LC	*	3,612	45	43
*RA4HMT	*	624	16	13
*RA4UAT	*	50	5	5
*RW4NH	28	1,769	31	29
*RA4WC	21	319,088	589	392
*UA4LW	*	100,815	272	235
*RN4SN	*	81,534	273	214
*RW4LQ	*	12,194	72	67
*RU4SO	14	141,343	341	281
*RK4PB	*	78,228	252	212
*UA4ASE	*	14,157	111	99
*RA4PTI	3.7	8,246	71	62
UA6UDV	A	2,049,660	1568	708
RU6YJ	*	98,271	215	183
RA6XV	*	31,047	159	131
RA6AR	*	29,337	145	127
UA6JFG	*	615	15	15
RK6CM	21	377	14	13
RX6AM	14	1,563,130	1422	722
RW6BN	7	231,820	321	268
UA6AIW	1.8	91,448	239	184
*RV6LFE	A	1,904,423	1605	713
*RA6LOO	*	588,699	688	447
*UA6GF	*	465,760	656	410
*RD6LP	*	258,258	382	286
*UA6HHE	*	239,732	462	292
*RA6XMF	*	164,197	309	253
*RX6LOL	*	82,800	213	180
*UA6AES	*	71,568	185	168
*UA6HRX	*	56,056	208	182
*RX6LD	*	23,712	132	114
*UA6ARR	*	17,700	105	100
*RN6DR	*	6,016	49	47
*RA6AX	*	5,292	47	42
*UA6YI	*	1,278	19	18
*UA6LPY	28	1,044	20	18
*RN6MA	21	36,300	147	121
*RW6HKF	*	666	18	18
*RU6YZ	14	312,750	537	375
*RW6AH	*	224,208	480	324
*RV6ACC	*	69,715	229	191
*UA6BJY	*	28,696	140	136
*RV6BK	*	17,572	93	92
*UA6NZ	7	55,183	163	139
European Turkey				
TA1DX	A	24,816	102	88
*TA1BM	A	216	9	8
*TA1HZ	7	210	7	7
Faroe Islands				
*OY9R	A	1,421	29	29
Finland				
OH8X	A	8,553,256	3533	1172
OG2P	*	170,595	324	255
			(OP: OH2PM)	
OH8KA	*	10,665	88	79
OH3BU	28	2,250	34	25
OG1T	21	28,704	113	96
OH2BBT	*	8	2	2
OH6NJ	14	1,238,202	1142	634
OH6RE	*	417,680	712	454
OG2U	*	349,650	496	315
			(OP: OH2IW)	
OH4TY	*	256,658	472	362
OG5B	7	2,158,065	1213	663
OH1RX	*	15,810	92	85
OG4T	1.8	40,767	146	127
			(OP: OH4MFA)	
*OH5JH	A	71,989	225	193
*OH6JYH	*	54,288	216	174
*OH2LP	*	1,316	28	28
*OH6GFI	*	494	19	19
*OH7FKV	21	84,960	231	180
*OH3CV	*	10,048	82	64
*OH3P	14	112,585	344	253
*OH5NE	*	1,107	27	27
*OH4FSK	7	180	9	9
France				
F6DZU	A	1,190,298	946	566
F4DSK	*	1,171,242	949	558
F5BBD	*	1,098,690	898	530
F5POJ	*	482,360	577	389
F5CQ	*	254,904	356	258
F1RHS	*	130,848	264	232
F4CPF	*	38,913	130	119
F1SMV	*	9,306	75	66
F5NBX	28	7,567	62	47
F5JY	21	225,400	348	280
TM77M	14	8,271,768	3335	1046
			(OP: F5MUX)	
TM1W	*	5,886,408	2662	968
			(OP: F1HAR)	
TM0T	7	4,604,418	1959	819
*F5LIW	A	830,620	747	476
*F5PAL	*	248,390	398	295
*F4DLL	*	177,100	333	253
*F4GBW	*	176,544	375	288
*F6GCI	*	175,274	305	257
*F6GPT	*	148,088	280	214
*F1MLN	*	105,105	228	195
*F5LCU	*	104,800	235	200
*F4ASK	*	99,216	249	208
*F4AGR	*	88,566	202	174
*F1EPQ	*	61,152	224	168
*F5TMJ	*	28,078	104	101
*F5OTZ	*	13,774	75	71
*F5GGL	*	8,901	72	69
*F6EWX	*	8,784	70	61
*F8DYD	*	8,357	65	61
*F8BBL	*	5,130	47	38
*F4EMU	*	4,998	51	51
*F6CZV	*	2,958	36	34
*F4FIA	*	1,116	32	31
*F1AGU	*	273	13	13
*F4FWN	*	140	7	7
*F8AKC	28	13,671	77	63
*F5DRD	*	2,378	32	29
*F6DRP	21	105,592	232	197
*F1FPL	14	97,867	238	217
*F5MPN	*	12,994	100	89
Germany				
DL4MCF	A	4,090,342	2034	827
DL9GWD	*	1,212,152	891	554
DF9OO	*	942,900	831	525
DM5JBN	*	665,457	733	453
DJ3LE	*	381,617	502	359
DL5JS	*	314,901	427	327
DL8DXF	*	299,586	419	294
DQ5T	*	295,290	409	306
			(OP: DL4LAM)	
DC1JAG	*	285,456	433	313
DR775TMG	*	275,427	442	303
DL9DYL	*	274,628	368	284
DF6RI	*	216,213	395	291
DN1CS	*	215,745	394	285
DG2NMH	*	203,825	373	263
DK0SU	*	196,669	290	209
			(OP: DF7SA)	
DL1RYD	*	190,270	335	265
DJ1TO	*	182,070	331	255
DJ6QT	*	175,824	300	264
DK5JM	*	144,225	268	225
DJ6TB	*	136,713	300	229
DJ5QE	*	115,446	294	213
DH1PAL	*	105,789	245	197
DK8EY	*	96,015	239	185
DJ5IW	*	94,996	220	187
DL1YFF	*	82,305	202	177
DF3TE	*	73,188	201	171
DL8EAQ	*	67,781	194	161
DG2SRL	*	55,200	172	150
DL6DVU	*	43,030	172	130
DL2SAX	*	25,145	134	107
DJ8EW	*	14,707	83	77
DK6CQ	*	11,456	67	64
DJ2SL	*	4,158	42	42
DL2RTL	*	1,518	23	23
DL0FR	*	560	19	16
			(OP: DJ5IW)	
DL1HRE	*	210	16	14
DL9GFB	*	55	7	5
DL3G	28	1,728	27	27
			(OP: DC3RJ)	
DM3MM	21	8,850	66	59
DK7AN	*	6,321	53	49
DL2AMD	*	4,988	44	43
DG3LCH	14	475,200	623	400
DL4WA	*	430,335	607	393
DL2DXA	*	412,269	537	341
DL9DRA	*	3,939	41	39
DJ5CL	*	2,072	38	37
DC2YY	3.7	23,052	110	102
DJ8ES	1.8	17,296	100	92
*DJ6BQ	A	1,150,240	928	553
*DL4ZA	*	1,016,209	982	529
*DL1NKS	*	1,000,632	941	482
*DR4G	*	797,498	724	481
			(OP: DJ0GM)	
*DJ0MCZ	*	703,969	734	469
*DL9OLI	*	534,912	587	384
*DJ8UV	*	450,844	639	419
*DH2PG	*	394,580	483	362
*DJ6OZ	*	379,620	490	342
*DL1DTL	*	351,805	482	355
*DL1EL	*	351,754	486	326
*DK7CH	*	316,129	483	319
*DF0BV	*	299,744	447	323
			(OP: DL1MAJ)	
*DK5DQ	*	224,664	411	296
*DM3HZN	*	201,600	311	224
*DK5MB	*	186,320	331	272
*DL3WKG	*	184,212	341	252
*DK6BT	*	158,193	299	243
*DL1TS	*	155,040	326	255
*DJ4MH	*	149,860	345	254
*DL4EBA	*	148,092	329	246
*DF3XZ	*	147,750	318	250
*DG1IU	*	131,852	325	238
*DH2DAM	*	124,490	265	211
*DL1DVE	*	122,335	252	215
*DM2AWM	*	121,264	268	212
*DL4RAT	*	116,470	248	190
*DL5JH	*	103,587	242	219
*DL7VX	*	102,485	253	199
*DD1OP	*	102,152	247	226
*DL9LF	*	100,352	225	196
*DK7MCX	*	94,923	242	199
*DL4OCH	*	92,235	235	195
*DL3KDC	*	81,340	241	196
*DB7BU	*	80,892	229	189
*DF8DHG	*	78,353	240	187
*DO7DU	*	73,312	179	158
*DL9KI	*	66,755	218	169
*DL2DQL	*	66,341	194	163
*DK9VA	*	64,476	192	162
*DO9PL	*	62,928	191	171
*DO5AWE	*	62,361	189	169
*DJ1FZ	*	60,295	193	155
*DF6WE	*	59,760	206	166
*DK6AY	*	58,989	197	159
*DH6BH	*	58,437	165	151
*DK2BJ	*	57,456	175	152
*DO1MGN	*	56,940	176	156
*DK6NF	*	56,056	196	154
*DL1TPY	*	53,874	179	146
*DJ2GMS	*	49,926	163	159
*DJ4PK	*	48,848	162	142
*DG3DAT	*	45,445	181	149
*DM5LK	*	44,730	167	142
*DL4VAB	*	44,064	168	144
*DP5X	*	43,365	177	147
			(OP: DL3EBX)	
*DO8YX	*	41,406	149	134
*DK1LRS	*	38,412	157	132
*DO4OO	*	35,875	149	125
*DF2PH	*	35,862	170	139
*DL1VJL	*	33,592	126	104
*DL7VRG	*	30,134	135	122
*DF4TD	*	29,200	108	100
*DG4HZ	*	27,840	132	116
*DL3ZAI	*	26,992	121	112
*DO1KUB	*	20,592	109	99
*DM3KZN	*	19,864	132	104
*DL9NDV	*	19,350	102	90
*DO8TB	*	18,414	110	93
*DL9HB	*	18,067	99	89
*DL8YR	*	17,139	99	87
*DL8ZAJ	*	16,683	102	83
*DL4VAQ	*	15,879	94	79
*DB1RL	*	15,224	99	88
*DM5DX	*	12,848	79	73
*DF8XC	*	12,775	78	73
*DF9FT	*	11,210	65	59
*DG6DAF	*	11,016	71	68
*DL1PF	*	10,578	92	82
*DJ6UP	*	9,656	80	71
*DL1DAW	*	8,840	59	52
*DK6RF	*	8,288	59	56
*DL8BTE	*	7,605	76	65
*DA3T	*	6,728	63	58
			(OP: DL8DXL)	
*DL7TJ	*	6,572	55	53
*DD8EI	*	5,406	53	51
*DL9FB	*	5,088	57	53
*DF8TI	*	5,047	51	49
*DL7ULM	*	4,879	46	41
*DF9FS	*	4,720	62	59
*DC2CT	*	4,294	40	38
*DL4SUN	*	3,441	41	37
*DL/LX1ER	*	3,354	45	43
*DL4EAX	*	2,784	35	32
*DO1DXX	*	2,580	33	30
*DL7CU	*	1,800	30	30
*DL2RCH	*	1,425	28	25
*DL5AXX	*	1,349	24	19
*DL8WJM	*	1,078	22	22
*DL7LZ	*	900	18	18
*DL1SBF	28	5,120	47	40
*DO6SD	21	226,304	336	272
*DL9ZP	*	62,565	182	129
*DO1HGS	*	52,264	151	139
*DK7GH	*	43,681	138	121
*DJ6TK	*	40,948	147	116
*DH7LF	*	12,810	78	70
*DL2RZG	*	10,664	73	62
*DO1BEN	*	6,615	61	45
*DL5ALW	*	6,578	51	46
*DL9LM	14	102,828	266	209
*DL4JYT	*	46,971	185	153
*DM6DL	*	26,432	133	112
*DL7FB	*	7,979	83	79
*DL2FFW	*	1,575	38	35
*DL9ZWG	*	1,125	25	25
*DL4NT	*	255	16	15
*DL9ECA	7	328,212	448	324
*DM4DX	*	187,200	394	260
*DL7DZ	*	152,004	247	212
*DL3YDY	*	28,272	132	114
*DL5ASK	*	9,954	67	63
*DR2Q	3.7	239,294	386	298
			(OP: DL1ALN)	
*DO6JAN	*	190	10	10
*DL1ET	1.8	82,593	238	189
Greece				
SV1JGX	A	867,680	1015	544
SV2GJV	*	829,192	799	476
SX1L	21	318,993	644	353
			(OP: SV1RP)	
SV1GRD	1.8	3,444	41	41
*SV8/SV1JG	A	2,012,680	1896	670
*SV2CUU	*	11,232	77	72
*SV2HWR	*	3,136	51	49
Guernsey				
*MU0GSY	21	75,985	237	167
Hungary				
HA1TNX	A	1,863,736	1140	644
HA7PL	*	42,927	151	123
HA8TP	21	103,376	214	182
*HA6NL	A	495,975	668	389
*HA2MN	*	139,860	303	222
*HA8CQ	*	87,135	243	185
*HA7JOK	*	66,967	215	167
*HG3FUG	*	36,984	153	134
*HA3JO	*	29,391	127	101
*HG3FMZ	21	12,444	80	61
*HG4F

EI6JK	**7**	**1,333,710**	**1034**	**522**
EI7M	**3.7**	**3,527,875**	**1583**	**731**
			(OP: LY3MM)	
***EJ8GQB**	**A**	**1,819,375**	**1220**	**625**
			(OP: ON4EI)	
*EI4GNB	*	295,680	436	336
*EI4GAB	*	85,459	216	187
*EI7CC	*	61,944	199	174
*EI4HQ	*	57,275	172	145
*EI6JY	*	36,765	152	129
*EI4DJB	*	21,597	88	69
Isle of Man				
***GD4IHC**	**A**	**162,998**	**308**	**239**
*MD3YLX	*	37,401	156	137
Italy				
IR4X	**A**	**10,559,192**	**3089**	**1099**
			(OP: IZ3EYZ)	
I03J	*	4,630,850	2042	917
			(OP: IV3ZXQ)	
I4AUM	*	1,338,582	995	609
IK8SEU	*	619,930	743	470
IK4DCX	*	560,441	580	413
IV3UHL	*	514,800	621	396
IZ1JLN	*	310,275	423	315
IWØGTA	*	298,596	457	334
IK3SSJ	*	112,404	280	228
IZ8EEL	*	96,696	246	204
IK5FKF	*	86,394	224	187
IZ5DKJ	*	73,386	182	151
IZ5ILK	*	46,863	148	127
IZ2KRZ	*	36,024	123	114
IZ8DDP	*	30,592	140	128
IZØFVD	*	12,000	78	75
IZ8JHO	*	1,824	32	32
IWØSAF	*	1,606	25	22
IW6PLY	*	1,440	32	32
IWØGBU	*	1,120	20	20
IK2RGT	**28**	**154**	**8**	**7**
IZØGKB	**21**	**354,090**	**454**	**330**
IWØBCF	*	256,960	366	292
IZ2DII	*	2,268	31	27
IWØHLZ	**14**	**239,580**	**527**	**330**
IZ8EFD	*	159,804	442	276
IZ2ACD	*	25,986	156	122
IK2MPR	*	10,660	89	82
IV3YYK	**7**	**1,541,452**	**1008**	**583**
IZ5MOQ	*	818,736	781	461
I4FYF	**1.8**	**443,223**	**568**	**363**
***IK7NXU**	**A**	**518,580**	**547**	**402**
*IZ8JFL	*	393,936	525	348
*IK3SSW	*	169,912	328	268
*IZ5OQX	*	154,785	312	255
*IZ2NZZ	*	116,841	242	237
*IZ3QHA	*	112,050	287	225
*I8OCA	*	101,304	239	201
*IZ7DOK	*	100,276	274	212
*IK8PLE	*	99,288	252	197
*IZ4EFP	*	97,400	219	200
*IZ5MMK	*	94,640	247	208
*IX1BFL	*	87,688	243	194
*IN3MNS	*	86,118	243	186
*IZ5RLK	*	83,848	233	188
*IZ2LQD	*	80,256	220	176
*IZ3GNG	*	61,701	173	157
*IZ5MKA	*	61,440	187	160
*IZ2BKA	*	57,912	160	127
*IK1ZOE	*	55,173	196	159
*IZ8PPJ	*	52,548	173	151
*IZØFVL	*	47,450	151	130
*IZ8LIP	*	44,114	165	137
*IZ5IMD	*	43,160	147	130
*IØKHP	*	41,072	159	136
*IZ1HBC	*	37,700	150	130
*IK2IKW	*	36,608	152	143
*IK2YSJ	*	27,940	130	110
*IV3APV	*	26,182	107	106
*IZ8GBT	*	25,123	105	97
*IZ8LLH	*	20,806	108	101
*IZØMJE	*	20,094	108	102
*IK4IDP	*	20,025	97	89
*IZ3DBA	*	19,710	105	90
*IW5EDI	*	19,092	103	86
*IW4EQI	*	18,080	87	80
*IW5ECP	*	17,052	106	98
*IV3NVB	*	16,835	93	91
*IZ1AOD	*	15,072	103	96
*IZ7EUB	*	14,700	77	75
*IK5YJK	*	11,830	81	65
*IZ1GLX	*	8,640	69	64
*IW5ELA	*	6,480	49	40
*IZ7IJW	*	6,360	61	60
*IN3FHE	*	5,665	55	55
*IZ8ESX	*	4,992	45	39
*IZØBTV	*	4,848	49	48
*IK4XQT	*	3,740	58	55
*IZ1MLS	*	3,132	37	36
*IK2EBP	*	1,620	37	36
*IV3BKB	*	989	24	23
*IW4EGX	*	697	17	17
*IZ1MHS	*	671	13	11
*IZ5LZP	*	629	17	17
*IK8MIG	*	435	16	15
*IZ7EXX	*	300	10	10
*IW3SRC	*	228	12	12
*IZ1MHY	*	55	5	5
***IK5WGK**	**28**	**7,440**	**55**	**48**
*IZ5NFD	*	3,605	38	35
*IZ1IVA	*	507	13	13
***IK5AFJ**	**21**	**144,957**	**254**	**229**
*IZ5HSK	*	58,788	163	142
*IZ8JPV	*	3,922	39	37
*IK3PQG	*	75	5	5
***IZ8HUJ**	**14**	**322,715**	**583**	**395**
*IZ2JQP	*	127,626	282	239
*IN3HUU	*	57,494	207	178
*IZ8NWA	*	26,964	141	126
*IZ2JNN	*	12,920	108	95
*IZØFWD	*	9,680	83	80
*IZ2CSX	*	260	13	13
***I03B**	**7**	**892,736**	**833**	**464**
			(OP: IV3KFB)	
*IZ1DGG	*	188,856	332	258
*IZ1NBX	*	28,260	96	90
*IZ1GJK	*	420	14	14
*IV3BCA	*	198	10	11
***IZ8CCW**	**3.7**	**18,109**	**101**	**91**
Kaliningrad				
RW2F	**1.8**	**571,130**	**667**	**398**
***UA2FHZ**	**A**	**58,740**	**200**	**165**
*RN2FQ	*	34,691	137	113

