ARRL Proposes Broad HF Privileges for Techs, pgs. 3 & 8

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COMMUNICATIONS & TECHNOLOGY

APRIL 2018

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- CQ Reviews: Elecraft KPA1500 Amplifier, p. 28
- First Look: MFJ/Xiegu X5105 Transceiver, p. 41
- QRP: Winter Field Day , p. 62

On the Cover: QRP Editor KA8SMA's Winter Field Day setup in Traverse City, Michigan. Details in his column on page 62.

DOCUMENTO DIGITALIZADO

DOCUMENTO
DIGITALIZADO

Este documento se ha digitalizado en Zaragoza (España), con el objetivo de poder recuperar viejos libros y revistas de tematica de ELECTRONICA y RADIOAFICION y que hoy en dia son difíciles de encontrar y poder comprar en kioscos.

Cada revista suele costar escanearla una hora de tiempo,incluso una hora y media, por lo que podeis calcular el tiempo que se ha dedicado a su digitalización asi como el de muchas revistas como la conocida RADIORAMA. Espero de que el esfuerzo haya valido la pena y que puedas disfrutar igual que yo de la lectura y puedas aprovechar los esquemas electrónicos.

Las revistas que he puesto a vuestra disposición son revistas antiguas y que ya no se comercializan en ningún kiosco o internet yo no digitalizo revistas actuales, dichas revistas hay que comprarlas. Recordar que el objetivo es recuperar nuestro pasado de nuestra aficion

Todos los documentos digitalizados llevan el sello en rojo de documento digitalizado, se han digitalizado mas de 700 revistas de tematica de electrónica y radioaficion de los años 70 y 80 y viejos libros de lámparas. Agradezco la donación de estas revistas por parte de dos radioaficionados, uno de ellos falleció recientemente nos ha donado un precioso material y algunas revistas son difíciles de localizar. Gracias a estos dos radioaficionados a los cuales les estoy enormemente agradecido y la atención y ayuda por parte de amigos de diferentes ciudades de España , les doy las gracias desde esta hoja añadida a este documento.

Espero de que no se olvide estos años de los 70 y 80 en el cual no existía internet y nuestra fuente de información y de aprendizaje era las revistas y libros. Hasta pronto

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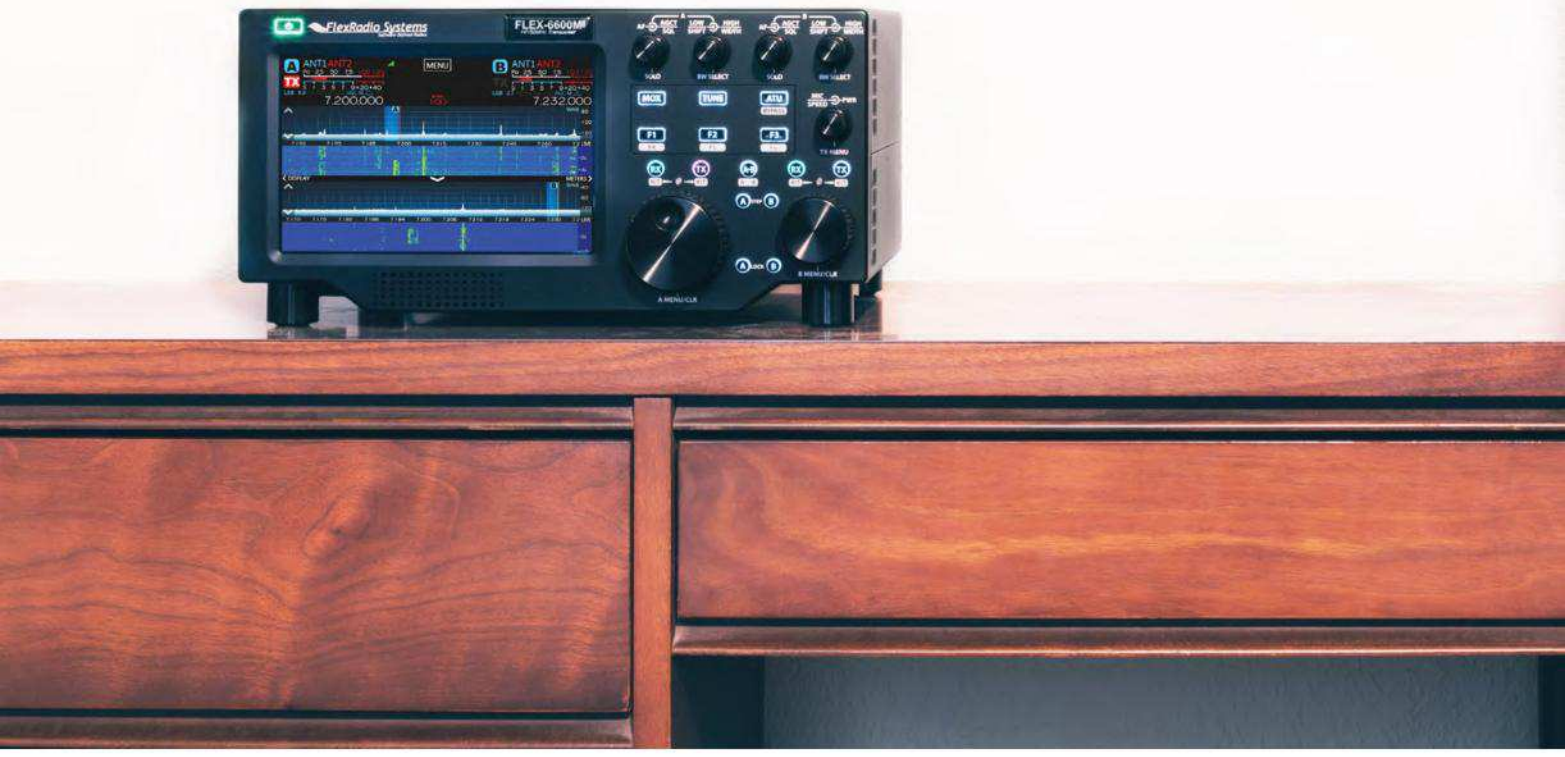

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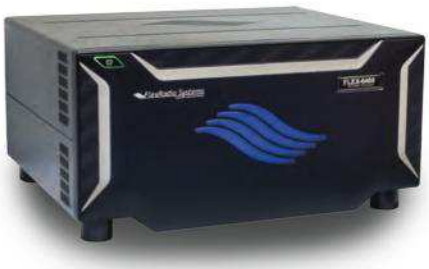

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announcements

APRIL

BRANSON, MISSOURI — The 4State QRP Group will hold the **OzarkCon QRP Conference** on Friday, April 6 and Saturday, April 7 at the Stone Castle Hotel & Conference Center, 3050 Green Mountain Drive. Website: <www.ozarkcon.com>.

BELTON, TEXAS — The Temple Amateur Radio Club will hold **HamEXPO, The Belton Hamfest** on Saturday, April 7 at the Bell County Expo Center, 301 West loop 121. Email: <hamexpo@tarc.org>. Website: <www.beltonhamfest.org>. Talk-in 146.820- (PL 123).

BRAINERD, MINNESOTA — The Brainerd Area Amateur Radio Club will hold the **Brainerd Area Hamfest** on Saturday, April 7 at the Brainerd National Guard Armory, 1115 Wright Street. Contact: BAARC, 33247 East Shamineau Drive, Motley, MN 56466. Website: <www.brainerdham.org>. Talk-in 147.225+. VE exams, card checking.

COLUMBUS, INDIANA — The Columbus Amateur Radio Club will hold the **35th Annual Columbus Hamfest** on Saturday, April 7 at the Bartholomew County Fairgrounds Community Building, 750 W. County Road 200S. Contact: Mathew Bruner, KC9BWO, 325 Robbin Street, Hope, IN 47246. Phone (812) 375-4860. Email: <kc9bwo@att.net>. Website: <www.carcnet.net>. Talk-in 146.79- (PL 103.5). VE exams.

FORT PIERCE, FLORIDA — The Fort Pierce Amateur Radio Club will hold the **Fort Pierce Hamfest** on Saturday, April 7 at Indian River State College, 3209 Virginia Avenue. Website: <http://fparc.org>. Talk-in 147.345 (PL 107.2). VE exams, DXCC card checking.

FORT SMITH, ARKANSAS — The Fort Smith Area Amateur Radio Club will hold the **Hanging Judge Hamfest** on Saturday, April 7 at the Sebastian County Emergency Communications & Training Facility, 8400 South Zero Street. Contact: Mike Cole, W5TMC, (918) 427-1431. Website: <http://hangingjudgehamfest.com>. VE exams.

LONGMONT, COLORADO — The Longmont Amateur Radio Club will hold **LARCFEST 2018** on Saturday, April 7 at the Boulder County Fairgrounds Exhibit Hall, 9595 Nelson Road. Contact: Jerry, <larcradio@w0eno.org>. Website: <www.w0eno.org>. VE exams.

NOBLE, ILLINOIS — The Clay County Area Amateur Radio Club will hold the **8th Annual April Fools' Fest** on Saturday, April 7 at the West Richland Center, 320 East North Avenue. Email: <claycountyradio @gmail.com>. Website: <http://claycountyradio.webs.com>. Talk-in 146.760- (PL 94.8). VE exams.

SHERIDAN, WYOMING — The Cloud Park Radio & Electronics Group will hold the **Sheridan Swapfest** on Saturday, April 7 at the Masonic Lodge Building, 109 S. Gould Street. Website: <http://cloudpeakradio.org>. VE exams.

STOUGHTON, WISCONSIN — The Madison Area Repeater Association will hold the **46th Annual Madison Hamfest** on Saturday, April 7 at the Mandt Community Center, 400 Mandt Parkway. Contact: Paul Toussaint, (608) 205-1994. Email: <w9hsy@execpc.com>. Website: <www.qsl.net/mara>. Talk-in 147.150+ (PL 123). VE exams.

YAKIMA, WASHINGTON — The Yakima Amateur Radio Club will hold its annual **Hamfest** on Saturday, April 7 at the State Fair Park-Modern Living Building, 1301 South Fair Avenue. Contact: Deanna Sanchez (509) 901-3175. Email: <27aqtreasurer@gmail.com>. Talk-in 146.660 (PL 123). VE exams, bunny hunt.

FRAMINGHAM, MASSACHUSETTS — The Framingham Amateur Radio Association will hold the **Framingham Flea** on Sunday, April 8 at Keefe Tech School, 750 Winter Street. Contact: Andy, KC1DMN, (508) 310-5913. Email: <tables@fara.org>. Website: <http://fara.org>. Talk-in 147.15. VE exams.

BOSTON, PENNSYLVANIA — The Two Rivers Amateur Radio Club will hold its **47th Annual Hamfest / Computer Show** on Sunday, April 8 at The Boston Spectrum, 6001 Smithfield Street. Phone: (412) 398-1092. Email: <petersondt@verizon.net>. Website: <www.trarc.net>. Talk-in 146.73. VE exams.

CLAREMORE, OKLAHOMA — The Green Country Hamfest Inc. will hold the **Green Country Hamfest** and **2018 ARRL Oklahoma State Convention** on Friday, April 13 and Saturday, April 14 at the Claremore Expo Center, 400 Veterans Parkway. Contact: John Harwell, KD5NAQ, (918) 379-0950. Email: <info@green-countryhamfest.org>. Website: <www.greencountryhamfest.org>. Talk-in 147.09+ (PL 88.5). VE exams.

BARTLETT, TENNESSEE — The Mid-South Amateur Radio Association will hold the **Memphis FreeFest** on Saturday, April 14 at the Bartlett Station Municipal Center, 5868 Stage Road. Contact: Art Barnett, WA4PSS, (901) 619-5573. Email: <wa4pss@gmail.com>. Talk-in 147.03+ (PL 107.2). VE exams.

CUYAHOGA FALLS, OHIO — The Cuyahoga Falls Amateur Radio Club will hold its **64th Annual Hamfest** on Saturday, April 14 at the Emidio and Sons Party Center, 48 E. Bath Road. Contact: Mike Luoma, K9MAL, (234) 206-0270. Email: <hamfest@cfarc.org>. Website: <www.cfarc.org>.

MOBILE, ALABAMA — The Mobile Amateur Radio Club will hold the **Mobile Hamfest** on Saturday, April 14 at the Abba Shrine Center, 7701 Hitt Road. Contact: David, (251) 802-6588 or LJ, (251) 635-2327. Email: <mobilehamfest@outlook.com>. Website: <www.w4iax.net>. VE exams.

TAMPA, FLORIDA — The Tampa Amateur Radio Club will hold **TARCFest Hamfest XLI** on Saturday, April 14 at the TARC Clubhouse, 7801 N. 22nd Street. Phone: (813) 301-7209. Website: <http://hamclub.org>. VE exams, fox hunt.

GALES FERRY, CONNECTICUT — The Radio Amateur Society of Norwich will hold the **RASON Auction 2018** on Saturday, April 21 at the Gales Ferry Fire House, 1722 Route #12. Contact: Larry, N1LFG, <lfgarvin@comcast.net>. Website: <www.rason.org>. Talk-in 146.730- (PL 156.7).

GEORGETOWN, DELAWARE — The Sussex Amateur Radio Association will hold the **Delmarva Amateur Radio & Electronic Expo** on Saturday, April 21 at the Cheer Community Center, 20520 Sand Hill Road. Contact: Vic, KC3BUI, (302) 628-3060. Website: <www.radioelectronicsexpo.com>. Talk-in 147.090 (PL 156.7). VE exams, card checking.

GODFREY, ILLINOIS — The Lewis and Clark Radio Club will hold its **2018 Hamfest** on Saturday, April 21 at the River Bend Arena-Lewis & Clark Community College, 5800 Godfrey Road. Contact: Jacques, KN9O, (618) 401-5558. Email: <hamfest@k9ham.org>. Website: <www.k9ham.org>. Talk-in 145.230- (PL 97.9). VE exams.

KANSAS CITY, MISSOURI — The Ararat Shrine Amateur Radio Club will hold **Hambash 2018** on Saturday, April 21 at the Ararat Shrine, 5100 Ararat Drive. Website: <www.hambash.com>. Talk-in 145.13. VE exams.

MORGANTON, NORTH CAROLINA — The Lenoir Amateur Radio Club, **McDowell Amateur Radio Club**, and **Western Piedmont Amateur Radio Club** will hold the **21st Annual Catawba Valley Hamfest** on Saturday, April 21 at the Burke County Fairgrounds, 145 Bost Road. Phone: (828) 437-2787. Website: <www.cvham-fest.org>. Talk-in 145.210+ (PL 94.8). VE exams, DXCC / VUCC / WAS card checking.

PALMYRA, NEW YORK — The Drumlins Amateur Radio Club will hold the **32nd Annual Drumlins Hamfest** on Saturday, April 21 at the Palmyra VFW Post 6778, 4306 Route 31. Contact: Rich Hamill, KC2TNJ, (315) 986-8589. Email: <hamfest@drumlinsarc.us>. Website: <www.drumlinsarc.us>. Talk-in 146.745 (PL 71.9). VE exams.

SEVIERVILLE, TENNESSEE — The 470 Amateur Radio Group will hold the **Sevierville Meet/Greet & Boneyard** on Saturday, April 21 behind the King Family Library, 550 Eastgate Road. Contact: Rick Sawaya, Sr., N4JTQ, (865) 446-4535. Email: <n4jtq@live.com>. Talk-in 146.940. VE exams.

WALDO, FLORIDA — The Gainesville Amateur Radio Society will hold the **Second Annual Gainesville Hamfest** on Saturday, April 21 at the First Baptist Church of Waldo, 14370 Kennard Street (SR-24). Phone: (352) 317-2820. Email: <hamfestinfo@gars.club>. Website: <http://gars.club>. Talk-in 146.82-. VE exams.

WEST MONROE, LOUISIANA — The NorthEast Louisiana Amateur Radio Club will hold the **NELA Hamfest 2018** on Saturday, April 21 at the West Monroe Convention Center, 901 Ridge Avenue. Contact: NELARC, P.O. Box 1871, West Monroe, MA 71294. Email: <hamfest@nelarc.org>. Website: <http://nelarc.org>. Talk-in 146.85. VE exams.

SUCCASUNNA, NEW JERSEY — The Splitrock Amateur Radio Association will hold the **2018 North Jersey Hamfest** on Sunday, April 22 at the Roxbury Senior Center, 72 Eyland Avenue. Contact: Splitrock ARA, P.O. Box 610, Rockaway, NJ 07866. Phone: (866) 457-6687. Email: <hamfest2017@splitrockara.org>. Website: <www.splitrockara.org>. Talk-in 146.985- (PL 131.8). VE exams, DXCC card checking.

CHASSELL, MICHIGAN — The Keweenaw County Repeater Association will hold its **Hamfest 2018** on Saturday, April 28 at the Chassell VFW Post 6507, 42103 Wilson Memorial Drive. Contact: Jeff, W9GY, (906) 337-4158. Email: <jeffw9gy@pasty.net>. Talk-in 146.880 (PL 100).

(Continued on page 60)

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ARRL Seeks More HF Privileges for Techs

The ARRL has petitioned the FCC for expanded HF voice, RTTY, and digital privileges for Technician Class licensees. The League says current growth rates in licensing are insufficient to sustain the amateur service in the long run, and points out the long-standing problem that many Technician licensees never get on the air or become active members of the broader amateur radio community. The entry-level license, says the ARRL petition, must "provide sufficient, relevant, operating privileges to allow these individuals to find value in Amateur Radio and to build in a strong incentive to upgrade to the next license class by a culture of involvement among new licensees."

Specifically, the League's February 28 petition asks for RTTY and other digital-mode privileges on current Technician CW subbands on 80, 40, 15, and 10 meters; plus new voice privileges on 3.900-4.000, 7.225-7.300 and 21.350-21.450 MHz. Maximum power output would be 200 watts PEP. At press time, the FCC had not yet given the petition a rulemaking number or requested public comment.

Much Ado About Bouvet

You can't get there from here … or much of anyplace else, it seems. The long-planned 3YØZ DXpedition to Bouvet Island had to be cancelled at the last minute — with the island in sight — due to a combination of bad weather and engine trouble on the team's ship. See this month's DX column for details.

In the wake of the 3YØZ cancellation, the organizers of the Polish-led 3YØI DXpedition renewed plans to travel to the island, most likely this coming winter (summer in the southern hemisphere). According to the *ARRL Letter*, the 3YØI group had deferred its plans at the request of the 3YØZ group, to avoid having two major DXpeditions to the same place within weeks of each other. The 3YØI group says it has chartered a vessel specially outfitted for severe weather and experienced with landing troops on Bouvet, which is a Norwegian dependency. The group said it also plans to conduct video-documented explorations of the island and its glacier, and to leave behind a time capsule at the glacier's peak.

ARRL Calls for FCC Antenna Action

Responding to reports that Congress is unlikely to pass *any* telecommunications legislation this term, including the Amateur Radio Parity Act (ARPA/S.1534) now pending before the Senate Commerce Committee, the ARRL said in FCC comments that the Commission must "take the action on its own initiative that would be called for by this legislation." According to the *ARRL Letter,* the comments — in response to a public notice seeking input on the communications industry's response to last year's hurricanes — noted amateur radio's role in providing communications in Puerto Rico and the U.S. Virgin Islands and said action is needed to require homeowners associations (HOAs) to permit effective outdoor antennas. "It is critical," the League noted, "to have stations located at one's residence in order to regularly participate in disaster preparedness training exercises and drills."

Commenting separately in the same proceeding in response to the ARRL filing, attorney Jim Talens, N3JT, who has written here and elsewhere about his serious concerns that the language of S.1534 will make it more difficult, not less, for hams to put up antennas in HOA-regulated areas, warned that the FCC "should not be deceived by ARRL into believing that moving forward on ARPA will help American emergency preparedness." Talens called on the FCC to adopt rules and procedures for amateur antennas in HOA-regulated areas that more closely parallel rules already in effect under the FCC's Over the Air Reception Devices (OTARD) rule for TV antennas and satellite dishes. The full text of both comments may be found on the FCC's Electronic Comment Filing System website under ET Docket number 17-344.

ARRL to FCC: Time to Legalize PACTOR 4

Commenting in the same proceeding as noted in the previous story, the ARRL also urged the FCC to act on its 2013 petition to eliminate the current restrictions on "symbol rate" for data transmissions below 29.7 MHz. That petition also called for allowing HF data signals to occupy up to 2.8 kHz of bandwidth, the same as a single sideband signal. The League's main goal in this petition is to get the FCC to legalize the use on HF of PACTOR-4, the mode that is at the heart of the WinLink data transmission system. The FCC granted a temporary waiver to permit its use last fall in connection with hurricane relief efforts in the Caribbean.

There is some controversy about the use of WinLink on the amateur bands, as some critics claim it is used by boaters to send and receive email which may include business communications. In addition, the system relies on automatically-controlled relay stations, which some claim will cause interference because they are unable to listen before transmitting to be sure a frequency is not already in use.

FT8 To Add "Fox and Hounds" DXpedition Mode

The developers of the FT8 digital mode say they're working on an enhanced version of the mode specifically designed for DXpeditions. The *ARRL Letter* reports that the goal is to allow high-volume operators to make FT8 contacts at the highest possible rate, with as little as a single transmission per contact and the ability to make up to five contacts at one time, offering a potential rate of up to 600 QSOs per hour! The developers are tentatively referring to DXpedition mode as "fox and hounds," with the DXpedition station being the fox and all the stations "hunting" for it labeled as "hounds." The WSJT-X Development Team says the mode will be included in an upcoming release of a new version of WSJT-X, with hopes for a field test during this summer's scheduled KH1/KH7Z DXpedition to Baker Island.

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VOLUME 74 NUMBER 4

CQ APRIL 2018

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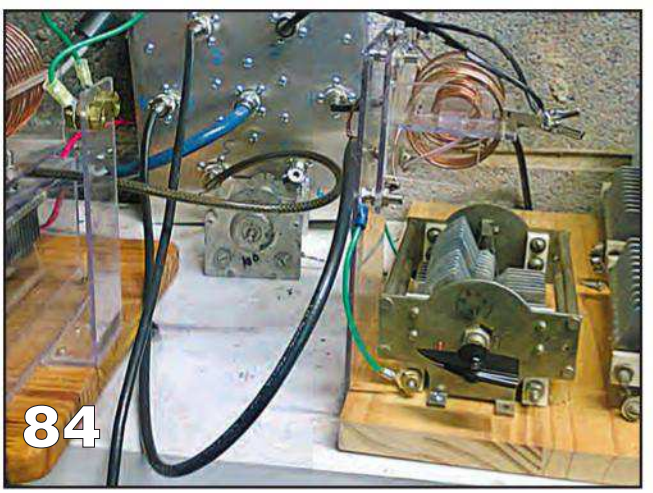

On the Cover: Spring is finally here, but outdoor hamming doesn't have to be restricted to warm-weather months. This issue's cover photo shows QRP Editor Scott Rought's outdoor setup for Winter Field Day at the end of January. See his column on page 62 for details. *(Cover photo by Helen Rought)*

FEATURES

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zero bias – a CQ editorial

BY RICH MOSESON,* W2VU

"Tear Down That Wall"

ARRL Proposes Full Integration of Technician Class with the Rest of Ham Radio

President Ronald Reagan, in 1987, famously stood at the Berlin Wall and called on Soviet leader Mikhail Gorbachev to "tear down this wall." Today, the ARRL is proposing to tear down a metaphorical wall that has separated Technician Class hams from the rest of their fellow hams for nearly 70 years. In a petition to the FCC filed on February 28, the League is calling for full integration of Technicians with mainstream (read HF-active) ham radio with a broad expansion of Tech voice and digital privileges on HF. While we have a few quibbles with the League's reasoning, we strongly support the proposal.

To fully understand its significance, though, we need to look at a little history. When the Technician license was created in 1951 (along with the Novice license), its purpose was to provide "experimenters" with slow-code access to the ham bands to explore and discover whatever might await on the frequencies above 220 MHz. They were to be a "different breed" of ham, a distinction that the FCC and ARRL persisted in making for decades to follow. The point of entry to "real" ham radio would be the one-year, non-renewable, Novice license.

By the time the mid-1980s rolled around, Novice licenses were renewable and privileges included only Morse code, at no more than 250 watts, on limited portions of the 80, 40, 15 and 10-meter bands. No voice, anywhere (the Novice was sometimes sarcastically referred to as the "No voice" license); no VHF or UHF privileges — at the peak of repeater popularity; and no digital modes at the peak of packet radio's popularity[1].

Many hams at the time were worried that the entry-level (Novice) license didn't offer enough "meat" to get new hams active and involved, and eventually to upgrade to higher-level licenses. They worried about the hobby's future. The amateur community responded with something called "Novice Enhancement," which the FCC adopted in 1987. It provided limited voice privileges on 10 meters and access to portions of the 220-MHz and 1296-MHz bands, at reduced power levels. It was remarkably successful, at least on HF, with activity levels and purchases of new HF gear soaring. It gave the hobby and the industry a huge boost, which lasted until the next "sky is falling" moment in the early 2000s. That resulted in restructuring and the phase-out of Morse code as a licensing requirement. These changes provided yet another big boost, and made the Technician license the "standard" entry-level ham license[2], as the FCC stopped issuing new Novice licenses as part of the whole package.

Today, just like a generation ago, many hams are worried that the entry-level (Technician) license doesn't offer enough "meat" to get new hams active and involved, and eventually to upgrade to higher-level licenses. They worry about the hobby's future. They are concerned that, once again, the privileges that come with the entry-level license are out of step with today's popular activities and technology. A perfect example is FT8, the hot new digital mode that started on VHF but quickly became popular on HF as well — in fact, the WSJT team is working on a DXpedition version that could permit up to 600 QSOs per hour for DXpeditioners. Yet, Technicians have no digital mode privileges on HF, and their HF voice privileges are limited to 10 meters, which will be mostly a local band for the next several years. It is time for another boost, and the ARRL's proposal is a good start.

Technician Enhancement

Here are the basics of what the League is proposing:

- Phone privileges for Technicians on 3.900-4.000, 7.225-7.300, and 21.350-21.450 MHz, in addition to the existing 10-meter phone allocation at 28.3-28.5 MHz. These suggested subbands are big enough to be significant, yet small enough to provide an incentive to upgrade and get additional frequencies.
- RTTY/digital mode privileges on the current Novice/Tech CW subbands on 80, 40, 15 and 10 meters. This will allow Techs to enjoy keyboard modes such as RTTY, PSK31 and others, as well as more automated modes such as JT9 and FT8.
- Maximum power levels for Technicians on HF would continue to be 200 watts PEP.

All in all, the proposed changes would give Techs the incentive to get on HF and get a taste of DXing, contesting and digital modes, as well as CW (which, despite ARRL assertions in the FCC petition, continues to grow in popularity). There would still be plenty of *un*available spectrum to encourage upgrading, such as the entire 2200, 630, 160, 60, 30, 20, 17, and 12-meter bands, and additional space and power on 80, 40, 15, and 10.

We would encourage the FCC to consider opening up the entire 10-meter band to Techs, to permit them to make use of FM repeaters at the top end of the band. But otherwise, we think the ARRL proposal is on the mark and worthy of serious consideration.

Perhaps most importantly, however, this proposal would finally "tear down that wall" between HF and VHF privileges that, for nearly seven decades, has resulted in Technicians being treated by their HF-focused peers as second-class citizens of the ham bands, even though Technicians today make up a majority of U.S. hams. Adoption of the ARRL's proposal would fully integrate all hams with significant operating privileges on both the HF and VHF/UHF bands. It's about time.

Quibble points: The League petition says license growth is essentially stagnant, relying for its assertion on overall numbers of licensees. What it ignores

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is the attrition rate of hams who become Silent Keys or who allow their licenses to expire without renewing them. The numbers of new hams joining our ranks each year continue to be healthy and impressive.

According to FCC data, 32,196 new amateur licenses were issued in 2017, on a par with the 32,552 new hams who joined our ranks in 2016 and 32,077 new licensees in 2015. That's nearly 100,000 new hams in the past three years. Recruitment is not the main problem. Retention is.

We need to focus on ways to make sure that newly-licensed hams are welcomed into the community, encouraged to get on the air and to discover which parts of this multi-faceted hobby catch their interest. It could be public service, building, QRP, backwoods hiking/hamming, moonbounce, or who knows what else. We need to put more energy into making sure they can try a little bit of everything and find what works for them right now and in the future. The League's proposal is one good step in that direction.

In This Issue: Contest Results and More

Our highlight this month is the SSB results of last year's CQ World Wide DX Contest, which featured the highest-ever number of logs received, despite propagation issues resulting from declining sunspot numbers. You'll find this year's results article a bit different than previous ones. Rather than simply running down the winners in each category, co-director Doug Zwiebel, KR2Q, offers quite a bit of analysis, looking at such things as QSO distribution by band, geographic distribution of logs (Quick: Which continent accounts for the greatest number of CQWW SSB logs?), hours operated and more. In addition, Doug looks at some very close "horse races" and muses about whether future results articles need to focus more on the locations and categories that account for the greatest amount of activity. If you're a contester, we'd like to hear your thoughts on the topic (but read the article first, please). If you're not a contester, we've got an article by VK4QS on all the benefits you can find by operating in the CQWW DX contests.

We've also got a look at two new pieces of station equipment — at both ends of the power spectrum. On the high-power side of things, W9KNI reviews Elecraft's new KPA1500 solid-state legal-limit amplifier, and at the QRP end of the scale, WB6NOA takes a "first look" at the MFJ-distributed Xiegu X5105 portable 5-watt transceiver. And speaking of QRP, our cover story this month is QRP Editor KA8SMA's account of his chilly experience operating low-power outdoors in late January for Winter Field Day. Plus, MF/LF Editor KB5NJD shares the story of how a condo-dwelling ham in Ohio is operating on 630 meters despite a very small amount of available antenna space.

Spring has sprung! Get outside … do some antenna work or take your rig out for some exercise in the great outdoors!

– 73, Rich, W2VU

Notes:

1. Novice privileges have varied through the years. In the 1950s and '60s, Novices had voice privileges on 2 meters; those were revoked as part of the incentive licensing decision in 1967. The license was originally issued for one year and was not renewable; it later became 2 years, still non-renewable, and later still became renewable and ran for the standard license term. Novices were originally limited to 75 watts and crystal control, restrictions that were eased in the 1970s.

2. Technician privileges have varied through the years as well. Techs were initially limited to VHF and UHF only, first gaining Novice HF privileges in 1978. When the code test for Technician was eliminated, only those Techs who had passed a code test retained those privileges. Once all code tests were eliminated, all Techs regained Novice HF privileges.

Results of the 2017 CQWW DX SSB Contest

"An all-time record number of logs received"

BY DOUG ZWIEBEL*, KR2Q

What a great statement about the biggest (and greatest) contest the amateur radio world has ever known. And it *is* still the biggest and it is still getting bigger. How satisfying. If you like numbers, 8,606 logs were submitted on phone, a more than 13% increase over last year, and 124 more logs than the prior all-time record reached in 2013, despite the big decline in sunspots since that time.

As we think about the massive, worldwide participation in the CQWW contest, as of presstime, we are reading disappointing news about the Bouvet expedition, cut short just a few miles away; so close they could almost touch it (*see this month's DX column for details – ed.*). As contesters, we are so lucky that no matter what, the contest goes on. It is an event we count on, look forward to with growing anticipation, and in which we do our best regardless of conditions because we just love the game, not to mention working the annual regulars and engaging in the competition. We love to just be a part of it. And anybody and everybody *can* be a part of it.

*c/o CQ Magazine

By the numbers, things were better than last year, especially for 15 meters. Ten meters continues to decline.(See charts below.)

CQWW Horse Racing: Photo Finishes

Right after the contest, lots of folks compare their claimed scores. Later, CQWW publishes RAW scores. These scores are based on the submitted log that are scored using a common (shared) methodology, and before any log checking. There is always big interest in those, too. But the only scores that really matter are the final scores, for which we all wait impatiently.

Hidden away, except for those who are looking closely at their own scores, are the super-close horse races — the competitions that seem to be too close to believe. And there are lots of them. Example: For 2017 phone, there were 3,021 scores, on a world ranking basis, that were within a half percent (0.5%) of each other. That's not 5%; it is one half of 1%. This is one of the main elements that makes contesting in CQWW so exciting. No, we won't go over all

QSO counts, distribution by band over the last 10 years

SSB	160	80	40	20	15	10	ALL
2017	87,025	364,827	663,891	1,089,839	1,076,617	249,281	3,531,480
2016	91,565	323,282	632,075	1,096,164	863,060	311,831	3,317,977
2015	75,892	297,933	607,356	1,089,102	1,333,440	1,280,820	4,684,543
2014	63,036	250,233	519,013	962,368	1,243,444	1,993,426	5,031,520
2013	80,157	290,961	583,674	1,070,449	1,290,113	2,008,877	5,324,231
2012	62,979	265,410	551,288	1,029,949	1,282,127	1,913,136	5,104,889
2011	86,450	288,365	571,517	985,590	1,196,006	1,873,553	5,001,481
2010	107,526	379,646	690,794	1,053,292	1,243,421	257,080	3,731,759
2009	94,519	332,631	661,030	1,087,242	1,058,864	290,898	3,525,184
2008	112,568	373,386	494,645	1,106,757	678,156	52,391	2,817,903

QSO percentage distribution, by band, per year

SSB	160	80	40	20	15	10
2017	2.5%	10.3%	18.8%	30.9%	30.5%	7.1%
2016	2.8%	9.7%	19.1%	33.0%	26.0%	9.4%
2015	1.6%	6.4%	13.0%	23.2%	28.5%	27.3%
2014	1.3%	5.0%	10.3%	19.1%	24.7%	39.6%
2013	1.5%	5.5%	11.0%	20.1%	24.2%	37.7%
2012	1.2%	5.2%	10.8%	20.2%	25.1%	37.5%
2011	1.7%	5.8%	11.4%	19.7%	23.9%	37.5%
2010	2.9%	10.2%	18.5%	28.2%	33.3%	6.9%
2009	2.7%	9.4%	18.8%	30.8%	30.0%	8.3%
2008	4.0%	13.3%	17.6%	39.3%	24.1%	1.9%

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3,000 of them, but here are some highlights for scores that were super-close.

On 80-meter low-power/unassisted (LP-U), LY2BMX, #2 world, edged out F5BEG, #3 world, by 45 hundredths of 1% (0.45%). On 80-meter low-power/assisted (LP-A), HGØR, #2 world, edged out EU2EU, #3 world, by 33 hundredths of 1% (0.33%). In Europe multi-multi, #1 M6T slid by #2 DFØHQ by 0.32%. Again in Europe, #3 multi-single/high power (MSH) IR4M squeaked ahead of #4 IR4X by 0.30%. Back on the world stage for 10-meter LP-U, LW5DPG took #4 by 0.27%, while LU6DU took #5. And IF9A, #3 world competing in the 20-meter LP-A category, managed an extra 0.26% over #4, IT9STX. In the U.S., K5ZD, #1 all-band/high power/assisted (AB-H-A), maintained a buffer of 0.25% over rival K3WW. And out west, N6RV #4 USA all-band/low power/unassisted (AB-L-U), sneaked past #5, N7IR by 0.12%. And in the closest race of all, SP5DDJ, #3 world in the 15-meter QRP unassisted category, beat out JR2EKD, #4, by 0.09%. Wow!

How to Make a Big Score: More QSOs and Multipliers Are Not Enough. Accuracy Still Counts!

One of the fun things to do is to compare a station's raw score with its final score. They rarely match. As you can imagine, most that do match are "small" logs. We found 1,085 logs with no change from Raw to Final score. The "winner" is K8PGJ, who had the highest score and a "golden log." He was #2 in Michigan in the AB-H-U category. Congratulations!