Latvia				
YL3DR	**A**	**637,551**	**663**	**459**
YL2PJ	**21**	**57,951**	**167**	**137**
YL2BJ	**14**	**1,547,455**	**1275**	**665**
YL3FT	**3.7**	**1,291,696**	**998**	**532**
***YL2TB**	**A**	**240,320**	**388**	**320**
*YL2CR	*	209,610	408	274
*YL2QV	*	80,088	240	188
***YL3BZ**	**21**	**54,340**	**170**	**143**
***YL2IP**	**14**	**25,929**	**145**	**129**
*YL3DX	*	18,144	114	108
*YL8M	*	10,010	77	77
			(OP: YL2KL)	
***YL2GQG**	**3.7**	**121,329**	**263**	**221**
Lithuania				
LY6A	**A**	**5,476,093**	**2452**	**989**
LY9Y	*	4,565,605	2158	935
LY4CW	*	1,189,438	1057	554
LY2TS	*	1,069,200	940	540
LY1CM	*	116,511	300	213
LY1XA	*	42,250	151	130
LY2CO	*	42,024	146	136
LY3CY	*	42,000	156	140
LY2OU	**21**	**255,780**	**387**	**261**
LY2BKT	*	3,420	42	38
LY8O	**7**	**4,662,028**	**1842**	**868**
***LY9A**	**A**	**3,136,260**	**1746**	**835**
*LY2T	*	1,046,400	895	545
*LY2K	*	335,849	525	313
*LY3B	*	290,952	436	324
*LY2RJ	*	269,700	428	310
*LY1DJ	*	246,214	439	307
*LY2OM	*	176,715	338	255
*LY1AKM	*	153,615	344	245
*LY2AT	*	134,470	295	226
*LY2AO	*	10,595	85	65
*LY3RQ	*	1,519	31	31
***LY2AE**	**21**	**161,040**	**289**	**220**
***LY2BUU**	**14**	**231,628**	**421**	**316**
***LY11MM**	**7**	**385,776**	**508**	**342**
			(OP: LY2MM)	
*LY2ND	*	105,777	252	207
*LY11BY	3.7	700	20	20
Luxembourg				
LX7I	**A**	**11,576,092**	**3579**	**1159**
			(OP: DJ8OG)	
LX1SG	**7**	**201,441**	**315**	**249**
Macedonia				
Z38A	**7**	**1,739,220**	**1049**	**606**
***Z35W**	**A**	**312,176**	**548**	**358**
***Z33F**	**21**	**31,979**	**165**	**113**
Moldova				
ER5AA	**7**	**120,016**	**235**	**208**
***ER4LX**	**21**	**12,528**	**73**	**72**
***ER2RM**	**1.8**	**49,183**	**168**	**137**
Monaco				
***3A/DL8BDR**	**A**	**8,000**	**69**	**64**
Montenegro				
403A	**A**	**11,674,302**	**3532**	**1146**
Netherlands				
PI65BRD	**A**	**2,416,512**	**1469**	**744**
			(OP: PA2M)	
PAØJNH	*	504,922	540	389
PA1NL	*	474,154	628	383
PA1TX	*	437,769	581	383
PA3AAV	*	143,664	300	246
PAØCYW	*	133,380	296	228
PA7LZ	*	50,544	191	156
PA9DD	*	30,082	100	89
PA1NHZ	*	24,440	114	104
PD3GSN	*	23,730	117	105
PAØVST	*	10,602	66	62
PI4COM	**14**	**899,783**	**844**	**437**
			(OP: PA2C)	
PA2MRT	**7**	**37,492**	**110**	**103**
PA5F	**1.8**	**71,643**	**216**	**167**
***PA1CM**	**A**	**937,736**	**854**	**502**
*PI4N	*	871,416	852	532
			(OP: PD1KSA)	
*PB6W	*	844,686	946	501
*PA8KW	*	682,380	690	446
*PH2A	*	590,512	640	442
*PDØHM	*	311,259	481	347
*PD7BZ	*	296,075	432	325
*PD6W	*	292,400	496	344
*PE1RF	*	274,116	399	318
*PD5LO	*	258,494	431	307
*PA3T	*	251,045	403	295
*PAØAGA	*	214,214	399	286
*PA8F	*	150,516	295	222
*PD9FER	*	142,538	311	242
*PD1TV	*	140,579	320	257
*PE2KM	*	136,246	299	242
*PE1EWR	*	121,380	270	210
*PA7BAS	*	115,291	280	223
*PA3DBS	*	111,684	280	227
*PI65DEV	*	107,576	244	238
*PAØW	*	97,427	211	187
*PF9A	*	96,565	257	217
*PA4PS	*	82,752	241	192
*PA5YL	*	74,820	198	172
*PA5VK	*	64,430	203	170
*PD1RP	*	57,669	188	141
*PAØGRU	*	57,585	202	165
*PA2CVD	*	48,720	193	168
*PDØHD	*	36,432	145	132
*PA7PYR	*	35,584	152	128
*PDØMNF	*	33,276	135	118
*PD5CW	*	31,242	142	127
*PA3ARM	*	30,821	140	119
*PA3ANN	*	28,968	161	136
*PA3CMF	*	26,260	144	130
*PE1BSI	*	16,791	97	87
*PA5RG	*	16,269	99	87
*PAØB	*	15,308	99	89
*PA2CHM	*	14,774	98	89
*PA3GEO	*	13,617	95	89
*PDØME	*	13,330	88	86
*PD3GVA	*	12,212	92	86
*PD1JTB	*	4,747	49	47
*PE1PRM	*	3,906	47	42
*PA5TT	*	3,397	43	43
*PAØFEI	*	2,233	29	29
*PA1AK	*	1,620	28	27
*PA1BBO	*	1,334	24	23
*PF5ØRNARS	*	45	5	5
			(OP: PF9A)	
***PAØCGB**	**14**	**21,312**	**117**	**111**
*PDØMD	*	504	21	21

***PA5AD**	**7**	**5,100**	**52**	**51**
*PB7XYL	*	4,392	36	36
***PA2REH**	**3.7**	**18,200**	**96**	**91**
Northern Ireland				
GI5K	**A**	**13,141,446**	**3981**	**1137**
			(OP: MIØLLL)	
MI1SJM	*	78,925	205	175
***MIØM**	**A**	**1,509,708**	**1090**	**582**
			(OP: MIØTFK)	
*GI7AXB	*	405,504	567	384
Norway				
LA9TJA	**A**	**723,667**	**811**	**469**
LA3BPA	*	289,244	377	334
LA6KOA	*	213,530	536	326
LA9LMA	*	113,152	309	221
LA2OKA	*	68,400	192	152
LB9RE	*	29,898	104	99
LA2GRA	*	12,118	85	73
LA9TY	*	882	18	18
LA5PRA	*	817	19	19
LA5VSA	14	15	5	5
***LA3S**	**A**	**990,150**	**911**	**525**
			(OP: LA3BO)	
*LA2HFA	*	162,540	350	258
*LA7GNA	*	162,134	343	259
*LA7TN	*	153,216	354	252
*LA5FJA	*	83,614	226	194
*LA1VNA	*	56,056	189	154
*LA8OKA	*	52,947	191	159
*LA1ORA	*	5,723	63	59
*LA2GN	*	4,550	52	50
*LA3ZSA	*	21	3	3
***LA7NFA**	**14**	**61,600**	**193**	**176**
***LA7WCA**	**1.8**	**22,077**	**108**	**99**
Poland				
SP9LJD	**A**	**6,552,068**	**2562**	**982**
SP8ØMVG	*	992,505	987	521
			(OP: SP1MVG)	
3Z8ØPZK	*	786,695	742	455
			(OP: SP4Z)	
SP8HXN	*	608,188	603	406
SP3GTS	*	399,595	516	343
SP8DIP	*	244,171	344	271
HF8ØJMR	*	184,485	319	245
SP4OIZ	*	101,088	261	208
SQ1BHH	*	60,196	182	149
SP1KCJ	*	39,900	163	140
			(OP: SP1MVW)	
SP5GMM	*	28,324	98	97
SP5EAQ	*	14,632	66	59
SQ7MHN	*	9,296	59	56
SP1TMB	*	8,030	65	55
SN2M	*	3,600	40	40
			(OP: SP2XF)	
SP1GZF	**28**	**160**	**10**	**10**
SN7D	**21**	**312,137**	**401**	**301**
			(OP: SP7IVO)	
SQ6R	*	146,964	276	222
SP9W	*	52,875	162	125
SN7Q	**14**	**5,991,992**	**2605**	**998**
SP9JZT	*	260,130	492	299
SP6OUJ	*	17,860	100	94
SP4JTJ	*	4,508	52	46
SP5ELA	**7**	**1,068,110**	**801**	**515**
SN2K	*	882,630	714	467
			(OP: SP2FWC)	
SO8T	*	179,883	324	253
			(OP: SP8TJU)	
SN3Q	*	78,526	179	158
			(OP: SP3FLQ)	
HF8ØGBG	*	5,184	51	48
			(OP: SQ8GBG)	
SN9P	**1.8**	**133,800**	**295**	**223**
			(OP: SQ9GAI)	
***SO8BJ**	**A**	**717,552**	**688**	**432**
			(OP: SP3J)	
*SP9NWN	*	549,451	596	371
*SP7IDX	*	278,886	503	318
*SP6JIR	*	275,496	438	312
*SQ8LSC	*	275,196	397	323
*SP7QJB	*	266,265	434	305
*SQ3RX	*	265,760	446	302
*SQ8JLN	*	239,904	382	272
*SP6ZJP	*	205,344	376	276
			(OP: SP6GHR)	
*SP6JZP	*	168,226	335	233
*SP9MAN	*	168,148	327	254
*SP6CCI	*	163,954	313	239
*SP4AAZ	*	158,750	333	250
*SP6RYD	*	137,940	287	228
*SN5ØSPP	*	126,004	294	218
			(OP: SP9ODM)	
*SP3JHY	*	112,761	248	187
*SP5GRU	*	110,424	266	214
*SP9RTL	*	106,169	275	203
*SP1QXK	*	98,747	249	191
*SN4W	*	97,709	260	199
*SP3ZIR	*	97,152	242	192
			(OP: SQ3JPV)	
*SQ7VO	*	87,768	210	184
*SP4FMD	*	86,905	239	191
*SQ8MHH	*	84,280	204	172
*SP2DKI	*	82,340	223	179
*SP9CLO	*	77,526	220	177
*SQ8ØJMC	*	63,244	192	163
			(OP: SQ8JMC)	
*SP6NVK	*	61,600	215	160
*SP8UFB	*	57,960	149	140
*SQ2HRJ	*	56,398	199	163
*SP7TES	*	55,062	160	126
*SP5HFS	*	51,646	156	119
*SP7QHR	*	49,440	146	120
*SQ3OGZ	*	47,784	172	132
*SP6OWY	*	39,438	149	126
*SQ3HMM	*	36,480	124	114
*SP3BVI	*	36,176	175	119
*SQ2D	*	33,060	139	114
*SP7FDV	*	33,000	144	120
*SP8ØPZK	*	21,056	98	94
			(OP: SP2UKB)	
*SP4ØEIY	*	19,995	101	93
*SP3HC	*	19,400	110	100
*HF8ØBUJ	*	14,532	95	84
*SP5BMU	*	12,852	94	84
*SQ3AUA	*	11,968	64	64
*SN1A	*	9,417	80	73
			(OP: SP1EG)	
*SQ7OTB	*	8,968	62	59
*SP1MWN	*	7,301	54	49
*SP8ONB	*	5,980	51	46
*SP3UQG	*	3,486	42	42
*SP6OPZ	*	3,071	38	37

*SQ7QM	*	2,430	32	30
*SP6IEQ	*	2,160	37	36
*SQ9NKK	*	2,144	32	32
*SP6IHE	*	351	10	9
*SQ1EIX	*	306	9	9
*SQ6STI	*	176	8	8
*SP6BEN	*	96	6	6
***SP6EF**	**28**	**928**	**20**	**16**
*SQ4CTS	*	3	1	1
***SP2AYC**	**21**	**25,721**	**108**	**89**
*SP9CLU	*	14,105	77	65
*SP4AVG	*	6,716	56	46
*SP6GTN	*	5,440	48	40
*SP9EWM	*	5,375	46	43
*SQ3WW	*	280	10	10
***SP3NNH**	**14**	**291,384**	**422**	**342**
*SP4LVK	*	146,640	325	235
*SP8CGU	*	115,104	300	218
*SN3C	*	60,372	197	156
			(OP: SP3ASN)	
*SQ5NBE	*	29,160	153	135
*SP5DRE	*	25,500	129	102
*SQ9NKR	*	108	9	9
***SO6V**	**7**	**1,279,850**	**1020**	**550**
			(OP: SP6DVP)	
*SQ2NNN	*	314,901	437	327
*SP2GJI	*	207,350	343	275
*SP9EML	*	138,567	266	221
*SP5X	*	74,191	194	169
*SP8BQL	*	65,526	183	163
*SQ5ABF	*	13,515	90	85
*SQ4G	*	5,661	52	51
***SP9H**	**3.7**	**366,825**	**539**	**335**
*SN1C	*	333,268	473	338
			(OP: SP1RFC)	
*SP4SHD	*	185,456	334	268
*SN5Q	*	63,896	203	163
			(OP: SQ5RDX)	
*SP5LCG	*	48,807	177	153
*SP8QJM	*	23,735	132	101
*SO7O	*	2,208	33	32
			(OP: SP7DQR)	
***SN5J**	**1.8**	**4,368**	**50**	**48**
			(OP: SP5JXK)	
Portugal				
CR6K	**A**	**7,949,880**	**2925**	**1020**
			(OP: CT1CJJ)	
CT1ILT	*	15,228	86	81
CT4NH	**28**	**52,440**	**161**	**120**
***CT1DIN**	**A**	**77,900**	**217**	**164**
*CT1EGF	*	46,565	160	139
***CT1EGW**	**21**	**162,534**	**263**	**263**
*CT2JBG	*	85,140	205	180
*CT1ENQ	*	2,030	36	35
***CT1EEK**	**14**	**31,020**	**137**	**132**
***CR5COK**	**7**	**281,014**	**370**	**298**
			(OP: CT1CQK)	
Romania				
YO4DW	**A**	**755,725**	**767**	**475**
YO4AUP	*	227,305	390	269
YO7CWP	*	117,448	286	212
YO9HP	**21**	**639,984**	**621**	**398**
YO2BPZ	**14**	**4,182**	**51**	**51**
***YO3CZW**	**A**	**1,904,643**	**1448**	**657**
*YO3APJ	*	1,554,333	1074	627
*YO7ARY	*	354,861	532	351
*YO5OEF	*	325,260	364	260
*YO5AIR	*	285,498	473	306
*YO8RFS	*	266,910	457	310
*YO4US	*	248,640	411	296
*YO3ZA	*	240,786	382	273
*YO5FMT	*	234,232	403	268
*YO9DL	*	176,056	328	236
*YO9FNP	*	165,438	401	273
*YO5BQQ	*	85,491	213	177
*YO8SAI	*	82,973	243	209
*YO2LIM	*	77,532	198	156
*YO3YB	*	73,584	196	168
*YO7NW	*	73,094	214	161
*YO5DGE	*	62,328	186	168
*YO5CBN	*	55,198	188	143
*YO9ION	*	41,832	165	126
*YO9IKW	*	31,776	112	96
*YO6HSU	*	30,345	119	105
*YO7AWZ	*	21,630	127	105
*YO3FOM	*	19,401	97	87
*YO9HG	*	19,224	119	108
*YO5OET	*	9,052	67	62
*YO8RKP	*	7,497	69	63
*YO2MHJ	*	7,446	54	51
*YO2LSP	*	3,240	37	36
*YO8OH	*	1,450	30	29
*YO5CZZ	*	630	22	10
*YO9ICT	*	330	10	10
***YO2AOB**	**28**	**22,244**	**105**	**83**
*YO2LHD	*	936	19	18
*YO2LEE	*	144	8	8
***YO2RR**	**21**	**396,976**	**468**	**344**
*YO5BRZ	*	179,214	293	238
*YO2IS	*	30,555	131	97
*YO4FTC	*	11,952	89	72
*YO9KPI	*	1,176	29	21
			(OP: YO9BHI)	
***YO4WZ**	**14**	**116,894**	**326**	**277**
*YO9CWY	*	78,568	257	184
***YO5KTK**	**7**	**238,246**	**345**	**278**
			(OP: YO5PJF)	
*YO9AGI	*	164,498	295	233
*YO8RZJ	*	114,256	234	193
*YO2MJZ	*	35,910	123	114
*YO5OLD	*	28,034	111	107
*YO8RFJ	*	24,823	108	103
*YO2OSV	*	11,620	74	70
*YO9HJY	*	5,640	48	47
***YO5OPH**	**3.7**	**71,649**	**192**	**171**
***YO5ALI**	**1.8**	**51,330**	**168**	**145**
San Marino				
T77GO	**14**	**4,028,754**	**2367**	**887**
			(OP: IZ4AKS)	
***T78A**	**3.7**	**921,564**	**922**	**483**
			(OP: IZ7KHR)	
Sardinia				
***IS8DFC**	**14**	**14,948**	**104**	**101**
Scotland				
GM4YXI	**A**	**6,213,429**	**3021**	**971**
GM3WOJ	**14**	**1,128,332**	**1063**	**548**
***GM4W**	**A**	**276,624**	**454**	**306**
			(OP: GM8NTL)	
*GMØNBM	*	158,735	364	265
*MMØVTV	*	114,056	296	212
***GMØIIO**	**21**	**22,848**	**127**	**102**

Serbia				
YU1PJ	**A**	**349,727**	**529**	**329**
YT7DQ	*	246,528	447	288
YT7W	*	211,735	358	265
YT3H	*	119,310	236	194
YU7ZZ	**28**	**28,028**	**131**	**91**
YUØW	**21**	**198,453**	**345**	**249**
YT8A	**7**	**8,977,007**	**2395**	**1027**
			(OP: YU1EA)	
YU9DX	**3.7**	**181,056**	**350**	**246**
***YT3M**	**A**	**1,058,616**	**938**	**507**
			(OP: YT1NT)	
*YU2A	*	867,790	804	506
*YT9C	*	441,504	601	378
*YT2VPA	*	300,812	477	314
*YU5CW	*	9,860	94	85
***YU4ØMM**	**28**	**1,160**	**21**	**20**
			(OP: YU1MM)	
***YT2B**	**21**	**243,005**	**376**	**265**
*YU7KM	*	83,106	196	162
*YT7EE	*	20,493	106	81
***YU7ZEX**	**14**	**389,856**	**666**	**393**
*YT2SMS	*	36,105	178	145
*YT7IM	*	2,698	40	38
***YU7YZ**	**3.7**	**324,160**	**444**	**320**
Sicily				
IR9Z	**A**	**369,402**	**684**	**386**
			(OP: IT9VCE)	
IR9W	**28**	**176,170**	**334**	**223**
			(OP: IWØHBY)	
IT9YVO	*	17,538	94	74
IT9FXY	**21**	**52,481**	**167**	**143**
***IT9YAO**	**A**	**125,103**	**304**	**223**
***IT9LED**	**21**	**56,672**	**206**	**161**
*IT9IMJ	*	28,441	135	119
***IW9FI**	**14**	**172,453**	**433**	**313**
*IT9MYY	*	71,839	229	199
*IT9AXQ	*	432	18	18
Slovakia				
OM4J	**21**	**30,875**	**118**	**95**
			(OP: OM4JD)	
OMØWR	**7**	**992,104**	**880**	**488**
OM4KK	**3.7**	**35,306**	**143**	**127**
***OM5X**	**A**	**1,435,215**	**1058**	**587**
			(OP: OM5XX)	
*OM4DN	*	400,624	589	343
*OM3IAG	*	245,840	387	280
*OM4DA	*	119,973	292	203
*OM7YC	*	105,732	246	198
*OM3TLE	*	29,869	150	119
*OM4ADR	*	17,195	103	95
*OM3KXR	*	10,248	70	61
*OM1II	*	8,532	60	54
*OM8AHI	*	861	22	21
***OM3TB**	**14**	**21,400**	**143**	**107**
***OM6TX**	**7**	**74,290**	**197**	**170**
***OM8DD**	**3.7**	**209,862**	**367**	**267**
*OM4FM	*	80,456	225	178
Slovenia				
S5ØA	**A**	**9,376,818**	**2755**	**1023**
S55O	*	266,602	364	274
S59T	*	364	17	13
S59EIJ	*	336	16	12
S57S	**28**	**182,281**	**366**	**227**
S53MM	**21**	**2,755,927**	**1495**	**719**
S52OP	*	139,840	278	190
S55T	**14**	**4,806,308**	**2409**	**884**
			(OP: S55OO)	
S55M	**7**	**1,771,289**	**997**	**611**
S53M	*	1,338,120	709	472
			(OP: S51FB)	
S51D	*	383,760	489	328
S53DU	*	1,800	31	30
S57C	**1.8**	**18,009**	**97**	**87**
***S51F**	**A**	**1,613,372**	**1058**	**596**
*S52WW	*	1,028,970	892	515
*S58MU	*	388,815	557	345
*S51ST	*	280,280	489	286
*S58RU	*	106,944	259	192
*S52Q	*	37,403	172	113
***S56ZZZ**	**21**	**10,614**	**79**	**58**
***S57U**	**14**	**240,036**	**418**	**332**
***S57DX**	**7**	**2,263,800**	**1218**	**686**
*S57LR	*	327,600	432	315
*S56DX	*	561	17	17
***S53EA**	**3.7**	**1,146,334**	**987**	**518**
Spain				
AN1A	**A**	**269,463**	**413**	**313**
			(OP: EA1AST)	
EA1VIC	*	11,214	71	63
***EA1EA**	**A**	**668,640**	**625**	**420**
*EA1DKV	*	518,199	556	383
*EA1JO	*	440,781	558	407
*EA1ET	*	196,384	364	272
*EA2CE/1	*	23,166	116	99
*EC1AE	*	17,756	96	92
*EC1CSV	*	9,010	59	53
***EE1E**	**21**	**490,000**	**593**	**392**
			(OP: EA1GFP)	
*AO1B	*	264,579	426	293
			(OP: EA1YB)	
*EH1K	*	181,632	331	258
*EA1YG	*	10,416	69	62
***EA1FAU**	**14**	**65,322**	**188**	**171**
AN2K	**A**

*EA3DUR	*	3,230	45	38
*EB3CML	*	2,044	29	28
*EA3FHP	*	1,334	30	29
*EA3GOD	*	3	1	1
***AO3K**	**28**	**19,099**	**100**	**71**
			(OP: EA3GHZ)	
***EC3PL**	**21**	**1,040**	**28**	**26**
***EA3EGB**	**3.7**	**130,505**	**246**	**215**
***EA3AKA**	**1.8**	**35,178**	**138**	**123**
EA4EER	**A**	**1,660,714**	**1191**	**638**
EA4ETW	*	1,396,200	1081	600
EE4E	*	170,275	324	245
EA4KD	**3.7**	**993,446**	**727**	**479**
***EA4EJR**	**A**	**95,348**	**241**	**197**
*EA4DTV	*	7,760	49	40
*EA4CU	*	1,680	29	28
***AO4Y**	**14**	**43,068**	**156**	**148**
*EA4IS	*	14,006	99	94
*AN4A	*	4,554	49	46
			(OP: EA4CWN)	
***EA4SG**	**7**	**31,878**	**101**	**99**
***EA5FWW**	**A**	**160,284**	**284**	**222**
*EE5O	*	68,370	193	159
			(OP: EA5HJO)	
*EA5FHC	*	67,320	238	187
*EB5CNK	*	66,132	200	167
*AN5W	*	23,300	108	100
*EA5AX	*	21,988	100	92
*EA5XA	*	6,302	48	46
*EB5GIV	*	48	5	4
***EA5HJO**	**21**	**75,359**	**202**	**179**
***EE5N**	**14**	**6,840**	**72**	**72**
***EA5EOR**	**7**	**309,228**	**360**	**292**
*EE5W	*	85,008	188	168
***EB5EKT**	**3.7**	**9,150**	**62**	**61**
EB7CIN	**A**	**167,013**	**311**	**241**
EC7AKV	**14**	**621,264**	**907**	**516**
EA7ATX	**7**	**676,324**	**563**	**418**
***EE7R**	**A**	**1,008,458**	**837**	**506**
*AM7C	*	90,093	227	177
			(OP: EA7HMD)	
*AN7HE	*	57,300	190	150
*EA7CWA	*	8,680	57	56
*EA7LU	*	5,805	51	45
*EC7DDZ	*	2,331	38	37
*EA7VJ	*	48	4	4
***EA7GV**	**28**	**16,170**	**86**	**70**
*EA7IBK	*	1,020	20	17
***EF7A**	**21**	**130,188**	**383**	**228**
*AO7T	*	102,335	255	211
			(OP: EA7KJ)	
***EA7EPF**	**14**	**9,035**	**66**	**65**

Sweden

SM6BGG	**A**	**1,158,066**	**944**	**546**
SE6Y	*	547,872	674	416
			(OP: SM6DED)	
SM6FJY	*	391,716	503	351
SMØBSO	*	259,050	417	314
SM7DQV	*	146,250	300	234
SLØW	*	104,954	240	194
			(OP: SMØAJU)	
SI3A	*	66,394	226	178
			(OP: SM3LIV)	
SD3A	*	4,576	45	44
			(OP: SM3FJF)	
SA7AUW	*	2,133	27	27
SA1A	**28**	**125**	**7**	**6**
			(OP: SM1TDE)	
SM5CEU	**21**	**113,775**	**239**	**205**
SM6AHU	**14**	**6,344**	**65**	**61**
***SM3C**	**A**	**606,582**	**681**	**423**
			(OP: SM5CCT)	
*7S5S	*	550,630	684	410
			(OP: SM5CSS)	
*SM7CQY	*	294,705	452	333
*SM5ACQ	*	250,368	431	326
*SM7NGH	*	220,206	381	294
*SE5S	*	213,885	365	291
*SF3A	*	212,240	415	280
			(OP: SM3CER)	
*SM5DXR	*	188,576	403	284
*SGØM	*	180,730	354	265
*SM6BSK	*	161,505	291	291
*SI5S	*	134,620	279	254
			(OP: SM5NVF)	
*SM7UFR	*	115,758	293	218
*SM3EAE	*	114,205	335	251
*SM3X	*	89,648	256	208
			(OP: SM3CVM)	
*SJ7M	*	82,510	228	185
*SM5FQQ	*	77,430	220	174
*SM7DXQ	*	74,698	192	169
*SM5CNQ	*	65,860	200	178
*SM5ISM	*	64,480	194	155
*SM7S	*	56,943	185	171
*SM4WKT	*	56,658	174	142
*SE6C	*	56,206	197	157
			(OP: SM6CDN)	
*SM6C	*	44,422	144	133
*SE7A	*	43,358	180	133
			(OP: SM7YII)	
*SAØBJL	*	39,732	177	154
*SMØHBV	*	32,912	156	136
*SM7GUY	*	14,878	98	86
*SE6N	*	12,402	96	78
			(OP: SA6AXR)	
*SM3SJN	*	10,032	84	76
*SA6AVB	*	6,960	57	60
*SMØBDS	*	200	10	10
***SM1CXE**	**28**	**48**	**4**	**4**
***SM6FKF**	**21**	**18,387**	**97**	**81**
*SA6AIN	*	9,204	71	59
*SK4UW	*	8,700	74	50
*SM7RPU	*	5,456	47	44
***SM5DQE**	**14**	**51,100**	**204**	**175**
*SM7DAY	*	38,135	164	145
*SA7J	*	9,794	91	83
			(OP: SM7XGG)	
*SE5X	*	754	26	26
***SM6NJK**	**3.7**	**51,340**	**166**	**151**
*SA6BET	*	1,056	22	22

Switzerland

HB9EFJ	**A**	**243,695**	**420**	**305**
HB9DHG	**21**	**53,460**	**161**	**135**
HB9LCW	**7**	**170,910**	**232**	**211**
***HB9WDY**	**A**	**404,840**	**551**	**349**
*HB9RJG	*	67,860	209	174
*HB9BGF	*	24,675	120	105
***HB9TSU**	**14**	**23,296**	**125**	**112**
*HB9TSA	*	48	4	4

Ukraine

US5D	**A**	**4,429,635**	**1906**	**871**
			(OP: UT7DX)	
UW1M	*	2,358,138	1453	758
			(OP: UR5MW)	
UW1G	*	1,153,866	1114	581
			(OP: UY5HF)	
UZØU	*	1,039,806	925	549
			(OP: UY5ZZ)	
UW8SM	*	917,188	840	491
UT6EE	*	717,991	708	437
US3IZ	*	642,180	692	420
UR7EQ	*	519,904	692	422
UR5RP	*	253,428	423	294
UX4U	*	197,820	285	252
UX3HA	*	141,648	338	227
UR7EU	*	86,478	218	174
UR4EI	*	71,231	196	163
UX7CQ	*	59,782	198	142
UX7LL	*	20,608	102	92
UW2Q	*	17,136	96	84
			(OP: UR6QS)	
UZ5Q	*	1,254	20	19
			(OP: UY5QZ)	
US8SY	*	1,155	22	21
UR6MX	**21**	**250,588**	**409**	**316**
UT7LA	*	225,446	396	299
US5UO	*	184,194	312	243
UT2IW	*	11,098	70	62
UW2I	**14**	**5,439,927**	**2765**	**1077**
			(OP: UT2IJ)	
UW5ZM	*	2,743,612	1963	838
UT7QL	*	549,822	743	494
UR5ZMK	*	100,570	284	226
UR3CKR	*	45,633	201	159
UY4WWA	*	24,200	116	100
			(OP: UT1WZ)	
UZ7M	**7**	**286,635**	**393**	**291**
			(OP: UT9MZ)	
UZ7U	*	97,637	181	163
			(OP: UT3UA)	
UT3SA	**3.7**	**735,588**	**762**	**441**
UY3AW	*	123,388	263	218
UR5AKU	*	35,872	123	118
UT4IR	**1.8**	**113,565**	**264**	**201**
***UX1UX**	**A**	**1,373,568**	**1132**	**584**
*EN7U	*	1,078,350	950	553
			(OP: UR4UDI)	
*UY2UQ	*	637,686	702	441
*UR5ETN	*	549,168	676	408
*UX7U	*	542,840	649	410
*UZ5U	*	475,728	698	424
			(OP: UT4UO)	
*UT3UZ	*	469,581	623	379
*UT2IO	*	396,306	575	369
*UR5AMK	*	394,257	567	339
*UT3EG	*	379,440	562	340
*US6EX	*	316,049	450	317
*UW7M	*	293,342	509	322
			(OP: UR3MP)	
*UT5PY	*	281,135	430	295
*UT1IM	*	246,636	413	306
*UV5EEO	*	219,929	424	289
*US5ISV	*	215,670	388	273
*UR4IXM	*	208,680	397	282
			(OP: US6IPD)	
*US2IW	*	201,828	412	278
*UT5JCE	*	182,000	340	250
*UX2MF	*	174,243	335	241
*UT5ECZ	*	166,668	323	258
*UR5WHT	*	137,710	310	235
*UT4XU	*	115,444	267	196
*US5IND	*	113,832	283	216
*UY5TE	*	97,920	274	204
*US8IJ	*	80,538	238	186
*UX7FC	*	63,690	210	165
*UR7CT	*	50,660	175	149
*UY1U	*	49,982	152	134
			(OP: UT5UN)	
*UT5ULX	*	45,792	178	144
*UR5XMM	*	42,390	157	135
*US7IM	*	39,824	181	152
*UU2JA	*	32,640	142	120
*UTØEZ	*	22,841	93	91
*UX2KA	*	22,000	94	88
*UT2M	*	20,889	123	99
			(OP: UR2ML)	
*UYØCA	*	20,246	120	106
*UT8IM	*	17,424	109	99
*UX2MK	*	16,080	89	80
*URØEG	*	11,315	81	73
*US2IHS	*	11,154	71	66
*US7IB	*	7,975	63	55
*UX5IB	*	5,757	60	57
*UY2RZ	*	1,479	29	29
*UT2AB	*	377	13	13
*UX3IO	*	105	7	7
*UU4JQE	*	52	4	4
***UT8EU**	**28**	**3,136**	**40**	**32**
*UT5EO	*	3	1	1
***UT5LO**	**21**	**176,580**	**337**	**270**
*UR8QR	*	101,871	253	189
*UT3RN	*	55,413	166	141
*UR7EC	*	30,030	116	110
*UT3EK	*	27,089	127	103
*US7IA	*	25,520	140	116
*UR5EPG	*	1,377	28	27
***US8IBS**	**14**	**303,408**	**573**	**387**
*US1PM	*	138,301	328	251
*UT4MW	*	14,105	99	91
***UR7TZ**	**7**	**803,472**	**758**	**456**
*UU5JFP	*	648,372	605	426
*UR3IJI	*	193,936	324	248
*US7WW	*	98,658	197	174
***UW3M**	**3.7**	**14,104**	**91**	**86**
			(OP: US2MT)	
***UT4EK**	**1.8**	**55,200**	**178**	**150**
*USØQG	*	10,787	76	67
*UR5ZLK	*	1,680	30	30

Wales

GW7X	**A**	**10,124,040**	**3254**	**1059**
			(OP: GW4BLE)	
MW1LCR	*	674,352	714	446
MWØMWZ	*	70,092	210	177
***GW8NBI**	**A**	**254,400**	**427**	**300**
*MW1MDH	*	91,980	275	219
*2WØXTP	*	74,753	211	181
*MWØIDX	*	19,251	101	93
***GW4EVX**	**7**	**106,183**	**240**	**197**

OCEANIA

Australia

VK2APG	**A**	**2,827,968**	**1378**	**618**
VK2ACC	*	44,308	119	106
VK2WAR	**7**	**28,500**	**88**	**76**
***VK2HBG**	**A**	**10,502**	**66**	**59**
*VK2WAY	*	8,234	51	46
***VK2WTT**	**14**	**3,220**	**38**	**35**
VK3IO	**A**	**589,356**	**461**	**306**
VK3TDX	*	511,056	486	312
VK3TZ	*	63,707	162	133
***VK3LM**	**A**	**39,168**	**110**	**102**
*VK3MDX	*	31,720	111	104
***VK3VTH**	**7**	**54,614**	**109**	**94**
*VK3ZGP	*	6	1	1
VK4GH	**A**	**73,580**	**168**	**130**
VK4ZD	**28**	**57,360**	**174**	**120**
***VK4BL**	**A**	**169,740**	**259**	**207**
*VK4ATH	*	156,800	241	180
*VK4XES	*	62,500	142	125
*VK4HEC	*	3,420	41	38
***VK4FJ**	**21**	**330,561**	**412**	**297**
*VK4EJ	*	168,639	309	201
VK3DXI/6	**28**	**73,502**	**175**	**143**
VK6DXI	**3.7**	**4,557**	**39**	**31**
VK2DXI/6	**1.8**	**60**	**10**	**4**
***VK6FDX**	**A**	**56,375**	**179**	**125**
VK7ZE	**A**	**3,635,620**	**1638**	**740**
***VK7AD**	**7**	**12,600**	**50**	**45**
***VK8PDX**	**A**	**625,975**	**602**	**343**

Brunei

***V85TX**	**A**	**203,792**	**378**	**188**
***V85ZX**	**14**	**31,525**	**139**	**97**
*V88AVE	*	28,530	130	90

East Malaysia

***9M6YBG**	**28**	**6,109**	**62**	**41**

French Polynesia

FO8RZ	**21**	**795,146**	**787**	**346**

Guam

KG6DX	**A**	**3,162,870**	**1693**	**622**
KH2JU	*	1,493,163	1163	411
WH2D	*	174,912	335	192
			(OP: K3UOC)	
WH2X	**21**	**1,585,857**	**1179**	**481**

Hawaii

KH7XS	**A**	**20,461,584**	**4782**	**1084**
WH7V	*	17,096,958	4337	1098
			(OP: KH6ND)	
NH7A	*	8,723,970	2961	790
KH6QJ	**28**	**23,016**	**114**	**84**
NH6P	**21**	**5,199,790**	**2480**	**730**
***KH7T**	**A**	**900,496**	**747**	**368**
*NH6WZ	*	173,524	275	188
*KH6CO	*	18,778	93	82
			(OP: KH6OO)	
*WH6C	*	16,120	72	65
***NH7PE**	**28**	**2,640**	**34**	**30**

Indonesia

YB1AR	**A**	**1,708,754**	**1035**	**566**
YB4IR	*	1,419,912	878	481
YC1LA	**21**	**567,853**	**580**	**361**
YB0MWM	*	242,968	356	251
YB1FWO	**14**	**128,543**	**231**	**191**
YC6EN	**7**	**46,930**	**99**	**95**
YB8FL	*	26,268	80	66
***YB1ALL**	**A**	**89,012**	**192**	**154**
*YB1CYD	*	65,380	181	140
*YC2FAJ	*	17,829	70	63
*YB1AQD	*	2,262	30	29
***YB3IZK**	**28**	**25,536**	**107**	**84**
*YC2LEV	*	8,600	67	50
*YB1UUN	*	6,624	52	48
***YB2DX**	**21**	**1,733,303**	**1164**	**527**
*YB8EL	*	511,280	543	332
*YB5OUB	*	416,295	456	319
*YC5VB	*	149,326	276	197
*YC2BBY	*	126,000	266	168
*YC2USI	*	30,800	112	100
*YB1BGI	*	27,324	104	99
*YB2OK	*	14,454	86	73
*YC1DYY	*	7,300	53	50
*YC3TKH	*	2,976	34	31
***YB1WR**	**3.7**	**70**	**5**	**5**

Mariana Islands

KHØUA	**A**	**3,368,263**	**1866**	**551**
***WHØ/WH7ZJ**	**28**	**270,750**	**621**	**150**
***WHØS**	**21**	**46,325**	**146**	**109**
*WHØ/WN1Y	*	7,215	66	39

New Zealand

ZL2UO	**A**	**153,608**	**239**	**182**
ZL4IG	*	77,616	142	126
ZL4NR	*	50,697	149	129
ZL1ALZ	**21**	**60,490**	**193**	**115**
***ZL1AAO**	**A**	**115,596**	**235**	**169**
*ZL2MM	*	74,772	181	134
*ZL4JB	*	41,580	101	90
*ZL3DXT	*	7,680	57	48

Philippines

DU1BP	**A**	**2,314,564**	**1193**	**482**
4H1T	*	2,056,968	1260	428
			(OP: DU1IVT)	
DU1AV	**14**	**323,204**	**493**	**238**
***DV1JM**	**A**	**1,548,800**	**1061**	**440**
*DU1EE	*	268,565	406	209
*DU1EG	*	167,494	335	166
***DV1KWH**	**21**	**137,455**	**271**	**185**
*DW1VKT	*	19,007	99	83
***DU1JI**	**14**	**86,360**	**229**	**136**

South Cook Islands

***E51COF**	**A**	**988,900**	**835**	**341**
			(OP: NL8F)	

Tonga

***A33A**	**21**	**5,831**	**50**	**49**

SOUTH AMERICA

Argentina

L21D	**A**	**4,118,794**	**1751**	**782**
			(OP: LU9ESD)	
LU7MCJ	*	3,483,648	1621	768
L33M	*	2,991,021	1508	699
			(OP: LU3MAM)	
LQ5H	**28**	**3,180,192**	**1766**	**633**
			(OP: LU3HS)	
LP2F	**21**	**10,238,718**	**3126**	**1126**
			(OP: LU1FDU)	
LW3EWZ	**7**	**8,190**	**47**	**45**
***LO7H**	**A**	**3,234,458**	**1570**	**709**
			(OP: LU7HW)	
*LW1DTZ	*	1,951,274	1170	598
*LW6DG	*	823,446	735	414
*LU3OR	*	751,026	692	398
*L60DK	*	517,470	568	367
			(OP: LW4EF)	
*LU8DY	*	98,384	214	176
*LU5CAB	*	94,428	222	183
*LU3FLV	*	81,774	211	154
*LU9FFZ	*	81,486	206	162
*LU2EQF	*	66,495	208	155
*LR1A	*	45,264	156	123
*LU9EY	*	26,300	127	100
*LU6KA	*	2,250	35	30
***LU6FOV**	**28**	**988,189**	**812**	**439**
*LU2UE	*	710,240	684	386
*LW7H	*	597,688	610	364
			(OP: LW7HT)	
*LU6FAH	*	501,067	578	329
*LTØD	*	463,188	534	319
*LW6DAK	*	129,886	269	202
*LW9ETQ	*	52,668	171	114
*L73DX	*	33,813	141	117
*LO7D	*	14,742	85	78
			(OP: LW1DRH)	
*LU6EVD	*	7,616	62	56
***LU5EVK**	**21**	**45,125**	**147**	**125**
*LU4DX	*	13,797	75	63
*LW5EE	*	6,468	51	49
*LU7DSU	*	4,095	41	39
***LU1JHF**	**7**	**656**	**19**	**16**

Aruba

P41M	**A**	**15,667,560**	**4400**	**1080**
			(OP: DK1MM)	
***P49Y**	**A**	**13,037,382**	**3773**	**1026**
			(OP: AE6Y)	
*P43E	*	1,796,250	1311	479

Bolivia

CP1FF	**14**	**23,688**	**101**	**94**

Brazil

PY2ZXU	**A**	**6,614,316**	**2345**	**939**
PY3DX	*	4,872,960	1955	864
PP1CZ	*	4,417,380	1879	828
PS2T	*	3,831,902	1826	731
			(OP: PY2DJ)	
PY1WS	*	248,519	327	257
PY1SX	*	191,180	299	242
PY2KP	*	90,856	221	164
PP5JY	*	63,910	175	154
ZW5V	*	56,942	155	142
			(OP: PY5KA)	
PW5G	**28**	**4,673,802**	**2130**	**771**
PR5Z	*	321,677	435	271
PP5JAK	*	12,282	71	69
ZX5J	**21**	**16,746,977**	**4205**	**1369**
			(OP: PP5JR)	
PT1A	*	5,087,700	1973	900
			(OP: PY1ZV)	
PR2B	**14**	**4,997,475**	**2033**	**855**
			(OP: PY2LSM)	
PY6HD	*	667,890	576	410
PY1NB	**7**	**1,441,552**	**612**	**427**
PP5TR	*	575,424	389	296
ZV9T	*	35,773	94	83
			(OP: PT9ZE)	
PV8AA	**3.7**	**106,788**	**147**	**132**
			(OP: PV8DX)	
***PY2NY**	**A**	**3,358,080**	**1599**	**720**
*PY2ZR	*	609,936	592	393
*PY3FOX	*	462,213	483	323
*PS2Y	*	400,520	461	323
*PY2XTA	*	181,930	313	230
*PY7VI	*	178,738	306	238
*PY5AP	*	104,144	246	184
*PY3APY	*	39,772	149	122
*PR7AYE	*	37,840	144	110
*PY2OX	*	33,600	126	112
*PY1CX	*	26,312	133	104
*PY1RY	*	20,698	97	79
*PY2MPG	*	17,091	92	81
*PU3KNG	*	14,924	90	82
*PY7GK	*	14,625	78	75
*PU5UAI	*	12,996	88	76
*PV8RF	*	12,025	78	65
*PY2AE	*	10,075	69	65
*PV8ADI	*	3,256	45	44
*PY3TIO	*	1,885	32	29
*PY2DXX	*	1,856	29	29
*PP7LL	*	912	24	24
*PV8AZ	*	714	17	17
*PY3OZ	*	570	19	19
***PU2LEP**	**28**	**979,473**	**811**	**443**
*PU5AAD	*	158,067	305	193
*PU2KLM	*	140,805	288	189
*PY1JR	*	89,916	220	177
*PU8TEP	*	70,810	194	146
*PY2HAM	*	60,417	171	147
*PU2TEA	*	46,609	159	127
*PU2UTC	*	28,749	128	111
*PU4HUD	*	6,099	62	57
*PU1LND	*	5,616	65	54
*PU2RKP	*	5,400	54	50
*PU2UJG	*	5,292	61	54
*PU2YMH	*	330	16	15
*PU5ICE	*	112	8	8
*PU7MMF	*	49	7	7
***ZV2C**	**21**	**3,155,178**	**1484**	**741**
			(OP: PY2CX)	
*PY2NA	*	1,193,560	785	530
*PY2BRA	*	437,844	478	321
*PY3FBI	*	126,250	237	202
*PV8ABC	*	4,815	48	45
*PY2TI	*	493	17	17
***PR7AR**	**14**	**49,288**	**147**	**122**
*PP5JN	*	1,775	26	25
***PR7AB**	**7**	**12,500**	**55**	**50**
*PR7FMT	*	2,106	27	26
*PY3KIM	*	1,863	30	27
***PY6KY**	**3.7**	**1,156**	**17**	**17**
*PU1MKZ	*	460	10	10

Chile

CE2WWF	**A**	**3,159**	**43**	**39**
CE3DNP	**14**	**312,312**	**411**	**273**
***CE4UJU**	**A**	**35,598**	**143**	**102**
*3G7A	*	1,643	38	31
***CE2WZ**	**28**	**1,295,442**	**975**	**474**
*XQ4CW	*	1,827	31	29
***CE1UGE**	**21**	**290,640**	**389**	**280**
***CA3KHZ**	**7**	**1,704**	**25**	**24**

Colombia

HK3Q	**A**	**11,322**	**55**	**51**
HK1KYR	**1.8**	**44,814**	**103**	**77**
***HK1NK**	**3.7**	**579,348**	**386**	**266**

Ecuador

HC2GF	**21**	**1,497,948**	**1087**	**516**
***HC2AQ**	**28**	**1,145,700**	**1007**	**402**
***HC7AE**	**21**	**11,288**	**79**	**68**

Netherlands Antilles

***PJ2/OH1VR**	**21**	**3,684,951**	**1676**	**747**

Paraguay

***ZP8VAO**	**21**	**652,360**	**602**	**376**

Suriname

PZ5RA	**A**	**7,150,616**	**2491**	**913**

Uruguay

CX4DX	**28**	**1,528,520**	**1053**	**515**
CX1AV	**14**	**253,626**	**391**	**246**
***CX9AU**	**A**	**29,670**	**104**	**86**
***CX2CC**	**7**	**121,535**	**167**	**153**

Venezuela

YV5AMH	**A**	**5,875,815**	**2016**	**745**
4M5IR	*	3,120,548	1342	634
			(OP: YV5KG)	
YV5MSG	**3.7**	**232,047**	**240**	**171**
YW4V	*	34,550	81	77
			(OP: YV4DYJ)	
***YW5T**	**A**	**244,575**	**381**	**225**
			(OP: YV5JBI)	
***4M6M**	**28**	**95,885**	**255**	**151**
*YY1OKR	*	59,396	200	124
***YY1MTX**	**21**	**226,044**	**355**	**234**
*YV4CW	*	67,598	186	146
*YY7OMF	*	1,595	30	29
***4M1F**	**14**	**315,248**	**406**	**272**
			(OP: YV1JGT)	
*YV5ER	*	3,196	34	34
***YY4CVI**	**7**	**120,263**	**158**	**143**