But accuracy stretches far beyond the domain of "golden logs." Many entrants are able to "move up a slot" in the rank-

2017 CQWW DX SSB TROPHY WINNERS AND DONORS

SINGLE OPERATOR

World
8P5A (Opr.: Tom Georgens, W2SC)
Donor: Southern California DX Club

World – Low Power
HI3T (Opr.: Ted Jimenez, HI3TEJ)
Donor: Slovenian Contest Club

World – QRP
Doug Zwiebel, KR2Q
Donor: Jeff Steinman, N5TJ

World – Assisted
P33W (Opr.: Andrey Sachkov, LZ2HM)
Donor: Glenn Johnson, WØGJ

World – Assisted Low Power
P4ØW (Opr.: John Crovelli, W2GD)
Donor: Gail Sheehan, K2RED

U.S.A.
Doug Grant, K1DG
Donor: Potomac Valley Radio Club – KC8C Memorial

U.S.A. – Low Power
John Vogel, N1PGA
Donor: North Coast Contesters

U.S.A. – QRP
Bob Jacobson, K2YGM*
Donor: Pat Collins, N8VW

U.S.A. – Assisted
Randy Thompson, K5ZD
Donor: John Rodgers, WE3C

U.S.A. – Assisted Low Power
Jim Bowman, KS1J
Donor: LA9Z/LN9Z Leia Contest Club

U.S.A. – Zone 3
Bob Wolbert, K6XX
Donor: Northern California Contest Club

U.S.A. – Zone 4
Mike Wetzel, W9RE
Donor: Kansas City DX Club

Europe
TK9R (Opr.: Salvatore Farina, IK8UND)
Donor: Potomac Valley Radio Club – W4BVV Memorial

Europe – Low Power
EI1A (Opr.: Olivier Vandenbalck, EI8GQB)
Donor: Tim Duffy, K3LR

Europe – QRP
HG8U (Opr.: Gukyas Imre, HA8EK)
Donor: Steve "Sid" Caesar, NH7C

Europe – Assisted
Bernd Och, DL6FBL
Donor: Martin Huml, OL5Y

Europe – Assisted Low Power
TM3Z (Opr.: Dimitri Cosson, F4DSK)
Donor: Rudy Bakalov, N2WQ

Africa
Mario Xavier Laporte, FR4QT
Donor: Chris Terkla, N1XS

Asia
Gia Gvaladze, 4LØA
Donor: Nodir Tursun-Zade, EY8MM

Caribbean/Central America – High Power
ZF9CW (Opr.: Stan Stockton, K5GO)*
Donor: John Rodgers, WE3C

Caribbean/Central America – Low Power
C6ARW (Opr.: Rich Westereberg, NØHJZ)
Donor: Albert Crespo, NH7A

Oceania
KH7M (Opr.: Jim Neiger, N6TJ)
Donor: Barbara Yasson, AC7UH

South America
P4ØT (Opr.: Yuri Onipko, VE3DZ)
Donor: Yankee Clipper Contest Club

Canada
Jeff Briggs, VY2ZM
Donor: Contest Club Ontario – VE3WT Memorial

Russia
Yuri Kotelnikov, RT9S
Donor: Roman Thomas, R5AA

Indonesia
Yana Koryana, YB1AR
Donor: Karsono Suyanto, YBØNDT

Japan
Masaki Masa Okano, JH4UYB
Donor: Rush Drake, W7RM Memorial

Japan – Low Power
Nob Watanabe, JH1EAQ
Donor: World Wide Radio Operators Foundation (WWROF)

Southern Cone (CE CX LU) – Assisted
Pablo Moretti, LU7MT
Donor: LU Contest Group

ASEAN (XZ HS XW XU 3W 9M 9V V8 YB DU)
Tony Waltham, HSØZDX
Donor: YB Land DX Club

ASEAN (XZ HS XW XU 3W 9M 9V V8 YB DU) – Low Power
Wayyu "Yun" Ningrat, YC1CWK
Donor: Bob Kupps, N6BK

SINGLE OPERATOR, SINGLE BAND

World – 28 MHz
CW5W (Opr.: Jorge Diez Furest, CX6VM)
Donor: Joel Chalmers, KG6DX

World – 21 MHz
D4Z (Opr.: Poitr Majchrzak, SQ9D)
Donor: Robert Naumann, W5OV

World – 14 MHz
EI7M (Opr.: Dmitrij Pavlov, EI3JZ)
Donor: North Jersey DX Assn. – K2HLB Memorial

World – 7 MHz
RU1A (Opr.: Andrey Karpov, RV1AW)
Donor: Fred Laun, K3ZO – K7ZZ Memorial

World – 3.7 MHz
Vlado Lesjak, E7ØT
Donor: Fred Capossela, K6SSS

World – 1.8 MHz
HG8R (Opr.: Pal Vrbovszki, HA8JV)
Donor: OL7M Contest Group, QRO.cz, RemoteQTH.com

U.S.A. – 28 MHz
Chuck Dietz, W5PR
Donor: John Rodgers, WE3C

U.S.A. – 21 MHz
Peter Bizlewicz, KU2M
Donor: 11PM Dayton Pizza Gang

U.S.A. – 14 MHz
Rich Di Donna, NN3W
Donor: Yankee Clipper Contest Club – KC1F Memorial

U.S.A. – 7 MHz
Dan Handa, W7WA
Donor: Chuck Dietz, W5PR

U.S.A. – 3.7 MHz
Ken Claerbout, K4ZW
Donor: John Rodgers, WE3C

U.S.A. – 1.8 MHz
Stephen Werner, AG4W
Donor: South Texas DX & Contest Club (STXDXCC)

Europe – 28 MHz
Tine Brajnik, S5ØA
Donor: John Rodgers, WE3C

Europe – 21 MHz
Antonio Rui Sousa Santos, CR6T
Donor: Tine Brajnik, S5ØA

Europe – 14 MHz
Frederic Lallemant, F8ARK*
Donor: Charles Wooten, NF4A

Europe – 7 MHz
LZ8A (Opr.: Mincho Petkoff, LZ2DF)*
Donor: Central Texas DX and Contest Club – NT5C Memorial

Europe – 3.7 MHz
Valery Sintsov, YL3CW*
Donor: Ted Demopoulos, KT1V

Europe – 1.8 MHz
G4L (Opr.: Tony Bettley, G4LDL)*
Donor: Robert Kasca, S53R

Caribbean/Central America (14 MHz)
Dean St. Hill, 8P2K
Donor: Nate Moreschi, N4YDU

Oceania (14 MHz)
Club Station ZL1AM
Donor: Bruce D. Lee, KD6WW

Asia (14 MHz)
Mamuka Kordzakhia, 4L2M
Donor: Dallas/Fort Worth Contest Group - W5PG memorial

OVERLAY CATEGORIES

World – Classic
P49Y (Opr.: Andy Faber, AE6Y)
Donor: John Rodgers, WE3C

U.S.A. – Classic
Bob Shohet, KQ2M
Donor: World Wide Radio Operators Foundation (WWROF)

The antenna farm is ready at EI1A.

Europe – Classic
Manfred Wolf, DJ5MW
Donor: Steve Cole, GW4BLE Memorial

World – Rookie
Cyril Colom, TK4RB
Donor: Tim Duffy, K3LR - N8SM Memorial

U.S.A. – Rookie
Don Gladwell, W4BBT
Donor: Tim Duffy, K3LR - K3TUP Memorial

Europe – Rookie
Roland Roeder, DK5RL*
Donor: EA Contest Club

MULTI-OPERATOR, SINGLE TRANSMITTER

World
EF8R (Oprs.: EA8RM, HA1AG, YO3JR, RA5A, UA3DJX, UA4WW, UA5C, R4FO, RW4WR, UA4FER, RA3AUU)
Donor: So. Calif. DX Club – W6AM Memorial

World – Low Power
ED9E (Oprs.: EA9CD, EA9FY, EA9ABC, EA9ABE, EA9ABV, EA9ACD, EA9ACE, EA9ACF, EA9ACL, EA7KI)
Donor: Rex Turvin, NR6M

U.S.A.
W1NA (Oprs.: W1NA, I8ULL, IC8WIC, I8QLS, N5NHJ)
Donor: Carolina DX Assoc. – Ted Goldthorpe, W4VHF & Ken Boyd, K4DXA Memorial

Canada
VE3EJ (Oprs.: VE3EJ, VE3EK, VE3EY, VE3MM)
Donor: John Sluymer, VE3EJ

Africa
CN2AA (Oprs.: R3DCX, RA3ATX, RA3CO, RA9USU, RCØF, RK3AD, RK4FW, RL3FT, RN5M, RU3RQ, RU9I, RX3APM, UA3ASZ, UA4Z, VE3LA)*
Donor: World Wide Radio Operators Foundation (WWROF)

Asia
UP2L (Oprs.: R8AA, R9IR, RA9Y, RM9I, SM6LRR, UA9BA, UN4L, UN6LN, UN9LG)
Donor: Edward L. Campbell, NW4DX – AA6BB and KA6V Memorial

Europe
TM6M (Oprs.: F1AKK, F4DXW, F8DBF, F8FKJ)
Donor: Gail Sheehan, K2RED

Europe – Low Power
IB9T (Oprs.: IT9APL, IT9BLB, IT9CLN, IT9DBF, IT9MBZ, IT9VDQ, IT9WKU, IT9ZMX,IT9ZRU)
Donor: EA Contest Club

Oceania
AH2R (Oprs.: JI3ERV/NH2C, JR7OMD/WI3O, JG3RPL/N1BJ, KH2JU, JE6HIB/AH2EG, JH1ASG/W3FO)
Donor: Junichi Tanaka, JH4RHF

South America
FY5KE (Oprs.: F1HAR, F4CWN, F5HRY, F5UII, F6FVY, FY5FY)
Donor: Victor Burns, KI6IM – The Cuba Libra Contest Club

Caribbean/Central America
6Y1LZ (Oprs.: 6Y5GC, 9A5K, K1LZ, K2SSS, K3JO, S55M)
Donor: Bob Raymond, WA1Z

Japan
JA7ZFN (Oprs.: JA7ACM, JH7XMO, JI7GBI, JP7DKQ, JR7UOL)
Donor: Arizona Outlaws Contest Club

ASEAN (XZ HS XW XU 3W 9M 9V V8 YB DU) – Low Power
E28AI (Oprs.: E24NQN, HSØKQR, HS5NFP, HS9YBR, E23GLG, E23WQD, E23WWT)
Donor: Bob Kupps, N6BK

MULTI-OPERATOR, TWO TRANSMITTERS

World
CN2R (Oprs.: OK1DO, OK1FFU, OK1JKT, OK1RI, OK1VVT, OK6NM, W7EJ)
Donor: Array Solutions

U.S.A.
KC1XX (Oprs.: JJ5GMJ, K1CC, K1QX, KC1XX, W1FV, WA1Z, KM3T, WP3A)
Donor: Kimo Chun, KH7U & Mike Gibson, KH6ND
Dan Robbins, KL7Y Memorial

Europe
ES9C (Oprs.: ES1OX, ES2ADO, ES2MC, ES2TI, ES4NY, ES5GP, ES5JR, ES5QA, ES5RY, ES5TV, ES6QC, ES7GM, YL1XN, YL3AD, YL3AJA, YL3DW)
Donor: Aki Nagi, JA5DQH

Japan
JA1YPA (Oprs.: JA1PEJ, JE1PMQ, JG4KZE)
Donor: Coconut Wireless Contest Club

ASEAN (XZ HS XW XU 3W 9M 9V V8 YB DU)
HSØAC (Oprs.: HS1FVL, HS1IFU, E2ØZFD, HS5NMF, E29BUQ, E23NHL, E24XUR, E24PNG, JJ1DQR, E2ØEHQ, E23NEZ, HSØKRM, E21FYK, HS7BHK, E21SP, E25AHH, HS7JPW, E24VRK, JA1WCV, E24MMV, HS1GAB, HS5VLE, E24PQG, E24VRP, E21GJC, E24XUS)
Donor: Champ C. Muangamphun, E21EIC – Siam DX Group

MULTI-OPERATOR, MULTI-TRANSMITTER

World
CN3A (Oprs.: IK2QEI, IK2SGC, IK2LFF, IZ2ZOZ, IK3STG, E77DX, LY4A, 9A6A, 9A5BWW)
Donor: Dave Leeson, W6NL & Barb Leeson, K6BL

U.S.A.
K3LR (Oprs.: AA4WJ, K1AR, K3LA, K3UA, K3LR, KL9A, LU7DW, N2NC, N2NT, N3GJ, N3SD, N5UM, N6MJ, W2RQ, WM2H)
Donor: Jim Lawson, W2PV Memorial

Europe
M6T (Oprs.: GØAEV, GØVJG, GØWCW, G2NF, G4BUO, G4PIQ, G7TWC, MØBCT, MØCLW, MØHKB, MØMDR, MØSDV, MØTGV, M1ACB, PT2FM)
Donor: Finnish Amateur Radio League

CONTEST EXPEDITIONS

World Single Operator
T8ED (Opr.: Tetsuya Sakabe, JA7XBG)
Donor: National Capitol DX Association - Stuart Meyer, W2GHK Memorial

World Multi-Op
VK9CZ (Oprs.: GM3WOJ, GM4YXI)
Donor: Gail Sheehan, K2RED

**Awarded to second place finisher*

EI1A at the helm for the 2017 CQWW DX SSB Contest.

ing because their log was more accurate. In other words, these entrants "came from behind." While they had an initial rank of X using their RAW score, they ended up in position X-1 when ranked by the final score. On a world score basis, 3,347 entrants improved their final ranking due to a more accurate log than their competitors. And 26 of them were in the World Top 5 by their category of entry. Here is the listing of these impressive entrants.

Call	Category	World Rank	Final Score
K3LR	MM	3	19,187,946
ES9C	M2	4	14,124,964
VA3DF	AB-L-A	4	1,899,235
C6ARW	AB-L-U	2	1,897,350
S57DX	20M-H-A	5	1,079,190
CF7RR	20M-H-U	3	923,580
RT5K	20M-H-U	5	814,320
CO6LC	15M-L-U	5	382,145
IF9A	20M-L-A	3	334,050
IT9STX	20M-L-A	4	333,168
S56A	40M-L-A	4	164,724
SV9GPV	10M-L-A	4	121,968
G3Y	20M-L-U	5	108,014
LW5DPG	10M-L-U	4	86,190
CO8ZZ	40M-L-U	4	68,931
OK2VWB	40M-Q-U	3	27,056
GW2X	160M-H-U	3	23,313
JM1NKT	20M-Q-A	5	20,475
RW3AI	20M-Q-U	5	18,023
YL2PP	160M-H-U	5	15,176
RD3K	160M-L-A	3	14,112
OK1JOK	160M-L-U	4	9,776
HA7I	160M-Q-A	2	5,547
9A4AA	15M-Q-A	1	3,973
3G3O	10M-Q-A	5	1,159
YC3PPD	40M-Q-A	5	336

All About You, the Entrant

Ever wonder where the logs come from or what the numbers by category look like? We do! By far, the largest number of logs are from Europe.

All Categories of Logs

Continent	# of logs	% of all
AF	85	1.0%
AS	1,079	12.5%
EU	4,157	48.3%
NA	2,437	28.3%
OC	394	4.6%
SA	456	5.3%
ALL	**8,608**	**100%**

As for category of entry, you may be surprised. Most entrants are Single-Operator, all-band (SOAB). Second are Single-Band entrants. With limited time and sunspots, that makes sense. The rest (not including check logs or other actions by the committee logs), are shown below. One might wonder why Multi-Multi (MM) gets so much coverage in the write up, since they are a very tiny group of logs. There are more than 5 times as many QRP logs as there are MM logs. Maybe we need more focus on Low Power and more on Europe and SOAB categories. Hmmm?

Type	Count	Percent
SOAB	5,259	61.1%
Single Band	2,277	26.5%
MS (Multi-Single)	428	5.0%
QRP	298	3.5%
M2 (Multi-Two)	107	1.2%
MM (Multi-Multi)	56	0.7%

Power Analysis

Continent	HIGH	LOW	QRP	Grand Total
AF	33	31		64
AS	363	555	38	956
EU	1,264	2,064	188	3,516
NA	1,103	1,102	37	2,242
OC	106	227	18	351
SA	110	280	17	407
Grand Total	**2,979**	**4,259**	**298**	**7,536**

Assisted Analysis: includes Single-Op Only

Continent	ASSISTED	NON-ASSISTED
AF	21	43
AS	323	633
EU	1,435	2,081
NA	1,003	1,239
OC	110	241
SA	189	218
Grand Total	**3,081**	**4,455**

Assisted Analysis %, includes Single-Op Only

Continent	ASSISTED	NON-ASSISTED
AF	32.8%	67.2%
AS	33.8%	66.2%
EU	40.8%	59.2%
NA	44.7%	55.3%
OC	31.3%	68.7%
SA	46.4%	53.6%
Grand Total	**40.9%**	**59.1%**

Time Study

A lot of folks gripe about not being able to stay awake all those hours. Well, it's true; it's difficult to stay awake, and relatively very few entrants make it past 40 hours. Doing the math, 25% of entrants operate less than 4.5 hours; 50% operate less than 9.3 hours; and 75% operate less than 17.2 hours. Operating more than 40 hours really puts you up into the rarified strata. So don't worry about how many hours you can operate. Just get on, have some fun, and remember to send us your log.

Hours	# of Logs	% of all	cum %
0-5	1433	27.7%	27.7%
5.1-10	1291	25.0%	52.7%
10.1-15	865	16.8%	69.5%
15.1-20	578	11.2%	80.7%
20.1-25	427	8.3%	89.0%
25.1-30	255	4.9%	93.9%
30.1-35	173	3.4%	97.3%
35.1-40	79	1.5%	98.8%
up to 41	14	0.3%	99.1%
up to 42	11	0.2%	99.3%
up to 43	9	0.2%	99.4%
up to 44	7	0.1%	99.6%
up to 45	7	0.1%	99.7%
up to 46	6	0.1%	99.8%
up to 47	1	0.0%	99.8%
up to 48	8	0.2%	100.0%

TOP SCORES IN VERY ACTIVE ZONES

Zone 3

K6XX	1,995,490
W6TK	834,912
N7ZG	748,880
W6AFA	636,350
NX1P	604,920

Zone 4

XL3T	7,343,728
W9RE	3,925,128
N9RV	2,481,972
KØEJ	2,310,120
N2IC	1,955,766

Zone 5

VY2ZM	8,514,880
K1DG	6,769,048
W2RE	6,692,379
NR3X	5,905,782
N5DX	5,825,913

Zone 14

EA5DFV	3,117,768
DJ5MW	3,047,198
*EI1A	1,797,582
DL7BC	1,177,908
DL1WA	1,057,680

Zone 15

TK9R	5,839,788
ES6RW	2,956,115
IO2X	2,733,805
YL2GD	1,856,778
*HA3NU	1,418,480

Zone 16

US5D (UT7DX)	2,538,200
RT9S	2,325,724
R8WF	1,508,420
RM4HZ	1,085,077
RM2U	1,073,550

Zone 20

H2T	3,572,603
YPØC	3,398,771
4Z5LY	1,675,320
YO3VU	727,659
YO3RU	443,552

Zone 25

JH4UYB	3,479,617
JE6RPM	1,823,290
JA7NVF	1,167,790
JH3CUL	737,704
JR1GSE	693,528

**Low Power*

Border Control Report

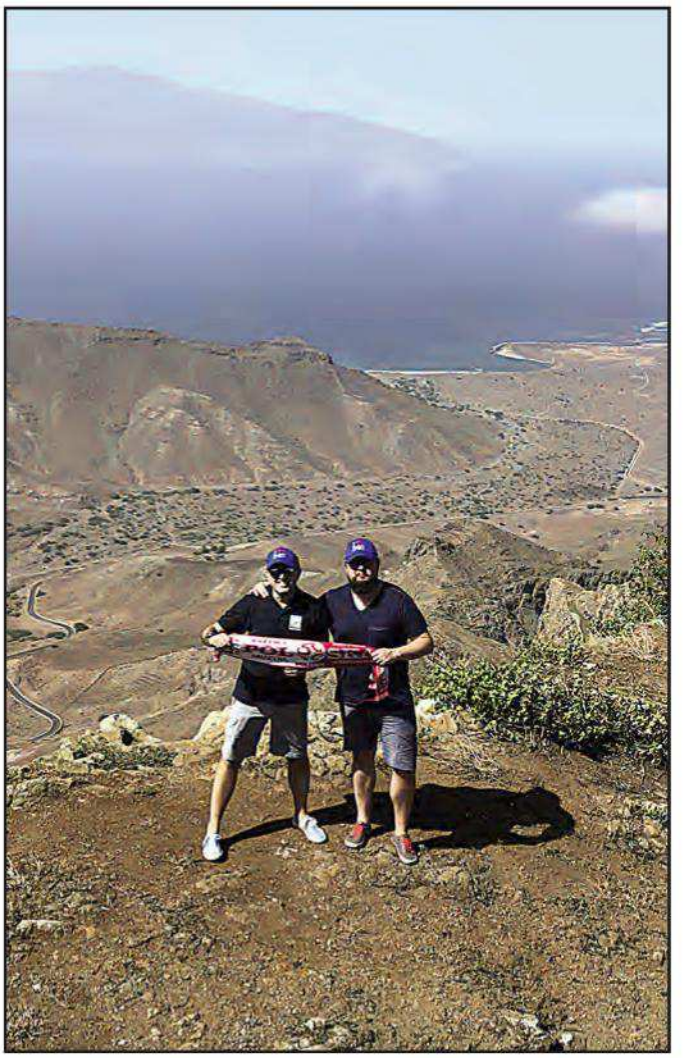
Adhering to the band edge is important. Last year (2016 contest), we removed a lot of QSOs that were Out-Of-Band (OOB) contacts. You only knew about it if you looked carefully at your individual log analysis. In composing the 2017 rules, we added a notation for ITU Region 1 (ITU R1 is the same as IARU R1). And now we make it very clear in your individual reports. And obviously, we are focusing attention on it here.

For 2017 SSB, we found and removed 601 OOB QSOs from entrant logs. They came from 300 separate logs. Approximately, 65% of the 300 made just one OOB contact while 14.3% made two such contacts. Remarkably, five folks made 10 or more OOB Qs. It might be time to set some add-on penalties for "excessive" OOB QSOs.

When identifying OOB contacts, we did not rely on the frequency in the submitted logs. Every OOB QSO was *confirmed* via audio using our global SDR system files. Yes, it

The team at 3V8SS during the 2017 CQWW DX SSB Contest.

The shack at LY7Z.



D4Z and D4C have an excellent view for the 2017 CQWW DX SSB Contest.

2017 CQWW DX SSB TOP SCORES

WORLD
SINGLE OPERATOR
HIGH POWER
All Band

8P5A 13,794,654
P40T 10,358,145
VY2ZM 8,514,880
XL3T 7,343,728
K1DG 6,769,048
W2RE 6,692,379
ZF9CW 6,564,075
NR3X 5,905,782
TK9R 5,839,788
N5DX 5,825,913

28 MHz
CW5W 1,178,376
LW7DX 650,670
CE2AWW 420,954

21 MHz
D4Z 2,954,982
CR6T 1,356,736
CV7S 1,134,296

14 MHz
EI7M 1,388,640
F8ARK 1,210,440
CF7RR 923,580

7 MHz
RU1A 671,974
4X2M 632,392
LZ8A 579,810

3.7 MHz
E7ØT 280,245
OK8WW 199,662
K4ZW 128,594

1.8 MHz
HG8R 95,459
G4L 24,750
GW2X 23,313

LOW POWER
All Band

HI3T 3,303,664
C6ARW 1,897,350
EI1A 1,797,582
V3A 1,547,808
HA3NU 1,418,480
N1PGA 1,036,480
N8II 1,009,896
UX1UX 896,080
VE9HF 683,880
M1U (MØUTD) 621,569

28 MHz
EA8TX 400,710
CB3LR 142,926
LW5DPG 86,190

21 MHz
9Y4D 1,195,122
YV4YC 1,101,992
CO6HLP 600,210

14 MHz
MIØM 257,504
RA3XM 127,800
OM6DN 126,636

7 MHz
EA7RM 139,776
LA2AB 114,466
HSØZIA 73,854

3.7 MHz
PA2TMS 86,240
LY2BMX 61,965
F5BEG 61,688

1.8 MHz
SNØR 33,062
SQ5GVY 18,468
SP5CJY 13,395

QRP
All Band

KR2Q 644,160
HG6C 427,785
JR4DAH 266,104
G4CWH 250,756
JH1OGC 224,301
UT5EOX 195,027
UA3OO 161,100
SP4LVK 112,714
UX2MF 105,090
PW5T 86,412

28 MHz
LU7VCH 32,096
I5KAP 17,263
R7NA 12,772

21 MHz
HG3C 43,952
K8ZT 24,820
SP5DDJ 20,826
JR2EKD 20,808

14 MHz
TG9ADQ 131,824
IZ1ANK 42,585
CT1BXT 30,952

7 MHz
KP3LR 64,676
LY5G 36,260
OK2VWB 27,056

3.7 MHz
SQ8MFB 10,296
CR5M 6,578
DO4HZ 5,136

1.8 MHz
HA5NB 3,680
SQ2BXI 3,535
VA3XO 2,431

ASSISTED
HIGH POWER
All Band

P33W 13,936,272
ZX5J 10,324,320
DL6FBL 9,525,360
S57AL 5,654,932
LY7Z 5,520,064
S53M 5,162,560
K5ZD 4,570,185
K3WW 4,558,642
ZZ2T 4,377,347
W3UA 4,341,753

28 MHz
LU7HN 461,010
CT9/DJ2YA 434,343
IT9BUN 128,934

21 MHz
CX2DK 1,896,412
CQ3W 1,603,296
9A9A 1,495,239

14 MHz
D4C 2,327,904
KH7XS 1,623,645
S5ØK 1,297,405

7 MHz
UPØL 1,018,720
OK7K 796,854
SN3A 762,125

3.7 MHz
OM2VL 398,130
9A8M 306,652
UA2F 279,744

1.8 MHz
5B4AIF 117,180
S53O 82,998
EU4A 80,388

ASSISTED
LOW POWER
All Band

P4ØW 5,077,050
TM3Z 2,356,263
HA4XH 2,047,222
VA3DF 1,899,235
UW6E 1,867,020
RA3Y 1,376,000
EW1P 1,200,870
RL6M 1,196,848
YO7SR 1,180,848
KS1J 1,115,926

28 MHz
LU9DDJ 220,214
PU2SDX 160,378
HZ1SK 135,622

21 MHz
PY2UD 512,080
BD7BM 486,286
II8M 401,301

14 MHz
UR3GU 473,628
S52OT 402,744
IF9A 334,050

7 MHz
9A5Y 286,800
YT5X 239,496
OL9R 198,648

3.7 MHz
UK9AA 120,951
HGØR 95,056
EU2EU 94,738

1.8 MHz
E74R 43,200
LZ2JE 34,050
RD3K 14,112

ASSISTED
QRP
All Band

OK2FD 391,710
RT4W 247,086
YU1LM 108,000
IZØFUW 102,816
IK1ZOF 69,520
PE2K 38,478
IZ8JFL 32,660
DO8YX 28,215
JK1TCV 27,768
HA5BA 27,000

28 MHz
PY2ZA 17,934
PU2RTO 6,042
SP5EWX 2,709

21 MHz
9A4AA 3,973
EI1E (EI5KF) 3,731
YC2VOC 3,204

14 MHz
UZ7M 91,800
YP8W 56,232
TA3AER 40,755

7 MHz
IT9GAK 34,040
LX/G1TPA/P 28,842
ES4O 2,652

3.7 MHz
OZ6OM 15,892
UT5WAA 2,013
HA8V 1,943

1.8 MHz
YO9FLD 5,841
HA7I (HA7JTR) 5,547
EU1AA 5,375

MULTI-OP
SINGLE TRANSMITTER
High Power

EF8R 31,451,984
CN2AA 27,771,275
CR3A 20,170,863
FY5KE 18,259,920
TM6M 13,676,145
LX7I 13,415,550
UP2L 13,011,399
IR4M 12,836,928
IR4X 12,798,432
9K2HN 12,730,971

Low Power
ED9E 4,485,280
3V8SS 3,172,500
IB9T 3,082,500
IQ3RK 2,630,880
ZW8T 2,158,650
YP7P 1,898,397
A61FK 1,584,740
PR1T 1,493,172
EA3CI 1,399,658
IZ8XXE 1,155,807

MULTI-OP
TWO TRANSMITTER
CN2R 26,206,313
PZ5K 23,541,502
PJ4G 17,801,244
ES9C 14,124,964
PX2A 13,941,148
PJ4Q 13,356,636
KC1XX 13,350,755
9A7A 13,087,800
LT1F 12,425,000
EC2DX 12,330,400

MULTI-OP
MULTI-TRANSMITTER
CN3A 34,131,377
A73A 19,654,817
K3LR 19,187,946
PJ2T 18,646,320
A44A 16,487,691
V26B 14,638,603
W3LPL 14,193,245
M6T 13,456,575
DFØHQ 13,414,101
LZ9W 12,984,558

ROOKIE
High Power
LB1AH 773,816
DK6MP 642,200
TK4RB 631,736
F4HRM 359,060
MØVCB 304,794
K4AKK 289,712
C93PA 235,620
DK5RL 209,884
EA8DET 186,202
W3XOX 132,111

ROOKIE
Low Power
EW7BA 267,850
PA9S 242,795
KM4SII 222,642
OH1XFE 176,484
OH5Y 143,060
SP5WIT 137,313
IU4HMY 133,749
MØTWB 121,326
W2XK 114,774
EA4GSL 111,735

CLASSIC
High Power
P49Y 5,370,008
4LØA 3,920,940
H2T 3,572,603
DJ5MW 3,047,198
VA2WA 3,021,744
ES6RW 2,943,738
KQ2M 2,367,480
RT9S 2,325,724
N2IC 1,955,766
YL2GD 1,856,778

CLASSIC
Low Power
HA3NU 1,418,480
N8II 1,009,896
V3A 914,628
M1U 621,569
USØHZ 545,445
RU9AC 483,531
K1HT 353,438
MM1E 330,544
UA3BL 320,736
N2GA 320,320

UNITED STATES
SINGLE OPERATOR
HIGH POWER
All Band

K1DG 6,769,048
W2RE 6,692,379
NR3X 5,905,782
N5DX 5,825,913
N1UR 4,848,096
W9RE 3,925,128
AA1K 3,715,191
N9RV 2,481,972
KQ2M 2,367,480
KØEJ 2,310,120

28 MHz
W5PR 32,760
K4WI 19,812
W4DD 18,241

21 MHz
KU2M 591,840
N4OX 303,298
WD5K 124,200

14 MHz
NN3W 591,680
N5CR 184,800
K2YY/6 154,810

7 MHz
W7WA 251,505
W1XX 119,068
KM5VI 29,842

3.7 MHz
K4ZW 128,594
W3BGN 88,032
W4QNW 22,536

1.8 MHz
AG4W 5,838
W2VO 3,636

LOW POWER
All Band

N1PGA 1,036,480
N8II 1,009,896
ACØW 513,264
N6RV 457,056
N7IR 456,494
K5FUV 415,584
K7ACZ 365,638
K1HT 353,438
N2GA 320,320
K3SU 295,456

28 MHz
NV4B 4,896
KA3MZR 1,800
N2VIG 1,680

21 MHz
W2AW (N2GM) 124,956
K5KJ 111,531
KØBBB 67,288

14 MHz
N5JJ 69,720

was a lot of work for us and we hope that *you* get the message. When you make an OOB QSO, you are wasting your time because it **will be removed**. Even worse, some of you attempted to "hide" what you did by changing the discrete frequency in your log. Come on guys, you think we don't know where the QSO actually took place? Working an OOB contact is most likely an error; changing the frequency in your log to hide it is *cheating*.

Somewhat surprising to us is that we found more U.S. entrants operating OOB than ITU R1 entrants. Everybody worldwide needs to know where the band-edge is, for their country and their license class. Sure, some folks get caught up in the excitement of the contest. It happens and most of us have done it at least once. If you only do it once or twice, you have not wasted a lot of time. If the guy you worked OOB was a mult and you didn't try to work "another one" that was not OOB, then you lost that mult. Just wait until the mult comes up/down into "your part" of the band before you attempt to make a QSO.

We did further analysis on the OOB QSOs. We think that, especially for Europe, contesters are just clicking on DXCluster spots and not bothering to check the frequency. Check out the table below.

Tracking who works OOB QSOs

QTH	ASSISTED	UNASSISTED
USA count	230	151
DX count	190	30
Total Count	**420**	**181**
USA %	60.4%	39.6%
DX %	86.4%	13.6%

Speaking of Assisted

The world of "assisted" continues to morph. Sure, it is fun to just click, click, click and work guys. A big problem is that

K3SWZ 56,352
N7FLT 51,980

7 MHz
W2AAB 10,914
WA7NWL 2,700
KE4KVC 2,370

3.7 MHz
W4PGM 1,288

QRP
All Band
KR2Q 644,160
K2YGM 78,110
W6QU 70,007
NDØC 44,880
W6VH 5,043
K8CN 3,225
WS9V 2,432
W4TTZ 1,530

28 MHz
N4IHS 468

21 MHz
K8ZT 24,820

14 MHz
K2GMY 5,265
KZ3I 4,914

ASSISTED
HIGH POWER
All Band
K5ZD 4,570,185
K3WW 4,558,642
W3UA 4,341,753
AB3CX 3,924,195
AA3B 3,771,632
K1ZZ 3,346,460
N3RS 3,326,904
N2RJ 3,168,662
N2SR 2,838,112
N2MM 2,683,652

28 MHz
N6SS 23,952
K4YYL 3,900
W3IP 2,523

21 MHz
N6WM 191,280
K2UR 143,374
WA3C/8 99,036

14 MHz
N2PP 522,668
N7DD 495,680
N4PN 475,244

7 MHz
K3EST 242,296
K3MA 124,084
K2RD 102,360

3.7 MHz
W3NO 68,706
K1KNQ 49,588
KM2G 12,155

1.8 MHz
W2MF 10,835
N4RJ 4,040

ASSISTED
LOW POWER
All Band
KS1J 1,115,926
W3KB 957,600
N2SQW 765,360
K7WP 497,777
W4ZAO 481,901
W1AEC 456,672
N1API 438,212
K8LY 422,406
AAØAI 369,642
AA4R 299,450

21 MHz
W9ILY 53,865
N3TD 48,208
N9TF 46,812

14 MHz
N4IJ 144,988
N9TGR 93,360
WK9U 78,600

7 MHz
WA1FCN 43,022
KB3LIX 9,024

3.7 MHz
AB4B 26,714
KK4BZ 3,876
NM9P 2,349

1.8 MHz
N4OC 1,403

ASSISTED
QRP
All Band
K4SSE 690

14 MHz
K7HBN 828

1.8 MHz
K3TW 276

MULTI-OP
SINGLE TRANSMITTER
High Power
W1NA 6,411,252
K1XM 5,329,986
K5TR 4,429,061
K8AZ 4,383,540
N4WW 4,052,724
NV9L 4,004,079
N1MM 3,211,747
AA9A 3,086,366
WX1S 1,835,541
W3MF 1,823,481

Low Power
WK1DS 306,772
WA1F 141,588
N8YXR 116,382
W8AJT 52,700
K7JAN 36,166
W6BHZ 35,640
W6NJB 27,136
ND6U 4,560
N5XXD 3,456

MULTI-OP
TWO TRANSMITTER
KC1XX 13,350,755
K2LE 5,316,135
WW4LL 5,096,979
K9CT 4,207,896
N7AT 2,606,752
K2AX 2,274,171
WA3EKL 2,063,000
W2CG 1,749,956
K7ZS 1,389,214
WB2P 1,373,625

MULTI-OP
MULTI-TRANSMITTER
K3LR 19,187,946
W3LPL 14,193,245
K1TTT 8,799,840
K1KI 4,399,488
K1KP 3,314,400
WØAIH 3,193,344
N5AA 2,340,700
NE3F 2,099,512
W1CSM 1,156,965
KØBBC 286,612

ROOKIE
High Power
K4AKK 289,712
W3XOX 132,111
KD2IWW 126,100
K2RYD 92,184
W6MOB 40,576
N4VLK 31,124
WA6NFJ 27,224
KEØCRP 23,051
K9GWS 20,739
K4AFE 17,661

Low Power
KM4SII 222,642
W2XK 114,774
NN2T 102,510
K7HKR 50,310
W4BBT 49,790
K2MV 35,310
AA5DX 31,242
NQ5M 27,192
W4LID 23,892
KM4RKT 23,072

CLASSIC
High Power
KQ2M 2,367,480
N2IC 1,955,766
W3LL 1,767,768
AA1K 1,692,288
KD2RD 1,513,673
N5AW 1,282,424
W1WEF 921,633
NX1P 604,920
W4KW 537,230
K3TC 511,280

Low Power
N8II 1,009,896
K1HT 353,438
N2GA 320,320
K1BX 274,950
W3MMM 252,572
K1VSJ 208,832
AC2RL 193,536
K4SXT 161,352
KC4TEO 159,399
WØETT 146,306

many "clickers" are not waiting to copy the callsign of the person they just worked. That's a big mistake. As a QRPer (often waiting in line), I cannot tell you how many times I am waiting for the DX to give his call, when I hear a string of cluster users stop by in rapid succession. They throw their call in, make a QSO, and instantly QSY. Hey wait a minute. How did you get his call? Sure, you just trusted the DX spot. It is startling to see how many bad calls (-B) there are because of that. Yes, we can, and do, listen to some of those QSOs (or should we say "QSOs" because they really are not valid QSOs).

In the old days, contesters used spotting networks as a source of additional information; a potential new-one to work. Increasingly, "spots" are being used as method of communication from someone trying to establish contact with the person they want to contact. That is not good. That is using non-amateur means to arrange a QSO. What's next? Will we see spot comments such as "Good QSO, you are in my log"

2017 CQWW DX SSB BAND-BY-BAND BREAKDOWN—TOP ALL BAND SCORES

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

WORLD SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
8P5A	158/11/30	658/18/74	2134/29/108	2059/35/104	3034/32/116	991/21/64
P4ØT	38/8/18	222/16/42	1996/30/109	1280/31/104	2427/31/111	529/16/49
VY2ZM	334/14/61	731/20/81	1227/25/100	1784/31/111	1398/22/99	35/8/18
XL3T	178/9/18	784/18/69	976/23/74	1999/32/116	1668/27/110	38/10/26
K1DG	101/12/44	333/19/78	525/24/81	1364/31/108	1979/25/109	87/12/29

USA TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
K1DG	101/12/44	333/19/78	525/24/81	1364/31/108	1979/25/109	87/12/29
W2RE	77/9/31	245/16/67	771/25/87	1371/29/104	2017/26/105	68/8/22
NR3X	29/7/14	241/16/69	610/23/91	1180/33/105	1864/24/110	142/11/28
N5DX	62/13/34	243/18/75	776/22/97	1042/32/114	1407/23/105	91/10/28
N1UR	29/8/14	321/17/74	505/23/92	1226/33/103	1183/25/97	128/11/31

WORLD SINGLE OPERATOR ASSISTED ALL BAND

P33W	182/11/59	426/18/80	1056/30/106	1636/38/137	2320/37/142	797/25/94
ZX5J	33/9/19	194/22/65	566/28/89	1271/38/110	2162/36/137	1339/26/106
DL6FBL	209/11/62	601/16/89	1096/34/122	1994/38/132	1390/37/143	237/22/74
S57AL	161/9/56	756/18/81	1075/31/113	1513/35/121	718/37/132	71/20/50
LY7Z	408/9/63	792/19/82	845/30/113	1573/36/123	865/34/128	189/17/50

USA SINGLE OPERATOR ASSISTED ALL BAND

K5ZD	31/9/17	155/16/67	217/23/78	1029/33/121	1321/27/119	117/12/35
K3WW	54/10/29	238/18/79	231/23/87	854/30/118	1313/24/117	130/13/39
W3UA	45/9/28	152/16/70	395/24/90	940/31/113	1184/23/113	138/12/30
AB3CX	34/8/17	233/16/74	214/24/86	826/30/117	988/25/118	185/12/34
AA3B	49/10/27	161/15/69	275/23/90	859/27/111	1026/25/113	108/11/33

WORLD MULTI-OPERATOR SINGLE TRANSMITTER

EF8R	290/17/80	1054/25/105	2524/35/131	3030/39/153	3060/39/160	1738/31/126
CN2AA	237/18/80	976/26/106	2463/35/127	3272/39/151	3227/39/155	531/29/120
CR3A	213/15/65	1071/23/96	1046/32/110	1707/37/136	3246/39/141	1059/28/115
FY5KE	62/11/35	636/25/87	1167/35/123	1469/39/147	2422/37/151	2045/30/120
TM6M	196/11/64	766/21/94	1547/36/129	2548/36/133	2422/38/153	108/22/72

USA MULTI-OPERATOR SINGLE TRANSMITTER

W1NA	28/9/27	324/17/81	606/28/102	1305/35/123	1606/30/125	93/13/38
K1XM	40/10/32	344/19/81	628/27/107	1132/34/130	1137/27/124	45/13/43
K5TR	27/12/24	102/22/66	964/34/113	744/34/122	1324/31/129	56/15/35
K8AZ	32/12/29	204/19/72	361/31/102	840/37/130	1111/27/125	42/14/41
N4WW	37/11/35	157/18/78	782/32/113	983/32/118	655/30/119	58/13/27

WORLD MULTI-OPERATOR TWO TRANSMITTER

CN2R	136/11/44	1475/25/97	2587/32/121	2704/35/128	3862/38/136	975/26/94
PZ5K	188/13/47	755/22/83	2421/33/110	2083/36/121	3590/34/132	1919/27/120
PJ4G	110/14/33	807/22/83	1638/31/116	2457/34/124	3067/34/127	1103/24/66
ES9C	539/14/76	1516/23/103	2070/33/135	3199/39/149	2249/37/164	207/22/73
PX2A	6/6/5	52/14/41	721/31/104	1596/37/125	3593/35/136	1637/27/115

USA MULTI-OPERATOR TWO TRANSMITTER

KC1XX	67/13/35	509/25/97	992/28/115	2107/33/139	961/27/114	224/21/60
K9CT	65/11/21	177/21/59	645/29/90	812/32/114	501/28/90	268/19/54
N7AT	12/5/5	265/24/44	695/29/72	523/29/75	661/29/74	142/16/38
KA1ZD	31/9/18	95/15/47	222/23/82	410/27/109	336/26/91	189/19/55
W2CG	24/7/17	98/19/54	215/25/74	445/29/105	358/26/88	211/17/50

WORLD MULTI-OPERATOR MULTI-TRANSMITTER

CN3A	418/14/68	1535/22/104	3431/33/130	2770/38/135	3822/39/148	1896/30/128
A73A	211/10/52	613/20/76	1981/31/120	2473/38/145	2924/36/137	1238/29/103
K3LR	536/18/59	808/27/101	2062/36/135	2812/39/156	2915/33/146	367/21/51
PJ2T	96/12/25	602/22/79	2282/29/103	2975/37/123	3503/30/121	1133/19/60
A44A	332/10/56	583/18/75	1388/31/115	1985/37/135	2795/33/137	1311/29/105

USA MULTI-OPERATOR MULTI-TRANSMITTER

K3LR	536/18/59	808/27/101	2062/36/135	2812/39/156	2915/33/146	367/21/51
W3LPL	407/17/59	663/21/93	1798/34/127	2363/36/138	1811/30/135	426/18/47
K1TTT	158/11/37	584/22/84	940/30/108	2070/36/131	1314/28/126	346/19/47
K1KI	47/10/27	251/17/77	723/32/111	804/31/119	810/24/113	78/13/34
K1KP	31/8/7	219/16/63	431/23/87	1014/31/103	992/23/108	6/5/6

N2RJ's antenna.