QRP

YW2LV	**A**	**1,647,512**	**1139**	**404**
			(OP: YV5YMA)	
HZ2H	*****	**1,525,591**	**992**	**523**
			(OP: 5B4MF)	
TI5N	*****	**1,467,531**	**1258**	**481**
			(OP: W8QZA)	
OK2BYW	*****	**984,966**	**864**	**501**
RX1CQ	*****	**926,144**	**935**	**499**
OK7CM	*	851,851	798	481
UA9BA	*****	**832,906**	**569**	**397**
NDØC	*****	**620,610**	**657**	**411**
YO8WW	*****	**515,424**	**596**	**416**
CT7/LZ3ND	*****	**483,612**	**633**	**422**
N2WN/4	*****	**457,600**	**517**	**352**
DL4VCG	*****	**370,620**	**505**	**355**
OK1DVM	*	337,289	465	331
IZ1JLF	*****	**292,940**	**425**	**302**
NAØCW	*	291,760	469	280
IZ1ANK	*	255,972	475	332
EA1GT	*****	**250,416**	**437**	**296**
KT8K	*****	**210,926**	**381**	**263**
PE2KP	*****	**205,506**	**391**	**294**
SP2DNI	*****	**185,234**	**370**	**262**
RN4HAB	*****	**178,432**	**394**	**272**
YO4AAC	*	177,636	354	262
RD4HD	*	161,944	343	248
4X6DK	*****	**155,220**	**232**	**199**
UT5UUV	*****	**150,104**	**331**	**232**
SP8LXE	*	128,336	268	208
LZ7H	*****	**123,857**	**322**	**211**
YU1LM	*****	**116,160**	**294**	**220**
RWØAA	*****	**104,139**	**226**	**189**
UX8ZA	*	103,950	283	210
RD3AJB	*****	**84,412**	**212**	**188**
SP2UUU	*	83,134	239	197
US2IZ	*	80,028	228	171
WA8WV	*	75,632	210	163
EA4FJJ	*****	**69,751**	**237**	**187**
HA7YS	*****	**65,790**	**210**	**153**
IZ3IBL	*	64,050	181	150
CT1ELF	*	62,328	202	168
I03R	*	57,420	194	165
			(OP: IN3UFW)	
EI4II	*****	**52,152**	**192**	**164**
K7HBN	*****	**51,984**	**166**	**152**
K9JWV/7	*	48,642	179	134
RZ6MP	*****	**48,504**	**187**	**141**
HA5BA	*	47,799	183	141
VX6BF	*****	**47,412**	**145**	**108**
			(OP: VE6BF)	
W2MFT	*****	**43,230**	**169**	**131**
IZ3NVR	*	41,230	153	133
SE6U	*****	**40,754**	**162**	**142**
			(OP: SM6KNL)	
SP9RQH	*	36,410	131	110
RW3AI	*	34,750	155	125
SA3BGM	*	29,160	152	135
DH5MM	*	28,638	115	111
F4FLF	*****	**25,086**	**134**	**113**
PD2ATG	*	24,038	130	119
KC5WA	*****	**23,970**	**132**	**102**
RV3BQ	*	20,952	110	97
DHØJAE	*	20,600	123	100
VA3RKM	*****	**18,160**	**95**	**80**
KD4OFG	*	17,856	108	93
UA3TW	*	17,577	109	93
EG4M	*	17,085	89	85
			(OP: EA

WW0WB	*	3,871	64	49
EA1TI	*	3,360	43	40
KF7FGN	*	2,550	31	30
AI9I	*	1,830	34	30
OK1DMP	*	1,680	26	24
ES1WST	*	**1,652**	**32**	**28**
IZ0MTF	*	1,350	31	30
RA3WCG	*	891	28	27
M3ZJO	*	**759**	**25**	**23**
IV3SGJ	*	300	12	12
N8QE	*	280	14	14
IK3XTY	*	144	10	9
VR2ZQZ	28	**71,749**	**295**	**157**
PU5ATX	*	**68,295**	**177**	**157**
LU3HFA	*	**17,928**	**95**	**83**
I5KAP	*	**15,276**	**82**	**67**
W6GMT/5	*	**3,924**	**39**	**36**
JA2MWV	*	**2,914**	**42**	**31**
YO4ATW	*	**2,850**	**34**	**30**
LZ2UW	*	**2,610**	**32**	**30**
VU2LYX	*	**2,320**	**34**	**29**
			(OP: VU2UR)	
CT9/M0BCT	*	**2,184**	**29**	**26**
JE1RZR	*	**1,782**	**31**	**27**
PU1KVA	*	500	23	20
EC4AA	*	**408**	**12**	**12**
YO5OHY	*	396	12	11
7N1QMC	*	3	1	1
KP2/NE1RD	21	**639,086**	**778**	**382**
JH7RTQ	*	**233,104**	**361**	**272**
I0UZF	*	**167,124**	**289**	**228**
FM5FJ	*	**63,448**	**155**	**154**
YO8DDP	*	**58,185**	**183**	**135**
IV3AOL	*	53,975	150	127
SP2EWQ	*	**36,297**	**119**	**111**
7N4WPY	*	**35,100**	**135**	**117**
JR1NKN	*	34,048	139	112
UN8PT	*	**31,694**	**128**	**106**
WA5FGV	*	**27,140**	**144**	**115**
K4XD	*	**17,680**	**98**	**85**
SQ9AOR	*	10,860	66	60
VU2PTT	*	**10,335**	**66**	**65**
SN7P	*	9,802	59	58
PY2IAX	*	**7,830**	**59**	**58**
KC9AMM	*	**5,141**	**57**	**53**
OK1AIJ	*	**5,084**	**50**	**41**
EI4GXB	*	**5,080**	**46**	**40**
7K1CPT	*	3,096	40	36
JK1TCV	*	2,574	36	33
RA9MU	*	**2,550**	**34**	**30**
XX9LQ	*	**2,449**	**38**	**31**
OM8JP	*	**2,366**	**36**	**26**
RK4PA	*	**2,100**	**42**	**42**
WC5C	*	**1,770**	**33**	**30**
			(OP: K5ANR)	
JG2CNS/3	*	**1,300**	**26**	**25**
VX3CW	*	**1,113**	**25**	**21**
			(OP: VE3CW)	
JO7FGZ/1	*	312	13	13
DO7XP	*	**15**	**3**	**3**
KD8MBI	*	12	3	3
TG9ADQ	14	**254,430**	**476**	**257**
YO8SSB	*	**189,685**	**395**	**295**
YT1CS	*	**76,960**	**268**	**208**
RC4AA	*	**69,696**	**237**	**192**
			(OP: RW4AO)	
SP4GFG	*	**64,529**	**232**	**173**
UA1CEC	*	**59,946**	**230**	**194**
SM6CRM	*	**52,668**	**200**	**171**
K3TW	*	**41,667**	**132**	**129**
SP3DRM	*	36,315	171	135
IZ5IIN	*	**25,960**	**134**	**118**
RK4FB	*	22,017	137	123
GW0VSW	*	**18,997**	**138**	**121**
SN2I	*	17,802	95	86
			(OP: SP2EWQ)	
HA8GK	*	**17,751**	**118**	**97**
IZ2QKG	*	16,650	128	111
IZ1PKV	*	12,672	98	96
LY3G	*	**12,635**	**101**	**95**
M0JBA	*	**12,348**	**112**	**98**
W0NV/6	*	**7,006**	**73**	**62**
W0MRZ	*	**5,270**	**72**	**62**
VU2UR	*	**4,400**	**49**	**44**
9A8MM	*	**4,293**	**59**	**53**
SQ3OGP	*	3,619	53	47
HR2/NP3D	*	931	20	19
ON3AD	*	**812**	**28**	**28**
XX9LB	*	**510**	**18**	**17**
JK3AHS	*	176	8	8
JA1POS	*	32	4	4
KI4NVL	*	8	2	2
HA6IAM	7	**255,187**	**380**	**289**
S57T	*	**177,840**	**294**	**247**
N1TM	*	**174,270**	**271**	**222**
LY5G	*	**147,941**	**296**	**239**
9A9L	*	**129,150**	**236**	**205**
OL4W	*	**123,170**	**271**	**218**
			(OP: OK1IF)	
ON3DI	*	**113,190**	**242**	**210**
WB7OCV	*	**65,331**	**181**	**153**
HQ9R	*	**19,140**	**65**	**58**
			(OP: WQ7R)	
BD4RDR	*	**5,670**	**52**	**45**
YO8DAR	*	**4,128**	**45**	**43**
YO6CFB	*	1,134	21	21
RZ3AIA	*	**540**	**15**	**15**
KE4HUD	*	**192**	**13**	**12**
DD1MAT	*	126	7	7
SP2QOT	3.7	**151,765**	**318**	**239**
SP8QLM	*	51,491	170	151
OM7SM	*	**17,978**	**96**	**89**
VG3JFF	*	**2,070**	**24**	**23**
DD9WG	1.8	**1,400**	**29**	**28**
OK1DF	*	703	20	19
DJ3GE	*	77	8	7
EA1DVY	*	60	6	6

ASSISTED

NORTH AMERICA

United States

WU3A/1	A	**6,674,940**	**2239**	**1052**
			(OP: W3UA)	
W5MX/4	*	**6,147,336**	**2581**	**969**
NY6DX/2	*	**5,911,260**	**2198**	**996**
W8MJ	*	**4,675,866**	**2230**	**906**
KI9A	*	**4,306,338**	**2013**	**918**
K3WW	*	**4,092,768**	**1779**	**864**
W4MYA	*	3,909,402	1767	798
WN9O	*	3,843,504	1766	861
			(OP: W9IU)	
AB3CX/2	*	3,451,350	1816	798
K9NW	*	2,651,488	1362	712
WG5J	*	**2,542,510**	**1599**	**710**
N2BJ/9	*	2,514,028	1631	748
N5WIN	*	**2,266,582**	**1722**	**679**
W3KL	*	2,203,080	1157	660
N6QQ	*	1,895,712	1230	672
W7IJ	*	**1,797,336**	**1145**	**636**
WD4DDU	*	1,672,263	1035	639
K0KX	*	**1,587,350**	**907**	**599**
NF4A	*	1,505,168	1124	604
AA3B	*	1,385,736	836	543
N9NC/1	*	1,319,760	924	564
N2SQW	*	1,290,949	901	517
NM6G	*	1,272,106	1000	583
			(OP: W6CZ)	
W9JA	*	1,238,640	904	520
AD5VJ	*	1,217,560	1024	499
K0LUZ/4	*	1,209,806	803	494
K2DB	*	926,045	752	445
N1IBM/2	*	922,760	691	472
K7HC	*	827,712	734	479
K3OQ	*	798,690	793	474
N4ZZ	*	778,392	775	456
W3FW	*	742,644	618	421
N3RD	*	728,992	569	352
W7VO	*	726,546	903	419
N6WK	*	628,485	645	429
N0ODK	*	615,756	627	388
WM4RM	*	614,385	552	369
			(OP: W4NF)	
ND8L	*	603,980	637	404
K1FWE	*	595,095	550	409
KR4F	*	594,558	496	402
N3MX	*	506,908	502	353
NM2O	*	470,883	610	357
WZ7M	*	452,790	647	351
			(OP: K7MO)	
K2OWR/4	*	421,466	483	359
K3FT	*	391,170	427	295
W3TZ/5	*	381,974	449	331
NY3DX	*	377,384	446	293
			(OP: K3SV)	
NC4KW	*	367,048	528	344
			(OP: N1LN)	
N2MUN	*	353,976	450	301
W6SA/7	*	343,072	555	284
W9GIG	*	341,348	382	334
WK4Y	*	339,359	584	337
W6XR/2	*	338,240	434	302
KQ3F	*	324,678	434	318
W4AS	*	317,504	338	328
N4DWK	*	286,760	322	268
W5GN	*	279,554	371	262
NY6N	*	270,000	368	270
			(OP: W6YI)	
K7VIT	*	263,725	489	275
W4RRE	*	255,786	321	267
W8RHM/9	*	255,769	359	251
AB2ZY	*	253,916	360	257
KV1J	*	247,480	404	269
K6JAT	*	233,934	414	254
W4JAM	*	231,608	324	262
N0KQ	*	231,546	397	259
NA3M	*	218,601	290	227
WA3G	*	208,500	317	250
W4RK/0	*	208,206	392	269
WA9IVH	*	194,555	313	233
WB4MAK	*	194,544	294	252
W0ON	*	187,885	303	265
AB2DE	*	185,130	262	242
WA4ASJ	*	184,011	323	249
K6RIM	*	176,528	293	236
WV1M	*	174,244	345	254
KM9M	*	173,038	432	241
K9MMS	*	172,730	261	230
N2NS/6	*	170,914	273	194
N3FP/4	*	160,666	293	218
K1ZW/4	*	158,025	263	215
N4FY	*	153,440	289	224
AE1T	*	147,430	272	230
KI7MT	*	144,595	347	239
K5NZ	*	132,568	359	227
NW7E	*	126,725	201	185
K7LV	*	119,040	276	192
N8OC	*	111,136	239	184
KT7G	*	110,016	240	192
K4IU/0	*	106,769	257	191
W1RPG	*	106,020	206	155
N4JOW	*	103,774	230	178
W7SW	*	102,500	211	164
K4JRA	*	99,280	196	170
N4DXI	*	98,283	232	181
AF6GL	*	97,920	261	180
W3GNQ	*	94,874	218	178
KC2LST	*	83,420	202	172
NX2PX/8	*	76,284	152	117
NO7T	*	74,245	180	155
WM6DX	*	59,214	157	139
			(OP: W6DPD)	
KM6I	*	56,960	194	128
WO1N	*	56,573	163	139
N4NM	*	54,528	160	128
N2VW	*	50,173	152	131
KC4YBO	*	49,950	160	135
N3KV	*	48,678	134	114
W6GX/7	*	47,000	157	125
N3CZ/4	*	45,666	137	129
K9OUR	*	44,200	150	136
NW6C	*	38,352	135	102
N6AJR	*	38,190	148	114
N0IW/4	*	34,344	118	108
			(OP: K1KO)	
AD1L	*	33,063	110	103
N8KOJ	*	25,956	133	103
AI2N	*	25,542	108	99
AA3K	*	25,250	101	101
K7BG	*	24,045	141	105
W4GHD	*	14,819	77	73
WE6Z	*	12,410	77	73
N7MB/9	*	7,128	41	36
N0BK	*	7,020	53	45
KW9A	*	6,815	53	47
			(OP: K9MMS)	
K7MZ	*	6,486	49	46
KF2O	*	6,063	48	47
KF6A	*	5,280	52	44
W5KI	*	3,744	40	36
WA3AFS/2	*	2,250	30	30
KD4FMW	*	442	14	13
K7MY	28	**34,800**	**131**	**100**
NX5M	21	**2,338,378**	**1626**	**749**
W4QN	*	**763,200**	**662**	**480**
K7OX	*	**51,100**	**160**	**140**
NK6A	*	**30,324**	**128**	**114**
K1JB	*	**12,312**	**88**	**72**
KI7M	14	**1,598,855**	**1381**	**655**
WR2G	*	**584,706**	**528**	**437**
N2RJ	*	513,258	520	393
NG6S	*	**291,992**	**372**	**323**
			(OP: W4UAT)	
W9IIX	*	**229,400**	**334**	**296**
WBCEM	*	**140,940**	**283**	**243**
N6BM	*	77,468	190	181
K7EIQ	*	39,300	146	131
WB8MIW	*	**11,786**	**74**	**71**
WI9WI	*	640	20	20
W2IRT	7	**840,336**	**816**	**427**
K4KZZ	*	**358,488**	**444**	**312**
N0UU	*	**93,784**	**168**	**152**
WA5PFJ	*	**18,135**	**116**	**93**
K7ZO	*	**13,875**	**90**	**75**
KD7DCR	*	12,600	65	63
KG1E	3.7	**525,594**	**475**	**349**
KK9V	*	**80,676**	**197**	**162**
W2MF	1.8	**146,335**	**289**	**185**
N4RA	*	**4,012**	**38**	**34**
***NN4F**	A	**1,425,363**	**1022**	**557**
***WW3S**	*	**1,084,192**	**888**	**544**
***NR1I**	*	**928,715**	**778**	**445**
			(OP: W1NT)	
*W4KTR	*	926,148	798	452
***K2PO/7**	*	**805,030**	**832**	**446**
***KS2G**	*	**587,328**	**615**	**399**
*AD2AM	*	553,875	522	375
***WZ8DX**	*	**501,312**	**645**	**373**
***W0VX/5**	*	**481,170**	**558**	**373**
*N3ALN	*	454,080	629	352
*NV4B	*	451,505	527	365
*WK5X/4	*	422,500	542	338
*NE5LL	*	384,948	720	333
			(OP: N1CC)	
*K2DBK	*	377,031	509	327
***KC0DEB**	*	**361,608**	**476**	**312**
*W7SO	*	335,038	438	314
***WW9R**	*	**277,906**	**589**	**283**
*KX5A	*	254,585	498	295
*W4EE/3	*	239,825	353	265
*AE4CW	*	236,895	395	255
*WB4MSG	*	211,085	350	259
*N3XRU/7	*	189,410	375	235
*KI4TZU	*	168,960	335	220
*KA9MOM	*	167,440	328	230
*KC2OBN	*	148,074	279	222
*K8GT	*	145,110	256	210
*N1IUN	*	140,182	252	217
*K0AD	*	135,135	311	231
*K2SI	*	134,312	276	206
*AD1C/0	*	126,776	307	212
*K5BZH	*	125,064	322	193
*N2FF	*	120,840	220	190
*N2NOM	*	119,592	291	198
*N4JIK	*	112,905	257	195
*WB1EDI	*	111,333	250	177
***K6GEP**	*	**91,896**	**270**	**168**
*N9UA	*	71,862	180	177
*AE5PW	*	70,970	224	151
*K4OMG	*	67,044	174	151
*WA1ZYX	*	65,475	163	135
*WM6A	*	63,928	174	131
			(OP: K6TA)	
*NE1F	*	59,983	180	133
*W2RT	*	57,200	159	143
*NU6T	*	51,660	209	140
*ND4V	*	42,210	140	126
*AG3R/9	*	34,001	136	121
*W4WNT	*	22,962	103	89
*W4KPG	*	20,554	94	86
*WB0RUR/5	*	18,490	96	86
*W3AG	*	18,278	95	74
*KE5OG	*	16,984	94	88
*K9TRV/8	*	11,859	60	59
*N1API	*	11,570	72	65
*AA2MF	*	10,660	81	65
*N5RMS	*	10,430	73	70
*N6MWX/2	*	9,520	76	68
*KC9LIF	*	9,313	71	67
*ND8N/7	*	7,380	73	60
*W4GKA	*	5,978	56	49
*KD6WKY	*	5,969	47	47
*N7IYT	*	5,424	52	48
*N8VZ	*	3,320	44	40
*NN2W	*	3,255	38	35
			(OP: N2VAW)	
*W6UX	*	2,484	40	36
*N6ER	*	1,925	28	25
*K8YSV	*	704	16	16
*W8TK/7	*	6	2	1
***W0ANT**	28	**7,599**	**57**	**51**
***WJ5OX**	21	**204,351**	**410**	**263**
			(OP: W5AJ)	
***K0WHV**	*	**36,830**	**134**	**127**
*KF0IQ	*	2,673	34	33
***K4MDX**	14	**849,852**	**767**	**516**
***W5GZ**	*	**226,778**	**335**	**298**
***N7FLT**	*	**223,852**	**334**	**293**
*K5MSO	*	23,210	175	110
***W1EQO**	7	**303,880**	**426**	**284**
***WC2L**	*	**154,167**	**235**	**201**
***N7MAL**	*	**2,070**	**25**	**23**
*AA1M	*	264	8	8

Alaska

AL9A	A	**1,935,010**	**1352**	**539**
KL7AIR	*	255,580	352	260
			(OP: NL7WW)	
KL7OU	7	**628,307**	**508**	**263**
***KL2R**	A	**542,850**	**559**	**385**
			(OP: N1TX)	
***WL7O**	3.7	**15,180**	**67**	**55**

Canada

VE3UTT	A	**8,105,130**	**2225**	**990**
VE3MMQ	*	3,866,334	1438	786
VE4EAR	*	**3,675,820**	**1637**	**769**
VA3DX	*	2,797,260	1181	690
VE9MY	*	**1,407,924**	**698**	**518**
VE2FXL	*	**1,139,930**	**726**	**482**
VE3ZZ	*	782,668	607	389
VE7KS	*	**642,798**	**516**	**369**
VE3EY	*	631,944	577	393
VE5MX	*	**532,800**	**552**	**360**
VE3BK	*	166,752	256	193
VG6XDX	7	**195,120**	**263**	**180**
			(OP: VE6LB)	
***VE1ZD**	A	**720,576**	**608**	**417**
***VE3VID**	*	**70,148**	**159**	**142**
*VE3XAT	*	12,036	72	68

Guatemala

TG9IRP	A	**1,867,600**	**1504**	**550**
			(OP: IV3IYH)	
***TG9AJR**	A	**4,536**	**49**	**36**

Honduras

HQ2T	21	**3,390,453**	**2022**	**759**
			(OP: NP3D)	
***HR2DMR**	A	**1,936,167**	**1376**	**573**
*HR2J	7	1,960	20	20

Mexico

4B2WK	7	**43,989**	**102**	**93**
***4A1B**	A	**62,604**	**188**	**141**
			(OP: XE1EE)	

U.S. Virgin Islands

***KP2DX**	A	**568,746**	**573**	**342**
			(OP: KP2BH)	

AFRICA

Canary Islands

EA8BGO	14	**344,318**	**377**	**323**
***EA8BUE**	28	**980**	**21**	**20**

Madeira Islands

CQ3L	A	**17,479,764**	**4153**	**1206**
			(OP: DF7ZS)	
CT3HF	*	1,924,092	1075	551

Namibia

***V5/DL5XL**	A	**315,704**	**400**	**268**

Tunisia

***3V8SS**	A	**3,895,380**	**1548**	**684**
			(OP: KF5EYY)	

ASIA

Asiatic Russia

UA9PC	A	**13,462,592**	**3594**	**1144**
RXBAW	*	**3,733,374**	**1670**	**753**
RW9TR	*	2,679,840	1396	720
RX9WN	*	1,301,944	845	536
RK9UE	*	1,222,326	858	534
RU9AC	*	1,046,502	818	423
UA9QCZ	*	533,903	506	331
RO9O	*	412,757	492	331
			(OP: RZ9OO)	
UA9AGX	*	409,920	397	305
RO8WA	*	**363,506**	**407**	**286**
			(OP: RW9WA)	
RA0SMS	*	346,680	490	321
UA9CGL	*	228,000	346	250
UA9OC	*	15,476	79	73
RA9ODR	*	10,726	81	62
RZ9IR	*	2,834	28	26
RZ8AF	28	**88,796**	**249**	**158**
UA9CDC	*	**60,250**	**172**	**125**
UA9QCQ	21	**2,481,390**	**1345**	**698**
RA8AM	*	**30,956**	**125**	**109**
RZ9HG	14	**6,680,100**	**2374**	**1050**
RM9RZ	*	1,941,435	1075	657
RA9A	*	1,268,930	836	559
			(OP: RZ9AR)	
RW9TP	*	267,149	328	311
UA9HR	*	194,120	308	230
UA0QBR	*	**131,784**	**244**	**204**
RZ9OJ	*	108,781	226	181
UA9CAX	7	**2,944**	**24**	**23**
UA9MA	3.7	**22,872**	**68**	**62**
***RN9CM**	A	**1,963,521**	**1093**	**567**
*RV9UP	*	1,720,128	1095	578
*RZ9CJ	*	909,300	704	420
*RX9SS	*	906,297	683	419
*RQ9I	*	667,419	622	379
			(OP: RW9IM)	
*RX9AM	*	585,622	547	349
*RU9DD	*	541,596	530	363
***RZ8AWO**	*	**213,567**	**319**	**257**
*RX9FG	*	188,160	283	210
*RV9UF	*	177,590	321	215
*UA0SE	*	147,472	243	208
*RA9UAD	*	106,470	235	182
*RA9AMO	*	98,748	194	156
*UA9AZ	*	61,102	157	137
*RA9UIV/9	*	56,889	155	129
*RW9QA	*	18,644	88	79
*RV9UB	*	11,968	76	68
*RA0ANO	*	6,550	50	50
*RA9OOW	*	434	15	14
***RA9XF**	21	**403,104**	**459**	**323**
*RA9MX	*	187,984	294	248
*RA9UAG	*	57,403	162	137
***RV9CP**	14	**2,331,758**	**1226**	**682**
*UA9OKM	*	50,085	154	135
***UA8AA**	*	**36,540**	**133**	**116**
***RU8AT**	*	**7,700**	**52**	**50**

China

BA7MY	A	**1,459,650**	**1298**	**555**
BD7IXG	21	**1,877,040**	**1258**	**660**
BG7BAH	*	414,120	494	340
B4TB	7	**414,464**	**443**	**256**
			(OP: BA4TB)	
BH1DIP	*	40	4	4
BH1BSH	*	2	1	1
***BG4AHD**	A	**56,017**	**183**	**139**
*BH4SFE	*	1,848	37	33
***BA7IO**	28	**37,698**	**205**	**122**
***BA7IN**	21	**628,082**	**686**	**442**
*BD7MFB	*	257,826	392	291
*BA6IV	*	8,120	84	70
***BG1TPD**	14	**31,005**	**175**	**117**

Cyprus

5B4KH	21	**4,092,606**	**1990**	**729**

Georgia

4L8A	A	**2,213,709**	**1007**	**547**

Hong Kong

***VR2ZRE**	A	**271,432**	**590**	**296**

India

***VU2NKS**	A	**591,981**	**572**	**353**

Japan

JA2IVK	A	**2,452,650**	**1182**	**591**
JA8BZI	*	**2,123,595**	**1102**	**615**
JQ1BVI	*	**1,929,900**	**1251**	**570**
JO3DDD	*	**938,828**	**785**	**418**
JA2XCR	*	316,008	387	264
JA7ZP	*	**233,454**	**300**	**219**
JF9JTS	*	**214,137**	**322**	**231**
JA3EY	*	132,352	245	176
JS1KQQ	*	106,480	241	176
JA3LEZ	*	93,073	187	163
JH2FXK	*	59,280	113	104
JH8CXW	*	**38,480**	**118**	**104**
JH1OVY	*	9,486	63	62
JA1HGY	*	3,248	33	28
7K1NUZ/8	*	1,943	31	29
JO4CFV	*	**1,898**	**29**	**26**
JA1IZZ	28	**2,550**	**38**	**34**
JL1SAM	21	**171,072**	**305**	**243**
JA1CTB	*	144,480	289	224
JA1EHV	14	**93,960**	**210**	**180**
JF1RYU	7	**236,138**	**264**	**202**
JO1WKO	*	16,610	57	55
JA6SRB	3.7	**3,050**	**25**	**25**
***JR5XPG**	A	**292,500**	**375**	**250**
***JA6DIJ**	*	**256,271**	**388**	**251**
***JG2REJ**	*	**122,111**	**255**	**187**
*JK2VOC	*	72,292	234	124
*JF2OZH	*	48,158	163	121
***JA1MZM**	*	**45,548**	**147**	**118**
***JL3RDC**	*	**35,148**	**153**	**101**
*JG5UWK	*	8,008	63	56
***JR0BUL**	28	**1,254**	**29**	**22**
***JL3VUL/3**	21	**171,602**	**300**	**239**
***JM1IMF**	*	**34,574**	**125**	**118**
***JA4AQR**	*	**11,520**	**65**	**64**
*JI1ALP	*	4,836	42	41
***JH9JJD**	*	**720**	**18**	**18**
*JJ7OIP	*	351	13	13
***7L2OHM**	14	**1,512**	**25**	**24**
***JM1NKT**	3.7	**6,200**	**49**	**40**

Kazakhstan

UN7MMM	A	**2,773,596**	**1314**	**636**
UP4L	14	**3,384,712**	**1522**	**808**
			(OP: UN7LZ)	

Kyrgyzstan

***EX7ML**	21	**113,088**	**247**	**192**

Mongolia

JT1CO	A	**277,248**	**428**	**256**
***JU1DX**	A	**1,898,596**	**1276**	**607**
			(OP: JT1BV)	
***JT1BZ**	21	**379,780**	**512**	**340**

Saudi Arabia

***HZ1DG**	14	**19,096**	**94**	**88**

Taiwan

***BU2AU**	A	**243,684**	**494**	**252**

Tajikistan

***EY8DD**	21	**569,217**	**569**	**367**
*EY7BJ	*	8,352	67	48

Thailand

***E21YDP**	A	**630,432**	**652**	**396**

United Arab Emirates

***A65CA**	A	**151,782**	**251**	**202**

EUROPE

Austria

OE3K	A	**13,587,608**	**3626**	**1192**
			(OP: OE3DIA)	
OE2S	*	6,723,475	2280	1063
			(OP: OE2VEL)	
OE9MON	*	1,566,345	1035	605
OE5UAL	28	**37,128**	**136**	**104**

Belarus

EU1AZ	A	**2,649,682**	**1659**	**742**
EW8BQ	*	33,768	155	134
***EW4AB**	A	**47,428**	**162**	**142**
*EU1DZ	28	340	12	10

Belgium

OT2A	A	**5,468,816**	**2368**	**984**
OO4B	*	1,004,980	838	545
			(OP: ON4BHQ)	
ON5GQ	*	715,952	694	464
OQ5M	21	**211,200**	**372**	**256**
			(OP: ON5ZO)	
OQ4T	14	**871,728**	**878**	**528**
			(OP: ON4TO)	
ON6NL	7	**690,986**	**706**	**439**
***ON4VDV**	A	**595,695**	**626**	**453**
*ON7BBR	*	98,980	237	196
*ON6LR	*	53,682	138	138
*ON9CC	*	19,530	104	90

Bosnia-Herzegovina

E73M	A	**9,583,980**	**3032**	**1140**
***E71DX**	A	**1,100**	**25**	**22**

Bulgaria

LZ2PL	A	**341,172**	**466**	**351**
LZ8E	*	303,072	400	328
			(OP: LZ2BE)	
LZ2ZG	21	65	5	5

Croatia

9A4D	A	**4,486,944**	**1733**	**924**
			(OP: 9A7DX)	
9A2U	28	**90,080**	**244**	**160**
			(OP: 9A3ZA)	
9A9A	21	**377,264**	**484**	**292**
9A5AMC	7	**40,365**	**127**	**117**
***9A3ALD**	A	**95,149**	**228**	**193**
*9A3XV	*	33,110	129	110

Czech Republic

OK4U	A	**9,288,364**	**2942**	**1108**
			(OP: OK1DIG)	
OK7Y	*	1,282,544	987	568
OK1TRA	*	94,866	236	194
OL2T	*	42,117	160	139
***OK4DZ**	A	**70,218**	**199**	**166**
***OK1IC**	14	**5,974**	**63**	**58**
***OK1UG**	7	**427,200**	**483**	**356**

Denmark

OZ2PBS	A	**270,745**	**389**	**313**
OZ1ADL	28	**624**	**17**	**16**
OZ/YT2T	7	**3,177,810**	**1581**

Estonia

ES7GM	**A**	**3,107,184**	**1789**	**912**
ES5MG	**7**	**1,091,501**	**781**	**523**
ES2EZ	*	17,688	95	88
***ES5TF**	**14**	**421,514**	**608**	**419**
***ES4RX**	**7**	**68,526**	**189**	**162**

European Russia

UA6GP	**A**	**4,414,914**	**2455**	**947**
RX3APM	**	**3,788,190**	**1897**	**859**
RD4WA	**	**3,297,590**	**2111**	**830**
RT4RO	*	2,902,264	2122	818
RW3DU	*	1,653,188	1244	692
RA1AR	**	**1,547,775**	**1230**	**675**
RA3TT	*	968,912	1015	574
RZ1AU	*	818,598	871	471
RU4WD	*	443,930	716	431
UA1AFZ	*	383,130	539	387
RA3ZZ	*	379,822	501	359
U1BD	*	312,900	536	350
RA3FC	*	293,074	397	326
UA4CC	*	270,215	441	289
RX3AEX	*	231,460	504	355
RU3FN	*	229,830	383	282
UA6AA	*	224,840	363	292
UA4PAN	*	217,775	389	281
RW4NN	*	41,535	140	117
RW3DD	*	40,703	137	101
UA3MEJ	*	22,746	112	102
UA3BM	*	18,228	91	84
RW4WZ	*	18,117	100	99
RK6FZ	*	8,680	66	62
RA4RO	*	4,494	46	42
RN3REY	*	2,592	29	27
UA1ORK	*	2,233	31	29
UA4HOX	**21**	**1,330,868**	**1316**	**638**
RZ3VA	**	**36,652**	**128**	**119**
RX3MA	*	7,852	55	52
RN3QO	**14**	**3,250,688**	**2134**	**907**
UA6LUQ	**	**819,950**	**923**	**575**
UA3KM	*	568,054	705	466
RT3T	**7**	**1,650,922**	**1049**	**611**
			(OP: UA3TU)	
RA3FD	*	320	8	8
***UA6MM**	**A**	**322,790**	**503**	**338**
***RL3FO**	**	**71,242**	**222**	**179**
***RA4ACX**	**	**54,524**	**203**	**172**
*RA6LIS	*	29,400	146	120
*RW6BD	*	4,895	60	55
*RU3UB	*	3,915	47	45
***UA1OMS**	**21**	**3,168**	**49**	**48**
***RX3DBG**	**14**	**17,542**	**108**	**98**
***RU3ST**	**7**	**212,715**	**294**	**261**
*RV3IC	*	2,380	34	34

Finland

OF5ØRR	**A**	**7,149,149**	**3068**	**1097**
			(OP: OH8LQ)	
OG6N	*	4,149,844	2097	989
OH6OS	*	84,632	188	149
OH6TN	*	297	11	11
OH2KW	**21**	**83,277**	**196**	**171**
OH6M	**7**	**292,236**	**427**	**284**
			(OP: OH6LBW)	
***OH3JP**	**A**	**154,128**	**294**	**247**
*OH3FOG	*	103,626	243	202
*OH2LNH	*	1,081	24	23

France

TM7F	**A**	**6,742,268**	**2583**	**1052**
			(OP: F6GLH)	
F1JKJ	*	486,744	575	408
F5KEQ	*	332,694	525	366
			(OP: F5MYK)	
TM3R	**21**	**843,500**	**810**	**482**
F5LJA	*	444,037	469	407
			(OP: F1UVN)	
F4FKJ	*	303,690	401	318
F6IIT	**1.8**	**269,808**	**446**	**292**
***F4FFH**	**A**	**940,401**	**812**	**531**
*F4EZJ	*	670,876	665	457
*F4FFZ	*	198,360	341	285
*F8CRS	*	165,968	285	253
*F8CGL	*	92,736	228	184
*F4FDA	*	8,964	57	54
***F5BEG**	**28**	**27,720**	**114**	**90**

Germany

DL3TD	**A**	**7,803,639**	**2723**	**1031**
DJ1AA	*	3,537,460	1829	830
DF1LON	*	3,335,619	1536	823
DD2ML	*	3,022,030	1773	830
DR5A	*	2,737,908	1486	753
			(OP: DL1ELY)	
DK5TX	*	2,624,732	1622	748
DL5GAC	*	2,128,305	1347	713
DLØWW	*	2,020,270	1239	665
DL7ON	*	1,421,428	967	634
DL1NEO	*	1,329,676	1012	596
DF2LH	*	1,027,735	797	535
DJ9MH	*	1,022,483	828	539
DHØGHU	*	986,378	814	523
DG1EA	*	853,920	804	480
DK2AT	*	813,855	792	483
DD1JN	*	735,840	702	438
DKØA	*	605,880	643	408
			(OP: DL7JAN)	
DJ9HX	*	546,934	559	389
DK4YJ	*	538,852	597	428
DJ5AN	*	514,647	561	389
DL7CX	*	508,200	553	420
DL4GBA	*	478,000	540	400
DF7EF	*	454,348	502	388
DL8SCG	*	449,430	489	355
DK1KC	*	443,916	496	354
DM3VL	*	442,015	480	365
DK9TN	*	416,361	502	363
DH1PS	*	414,710	487	367
DF2TT	*	399,996	473	369
DK1AX	*	334,530	493	354
DP6A	*	312,360	339	285
			(OP: DL8OH)	
DJ5GK	*	297,111	391	291
DL9SEV	*	161,745	340	263
DL9GS	*	146,370	308	238
DL5KUT	*	124,110	245	197
DL1PT	*	103,970	233	185
DF2MM	*	102,396	222	212
DL8UAT	*	91,936	189	169
DJ6KS	*	65,120	204	160
DJØTP	*	24,500	114	100
DAØI	*	16,517	97	83
			(OP: DK1II)	
DL6AG	*	11,776	68	64
DL2OBO	*	7,980	45	42
DL2SWN	*	6,956	50	47
DG2UA	*	544	17	17
DK1II	*	6	6	1
DF9ZP	**21**	**2,645,760**	**1388**	**768**
DL1WA	*	208,260	333	260
DK1QH	*	192,390	309	242
DHØGDS	*	73,931	205	143
DL3LAB	*	26,384	100	97
DL4SVA	*	22,250	89	89
DK2OY	**14**	**3,960,455**	**2014**	**887**
DG4R	**7**	**1,163,952**	**920**	**548**
			(OP: DL1RG)	
DFØUM	**1.8**	**289,332**	**505**	**324**
			(OP: DL3BQA)	
***DJ3HW**	**A**	**1,297,296**	**977**	**572**
*DD5M	*	1,008,216	829	536
			(OP: DJØZY)	
*DLØNG	*	637,672	677	413
			(OP: DK8NC)	
*DL2IAN	*	583,626	670	422
*DF2AJ	*	558,656	665	406
*DK7ZH	*	302,364	490	333
*DK5IR	*	248,784	382	292
*DH6DAO	*	207,496	374	296
*DL9HD	*	195,408	310	276
*DO9ST	*	188,235	318	267
*DD8JJ	*	185,256	320	249
*DK4WF	*	81,015	202	165
*DO6SR	*	45,016	162	136
*DL1SVA	*	30,576	124	112
*DL1DBR	*	27,255	132	115
*DL1OLJ	*	25,064	116	104
*DJ5QV	*	24,354	113	99
*DF1HF	*	19,998	111	101
*DL4EBW	*	15,810	100	93
*DF6YC	*	10,640	76	70
*DG2BHB	*	6,500	75	65
*DL1SWT	*	6,375	53	51
*DL3DRN	*	3,939	46	39
*DJ4MZ	*	1,680	30	28
*DO4DXA	21	1,357	24	23
***DM2A**	**14**	**777,033**	**743**	**477**
			(OP: DH2UHF)	
***DF8AE**	**7**	**209,844**	**390**	**261**
*DJ2MX	*	51,038	157	151
***DK9HN**	**3.7**	**96,400**	**225**	**200**
***DL3KZA**	**1.8**	**59,285**	**283**	**167**

Greece

SV1DPI	**A**	**18,020**	**90**	**85**
***SV1NK**	**A**	**75,658**	**218**	**181**

Hungary

HA8JV	**A**	**9,125,040**	**3100**	**1182**
HA5PT	*	33,027	119	101
HA9PP	**14**	**3,203,788**	**1836**	**868**
HA5NB	*	3,744	50	48
HG2W	**7**	**899,002**	**816**	**487**
			(OP: HA2QW)	
***HG8C**	**A**	**125,531**	**311**	**227**
			(OP: HA8EK)	
*HA6NN	*	3,569	46	43
***HA7VK**	**21**	**150,096**	**267**	**212**

Ireland

EI9HX	**14**	**2,452,703**	**1580**	**761**
***EI4CF**	**21**	**282,555**	**483**	**315**

Italy

IZ2FOS	**A**	**4,069,988**	**1991**	**943**
IR1M	*	567,663	675	433
			(OP: IK1UGX)	
IZ2WIJ	*	412,550	488	370
IR4E	*	342,104	418	328
IV3JVJ	*	288,000	383	300
IZ1OQB	*	249,288	396	282
IK8UND	*	211,950	442	314
IZØGYP	*	99,760	202	172
IWØGYC	*	78,710	201	170
IZ2ODM	*	1,176	21	21
IW2HAJ	**21**	**2,494,247**	**1354**	**763**
IR2M	*	1,569,568	1038	616
IR1K	*	752,192	700	448
IK2LTR	*	452,392	474	386
II5W	*	254,408	326	308
IZ5ASZ	*	176,894	292	241
IR2C	**14**	**3,357,195**	**1808**	**851**
			(OP: HB9DUR)	
IR1Y	**7**	**5,720,400**	**1880**	**900**
			(OP: IK1HJS)	
IZ4MJP	*	495,520	569	380
***IZ5NCN**	**A**	**387,260**	**512**	**340**
*IK3SCB	*	237,424	409	304
*IC8POF	*	35,880	124	115
*IZ8GBH	*	22,440	116	102
*IZ4AFW	*	6,132	51	42
***IZ5CML**	**21**	**269,348**	**373**	**289**
*IZ2KPE	*	73,150	187	154
***IW1QN**	**14**	**724,716**	**790**	**491**
***IR8W**	**3.7**	**1,000**	**22**	**20**
			(OP: IK8YFU)	

Kaliningrad

***UA2FT**	**A**	**8,580**	**66**	**60**

Latvia

YL6W	**A**	**6,726,628**	**2783**	**1054**
YL7A	*	4,289,208	2219	924
YLØY	*	4,283,304	1956	951
			(OP: YL2GQT)	
YL2KO	**21**	**131,124**	**255**	**196**
***YL4U**	**A**	**20,140**	**100**	**95**
***YL2PP**	**21**	**24,570**	**99**	**91**
***YL2KF**	**14**	**4,697**	**61**	**61**

Lithuania

LY2CX	**A**	**11,529**	**73**	**61**
LY1R	**21**	**742,144**	**710**	**416**
LY4OO	*	10,203	63	57
LY5W	**3.7**	**1,258,075**	**1013**	**553**
***LY2SA**	**A**	**298,728**	**407**	**324**
*LY3BY	*	140,420	308	238
***LY4Q**	**3.7**	**442,860**	**586**	**363**
*LY1G	*	279,072	377	306

Moldova

ER4KAA	**A**	**6,789,581**	**2703**	**983**
***ER3CT**	**A**	**106,896**	**250**	**204**

Netherlands

PE1MMZ	**A**	**260,429**	**411**	**299**
PAØLOU	*	118,560	254	208
PAØM	**21**	**100,260**	**223**	**180**
PF1MO	**14**	**64,617**	**225**	**181**
PA1BDO	**7**	**304,311**	**407**	**301**
***PD4DX**	**A**	**1,130,876**	**959**	**538**
*PE1FTV	*	222,956	419	278
*PE4BAS	*	170,565	317	249
*PD3EM	*	72,568	223	193
*PD5LKM	*	56,760	195	172
*PE1KL	*	17,556	98	84
*PA2LS	*	13,760	92	86
*PE7T	*	4,968	48	46
*PE1NCP	*	3,124	52	44
***PAØMIR**	**21**	**88,403**	**213**	**173**
***PI4WLD**	**14**	**14,601**	**99**	**93**
			(OP: PAØMIR)	

Northern Ireland

***GI4AAM**	**A**	**201,684**	**397**	**294**

Norway

LA5HPA	**A**	**999,799**	**831**	**521**
LA8KRA	*	86,640	225	190
*LA6MJA	A	221	13	13
***LA8NRA**	**14**	**32,568**	**149**	**138**