N2RJ poses for a selfie in front of her Flex Maestro.

hoping that the other end will reciprocate by logging him if the QSO was shaky, or worse, non-existent? We see that often for DXing, but not for contesting. Don't do it. DX spotting is supposed to be used as a resource for gathering DX data; it is not supposed to be a substitute for your radio. Things are getting out of hand (if not there already).

With the "assisted" category moving farther beyond past practices, and more and more functioning as a social media mode of ancillary communication, I am becoming convinced that this category should never be "merged" in any way, shape, or form with the minority of vocal operators (that gets smaller every year) who shout, "keep single-op unassisted separate!"

Closing Remarks

We would like to thank the many contesters out there who continue to send us suggestions on where to look to identify potential unsportsmanlike behavior that they have observed or suspect. We check every one of them out; keep 'em coming! The CQWW Contest is the biggest and best contest going (always has been) and appreciate everyone's input to keep it that way.

At this time, we enthusiastically look forward to seeing all of you again on October 27, 28 on Phone and on November 24, 25 on CW in 2018.

And finally, many thanks to the members of the CQWW Contest Committee, whose help, suggestions, expertise, and even criticism, make the contest the huge success that it is:

CT1BOH, José Nunes; EA4KD, Pedro Vadillo; ES5TV, Tonno Vahk; F6BEE, Jacques Saget; GØMTN, Lee Volante; HA1AG, Zoli Pitman; IK2QEI, Stefano Brioschi; JH5GHM,

EUROPE TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
TK9R	322/8/48	617/14/67	785/22/90	1979/31/96	1393/30/106	190/15/55
YPØC	141/7/33	514/11/55	1134/27/83	1141/27/80	1327/28/90	128/18/44
EA5DFV	62/7/34	251/8/48	737/25/83	854/19/61	1869/25/96	138/8/30
DJ5MW	93/6/37	275/11/48	522/23/78	1290/30/84	570/32/102	120/16/50
ES6RW	146/8/43	394/15/59	467/28/78	1041/31/82	805/32/99	225/17/59

EUROPE SINGLE OPERATOR ASSISTED ALL BAND

DL6FBL	209/11/62	601/16/89	1096/34/122	1994/38/132	1390/37/143	237/22/74
S57AL	161/9/56	756/18/81	1075/31/113	1513/35/121	718/37/132	71/20/50
LY7Z	408/9/63	792/19/82	845/30/113	1573/36/123	865/34/128	189/17/50
S53M	102/10/51	596/15/78	652/31/99	1090/37/115	1101/35/128	169/20/61
YL2SM	202/13/64	427/18/82	568/29/102	934/36/118	747/35/135	142/22/63

EUROPE MULTI-OPERATOR SINGLE TRANSMITTER

TM6M	196/11/64	766/21/94	1547/36/129	2548/36/133	2422/38/153	108/22/72
LX7I	299/13/71	924/22/98	1967/34/126	2380/38/145	2059/38/149	149/23/93
IR4M	73/13/71	619/20/95	1773/34/123	2675/38/145	1769/37/150	103/25/81
IR4X	140/13/72	524/20/96	1547/36/132	2622/39/147	1842/39/154	130/24/92
OM7M	126/13/69	826/26/98	1534/35/134	2541/39/146	1499/38/150	84/25/84

EUROPE MULTI-OPERATOR TWO TRANSMITTER

ES9C	539/14/76	1516/23/103	2070/33/135	3199/39/149	2249/37/164	207/22/73
9A7A	184/12/63	1094/21/92	2011/34/134	2564/39/141	2148/38/149	172/26/76
EC2DX	229/12/65	1240/24/103	1530/32/115	2940/36/132	2585/38/144	146/23/76
HG7T	302/12/66	1302/24/98	1771/32/131	2408/39/133	1612/38/153	339/25/87
YT5A	205/12/60	1116/22/91	1663/33/112	2311/38/133	1379/36/138	133/25/81

EUROPE MULTI-OPERATOR MULTI-TRANSMITTER

M6T	919/11/67	1964/23/98	3003/36/137	2145/37/138	1453/34/128	543/21/95
DFØHQ	906/13/74	1442/21/98	2974/32/142	2137/39/151	1246/38/145	521/28/106
LZ9W	753/12/74	1645/25/103	2193/33/131	3158/37/137	1727/38/146	463/26/89
CU4DX	232/12/49	1048/17/86	1487/27/97	2516/32/107	2966/30/99	1130/24/96
OT5A	756/13/64	1320/15/74	2677/36/135	1430/36/104	1113/34/120	355/20/66

Katsuhiro (Don) Kondou; K1AR, John Dorr; K1DG, Doug Grant; K3LR, Tim Duffy; K3WW, Charles Fulp; K3ZO, Alfred A. (Fred) Laun, III; K5ZD, Randy Thompson; KR2Q, Doug Zwiebel; LU5DX, Martin Monsalvo; N8BJQ, Steve Bolia; OH6LI, Jukka Klemola; PA3AAV, Gert Meinen; RA3AUU, Igor (Harry) Booklan; S5ØA, Tine Brajnik; S5ØXX, Kristjan Kodermac; UA9CDC, Igor Sokolov; VE3EJ, John Sluymer; VK2IA, Bernd Laenger; W4PA, Scott Robbins; W5OV, Bob Naumann; YO3JR, Andrei (Andy) Ruse; YU1EW, Zoran Mladenovic.

(Continued on page 94)

The team of the Red Forest Contest Station, SV1DPI.

what's new

KeychainQRP HF Transmitters

Did you ever want a full-fledged CW QRP transmitter that can fit on your keychain that actually works? Well QuirkyQRP Ham Radios has the solution for you with its micro-sized CW ham radios that are small enough to keep attached to your car keys.

Each rig weighs in at roughly 1 ounce and measures 1 inch x 1 inch x 0.75 inches.

They are currently for sale on Etsy in the following bands: 10, 15, 17, 20, 40, 80, and 160 meters. Each KeychainQRP transmitter is set to a single operating frequency: 28.224, 21.10248, 18.080, 14.1120, 14.1475, 14.31818, 7.200, 3.57954, or 1.8432 MHz.

When paired with an inexpensive multi-band shortwave receiver or HF receiver kit, a very lightweight transceiver setup can be achieved. Another HF receiver option is one of the many dual-band VHF/UHF handheld ham radios on the market that has a built-in wide band HF receive mode, which many hams already own.

Each transmitter has a built-in micro straight key for transmitting code without the need for an external key. The latest model now sports a standard 3.5-millimeter jack to allow the use of any external straight key or electronic keyer. There is even the potential to use KeychainQRP as an experimental propagation beacon or as an RDF "foxhunting" transmitter.

KeychainQRP is powered by a standard 9-volt battery and puts out a maximum of 160 milliwatts of RF power via its SMA antenna connector. Batteries as well as BNC/SMA adapters are available as optional accessories.

A transmit indicator LED shows you that you are transmitting and can be helpful for beginners when sending code. Another helpful addition for hams still learning CW is the built-in Morse code chart, which is part of the label on the front of the rig.

Each KeychainQRP transmitter is handmade in the U.S., is available now, and has a retail price of $39.95. For more information or to purchase, visit: <www.etsy.com/shop/QuirkyQRPHamRadios>.

A non-contester looks at the very many reasons that he, and other hams like him, can benefit from being on the air during a major contest like the CQ World Wide.

The CQ World Wide DX Contest: What's In It For Me?

A Look at the CQWW SSB DX Contest by a Non-Contester

BY MICHAEL J. CHARTERIS,* VK4QS, VK4XQM

Hi, I'm Mike Charteris, VK4QS, and in my humble opinion, one or the best radio contests each year is the CQ World Wide DX SSB Contest, which takes place annually on the last full weekend of October. This is said as a non-contester, who, like many other radio amateurs, ask myself, "What's really in it for me?" Or for that matter, for you?

October 30th 2017, the clock has just passed 00:00 UTC, and it's 10 o'clock Monday morning here in Australia. The annual CQ World Wide DX Contest has finally concluded as sharply as it began two days before. Now the bands have fallen eerily silent, despite the propagation that still exists. And all who participated begin the task of scoring and evaluation of this global amateur radio event.

For many of the amateur radio fraternity throughout the world, "contests" generally are a right royal pain in the neck, and considered as lost radio weekends. These events see the HF spectrum enveloped by thousands of determined operators seeking contacts worldwide with other enthusiasts just as keen, if not as mad, as themselves. For the rest of us, it does not get any worse, with the bands being full of foreign signals that somehow interfere with our version of the hobby. A full weekend of garbled "Duck-talk" cacophony that fills the bands like some biblical plague of swarming locusts from earlier times. Here then, for two days, the Propagation Gods amuse themselves listening to the "big guns" along with all and sundry who take the time to be part of this global radio event.

Now, before I paint too harsh a portrait of contests and those who pursue them, let's consider who some of these people are and what actually drives them. Let it also be said that in the end, contests are in fact two-way streets with much to offer everyone who makes an effort to participate. Many have made the effort to save their pennies for a year or more to travel to exotic locations and activate seldom-heard DX entities. This is not only for the contester's benefit, but for all us seeking to work them, perhaps for the very first time. Then there are the other operators who are distinctly more financially well-heeled than most of us. They have dedicated a lifetime to perfecting their stations for the purposes of contesting and DXing. Such investments have seen many tens of thousands of dollars go into establishing so called "contest stations" for the original form of social media, "amateur radio." These radio mega structures and their operators seek to somehow defy the "Propagation Gods" through their hardware, software, and radio knowledge. Their sole purpose and mission is to be heard despite any adverse conditions Mother Nature or the universe can throw at them.

So where does that leave the rest of us who are caught in the crossfire with a comparatively standard station setup at our various QTHs across the world? We, who are "the many," playing the game in other ways with different goals and agendas across a broad field of options within the hobby. We are neither classed as "contesters" nor described as "diehard amateur radio operators." Alas, we come from both ends of the spectrum and everywhere in between.

You may be an avid QRP station using basic wire antennas whose achievements every day are most commendable with low power. Maybe you operate radios with just standard output power and a vertical you homebrewed due to space restrictions. For you, just being in the game is enough of a challenge daily. Or perhaps you're the veteran DXer with most of the preferred options such as a tower, a Yagi and the "full gallon" kilowatt. You indeed hold a couple of aces to make life on the HF bands more manageable when it comes to directing RF around the globe.

Having said that, we all have our place and our views as to what the hobby should be for each and every one of us. But in effect, and by consequence, "we" are all in fact both the audience and the appreciation for the efforts of those contesters, their megastations, and the exotic locations from which they operate. With this as a primary fact, you and I are as much a needed entity as anyone else from a world zone point of view. Thus, regardless of how you feel, do not underestimate the importance of your role on the world stage that is the CQWW DX Contest. For if it was not for "us" of the many, the contesters themselves would only hear the rest of their tribe working each other while "we" turned our backs and delivered them bands of silence.

But ironically, how else are we of the "average tribe" to hear and potentially contact rare DX from exotic locations across the vastness of the globe, if not by way of the opportunities such a contest presents? Some rare stations at exotic locations only get on the air for contests. So the question remains, *"What's in it for me?" the so-called "non-contester," when it comes to the CQ World Wide DX Contest?*

* *email: mikevk4qs@gmail.com*

Well my friends, the answer is plenty, but it all depends on how you look at it. From this point forward, I can offer you my own approach to this particular radio event. I hope that you may take away a few good points and perhaps slightly alter your views on such events that constantly enlighten our worldwide interactive hobby.

Set Goals for Yourself

The CQ World Wide DX Contest sees the world broken up into 40 zones, with many participation options on offer. I decided a few years ago to set myself a couple of goals of my own based on that I would never win any part of the contest. Once you adopt this outlook, then any contacts you make are a bonus towards your own DXing goals. I chose to utilize this weekend of RF hysteria to challenge myself and my station, and to assess where improvements could be made with the following eight goals as a guide.

1) To work as many zones as possible out of the 40 up for grabs, propagation pending;

2) To work only one or possibly two stations from each zone if they became available;

3) To work as many exotic DX stations as possible within a zone, even if it overrules Goal No. 2;

4) To increase my overall country count worldwide for DX awards across the 40 zones (see *Photo A*).

5) To QSL those exotic DX stations that would do so, after a confirming email reply.

6) To plot and understand how well or poorly my antennas worked to certain areas.

7) To learn to LISTEN more and talk less, thus waiting for the right moment to strike.

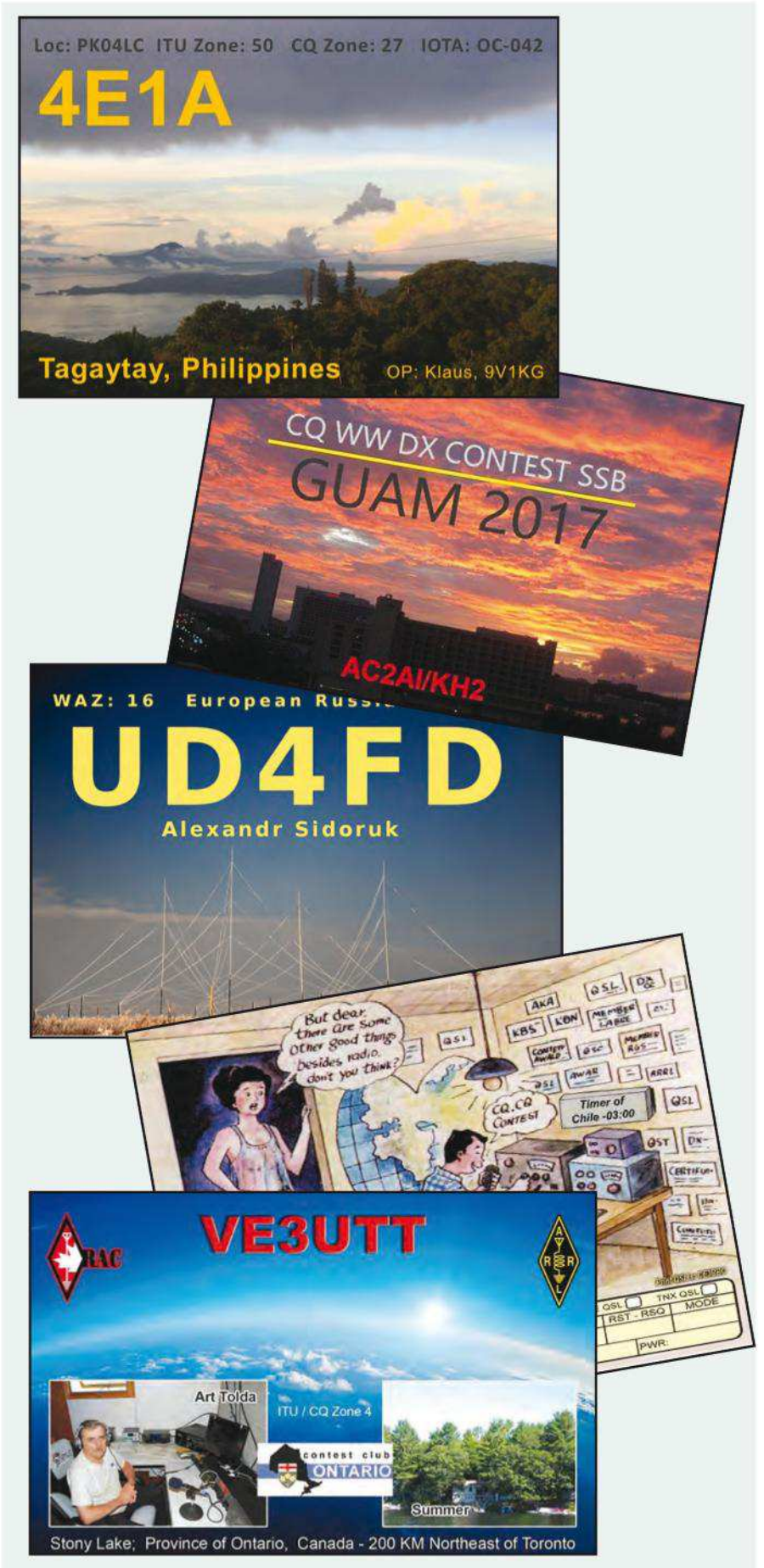
8) To try new antennas and assess their DX qualities compared to my current ones.

Chasing My Own Goals

I use a transceiver with a power output of 200 watts into my homemade 5/8th-wave vertical for 20 meters, plus an antenna tuner. At 12.5 meters (41 feet) long with a coil at the base and radials, plus three 10-meter top hat wires, this particular antenna offers a good many gifts for those willing to build one as an all-band DX vertical. What do you get for your money?

Well for one, it has not cost you an arm and a leg in the form of a tower, rotator, and a Yagi. True, you do not have all the benefits of such a wonderful beam setup, but there are always at least two ways to skin a cat (with apologies to cat lovers). Upon building a 5/8th-wave vertical, you will have invariably applied both physics and earth science to achieve a take-off angle in the order of 16°, some 3 dB of gain and reduced reception of high angle radiation. Now that 3 dB equates to a two times multiplication of the power, which sees my 200 watts input effectively become 400 watts.

By comparison, a quarter-wave vertical for 20 meters at five meters (16-1/2 feet) in length will have a main radiation lobe in the order of 60° and an effective mean takeoff angle of 30° to the horizon. Now compare this to our 5/8th vertical which, in comparison, will have a main radiation lobe of just 30° and a mean takeoff angle of approximately 15° and you can see everything has been halved. The gain factor and the lower angle of radiation of the signal to the horizon now work to your advantage for DX by a power factor of two. Another way of looking at it is to imagine it as a beam of light whereby the quarter-wave is fairly broad at 60°, but it is then sharply



refocussed to be just 15° by way of the 5/8th wavelength vertical. You can now see how the intensity of the radiated light increases dramatically in the dark. This same antenna with a 40-turn base coil and three 10-meter-long top hat radials will work very well across 160 through 10 meters, with an antenna tuner, of course. So invariably you have managed to kill a few birds with one stone, and you have also put all your eggs in one basket, for better or for worse.

We all know, of course, that there are many factors over which we have no control, regardless of our towers and linear amps or basic verticals, dipoles, loops and a few hundred watts, if not just QRP watts. If the Weather Gods chuck a tantrum and the next minute, the Sun vomits a CME (coronal mass ejection), it's curtains for us all. Plus, as the sunspot cycle declines ever-more rapidly, we must endure fewer occasions of 59-plus signals from DX stations across the globe. Conversely, what you will find during such contests is that radio amateurs are indeed prepared to listen more intently and to dig your signal out of the noise to work you for your zone and the mutual points. Whereas normally you might scream till you are blue in the face, now it seems that even at signal strength one and readability 3 to 5, that there is a contact made after a few attempts and everyone is happy.

Many will also tell you of times past and perhaps more recently, when with just a few watts they worked across the planet for a 59 report that amazed everyone. This, of course, is one of the great joys of unpredictable propagation that is visited upon our stations from time to time. And then when it seems that across the world that the bands are dead, they magically come to life when a contest takes over the airwaves and electrifies the ionosphere.

So, do not underestimate the capabilities of your station when it comes to the power of propagation. For even the megastations suffer the fate of the many if the Gods dictate. And small so-called QRP stations can often roar like lions when conditions are favorable for everyone.

Strategy

I can tell you that I am not one for calling "CQ Contest" ad nauseam for two

Photo A. Operating a contest like the CQWW gives you the opportunity to add new countries and uncommon prefixes to your DX award totals on a variety of bands.

C4FM/FM 144/430 MHz Dual Band 5W
Digital Transceiver

New

FT-70DR

《 700 mW Loud and Clear audio,
Commercial Grade Specifications 》

C4FM/FM 144/430 MHz Dual Band 5 W
Digital Transceiver

FT2DR

《 Improved 66 ch GPS receiver included 》

System Fusion II

C4FM Digital
Pursuing Advanced Communications

C4FM/FM 144/430 MHz Dual Band 50 W
Digital Transceiver

FTM-100DR

《 Improved 66 ch GPS receiver included 》

C4FM/FM 144/430 MHz
Dual Band Dual Receive Digital Repeater

New

DR-2X

C4FM/FM 144/430 MHz Dual Band 50 W
Digital Transceiver

FTM-400XDR

《 Improved 66 ch GPS receiver included 》

C4FM/FM 144 MHz 65 W
Digital Transceiver

FTM-3200DR

《 Genuine 65 Watts High Power 》

CW/SSB/AM/FM/C4FM
HF/50/144/430 MHz Wide-Coverage
100 W All Mode Transceiver (144/430 MHz: 50 W)

FT-991A

《 Real-Time Spectrum Scope included 》

C4FM/FM 430 MHz 55 W
Digital Transceiver

New

FTM-3207DR

《 Heavy Duty 55 Watts High Power 》

System Fusion II Supports All C4FM Portables and Mobiles

- Firmware updates will enable System Fusion II compatibility with all existing C4FM products.

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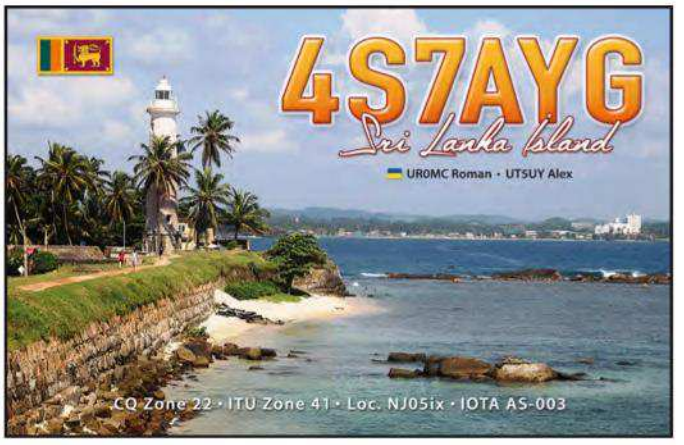

Photo B. A group of Ukrainian contesters invested a lot of time and money to travel to Sri Lanka for the contest, not only for their benefit but for that of others — including non-contesters like me — who'd like to put a rare DX entity in their logbooks.

whole days. But rather, I like to work up and down the bands for the best contacts at the time as propagation presents them. Then, by the time I get to the band's end, the conditions have changed just slightly and a few more new stations have emerged from the ether.

My operating is, of course, based on the spare time I have available in between everything else going on over the course of the weekend. Thus, I am not a slave to the contest itself, but rather enjoy it at my own pace as time permits each day. The other side of the coin, of course, is the critical balance between our families and the event. Our radio time shouldn't cause a rift between the hobby and our loved ones.

My 2017 Experience

I started chasing stations in the 2017 CQWW DX SSB Contest on Saturday afternoon on the normally quiet 15-meter band, then in full swing. The countries and zones I initially worked by way of my eight golden rules were as follow: Japan, zone 25; Hawaii, zone 31; New Zealand, zone 32; Indonesia zone 28; Papua New Guinea zone 28; China, zone 24; Thailand, zone 26, and Guam, zone 27. Now the signals into my QTH were not all 5x9 needle-busters by any stretch, with many in the order of just S3 to 5 at R3 to 5. Some rolled in here quite strong indeed, but despite being 5x9, they could for some unapparent reason not hear me at all.

Some of the real highlights for me were as follows: A contact with D4Z way out on Cape Verde in zone 35, a distance of 18,911 kilometers (11,751 miles), which I have proudly achieved for the past three years. I also enjoyed working ZF9CW in the Cayman Islands being zone 8 at 14,454 kilometers (8,981 miles) as a first. Two definite standouts were my contacts with KL7RA, the North Pole Contest Group in zone 1, at a distance of 10,919 kilometers (6,785 miles), and VE3EJ in Ontario in zone 4 at 14,913 kilometers (9,266 miles). Then, by contrast, I was fortunate enough to work XQ6OA from Osorno, Chile, at 11,265 kilometers (7,000 miles) in zone 12, a great contact with JT5DX from Mongolia at 9,351 kilometers (5,810 miles) in zone 23, and finally RWØA from the Central Siberia DX Club at 10,664 kilometers (6,626 miles) in zone 18. Another highlight was AHØK, the Mariana Intrepid Contest Club. They are located on Tinian Island, 4,570 kilometers (2,951 miles) away as a drop in the ocean out in zone 27, and it was another first for me.

Factors such as the state of the ionosphere, space weather, and a myriad of factors in nature all play a role in the quality of our contacts with each other.

And just to emphasize one of my opening points about contesters saving up to visit exotic locations, there was 4S7AYG in Sri Lanka, zone 22 (*Photo B*), which I happily worked. This was actually run by a group of Ukrainian DXpeditioners. No doubt they would have saved up for many months to come all the way out to nice hot Sri Lanka to provide us all with the opportunity to add this DX entity to our logbooks. In total, for the time spent across the weekend, I managed to work 50 DX stations for a total of 26 zones out of the 40, even though Africa was not heard at this QTH. Then despite signals from Oman, the UAE, and Aruba booming into my QTH at 5x9, they could not hear me.

Just for the sake of curiosity, once you have made your contacts for the weekend, go to Google (or another search engine of your choice), and type in: "How far is it from (your QTH) to (the location of the DX station as listed on QRZ.com)?" It also makes for interesting analysis to combine an amateur radio 40-zone map of the world, as well as plotting your frequency, times, and antenna used for each contact.

Science Experiments

We often seem to forget that every time we key the microphone or send Morse code, we are undertaking an experiment with Mother Nature herself. Factors such as the state of the ionosphere, space weather, and a myriad of factors in nature all play a role in the quality of our contacts with each other.

Somehow for me, even after being licensed for 33 years the magic of amateur radio still permeates my soul. The sense of accomplishment in rolling your own antennas and participating firsthand in the achievement of a contact across the globe still gives me a buzz. Far more indeed than email, Facebook, and other forms of socially transmitted 1s & 0s that have sought to render our hobby as old hat and Neanderthal. It's now up to you to decide if you feel like tackling the CQWW DX Contest head on. Or perhaps just utilize the opportunity to achieve some DX goals of your own.

Whatever you decide to do, please consider sending in a log, even if it's just 50 stations or less, as it all really helps with the "cross-checking." My best effort to date has been to work 30 of the 40 zones in one weekend, and that's with just a 5/8th vertical for 20 meters and 200 watts.

Australia Calling…

It often seems to me and a few other VKs that a lot of the efforts in the CQ World Wide DX Contests and other similar events are directed between the U.S., Canada, Europe, and a splash of Africa. Here's a clue for anyone chasing great contacts and good multipliers. Consider pointing your "RF" down to the bottom of the world where potentially *hundreds* of VKs are listening for and calling *you*, especially so the average non-Big Gun stations like me.

I look forward to working you on air one day in the future all the way from "Down-Under."

A version of this article was published previously in the Wirelesss Institute of Australia's Amateur Radio magazine and is republished here by permission.

Professor Emil Heisseluft reveals a plan by a national amateur radio organization to introduce the "Mother of all Awards" … Worked All Rivers and Tributaries (WART)

A CQ Exclusive:

Worked All Rivers and Tributaries

New Award to Kick Off with Challenge to Work all Tributaries of the Missouri River

BY PROFESSOR EMIL HEISSELUFT*
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There is no end to the number of awards available to the amateur radio community. At CQ, for example, we take great pride in our Worked All Zones (WAZ) DX award, not to mention our Worked All Prefixes (WPX), CQ DX/DX Field, and United States of America Counties (USA-CA) awards as well as the great trophies and certificates we present to those who excel in our many contests throughout the year. The same can be said of the American Radio Relay League (ARRL), which is well-known for such awards as those associated with the organization's DX Century Club (DXCC). In the last few years, however, a new ARRL award program has caught the attention of many amateurs; it is the League's National Parks On the Air (NPOTA) event, spurring participants to both activate and work stations in all of the nation's national parks. This year, the League has upped the ante with its International Grid Chase competition.

Now, in a move to provide the ultimate challenge, a national amateur radio organization is about to kick off the "Mother of all Awards": Worked All Rivers and Tributaries (WART). The first phase of this award, which eventually will be expanded internationally, will require participants to confirm contacts with marine mobile stations on all 81 tributaries of the Missouri River plus the river itself, from St. Louis to the headwaters in Montana. Our intrepid Professor Heisseluft has caught up with the sponsors for this exclusive report. –W2VU

Photo A: Professor Heisseluft shown in a moment of contemplation as he awaits other members of the Missouri River Expedition to begin planning for their 2018 effort. (Photo: Igor Stepovik, Big Stock Photo)

Oh, dear readers, what an interesting hobby you have! I learned long ago from my mentor, Dr. Jerzy Ostermond-Tor, ex YM4XR[1], that radio amateurs will participate in virtually any on-air competition at the drop of a hat! This addiction, if it can be called that — and I've written many times about the psychoses[2,3] attendant to those who are particularly involved with DX — is not easily sated. (By the way, in response to an overwhelming demand by our readers for a photograph of Professor Heisseluft, we provide one in Photo A. –*ed.*) It's bad enough that people are chasing U.S. states and counties, countries of the world, worldwide prefixes, and even U.S. national parks, but throw in a good dose of competition such as that found in the CQ and ARRL DX contests, and you'd think the entire world has gone crazy!

The above notwithstanding, there are those who have worked just about every state, county, country, prefix, and national park. Alas, what are they going to do now? Sit on 20 meters and work the same DXpedition over and over again, depriving the poor QRPer the one, last contact he needs to complete WAZ? (Gott im Himmel, are there really people like that?)

Get Ready for WART

It is with these poor, competition-starved operators in mind that a major national amateur radio organization has con-

** Professor Heisseluft currently is in St. Louis, Missouri, planning for the launch of a marine mobile station that will sail up the Missouri River from St. Louis for this summer's WART effort. Mail may be conveniently sent to the professor c/o CQ Magazine, 17 West John Street, Hicksville, NY 11801.*

River and Tributary (RAT) Major Achievement Levels

Number of Waterways	Designation
50	Novice
1,000	Good Start
10,000	Spongeworthy
50,000	Get a Life
100,000	Meshuga

Figure 1. The major River and Tributary (RAT) Achievement Levels for WART competition are above and beyond anything known today in amateur radio.

ceived of a new award program: *Worked All Rivers and Tributaries* (WART). The competition involves working marine-mobile stations on all tens of thousands of rivers and their tributaries worldwide[4], with the various major award levels shown in *Figure 1*. Now you see why some are calling this the Mother of All Awards!

To get things kicked off this year, the first challenge will be to work marine-mobile stations traversing the 81 tributaries of the Missouri River from St. Louis to its headwaters in Montana (see *Figure 2*).

Trial Run of the Aprilscherz

Immediately upon the announcement of the WART award, the Lauton Institute was in receipt of an urgent message from the Missouri Valley DX Association (MVDXA), asking for assistance in mounting the first Missouri River WART Expedition. The boat they offered for this effort, which was to be renamed the Aprilscherz in honor of the Institute, had just been raised from the bottom of the harbor in Kansas City. Still, it was deemed "seaworthy" enough for this expedition. A photo of the Aprilscherz, taken last year at sunset just before it sank for the fourth time, is shown in *Photo B*.

Two full weeks of on-river trials under all weather conditions will be conducted this May by Institute graduate students so as not to endanger either members of the MVDXA or the professional staff of the Lauton Institute. Then, we will set out on the river and its tributaries to work amateurs around the world. As seen in *Photo B*, the antenna we will use is a single multi-band vertical. Two multiband transceivers (one operational, one on standby) will provide coverage of the bands from 40-10 meters. Power will be provided by a sin-

Photo B: The Aprilscherz, just before it sank in Kansas City in 2016. The boat now has been raised for the first WART expedition, and trials will soon be under way. (Photo: michelealfieri, Big Stock Photo)

gle gasoline generator (though a spare will be carried). The callsign has yet to be assigned, but we have applied for KMØWART ... /mm, of course.

Summary

The Lauton Institute, working with MVDXA, will mount a WART expedition this summer, providing amateur radio operators worldwide with the opportunity to work a marine-mobile station on all of the 81 tributaries of the Missouri River and the river itself from St. Louis to its headwaters in Montana. Don't miss this opportunity not only to kick off this effort, but to put a WART certificate on your wall by the end of the year!

Notes:

1. J. Ostermond-Tor, Ex-YM4XR, Special Subscriber Service: The Telephone Company's Answer to Amateur Radio, *CQ*, April, 1967
2. Heisseluft, E., *Psychological Testing of Amateur Radio Applicants …The Cure for Spectrum Rage, CQ,* April 2005
3. Heisseluft, E., "Lauton Institute's Center for Research of Abnormal Personalities Offers Explanations for On-Air Misbehavior by Radio Amateurs," *CQ*, April 2014
4. http://bit.ly/2nL1oIP

Tributaries of the Missouri River

A	Arrow Creek (Fergus County, Montana)	
B	Bad River (South Dakota)	Belle Fourche River
	Belt Creek (Montana)	Big Muddy Creek (Missouri River)
	Big Piney River	Big Sioux River
	Blackwater River (Missouri)	Blue River (Missouri River)
	Boyer River	Brush Creek (Blue River)
C	Cannonball River	Chariton River
	Cheyenne River	Cow Creek (Montana)
	Cracon du Nez (Montana)	Crooked River (Missouri)
D	Dearborn River	
F	Firehole River	Fishing River
	Floyd River	
G	Gallatin River	Gasconade River
	Gibbon River	Grand River (Missouri)
	Grand River (South Dakota)	Grandglaize Creek
H	Heart River (North Dakota)	
J	James River (Dakotas)	Jefferson River
	Judith River	
K	Kansas River	Knife River
L	Lamine River	Little Blue River (Missouri)
	Little Missouri River (North Dakota)	Little Muddy Creek (North Dakota)
	Little Niangua River	Little Osage River
	Little Sioux River	Loutre River
M	Madison River	Marais des Cygnes River
	Marias River	Marmaton River Milk River (Alberta–Montana)
	Moreau River (South Dakota)	Mosquito Creek (Iowa)
	Musselshell River	
N	Niangua River	Niobrara River
	Nishnabotna River	Nodaway River
O	One Hundred and Two River	Osage River
P	Papillion Creek	Perry Creek (Missouri River)
	Platte River	Platte River (Iowa and Missouri)
	Pomme de Terre River (Missouri)	Ponca Creek (Missouri River)
	Poplar River (Montana–Saskatchewan)	
R	Redwater River	Roe River
S	Sac River	Sixteen Mile Creek (Montana)
	Smith River (Montana)	Soldier River
	South Fork Grand River (South Dakota)	Sun River
T	Tarkio River	Teton River (Montana)
	Thompson River (Missouri)	Tobacco Garden Creek
	Turkey Creek (Kansas)	
V	Vermillion River (South Dakota)	
W	West Fork of the Little Sioux River	White Earth River (North Dakota)
	White River (Missouri River)	Wolf River (Kansas)
Y	Yellowstone River	

Figure 2: The 81 tributaries of the Missouri River that will count for the newly announced Worked All Rivers and Tributaries (WART) award. (Source: Wikipedia)

W9KNI says connecting Elecraft's new KPA1500 amplifier to a K3 effectively turns the K3 into a 1,500-watt, solid-state transceiver. And he thinks it may mark the beginning of the end for tube-based amplifiers. Here's his review.