Poland

SQ8JX	**A**	**2,884,896**	**1654**	**742**
SQ9HZM	*	1,262,196	978	558
SP3GXH	*	798,238	728	469
SP6CZ	*	739,962	583	426
SO6I	*	374,420	407	388
			(OP: SP6JIU)	
SN1J	*	18,786	102	93
			(OP: SP1MWF)	
SP6PLH	*	9,936	74	72
SQ1OD	*	1,020	21	20
SP4CUF	*	969	20	19
SP1RKT	**21**	**35,282**	**127**	**118**
SP1APZ	*	576	16	16
SN3S	**7**	**2,009,460**	**1248**	**626**
			(OP: SQ3LVO)	
SP9OJM	**1.8**	**4,416**	**50**	**46**
***SQ8LSB**	**A**	**187,680**	**366**	**276**
*SP6FXY	*	89,647	216	157
*SQ8MFB	*	9,522	75	69
*SP1MHZ	*	6,345	49	47
*SQ1DWS	*	5,856	50	48
*SQ5RTU/9	*	1,363	29	29
***SO9C**	**21**	**87,576**	**200**	**164**
			(OP: SQ9CNN)	
*SO9G	*	42,020	142	110
			(OP: SP9OTE)	
*SQ9IAU	*	1,008	20	18
***SN3X**	**7**	**1,579,347**	**1115**	**583**
*SP5AUY	*	269,793	328	279
***SQ8BUM**	**3.7**	**668,964**	**750**	**428**
			(OP: SQ9UM)	
*SO5A	*	505,422	604	387
			(OP: SP5LS)	
*SQ5SDW	*	1,219	23	23
***SP8LBK**	**1.8**	**85,932**	**234**	**186**

Portugal

***CT2IVH**	**A**	**428,808**	**629**	**408**

Romania

YO6A	**A**	**1,144,773**	**993**	**567**
			(OP: YO6BHN)	
YRØR	*	679,684	685	463
			(OP: YO3HKW)	
YO7LGI	*	214,608	363	263
YP1WFF	*	132,858	370	242
			(OP: YO9WF)	
YO9BXE	*	28,890	123	107
YO3JW	*	28,080	127	117
YO5BBO	**21**	**150,271**	**284**	**209**
YO5OED	*	147,864	278	202
YO4RDN	*	15,862	103	77
YP3A	**14**	**1,006,265**	**1336**	**565**
			(OP: YO3GOD)	
***YO4RST**	**A**	**435,953**	**490**	**343**
*YO2LXW	*	48,951	182	147
*YO9GVN	*	37,859	151	131
***YO9XC**	**21**	**66,900**	**202**	**150**
*YO9BXC	*	38,016	137	108
*YO3JF	*	630	15	15
***YO5OAG**	**14**	**86,735**	**281**	**209**
***YO5OHO**	**7**	**545,688**	**574**	**396**

Scotland

MMØDXH	**A**	**253,005**	**444**	**303**
GMØDBW	*	133,560	299	252
***GM4UYZ**	**A**	**14,652**	**104**	**99**

Serbia

YT4W	**14**	**3,261,456**	**2023**	**852**
YT1BB	*	1,149,495	1174	591
YT2AAA	**7**	**3,524,724**	**1482**	**788**
YT5C	*	1,322,099	995	547
***YU6DX**	**21**	**69,825**	**183**	**147**
***YU1ARC**	**14**	**444,308**	**791**	**401**
			(OP: YT3PL)	

Sicily

IU9T	**A**	**2,522,112**	**1520**	**768**
			(OP: IT9ESW)	
IR9P	**7**	**232,900**	**339**	**274**
			(OP: IW9HMQ)	
***IU9A**	**A**	**613,920**	**663**	**480**
*IT9JQY	*	186,984	410	294
*IT9ABN	*	4,484	39	38
***IT9AUG**	**28**	**112,140**	**258**	**178**
*IT9ACN	*	31,635	121	95
*IT9AUH	*	406	16	14
***IT9RWB**	**7**	**576,444**	**539**	**397**

Slovakia

OMØM	**A**	**4,575,375**	**1841**	**875**
			(OP: OM8AW)	
***OM3NI**	**A**	**229,250**	**391**	**262**
*OM6AL	*	173,706	366	262
*OM5UM	*	89,180	244	182
*OM8TA	*	8,118	68	66
***OM8LA**	**21**	**43,554**	**135**	**119**
***OM8HG**	**14**	**21,830**	**135**	**118**
***OM7AB**	**3.7**	**338,870**	**507**	**329**

Slovenia

S51DX	**A**	**493,962**	**589**	**399**
S53XX	*	31,065	108	95
S56P	**28**	**101,516**	**257**	**164**
S5ØG	**21**	**3,093,912**	**1570**	**776**
			(OP: S57AW)	
S51CK	**7**	**2,259,406**	**1311**	**662**
S57M	**1.8**	**392,958**	**521**	**342**
***S56A**	**A**	**958,976**	**743**	**512**
*S52W	*	137,862	290	222
*S53F	*	38,976	135	112
*S59ZZ	3.7	2,380	34	34

Spain

EA7RU	**A**	**2,236,260**	**1421**	**732**
EA5BY	**	**1,977,066**	**1196**	**714**
EF1A	**	**1,543,887**	**1044**	**633**
			(OP: EA1XT)	
EE3R	**	**444,610**	**482**	**346**
			(OP: EA3OR)	
EA5EV	*	291,306	399	282
ED4A	**	**286,425**	**476**	**335**
			(OP: EA4TV)	
EE5J	*	245,244	424	321
			(OP: EA5YJ)	
EE5G	*	129,168	292	234
EH5J	*	46,060	159	140
			(OP: EA5DM)	
EA3CEC	*	28,896	119	112
EA5FID	*	4,896	36	32
AO7K	**28**	**34,038**	**133**	**93**
			(OP: EC7AMT)	
EC2DX	**21**	**2,022,387**	**1327**	**669**
EA5GS	**	**545,056**	**562**	**392**
EA4FSL	**	**530,400**	**624**	**400**
AN5E	*	179,520	379	272
			(OP: EA5HAB)	
EB1EWE	**	**7,672**	**59**	**56**
EH7Z	**14**	**449,792**	**786**	**448**
			(OP: EA7ZY)	
EB1TR	*	660	26	22
EA7LL	**7**	**5,195,448**	**1680**	**804**
AM3M	**	**1,228,992**	**832**	**519**
			(OP: EA3ATM)	
ED1K	**	**190,311**	**281**	**237**
			(OP: EA1HET)	
EA1DR	**1.8**	**36,108**	**137**	**118**
***EF1W**	**A**	**1,825,968**	**1317**	**698**
			(OP: EA1WS)	
***EA5RM**	**	**170,605**	**282**	**229**
***EA2WD**	**	**105,060**	**251**	**204**
*EA1HLL	*	85,752	310	216
***EB3FLY**	**	**80,178**	**197**	**166**
*EA3GYK	*	27,440	128	112
			(OP: DK7TM)	
*EA1JK	*	24,139	116	101
*EA1GPL	*	14,527	80	73
***EA3NO**	**21**	**55,890**	**147**	**138**
***AM1Q**	**1.8**	**50,184**	**158**	**136**
			(OP: EA1QA)	

Sweden

SM6U	**A**	**1,242,435**	**988**	**565**
SMØR	*	521,160	583	404
			(OP: SMØRUX)	
SF7WT	*	69,750	183	150
			(OP: SM7WT)	
8SØC	**14**	**1,636,722**	**1241**	**711**
			(OP: SMØMPV)	
***SM5D**	**A**	**440,793**	**572**	**387**
			(OP: SM5DJZ)	
*SM7E	*	393,840	525	360
			(OP: SM7BHM)	
*SE5E	*	237,432	400	312
			(OP: SM5AJV)	
*SM7GIB	*	148,960	292	245
*SK6HD	*	142,800	315	238
			(OP: SA6AQP)	
*SA3V	*	109,414	288	227
			(OP: SA3ARL)	
*SM6MVE	*	63,700	200	175
*SK7A	*	33,880	146	121
			(OP: SK7BQ)	
*SMØFM	*	22,785	105	93
*SA7AOI	*	3,952	40	38
***SMØOGQ**	**21**	**7,049**	**71**	**53**
***SMØQ**	**14**	**70,350**	**262**	**210**
			(OP: SMØOGQ)	
***SC3A**	**3.7**	**11,248**	**78**	**74**
			(OP: SM3WMU)	
*SM7TZK	*	160	8	8

Switzerland

HB9OCR	**A**	**1,489,831**	**1110**	**643**
HB9CVQ	*	896,313	818	471
***HB9EMS**	**A**	**3,060**	**36**	**36**

Ukraine

UW5U	**A**	**3,093,810**	**1728**	**843**
UX1UF	*	2,569,380	1649	748
UR5AS	*	2,055,579	1371	713
UY4F	*	614,496	673	444
UT5ERV	*	263,412	457	324
UR7EP	*	131,320	259	196
UU2JQ	*	85,306	201	193
US8LW	*	60,228	171	126
US6IKV	*	27,816	144	122
UR6F	**28**	**49,776**	**161**	**122**
			(OP: UXØFF)	
UT1IA	*	260	10	10
EO3Q	**14**	**4,942,887**	**2635**	**1047**
			(OP: UR3QCW)	
UW8I	*	3,237,007	2062	877
			(OP: UT2IZ)	
UV8M	*	2,384,656	1993	824
			(OP: UX3MR)	
USØZK	*	72	9	9
UU9CW	3.7	16	2	2
***UT2UU**	**A**	**1,023,555**	**920**	**543**
*US7LM	*	125,209	269	217
*UW7CN	*	53,625	177	143
*UX6VA	*	7,085	71	65
***UT5ERP**	**28**	**1,080**	**20**	**18**
***UR2VA**	**21**	**11,748**	**77**	**66**
***USØYW**	**14**	**55,444**	**190**	**167**

Wales

GW9T	**A**	**5,382,612**	**2158**	**999**
			(OP: MWØZZK)	
GW4OH	**21**	**169,880**	**331**	**248**
			(OP: MWØJZE)	
***MWØMAU**	**A**	**2,950**	**52**	**50**

OCEANIA

Australia

VK5HZ	**A**	**791,056**	**675**	**392**
VK2CA	**	**534,360**	**615**	**292**
VK2BCQ	**21**	**275**	**12**	**11**
***VK4VSP**	**14**	**2,640**	**34**	**33**

Hawaii

KH7BB	**A**	**2,194,720**	**1344**	**473**
AH6RR	**14**	**1,154,160**	**878**	**458**
***AH6NF**	**A**	**56,196**	**161**	**126**
***NH7FY**	**21**	**60,620**	**167**	**140**

Indonesia

***YBØNFL**	**A**	**582,760**	**543**	**340**
*YB1TJ	*	126,148	252	188
***YBØCOX**	**21**	**69,762**	**169**	**151**
***YBØBCU**	**14**	**13,510**	**84**	**70**
*YB2ECG	*	8,798	61	53

New Zealand

ZL1T	**A**	**23,885**	**105**	**85**
ZM4G	**21**	**843,200**	**756**	**400**
			(OP: ZL2IFB)	
ZM3T	**14**	**1,150,128**	**825**	**504**
			(OP: W3SE)	

SOUTH AMERICA

Argentina

AY8A	**A**	**2,313,249**	**1371**	**601**
LU3DX	*	2,028,885	1193	615
LU2VC	*	80,514	211	162
LR2F	**28**	**3,776,384**	**2022**	**652**
			(OP: LU2FA)	
LU6QI	7	300	10	10
***LU5FF**	**A**	**5,415,475**	**2169**	**877**
*LR4E	*	1,889,440	1177	560
			(OP: LW4EU)	
***LU7YZ**	**28**	**485,716**	**563**	**332**
*LU3JVO	*	70,413	186	147

Brazil

ZX2B	**A**	**11,664,450**	**3445**	**1127**
			(OP: PY2MNL)	
PW2P	*	4,114,572	1775	803
			(OP: PY2XAT)	
PY2MTV	*	4,026,610	1764	805
PT9PA	*	354,585	400	307
PV8DR	*	4,655	37	35
PY1CJ	*	760	21	20
PY5RB	**21**	**340,676**	**387**	**322**
PY5QW	**14**	**1,005,700**	**786**	**445**
PV2P	**7**	**822,464**	**454**	**362**
			(OP: PY2DY)	
***PY2SEX**	**A**	**3,791,616**	**1572**	**768**
*PX2T	*	2,542,869	1330	669
			(OP: PY2DN)	
*PY2VZ	*	565,704	573	388
*PY2MR	*	200,265	342	237
*PY7ZY	*	90,882	212	153
*PY2DEZ	*	22,968	121	99
*PY5KC	*	15,228	99	81
*PY2ASS	*	14,110	113	83
			(OP: PY2AXH)	
*PY2AC	*	9,352	67	56
*PY1POF	*	7,564	76	61
*PR7AF	*	1,326	26	26
***PY2OE**	**28**	**1,276,941**	**939**	**499**
*PP5BZ	*	303,255	391	293
*PU9OSB	*	294,758	418	293
*PU1KGG	*	235,949	365	259
*PU2SDX	*	161,460	289	230
*PY2LUC	*	16,740	97	90
***PW2B**	**21**	**3,015,375**	**1426**	**731**
*PY2TIM	*	1,563,704	964	568
*PY4XX	*	29,318	117	107

Chile

XR3P	**A**	**1,814,256**	**1138**	**586**
			(OP: CE3PG)	

Uruguay

CW7T	**A**	**536,670**	**493**	**402**

Venezuela

YV6BXN	**3.7**	**64,251**	**119**	**99**
***YV5EAH**	**A**	**618,744**	**606**	**348**
*YV1FM	*	130,848	215	174
***YV5LI**	**7**	**300,687**	**241**	**219**

TRIBANDER/SINGLE ELEMENT

United States

NXØX/4	**A**	**8,023,947**	**3077**	**1083**
			(OP: N4PN)	
WZ4F	*	3,229,096	1845	793
			(OP: K4AB)	
W6TK	**	**2,393,716**	**1654**	**676**
K3MD	**	**2,186,330**	**1433**	**703**
N1WR/3	*	2,006,320	1144	620
K1HI	**	**1,794,824**	**1295**	**628**
NT2A	**	**1,461,834**	**935**	**621**
N3UM	*	1,376,204	846	538
NK5O	**	**879,980**	**1007**	**460**
W1BYH	*	794,313	690	403
KV7DX	**	**757,809**	**1108**	**459**
			(OP: KN5H)	
N1BCL	*	698,400	632	400
K8KY	**	**666,000**	**679**	**400**
NC6X/7	*	644,245	672	395
KW3A	*	585,327	725	391
NJ2F/4	*	516,574	575	362
K4IE	*	497,673	533	363
K6TU	*	474,720	633	368
N1KON	*	458,280	546	342
N2NC	*	429,693	456	319
AB5C	*	348,540	490	314
AC7GP	*	332,304	435	322
W8GG	*	299,624	385	268
NJ1F/2	*	284,900	388	259
KT6YL	*	262,704	525	312
WG7X	*	261,370	522	295
KF7IQ	*	260,934	435	277
W1FM	*	250,120	387	260
WR5G/7	*	201,676	378	254
NY1H/Ø	**	**200,123**	**357**	**253**
AD4L	*	188,160	340	240
ND9Z	**	**182,250**	**333**	**243**
NØOST	*	157,320	309	230
KØGAS	*	152,250	339	250
K5YM	*	148,392	310	229
N5KO/6	*	132,310	259	202
K6RJP	*	127,635	281	201
NC4MI	*	103,592	220	184
KG2V	*	67,425	192	145
K6III	*	34,299	147	111
N7LR	*	19,090	109	83
KB6A	*	18,225	105	81
4U1WB/3	*	14,691	104	83
			(OP: AJ3M)	
WA6TLG	*	14,527	75	73
W6SX	*	5,356	61	52
KZ5OM/6	*	4,361

WD5K	14	1,323,875	1177	623	
W5AEA/7	*	1,264,200	989	602	
KD8SQ	*	161,538	282	247	
WØPPF	*	32,469	148	137	
W4YKF	*	2,848	32	32	
KU8E/4	7	686,913	792	401	
KZ1A/4	*	90,825	310	173	
AA4D	*	71,446	160	139	
WJ1R	*	52,704	131	122	
W8JMF	*	30,099	81	79	
WN2O	3.7	314,004	404	274	
			(OP: N2GC)		
***NX6T**	A	1,623,725	1484	607	
			(OP: K6AM)		
***KT4ZB**	*	1,514,436	1119	596	
***WB8TLI**	*	1,205,298	851	522	
***AC5O**	*	1,142,270	961	515	
***KØCN**	*	950,915	1024	505	
***KB3LIX**	*	583,906	587	362	
*WB4JFS	*	569,088	607	384	
*KS4X	*	536,176	550	376	
*WAØL	*	501,960	583	356	
*NR3X/4	*	474,220	545	362	
			(OP: N4YDU)		
*K8BL	*	461,153	564	371	
*W4NBS	*	454,990	557	346	
***WD8CQB/2**	*	405,806	481	331	
*AAØNK	*	401,984	505	352	
***KA1GEU**	*	376,295	471	323	
***K9JE**	*	344,318	443	323	
*WT8E	*	311,535	489	315	
*K3FIV/6	*	307,190	480	278	
*KB8OCP	*	296,460	425	270	
*N2YBB	*	289,710	394	270	
*WN6K	*	286,650	591	315	
*WBØTSR	*	274,800	441	300	
*WA1DRQ	*	271,616	418	256	
*WYØB	*	263,520	511	270	
*W1WBB	*	259,347	392	271	
*N8MPX/4	*	256,424	393	266	
*K5DHY	*	253,400	367	280	
*WV6N	*	252,757	452	251	
*K6RJ	*	215,110	405	245	
*AJ5C	*	209,969	372	257	
***NQ7R**	*	199,617	406	253	
*N7UR	*	189,728	362	242	
*W7RV	*	175,791	299	231	
*N7VM	*	173,038	347	241	
*K4NAU	*	171,350	316	230	
*WB8JUI	*	170,709	337	231	
*KI4FIA	*	168,592	485	257	
*N3RC/6	*	160,515	418	205	
*W8GOC	*	151,368	300	212	
*K9CHP/2	*	141,668	301	214	
*W1TO	*	133,700	239	191	
*W7KAM	*	132,220	297	220	
*NG4L	*	125,200	262	200	
*KT3W	*	118,156	304	218	
			(OP: K1RY)		
*AC6E	*	117,216	303	198	
*NE7D	*	113,405	240	185	
*WE6EZ/7	*	110,980	307	179	
*NJ1H	*	101,200	231	176	
*N8HP	*	98,604	218	198	
*W7KU/Ø	*	98,208	262	176	
*K1MVM	*	90,650	203	175	
*N6JRL/8	*	87,039	227	171	
*AA7DK	*	86,100	272	175	
*NY4JB	*	78,489	226	153	
*W6ZL	*	77,672	199	133	
*K4FTO	*	75,429	203	153	
*W2VU	*	73,625	204	155	
*AI4GR	*	68,847	223	159	
*W3LL	*	64,678	172	146	
*N4DE	*	58,740	167	132	
*K7RB/5	*	56,980	208	148	
*K5IID	*	53,108	192	142	
*NØGOS	*	52,850	207	151	
*AD7MQ	*	47,799	216	141	
*WA2FBN	*	47,388	174	132	
*NW4V	*	46,440	142	129	
*NØRZT/4	*	45,720	146	127	
*W6TAN	*	44,649	197	121	
*W8DW	*	42,757	171	143	
*NY4D	*	41,005	144	139	
*K1WCC	*	39,176	141	118	
*WI7F/6	*	38,592	202	134	
*W6FB	*	36,630	150	110	
*NØEOP	*	34,884	149	114	
*W8BFX/7	*	32,775	154	115	
*W3CP/7	*	29,561	115	103	
*KØAIZ	*	29,274	109	102	
*N4LKE	*	27,819	117	99	
*KK1W	*	26,950	111	98	
*NØMSB/3	*	24,304	121	98	
*K6CSL	*	24,252	118	94	
*NA8SA	*	23,275	119	95	
			(OP: AF8C)		
*K6UM/7	*	22,413	108	93	
*NØGMT	*	22,155	133	105	
*AA6EE	*	20,646	106	93	
*K4DMH	*	18,868	94	89	
*K7ACZ	*	17,700	87	75	
*AF6VQ	*	16,915	100	85	
*KA8NJW	*	16,716	88	84	
*AJ4GL	*	13,320	82	74	
*KE7WVZ	*	9,455	66	61	
*KD8FDO	*	8,910	82	66	
*KJ9B	*	8,532	66	54	
*KI4KFW	*	7,923	65	57	
*KD2MU	*	4,601	44	43	
*AB8DF	*	4,050	53	45	
*KI4HHK	*	3,325	40	35	
*N8NA/3	*	2,852	33	31	
*AF8C	*	1,953	39	31	
*K4GDW	*	1,566	28	27	
*K9JG/4	*	663	17	17	
*W4JHC/5	*	330	15	15	
*WB5SGN	*	297	11	11	
*WU9B/7	*	168	8	8	
***AE6YB**	21	46,332	234	143	
***N5DTT**	*	33,988	120	116	
***KN8D**	*	15,456	92	84	
***W9ILY**	*	3,116	43	38	
***NN5Z**	14	802,602	916	501	
			(OP: K5PX)		
***KC2MBN**	*	20,758	102	97	
***KC7H**	*	2,880	41	40	
***N8WAV**	*	2,496	33	32	
***KG6YMN**	*	6	2	2	
***KG4W**	7	599,060	777	389	
***WD3C**	*	113,296	236	194	
*K4KCS	*	4,000	33	32	
***N2AET**	3.7	1,344	25	24	

DX

ST2AR	A	15,353,520	4233	1110	
			(OP: S53R)		
L21D	*	4,118,794	1751	782	
			(OP: LU9ESD)		
DL4MCF	*	4,090,342	2034	827	
VK7ZE	*	3,635,620	1638	740	
LU7MCJ	*	3,483,648	1621	768	
EW5A	*	3,450,536	1873	856	
			(OP: EW2AA)		
KG6DX	*	3,162,870	1693	622	
4M5IR	*	3,120,548	1342	634	
			(OP: YV5KG)		
UA9QA	*	3,036,132	1463	612	
L33M	*	2,991,021	1508	699	
			(OP: LU3MAM)		
VK2APG	*	2,827,968	1378	618	
VE3CR	*	2,514,113	1123	629	
RU9CK	*	2,435,335	1347	595	
EA3RR	*	2,186,748	1360	584	
4H1T	*	2,056,968	1260	428	
			(OP: DU1IVT)		
HA1TNX	*	1,863,736	1140	644	
TA2DS	*	1,838,832	1025	464	
EX2X	*	1,611,936	1093	579	
KH2JU	*	1,493,163	1163	411	
VO1KVT	*	1,490,016	879	544	
OE6MDF	*	1,324,203	981	573	
MØWLF	*	1,263,024	960	537	
DL9GWD	*	1,212,152	891	554	
F4DSK	*	1,171,242	949	558	
LY2TS	*	1,069,200	940	540	
UW8SM	*	917,188	840	491	
JM1UTT	*	846,945	740	435	
EW4AA	*	748,960	698	496	
JA7COI	*	695,976	657	376	
MW1LCR	*	674,352	714	446	
VA7IR	*	630,763	767	359	
TF8GX	*	601,869	874	457	
PA1NL	*	474,154	628	383	
SP3GTS	*	399,595	516	343	
DJ3LE	*	381,617	502	359	
KP4JRS	*	380,528	554	272	
IR9Z	*	369,402	684	386	
			(OP: IT9VCE)		
M5A	*	345,347	533	367	
			(OP: G3WVG)		
AN2K	*	340,442	421	323	
			(OP: EB2RA)		
JR2PMT	*	338,328	391	263	
DL5JS	*	314,901	427	327	
IZ1JLN	*	310,275	423	315	
9A3TA	*	300,144	403	296	
IWØGTA	*	298,596	457	334	
YT7DQ	*	246,528	447	288	
YO4AUP	*	227,305	390	269	
DF6RI	*	216,213	395	291	
RU3UR	*	211,665	463	309	
DKØSU	*	196,669	290	209	
			(OP: DF7SA)		
G1MIE	*	186,930	332	279	
JJ2CJB	*	169,644	291	211	
DJ6TB	*	136,713	300	229	
EI7JQ	*	136,038	326	237	
YO7CWP	*	117,448	286	212	
VE3KPP	*	115,761	243	141	
IK3SSJ	*	112,404	280	228	
JA3ETD	*	99,624	232	168	
EW7BR	*	98,959	219	211	
DK8EY	*	96,015	239	185	
P33P	*	82,460	151	133	
			(OP: 5B4ZN)		
ZL4IG	*	77,616	142	126	
VK3TZ	*	63,707	162	133	
ZW5V	*	56,942	155	142	
			(OP: PY5KA)		
VA7DZ	*	54,900	174	150	
RA1TV	*	41,230	140	133	
RA6AR	*	29,337	145	127	
VE3FTM	*	27,720	105	99	
RZ9OW	*	27,714	121	93	
JA1IXY	*	19,968	76	64	
XE2YOM	*	14,580	88	81	
S21RC	*	7,685	66	53	
CE2WWF	*	3,159	43	39	
IW6PLY	*	1,440	32	32	
JO1NLN	*	612	18	17	
VK3DXI/6	28	73,502	175	143	
CT4NH	*	52,440	161	120	
OH3BU	*	2,250	34	25	
IK2RGT	*	154	8	7	
SA1A	*	126	7	6	
			(OP: SM1TDE)		
JN1NDY	21	1,174,380	898	529	
UA9FGJ	*	1,074,964	805	484	
JA1LZR	*	837,935	732	445	
IWØBCF	*	256,960	366	292	
YBØMWM	*	242,968	356	251	
G4IUF	*	26,235	111	99	
JH7XMO	14	1,343,760	966	528	
OH6NJ	*	1,238,202	1142	634	
EI/EA3BOX	*	714,525	909	525	
VY1EI	*	700,128	743	416	
EC7AKV	*	621,264	907	516	
DL4WA	*	430,335	607	393	
IZ8EFD	*	159,804	442	276	
OP1A	*	152,576	303	298	
VE8DW	*	62,486	163	157	
JH8SIT	*	49,911	143	131	
SS1D	7	383,760	489	328	
UZ7M	*	286,635	393	291	
			(OP: UT9MZ)		
SO8T	*	179,883	324	253	
			(OP: SP8TJU)		
EA4KD	3.7	993,446	727	479	
G3YBY	*	241,660	345	281	
VK6DXI	*	4,557	39	31	
JH1APK	*	560	10	10	
SV1GRD	1.8	3,444	41	41	
VE3CUI	*	360	10	10	
VK2DXI/6	*	60	10	4	
***CN2BC**	A	4,416,000	1923	750	
			(OP: DL7BC)		
***LO7H**	*	3,234,458	1570	709	
			(OP: LU7HW)		
***SV8/SV1JG**	*	2,012,680	1896	670	
***VE3DZ**	*	1,974,378	1031	609	
*LW1DTZ	*	1,951,274	1170	598	
***EJ8GQB**	*	1,819,375	1220	625	
			(OP: ON4EI)		
***P43E**	*	1,796,250	1311	479	
***V55X**	*	1,758,174	1069	561	
			(OP: V51YJ)		
***S51F**	*	1,613,372	1058	596	
***YO3APJ**	*	1,554,333	1074	627	
***EA8OM**	*	1,280,769	824	497	
*5C2P	*	1,197,004	833	493	
			(OP: IK2PZC)		
***EN7U**	*	1,078,350	950	553	
			(OP: UR4UDI)		
***EE7R**	*	1,008,458	837	506	
***G3ZQH**	*	990,996	916	538	
*VE3TW	*	852,845	673	413	
***UA1CUR**	*	838,729	877	479	
***F5LIW**	*	830,620	747	476	
*LW6DG	*	823,446	735	414	
***DR4G**	*	797,498	724	481	
			(OP: DJØGM)		
***EW1IP**	*	726,077	760	443	
***BD1TCC**	*	703,564	824	398	
***HZ1PS**	*	673,360	579	380	
***EA1EA**	*	668,640	625	420	
***VX7BC**	*	610,218	668	334	
			(OP: VE7BC)		
***SM3C**	*	606,582	681	423	
			(OP: SM5CCT)		
***OK2BUT**	*	579,180	615	394	
***OZ4NA**	*	578,158	661	427	
*OZ1ACB	*	539,965	636	395	
***IK7NXU**	*	518,580	547	402	
*L6ØDK	*	517,470	568	367	
			(OP: LW4EF)		
*VE3TU	*	504,464	509	328	
***SY9A**	*	497,517	690	433	
			(OP: SV9COL)		
*VE3OX	*	480,180	482	318	
***VO1DJT**	*	439,890	458	330	
*VA7CRZ	*	420,444	459	306	
***OR6C**	*	407,680	524	364	
***GI7AXB**	*	405,504	567	384	
***HB9WDY**	*	404,840	551	349	
***RZ3XA**	*	402,752	598	406	
***PS2Y**	*	400,520	461	323	
***JA2CUS**	*	396,474	484	299	
***JM1LRQ**	*	395,945	538	313	
*G4DFI	*	366,417	523	369	
***LY2K**	*	335,849	525	313	
***WP3GW**	*	325,759	386	269	
*OK2WYK	*	312,939	496	319	
*RV3EAK	*	306,190	453	335	
***JR4VEV**	*	301,644	461	266	
*DFØBV	*	299,744	447	323	
			(OP: DL1MAJ)		
***PD7BZ**	*	296,075	432	325	
*EI4GNB	*	295,680	436	336	
*PD6W	*	292,400	496	344	
*UT5PY	*	281,135	430	295	
*5PØO	*	278,460	461	315	
***GM4W**	*	276,624	454	306	
			(OP: GMØNTL)		
*OK1CLD	*	269,280	405	288	
***DU1EE**	*	268,565	406	209	
*UT1IM	*	246,636	413	306	
*UA3DW	*	235,865	366	293	
*U1BA	*	221,366	419	302	
*SE5S	*	213,885	365	291	
*SF3A	*	212,240	415	280	
			(OP: SM3CER)		
***TE2M**	*	205,758	467	213	
			(OP: TI2KAC)		
*VE3RCN	*	205,110	303	215	
***V85TX**	*	203,792	378	188	
*JA2PFO	*	200,560	347	218	
***XX9LT**	*	198,531	430	243	
*EA1ET	*	196,384	364	272	
*EU4AA	*	196,348	344	257	
*PY2XTA	*	181,930	313	230	
*PY7VI	*	178,738	306	238	
*F6GCI	*	175,274	305	257	
*UX2MF	*	174,243	335	241	
***NH6WZ**	*	173,524	275	188	
***VK4BL**	*	169,740	259	207	
*DU1EG	*	167,494	335	166	
***LA7GNA**	*	162,134	343	259	
***EB3JT**	*	150,638	290	218	
*DJ4MH	*	149,860	345	254	
*PD9FER	*	142,538	311	242	
***RA4WO**	*	132,026	340	263	
*JA1FRQ	*	126,162	264	163	
***IT9YAO**	*	125,103	304	223	
*JE4MHL	*	123,120	265	180	
*PE1EWR	*	121,380	270	210	
*UA3AIU	*	116,600	303	220	
*DL4RAT	*	116,470	248	190	
***ZL1AAO**	*	115,596	235	169	
*EA3FF	*	114,904	256	212	
***OE2XWL**	*	112,736	249	208	
			(OP: OE2UKL)		
*PA3DBS	*	111,684	280	227	
*RA3DCT	*	104,650	204	182	
*PY5AP	*	104,144	246	184	
***ZS4JAN**	*	103,797	216	171	
*RA3VLD	*	103,282	274	226	
*I8OCA	*	101,304	239	201	
*IZ7DOK	*	100,276	274	212	
***RX9DJ**	*	99,186	233	183	
*AM7C	*	90,093	227	177	
			(OP: EA7HMD)		
***SQ7VO**	*	87,768	210	184	
*US0IU	*	80,538	238	186	
*G7DDN	*	79,794	229	186	
*YO2LIM	*	77,532	198	156	
*EA3WX	*	77,252	197	178	
*RV1CB	*	67,662	206	189	
*G6UBM	*	66,259	204	173	
*VK4XES	*	62,500	142	125	
*EI7CC	*	61,944	199	174	
*UA9AX	*	61,612	168	146	
*SP6NVK	*	61,600	215	160	
***JK3GWT**	*	59,409	161	123	
*EA8AJO	*	57,486	150	134	
*EI4HQ	*	57,275	172	145	
*SE6C	*	56,206	197	157	
			(OP: SM6CDN)		
*DK6NF	*	56,056	196	154	
*SP7TES	*	55,062	160	126	
***OH6JYH**	*	54,288	216	174	
*LA8OKA	*	52,947	191	159	
***VE6LE**	*	50,344	144	124	
*OK2BZE	*	47,040	150	140	
*RN3FS	*	46,506	150	138	
*JA1AZR	*	45,084	171	102	
*DP5X	*	43,365	177	147	
			(OP: DL3EBX)		
*G4DDL	*	40,350	173	150	
***VA2WDQ**	*	38,872	128	113	
*S52Q	*	37,403	172	113	
*IK2IKW	*	36,608	152	143	
***EA2SS**	*	33,500	152	125	
*BD4JZY	*	33,060	142	114	
*SMØHBV	*	32,912	156	136	
***9A4WY**	*	29,748	122	111	
*OK7N	*	29,400	113	100	
*PA3ANN	*	28,968	161	136	
*IK2YSJ	*	27,940	130	110	
*RA3DAD	*	26,448	128	116	
***RX6LD**	*	23,712	132	114	
***RAØWHE**	*	22,659	98	83	
*G8NEO	*	20,680	125	94	
*IZØMJE	*	20,094	108	102	
*KP4JFR	*	19,040	92	80	
*IW5ECP	*	17,052	106	98	
*IV3NVB	*	16,835	93	91	
*DL8ZAJ	*	16,683	102	83	
*G4FFN	*	15,486	90	89	
*PY7GK	*	14,625	78	75	
*RV4CO	*	13,172	96	89	
*EA2TA	*	11,799	74	69	
*G8GBY	*	10,956	95	83	
			(OP: MØGOY)		
***EA4DTV**	*	7,760	49	40	
*SP1MWN	*	7,301	54	49	
*IZ7IJW	*	6,360	61	60	
*IZØBTV	*	4,848	49	48	
*DL4SUN	*	3,441	41	37	
*YO2LSP	*	3,240	37	36	
*JR3GVH	*	3,168	43	36	
*JR1AHP	*	1,584	23	22	
*LY3RQ	*	1,519	31	31	
*JR3SZZ/3	*	1,311	23	23	
*M1JJK	*	1,305	29	29	
*IW4EGX	*	697	17	17	
*MØPKZ	*	651	21	21	
*JR1MRG	*	468	15	13	
*8G4LKZ	*	300	15	15	
*SMØBDS	*	200	10	10	
*JI1UDD	*	160	8	8	
*JN1DNV	*	55	5	5	
***PU2KLM**	28	140,805	288	189	
***EA7GV**	*	16,170	86	70	
***7N2UQC**	*	5,016	58	44	
***XQ4CW**	*	1,827	31	29	
*SM1CXE	*	48	4	4	
***UN4PG**	21	444,705	533	345	
***RA4WC**	*	319,088	589	392	
***IZ5CML**	*	269,348	373	289	
***AO1B**	*	264,579	426	293	
			(OP: EA1YB)		
***YT2B**	*	243,005	376	265	
*EH1K	*	181,632	331	258	
***VK4EJ**	*	168,639	389	201	
***UA3VVB**	*	164,472	335	267	
***YC2BBY**	*	126,000	266	168	
***MUØGSY**	*	75,985	237	167	
***VE7NS**	*	59,360	170	140	
***SM6FKF**	*	18,387	97	81	
***JA2VSU**	*	15,405	84	79	
***JF1GZZ**	*	11,690	73	70	
*SA6AIN	*	9,204	71	59	
***LW5EE**	*	6,468	51	49	
***ZS6ELI**	*	4,095	40	39	
*IZ8JPV	*	3,922	39	37	
***XV4TUJ**	*	900	21	20	
*IK3PQG	*	75	5	5	
***S57U**	14	240,036	418	332	
***IW9FI**	*	172,463	433	313	
***UN9PQ**	*	168,012	279	234	
***IZ2JQP**	*	127,626	282	239	
***OH3P**	*	112,585	344	253	
***DL9LM**	*	102,828	256	209	
***F1FPL**	*	97,867	238	217	
***G1FON**	*	88,476	258	219	
***DU1JI**	*	86,360	229	136	
***RV6ACC**	*	69,715	229	191	
*DL4JYT	*	46,971	185	153	
***CT1EEK**	*	31,020	137	132	
*DM6DL	*	26,432	133	112	
***PAØCGB**	*	21,312	117	111	
*RV6BK	*	17,572	93	92	
***JA3DAY**	*	15,111	80	73	
***SA7J**	*	9,794	91	83	
			(OP: SM7XGG)		
***AN4A**	*	4,554	49	46	
			(OP: EA4CWN)		
***LY11MM**	7	385,776	508	342	
			(OP: LY2MM)		
***IZ1DGG**	*	188,856	332	258	
***VE1AOE**	*	168,566	282	178	
***DL7DZ**	*	152,004	247	212	
***OE2UKL**	*	114,536	239	206	
***GW4EVX**	*	106,183	240	197	
***OK2ILD**	*	82,800	191	184	
***UA6NZ**	*	55,183	163	139	
***YO5OLD**	*	28,034	111	107	
***JR4URW**	*	25,677	93	81	
***9A2GA**	*	24,543	111	101	

*JL3MCM	*	19,734	73	66
*JH1RDU	*	216	6	6
*IV3BCA	*	198	10	11
*VK3ZGP	*	6	1	1
*HK1NK	3.7	579,348	386	266
*UA3LHL	*	113,955	266	213
*SN5Q	*	63,896	203	163
		(OP: SQ5RDX)		
*SM6NJK	*	51,340	166	151
*OR2A	*	32,754	121	103
		(OP: ON7YX)		
*VE2JMK	*	28,798	94	77
*PA2REH	*	18,200	96	91
*EB5EKT	*	9,150	62	61
*VE3EDY	1.8	49,068	142	94
*EA3AKA	*	35,178	138	123

ROOKIE
United States

AD7YT	A	472,632	804	376
KI6QDH	*	164,640	355	224
K7DNH	*	45,260	150	124
K8KXN	*	3,510	39	39
*K2DSL	A	553,125	661	375
*K6FI	*	152,292	345	222
*AB4G	*	139,520	283	218
*NC2T	*	87,096	208	152
*K6MEE	*	80,688	243	164
*KJ4BIX	*	67,160	209	146
*KB1TOC	*	58,672	163	152
*AK4IK	*	56,541	192	141
*NV3V	*	55,890	176	138
*KJ4ERZ	*	50,625	174	135
*KJ4KNW	*	49,206	188	139
*WE7P	*	48,138	186	142
*KC9LQS	*	42,900	161	130
*KJ4JEY	*	42,312	175	123
*K3GMT	*	33,411	129	111
*K2DEN	*	24,786	115	102
*KJ4GDW	*	20,424	108	92
*AG6MB	*	19,170	105	90
*W1SKB	*	18,576	95	86
*N6VDR	*	16,576	92	74
*KB3EOJ	*	16,380	97	90
*K3GEN	*	16,132	90	74
*KJ4BQS/7	*	15,745	86	67
*WA2CG	*	15,326	89	79
*KB1PWF/7	*	12,629	79	73
*W6NWF	*	11,120	95	80
*KI6WCI	*	9,380	77	67
*KC2SNW	*	9,060	64	60
*KE7ZZO	*	8,094	81	71
*K4RAY	*	7,644	55	52
*WW1N	*	7,020	56	52
*W3EDP	*	5,292	59	54
*NS6T	*	3,724	42	38
*K1JHS/5	*	3,680	46	46
*KC2VUP	*	2,479	39	37
*N8RLG	*	1,975	26	25
*KI4ZDR	*	1,620	32	27
*WX6O	*	1,104	25	24
*W8IDW	*	35	5	5
*KE1BYL/6	28	3,811	40	37
*KE5SNJ	*	243	9	9
*KE9YA	14	3,834	42	41
*K6UMO	*	1,551	33	33
*KE7PNF	*	144	12	12
*K4MTX	*	126	9	9
*AB1JU	7	520	14	13

DX

KH8UA	A	3,368,263	1866	551
E7/S56AA	*	2,248,248	1535	678
		(OP: S56AA)		
EA4ETW	*	1,396,200	1081	600
DN1CS	*	215,745	394	285
6Y1X	*	121,638	269	194
		(OP: KD8MJR)		
VE5ZC	14	1,377	28	27
PJ7MF	7	110,400	164	138
VK2WAR	*	28,500	88	76
*JY5CC	A	5,322,240	2006	768
*EH2R	*	672,204	639	417
		(OP: EA2AOD)		
*VK8PDX	*	625,975	602	343
*VA3GKO	*	507,100	496	275
*OE6HLF	*	394,830	515	369
*PD8HM	*	311,259	481	347
*PD1TV	*	140,579	320	257
*IZ2NZZ	*	116,841	242	237
*MM8VTV	*	114,056	296	212
*2E8CPT	*	111,612	275	213
*2W8XTP	*	74,753	211	181
*M6APA	*	63,135	215	183
*PD1RP	*	57,669	188	141
*IZ8PPJ	*	52,548	173	151
*2E8WAW	*	52,500	203	175
*DJ4PK	*	48,848	162	142
*EA2ONR	*	45,820	190	158
*SA8BJL	*	39,732	177	154
*MD3YLX	*	37,401	156	137
*PD8MNF	*	33,276	135	118
*PY1CX	*	26,312	133	104
*DB1RL	*	15,224	99	88
*JS3EOE	*	14,272	92	64
*PD8ME	*	13,330	88	86
*EW4PA	*	13,026	82	78
*PU5UAI	*	12,996	88	76
*UR8EG	*	11,315	81	73
*BH4RDU	*	8,758	89	58
*BG5HSC	*	8,540	87	61
*DL7TJ	*	6,572	55	53
*ON3MT	*	6,565	72	65
*LA1ORA	*	5,723	63	59
*M6JJK	*	4,720	64	59
*BH1LEJ	*	3,663	42	37
*BH4RDB	*	3,402	50	42
*SV2HWR	*	3,136	51	49
*IZ1MLS	*	3,132	37	36
*BH4SCF	*	2,244	37	33
*BG8GGT	*	1,664	36	32
*BH4RCI	*	1,140	33	30
*IV3BKB	*	989	24	23
*YO5CZZ	*	630	22	10
*BH1IIA	*	442	20	17
*YO9ICT	*	330	10	10
*F4FWN	*	140	7	7
*EB5GIV	*	48	5	4
*EA3GOD	*	3	1	1
*WH8/WH7ZJ	28	270,750	621	150
*PU8TEP	*	70,810	194	146
*YY1OKR	*	59,396	200	124
*PU2TEA	*	46,609	159	127
*NP3SI	*	8,632	59	52
*PU1LND	*	5,616	65	54
*EA2CTB	*	1,044	20	18
*JO3RCK	*	75	5	5
*9W2ESM	*	60	7	6
*EE1E	21	490,000	593	392
			(OP: EA1GFP)	
*PY2BRA	*	437,844	478	321
*OH7FKV	*	84,960	231	180
*BH7LMD	*	62,266	211	163
*TA4AU	*	36,358	134	106
*IT9IMJ	*	28,441	135	119
*DW1VKT	*	19,007	99	83
*BA4ID	*	9,324	66	63
*EY8BG	*	9,240	63	56
*EY8BI	*	8,910	63	54
*JR2AAN/2	*	7,452	57	54
*BD4EXL	*	1,643	33	31
*BH1HSX	*	4	2	2
*IZ8NWA	14	26,964	141	126
*ON3HVH	*	1,247	29	29
*PD8MD	*	504	21	21
*IT9AXQ	*	432	18	18
*OK1LX	7	413,848	546	358
*S57LR	*	327,600	432	315
*SQ2NNN	*	314,901	437	327
*VK3VTH	*	54,614	109	94
*YO2MJZ	*	35,910	123	114
*IZ1NBX	*	28,260	96	90
*DO6JAN	3.7	190	10	10