CQ Reviews:

Elecraft KPA1500 Solid-State Amplifier

BY BOB LOCHER,* W9KNI

For someone who has been a ham — and a committed DXer — for over 60 years, an effective, reliable solid-state amplifier has long been a dream. For over 30 years, a solid-state legal-limit linear has been "right around the corner." Finally, in the last five years, that dream has started to become a serious reality.

The Elecraft KPA1500 amplifier is truly one fulfillment of that dream. This is an outstanding product. Simply put, it converts my transceiver, an Elecraft K3 — into a 1,500-watt output transceiver. No tune up! No three-minute wait. And a lot less noise!

I was selected to be a field tester for the amplifier, and received the last of the field test units. Although there are still a few firmware tweaks coming, I have been assured that my amplifier is in every way a full production model. Elecraft has informed me that shipment of regular orders was expected to start by the end of January 2018, so by the time you read this review, it is likely there will be quite a few production units already shipped and on the air.

Photo A. The Elecraft KPA1500 amplifier comes in two packages, the RF deck (seen here) and a separate 220-volt power supply. (Photos by the author)

Opening the Carton

My amplifier arrived beautifully and carefully packed, always a good start to receiving a new piece of gear. There are two major components — a switching power supply that weighs 17 pounds, and the amplifier itself (*Photo A*), which weighs 22 pounds. Like most other Elecraft desktop products, both the power supply and the RF unit feature carry handles (*Photo B*). Both units also include a tilt-up bail that folds underneath if not desired.

What is really a surprise when you first see it is the size of the RF deck. It is really quite small for the powerhouse that it is. I remember the olden days, when an amplifier capable of 600 watts output was built in a 6-foot panel rack. Instead, this little box can put out well in excess of 1,500 watts.

Taking a Tour

The amplifier offers a clean panel layout — and there are NO KNOBS! No tuning required or even possible in the traditional sense. There are no meters either ... A light bar (*Photo C*) shows power output, with green bars to 1,500 watts, then red bars for output over 1,500 watts. There is also another light bar showing SWR. There are pushbuttons for each band (*Photo D*), plus pushbuttons for other amplifier controls, such as accessing and entering menu items, antenna port selection, ATU control etc.

The power cable supplied with the amplifier is terminated in a NEMA 6-20P plug. The high voltage cable (50 volts at 60 amps) between power supply and RF deck is 5 feet 6 inches (1.6 meters) of VERY heavy wire, and uses heavy-

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Photo B. Both the RF deck and the power supply feature carrying handles, making the units easy to lift and transport.

duty Anderson Power Pole connectors. The connectors give a very firm "click" when seated properly, assuring good contact. Additionally, there is a control circuit cable that runs between the power supply and the RF deck, also five feet six inches long.

My unit also came with the Elecraft KPAK3AUX Optional KPA1500 to K3 AUX Cable Set, which closely integrates the K3 with the KPA1500 (more on that in a moment). The amplifier requires a service supply of 220-240 volts AC at 20 amps. The power supply for the amplifier is well enclosed and can safely be put on the floor near the amplifier or even in the next room with the cables through the wall.

Integration With the K3 and Other Transceivers

For owners of Elecraft K3 transceivers, integration between rig and amplifier is extremely tight. With the optional KPAK3AUX cable attached, when you change bands on the K3 the amplifier automatically follows. Similarly, if you change bands on the KPA-1500, the K3 automatically follows. The K3 allows the user to set precise drive levels for each band and, once set, to lock them. Truly, the KPA1500 turns the K3 into a 1,500-watt transceiver. A feature I think is really neat is that when the amplifier is switched to standby, the K3 can go automatically to a different preset power setting, typically to the 100-watt level.

The KPA1500 is almost as versatile with non-Elecraft transceivers. Virtually any of today's transceivers offers several different formats of frequency data output, all of which are readily compatible with the KPA1500. As long as the user connects an appropriate cable to the amplifier supplying that data, the KPA1500 will track the transceiver from band to band. The amp's manual includes information on making appropriate cables for non-Elecraft transceivers. Also, the amplifier includes an RF sensor, so even without data information from the transceiver, the amplifier will sense a drive signal and put itself on the correct band and antenna, albeit with a very brief startup delay.

The amplifier includes a 12-volt input RCA jack. Most modern transceivers include a switched 12-volt output. Running a cable from that point to the KPA1500 will automatically turn on the amplifier whenever you turn on the transceiver. This is a real benefit for people using remote rig locations, simplifying control. Indeed, once the home system is set up and dialed in, the amplifier can be run remotely with no additional control software required.

The amplifier offers two different antenna output connectors (*Photo E*), which can be selected by a button push on the front panel. Once an output is selected for a given band, the amplifier will go to that output whenever the selected band is in use. Other options for disabling or selecting an output connecter on a given band are available from the menu system.

The amplifier uses PIN diodes for QSK (full break-in keying). A note here — PIN diodes started being used in high-power amplifiers in the late 1980s — and quickly acquired a bad reputation for expensive failures, requiring shipping a heavy amplifier back to the manufacturer for a costly repair and an expensive two-way freight bill. But that was literally more than 30 years ago. The diodes used in this amp are a far cry from those of yesteryear; and are well known in RF engineering circles to be rugged and extremely reliable. QSK with the amp

Photo C. The KPA features LED light bars to show both power out and SWR. Note that all controls are via pushbuttons.

is blessedly free from loud clicking noises in the shack as you key.

Permit me a confession here — I have trouble walking and chewing gum at the same time, so I operated CW all my life in semi-break-in mode. When I put the KPA1500 online, I decided to give QSK a serious try. At first, I was a bit nonplussed. Sending sounded strange in my headset. The CW monitor note was there, of course, but so were lots of burbles and other odd noises. I almost gave it up. Then, a couple days later, I was testing on a dead band — and miraculously the CW sending in QSK was clean and pleasant. It did not take me long to figure it out — what I was hearing earlier was my own signal, complete with Doppler shift, coming from backscatter reflections or even around-the-world paths. I further discovered that the burbles I was hearing represented an open path, at least far enough to get to an ionoispheric F_2 region supporting backscatter, indicating that the band was at least partially open.

Simple Setup

Setting up the amplifier proved extremely simple. I set the RF deck on the amplifier table next to my operating position and placed the power supply on the floor behind it, of course making sure that there was adequate room for ventilation. I plugged in the heavy voltage cable from the power supply, hearing the satisfying "click" from the large Anderson Power Pole connectors when properly seated. The included power supply control cable was next. This is a data cable that allows communication between power supply and amplifier. I attached the drive cable from the transceiver to the amplifier input, followed by the output coax, which I connected to the #1 antenna output. Next, I connected the data cable between the transceiver and the amplifier, and I ran an RCA cable from the switched 12-volt output of the transceiver to the matching plug on the amplifier so that the amp would power up automatically whenever the transceiver was turned on. Last step was to plug in the power cord. I was good to go.

Show Time!

OhhKay. Show time, girls and boys. Queue the drum roll. I turned on the K3, and ... nothing happened with the amp (kill the drum roll). Oh yeah … I pressed the "On" button on the front of the RF deck. Still nothing. Wait. Yes. OK. I reached down to the power supply and threw its rocker switch to "ON." Still nothing happened.

I turned the K3 off, then turned it on again. Bingo! The amp now turned on. Several relays clicked. The K3 was set on 20 meters. I looked at the LCD display on the amp — yup, it was on 20 meters. I tried switching the K3 to 40 meters. Several relays in the amp clicked, and the amp was on 40 meters (see *Photo D* again). Neat! It retrospect, it is obvious that when the +12 volts DC is applied to the "remote" RCA connector, this takes over control of the off/on function. I later confirmed that by temporarily removing the 12-volt RCA cable.

I turned my K3 power output all the way down, found an empty frequency on 20 meters, then keyed the radio. I started adding power — ah — Yesss! The green bars on the amp started illuminating, marching to the right as I added power. At 32 watts drive, I had 1,500 watts output, as shown on my LP-100 wattmeter. Yeah, 1,500 watts — and no power transformer grunt, no apparent strain on anything.

My antennas are all fairly flat, with SWRs below 1.4:1 on all frequencies on which I operate. I typically operate 40-

Photo D. Pushbuttons are used to select the operating band. If used with the K3 transceiver and optional KPAK3AUX connecting cable, switching the band on either unit changes the settings on both.

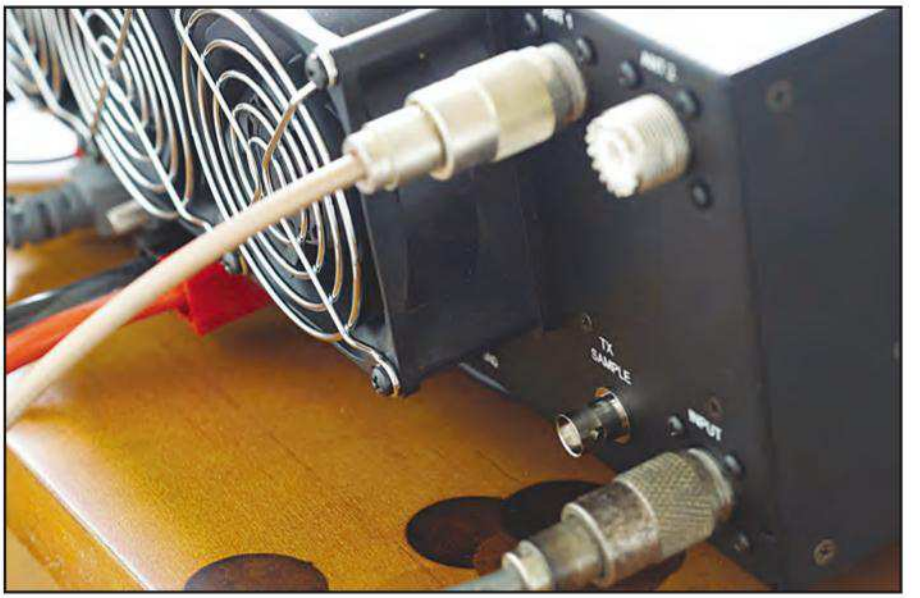


Photo E. The rear of the KPA1500 includes two antenna jacks, cooling fans, and heavy-duty power cable with Anderson Power Pole connectors.

15 meters, plus 12 and 10 meters if they ever open. I walked through the bands, setting drive power for each band, which the K-3 memorized. I was happy to see that the KPA1500 easily delivered legal power on my bands. A good friend also has a KPA1500, and he operates 80 and 160 meters, as well as 6 meters, which I don't, and don't have antennas for. He assures me the amp is equally effective on those bands.

Since my antennas are essentially flat, I can operate bypassing the amplifier's built in antenna tuner (ATU). Nonetheless, I thought I would check out the tuner. The ATU will tune antennas up to a 3:1 SWR at full power output. When the amplifier is in standby mode, the antenna tuner remains in the circuit, so that you can run barefoot though the amp into a mismatched antenna, as long as the amplifier is powered up and in standby mode.

The procedure for setting up the antenna is well described in the manual, and can be done in less than a minute for most bands. Tuner settings for each frequency segment are memorized, so when the amp returns to such a frequency, the ATU automatically is ready to transmit. In situations where the SWR will change a lot as frequency changes, typical of some low-band antennas, the antenna tuner tracks frequency and, for example, on 160 meters, can call up a different tuning solution every 10 kilohertz.

Operationally, the amplifier is a joy to use. Once set up as described above, the operator need rarely give a thought to the amp. It just sits there and pumps out power — exactly what I wanted it to do. A fair amount of customization can be done using the menu system, such as control of the cooling fans, antenna selections, etc., but most operators will never need to even try the menu system, which, however, is well documented in the manual.

When I press the turn-on button on the K3, it takes the whole station about three seconds to be fully operational and ready to transmit. In normal use, many operators will rarely hear the fans. In my case, the fans only run when I get into a long CW transmission, or when calling in a high duty cycle pile-up. The amp really looks after itself.

Elecraft will occasionally introduce new firmware for the amplifier. Updating is very easy, using PCs, Macs, or Linux computers. The user downloads an update utility from the Elecraft site, runs it, hooks the amplifier to the computer using a supplied USB cable, and in a matter of a minute or so, the amplifier is updated. The user should occasionally check the Elecraft website to see that the latest downloadable version of firmware is installed.

Beginning of the End for Tube Amps?

The operational success of this amplifier and of other solid-state amplifiers as well begs the question: Are we seeing the twilight of conventional tube amplifiers? I think there can be little question that this is so. If power at the absolute lowest cost is the criteria, there will be some tube amplifiers around for a while yet. Good amplifiers up to about the 800-watt output level using glass tubes still offer excellent value, if much reduced convenience. But past that power level, the costs are tilting towards solid-state, especially considering the added utility and convenience. Consider power dissipation. Even the least expensive imported quality power tubes cost at least 40 cents per watt of dissipation. The new family of LDMOS (laterally-diffused MOSFET) power chips cost less than $.10 per watt. Tube amplifiers can be slightly more efficient in linear service — typically around 60%. Solid-state amps are closer to 50%.

Tube amplifiers will absorb considerably more punishment before catastrophic failure than will solid-state devices, but additional circuitry and clever engineering make the solid-state amps virtually bulletproof. In a proof of that, I accidentally drove my KPA1500 into a dead short on the output. I got a rather annoyed beep from the amplifier enunciator, and the amp tripped off line. I discovered my grounding relay for lightning protection had failed to release when I turned on the equipment, leaving a short across the antenna. I corrected that problem, pushed the reset button on the amplifier, then put it back to Operate mode from Standby, and all was well. Believe me, that gave me a nice feeling of relief.

(Not) Feeling the Heat

Dealing with heat in any legal-limit amplifier is always a significant design issue. Whether tube or solid-state, an amplifier operating at 1,500 watts output must dissipate somewhere about 1,200 to 1,500 watts of heat when transmitting. Although there are other ways to carry off the heat, virtually every legal-limit amplifier in the amateur radio service uses air cooling.

Tube amps typically use tube chimneys and blowers that run continuously, and to be effective tend to be loud. Even at idle, the tube is generating somewhere between 25 and 200 watts of filament heat. Solid-state amps, on the other hand, generate no heat until they begin transmitting, so cooling is not required until then. So, the cooling fans do not start up until a heat threshold is reached. However, in the case of the KPA1500, the switching power supply has its own fan, which runs quietly whenever the amp is turned on.

The two LDMOS RF power devices in the KPA1500 each have about a square inch of contact surface to the heat sinks, so this means that somewhere around 750 watts per device has to be pulled away — FAST — from the devices when operating at full legal output. The most efficient affordable metal for this is copper — lots of copper. So the KPA1500 has a huge copper plate that is coupled to aluminum fins for fan cooling. This sheet of copper contributes a good deal of the weight in the RF deck.

The design of the KPA1500 is, in these respects, quite conservative. While it is readily possible these days to build a legal-limit amplifier using a single LDMOS device, using a pair of them offers huge design dividends in terms of reliability, cooling, and overall ruggedness, at — of course — slightly higher cost and more weight. However, running LDMOS devices at temperatures well below their maximum specification exponentially extends their lives. The aggressive cooling regime of the KPA1500 surely fulfills these terms. The payback is a rugged amplifier that runs cooler and quieter and should give years of faithful service.

Cost vs. Value

A quality legal-limit tube amplifier can be purchased today starting at about $2,800. Such an amp is not automatic, includes no antenna tuner, has constant loud cooling fans, and requires tune-up for each band. (But please! Please! NOT on the DX station's frequency!) By comparison, the introductory price for the KPA1500 is $5995, including the built in antenna tuner.

Do you get value for the added money? That is your choice. I made mine and I am delighted with it.

BY IRWIN MATH,* WA2NDM

(Very) Narrow Bandwidth Modulation

Many of you may be aware that there is, and has always been, a continuing effort to discover ways to use as little bandwidth as possible for the transmission of a signal. This month, I would like to describe a method that — for some reason — has not been explored to any great degree. As you will see, this scheme can radically reduce the space required and I would like to present a brief description of this now, especially in April, as it is not only food for thought but the perfect time of year to review what to experiment with in our spare time as the warm weather approaches. The approach presented here will hopefully spark the interest of the technically-inclined among us.

*c/o CQ magazine

Figure 1 is a block diagram of the system, which consists of a pulse-width modulator that takes a standard audio signal and varies the width of a square

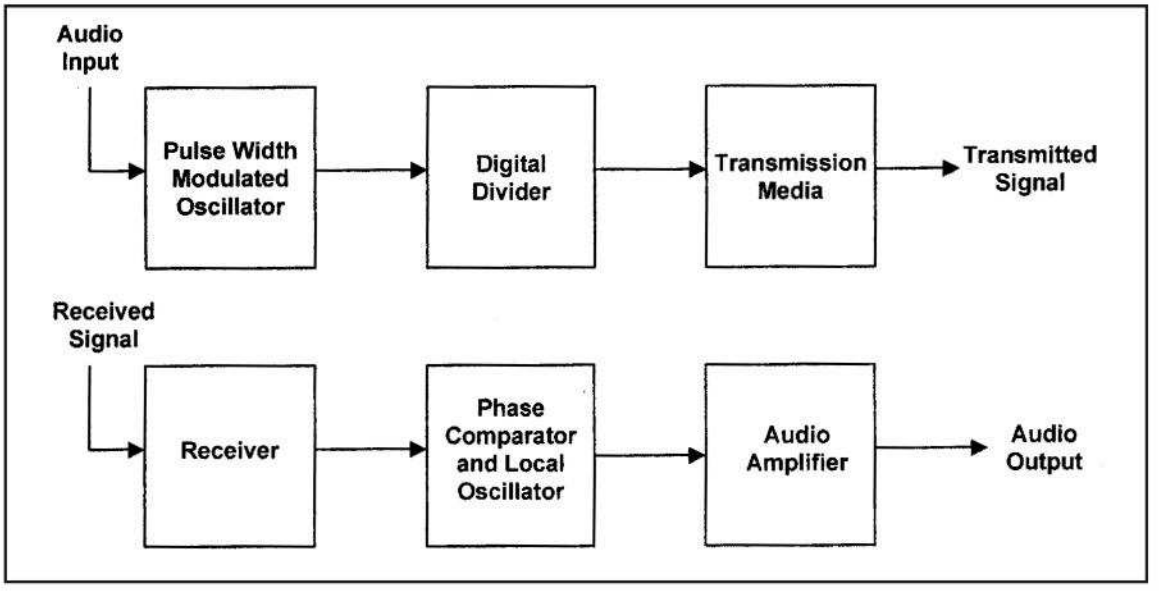


Figure 1. Block diagram of Very Low Bandwidth System

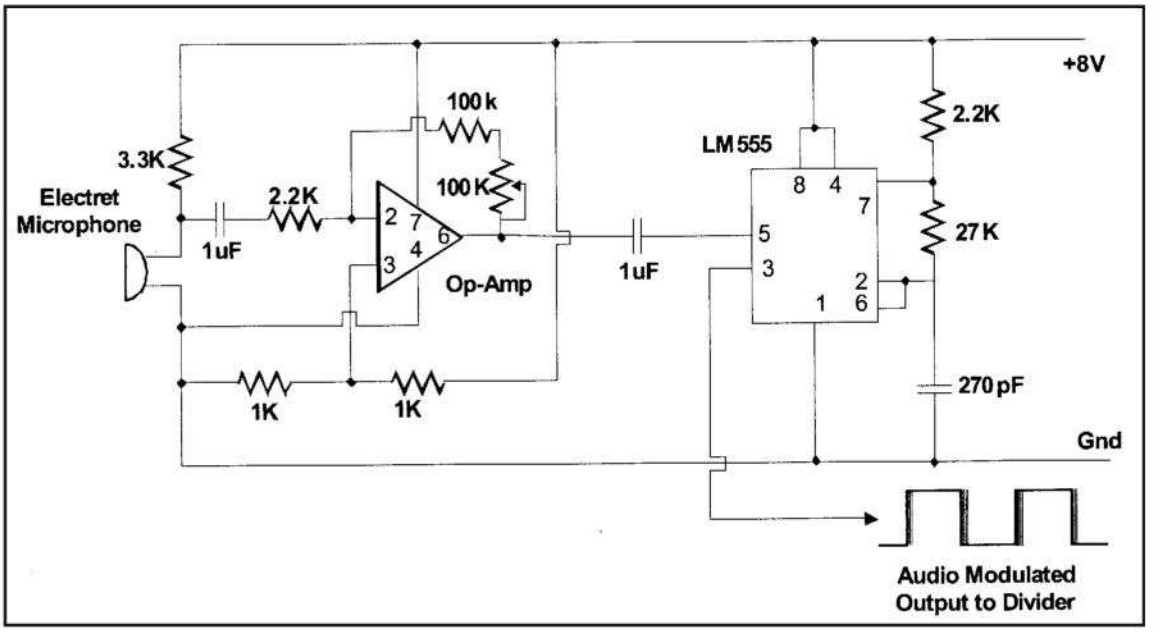


Figure 2. Basic FM Modulator

wave produced by a simple oscillator in step with the applied audio signal. This signal is then applied to a divider chain. The divided signal is then transmitted by standard means. When received (also by standard means), the signal is applied to a phase comparator, detected, and the resulting audio is fed to an amplifier that reproduces the original audio signal.

Figure 2 shows just how simple the transmitter portion can be. The pulse-width modulation is actually accomplished with a common and inexpensive LM555 IC. The LM555 is configured as a voltage-controlled oscillator (VCO) in which the control voltage is the audio signal from a microphone. The op-amp in the schematic simply allows the level of the audio to be controlled so that it does not overmodulate the oscillator. The particular frequency chosen here is around 100 kHz (although this is not critical) and *Figure 2* also shows what the modulated oscillator output looks like on a scope. So far, all is pretty much direct.

The oscillator output is now fed to a two-stage standard digital divider chain comprised of standard CD4017 TTL chips, which drops the frequency by a factor of 100 to 1 kHz. Note that, although the "carrier" frequency is much lower, the modulation is still there. The result is a 1-kHz signal with all of the audio still present and the output wave shape will still look like *Figure 2* (only the frequency will be lower). The details of the digital divider stage are not shown but can be easily found on the internet and there are many digital divider ICs, in addition to the CD4017, that can be used. This can then be transmitted by normal means.

At the receiver, the received pulse-width modulated output signal is applied to a phase detector (such as a common CD4070 exclusive OR gate TTL chip) where it is compared to a stable 1-kHz local oscillator signal as shown in *Figure 3*. The output of the CD4070 is the difference between the input-modulated 1-kHz signal and the input non-modulated 1-kHz signal which, by the way, is the original audio! This is then filtered to eliminate the basic carrier and applied to a simple audio amplifier, and you are done!

As part of the investigation it would be interesting to see just how low in frequency you could actually go. Another divide-by-10 at the transmitter and a 100-Hz reference at the receiver (for example) would reduce the carrier bandwidth to 100 Hz. This month, as in past Aprils, I leave the rest up to you!

– 73, Irwin, WA2NDM

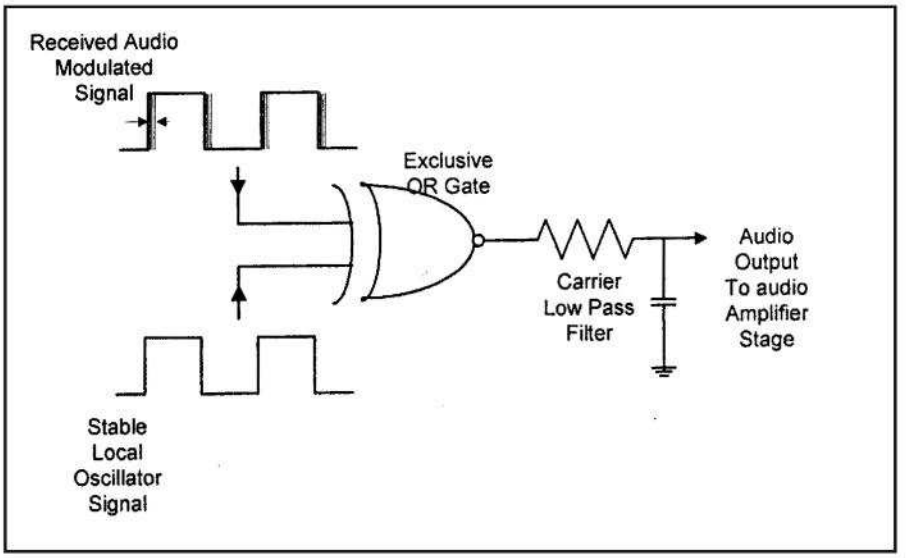


Figure 3. Details of Modulated Signal and Phase Detector

BY GERRY DEXTER*

WBCQ May Have Big Plans for the Future

Also Brother Stair is Finally Silenced

April showers bring still more shortwave wave-lets:

~ WBCQ must have BIG plans for the future. It has placed an order for a giant Ampegon rotatable antenna system, which will be the first in North America and looks as though it might be revolutionary in its design and its ability to quickly direct a 500-kilowatt signal to any target around the world. It will withstand extreme weather conditions and allow WBCQ to operate on any frequency between 6 and 26 MHz, all computer-controlled and monitored. WMLK in Pennsylvania also has a contract for a rotatable antenna from Ampegon.

~ It seems WBCQ had a transmitter fire that burned out and destroyed one of its main (50-kilowatt) transmitters. The station had no insurance and needs at least $20,000 to acquire a used unit. (The piggybank must be empty after buying that big antenna. –*ed*)

~ That strange, very annoying, Brother Stair is off shortwave due to his legal problems resulting from accusations of his sexual misconduct involving children. That means some five U.S. shortwave broadcasters have been hit in the pocketbook recently. Unfortunate for them, but likely beneficial for our aural sensibilities!

~ A new opposition broadcaster has opened — The Indigenous People of Biafra (IPOB) began broadcasts in early January using 15110 kHz from 1800-1900 UTC.

~ It seems the Caribbean Beacon has returned to the air from Anguilla on 11775 kHz, in addition to 6090 kHz, which came back a couple of months ago.

~ Once again, it's noted that the elusive Radio Bahrain operates 24 hours on 9745 kHz, all in Arabic. With 60 kilowatts, it's odd that Bahrain isn't more frequently heard.

~ China Radio International's English broadcasts may be operating under a new name: "China Plus" or "News Plus," although the CRI tag is also still used sometimes.

~ Radio Alvorada, Parintins, Brazil, (4965 kHz) has apparently been reactivated.

~ Opposition broadcaster Denge Kurdistane, which airs in favor of Kurdish independence and largely against Turkey, has also begun using 4810 kHz.

~ Cuba's Arnie Coro says he plans to put at least one Cuban station on 90 meters sometime yet this year. Oh, goodie!

~ All India Radio's outlet at Gangtok (Sikkim) is noted on new 4836 kHz, which is slightly off their usual 4835 kHz.

~ Saudi Arabia's new broadcaster Al Azm Radio is seemingly running 24 hours on 11745 kHz from

*c/o CQ magazine

Radio Nacional Angola uses all Portuguese on 4950 kHz. (Courtesy of Rich D'Angelo)

either the Jeddah or Riyadh site. I hope you speak Arabic because that is the only language it broadcasts.

~ Lastly, I'm sorry to report the passing earlier this year of Tom Taylor, founder of pirate European Music Radio. RIP.

Leading Logs

Remember, your shortwave broadcast station logs are always welcome. But please ensure to double or triple space between the items, list each logging according to the station's home country and include your last name and state abbreviation after each. Also needed are spare QSLs, station schedules, brochures, pennants, station photos, and anything else you think would be of interest. The same holds for you amateur radio operators who also listen to or chase shortwave broadcasters. You, too, are most welcome to contribute!

Here are this month's leading logs. All times are in UTC. If no language is mentioned English is assumed. After you've read the printed logs, you'll find more online at <http://cqplus-listeningpost.blogspot.com>.

Radio Taiwan International celebrated 88 years with this commemorative QSL sent to Rich D'Angelo

ANGOLA—Radio Nacional, 4949, Mulvenos at 0003 with male announcer in Portuguese and Afropops. (Taylor, WI)

AUSTRALIA—4KZ, Innisfail, 5055, just getting bits of men talking and music at 1259-1310, (Valko, PA)

OZY Radio, Glenmore Park, 5045 at 1424 poor with pop songs and male announcer. (Sellers, BC)

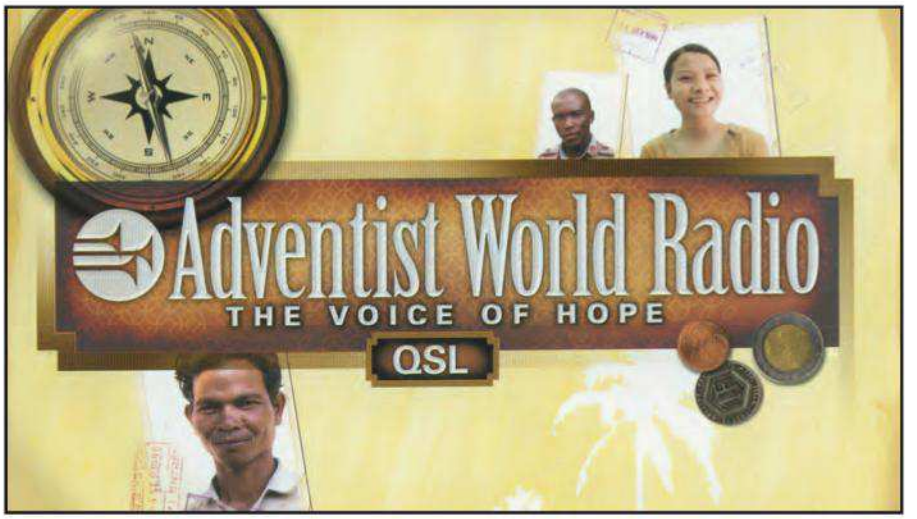
BHUTAN—Bhutan Broadcasting Service, 6035 mixing with Yunnan at 1200 until the latter went off at 1201, then man apparently reading the news. (Valko, PA)

ERITREA—Voice of the Broad Masses, Asmara, 7181 (INTRUDER) with tone at 0258, into HOA music at 0301 and male announcer. (Valko, PA)

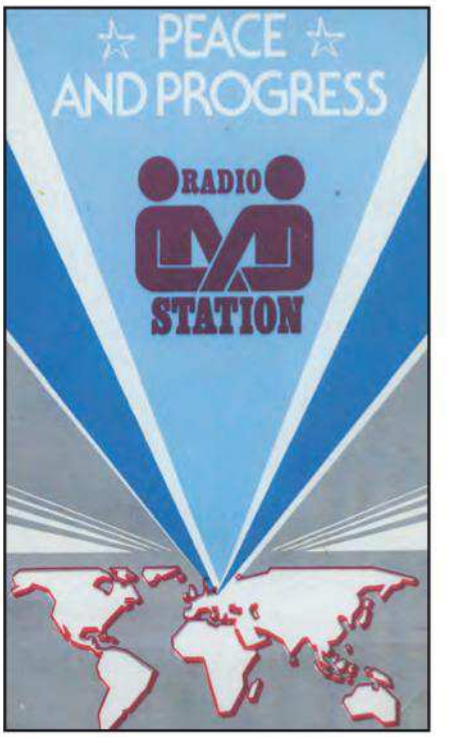
LIBERIA—ELWA, Monrovia, 6050 at 2150 with religious phone-in program, short ID at 2200, then into next religious program but blasted by WHRI slop. Another ID at 2230. Also had QRM from HCJB. (Valko, PA)

MYANMAR—Myanmar Radio, 5985 with woman talking in Burmese at 1401 with slop from WEWN. 7200 at 1140 with Asian pops and male announcer, later man reading possible news. (Valko, PA)

RTI's QSL also shows this woodlands view



Adventist World Radio is always leading the way in a race to produce the most QSL designs

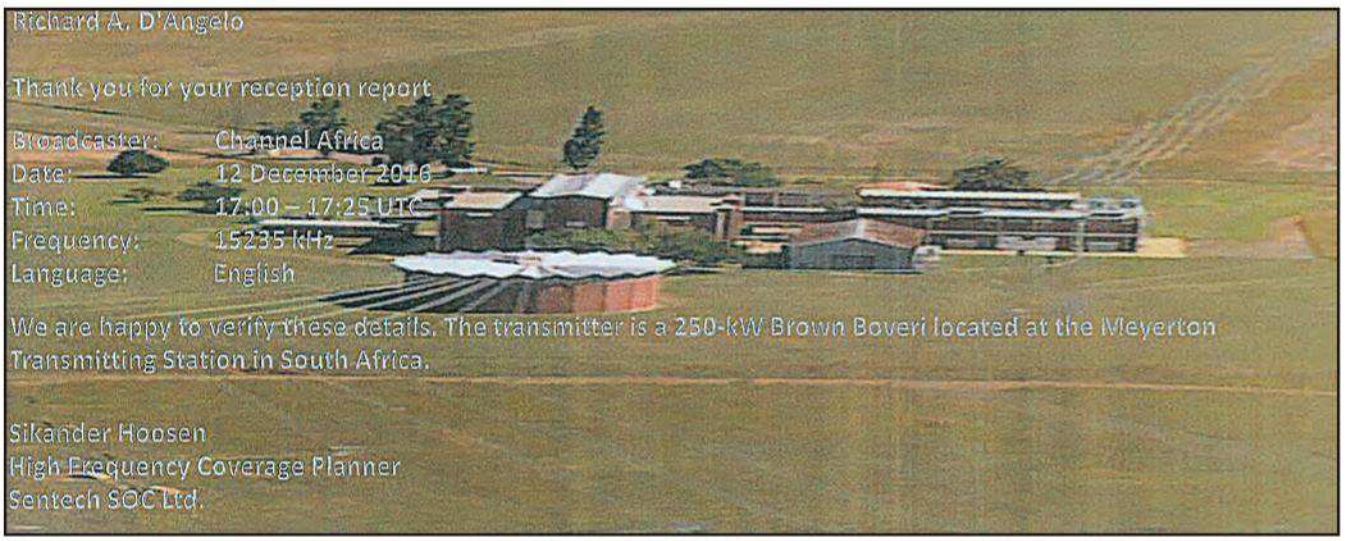


The Soviet Union's Radio Peace and Progress QSL from about 1990

RUSSIA—Kamchatskoye Radio/RadioRussii, 5940 at 2151 barely heard under Algeria via France, also slop from Voz Missionaria. (Valko, PA)

SURINAME—Radio Apinte, 4990, Paramaibo at 0949 in Sranan Tongo, into canned announcements and ads at 0952, man shouting, ID, singing and shouting "Radio Apinte – the happy station" ID by woman at 0955. (Valko, PA)

TAJIKISTAN—Radio Tajikistan, 4765 at 1256 with woman speaking in apparent Tajik. (Valko, PA)



Channel Africa sent Rich D'Angelo this view of the Sentech transmitter site at Meyerton

ZAMBIA—Zambia National Broadcasting, 5915 at 0238 with fish eagle IS. Needed LSB to avoid WHRI slop. (Valko, PA) Really thumping in at 0512. (Perry, IL)

The rest of this month's logs are at: <http://cqpluslisteningpost.blogspot.com>.

QSL Quests

~ Radio Free Asia has announced the release of the 60th version in its QSL series. This one commemorates the Olympic Games in Seoul and will be issued for all reports through April.

~ Ralph Perry (IL) reports a long-awaited QSL from Thazin Radio in Myanmar (7345) which he's been "hammering" with reports since 2014. That reinforces what I always say: "Never, never give up!"

~ Ralph also reports a couple of unusual ones: SuperClan Radio, which began in the 1980s as a Dutch pirate, now uses this new name and is temporarily relayed by WINB. Its website is <www.surfradio.nl>. The next in this offbeat duo is RCW-Radio Compania Worldwide, based in Chile using 6925 kHz irregularly from 2200-0000 UTC.

~ Rich D'Angelo steps in to report answers from Radio Nacional, Angola on 4949 kHz from Joseph Kanzuela <josela.mami@hotmail.com>. Rich also had answers from Radio Taiwan International via France on 11955 kHz and Channel Africa on 15325 kHz.

Who Goes There?

Steven C. Wood (MA) found a puzzle on 6041.68 kHz at 0136 UTC with western-style music. Unfortunately, the QRN level was so high it was impossible to get a fix on the language.

Back in the Day

La Voz del Napo, Tena, Ecuador, with its domestic service in Spanish on 3280 at 0258 with 2.5 kilowatts on October 2, 1996.

Just Sayin'

I really am not fond of doing this; but again, I feel I must, to wit: I do not print pirate logs labeled "unidentified." Pirates, by their very nature, play mostly rock or "prock" (pop-rock). So there is little programming there to isolate it from the rest. In short, it's a case of "what's the point?" The poor pirates who don't fit that format have to have their better intentions thrown out with the bath water.

Thanks For Your Logs

High fives, end zone dances, back slaps, etc. go to the following good guys who came through this time: Harold Sellers, Vernon, BC; Ralph Perry, Wheaton, IL; Rich D'Angelo, Wyomissing, PA; Dave Valko, Dunlo, PA; Mark Taylor, Madison, WI; William Hassig, Mt. Pleasant, IL; Richard Parker, Pennsburg, PA; Bob Brossell, Pewaukee, WI; and Steven C. Wood, Harwich, MA. Thanks to each of you!

Until next month … Keep on keepin' on! … and Celebrate Shortwave!

BY WALT PALMER,* W4ALT

Homeland Security begins with Hometown Security

"It's a simple idea, but a powerful one: Homeland security begins with hometown security. And when we equip local law enforcement, citizens, and communities to understand and combat violent extremism, we make our home towns — and our nation — safer." –Homeland Security Secretary Janet Napolitano, August 2010.

It makes sense … the federal government is responsible for high-profile areas, such as borders, transportation, infrastructure, large gatherings, high-profile public places, and high security areas. State governments identity threats and protect people and places within their borders, and local governments look after threats to the populations of cities and towns. But let's drill down one more level to neighbors, blocks, and street-level hometown security.

As amateur radio operators, we are the "eyes on the street" when deployed to the various events we generally work, such as picnics, parades, marathons, large attendance events and gatherings. But unfortunately, while on station, our observations are often too late to stop a terroristic event that has been planned. Weeks of thought and planning have taken place prior to an individual or group executing their attack. A part of our jobs — every day — is to keep a keen and vigilant eye for clues that are out of the norm for our hometowns. And as the saying goes, "If you see something, say something."

The U.S. Department of Homeland Security (DHS) provides a wealth of information on its website about threats to our security and recommended ways to respond to them. We have collected and combined some of the highlights here, with a focus on situations that may be faced by hams. According to DHS, the most common threats Americans face today are:

Active Shooter

An active shooter is an individual or group actively engaged in killing or attempting to kill people in a confined and populated area; in most cases, active shooters use firearms(s) and there is no pattern or method to their selection of victims. Active shooter situations are unpredictable and evolve quickly. Typically, the immediate deployment of law enforcement is required to stop the shooting and mitigate harm to victims. Because active shooter situations are often over within 10 to 15 minutes, before law enforcement arrives on the scene, individuals must be prepared both mentally and physically to deal with an active shooter situation.

* email: <w4alt@cq-amateur-radio.com>

Good practices for coping with an active shooter situation – flee, hide, or fight

- Be aware of your environment and any possible dangers
- Take note of the two nearest exits in any facility you visit
- If you are in an office, stay there and secure the door
- If you are in a hallway, get into a room and secure the door
- As a last resort, attempt to take down the active shooter. When the shooter is at close range and you cannot flee, your chance of survival is much greater if you try to incapacitate him/her.

How to respond when law enforcement arrives:

Law enforcement's primary purpose in this type of situation is to stop the active shooter as soon as possible. Officers will proceed directly to the area in which the last shots were heard.

- Officers usually arrive in teams of four (4)
- Officers may wear regular patrol uniforms or external bulletproof vests, Kevlar helmets, and other tactical equipment
- Officers may be armed with rifles, shotguns, handguns or a combination
- Officers may use pepper spray or tear gas to control the situation
- Officers may shout commands, and may push individuals to the ground for their safety

How to react when law enforcement arrives:

- Remain calm, and follow officers' instructions
- Put down any items in your hands (i.e., bags, jackets, portable radios, cellular telephones, etc.)
- Immediately raise your hands and spread your fingers
- Keep your hands visible at all times
- Avoid making quick movements toward officers such as holding on to them for safety
- Avoid pointing, screaming and/or yelling
- Do not stop to ask officers for help or directions when evacuating, just proceed in the direction from which officers are entering the premises or in which you are directed

Information to provide to law enforcement or 911 operator:

- Location of the active shooter
- Number of shooters, if more than one
- Physical description of shooter(s)
- Number and type of weapons held by the shooter(s)
- Number of potential victims at the location

The first officers to arrive to the scene will not stop to help injured persons. Expect rescue teams com-

"The price of freedom is eternal vigilance."
As quoted in *The Life Of Lord Courtney* (1920) by G. P. Gooch.

prised of additional officers and emergency medical personnel to follow the initial officers. These rescue teams will treat and remove any injured persons. They may also call upon able-bodied individuals to assist in removing the wounded from the premises. Once you have reached a safe location or an assembly point, you will likely be held in that area by law enforcement until the situation is under control, and all witnesses have been identified and questioned. Do not leave until law enforcement authorities have instructed you to do so.

Improvised Explosive Device (IED)

An improvised explosive device (IED) attack is the use of a "homemade" bomb and/or destructive device to destroy, incapacitate, harass, or distract. IEDs are used by criminals, vandals, terrorists, suicide bombers, and insurgents. Because they are improvised, IEDs can come in many forms, ranging from a small pipe bomb to a sophisticated device capable of causing massive damage and significant loss of life. IEDs can be carried or delivered in a vehicle; carried, placed, or thrown by a person; delivered in a package; or concealed on the roadside. The term IED came into common usage during the Iraq War that began in 2003.

Elements of an IED

IEDs consist of a variety of components that include an initiator, switch, main charge, power source, and a container. IEDs may be surrounded by or packed with additional materials or "enhancements" such as nails, glass, or metal fragments designed to increase the amount of shrapnel propelled by the explosion. Enhancements may also include other elements such as hazardous materials. An IED can be initiated by a variety of methods, depending on the intended target.

Materials Used as Explosives

Explosives in IEDs may be made from many commonly available materials, such as fertilizer, gunpowder, and hydrogen peroxide. Explosives must contain a fuel and an oxidizer, which provides the oxygen needed to sustain the reaction. A common example is ANFo, a mixture of ammonium nitrate, which acts as the oxidizer, and fuel oil (the fuel source). Concern about the use of explosives created from liquid components that can be transported in a stable form and mixed at the site of attack is the reason that in 2006 the U.S. Department of Homeland Security restricted the amount of liquids that passengers may carry on commercial aircraft.

Mowing Machine Attacks

This is the terrorist attack pattern that has left more than 100 people dead and hundreds more wounded in Nice, Berlin, London, Stockholm, Miami, New York City, and Ohio State University — a terrorist takes a van or truck and plows through innocent pedestrians on a crowded thoroughfare, turning the vehicle into "a mowing machine, not to mow grass but mow down the enemies of Allah."

Those words come from an article called "The Ultimate Mowing Machine" in the 2010 edition of the glossy online al-Qaeda magazine *Inspire*, which provided detailed instruc-

tions on how to carry out vehicular attacks, urging would-be terrorists to "pick up as much speed as you can while still retaining good control ... to strike as many people as possible in your first run."

Edged Weapons

A common practice following a mowing machine attack is use of edged weapons. Attackers will exit their vehicles brandishing knives, machetes or other edged weapons to further inflict injury and death.

Bomb Threats

Bomb threats or suspicious items should always be taken seriously. How quickly and safely you react to a bomb threat could save lives, including your own. What should you do? If you see something that is suspicious, out of place, or doesn't look right, *say something*. A **suspicious item** is any item (e.g., bag, package, vehicle, etc.) that is reasonably believed to possibly contain explosives, an improvised explosive device (IED), or other hazardous material that requires a bomb technician and/or specialized equipment to further evaluate it. Examples that could indicate a bomb include unexplainable wires or electronics, other visible bomb-like components; unusual sounds, vapors, mists, or odors. Generally speaking, anything that is **H**idden, **O**bviously suspicious, and not **T**ypical (**HOT**) should be deemed suspicious. In addition, potential indicators for a bomb are threats, placement, and proximity of the item to people and valuable assets.

Not all items are suspicious. An unattended item is an item (e.g., bag, package, vehicle, etc.) of unknown origin and content but for which there are no obvious signs of being suspicious. Area search, lock-down, or evacuation is not necessary unless the item is determined to be suspicious.

You may encounter a suspicious item unexpectedly or while conducting a routine search of your assigned area. If it appears to be a suspicious item, follow these procedures:

- Remain calm
- Do **NOT** touch, tamper with, or move the package, bag, or item
- Notify authorities immediately:
  - Notify your supervisor, such as a net control station, operator, or administrator
  - Call 9-1-1 or your local law enforcement if no supervisor is available
- Explain why it appears suspicious
- Follow instructions. Supervisors and/or law enforcement will assess the situation and provide guidance regarding shelter-in-place or evacuation.
- If no guidance is provided and you feel you are in immediate danger, calmly evacuate the area. Distance and protective cover are the best ways to reduce injury from a bomb.
- Be aware. There could be other threats or suspicious items.

If your local or regional EmComm group has not received training or attended lectures on Hometown Security, I recommend that you ask your leadership to contact your state's homeland security office, state police, or emergency management agency director. And when you do arrange for these lectures or training, don't forget to invite other local groups, such as CERT, Scouts, Civil Air Patrol, neighborhood security watches, etc. We're all out there working together to protect our hometowns!

BY GORDON WEST, WB6NOA

First Look: MFJ/Xiegu X5105 Portable HF Transceiver

Plus … New Tech Question Pool, Fixing Problem Traps, and Portable Power

MFJ Enterprises is teaming up with the Xiegu Technology Co. of China to market Xiegu's "X5105" 160- to 6-meter, 5-watt, 2-pound portable transceiver (*Photo A*), with a built-in 3.8-Ah, 12-volt Lithium Ion battery. It also works on external 12 volts, with about a half-amp draw on receive. We measured 2.5 amps on SSB transmit peaks. Yes, the internal Lithium Ion battery safely recharges automatically on an external 12-volt connection. The rig also has a built-in mic and speaker, like a Rambo-style handheld.

We took our demo unit to Quartzfest, the annual ARRL ham/RV special operating event, and put it through its paces, with several hams saying the unit was indeed "unique," and making contacts both locally and via 40- and 20-meter skywave, with reports of "great transmit audio." These reports were from both the built-in mic and the included plug-in microphone.

This is a heavyweight, self-contained transceiver, weighing in at 2 pounds. The way it was designed could lead to a QRP operator affixing a lightweight tunable HF single-band whip to the sturdy BNC antenna jack (*Photo B*), and operating it on the trail like the WWII military PR pack sets. The fast built- in antenna tuner will match nearly any type of single-band whip resonated for the band selected. The very heavy aluminum chassis and heat sink form the other side of the antenna circuit ground plane.

The X5105 can transmit up to 5 watts SSB/CW with adjustable power down to 1/2-watt, and even works FM up on the 29.6 MHz portion of the 10-meter band. CTCSS will likely be added in the production units for 10-meter FM repeater operation.

The dimmable LCD display offers a light blue background, with blue letters and numbers. Internal battery voltage reads out, too.

The LCD volume bar, just below the S-meter (*Photo C*), shows how you have set the volume control. Everyone was looking for how to turn it *off*, mistaking it for RF gain, not volume control gain. I am still reading the preliminary Chinese instruction manual for that option.

The S-meter bar automatically turns into SWR on transmit. This was nice. For CW ops, this unit also has three menu settings for CW messages, and the internal keyer circuit has several adjustments. We understand that full break-in may be included on regular production units.

The external mic is backlit, but again, the unit operates with a built-in mic and speaker for on-the-trail ops with a portable whip resonant close to the frequency of operation.

The LCD display also has a graph function, to see an SWR plot of the antenna, or see a graph of band activity (*Photo D*), sweeping left to right. It is a scanning type of readout, not live from edge to edge, nor with waterfall capabilities.

For the serious backpacker wanting to play Radio Rambo in the forest, this rig will be unique. At

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Photo A. The Xiegu X5105 portable HF/6-meter transceiver from China is marketed exclusively in the United States by MFJ Enterprises.

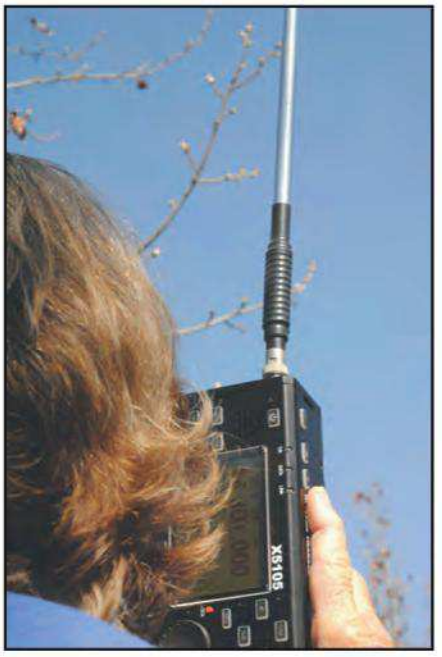

Photo B. The X5105 includes a built-in microphone and speaker for hand-held use, along with a single-band whip antenna, for self-contained portable operation. A plug-in mic is also supplied with the rig.

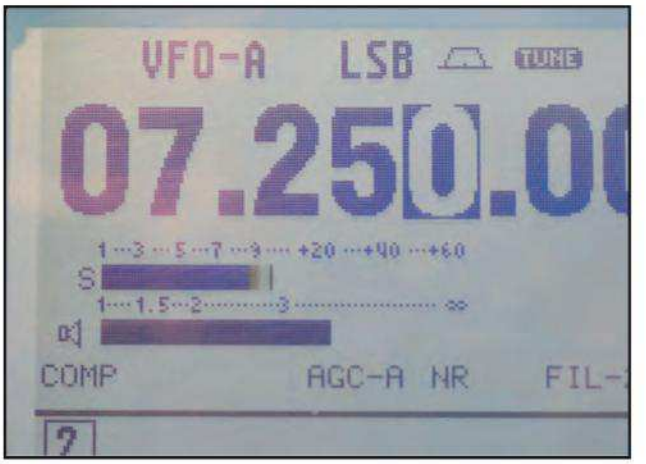

Photo C. One of the features of the LCD display on the X5105 is an indicator of where your volume control is set, just below the S-meter graph. On transmit, the S-meter automatically switches to reading SWR.

Photo D. The blue LCD display also features a graph function that can show you band activity or the SWR plot of your antenna.

Quartzfest, it did well in bucking all the QRM around us, pulling out stations from local QRM like a pro.

MFJ is working up a host of added software mods and features to be included with this unit, when the final version will begin to ship this summer. It will sell in the $670 range. For more details, see <http://bit.ly/2C0wXDB>.

New Technician Class Exam Pool Released

The new Technician Class element 2 question pool has been released to publishers and the public for Technician exams beginning this July 1st. The current pool remains unchanged until June 30, as do the current training materials.

The new Technician Class question pool has about the same number of questions as the current pool, 424 total, from which 35 appear on the test. Fifty-five new questions were added, taking the place of 61 which were deleted. In addition, a host of current questions were slightly modified, such as capitalizing Amateur Radio Service, adding a comma, or changing distractor (wrong) answers to be *more* wrong.

The segments on rules and regulations, operating procedures, and non-voice operation each added about a dozen new questions, but technical topics like formulas and equations were simply re-warmed with few changes.

The question pool committee *did* add four DMR-type questions, such as "what is DMR?," "talk groups," and Mesh networks using old routers. But only four DMR questions for the Technician Class operator? I would have liked to see a dozen more questions on DMR operation, code plugs, and transceiver operation on DMR. New hams are likely to find this mode appealing and it's important for them to know how to properly operate with it.

Also, a very few questions were added on how a new Tech operator goes on the air for the first time. Yet this new pool asks about voltage and currents in parallel and series circuits, which few new hams will encounter straight out of the chute.

There was no major change in direction on how the pool would address the new ham entering our hobby, so work with potential hams taking your club's courses, and let them know this test will get them set for the *real* learning about ham radio, which means passing the test on the first try, and then immediately getting on the air and making contacts! Here is where the real learning begins — on the air, at club meetings, hamfests, and Field Day.

Next year, General Class will undergo the update procedure.

Check Your "Bad" Trap

Some popular multi-band verticals and beams use high-Q parallel LC traps to block a specific frequency from traveling farther out to the lower band sections (*Photo E*). Same with popular tri band beams — many will use high-Q traps to "resonate" the signal to just the correct portion of the band you select.

Photo E. Traps are common elements of many multiband antennas. Long-term exposure to weather extremes can cause them to become intermittent, but the fix is often quite simple.

The popular Cushcraft traps, and the Hustler 5 BTV traps, for example, feature a big KW coil, surrounded by an outside aluminum sleeve, screwed in place at one end. Both ends of the trap have a black boot, which hides this pesky loose screw setup.

The trap is an LC parallel-tuned circuit, with the highest band trap, say 10 meters, the first one the signal sees as a high impedance "stop here" signal in a network. If you're operating on the 15-meter band, the signal passes through the 10-meter trap, with a bit of loading for 15 meters. The 15-meter trap then stops the signal from going any farther out the antenna length. On 20 meters, the first trap for 10 meters looks like a small amount of inductive loading, the 15-meter trap looks like a little more inductive loading, and the 20-meter signal uses the entire length of the radiator and the slightly inductive traps for 20-meter resonance.

Trap *coils*, inside the outer aluminum sleeve, seldom go bad. The coils are heavy-gauge solid copper wire, wound on a form, covered with varnish, so they stay shiny clean. But if the trap was mounted on the beam without the drain holes pointing down, water *will* detune the coil. Dry it out, set the drain holes *down*, and you are back on the air.

But wait! The biggest trap "failure" is the outside surrounding capacitive sleeve — This is the Xc component of the resonant circuit, and the sleeve may have only a single sheet metal screw holding *one end* in place to each of the elements.

Does this outer sleeve easily turn when you gently twist it? If so, you likely have an intermittent connection on that particular band. But where is the screw to tighten it?

The screw is factory "sealed" under the brittle black boot, with one end attaching the outside sleeve to the ele-

Photo F. A single sheet-metal screw — generally hidden under a rubber boot — connects the trap to the antenna element. Tightening this screw and restoring water / critter protection to the junction can often resolve a "bad trap" issue.

Photo G. The BioennoPower 20-aH Lithium Iron Phosphate battery ran this gear all day long at Quartzfest.

Photo H. A selection of Bioenno power options, from small portable batteries and folding solar panels to high-capacity RV "house batteries."

ment. You will need to remove the black sleeves at both ends to spot the one end with the sheet metal screw that is loose (*Photo F*).

Tighten it, brush on some LockTite™, and now cover up both ends of the coil and outer shell with a non-conductive dielectric goo, to seal out moisture and varmints from nesting on the inside. Or, contact the manufacturer, and order some replacement black boots. Their only role is to keep the innards clean and free of creatures, and the boots don't last very long in the hot summer months out here in hot California. I imagine they freeze and break away out east.

After a long winter with lots of wind and vibration, the outside capacitive sleeves work loose, and need to be tightened. Once you find it, a couple of turns of a single sheet metal screw does the job, and Presto, your "bad" trap is now fixed.

Remember, only one end of the trap's outer capacity cover is physically attached by the screw. The other end is left as an open circuit, to form the correct LC resonant circuit.

Bioenno Big Boy Batteries

Hams across the U.S. love the lightweight 20-amp-hour and 40-amp-hour Lithium Iron Phosphate batteries marketed by BioennoPower <www.bioennopower.com/>. They are rugged, run rigs for a least a day, as we did at Quartzfest (*Photo G*), and hold their 13.2-VDC voltage during HF transceiver transmitting. They also recharge quickly.

With so many ham RVers at Quartzfest, many asked whether BioennoPower also has RV "house batteries," in 100-, 150- and 200-amp-hour capacities. House batteries maintain all the operation of electronics within an RV or communications van. They are independent of the starting battery, and of any need for outside alternating current.

Yes, Bioenno does offer these high-capacity batteries (*Photo H*) but this technology needs a higher charging voltage, between 13.8 and 14.8 volts, for a good charge from the RV's main alternator system.

So check both your RV house battery AC battery charger system voltage, then double-check that your RV alternator can build a charge up to 14.8 volts, the ideal to voltage for BioennoPower Lithium Iron Phosphate technology. You will need a blocking diode isolator package to prevent the regular RV lead acid batteries, which rest about 12.8 VDC, from pulling down the BioennoPower Lithium Iron Phosphate battery, which rests at a normal 13.4 volts after a good charge.

Announcing:

2018 CQ World Wide Foxhunting Weekend – May 12-13

Now is the time to plan for this year's CQ World Wide Foxhunting Weekend, which will be May 12-13 — or another date in the spring if it works better for your group. Mobile or on-foot, one transmitter or many, a radio foxhunt is sure to stir up activity in your ham club. *CQ* doesn't impose any rules or offer any awards for Foxhunting Weekend. That's up to you and the hams in your hometown. Your hunt can be for mobiles or all on foot. Use the international rules or make up your own.

For many clubs, CQWW Foxhunting Weekend kicks off a season of regular transmitter hunts. For others, it's a special once-a-year event, like Field Day. Since the primary objective is lots of hunt participation, we don't insist that your event be on that particular weekend. Any time in the spring is fine with us!

If your club has always had one kind of hunt on Foxhunting Weekend, why not try something different this year? Some hams prefer the formalities of carefully-crafted boundaries, specifications for signal parameters, time limits, and so forth. Others are content just to have one or more signals to hunt. No need for any regulations, they say. Talk it up on the local repeater and social media to find out what your friends have in mind.

Foxhunting teaches an important skill — the ability to find the source of signals from afar. Radio Direction Finding (RDF) is useful for public service and volunteer enforcement. It can even save lives. Most of all, it's fun. Give it a try, but ensure your group has *safe* fun. See to it that no one can be injured by your hidden transmitter or by trying to get to it. That goes for the public as well as your club members.

Don't let the excitement of the hunt make you an unsafe runner or driver. Make sure that all transmitting and receiving antennas are eye-safe. Always be mindful of your own physical limitations and never take chances behind the wheel or in the forest.

Make your Foxhunting Weekend activities into a magnet for every club member. Better yet, include the whole community, especially young people. Invite a Scout troop to experience on-foot transmitter tracking or to ride along with the mobile hunters. Look for opportunities to incorporate foxhunting into Scout activities such as Camporees, Scout-O-Ramas, and Jamboree-On-The-Air. Seek out other youth groups that might be interested.

Afterward, write up the results and send them to me. The list of information in a complete CQWW Foxhunting Weekend report is posted at <www.homingin.com>. In addition to the details of date, location, hiders and winners, *CQ*'s readers also want to know what was unique about your hunt and what lessons (positive and negative) you learned from it. Don't forget to include some sharp action photos. The higher the resolution, the better.

I am eager to read your reports of this year's foxhunting activities and the new ideas that you come up with. Happy hunting!

–*KØOV*

**Joe Moell, KØOV*
CQWW Foxhunting Weekend Moderator
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email: <homingin@aol.com>
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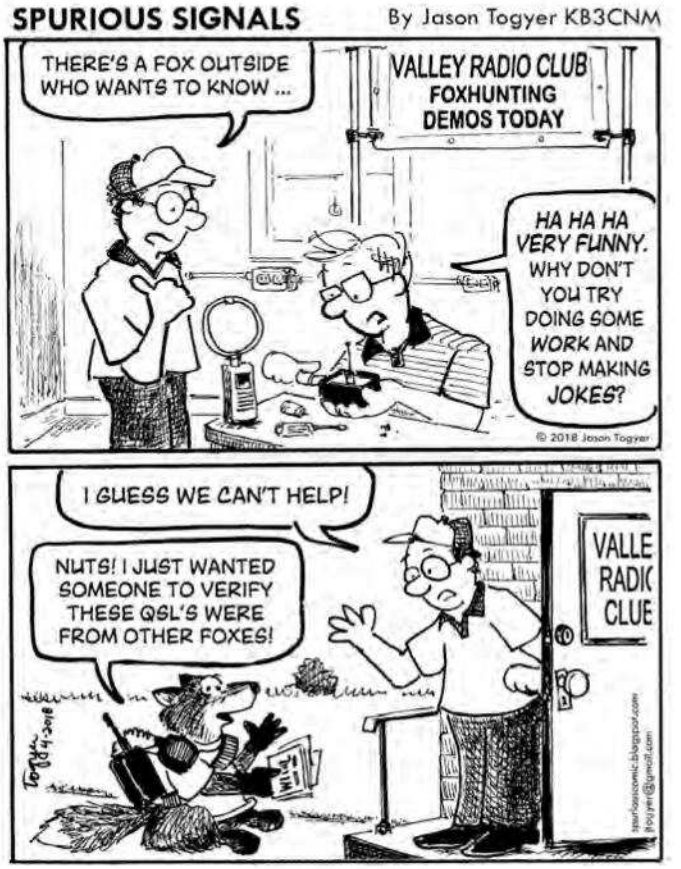

The things you find at truck stops… Kit-Building Editor Joe Eisenberg, KØNEB, came across this display of CB antennas recently at a truck stop in Arizona. The marketing pitch on the center one, with the blue packaging and loading coil, caught his eye. Take a close look: "Air Cooled High Tech Helix Design for Maximum VSWR." Um, yeah, that's what we all want for our antennas … maximum VSWR! And it's good to know what antenna coils are really for … cooling down your hot RF! (KØNEB photo)

kit-building

BY JOE EISENBERG,* KØNEB

A Clear Case and a Dremel® Tool

This month, I am building an inexpensive Chinese kit that tests crystals and displays their frequency on a 5-digit display. This kit can also be used as a digital display for a radio without a frequency readout. There is a setting that allows you to program a frequency offset to enable it to be used for a digital dial display. The kit itself is simple to assemble and has a low parts count, making for a great group kit building activity as we did with the Midwest Home Brewers and QRP (HBQRP) group here in Nebraska. The kit is built around a Colpitts oscillator coupled to a simple frequency counter.

Easy Assembly, But Not Without Issues

The main board assembles easily. I suggest following the directions when it comes to parts mounting order, or you can follow my order, which is usually resistors first, then capacitors, diodes, transistors, and larger parts. I try to have the resistors all facing the same direction so that they are easy to identify should you need to perform troubleshooting after assembly.

The small difficulties I encountered putting it together point out some simple and good tools any builder should have on hand for assembling kits. This crystal tester comes with a clear plastic case. The parts to the case are not labeled, but it becomes clear once you lay out the parts how they are to be assembled. It is kind of like assembling a jigsaw puzzle, with each piece giving you clues as to where it goes. I first attached the PC board to its base before adding the other parts to the case. A problem I first encountered with the case was that the pieces were each covered on both sides with an adhesive coating used to prevent scratching of the plastic. Those adhesive coatings come off, but need to be peeled back slowly to prevent small pieces from tearing

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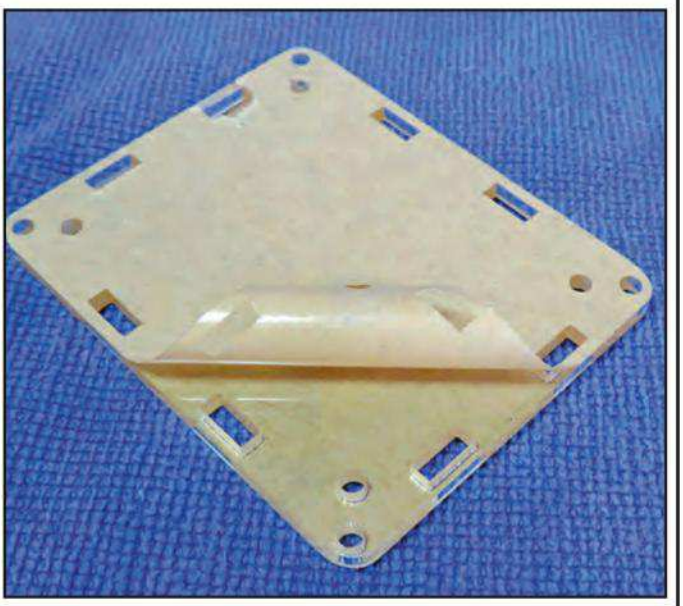
e-mail: <k0neb@cq-amateur-radio.com>

Assembled crystal tester along with the parts that make up the case.



Peeling away the adhesive coating reveals the clear plastic that makes up the case parts.

Completed crystal tester measuring a 20-meter crystal.

off and having to be removed separately.

The next problem I encountered was that the holes in the plastic case parts had burrs, making it difficult to press-fit everything together. I used a tiny file and a Dremel® tool to fix this issue. I am not perfect when it comes to assembling things, and with this kit, my biggest problem was the plastic piece that is on the side of the coaxial power jack. It didn't seem to line up exactly with the power jack, and cracked when I tried to assemble it. Moral of the story … gently test each part as you assemble it and use a file or Dremel tool to make any corrections needed to make everything fit. The problem in this case was that the holes where the jack went into the PC board were slightly larger than needed, and the

Dremel® 7300 and accessory kit.

Dremel 7300 all charged up and ready to go!

jack was not exactly in the center of them when soldered into place. This made it difficult for that edge panel to fit correctly and broke it when assembled.

Using the Kit

I suggest using a 9-volt battery or other source of 5 to 9 volts DC to power this kit, as using 12 volts gets it too hot. A cell phone / USB charger or a 9-VDC source will work just fine. This is a very good reason to have a metered variable-voltage power supply. If using this for a digital display, follow the directions in the special document available online to choose either a custom offset, or to choose one of the standard IF offsets provided, such as 455 kHz, 10.7 MHz, etc. The crystal is inserted into the outer two machine pins on the lower part of the board and the power connected to perform the measurement. The button is only for setting offset frequencies. I found this Geekcreit® crystal tester/digital display kit at Banggood.com <http://bit.ly/2BjEHUp> for about $8.50 including the case.

Get Yourself a Dremel (or Similar) Tool

The Dremel® tool I used to fix the case parts is a model 7300. The Dremel 7300 is commonly available at many hardware and home improvement stores for about $26. Watch for it to be featured in sale ads. There is also a set of extra accessories for it that is highly recommended as it will give you a good supply of all the different types of bits needed. There are cutting wheels, grinding bits, drill bits, sanding and polishing bits, so any kit builder will find whatever he/she needs. The accessory kits are usually around $20 and sometimes less when on sale. With its light weight, the Dremel 7300 makes a nice addition to my portable fixit tool bag.

I also have used my previous cordless Dremel tools to fix bad spots on aluminum antennas during assembly. Often, burrs get in the way of easy antenna assembly, and a cordless rotary tool does the trick outdoors. I even used it to create a slot in aluminum tubing that was not present as it should have been, and it did the job easily. The 7300 has a lithium-ion type battery, making it a lot lighter than previous versions, and charges much more quickly than the older battery types. The Dremel 7300 has two speeds, 6,500 RPM and 13,000 RPM. The high-speed mode sounds kind of like a dental drill, so if you have a phobia about those, well, be aware.

Non-Kit Kits

There are a lot of new low-cost "non-kit kits" out there that I will cover soon. These radios do not come with cases, and that is the part each builder takes on as a challenge. I have a µBITX on its way from India that should be interesting. The µBITX is a multi-band transceiver that does CW and SSB, with 10 watts output, making it ideal for FT8 or other digital modes as well. It covers from 3 to 30 MHz continuously, making it also useful as a general coverage receiver. It comes as a pre-assembled main board that is tested and aligned, but just needs the plugs and jacks and display attached, which are all supplied. W8TEE provided a "first look" at the µBITX in last month's issue. I'll add my take on it as soon as mine arrives.

Finally, April is time for Ozarkcon in Branson, Missouri. This is where QRP fans gather to enjoy a weekend in the Ozarks entertainment capital, and take part in a group kit-build as well as seminars, and just a great time talking with fellow QRP ops and kit builders. Visit Ozarkcon at <www.ozarkcon.com>. I hope to see you there in April, and at Dayton in May!

– Until next time, 73 de KØNEB

Power to the People

BY RON OCHU, KOØZ

This month, let's explore a topic vital to every ham shack: Power to the people! Don't fret and please don't turn the page quite just yet. This isn't going to be an analysis of free market economies, political science, or sociological revolutionary trends. Rather, let's take a closer look at electrical power in the shack; namely, converting the alternating current voltage (VAC) in your wall socket to the direct current voltage (VDC) which is used to power much of the gear in our ham shacks.

AC Versus DC

You're probably familiar with the term, "power grid," and even if you aren't, you depend upon it daily. The grid is a term used to describe the nation's electrical power distribution system. Power plants generate AC (alternating current) voltages that are stepped down to the 220-VAC levels that service most residential homes. In our homes, the 220 VAC is divided into household circuits utilizing 110 VAC, which powers most of our appliances such as televisions, stereos, computers, clocks, etc.

AC is used because it is more easily transferred over long distances. DC (direct current) doesn't travel nearly as far without a degradation of power. For example, connect a four-foot wire pair to your 13.8 VDC power supply and measure the voltage at the far end. Now, do the same thing and use a 30-foot wire pair and measure the difference. Wire length and size (gauge) and consequent resistance per foot makes a big difference. That's why Nikola Tesla's AC power distribution scheme combined with George Westinghouse's resources became the industry standard for long-haul power distribution, also known as "the grid."

However, let's not rule out DC. DC does have its good points. Since the current in DC isn't alternating, it isn't producing unwanted frequencies that can prove to be noisy to radio receivers. Moreover, DC is used by electrical engineers to power semiconductors, which are the heart of modern electronics. Consequently, household AC voltage is converted to DC voltage to power such household electronics as televisions, home entertainment systems, computers, and ham radios.

Power Supply Parameters

Converting household 110 VAC to 13.8 VDC is accomplished with the *power supply*. Frequently, I hear hams ask, "What power supply do I need to work with my radio?" To answer that question, one must ascertain a few radio parameters. Since most HF (high frequency) rigs and dual-band VHF/UHF (very-high and ultra-high frequency) mobile rigs operate on 13.8 VDC, the first parameter to determine is the maximum current drawn by the radio when operating on high power. It essential to know the current draw of a transmitter because, if it is working correctly, it will draw much more current than the receiver.

If you don't have any technical specs handy, the power equation P = E x I will work nicely. Take the rig's output power and divide it by the voltage (13.8 VDC) to get the current value. For example, if a dual band rig's highest output is 70 watts, then 70 watts divided by 13.8 VDC will give us a current draw of 5.072 amps DC. So, we'll need a power supply that can deliver 13.8 VDC at 5 amps. But, not so fast, let's wait a minute! A good, general, rule of thumb to remember is that semiconductor rigs can be up to 50% efficient, so we will need to

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Photo A. The Astron RS-70M analog power supply provides filtered, regulated 13.8-volt DC power at 57 continuous amps for my operating desk.

Photo B. The MFJ-4225MV switching power supply (top) is my primary workbench DC supply. It offers 22 continuous amps and variable voltage settings. Below it is an Astron RS-12 A analog power supply (without meters).

compensate for the 50% efficiency by doubling our current draw from 5 amps to 10 amps. In other words, our 70-watt radio will need at least 10 amps from the power supply to deliver full power out. Of course, that is assuming 50% efficiency and that doesn't leave wiggle room very much for error. My preference is to have a power supply that will deliver more amps than I actually need. That way, while the power supply is under load, it is not being taxed too heavily and it can just "loaf along."

Continuous Duty Cycle

Once the current draw is known, we are almost ready to match the rig to a power supply. A power supply delivers a voltage and a specific amount of current. The power supply's DC current will have a peak value and a continuous value. The continuous rating is the one most useful when considering a power supply. It's a good idea, when purchasing a power supply, to know its continuous duty rating cycle. For example, a power supply may proclaim 13.8 VDC at 25 amps. But that 25 amps may be only on peaks and for only a short duration. Typically, that power supply may only deliver 22 amps continuously. If a transceiver needs 25 amps continuously to deliver full power out, then our 25 peak-amp supply is going to fall short. It could still be used in a pinch, but the rig's output power will need to be reduced. Don't expect the rig to put out full power if the power supply is going to come up short with the required amperage. When using a power supply, ensure its peak and its continuous amperage rating.

Regulated Power Supplies

Most commercially-built power supplies are regulated. A regulated power supply will deliver a constant DC output voltage; 13.8 VDC is typical for most amateur radio applications. Some bench supplies offer variable regulated voltages. This can be handy when powering up circuits with different voltage requirements. For example, you may need a 9-VDC source for a circuit. The best quality of a regulated power supply is that it will provide a constant voltage when connected to a rig. This is important because you will need 13.8 VDC not only when the rig is turned on, but when it is transmitting as well. This is called voltage under load. Varying voltages under different load conditions can cause all types of transmitted distortion. It's best to have a well-regulated power supply for optimum rig performance.

Analog Versus Switching

In addition to voltage regulation and continuous amperage output, another power supply consideration is whether to use an analog or a switching power supply. Analog power supplies use a heavy-duty transformer to step down 110 AC household voltage to a lower value, such as 13.8 volts. After the transformer, stage, a rectifier converts the AC to DC; then, filter and regulator circuits produce the final 13.8 VDC for our rigs. Analog power supplies tend to be heavy, somewhat bulky and pricey. Switching power supplies are becoming common because they are lighter and less expensive. Switching power supplies have more components to them, but are considerably lighter and smaller. A switching power supply bypasses the bigger, heavier, transformer by first rectifying an AC voltage to a DC voltage and then converting it to a high-frequency square wave before converting it back to a lower DC voltage that is rectified. These supplies are remarkably lightweight and less expensive than analog power supplies. Unfortunately, early switching power supplies tended to emit a lot of RF noise, making them a source of RFI (radio frequency interference) in the shack. Better design and filtering contin-

ue to make switching power supplies far less noisy, but it's not a bad idea to check beforehand about the RFI potential of a switching power supply by consulting with fellow hams, checking the internet, or talking with a knowledgeable salesperson.

Meters?

I like to monitor what is going on in my shack and that includes my power supplies. I don't mind spending the extra money for a power supply that, with a glance of the eye, will tell me the operating voltage and current draw. Metering isn't necessary; a digital multimeter (DMM) will tell you those parameters as well. However, I find it more convenient to have the meters installed in the supply, constantly giving me feedback and freeing up my DMM for bench work.

How Many Amps?

How many amps your power supply needs to deliver depends on the total amount of current required to power up your radio shack. I prefer to have one big power supply that powers all my radios through a distribution system on my operating desk. I have an Astron RS-70M (*Photo A*). The M stands for metered, which gives me constant feedback for voltage and amperage. Although this amp is rated for 70 amps, its continuous amperage is closer to 57 amps. I've had this amp for many years. On my workbench (*Photo B*), I have an Astron RS-12 A (with no metering), as well as a MFJ 4225MV switching power supply — with meters — which provides a variable DC voltage output and 22 continuous amps. It is very lightweight and I've used it at club outings such as Field Day.

Protection

In addition to a fused AC line, many power supplies offer over-voltage and over-current protection circuits. These are great features. If there's a rig component failure or a short circuit, the power supply will limit the voltage and current output, a great safety feature.

Power On

I hope this article has shed a little light on power supplies. Like most things in life, there are compromises. We know what we'd like to have, but we also know what we can afford. It pays to shop around, but before you do, have a good understanding of your power needs. Inform yourself before making a purchase.

Thank you for reading *CQ* magazine and I hope to hear you on the air!

– 73, GL de Ron, KOØZ

ROB DESANTOS*, K8RKD

Smart Listening

With the rapid advance of voice activated speakers, I've been testing voice activation. I'd like to share some of the things I've been thinking about as I did this. I'd also like to hear from all of you how it's working on your end of the radio spectrum and an update on the trends in radio listening. More on that later.

Millions and Millions…

The recent holiday selling season saw record-breaking sales of voice activated devices such as Google Home and Amazon Dot. By some estimates, they are now in 12% to 14% of American homes. More and more devices have the technology built-in, too.

A few ham and SWL radios have had limited voice commands, originally intended for those with visual or other disabilities. However, this did not extend to the everyday radio user, often was limited to a few average and frequently required the purchase of added hardware. With the rapid advances in technology, it would be surprising if a more complete suite of voice commands was not built into the next generation of ham and scanner radios. (I'm going to leave shortwave listening out of this for the moment as few SWL radios are in current development.) The necessary hardware and software are now widely available to the hobbyist. Wouldn't it make sense that the manufacturers are at least thinking about it?