MULTI-OPERATOR SINGLE TRANSMITTER
NORTH AMERICA
United States

NG3R	15,690,724	4236	1324
NN1N	11,843,685	3722	1245
WR3Z	10,086,180	3376	1158
KX7M/6	7,478,935	2991	977
KV8K	6,619,538	3100	953
AJ9C	6,563,520	2772	1032
WU2X	5,953,220	2137	910
KD9ST	4,685,949	2466	879
WC5T	3,616,873	2368	793
NO4U	3,254,931	1761	783
WO8CC	2,970,624	1712	758
KA1IOR	2,124,544	1195	688
KQ7W	2,088,416	1637	698
WX7P	2,042,442	1626	694
W7EB	1,948,640	1707	608
N8MA	1,925,758	1392	662
K5UA	1,913,301	1257	621
NC7M	1,796,067	1428	663
WQ6X	1,682,174	1461	598
AI5M	1,470,744	1343	619
N8AJN/8	792,527	765	443
N7VF	672,878	651	401
N6MI	607,969	805	419
WV2ZOW	490,428	576	342
W6KA	388,008	557	306
W3LJ	339,568	428	304
NO2J	193,688	343	248
KD8S	141,026	430	214
NE6M	101,421	293	177
W8BI	84,320	189	155
KC8YJO	53,911	195	143
KJ4BIW	24,158	106	94
N2NGW	18,673	73	71
KI6UAP	1,716	26	26

Antigua & Barbuda

V25Y	14,801,966	3787	1138

Canada

VE7GL	10,196,445	2877	1083
VC6R	8,087,360	2865	995
VX6AO	2,841,625	1959	635
VA2TG	1,802,227	977	553
VC7C	1,166,394	903	438
VE7NSR	43,673	159	119

Mexico

XE2AUD	593,370	754	342
XE1CRG	65,286	140	117

AFRICA
Morocco

5D5A	36,669,952	6300	1532

Senegal

6V7M	12,640,095	3593	1105

ASIA
Asiatic Russia

RK9CYA	2,739,686	1310	646
RZ8SZZ	2,021,760	1170	576
RZ9WXK	1,312,416	814	441
RK9CWW	509,439	453	357

China

B1Z	3,211,270	1760	730
BY5CD	2,142,270	1506	585
BY8DX	1,623,272	1178	574
BY4QA	1,575,968	1290	544
BY4HAM	485,002	653	343
BY4DX	11,448	82	72

Cyprus

P39P	1,973,906	1027	506

Hong Kong

VR2C	3,046,320	2078	720

India

VU2SWS	291,537	396	261

Japan

JI2ZJS	4,465,430	1854	743
JI2ZEY	2,658,222	1365	578
JA1ZGP	252,324	396	258
JA4YHX	109,686	250	181

Kazakhstan

UP8L	19,925,262	4636	1197
UP9L	3,803,815	1565	751

South Korea

D73D	2,639	30	29

Tajikistan

EY8ZF	20,900	98	76

Thailand

E2BAS	3,323,229	1858	777

Turkey

TA7KA	8,080,678	2753	877
TA2KK	2,091,132	1081	522
TA2KD	217,800	286	200
TA8KA	166,064	244	194

UK Bases on Cyprus

ZC4T	5,024,398	2157	722

Vietnam

XV2RZ	2,439,618	1892	659

EUROPE
Azores

CQ8X	20,882,307	5864	1343

Belarus

EW8ZO	104,706	269	189
EW8ZZ	3,774	45	37

Belgium

OP4K	3,510,298	1721	842
ON6BR	3,067,018	1733	817

Bosnia-Herzegovina

E73ESP	461,243	590	379

Bulgaria

LZ5K	5,003,245	2606	955

Croatia

9A3B	5,507,349	2508	977
9A5D	3,371,808	1976	824

Czech Republic

OL1C	3,840,624	1771	894
OK2KOJ	1,450,780	1034	578

Denmark

OZ2AR	1,557,540	1208	612
5Q1A	495,235	579	401

England

G2W	3,086,775	1756	807
G5FZ	2,487,240	1539	756
M4U	2,122,848	1334	702
GB2DX	1,050,840	956	540
G1T	757,272	738	454
M8C	336,660	514	362
GX3YNN	119,215	260	211
G3PIA	117,132	277	227
M0B	110,475	300	225
G5N	86,691	252	213

Estonia

ES1XQ	1,127,126	1252	563

European Russia

RT4F	17,902,720	5435	1408
RT3F	8,739,945	3600	1163
RN3T	2,528,076	1597	764
RC3W	2,523,430	1732	767
RM3Q	2,473,325	1612	779
UA3R	1,904,814	1453	642
RZ4CWW	1,576,056	1184	677
RA3AWO	1,424,250	1177	675
RK3DZH	1,253,799	1241	621
RK3GWW	1,247,817	1181	569
RK4HYT	1,049,041	1100	553
RZ1AWZ	101,806	248	218
RK3PWJ	56,544	180	152
RK3DWR	24,592	131	116
RK3EWW	2,432	44	38

Faroe Islands

OY6A	2,704,740	2193	739

France

F6FYD	1,650,384	1077	657
F6KNB	1,546,725	1241	615
TM5W	1,043,072	878	562
F5KCH	82,668	192	166

Germany

DP3D	7,525,452	2598	1034
DP4W	3,766,572	1743	828
DB2B	2,944,830	1807	758
DKØEE	2,701,370	1458	745
DAØCA	1,791,982	1489	622
DLØP	1,371,475	1060	595
DP9I	1,365,976	1064	584
DAØHEL	879,035	886	487
DK4A	574,458	636	402
DKØGYB	411,232	547	362
DM2C	309,374	447	326
DN5KID	54,166	174	146
DLØAA	46,956	148	129
DL5HN	24,752	110	104
DLØMFL	19,364	108	94
DP4D	3,570	43	42

Greece

SZ3P	2,227,757	1873	707
SZ1TEIA	1,492,248	1306	641
SZ1A	116,397	357	243

Hungary

HA1ØØKDNE	28,386	134	114

Ireland

EJ5DX	4,811,840	2610	880
EIØW	1,614,150	1377	633

Italy

IO5O	11,541,075	3294	1235
IQ1RY	9,221,300	3083	1111
IR5X	2,441,501	1479	751
IR6T	1,939,048	1196	652
IR3P	113,386	212	182
IQØFR	22,624	128	101

Latvia

YL1XN	438,141	579	363

Lithuania

LY2ØW	132,545	330	245

Netherlands

PI4TUE	5,141,970	2201	930
PA6V	2,187,012	1347	708
PI4W	750,066	810	447
PA5W	279,000	404	310

Norway

LN9Z	7,687,806	3011	1106

Poland

SN3R	12,237,480	3625	1215
SO9Q	11,979,900	3433	1275
SN2B	11,318,340	3390	1210
SP1KZE	19,314	118	87
SP1PWP	602	15	14

Portugal

CT1JLZ	14,533,301	4304	1201
CR6P	4,547,625	2048	905
YP7P	3,070,704	1905	777
YR2U	183,516	365	246

Romania

Scotland

GM3W	3,265,574	1693	793
GM7A	1,277,100	980	594
GM4BRN	340,423	516	361
MMØDGR	24,190	167	118

Serbia

YTØA	5,270,616	2224	936
YU14ØZ	755,888	752	476

Sicily

IF9A	3,264,864	1932	856
IQ9NI	1,853,302	1369	671

Slovakia

OM7M	13,036,875	3562	1275
OM3KXX	4,969,340	2330	838

Slovenia

S54K	2,179,155	1444	705

Spain

ED1R	7,571,172	2997	1042
EE2W	7,372,967	2739	1043
ED5CJX	3,195,709	1907	823
EA3WD	2,351,700	1450	675
AM5A	923,831	926	527
AO2W	675,925	805	475
EA4RCT	324	19	18

Sweden

7SØX	4,042,940	1867	940
SK7OA	2,758,992	1717	753
SK3W	1,176	21	21

Switzerland

HB9AUS	1,809,956	1077	619
HB9EE	962,588	840	524
HB4FL	210,997	375	257

Ukraine

EM7L	6,164,037	2809	1017
UW3E	2,983,652	1873	791
UR4PWC	30,940	139	119

OCEANIA
Australia

VK6NC	1,272,744	945	396

East Malaysia

9M6BRC	2,621,026	1349	607

Indonesia

YE1ZAL	277,168	371	272

New Zealand

ZM4A	307,197	373	261

Philippines

DU1HR	141,588	290	162

SOUTH AMERICA
Argentina

LT1F	12,504,800	3562	1120
LS1D	6,023,520	2246	890
LV6D	2,411,730	1283	633
L73D	1,969,344	1144	624
LT4S	1,283,800	957	490
LT5D	250,170	351	269

Aruba

P4ØV	23,038,064	5516	1148

Brazil

PQ5B	14,000,194	3762	1163
ZV2K	1,843,456	1076	606
ZW8T	1,194,702	890	498

Chile

XR6T	8,630,768	2974	956
CE1Z	323,259	467	277
CE2LS	68,354	179	143

Netherlands Antilles

PJ4L	8,483,606	2839	953

MULTI-OPERATOR TWO TRANSMITTER
NORTH AMERICA
United States

K1LZ	30,393,480	6438	1560
KD4D/3	17,686,440	4806	1314
ND2T/6	13,174,813	4577	1139
WC8H	12,920,985	4857	1155
NK7U	12,708,572	4555	1228
KZ9O	12,534,964	4698	1249
KZ2V/6	9,201,079	3919	1013
W7RN	9,041,878	3598	1063
AK6M	8,603,440	3938	976
K4BP	7,300,610	3055	1070
WF3C/4	4,563,605	2489	895
W7DG	2,177,615	1739	685
K4VV	609,760	567	370

Alaska

KL7RA	21,531,565	5600	1265

Canada

VE6FI	8,508,144	2896	942
VE9ML	2,117,982	1110	579

AFRICA

CR3A	39,914,050	6934	1550
EF9K	701,400	518	420

ASIA

C4I	25,997,034	5328	1271
4L3A	21,600,320	5287	1120
BXØWPX	1,610,000	1385	560

EUROPE

OL4A	33,393,180	7118	1590
OLØW	23,705,850	5781	1477
RL3A	21,080,700	6053	1475
OG7X	16,844,403	5059	1389
DQ8N	16,044,117	4748	1347
OL1X	13,326,300	4172	1300
IR9Y	13,277,825	4494	1325
LZ5R	12,791,208	4544	1284
EI9E	10,687,157	3824	1153
S52ZW	10,567,220	3530	1132
PI4DX	10,503,618	3500	1194
LY2W	10,412,720	3486	1168
MØXXT	8,309,796	3163	1067
AN5P	7,858,020	3465	1130
G5O	6,223,800	2541	1025
YT9X	5,400,759	2477	949
M6T	5,168,032	2223	928
DKØWL	4,839,300	1992	900
Z37M	4,331,639	2330	923
OMØA	4,265,580	2303	843
ES5G	4,220,776	2137	904
J42T	3,882,450	2488	858
OZ7A	3,869,742	2167	849
DQ4W	3,243,443	1685	823
AM1A	3,001,503	1741	771
DP6T	2,834,464	1547	808
ED1T	2,561,592	1754	744
DLØAT	2,442,990	1657	726
TM57M	2,166,726	1527	662
ED1RCM	2,153,900	1345	700
M2W	2,065,728	1462	672
OZ5GX	1,560,924	1416	596
DLØER	1,379,961	992	583
LN5O	1,217,958	955	617
PI4FRG	643,318	713	454
LN1T	543,480	636	420
DF1DX	219,929	378	289
DLØLN	149,430	325	255

OCEANIA

VK4KW	16,480,506	4377	1106
YEØX	8,101,692	2854	939

SOUTH AMERICA

HC8GR	52,450,389	9168	1497
ZY7C	40,235,350	7444	1558
PJ2T	38,322,900	7443	1386
LP1H	31,181,257	6829	1457
CE4CT	19,384,420	4937	1241
PR5D	6,468,120	2345	954
ZW4O	3,057,240	1461	730

MULTI-OPERATOR MULTI-TRANSMITTER
NORTH AMERICA
United States

NO4I	23,093,496	6771	1476
WX3B	16,588,290	5256	1334
NR6O	16,213,505	6130	1265
NE1C	11,532,892	4295	1187
KK7OO	7,781,580	3571	1020
KS3F	2,658,117	1434	777

Canada

VG7G	4,735,741	2712	629
VE5PV	3,953,425	1891	779

AFRICA

EB8AH	62,470,800	9685	1665

ASIA

8N5A	1,354,904	1144	514
BVØL	578,170	1208	323

EUROPE

DR1A	47,783,944	10091	1747
LZ9W	24,780,945	6579	1533
HG1S	26,977,131	6415	1539
OT5A	23,662,804	6348	1529
UU7J	19,526,832	6258	1404
LY7A	15,745,961	5331	1309
PA6Z	10,184,636	3680	1204
E74EBL	4,299,316	2051	932
EA3PT	3,822,700	1913	860
II5P	3,477,175	1813	845
SK6D	1,474,762	1103	622
DR2P	1,205,540	965	545
9A6K	502,128	596	396
OK1KOB	190,554	353	273
PI4ZI	34,638	148	138

OCEANIA

VK1CC	8,840,424	2636	958
VK3HR	1,803,776	973	512
DX1DBT	612,040	737	286

SOUTH AMERICA

PY5GA	32,547,588	6613	1549
XR1A	5,917,585	2309	857
LU1UM	12,540	72	66

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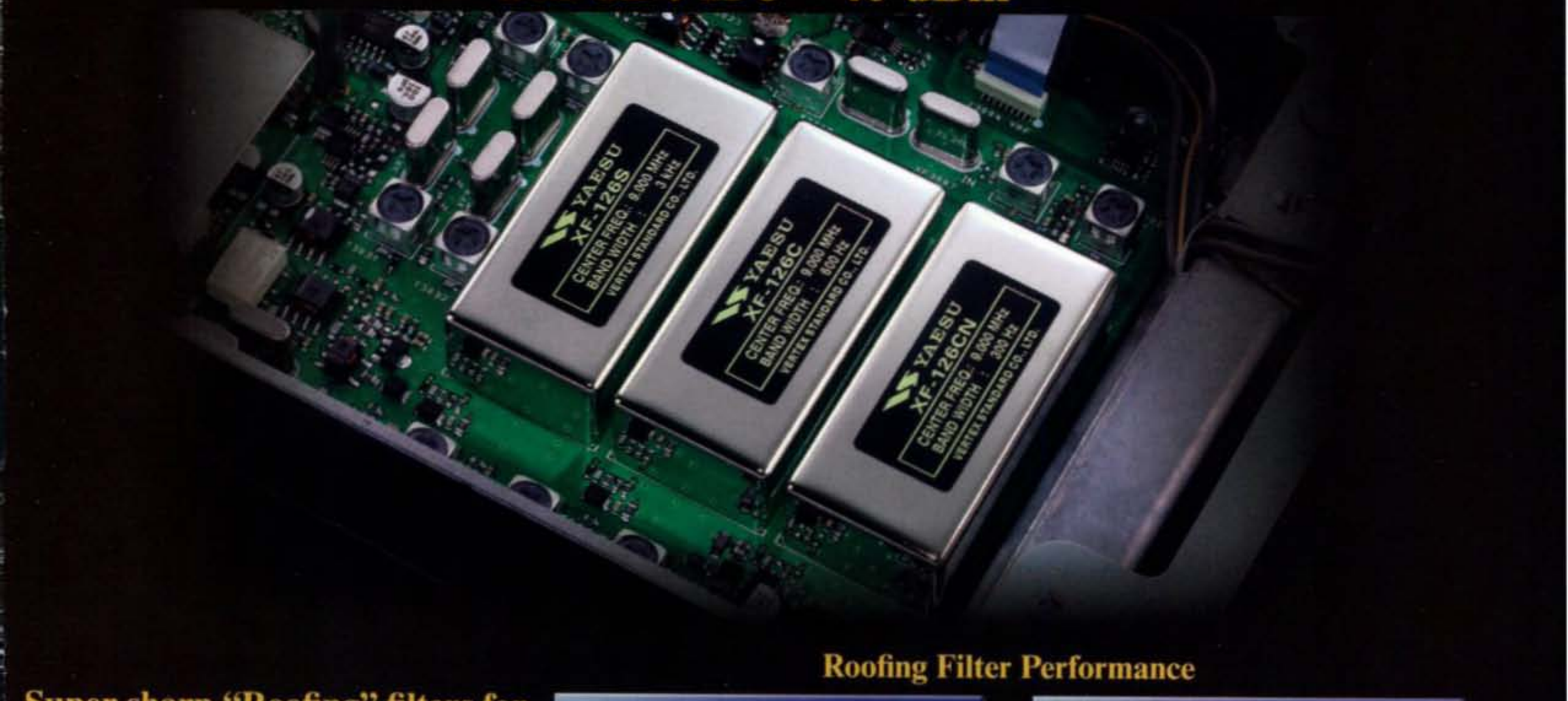

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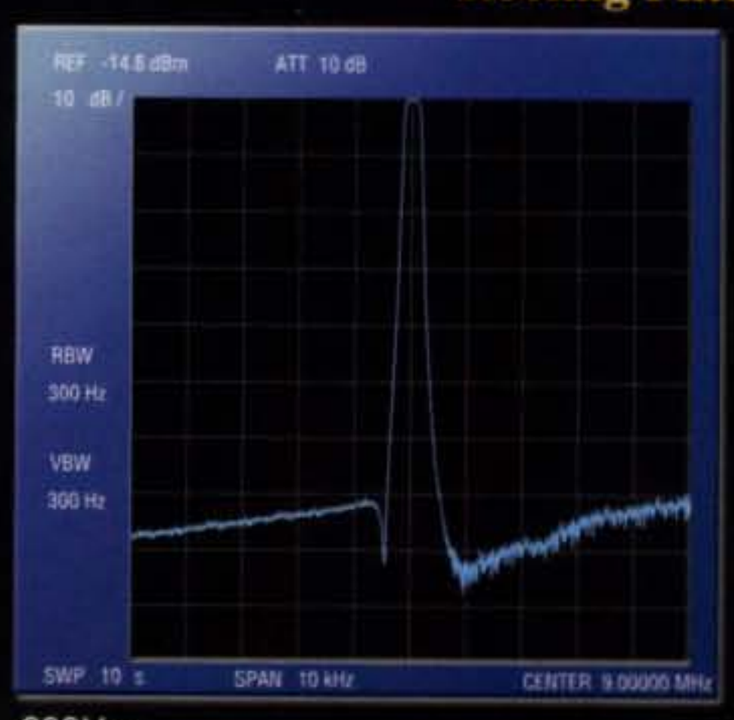

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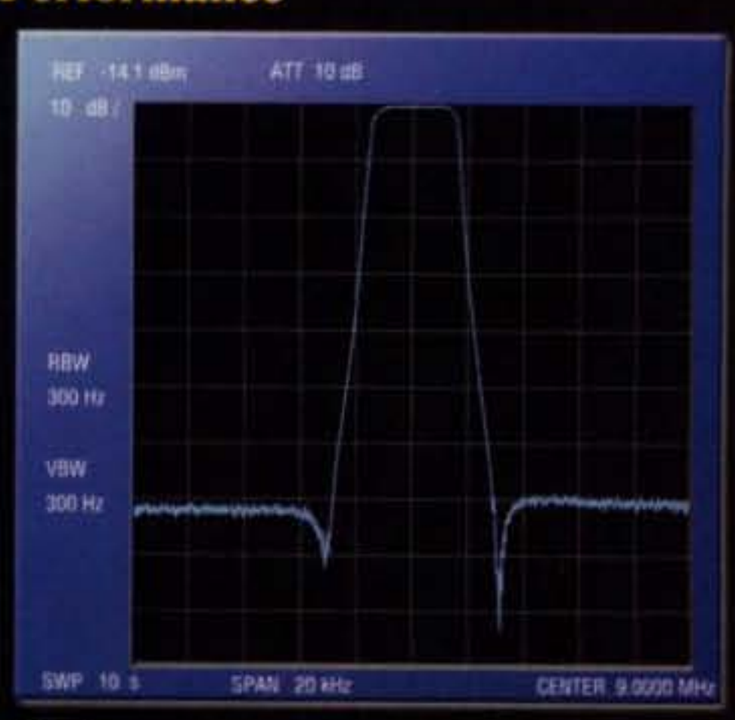

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- Station Monitor SM-5000 included
- ±0.05ppm OCXO included
- 300 Hz Roofing Filter included
- 600 Hz Roofing Filter included
- 3 kHz Roofing Filter included

HF/50 MHz 200 W Transceiver
FT DX 5000D

- Station Monitor SM-5000 included
- ±0.5ppm TCXO included
- 600 Hz Roofing Filter included
- 3 kHz Roofing Filter included

HF/50 MHz 200 W Transceiver
FT DX 5000

- Station Monitor SM-5000 optional
- ±0.5ppm TCXO included
- 600 Hz Roofing Filter included
- 3 kHz Roofing Filter included

For the latest Yaesu news, visit us on the internet:
http://www.vertexstandard.com

Specifications subject to change without notice. Some accessories and/or options may be standard in certain areas. Frequency coverage may differ in some countries. Check with your local Yaesu Dealer for specific details.

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IC-92AD

- D-STAR DV mode
- Analog FM
- IPX7 Submersible
- Dualwatch receive
- Wideband receiver
- Optional GPS Mic HM-175GPS

D-PRS™

*Frequency specs may vary. Refer to owner's manual for exact frequency specs. **IPX7: Tested to work after being under 1 meter of water for 30 minutes.

ICOM