Expectations

The question facing a hobby is: What do we expect? With voice activation, do we want simple commands? Or are we expecting integration with the other devices that are in our home? For example, if you have a Sonos or other home audio system, would you like that system to be able to pick up the audio from your scanner in any room? Do you want to be able to initiate a 2-meter contact via voice command to the nearest smart speaker and then to your station? This would almost certainly require the hardware to be able to communicate over Wi-Fi and the internet without the user doing any more than entering network passwords and linking to appropriate online apps or "skills." Some of this capability is already present in many radios and SDRs.

Would these features fundamentally change an essentially solitary hobby? It may be that we don't want those features in our radios now. I wonder, though, if the next generation might view it differently if they grow up in a mostly voice-activated world? This goes to one unknown that even the programmers at Amazon can't answer: Just how much voice control do we want and what things should never be voice activated?

While hams have been communicating over internet links for decades now, the radios haven't fully caught up. We can tune and listen to radios over the net; we can download an incredible amount of data related to our hobby. In some cases, we can update the firmware on our radio to fix issues or get new features. With SDRs, we can practically create whole new radios. There are already great apps out there for remotely-controlling radios, so it would make sense that these could easily become voice-activated.

If you already do this, I would be interested in hearing what works and what doesn't and what tools you are using to accomplish it.

Research Summary

I want to share some interesting numbers that were recently published from several research sources on the trends in audio consumption. I think that the numbers will provide a picture of how quickly streamed audio and smart speakers are changing the audio landscape. I've compiled this data as part of a more detailed presentation I will be giving at several radio meetings soon. *CQ* readers get an early peek.

Jacobs Media conducted research[1] on public radio listeners across the U.S. last year. (Keep in mind that the Jacobs Media numbers are 12 months old. You can extrapolate to where we are now, considering the advance of smart speakers and voice technology. You should also take note that this was not a truly random sample and consisted of the most serious public radio listeners and looked at their total audio consumption, not just public radio).

- 17% had increased their total listening in the previous year, only 10% had decreased
- The biggest turnoffs were excess commercials and music repetition
- 21% listened to podcasts daily or weekly and, among the so-called millennials, that jumped to 33%
- Smartphones account for more than half of podcast listening
- 20% use voice activated commands with smart speakers frequently, and another 25% do so occasionally
- Smart speaker ownership among this group was already 11% at that time (for the general population it was at 7% a year ago[2]. More recent data from NuVoodoo Media Services[3] suggests the number has jumped to 15% for the broader population.)
- The most important car features were access to AM/FM radio and Bluetooth. (Surveys since that time suggest that Android Auto/Apple CarPlay are rising rapidly. Reports from car dealers suggest the same trend.)
- 64% of millennials connect their phones to the car audio in some fashion
- 63% of all surveyed now stream audio from some source weekly and that rises to 81% among the youngest in the survey
- Twice as many people now wake up to their phones than to traditional bedside radios
- Listening patterns among women and men were more alike than different

Another more recent research study by NuVoodoo Media Services[3] offered up these tidbits:

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• Among all radio listeners using a smart speaker, the most common audio choices were weather (50%), AM/FM radio (46%), streaming audio services (45%) Spotify, Pandora (43%), news (41%), audiobooks (27%), talk shows (18%) and podcasts (14%)

Pandora sponsored an Edison Research study[4] with similar numbers:

• 58% of smart speaker owners listen to music, weather (46%) jokes (42%), general question (40%), a timer (27%), interact with other smart devices (26%), and access a broadcast radio station stream (11%)

The Pandora study[5] also produced some remarkable numbers on listening in cars among new car owners:

• AM/FM listening in cars has declined to 54% of the in-car audio. This is consistent with other studies

In another study last summer of Canadian podcast listeners done by Ulster Media and Audience Insights[6], the trends in Canada are similar to the U.S. but lagging a little behind. There were also some differences:

• 15% listen to a podcast daily or weekly
• Listening among young men at least once a month was 31% but jumped to 46% among women. Similar trends were seen in every age group
• Nearly half of all podcast listeners had started listening in the previous 12 months
• Most listening was at home or in the car

Finally, the folks at Nielsen who do the ratings for local radio and TV across the U.S., published this startling trend[7,8]. Time spent listening to AM/FM radio among generations (hours and minutes per day):

• Gen Z: 1:08
• Millennials: 1:37
• Gen X: 1:59
• Boomers: 2:03

What can we take from these numbers? In a broad sense, the trends toward using online sources for audio are continuing and traditional radio continues to see a very gradual decline. The decline, however, grows dramatically among younger listeners. As an audio source, broadcast radio is declining in importance but if it continues to expand into the streaming world through smart speakers, Android Auto, and other methods, it can remain relevant. In less than another generation, the RF side will no longer be the most important method of distribution.

What's On Your Mind?

As always, I am happy to receive your comments, suggestions, and ideas. Feel free to reach out to me and share what you are thinking.

Notes:

1 "*Navigating The New Media Landscape*", Jacobs Media Tech Survey, <www.jacobsmedia.com>, 2017
2. <http://bit.ly/2GupUpd>
3. <http://bit.ly/2okecGh>
4. Op cit., #2
5. <http://bit.ly/2ysLfiJ>
6. "*The Canadian Podcast Listener: A Landscape Study*", Summary Report, October 2017, Jeff Vidler, Audience Insights Inc. and Jeff Ulster, Ulster Media.
7. <http://bit.ly/2gaaNXh>
8. <http://bit.ly/2vkaKOP>

BY TOM SMERK,* AA6TS

Canadian Amateur Radio Organizations Seek Collaboration While Australian Hams May Seek Power Increases

New hams on-the-air from Cuba, Ontario extends distracted driving law exemption, Australia holds 60th anniversary hamfest, Germany says "nein" to new entry-level license, and more

RAC and RAQI Cooperate and Consolidate in Canada

Representatives from the Radio Amateurs of Canada (RAC) and Radioamateur du Québec (RAQI) met in October to discuss how the two organizations could work together for mutual advantage. Since both agencies operate a QSL bureau for their members, a first step will be to combine the QSL card services with RAC's Outgoing QSL Bureau becoming Canada's sole outgoing bureau for QSL cards. RAQI's outgoing bureau will serve as a branch of the larger RAC bureau, continuing to receive cards from RAQI members, sort them and then forward the cards to the RAC Bureau. RAQI will pay RAC an amount based on the volume of RAQI cards processed. The organizations agree that with postal rates rising, this makes good sense for fewer QSL cards being sent. The new arrangement was set to commence on January 1, 2018.

In another collaboration, RAC agreed to promote outside of Quebec an online amateur radio course offered by RAQI. This will give all Canadians an opportunity to take advantage of this online resource, particularly if they are unable to attend courses offered by local clubs. RAC will receive a portion of the registration fees for all those outside of Quebec who register for this course.

[RAC]

Distracted-Driving Law Exemption Extended In Ontario

In Canada, distracted driving regulations can vary considerably from province to province. In Ontario, RAC Directors Allan Boyd, VE3AJB, and Phil McBride, VA3QR, have been working hard on this issue, and while the hoped-for permanent exemption for hams was not achieved, the Ontario Ministry of Transportation (MTO) announced on December 15, 2017 that the current two-way radio exemption for "Amateur Radio operators and specified commercial, public transit, and public function drivers" will be extended for an additional three years, effective until January 1, 2021.

The RAC announced that it would continue to press for a permanent exemption going forward.

[RAC]

"The South's" Biggest Hamfest Marks 60 Years

As I am writing this in January, Australia's Central Coast Amateur Radio Club (CCARC), which celebrated its 60th anniversary last year, is putting the finishing touches on preparations for what will be the 60th anniversary of the Wyong "Field Day." Although it is called a Field Day, it is actually more of a hamfest. Alex Stewart, VK2PSF, from the Waverley Amateur Radio Society, explained to me last year that the concept is essentially a carryover from its use in the farming industry where a field day literally means a farmer opens up a field and all the different tractor or agricultural suppliers bring their products for all the district farmers to check out in actual conditions. The Wyong Field Day applies this concept to the amateur radio hobby.

This event, the largest meeting of radio amateurs in the Southern Hemisphere, was held on Sunday, February 25, 2018 at the Wyong Racecourse on the Central Coast of New South Wales.

For more information, see <http://fieldday.org.au>.

[CCARC, Amateur Radio Newsine]

Australian Hams Consider Seeking Power Increases

The Wireless Institute of Australia (WIA) is soliciting comments from the membership before submitting a request to the Australian Communications and Media Authority (ACMA) to increase maximum power levels for all three license classes to 50 watts for Foundation licensees, 200 watts for Standard licensees, and 1,500 watts for Advanced licensees.

Current HF power limits are 10 watts PEP on SSB (or 3 watts on CW, AM, or FM) for Foundation licensees while Standard licensees have a 100 watt PEP HF power limit (SSB) or 30 watts for constant-carrier modes and Advanced users may run up to 400 watts HF power limit (120 watts on constant-carrier modes).

The ACMA feels that the limits put Australian hams at a disadvantage, especially during contests

*17986 Highway 94, Dulzura, CA 91917
Email: <aa6ts@cq-amateur-radio.com>

Photo A. Some of the proud license recipients after a license exam session in Cuba. (Courtesy of the Federacion de Radioaficionados de Cuba) →

Photo B. Do you remember when this was you in the hot seat? License candidates in Cuba take exams for new or upgraded ham licenses (Courtesy of the Federacion de Radioaficionados de Cuba) ↓

in which other countries permit 1 kilowatt or more. An 18-month trial that allowed participating Advanced licensees to run up to 1 kilowatt on HF ended in 2013.

[ARRL News]

Cuba Welcomes 103 New Hams

On December 16, Cuba welcomed 103 new hams as 98% of the applicants passed the exam for the "Third" (entry-level) category (CL prefix) while about 100 more moved up to the top license categories with CM and CO callsigns (*Photos A & B*). This is about 8% higher than the first half of 2017.

Two of the goals of the Cuban Radio Federation (FRC) are to increase its presence in mountainous and inaccessible localities, and to increase the number of women and young people among its members.

[FRC Facebook page]

New Zealand 60 Meters Trial

The New Zealand Association of Radio Transmitters (NZART) reports that it has negotiated with government authorities to obtain a license to allow limited operation on the 60-meter band on a one year trial basis.

The approval calls for single sideband and low power and on a secondary basis only. Hams will need to download and submit a completed form to NZART to establish a sub-license which sets out the terms of operation for band usage.

Once NZART acknowledges receipt of this form, New Zealand hams can begin operation on 5353 kHz and 5362-5364 kHz with a maximum output of 10 dBW EIRP (effective isotropic radiated power)

This trial will determine whether 60-meter transmissions are feasible for amateurs without interfering with primary users.

[NZART]

Allocation Changes for Iceland

Southgate Amateur Radio News reports that Icelandic amateurs have gained the new WRC-15 60-meter 15-kHz-wide allocation of 5351.5-5366.5 kHz, limited to 15 watts; but lost the 150-kHz-wide allocation between 5260 and 5410 kHz, which permitted 100 watts EIRP and had been available by special permit.

[Southgate Amateur Radio News]

Germany Tables New Entry Level License but Keeps 6 Meters

German radio enthusiasts who were hopeful for a new entry-level "klasse K" license will have to wait indefinitely. An article in the Southgate Amateur Radio News states that a meeting between the amateur radio round table (RTA) and the German Federal Network Agency (BNetzA) on November 24, 2017 presented the reason as "… because it cannot be ruled out that such an introduction could restrict the self-construction privilege of amateur radio operators."

Amateur radio licenses in Germany peaked in 2002 at 80,000 licensed amateurs, and slipped to 67,349 in 2015. In recent years, the Deutscher Amateur Radio Club (DARC) has been promoting amateur radio and offering a free online training course. While figures show an increase in the numbers of applicants taking license exams, there is no entry-level category for new radio operators to get started in the hobby.

In other news from Germany, access to the 6-meter band, which was on a temporary basis and was due to expire, has been extended at least another year. Additionally, Class E (Novice) licensees are now to be able to use the 13- and 6-centimeter bands at a maximum of 5 watts PEP until the end of 2018.

The allowable power on 160 meters (between 1850 and 1890xKHz) has been increased from 75 to 100 watts PEP. Contests are also now allowed on weekends, but only in the frequency range of 1890 to 2000 KHz.

[Southgate Amateur Radio News, Amateur Radio Newsline]

In Closing

We appreciate hearing from you. Keep the stories and photos coming! Email your ham radio news and high-resolution photos to <aa6ts@cq-amateur-radio.com>. Thank you!

—73 de AA6TS

When you're ready to get on HF,
or to upgrade your HF station,

DO IT RIGHT - GET A

In 1865 physicist James Clerk Maxwell mathematically predicted electromagnetic waves, and in 1888 experimenter Heinrich Hertz confirmed their existence. From that moment on it was a race to see who could build a practical wireless telegraph and telephone system based on this new science. Pioneers like Tesla, Fleming, de Forest, Armstrong, Marconi and Fessenden all made critical contributions to the development of radio as a practical communications medium, and by the 1920s radio spanned the world.

Hams were there from the beginning, building their own spark gap transmitters and coherer receivers, adding to radio science and engineering. Skywave propagation, which makes direct long distance communications possible, was entirely an amateur discovery made after the government relegated hams to wavelengths below 200 meters. These were thought to be useless but hams proved them wrong, ushering in the shortwave era.

In my humble opinion HF is the heart and soul of ham radio; it's where it all started. Sure I'm on two meters and 440, but for me the magic happens when I talk to another ham on the other side of the world, direct from my station to his. Even though most new hams get their start on VHF these days, there are millions of hams in nearly every country of the world just waiting to talk on HF.

Back in the day HF equipment was expensive, and not very capable. Today it's a bargain, and modern radios offer a fantastic array of functions. Most even include a built-in antenna tuner, although they're quite limited in capacity and can handle SWRs of only 3:1 at most, insufficient for many real-world antennas.

LDG makes a full line of tuners for every amateur purpose, from QRP to QRO. Many are fully automatic, tuning as you operate to maintain a match between the transmitter and antenna. They handle SWRs of up to 10:1, and have 2,000 memories for nearly instant retuning on previously used frequencies.

LDG tuners are designed to work with coax-fed antennas, but they can also be used with antennas fed with ladder line, or with long-wire antennas. LDG makes a full line of Baluns and Ununs for these purposes.

All LDG tuners come with a two-year warranty, and it's fully transferable. If you sell or give away your tuner just give the new owner the receipt and it's covered for the remainder of the two-year period. And of course all of our tuners come with our legendary customer support, the best in the industry.

When you're ready to get on HF, or to upgrade your HF station, do it right and get an LDG tuner.

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These brand-specific LDG tuners integrate seamlessly with your rig for streamlined operation.

NEW YT-1200

Designed for Yaesu's FT-450, FT-450D, FT-950, FT-991, FTDX-1200, FTDX-3000 and FT-2000 (non-D). Seamless integration. The tuner is powered by the transceiver (except the FT-2000). It has a CAT port pass-through - use computer control of the transceiver when using this tuner. Power and control through the provided interface cable.

Suggested Price $259.99

KT-100

For AT-300 compatible Kenwood transceivers (except TS-480HX). The KT-100 allows you to use the Tune button on the radio. 2,000 memories for instant recall of tuning parameters for favorite bands and frequencies.

Suggested Price $199.99

IT-100

Matched in size to the Icom IC-7000 and IC-706. 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. For your Icom radio that is AH3 or AH-4 compatible.

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. 2000 memories cover 160 through 6 meters.

Suggested Price $129.99

Your Favorite Dealer has these tuners in stock NOW! Don't Miss Out - Call or visit them TODAY!

TUNER FROM LDG ELECTRONICS

Generic Tuners

AT-1000ProII shown with optional M-1000 external analog meter $129.99

AT-1000ProII

Our flagship 1KW tuner: 5 to 1,000Watts PEP; RF Sensing; Auto and Semi Tuning Modes; 1.8 to 54 MHz range; 6 to 800 ohm range (15 to 150 on 6M); simplified operation; and an optional external 4.5" analog meter. With the two position antenna switch, there are 2,000 memories that store tuning parameters for almost instantaneous memory recall whenever you transmit on or near a frequency you've used before.

Suggested Price $539.99

Optional M-600 external analog meter $129.99

AT-600ProII

Simplified operation with two-position antenna switch, there are 2,000 memories that store tuning parameters for almost instantaneous memory recall whenever you transmit on or near a frequency you've used before.

Suggested Price $369.99

Z-100Plus

Runs on any voltage source from 7 to 18 volts; six AA batteries will run it for a year of normal use. Includes an internal frequency counter so the operating frequency is stored with tuning parameters.

Suggested Price $159.99

AT-100ProII

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.

Suggested Price $229.99

AT-200ProII

The AT-200ProII now includes LEDs to show antenna position and if the tuner is in bypass. A two position antenna switch stores 2000 memories per switch. Handles up to 250 watts SSB or CW on 1.8 to 30 MHz and 100 watts on 54 MHz. Rugged and easy to read LED bar graphs simultaneously show RF power and SWR.

Suggested Price $259.99

Z-11ProII

Designed for battery operation. Handles 0.1 to 125 watts, great for both QRP and standard 100 watt transceivers from 160 - 6 meters. It will match dipoles, verticals, inverted-Vs or virtually any coax-fed antenna.

Suggested Price $179.99

Don't know which tuner is right for you?

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BY JEFF REINHARDT,* AA6JR

The "Play's" The Thing

With apologies to Bill (OK, William) Shakespeare and his character Hamlet, which was at times pretty serious subject matter, April seems to be an appropriate month to explore the notions of play and playfulness. Take just a moment to explore the many different interpretations of the word "play" and let's explore a few ways to add enjoyment to this wonderful pastime we call ham radio.

Learning Through Play

Play is fun, oftentimes combined with learning. Our earliest memories are often associated with play and as adults, we derive enjoyment watching children at play. When you play, you can be anything you want to be, from Superman to Mighty Mouse. While it may start "foolishly," April is the month when the words "play ball" echo across the stadiums of America. Every youthful ballplayer has imagined stepping up to the plate in the bottom of the ninth inning in the seventh game of the World Series, down three runs with two outs and the bases loaded. Later on, we pay to watch athletes "play" at a sport that is very serious business to many of them (and no doubt, their agents and team owners). Happily, there are many successful pros who never lose their love, or respect, for *playing* a game.

Play is an essential gift. In my yard, we often watch wild rabbits bounding over one another. Most dogs love to play, especially with their pet humans. Show a cat a string, a ball of yarn, or a laser pointer. They play — and they learn because learning is always more fun when combined with play.

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e-mail: <aa6jr@cq-amateur-radio.com>

Don't Tell Me What I Can't Do!

Very few of us are gifted with the ability to clobber a baseball 450 feet, drive the fairway at Augusta, or hoist the trophy at Wimbledon. But as hams, we do have abilities that are pretty darn awesome. I can't heave a football 40 yards to a streaking tight end, but I can throw an intelligible signal halfway around the world. I can't play shortstop in the major leagues, but I have the ability to string together some wire and snare a "line drive" signal from a ham in another state or country.

And with my radio, I can play among the stars. My signals can easily reach the orbits of satellites or the International Space Station; maybe even bounce off the Moon and back to Earth. Some of my signals are now zipping across space at light speed, bound for who knows where? (Several millennia from now, I hope some faraway life form finds my comments entertaining, if nothing else.)

Along with the ability to play comes playfulness in many forms. Take Elon Musk, for example. An immigrant from South Africa, he has amassed significant accomplishments and fortunes in the worlds of data, finance, clean energy, automotive transportation, and spaceflight. But with all that "serious" stuff going on and literally billions of dollars on the table, there's a strong strand of playfulness, as in placing a sports car into orbit with a dummy astronaut (*Photo A*) and a nav screen that reads "Don't Panic!" (homage to the *Hitchhiker's Guide to the Galaxy*) (*Photo B*). Now if that ain't

Photo A. (Very) high-level playfulness — space entrepreneur Elon Musk is sending one of his Tesla sportscars to the asteroid belt, complete with a dummy astronaut behind the wheel. (Photos courtesy SpaceX)

Photo B. The asteroid-bound sportscar also sports a navigation screen with perhaps the best-known quote of The Hitchhiker's Guide to the Galaxy's Ford Prefect: "Don't Panic!"

playful, what is? What's the connection? Imagination. Folks like Edison, Tesla, Disney, the Wright Brothers, and others could play out their imaginations and connect them to tangible realities that are now commonplace.

Caution – Hams At Play

So this month's visit is an invitation to rediscover your own sense of playfulness. Go back to those days of your youth and touch on the happiness of playing a game and winning, waking up on the first day of summer vacation, of saying "checkmate" for the first time, of catching the fastest kid in the neighborhood by tagging him and making him "it," or dancing to the music like you don't care who's watching.

Get back in touch with the great feeling of passing your licensing test, making that first contact, or completing a goal like Worked All States. Maybe it's the thrill of turning on a pro-

announcements *(from page 2)*

GLENWOOD, IOWA — The Heartland Hams Amateur Radio Club will hold its **Hamfest-2018** on Saturday, April 28 at the American Legion Hall, 104 N. Vine Street. Contact: Don Brown, (712) 520-7942 or Sharon Sullivan, (402) 551-1673. Website: <www.heartlandhams.org>. Talk-in 145.290.

HASTINGS, NEBRASKA — The Amateur Radio Association of Nebraska will hold the **3rd Annual Greater Midwest Radio Show** on Saturday, April 28 at the Adams County Fairgrounds, 947 S. Baltimore Avenue. Website: <http://greatermidwestradio.org>. VE exams.

PERU, INDIANA — The Cass County, **Grant County**, **Miami County**, and **Kokomo Amateur Radio Clubs** will hold the **14th Annual North Central Indiana Hamfest** on Saturday, April 28 at the Miami County 4H Fairgrounds, 1029 W. 200 North. Contact: Steve Shepler, P.O. Box 824, Marion, IN 46952. Email: <shepler1@gmail.com>. Talk-in 147.345+ (PL 131.8). VE exams.

PLYMOUTH, MINNESOTA — The Twin City FM Club will hold the **2018 Spring Tailgate Swap Meet** on Saturday, April 28 at the West Medicine Lake Community Club, 1705 Forestview Lane North. Phone: (612) 718-4718. Email: <trustee.tcfmc@gmail.com>. Talk-in 146.76.

SONOMA, CALIFORNIA — The Valley of the Moon Amateur Radio Club will hold its **Annual Hamfest** on Saturday, April 28 at the Sonoma Veterans Memorial Building, 126 First Street West. Website: <http:/vomarc.org>. Talk-in 145.350 (PL 88.5). VE exams, fox hunt.

SPRING GROVE, PENNSYLVANIA — The York Hamfest Foundation will hold the **2018 York Hamfest** on Saturday, April 28 at Elicker's Grove Park, 511 Roth Church Road. Email: <duane.sterner@yahoo.com>. Website: <www.yorkhamfest.org>. Talk-in 147.330+ (PL 123). VE exams, DXCC / WAS / VUCC / WAC card checking.

ATHENS, OHIO — The Athens County Amateur Radio Association will hold the **Athens Hamfest** on Sunday, April 29 at the Athens Community Center, 701 East State Street. Contact: Carl Denbow, N8VZ, (740) 591-8471. Email: <carl@n8vz.com>. Contact: Eric McFadden, WD8RIF, (740) 593-7176. Email: <william@mcfaddenphoto.com>. Website: <www.ac-ara.org>. Talk-in 145.15. VE exams.

MADISON HEIGHTS, MICHIGAN — The General Motors Amateur Radio Club will hold its **First Annual Swap & Shop** on Sunday, April 29 at the UFCW Local 876, 876 Horace Brown Drive. Contact: Mike Carelli, W8MJC, (248) 835-9545. Email: <swap@gmarc.org>. Website: <www.gmarc.org>. Talk-in 443.075+ (PL 123). VE exams.

MIDDLETOWN, NEW YORK — The Orange County Amateur Radio Club will hold its **Spring Hamfest** on Sunday, April 29 at the Town of Wallkill Community Center, 2 Wes Warren Drive. Phone: (845) 391-3620. Website: <www.ocarcny.org>. Talk-in 146.76 PL 100). VE exams.

THOMPSON, CONNECTICUT — The Eastern Connecticut Amateur Radio Association will hold its **Amateur Radio Flea Market** on Sunday, April 29 at the Raceway Restaurant at Thompson Speedway, 205 East Thompson Road. Contact: John, KA1MPG, (508) 943-4467. Email: <jonas217@verizon.net>. Website: <www.ecara.net>. Talk-in 147.225 (PL 156.7). VE exams.

MAY

CADILLAC, MICHIGAN — The Wexaukee Amateur Radio Club will hold the **Cadillac Amateur Radio and Computer Swap** on Saturday, May 5 at Cadillac Junior High School, 500 Chestnut Street. Contact: Duane, KD8ULW, (231) 824-9813. Email: <kd8ulw@arrl.net>. Website: <www.wexaukeearc.org>. Talk-in 146.98. ARRL card checking.

GRAND FORKS, MINNESOTA — The FORX Amateur Radio Club will hold the **Grand Forks Area Amateur Radio & Electronics Fest** on Saturday, May 5 at Heritage Village, 219 20th Street, NE. Contact: Brian Fedje, KDØUXO, (701) 373-5321. Email: <kd0uxo@outlook.com>. Website: <www.wa0jxt.org>. Talk-in 146.940- (PL 123). VE exams.

SPARTANBURG, SOUTH CAROLINA — The Blue Ridge Amateur Radio Society will hold the **2018 Upstate Hamfest** on Saturday, May 5 at the Piedmont Interstate Fairgrounds, 575 Fairgrounds Road. Email: <wr8rw@arrl.net>. Website: <http://brars.cc>. Talk-in 146.610 or 146.870. VE exams.

SUPERIOR, WISCONSIN — The Arrowhead Radio Amateur Club will hold it **HAM FEST!** on Saturday, May 5 at the Head of the Lakes Fairgrounds-Multi-Purpose Building, 4700 Tower Avenue. Contact: Robert Schultz, KCØNFB, 115 Eden Lane Duluth, MN 55805-1533. Phone: (218) 481-7458. Email: <arac_hamfest@charter.net>. Website: <www.thearac.org>. Talk-in 146.940- (PL 103.5), 147.000- (PL 103.5), or 146.940- (PL 114.8). VE exams, card checking.

SANDWICH, ILLINOIS — The Kishwaukee Amateur Radio Club will hold **The DEKALB Hamfest** on Sunday, May 6 at the Sandwich Fairgrounds, 1401 Sunydam Road. Contact: Bob Yurs, W9ICU, (815) 757-3219. Email: <w9icu@arrl.net>. Website: <www.karc-club.org>. Talk-in 146.730- (PL 100).

BOONE, IOWA — The 3900 Club will hold its **Hamboree 2018** on Saturday, May 12 at the Boone County Fairgrounds-Community Building, 1601 Industrial Park Road. Contact: Clay Conard, WØFS, (515) 838-2285. Email: <hamboree@3900club.com>. Website: <www.3900club.com>. Talk-in 146.850-. VE exams, DXCC card checking.

REIDSVILLE, NORTH CAROLINA — The Rockingham County Amateur Radio Club will hold the **14th Annual Rockingham County Swapfest** on Saturday, May 12 at the Community Baptist Church, 509 Triangle Road. Contact: Paul Patterson, 125 Woodstone Drive, Stoneville, NC 27048. Website: <www.n4iv.org>. Talk-in 147.345 (PL 103.5).

STANWOOD, WASHINGTON — The Stanwood Camano Amateur Radio Club will hold the **SCARC 27th Annual Electronic Flea Market and Hamfest** on Saturday, May 12 at Stanwood Middle School, 9405 271st Street NW. Contact: Fred Laun, N7KRN, (360) 387-0624. Email: <w7pig@arrl.net>. Website: <www.scarcwa.org>. Talk-in 145.19. VE exams.

XENIA, OHIO — The Dayton Amateur Radio Association will hold the **2018 Dayton Hamvention®** on Friday, May 18 through Sunday, May 20 at the Greene County Fairgrounds, 210 Fairground Road. Phone: (937) 276-6930. Email: <info@hamvention.org>. Website: <http://hamvention.org>. Talk-in 146.94- (PL 123). VE exams; card checking; special event station, W8BI.

GOSHEN, CONNECTICUT — The Southern Berkshire Amateur Radio Club will hold its 27th Annual Hamfest on Saturday, May 19 at the Goshen Fair Grounds, 116 Old Middle Street. Contact: Steve, W2VID, (518) 369-2863 or Lee, K1LEE, (860) 435-0051. Website: <www.sberk.org>. Talk-in 147.285+ (PL 77). VE exams.

PINELLAS PARK, FLORIDA — The Glorious Society of the Wormhole will hold its **2018 Wormfest** on Saturday, May 26 at Freedom Lake Park, 9990 46th Street, North. Contact: Mike Scott (727) 492-6454. Email: <jemke@jemke.com>. Talk-in 146.850 (PL 146.2).

TOWNSHIP OF WASHINGTON, NEW JERSEY — The Bergen Amateur Radio Association will hold the **BARA Spring Hamfest** on Saturday, May 26 at Westwood Regional High School. Contact: Jim Joyce, K2ZO, (201) 664-6725. Email: <k2zo@arrl.net>. Website: <www.bara.org>. Talk-in 146.19+ (PL 141.3). VE exams, DXCC card checking.

WEST FRIENDSHIP, MARYLAND — The Maryland FM Association will hold its annual **Memorial Day Hamfest** on Sunday, May 27 at the Howard County Fair Grounds, 2210 Fairgrounds Road. Contact: Maryland FM Association, P.O. Box 351, Hanover, MD 21076. Phone: (301) 641-5313 (6-10 p.m.). Email: <marylandfm@verizon.net>. Website: <www.marylandfm.org>. Talk-in 146.16+ (PL 107.2), 223.16+ (PL 107.2), or 449.0- (PL 107.2). VE exams.

ject you built or repaired and seeing it work as envisioned. One of the great characteristics of ham radio is that it takes others to make the magic complete. After all, if I transmit and no one responds, the loop is open. Satisfaction only sets in when a response comes back. That's where playfulness can make an entrance.

Some of the best exchanges I have had on the radio are with other hams who have shared interesting stories. Descriptions of travel to exotic locations, recommendations of sights to see or restaurants to enjoy in faraway places, accomplishments like living "off the grid," hobbies like Habitat for Humanity or Engineers Without Borders, and more.

I had a contact with a member of the crew at the South Pole who made me feel as though I was visiting that location in person. I once had a conversation with a ham in Samoa who had to take a break to chase the wild pigs out of his hut.

Special event stations commemorating occasions large (Pearl Harbor Day) and small (Oil Heritage Week, Venango County, PA) are a hoot — I have certificates from both. I love history and it's always fun to make contact and get a certificate, but it's even more fun to put an event station on the air and celebrate *something.*

A Headache With Pictures

My daughter Jessica, KD6ARA, once broke us up by defining the term "idea" as a "headache with pictures." When you stop to think about it, so much of our playfulness and enjoyment in conversation comes from the images we create when communicating with others, or being creative in our own thoughts. Imagination is one of the great advantages of radio. If you ever listened to the old radio programs that featured sound effects like opening and closing doors, or the crackling fire created by squishing a ball of cellophane, you were drawn into the "theater of the mind." Orson Welles took that to an apex with his radio production of *War of the Worlds*. You can make your contacts enjoyable and memorable by adding color to routine descriptions. For example, instead of just saying the weather is warm, I heard one person say, "It's so hot here I saw a dog chasing a cat and they were both walking..." Maybe not sidesplitting humor, but colorful — and it conjures up great images.

Escape the Box

So "thinking outside the box" challenges us to break out of our conventions and in some instances, our comfort zones. Yeah, it's easy to exchange a signal report, state your location, and give a weather report. But you'll really get my attention when you tell me about the old car you're restoring, the cross-country trip you're planning in your RV, or the interesting distinguished speaker you listened to last night. Pique my interest. Challenge my imagination. Teach me something. I'll try to do the same for you.

Fun Doesn't Require a License

"If you go back a few hundred years what we take for granted today would seem like magic — being able to talk to people over long distances, to transmit images, flying, the ability to access vast amounts of data like an oracle. These are all things that would have been considered magic a few hundred years ago." –Elon Musk

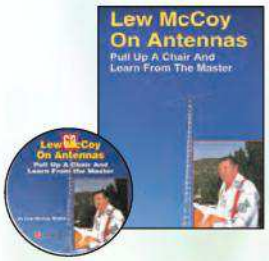
I believe our hobby is a boundless playground that's alive with potential for fun and fulfillment every minute of every day, powered by the millions of radio operators around the world. So let's play — by putting a little more *Magic In The Sky*.

Spring is in the Air...

Lew McCoy on Antennas

by Lew McCoy, W1ICP

Unlike many technical publications, Lew presents his invaluable antenna info in a casual, non-intimidating way for anyone!



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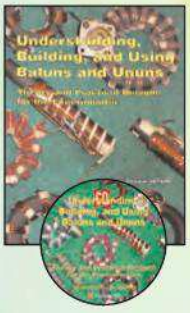
Understanding, Building & Using Baluns & Ununs

by Jerry Sevick, W2FMI

The successor to the popular and authoritative Baluns and Ununs. Great deal of new tutorial material, and designs not in previous book, with crystal clear explanations of how and why they work.



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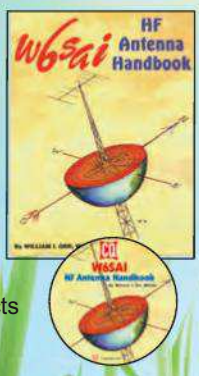
W6SAI HF Antenna Handbook

by Bill Orr, W6SAI

W6SAI was known for his easy-to-understand writing style. In keeping with this tradition, this book is a thoroughly readable text for any antenna enthusiast, jam-packed with dozens of inexpensive, practical antenna projects that work!



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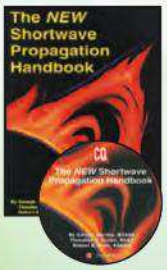
by W3ASK, N4XX & K6GKU

This authoritative book on shortwave propagation is your source for easy-to-understand information on sunspot activity, propagation predictions, unusual propagation effects and do-it-yourself forecasting tips.



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DITS and DAHS

The .A _B... _C._.'s of Morse Code Operating

by Ed Tobias, KR3E

This small but solid guide is the perfect read for those interested in learning or improving CW operating techniques!

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- **Where and how to practice, practice, practice.**
- **Straight Key or Paddle?**
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BY R. SCOTT ROUGHT,* KA8SMA

Winter Field Day 2018... QRP-Style!

Welcome to the April QRP column. This month we delve into Winter Field Day (WFD) … no April tomfoolery here, WFD is an actual event and it occurs each year on the last full weekend in January. The purpose of WFD is simple … to set up emergency communications, make as many contacts as possible during the 24-hour event period, and have some wintertime FUN! For me, WFD is just what the doctor ordered to help beat those northern Michigan wintertime blues that often linger until spring thaw. WFD offers something for every ham, but for the QRP operator it is a winter's dream since it focuses on making contacts from a portable location (preferably from the field) with an alternative power source and simple antennas.

This annual event is sponsored by the Winter Field Day Association (WFDA)[1], not the American Radio Relay League, as some may believe. The WFDA (*Figure 1*) is a group of hams who believe that preparing and maintaining your emergency communications gear and skills should not be limited to just summertime or fair-weather conditions, but rather all types of weather. WFD helps to further prepare and sharpen each ham's operating skills for a professional and timely response in the event that local, state, or federal agencies put out a call for help, whenever that call may come. With freezing temperatures and snow-covered ground in the northern tier of the country and cooler temperatures for those residing in the south, much of the country is affected by less than favorable outdoor conditions when this event is held each January. It is important for all to remember that natural disasters and emergencies can occur anytime and seldom occur during periods of favorable weather.

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Figure 1. The Winter Field Day Association's polar bear on skis logo symbolizes the spirit of WFD … Get outdoors and have some fun!

Those who have participated in this event in the past may recall the first WFD was held in 2007 and was initially sponsored by the Society for the Preservation of Amateur Radio (SPAR). The first WFD had 28 logs submitted, containing nearly 1,600 contacts covering every corner of the United States and Canada and spanning 33 countries. Since then, the event has grown significantly and is now sponsored by the WFDA. According to WFDA Event Manager Tom Phelps, WD8MBE, the event currently has over 2,000 followers on Facebook and more than 500 logs were submitted for WFD 2017. For 2018, WFDA anticipates receiving over 800 logs — a growing event indeed. WD8MBE indicates a fair share of each year's entries are strictly QRP and that the actual number of participants is much higher than the number of logs submitted.

My First Winter Field Day

After several years of making excuses why I should not operate from the field in the dead of winter, I decided that 2018 would be the year I would pack up my gear and set up a portable operation in the great outdoors. Living in northern Michigan and lacking a pair of snowshoes or cross-country skis, I knew that hiking a trail during winter could be difficult so I set my eyes on a local operation. After some deliberation, I opted for the Traverse City State Park, a state-run campground that is open year-round and not far from my QTH. To keep in the spirit of WFD, I decided to pack light and take only those items that would be readily available to me if I were operating during an emergency. Since I was planning to only operate Saturday afternoon/evening and be home in time for a late dinner, packing did not take long.

My first job upon arrival at the campground, after choosing a site for my operation was to load up a fire ring with firewood and start a fire to keep warm. I had the run of the campground (not too many winter campers in northern Michigan in January, HI HI). I moved a picnic table near the fire and then put my eyes toward the sky in search of a tree limb to support my inverted-V antenna. The inverted-V is my preferred antenna for portable operation as it is an effective radiator and needs only one support. I used a slingshot to loop my antenna support line over a limb about 50 feet above ground. After the antenna was in the air, I draped the wires down-

ward and tied them off using masonry line and wooden stakes that were pounded into the ground. Since there would be no hiking for this venture, I brought my homebrew open wire/ladder line for my feedline. It was heavier and more cumbersome than twinlead, window line, or coaxial cable, but I thought I would try something different for this operation … after all, the event is about being prepared in the event of an emergency and I had never tried ladder line in the field.

My portable station consisted of a Yaesu FT-817 transceiver, MFJ 971 antenna tuner, external speaker, hand mic, and straight key. For power, I used a 9-amp gel cell in line with the Buddipole POWERmini portable DC power management system with built-in solar controller and a PowerFilm Solar 20-watt foldable solar panel. Total time to set up camp, hang my antenna and hook up the radio gear was about 45 minutes, not too bad for my first WFD adventure. I will admit, had there been an appreciable amount of snow to contend with, my setup time would have been much longer.

To stay warm outdoors, I wore several layers of clothing (the temperature at the start of WFD was 35° Fahrenheit with wind gusts up to 10 mph). My attire consisted of two pairs of socks, long johns, blue jeans, T-shirt and sweatshirt, boots, coat, hat, and a pair of heavy winter gloves. To keep my fingers warm while operating the radio, I wore a pair of disposable nitrile gloves under my winter gloves. The nitrile gloves enabled me to remove my hands from the winter gloves to tune the radio and press the tiny buttons to activate the radio's menu while maintaining an extra layer of skin (insulation) over my hand. These gloves also protect your skin from wet conditions … I knew it would be "all over" if my hands got wet while operating … cold temperatures and wet hands can quickly spoil any outdoor fun (been there, done that). I have used latex gloves under my winter gloves when working outdoors, but find nitrile to be more durable and more resistant to ripping than latex.

An item I debated about taking was clear plastic sheeting (visqueen). I was not sure if I would have a use for the plastic, but thought it would be a good idea to have it on hand. I was glad I packed the plastic when I discovered the picnic table at the campground was wet from melting snow. I cut a section about 5 feet wide by 8 feet long and covered the wet table with the plastic to provide a dry operating surface (*Photo A*). Since I was not using the entire table, I kept the loose end of plastic available for folding over my radio gear in the event of a sudden snow squall, or worse yet, a bout of freezing rain.

On the Air

I pushed the power switch on my trusty FT-817 around 1930 UTC (2:30 p.m. eastern) and 20 meters came to life with a slew of WFD stations on the air. I scanned the SSB portion of the band and contacted a few of the louder stations before switching to CW and logging a few more contacts. After a bit of operating, I headed to the campfire to put a few more logs on the fire and enjoy a hot cup of coffee. Nothing beats a cup of coffee brewed over an open campfire while listening to the music of dits and dahs in the background. After my warm-up, I tried my luck on 40 meters and logged several more stations on CW and SSB right out of the gate. Forty meters appeared to be in much better shape than 20, where I'd been battling QSB, weak signals, and multiple repeats of exchanges. For this reason, 40 meters became my band of choice for the remainder of my operation.

My portable station performed flawlessly. The open wire/ladder line was a bit bulky for a field operation, but the antenna performed well and I received many excellent signal reports. The Buddipole charge controller, in concert with the foldable solar panel, hit the mark for my power needs. I have used both products for the past several months (see the December 2017 issue of *CQ*[2] for product reviews of the Buddipole POWERmini and PowerFilm Solar foldable panels) and can firmly say these are great products. The solar panel did a remarkable job in turning the sun's rays into energy … even under cloudy conditions and well into the evening (until sunset), it was producing enough juice to charge my battery!

Around 2130 UTC (4:30 p.m. eastern), a posse of unexpected visitors showed up at the campsite. My XYL, our daughter and a few of her friends, and several foreign exchange students (my XYL is a coordinator for a foreign exchange agency) showed up with hot dogs, chips, and S'more makings — all the fixings for a true campfire dinner. This was a nice surprise as I had only packed coffee, trail

Photo A. My outdoor Winter Field Day operation on a cold winter day at Traverse City State Park. The plastic sheet kept the gear dry on a table that was damp from melting snow.

Photo B. Good eats while on the air. Nothing beats a hot dog roasted over an open campfire … even in the middle of winter!

mix, and a bag of pretzels. Although all the activity prevented me from making contacts (my log has a huge hole in it from the time everyone arrived until they left), the food was excellent (skin-on hot dogs roasted over an open fire topped with mustard … better than those at the ball stadium! (See *Photo B*) and I talked-up amateur radio to the students and demonstrated how it can assist during an emergency — a fair trade off in my opinion.

Next Year, I Will…

Despite what my XYL may say, next year I'm taking her laptop into the field to log contacts — my ham shack computer is an old desktop. Knowing my XYL would not be happy if I took her laptop outdoors, I logged with pen and paper at the campsite. After I returned home, I reentered all my contacts into the computer since WFD entries must be in Cabrillo format. N3FJP[3] offers a logging program specifically designed for WFD! The program is easy to use, checks for dupes, tracks contacts and multipliers, and when finished, generates a WFD log file in Cabrillo format that can be attached to an email for submittal to the WFDA. Since I use N3FJP logging software for my regular station and contesting needs, I downloaded the WFD log and added it to my library of contest logging software.

Gloves with a longer wrist are on my packing list for next year. I discovered that when I send code with my straight key, my coat sleeve rides up my arm, exposing my wrist to the elements. A cold wrist equals cold fingers … a less-than-comfortable feeling when pounding brass. I tried bending my arm and adjusting my coat sleeve, but no luck. Another option would be a shirt with sleeves long enough to protect my wrist from frigid temperatures.

WFD Rules, Categories, and General Information

WFD is the last full weekend in January and next year's event is scheduled for January 26 and 27, 2019, the weekend before Super Bowl Sunday. Be sure to review the WFD rules for operating class designation (based on operating location), multipliers, bonus points, etc., before the contest. Knowing how multipliers and bonus points affect your overall score will help you decide how to operate the event (hint — you will gain the most points operating QRP!). Below is an overview of the WFD rules. Visit the WFD website at <www.winterfieldday.com> for a complete list of the rules and log submittal information.

Bands and Modes: All amateur bands are fair game except 12, 17, 30, and 60 meters. Any mode, except FT8 (not an allowable WFD mode) may also be used. A list of suggested frequencies to make it easier for participants to find one

Looking Ahead in CQ

Here are some of the articles we're working on for upcoming issues of ***CQ***:

- CW Results, 2017 CQ WW DX Contest
- TK0C - Between Fishing and Table Tennis "Landing Whales on Wet String"

Plus…

- Make Your Own Remote Base

Upcoming Special Issues

June: Take it to the Field
October: Emergency Communications
December: Technology
February: QRP

Do you have a hobby radio story to tell? Something for one of our specials? *CQ* now covers listening and personal two-way services in addition to amateur radio. See writers' guidelines on the CQ website at <http://www.cq-amateur-radio.com/cq_writers_guide/cq_writers_guide.html>.

another is located on the Winter Field Day website.

Categories: There are three entry categories, Indoor, Outdoor, and Home. "Indoor" is defined as working from inside a remote structure (i.e. cabin, community center, etc.) that does not typically house an amateur radio station. The "Outdoor" category is reserved for those who operate from someplace at least 30 feet away from their normal operating location and not using a previously erected antenna system (operation from a backyard deck or tent, campground, park pavilion, etc.). Obviously, it must also be outdoors. "Home" is defined as operation from inside a house or from another structure attached to a house that is the usual location of an amateur radio station. Home stations may use previously erected antennas.

The Magic QRP Multiplier: Points are earned for each contact. SSB contacts are worth 1 point each and CW/Digital contacts are worth 2 points. Like magic, though, QSO points are multiplied by a factor of 4 if you operate QRP-style (defined as 5 watts or less for CW and 10 watts or less for SSB). Hams who use up to 100 watts receive a multiplier of 2, and those who use 100 watts or more receive no multiplier.

Bonus points can also be claimed for those who use no commercial mains to power radio equipment (1,500 points), are operating from the outdoors (1,500 points), or not operating from their QTH (1,500 points). A 1,500-point bonus is also available if a contact is made via a satellite. Based on the bonus point program, the QRP operator working from the field should be able to claim 4,500 points, and perhaps an additional 1,500, if a satellite QSO is made.

Looking Forward to WFD 2019

After each field excursion, I ask myself whether I would have done anything differently. My answer for WFD 2018 is no, except that I wish I would have prayed a little harder to the ham gods for a few more sunspots. I stayed warm, made contacts that helped polish my emergency communications skills, prepared S'mores and hot dogs over an open fire, and most of all, had FUN! Packing up the gear for a winter's afternoon away from the QTH was exactly what the doctor ordered to cure my wintertime blues.

Will I be on the air for WFD 2019? Absolutely! Will I have a fix for my cold wrist next year? You betcha! Will I work you during next year's WFD? I hope so! If you begin planning now, there is no excuse why you should not be on the air for next year's event. *Until June, 73*

Notes:
1. <www.winterfieldday.com>
2. <http://bit.ly/2FzyKlb>; see pages 28-35
3. <www.n3fjp.com>

BY JOHN LANGRIDGE,* KB5NJD

630 Meters From a Condo? W8ARE Made it a Reality!

… Plus: Retrofitting an HF station in San Francisco; first-ever 2200-meter JT9 QSO and first 630-meter transatlantic JT9 QSO under Part 97 rules; why resonant systems and RF don't always mix, and a very successful beginning to 2018.

Before we get down to the business of the goings-on at MF and LF over the past few months, I want to be clear and emphatically state that *nothing* in this month's column is an April Fool's joke in spite of appearing in the April edition. Some may look at the title as pure fantasy, but I assure you that every bit of it is true. Now, let's get started!

630 and the Condo Dweller

Some time ago, I was approached by Terry Meredith, W8ARE, a condo dweller in Ohio who was interested in operating on 630 meters. In spite of his living situation, he had devised a vertical antenna solution in the woods behind his condo that was amenable to all parties involved, not the least of which was his homeowners' association. The antenna, a 40-meter quarter-wave vertical that was retrofitted with base and top loading for 630 meters, brought Terry quite a bit of enjoyment and success using JT9 until a storm caused a tree to fall on the installation, resulting in irreparable damage.

Terry was not deterred, however, instead deciding to rebuild using a more direct approach, locating his antenna on the patio of his condo, right out in the open (*Photo A*). The height would no longer be 33 feet as was the original antenna, instead settling for a 19-foot tall structure with multiple top-loading spokes attached to an improvised mount that complemented his base loading. Surely the HOA would say something eventually, but at this height, at least it would not be visible from the street.

For RF safety, Terry built the structure from a telescoping fiberglass mast with a 10-gauge wire running down the center as the radiator. As part of his ruse, Terry added a bird feeder and squirrel skirt to the mix (*Photo B*). The top-loading spokes actually look like bird perches and many of us expected that the HOA wouldn't say a word under the circumstances.

Terry rebuilt the base loading coil because the original was too small to cancel his increased capacitive reactance and located it in a camouflaged cabinet hidden in his shrubs on the patio (also visible in *Photo B*). His radials also had to

Photo A. The 19-foot, 630-meter antenna at W8ARE, complete with bird feeder and top loading spokes that resemble bird perches. (Courtesy of W8ARE)

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Photo B. This is W8ARE's fiberglass radiator support, showing the bird feeder and squirrel skirt in addition to the camouflaged ATU cabinet. (Courtesy of W8ARE)

change due to limited space; he used 14 wires, each 16 feet long and spanning 205° around the patio. This physical antenna arrangement is a far cry from his original system but, judging from his early results, it seems to work well, as Terry indicates that, "From Dec 3, 2017 through Dec 19, made 35 JT9 QSOs, over 10 states..." ranging from Oklahoma to Florida to Vermont using just 40 watts applied to the antenna, equating to probably a few hundred milliwatts EIRP (Effective Isotropic Radiates Power).

An Antenna by the Bay

A transmit antenna with similar limitation was retrofitted by Ben Gelb, N1VF, located in San Francisco. Ben already had an inverted-L that he used for HF that was 30-feet tall and supported by a tree with a 30-foot horizontal section that used a fishing pole to support the far end. It was coupled to the transmitter via a remote autotuner. Knowing that he would use the same system for 630 meters, Ben wound a coil on a bucket and made switching between HF and 630 meters quick and easy by using Powerpole connectors (*Photo C*).

Fed against about 10 radials ranging in length from 10 to 35 feet and concentrated over roughly 90° in his backyard, Ben has had a very successful start to his medium-wave career. He reports JT9 contacts with 22 unique stations since October, including Alaska, Hawaii and Pennsylvania, operating at an estimated 5 watts EIRP.

Seeking Contacts, Not Perfection

These success stories are a small sampling of accomplishments achieved by operators on these new bands thus far, and they illustrate the very important fact that a bit of ingenuity and a desire to be successful can go a long way in meeting the goal of getting an effective signal on the air. I often hear prospective operators lamenting how they don't have room for antennas at these frequencies, but I think what they really mean is that they don't have room for the *perfect* antenna. Let me fill you in on something: *NO ONE* has a perfect antenna at these frequencies, not even the professionals.

It doesn't take a tremendous amount of power to find success on these bands either. Recently Keith Ericson, KØKE, in Colorado, reported a failure with his main power amplifier, which brought him up to the legal limit. He thought he was going to be off of 630 meters until he could source replacement parts but, instead of shutting down, he rerouted the driver output to the antenna matching network and got on the air "barefoot." He was amazed to receive WSPR reports from VE6JY at -26 dB S/N using just 2 mW total power out (TPO), which probably amounted to microwatts of actual radiated power. Subsequently, Keith has gone on to complete JT9 contacts using only milliwatts to the antenna. On quiet nights, which the winter often provides, 630 meters can behave like 6 meters, which may explain why we get so many VHF and UHF converts. Don't let yourself think that you can't get on the air for whatever the reason may be. Someone else with similar limitations has likely already done it and done it well.

First 2200-Meter JT9 Contact

Shortly after the opening of the MF and LF bands under Part 97 rules, Doug Allen, K4LY, and Rob Renoud, K3RWR, completed the first two-way JT9 contact on 2200 meters using just a fraction of a watt radiated from each antenna (*Photo D*). A bit of S/N headroom remained for signal fading, so the pair decided to try an FT8 contact, but they were unsuccessful at the time. It's not known at this time whether subsequent FT8 attempts resulted in a successful QSO using that mode. No additional contacts on 2200 meters had been reported as I wrote this in late January.

Rob also experienced another success during the winter, receiving what is believed to be the first 2200-meter reception of a North American station in Europe using WSPR. Mike Dennison, G3XDV, reported on the RSGB-LF reflector on December 28, 2017 that "...The 0352 and 0356 transmissions from K3RWR were decoded with a SNR of -27 and -26dB at 5920 km." Mike added that the path between 2EØILY and N1BUG was also open during December, but the path was not reciprocal. While two-way contacts have been completed in the past on 2200 meters using very slow modes like QRSS-60, it seems that the vigil for a two-way transatlantic JT9 contact on 2200 meters will continue.

First Transatlantic JT9 Contact on 630 Meters

At the beginning of December 2017, David Bowman, GØMRF, reported that

Photo C. The feed point of N1VF's 'tree' inverted-L, showing the ICOM autotuner for HF, the bucket coil for 630 meters, ground rod with radials and matching transformer for the 630-meter coil. Ben uses a Powerpole connector for the radiator to facilitate rapid spectrum changes between HF and 630 meters. (Courtesy of N1VF)

UTC	dB	DT	Freq	Message
2359	Tx		1420	@ K3RHR K4LY EM85
0009	Tx		1470	@ WE4X K4LY EM85
0011	Tx		1470	@ K3RHR K4LY EM85
0013	Tx		1470	@ K3RHR K4LY EM85
0027	Tx		1500	@ K3RWR K4LY EM85
0029	Tx		1500	@ K3RWR K4LY EM85
0029	Tx		1500	@ K3RWR K4LY EM85
0048	-24	0.1	1461	@ K4LY K3RWR FM18
0049	Tx		1461	@ K3RWR K4LY -24
0051	Tx		1461	@ K3RWR K4LY -24
0053	Tx		1461	@ K3RWR K4LY -24
0053	Tx		1461	@ K3RWR K4LY -24
0055	Tx		1461	@ K3RWR K4LY -24
0057	Tx		1461	@ K3RWR K4LY -24
0059	Tx		1461	@ K3RWR K4LY -24
0101	Tx		1461	@ K3RWR K4LY -24
0103	Tx		1498	@ K3RWR K4LY -24
0105	Tx		1498	@ K3RWR K4LY -24
0107	Tx		1498	@ K3RWR K4LY -24
0108	-24	0.0	1496	@ K4LY K3RWR R-26
0109	Tx		1498	@ K3RWR K4LY R-24
0109	Tx		1498	@ K3RWR K4LY RRR
0110	-23	0.1	1496	@ TU ES 73
0111	Tx		1498	@ K3RWR K4LY 73
0113	Tx		1498	@ K3RWR K4LY 73

Photo D. K3RWR and K4LY completed the first-ever 2200-meter JT9 QSO shortly after the band opened to amateurs. (Courtesy of K4LY)

he would be installing a remotely-operated station and antenna at a favorable location that was quieter than conditions at his home in London in order to operate JT9 remotely (via Teamviewer) in hopes of accomplishing a two-way QSO with North American stations over the span of weeks or months (*Photo E*). It didn't take long for stations like NO3M, KA1R, and AA1A, all located in the northeastern U.S., to begin reporting David's signal during the early evening on number of nights. Hearing David was not the main problem; rather transmitting AND receiving the necessary exchanges to call the contact good was the challenge.

On the evening of December 23rd and after several attempts, the historic first transatlantic QSO under Part 97 rules was finally accomplished when AA1A and GØMRF successfully exchanged reports using JT9 (*Photo F*). This is only the beginning and we hope to see many other stations in Europe and North America accept the challenge of very long haul communications below the broadcast band. It's not an easy undertaking, but it can be very rewarding.

When RF and Resonant Antenna Systems DON'T Mix

Laurence Howell, KL7L, was recently testing a short portable vertical for 630 meters that was about 30 feet tall with a loading coil at the base and a gullwing-style top loading element that was 6 feet long. This resonant antenna, located adjacent to his home, had a meager ground system but nevertheless it worked for his testing purposes. During these tests, he was using a Hans Summers Ultimate 3S beacon transmitter generating very low-power WSPR signals. The plan was for this antenna, along with a small transmitter and/or transceiver, to ultimately travel with Laurence to a number of destinations that he frequents in the course of his employment where he has already submitted notification to the UTC of his intent to operate (and 30 days have elapsed).

Laurence's station in Alaska is well equipped for both MF and LF and he has a complement of nice transmit and receive antennas for both bands. His main 630-meter antenna is a Marconi-T that is less than 100 feet tall and has multiple horizontal, parallel, top loading wires to improve on-air performance. The system is on the order of 150 feet away from the house, located in the woods and relatively safe from intruders and wildlife most of the time. Like its smaller, portable counterpart, the main antenna is carefully resonated and matched for optimal power transfer and maximum antenna current.

When Laurence originally told me about his testing, it didn't occur to me that he was going to be on the air simultaneously with both the main antenna and the portable antenna, but that's exactly what happened and the results were pronounced. His test ended almost as quickly as it began with something smelling hot in his garage, which was where he had temporarily located the Ultimate 3S that fed the antenna tuning unit connected to his portable antenna. Upon examination, it was obvious that the Ultimate 3S was no match for the voltage that was being generated at the short antenna from signals received from the main antenna which was operating at considerably higher power levels. As seen in *Photo G*, the BS-170's FETs, located on the RF board, as well as other control circuitry, simply vaporized. Remember, these antennas were only about 150 feet away from one another, but even if they had been a mile apart that may have still been too close, depending on what piece of equipment was coupled to the coax and how much power was applied to the main antenna.

What happened in this case was exactly what led Heinrich Hertz in the 1880s to his discovery that electromagnetic waves can couple between two physically separated tuned circuits.

Photo E. David, GØMRF, installed a remotely-controlled station for JT9 and WSPR in a quiet location that allowed him to successfully complete the first transatlantic QSO on 630 meters using JT9. His antenna is 114 feet tall. (Courtesy of GØMRF)

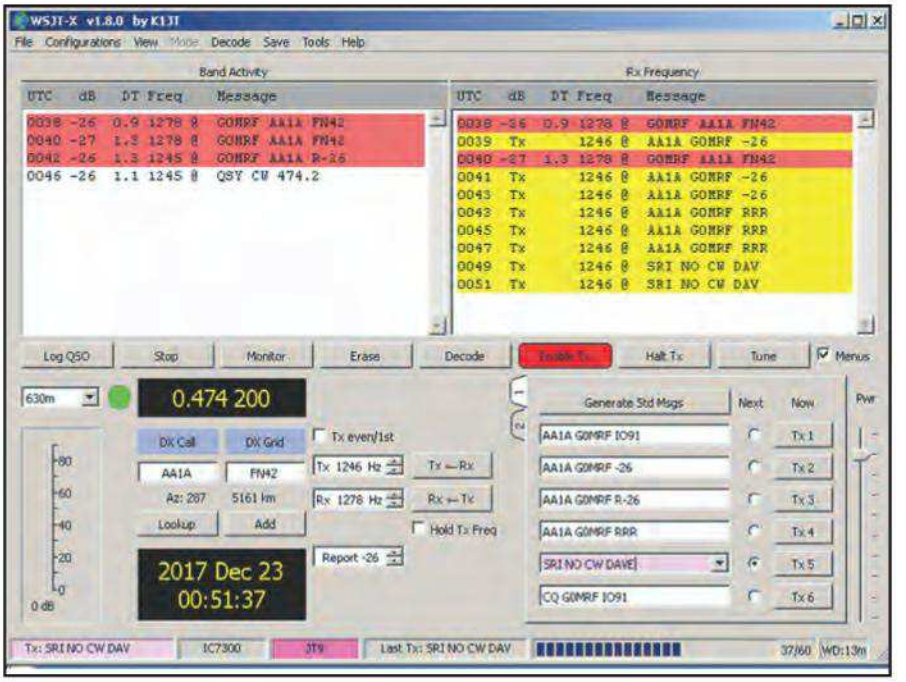


Photo F. Details of the first transatlantic JT9 QSO between AA1A and GØMRF. (Courtesy of GØMRF)

In the Hertz experiment, the received signals manifested themselves as sparks between a gap in a loop of wire that was resonated to the same frequency as his short, capacitively loaded dipole that was coupled to his crude spark gap transmitter. The voltages that the RF and control section of Laurence's Ultimate 3S experienced were likely very significant. Thankfully, his unit can be replaced without considerable expense.

The "Take Home" Message

Every conductor near an energized antenna likely has some RF current flowing on it while you are transmitting, whether or not it is resonant on the transmit frequency. This is particularly true for "backyard" MF or LF antenna systems that are often located on small suburban plots of land close to other structures. Be mindful of other antennas located in the near field of an energized antenna that are resonant on the same band, as dangerous voltages may be developed at the feed point of the unenergized antenna. I have resonant receive loops located within about 100 feet of my MF and LF transmit antenna. When transmitting, relays across the tuned circuits of these receive loops are

closed, shorting out the circuit so that power from the transmit antenna doesn't couple into my receive antenna buss, potentially damaging preamplifiers and receivers. Similarly, be careful with antenna analyzers that are coupled to antennas in the near field of an energized antenna, regardless of band. I recall one time when I was about two miles away from home, helping another amateur with his 630-meter antenna system, and I had forgotten that WSPR was running at my station, transmitting at predetermined intervals. Needless to say, data from the analyzer were bizarre until I realized that my signal a few miles away had burned out the detector diodes. Oops. It doesn't take much field strength to "let the smoke out," so let's be careful out there. If you live in populated areas with lots of MF and LF activity (like the Pacific Northwest and British Columbia!), it may be worthwhile to coordinate with other local operators if you have antenna work to accomplish.

Where Do We Go in 2018?

The new year (still new as I write this in late January) is off to an amazing start. Every week we are seeing a few more stations on the air for the first time. This is not a trivial accomplishment and often requires skill sets be developed that are taken for granted when operating HF. My hope for 2018 is that amateurs will continue to step outside of their comfort zones, learning more about the MF and LF arts and improving their stations, in particular receiving capabilities, as well as operating skills.

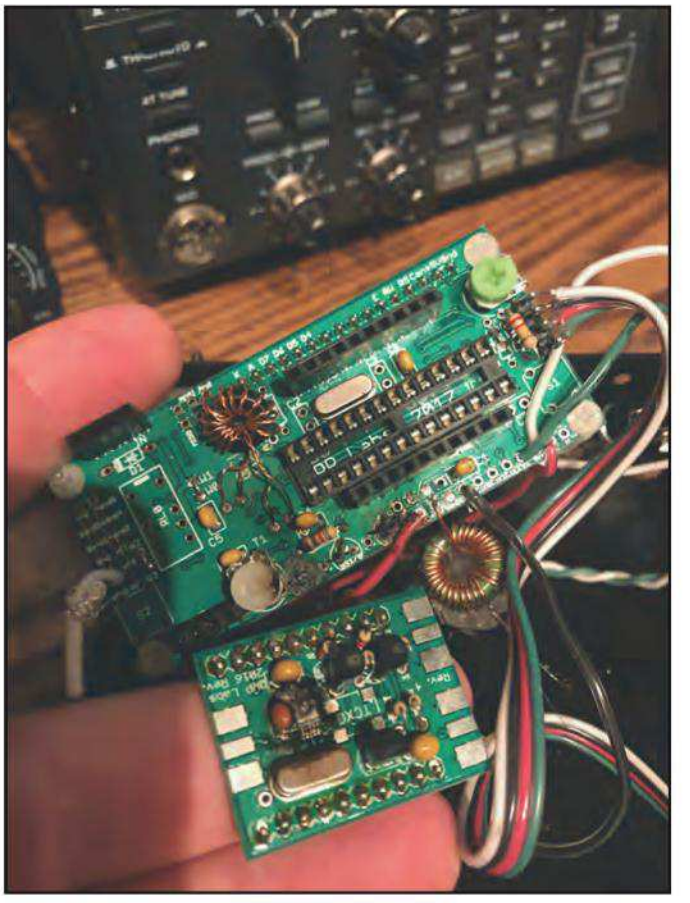


Photo G. Watch out for what you connect to your antenna in a cramped RF environment. KL7L unintentionally backfed RF from his main transmit antenna into a small test antenna located across his yard that was attached to an Ultimate-3S WSPR beacon transmitter. Needless to say, the main transmit antenna won. (Courtesy of KL7L)

The 2018 Grid Chase[1] event is off to a good start and there is plenty of room for many more stations to become active and make a few contacts. If you ever wanted to be the center of a pile up, this event may offer you the chance. Regardless of what you may think of Logbook of the World (LoTW)[2], please be sure to upload your MF and LF contact logs to the LoTW system as this is the only way that participating stations can receive credit for their on-air efforts. I prefer traditional QSL cards but I upload every grid that I work on CW or digital modes to LoTW. If you are not familiar with LoTW there is a link to details located in the notes to help you get up to speed. The process is significantly easier than it used to be.

Opportunities at MF and LF are limited only by your imagination and, as has been shown, massive stations are not necessary to find success. Make it a point to get a station on the air in 2018 and make a few contacts. See you in the pile up!

Notes

1. 2018 Grid Chase activity: <https://tinyurl.com/y9h8tkb9>
2. Logbook of the world: <https://tinyurl.com/33grj3u>

For your convenience, these links plus additional bonus material can be found at <http://njdtechnologies.net/cq/>.

Questions? Comments? Contact me: <KB5NJD@gmail.com>.

What You've Told Us…

Our July survey was all about propagation, a topic that clearly is of great importance to those of you who responded. In fact, that was our first question — how important is it for you to understand the mechanics by which radio signals travel from place to place? — 44% of you responded "very important," followed by 42% saying "extremely important," 10% somewhat important, and 2% each not very important or not important at all.

We next asked the extent to which your knowledge of propagation affects your decisions on operating times and frequencies, to which 65% of you answered that it's a major influence, followed by minor influence at 25%, don't know enough for it to have an impact at 8% and finally, 2% who don't consider propagation at all in their operating decisions.

Our monthly propagation column is a helpful tool to many of you, with 37% responding that it's either very important or extremely important, followed by somewhat important at 38%, not very important at 21% and not important at all to 4%.

We next asked about which HF propagation modes you have knowingly used for making contacts. The big winner there was gray-line at 71%, followed by F_2 layer "skywave" and groundwave at 60% each, sporadic-E at 46%, long-path at 44%, and near vertical incidence skywave (NVIS) at 40%. Next came "other known propagation modes" such as skewed path, meteor scatter, and transequatorial propagation (TEP) at 10%, "don't know" at 10% and "other unknown propagation modes" at 4%.

The same question about VHF propagation modes produced responses of 72% for ground-wave/line-of-sight, 53% sporadic-E, 51% tropospheric ducting, and 32% F_2 layer "skywave." Others included meteor scatter (17%), aurora (15%), troposcatter and TEP (13% each), airplane scatter and "don't know" (11% each), auroral-E (9%), Earth-Moon-Earth (6%), and rain scatter (2%).

Finally, we asked about your interest in articles about new and different influences on propagation — 48% of you are very interested, 40% are somewhat interested, 12% are not very interested and nobody said "not at all interested."

Thank you for your responses. Our free subscription winner this time is digital subscriber **Dave Weinstein**.

April 2018 Reader Survey

We'd like to know more about you…and especially what's important to you in ham radio and how we at *CQ* can help serve you better. There are two ways to respond to this survey:

- **Respond online** at <www.surveymonkey.com/r/CQApr18> [From the digital edition, just click on the link].

- OR -

- **Cut out or photocopy** this page
- **Circle the numbers** that correspond to your answers
- **Mail your completed survey to:** April Reader Survey, CQ magazine, 17 West John St., Hicksville, NY 11801.

We will continue to select one respondent to each survey to receive a free one-year subscription (or extension) to *CQ*. Spring is finally here, and with it come thoughts (we hope) of outdoor hamming. We'd like to get an idea of what you may have planned for this year.

1. Are you planning on any ham-related outdoor activities this year?

Yes 1
No 2
Don't know 3

2. If you answered yes to question 1, what sorts of activities do you have in mind? (Answer all that apply)

Antenna work 4
Backyard/local park operating 5
Bike-in or hike-in portable operating 6
DXpedition operating 7
Field Day 8
HF contesting from outdoor location 9
Island, summit, grid square or similar "OTA" activation 10
Portable operating from vacation QTH 11
Public service activity 12
QRP operating event 13
VHF contesting from outdoor location 14
Winter Field Day 15
Other outdoor operating (what?) 16

3. If you enjoy portable/outdoor operating, what are the main aspects that attract you to it? (Answer all that apply)

Exercise from hiking/biking to an operating location 17
Operating "off the grid" 18
Operating in a low-noise environment 19
Opportunity to enjoy ham radio and being outdoors 20
Other (what?) 21
Do not operate portable/outdoors 22

4. If you answered no to question 1, why not?

Age/health 23
No time 24
No interest 25
No portable gear 26
Other (what?) 27

Thank you for your responses. We'll have more questions next time.

Survey Response for Issue:April 2018

Name _____ **Call Sign** _____

Address _____

City _____ **St/Prov** _____ **Zip/PC** _____

Country _____

E-mail _____

BY KARL SCHULTE,* WA2KBZ

You may have heard it before … "The band was so good he could use a wet noodle for an antenna!" WA2KBZ put the theory to the test on an early April campout.

QRP Pasta

Ham Ingenuity Boils Over for Makeshift Antenna

WA5VJB was up to his reflector in real work for his day job this month, so we pasta baton for this issue to Guest Columnist Karl Schulte, WA2KBZ, who shares this story of really using his noodle to get a station on the air. – W2VU

I sat in disbelief, as I stared at my QRP KX1, with an Elecraft AT1 tuner and CW key. I was all set for some outdoor QRP operation, but it had just sunk in that I had no antenna. How could such a silly thing happen? I had placed the antenna and a light rope in a small fanny pack right by the door, where I could not possibly forget it. It was still there, on the other side of the state. The trip had gotten off to a late start, due a last-minute meeting at work. I was off to a National Guard weekend drill in southeastern Missouri, and that was a 4-hour drive. In the rush, I had gone off without the antenna and a few accessories.

Now it was Saturday evening in (very) early April at a beautiful state park/campground, but unattended at night by any rangers. It had been a long hike up the trail to a lookout area with a few picnic tables, and here was where I had planned to set up my rig. I was ready for some all-night ham fun.

After realizing my antenna was still at home, I started looking around the area, including a park trashcan, for some wire to use as a makeshift antenna. No luck. Nothing but used bottles, food wrappers and an old hose, which some ranger or camper had discarded, I supposed, as it had a tear near one end. So much for hamming that night, I thought.

But at least the weather was warm and the view was great, so all was not lost. It was time to set up my camp and start supper before it got dark. There was a small light by the covered tables, but no AC outlet, and it was not much use in setting up a tent nearby. I had a small pup tent (fiberglass rods, no metal). My gear included a small backpacker gas stove, fuel, and my dinner fixings, besides an emergency Army MRE meal pack. My meal was to be spaghetti, for which I had a box of pasta, salt, sauce in small squeeze bottle, and a small pot. Water was available at a park pump. I had wanted to try camp/QRP fun for myself, as several club members had told me what a blast it was, using camping/backpacking lifestyle and QRP ham radio at the same time. Having been a Scouter for a few decades, camp gear was no problem. So I packed up my little QRP rig, key, small gel-cell battery and a 12-volt solar trickle charger in a waterproof container. I had everything I needed … except the antenna, which was still safely waiting by my back door.

The Proverbial Wet Noodle

As I began cooking the spaghetti, an idea hit me. There was an old joke, when I was a Novice back in 1959, about a weak signal sounding like someone was using a wet noodle for an antenna. Then a picture popped into my head of a line of wet, salty spaghetti for an antenna. Could it work? Well, salty

* <wa2kbz@gmail.com>

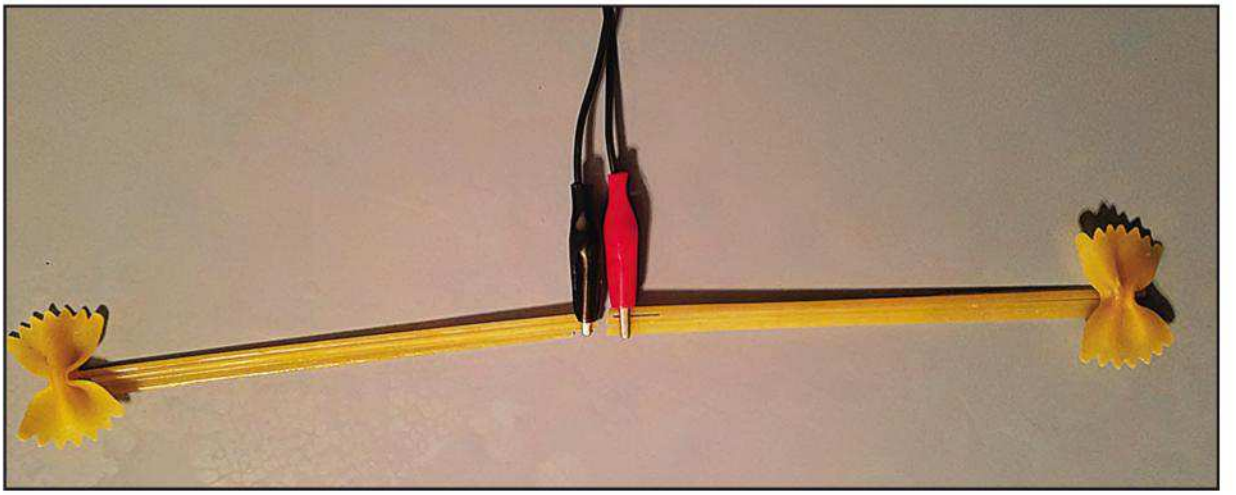


Photo A. Prototype of version 2 of WA2KBZ's pasta dipole … this one with bowties at the end for extra (carb) loading.

Photo B. The secret is in the salt … keeping the spaghetti antenna wet and salty allowed it to be a conductor for RF!

water *does* conduct electricity, and soft, wet, salty noodles mashed together in a row might do so as well. But how could I hold them in a straight (ish) line? I need at least 34 feet, not lying on the dirt. Hey, that hose was about 20 feet long, hmm…

In a few minutes, I had the hose stretched out, sliced lengthwise to make two 20-foot-long channels, like mini-aqueducts, and held off the ground by three wooden park tables I had rearranged. The hose halves were held straight by rocks. Each end was closed by a bottle cap, to keep in as much moisture as I could. For a connection to the tuner, I had a short coax jumper with alligator clips on the end (*Photo A*), normally packed with the tuner (lucky for me!).

Next, I carefully placed strands of cooked, very salty (*Photo B*), pasta down along the hose. As I had a full box, there was enough for three "strands" alongside each other, 33 feet long in total. I squished the joints together to form a connection, then poured a little extra super salty water over each hose half to keep the pasta antenna wet. I had a sort of 20-meter dipole!

The Ultimate Test

First, I used my finger on the end of my RG174 coax jumper and heard faint signals in a couple of spots, so I knew the radio was working. Now for the "Ronzoni antenna!" I clipped a skinny coax jumper to each half and turned on the radio. I pressed down the key and adjusted the antenna tuner. It tuned. How about that!

Wow! I heard 20-meter CW as I tuned the receiver; some signals were strong, to my surprise, coming in around 579. Some SSB too, but that was of little interest to me as this was a CW rig. So I tuned in the strongest station I heard calling CQ and answered him. And do you know what? He did not answer. Tried again with the same result. But the third try was the charm; I was amazed when I got a response. Well, it was not much of a report, but it was a memorable one, with 579/329 reports exchanged (do I have to tell you which report was mine?). The main thing is that I had made a QSO using a wet noodle! In fact, I got two more that night, but soon the antenna dried out and adding more water seemed to wash away a lot of the salt as reception got poorer and I had no more responses and then the band faded.

Hungry for QSOs

Of course, 40 and 80 were out of the question (no more salt or spaghetti), although I did hear a few faint stations while I ate my MRE. Still, it was a very neat experience for sure. I soon hit the sack, wondering if the next time I would try lasagna … (*might it be more broad-banded? – ed*)

The moral of the story is to remember, the next time you go portable QRP, to EAT the pasta and *bring an antenna*!

BY TONY EMANUELE,* K8ZR

Sprinting Into Spring

VHF Plus Calendar

144 MHz Spring Sprint:	April 9th 7-11 p.m. local
222 MHz Spring Sprint:	April 17th 7-11 p.m. local
N.E.W.S. VHF Conference:	April 20th – 22nd Manchester, CT
DUBUS EME Contest 1296 MHz:	April 21st & 22nd
Lyrids meteor shower: Predicted peak	April 22nd & 23rd
SEVHF Conference:	April 26th – April 29th Valdosta, GA
432 MHz: Spring Sprint:	April 25th @ 7-11 p.m. local
Microwave Sprint – 902 MHz & Up:	May 5th 8 a.m. to 2 p.m. local
50 MHz Sprint:	2300z May 12th – 0300z May 13th
Dayton (Xenia) Hamvention VHF/UHF/Microwave Forum:	May 19th
ARRL VHF Contest:	June 9th and 10th
DUBUS EME Contest 10 GHz:	June 15th & 16th

The results of the 2017 Fall Sprints, sponsored by the Southeastern VHF Society, have been scored by Bruce Randall, NT4RT. See *Table 1* for the results. Participation remained at about the same levels as 2016, but with a slight decrease in the 50 MHz Sprint based on log submittals. The 144 MHz Sprint remains the most popular of the four hour-long Sprints, followed closely by the 432 MHz and the 222 MHz Sprints. *Table 2* is a comparison by band over the past five years of Fall Sprint activity[1]. In general, log entries have for the most part remained constant.

c/o CQ magazine
email: <k8zr@cq-amateur-radio.com>

Though the Spring and Fall Sprints are competitive events, they are a bit more casual than the weekend-long VHF contests. The Spring Sprints this month, sponsored by the Central States VHF Society <www.csvhfs.org/>, give you a good reason to get on the air, make a few contacts (or more), say hello to old friends, try a new mode, and have fun. The Spring Sprints are a good warm-up to the ARRL June VHF Contest and the CQ World Wide VHF Contest in July. Why wait until the week before those two contests to determine if your antennas, feedlines, and rotor have survived the winter?

Scores are reported by the participants to the 3830scores.com website. See: <www.3830scores.com/>. Contests are listed in the left-hand column

50 MHz 2017 Fall Sprint

Single Op Callsign	QSOs	Grids	Score
WZ1V	28	15	420
K1RZ	30	13	390
WA2VNV	24	13	312
Rover			
WW7D/R	62	14	868
N2RJ/R	33	26	858
K0BAK/R	20	13	260

144 MHz 2017 Fall Sprint

Single Op Callsign	QSOs	Grids	Score
K1TEO	105	28	2,940
KA2LIM	73	28	2,044
W2KV	80	25	2,000
Rover			
KØBAK/R	77	34	2,618
WW7D/R	82	23	1,886
K9JK/R	48	21	1,008

222 MHz 2017 Fall Sprint

Single Op Callsign	QSOs	Grids	Score
K1RZ	55	30	1,650
K1TEO	57	25	1,425
N2NT	50	22	1,100
Rover			
KØBAK/R	50	22	1,100
WW7D/R	53	15	795
VE3CRU/R	18	18	324

432 MHz 2017 Fall Sprint

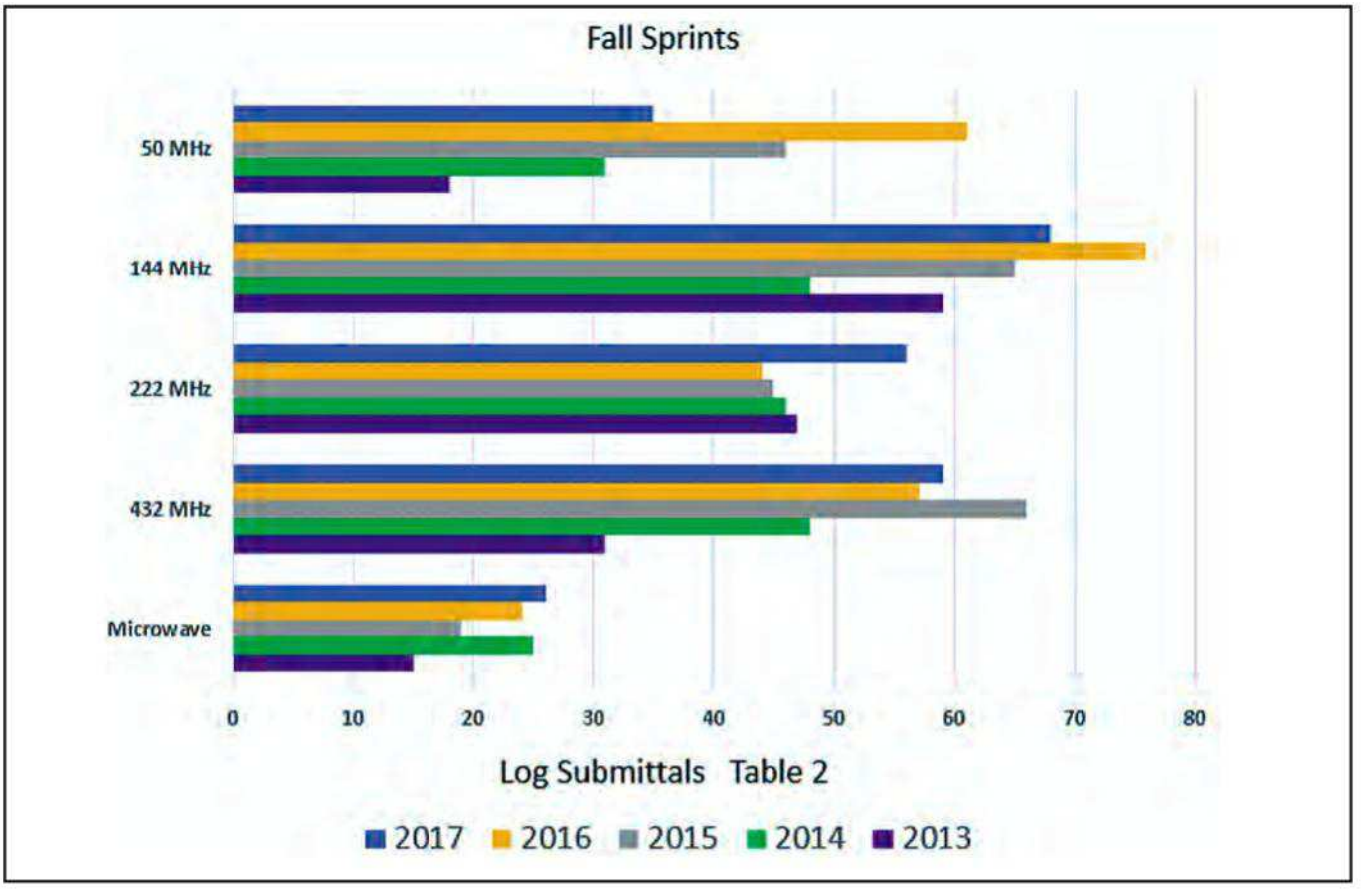
Single Op Callsign	QSOs	Grids	Score
K1TEO	72	26	1,872
K3TUF	64	27	1,728
K1RZ	66	23	1,518
Rover			
KØBAK/R	48	26	1,248
WW7D/R	59	20	1,180
K2WZ/R	45	26	1,170

Microwave 2017 Falls Sprint

Single Op Callsign	Score*
AC7MD	2,945
VE3DS	1,662
W9SZ	1,550
Rover	
KF2MR/R	4,485
VE3CRU/R	4,004
WW7D/R	3,151

*The Microwave Sprint is accumulative distance scoring with 1 point per km worked.

Table 1. Scores of the 2017 Fall Sprints



of the home page. Selected the appropriate Sprint and you will be prompted for the required summary information. Note that submission of your full log with times, stations worked, etc. is not required. The Sprint scoring committee will request logs from the top scorers in each category for review once the submittal deadline has passed. There is really no excuse for not submitting your Sprint score.

To help facilitate QSOs during the Sprints, the use of the internet is permitted and encouraged. The most popular site is the ON4KST website. See <www.on4kst.com/chat/start.php>.

Note that there is a separate page for 50 MHz, labeled as "Enter into the 50 MHz IARU Region 2 chat here," and, though labeled as the 144 MHz & 432 MHz chat page, "Enter into the 144 & 432 MHz IARU Region 2 chat here," this page is also used during the 222 MHz Sprint, Microwave Sprint, VHF contests, and band openings to coordinate activity on 144 MHz and higher bands. In case you are curious, IARU Region 2 is North and South America.

Microwave Update 2018

The Midwest VHF/UHF Society is hosting Microwave Update (MUD) 2018 in Fairborn, Ohio — near Dayton and Wright-Patterson Air Force Base. MUD is recognized as the premier microwave amateur radio event of the year and this year's event will certainly live up to its reputation as Tom Holmes, N8ZM, General Chairman, along with the other members of the Society have been hard at work assembling a first-rate program. In addition to the usual technical presentations, noise figure measurement, test and measurement bench, flea market and vendor area, tours are planned for Voice of America Museum, the U.S. Air Force Museum, and the Carillon Historical Park.

At first blush, the 900 MHz and above bands may seem to be a bit intimidating, but you will find a wealth of experience at MUD and, more importantly, a universal enthusiasm for assisting others to become QRV on the nosebleed bands. If you would like to learn about the microwave bands, then head to Fairborn, Ohio, the second weekend in October. For additional information see: <www.MicrowaveUpdate.org>.

Hamvention VHF/UHF/Microwave Forum

The presentation schedule for the VHF/UHF/Microwave forum at the Hamvention in Xenia, Ohio, is almost finalized. To date, the presentations will include: *Inexpensive and readily available test equipment* by Michael Davis, KB1JEY; John Ackermann, N8UR, will present *The VHF Reverse Beacon Network;* ARRL Contest Branch Manager Bart Jahnke, W9JJ, will review the 1st ARRL 222 MHz and Up Distance Contest as well as discuss other topics related to ARRL VHF contests; and Mark Kerhlikar, WD9HBF, will share his experiences as newcomer to VHF rovering. Check the Hamvention website or Hamvention program for the forum time and location.

Beacons

The advantages of beacons on the VHF, UHF and microwave bands have been well documented. As a reminder, Ron Klimas, WZ1V, maintains the VHF/UHF/Microwave beacon list at <www.newsvhf.com/beacons2.html>. Equally important as advising Ron of a new beacon is notifying him if there has been a callsign change, changes to the beacon's power, antenna, etc., or if a beacon is no longer QRV. Ron can be contacted at <wz1v@arrl.net>.

– 73 & CU on the bands, Tony, K8ZR

Notes:

1. Courtesy of the Southeastern VHF Society.

awards

BY TED MELINOSKY,* K1BV

Denmark Updates Award Program

Allis Andersen has been associated with Danish awards for as long as I can remember. In January, I read that she had updated some of the rules and I was pleased to re-acquaint my association. Here is a nice selection of the available awards, and you will be able to find all of the others at <www.ddxg.dk/award.htm>.

Danish Island Award

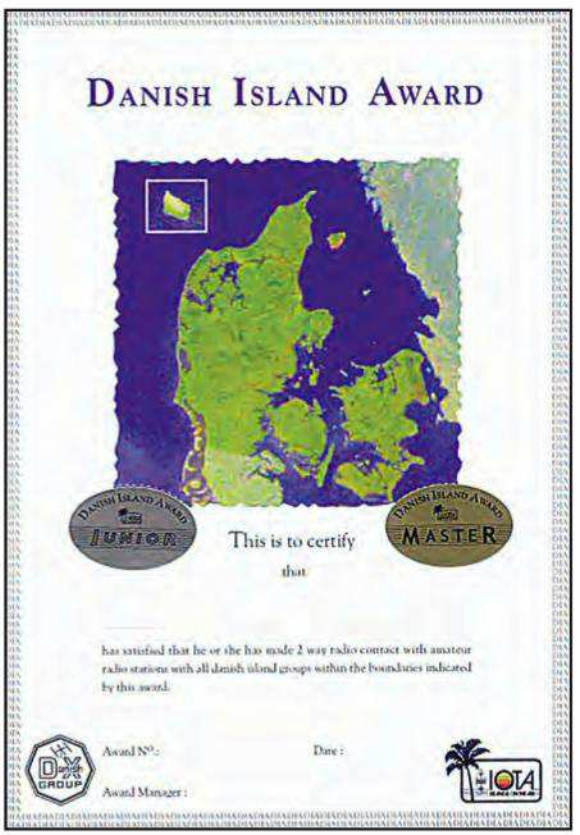
This award is sponsored by Danish DX Group (DDXG) and is available to all licensed radio amateurs and shortwave listeners who provide proof of contact (or SWL) QSOs with Danish Islands. All QSOs after January 1, 1997 are valid. You may use all bands or modes. A QSO via a repeater does not count. The award is issued in three classes.

A. Basic-award: You must have confirmed QSO or SWL with five island-groups.

B. Junior-award: You must have confirmed QSOs with 10 different islands in all six island-groups.

C. Master-award: You must have confirmed QSOs with 25 different islands in all six island-groups.

*12 Wells Woods Rd.
Columbia, CT 06237
E-Mail: <k1bv12@charter.net>



The certificate for the Danish Island Award.

USA-CA Honor Roll

500		1000	
WK3V	3732	KF7ZN	1895
WA3ONY	3733		
KF7ZN	3734		

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 by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 12 Wells Woods Road, Columbia, CT 06237 USA. DX stations must include extra postage for airmail reply.

The islands of Denmark can be divided into six groups, of which some have status as Islands on the Air (IOTA) islands.

- EU-029 Sjaelland Archipilago
- EU-030 Islands in the Baltic Sea
- EU-088 Islands in the northern part of Kattegat
- EU-125 Islands in the North Sea
- EU-171 Nordjylland and the islands in Limfjorden
- EU-172 Jylland East and Fyn group

The basic award can be upgraded with stickers to Junior or Master class. To apply, send your GCR list and payment to award manager OZ1ACB by email to <oz1acb@wiland.dk> or at the address below. The price for the award is 50 DKK, or $7 U.S.; endorsements cost 25 DKK, or $3 U.S. To get an extensive listing of all the islands that count for the award, visit <http://bit.ly/2E5vddU>.

OZ-Prefix-Award

On its 50th anniversary, The Copenhagen Division of Eksperimenterende Danske Radioamatører (EDR) began the OZ-Prefix-Award, which is available to hams and SWLs. To qualify for the award, Danish stations need 3 stations with each prefix, OZ1 to OZ9 (27 QSLs). The rest of Europe needs 2

The OZ prefix award is granted for making contacts with a different callsign prefixes in Denmark.

stations with each prefix (18 QSLs), and the rest of the world needs 1 station with each prefix (9 QSLs). Note that a QSL from the club station OZ5EDR can act as a "joker" to replace one missing QSL. All amateur bands and modes are allowed. There are endorsements for CW, 2x SSB, RTTY, or single band. You do not send QSL cards, but send a GCR-list with the fee of $6 U.S. to: Allis Andersen, OZ1ACB, Kagsaavej 34, DK-2860 Soeborg, Denmark.

The Copenhagen Award

The Copenhagen section of EDR commissioned the Copenhagen Award for the 800th anniversary of the Dutch capital in 1967 and has grown in stature to become a symbol of the entire nation of Denmark. The certificate bears a mermaid that is located in a small park, sitting about 20 to 30 feet into a protected bay, and is surprisingly small. It is usually mobbed with tourists who like to take pictures.

The table below shows the required numbers of contacts with stations located within the city of Copenhagen. You can check your Danish QSLs to see if you qualify. The best way to do this is to examine the address shown on your QSLs. Look at the postal code and see if the numbers lie between 1000 and 2999.

	HF	VHF	UHF
Scandinavian stations:	15	10	5
Other European stations:	10	5	3
DX stations:	5	2	1

The award may be endorsed for phone, CW, or mixed mode; and by single or mixed bands. To apply, send your log, which will need to be certified by two other amateurs, and a $5 U.S. fee to Allis Andersen.

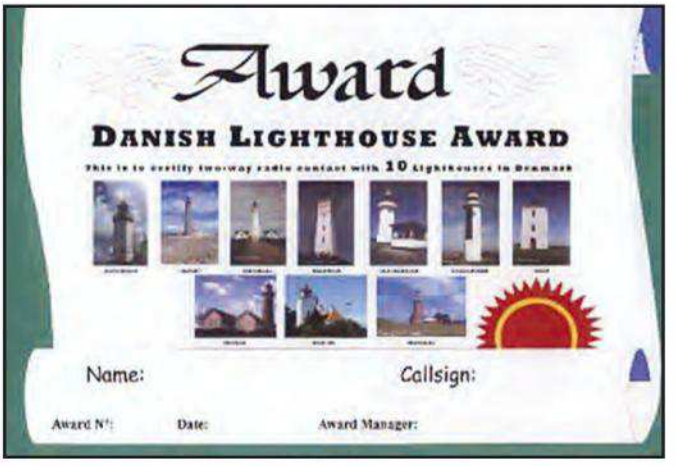
Danish Lighthouse Award

The award is issued by the Danish Lighthouse Society and managed by OZ1ACB. To qualify, you must contact Danish lighthouses on or after 1 January 1996. Contacts with Danish lightships do not count for this award. The QSL (or SWL) of each lighthouse station must reflect their QTH and clearly show a photo or rubber stamp on the QSL to identify the lighthouse. QSL cards are not needed, except at the specific request of the award custodian. Send a GCR list showing full details of the contacts, which need to be certified by the award manager of your national society. The fee for the award is $9 U.S., 50 DKK or 8€. This price includes shipping by first class mail. The award manager is OZ1ACB.

Requirements:
- Award 1: For confirmed QSOs with 5 lighthouses
- Award 2: For confirmed QSOs with 10 lighthouses
- Award 3: For confirmed QSOs with 15 lighthouses

We're always interested in the discovery of new awards, whether they be by your club or by those you've run across while exploring the internet. Send me the URL and I'll take it from there.

The Copenhagen award bears the statue of a mermaid, which is a famous part of park in Copenhagen.



The Danish Lighthouse Award is given to hams who make contacts with Danish lighthouses.

BY BOB SCHENCK, N2OO

Remembering Neville Cheadle, G3NUG (SK)

This month's DX Column is dedicated to a memorial to Neville Cheadle, G3NUG, who became a Silent Key suddenly this past January. I asked his good friend, Chris Duckling, G3SVL, to write something for our readers. Chris was joined by International Amateur Radio Union Region 1 President Don Beattie, G3BJ, in preparing the following. Thanks to both of you.
With the recent loss of David Collingham K3LP, this makes two DX and DXpedition icons that we have unexpectedly and suddenly lost recently. The staff at CQ extends it sincere condolences to the families of both of these very special DXers. RIP Neville and David. Both of you will be missed. – N2OO

BY CHRIS DUCKLING#, G3SVL, AND DON BEATTIE%, G3BJ

Neville Cheadle, G3NUG (*Photo A*) passed away suddenly and unexpectedly on January 14, 2018. He was 77 years old. Licensed for almost 60 years, his contributions to amateur radio will be a fitting legacy of a great DXer, DXpeditioner, and mentor.

Neville was born in Disley, Cheshire, UK to a family heavily involved in the newspaper industry. His father was knighted by Her Majesty Queen Elizabeth II for his services to the newspaper industry and for his charitable work for the Stroke Association. The family moved to Mill Hill in London

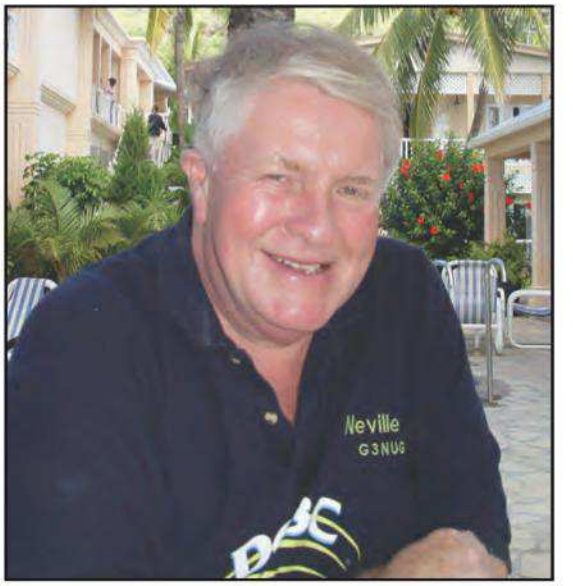


Photo A. Neville Cheadle, G3NUG (SK) (G4JKS photo)

*Email: <n2oo@comcast.net>

Chairman, CDXC, <chris@g3svl.com>
% President, IARU Region 1, <don@g3bj.com>

Photo B. Typical antenna set-up for a Five Star DXpedition. This was at 3B7C on St Brandon Island. (G4JKS photo)

where Neville attended Mill Hill School, whose alumni include Francis Crick, co-discoverer of the DNA molecule. Mill Hill School had also been the site of '2SZ,' the school radio station where Cecil Goyder made the first amateur radio G – ZL contact. That inspired Neville to follow the hobby that would become one of his life's passions.

Like most of his generation, Neville juggled a career, a family, and a hobby, but once he took early retirement at the age of 50 from a major international consultancy company, he concentrated on DXing from his impressive station located just north of London. He was a single-mode operator, achieving all of his successes and awards on SSB. Those include over 370 DXCC entities and 1,025 IOTA islands confirmed.

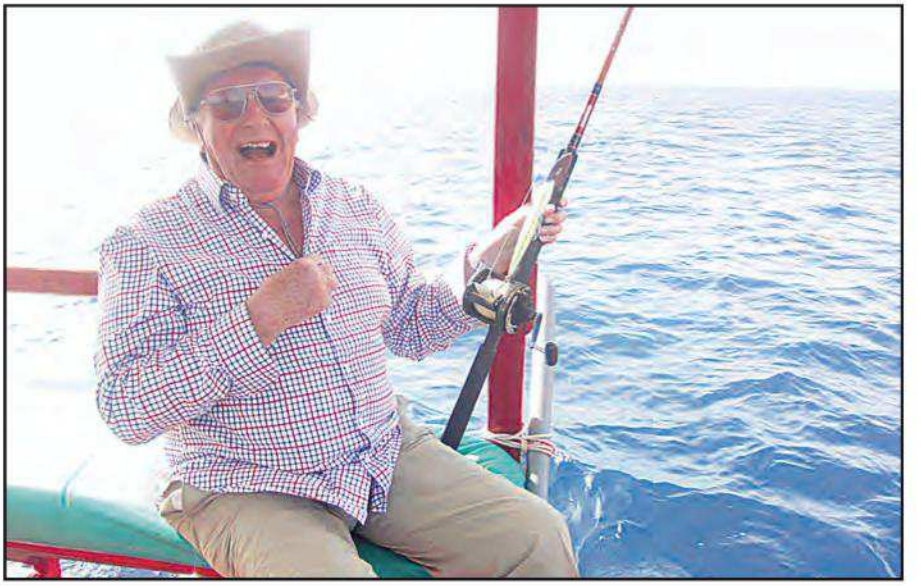


Photo C. Neville was able to take some time out for sea fishing while on the T32C DXpedition to Christmas Island (G2NF photo)

The DXpedition Bug

But working DX was not enough and Neville started to think about putting on DXpeditions himself. He activated a few Malaysian Islands as 9M2/G3NUG and the bug started to bite. By this time, Neville was also heavily involved with CDXC: The UK DX Foundation, which meant that he was in regular contact with many of the UK's top DXers. A plan started to form and in 1998, he and 12 others put on the 9MØC DXpedition to the Spratly Islands. By his own admission, it was a learning curve — but it was also a huge success, making 65,511 QSOs over 14 days of operating.

The success of that first adventure led Neville to form the Five Star DXers

The WAZ Program

ALL BAND WAZ

CW

842 ..... F6KOP
844 ..... W8TU
843 ..... AK7O

Mixed

9404 ..... TF5B
9405 ..... ISØEBO

RTTY

267 ..... TF5B
268 ..... VU2LBW

SSB

5360 ..... F6KOP

SINGLE BAND WAZ

15 Meter SSB

671 ..... JA5ALE

20 Meter CW

631 ..... VU2PTT

160 Meters

492 ..... SV1AOZ, 40 Zones

160 Meter Updates

465 ..... F4GTB, 40 Zones
369 ..... OZ8BZ, 40 Zones

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, John Bergman, KC5LK, 125 Deer Trail, Brandon, MS 39042-9409. 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 John Bergman. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. KC5LK may also be reached via e-mail: <kc5lk@cq-amateur-radio.com>.

The WPX Program

CW

3846 ..... LA6OP
3847 ..... OK1RO
3848 ..... G8GHD
3849 ..... YL2HX
3850 ..... OZ3SM

SSB

4104 ..... LA6OP
4105 ..... KG5LRP
4106 ..... K5LGX
4107 ..... K8JTD
4108 ..... IU8DSP
4109 ..... G4IDF
4110 ..... OZ7S
4111 ..... XE1ZTW
4112 ..... OE3TWA
4113 ..... KJ7M

Mixed

3551 ..... K2MFW
3552 ..... W3OKC
3553 ..... LA6OP
3554 ..... KG5LRP
3555 ..... DK1LRS
3556 ..... VA2WT
3557 ..... AC2QH
3558 ..... IZØOTV
3559 ..... ON7MIC
3560 ..... K8JTD
3561 ..... W6KF
3562 ..... KF7ZN
3563 ..... IU4DTT
3564 ..... VE2ZWA
3565 ..... KT3L
3566 ..... RA4PQ
3567 ..... WW7B
3568 ..... JA7FVA
3569 ..... N6BO
3570 ..... 7K3OZQ
3571 ..... K4CU
3572 ..... OZ3SM
3573 ..... W5IO
3574 ..... NC4RY
3575 ..... WN2J
3576 ..... JA1PWK
3577 ..... XE1ZTW
3578 ..... KEØGHU
3579 ..... WF2F

Digital

740 ..... K6FD
741 ..... DO3GE
742 ..... KG5LRP
743 ..... W8RDZ
744 ..... ON7MIC
745 ..... KM4FTK
746 ..... K8JTD
747 ..... KO4XL
748 ..... KF7ZN
749 ..... W7DMC
750 ..... KT3L
751 ..... JA7FVA
752 ..... N6BO
753 ..... AA9AW
754 ..... K4CU
755 ..... R1BBE
756 ..... NC4RY
757 ..... W6APH
758 ..... KEØHZX
759 ..... WD8KND
760 ..... WA4DYD
761 ..... AB4KJ
762 ..... GM6MQP
763 ..... KB7IVK
764 ..... W5BR
765 ..... WF2F
766 ..... WA9ONY/KH6
767 ..... PY2APK

CW: 350: LA6OP, KJ7M. **550:** K4OY. **650:** JA7FVA. **700:** AB4KJ. **800:** OK1RO, W4GE, JH9AUB. **1400:** RA4PQ. **1450:** OZ3SM. **1800:** N3RC. **2050:** W3LL. **4150:** JN3SAC.

SSB: 350: VE6NS, VK2AAH, G4IDF, W9CLA. **400:** LA6OP. **450:** XE1ZTW. **500:** IZØOTV, K8JTD. **550:** K1HG. **600:** MMØRYP, W4GE. **650:** G8GHD. **700:** EA3IAA, AI8P, W9HBH. **1500:** IK4LZH. **2050:** N3RC. **2550:** JN3SAC. **2650:** HA9PP.

Mixed: 450: W8RDZ, ON7MIC, KO4XL. **500:** K2MFW, DO3GE, KG5LRP, IZØOTV, KF7ZN, W8RDZ. **550:** NA5WH, VE6NS, VE2SYQ, K1HG. **600:** NA5WH, KJ7M. **650:** AL4Y, LA6OP, KN4BBC, KT3L, JA1PWK, XE1ZTW. **700:** N4JJS, WF2F. **750:** GØHEU, W6WF. **800:** AC2QH, JA7FVA, WD8KND, N6DBF. **850:** NC4RY. **900:** K8JTD, AB4KJ. **1000:** DK1LRS. **1050:** VA2WT, EA3IAA. **1100:** JH9AUB. **1150:** G8GHD, W9HBH. **1400:** RA4PQ. **1500:** OZ3SM. **1550:** W4GE. **1600:** IZØFUW. **1700:** TF5B. **1800:** JA7FFN, N7ZO. **2800:** N3RC. **3750:** W3LL. **3950:** HA9PP. **4800:** JN3SAC.

Digital: 350: DO3GE, KG5LRP, KF7ZN, GØHEU, K4CU, W8RDZ. **400:** VE2ZWA, WA4DYD. **450:** AL4Y, JF2OHQ. **500:** VE2SYQ, AL4Y. **550:** NA5WH, K8JTD, EA3IAA, KT3L, N6DBF. **600:** KN4BBC, NA5WH. **650:** NC4RY, JA1PWK, IZØFUW, K4OY. **700:** N4JJS, WF2F. **705:** G8GHD. **1050:** KH6SAT. **1150:** N7ZO. **1350:** N3RC. **1750:** JN3SAC. **2500:** W3LL.

160 Meters: LA6OP, EA3IAA, RA4PQ, NC4RY, WA4DYD, NØRQV
80 Meters: AL4Y, DO3GE, EA3IAA, RA4PQ, NC4RY, AI8P, AB4KJ
40 Meters: AL4Y, KG5LRP, RA4PQ, G8GHD, JA7FVA, JN3SAC, NC4RY, AI8P, GM6MQP, WF2F
20 Meters: K2MFW, KG5LRP, IZØOTV, KF7ZN, VE6NS, VE2ZWA, RA4PQ, JN3SAC, AI8P, W8RDZ, AB4KJ, NA5WH, KEØGHU, AL4Y, WF2F, WA9ONY/KH6, KJ7M
17 Meters: JA7FVA
15 Meters: EA3IAA, RA4PQ, JA7FVA, JN3SAC
10 Meters: RA4PQ, JN3SAC, XE1ZTW

Asia: LA6OP, HA9PP, RA4PQ, G8GHD, JA7FVA, JN3SAC, PG9HF
Europe: K2MFW, DO3GE, LA6OP, IZØOTV, ON7MIC, AB2DP, IU4DTT, KT3L, RA4PQ, G8GHD, JA7FVA, JN3SAC, G4IDF, R1BBE, NC4RY, AI8P, GM6MQP, XE1ZTW, K1HG, OE3TWA, KJ7M
Oceania: HA9PP, RA4PQ, JA7FVA, JN3SAC, KJ7M
North America: K2MFW, K6FD, KG5LRP, K5LGX, W8RDZ, KM4FTK, KO4XL, KF7ZN, W7DMC, VE2ZWA, KT3L, AA9AW, JN3SAC, NC4RY, AI8P, WN2J, W6APH, WA4DYD, XE1ZTW, KB7IVK, W5BR, KEØGHU, WF2F, WA9ONY/KH6

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. and the ARRL Logbook of The World (LoTW).

*Please Note: The price of the 160, 30, 17, 12, 6, and Digital bars for the Award of Excellence are $6.50 each.

Photo D. CDXC Summer Social at Lower Withers Barns (G4JKS photo)

Association. Planning started almost immediately for the next DXpedition, and this was to Comoros in 2001. The team was enlarged and the antenna farm increased. Indeed, the amount of kit needed was such that a 20-foot shipping container was used to transport the equipment ahead of time to Moroni. With a team of 26 operators, D68C made 168,695 QSOs in a three-week period and introduced new modes for a major DXpedition of PSK, FM, and MFSK16. Six-meter equipment was also taken and successfully used to provide over 400 QSOs on the Magic Band.

It was clear that Neville's managerial and organizational skills were producing great results and the third DXpedition, to Rodrigues Island as 3B9C in 2004, proved that a team could consistently produce 10,000 QSOs a day. A particular driver for Neville was always the number of unique callsigns that were worked. Of 3B9C's 153,016 QSOs, just under a quarter were uniques.

For D68C and 3B9C Neville had pioneered a system by which operators could participate for the full duration or just the first or second half of the trip. The beauty of this was that those who were in full-time employment and those with young families could experience DXpeditioning without being away for too long. It also reduced the cost for those participants. Further, it provided places for more operators and allowed

Photo E. Towers at Lower Withers Barns (G4JKS photo)

5 Band WAZ

As of February 15, 2018
1966 stations have attained at least the 150 Zone level, and
968 stations have attained the 200 Zone level.

As of February 15, 2018
The top contenders for 5 Band WAZ (Zones needed on 80 or other if indicated):
CHANGES shown in **BOLD**

Callsign	Zones	Zones Needed	Callsign	Zones	Zones Needed
EA7GF	199	1	W3NO	199	26
H44MS	199	34	W4DC	199	24
HA5AGS	199	1	W4LI	199	26
I5REA	199	31	W6DN	199	17
IKØFVC	199	1	W9XY	199	22
IKØXBX	**199**	**19 on 10M**	WO7R	199	21
IK1AOD	199	1	9A5I	198	1, 16
IK8BQE	199	31	AK8A	198	17, 22
IZ3ZNR	199	1	DK2LO	198	2, 19
JA1CMD	199	2	DM5EE	198	1,31
JA5IU	199	2	EA5BCX	198	27, 39
JA7XBG	199	2	F5NBU	198	19, 31
JH7CFX	199	2	G3KDG	198	1, 12
JK1BSM	199	2	G3KMQ	198	1, 27
K1LI	199	24	JA1DM	198	2, 40
K4XP	199	23	JA3GN	198	2 on 80 & 40
K7UR	199	34	K2EP	198	23, 24
K9KU	199	22 on 15	K2TK	198	23, 24
KBØEO	199	23	K3JGJ	198	24, 26
KZ4V	199	26	K4HB	198	24, 26
N3UN	199	18	K4JLD	198	18, 24
N4NX	199	26	K5FUV	198	18,23
N4WW	199	26	K6FG	198	17, 18
N4XR	199	27	KZ2I	198	24, 26
N8AA	199	23	N2QT	198	23, 24
RA6AX	199	6 on 10M	N4GG	198	18, 24
RU3DX	199	6	OK1DWC	198	6, 31
RW0LT	199	2 on 40M	UA4LY	198	6 & 2 on 10
RX4HZ	199	13	US7MM	198	2, 6
RZ3EC	199	1 on 40M	W4UM	198	18, 23
S58Q	199	31	W5CWQ	198	17, 18
SM7BIP	199	31	W6OUL	198	37, 40
VE2TZT	199	23	W9RN	198	26, 19 on 40
VO1FB	199	19	WA2BCK	198	23, 24
W1FJ	199	24	WC5N	198	22, 26
W1FZ	199	26	WL7E	198	34, 37
W2LK	199	23	ZL2AL	198	36, 37

The following have qualified for the basic 5 Band WAZ Award:

5BWAZ #	Callsign	Date	# Zones
1963	K5LFY	2018-01-20	196
1964	TF3DC	2018-01-22	165
1965	VUPTT	2018-02-08	183
1966	VU2LBW	2018-02-13	163

Updates to the 5BWAZ list of stations:

5BWAZ #	Callsign	# Zones
1934	W5GDX	190
1962	IKØXBX	199

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

5BWAZ #	Callsign	Date	All 200 #
none			

***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, John Bergman, KC5LK, 125 Deer Trail, Brandon, MS 39042-9409. 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 John Bergman. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. KC5LK may also be reached via e-mail: <kc5lk@cq-amateur-radio.com>.

newcomers to dip their toes into DXpeditioning to see if they liked it. Finally, it created an opportunity for first-timers to learn from the more experienced DXpeditioners on the team.

With a pattern developing of a DXpedition every three years, the Five Star DXers took a slightly different approach for their 2007 trip to St. Brandon Island, 3B7C. The only way to get to the island was by chartering a boat and sailing 30 hours from Mauritius — and taking all supplies and support staff with you. The maximum team size was set at 20 operators. Many would need to camp under canvas and all would need to stay for the entire duration. A boat was hired and a "recce" (reconnaissance) trip planned. As the time approached for the recce trip, Neville was diagnosed with lymphoma and had to undergo chemotherapy. The treatment worked and nine months later, he was off to 3B7C to lead the DXpedition (*Photo B*). With a team of 20 operators on an uninhabited island and zero sunspots throughout the entire DXpedition, 137,484 QSOs were made with, once again, a quarter of those being uniques.

The final (as it turned out to be) Five Star DXers Association outing was to be the big one: A trip to the Pacific in 2011 to mount the T32C DXpedition to Christmas Island. Being a 'fly-in' location, the system of operator change-over was used once again, allowing a total of 37 operators to participate. As is well known from the write-ups, the container full of equipment got stranded in Tarawa as ship after ship ran late or broke down. With the DXpedition at risk, Neville's persuasive powers and organisational skills came to the fore. The entire

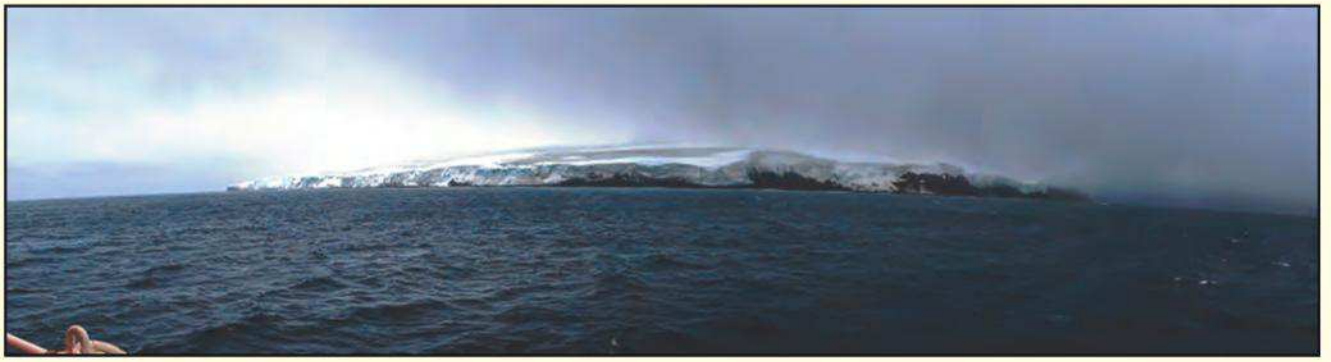


Photo A1. So close and yet so far … the 3YØZ DXpedition team arrived off Bouvet Island on January 31 but was never able to go ashore due to bad weather, heavy seas, and engine trouble aboard their ship. The ship's captain aborted the expedition on February 3 due to safety concerns. (Photo via bouvetdx.org website)

Bouvet DXpedition Cancelled

The planned 3YØZ DXpedition to Bouvet Island was cancelled for safety reasons by the captain of the ship transporting the team and its gear to the remote sub-Antarctic island. The team had arrived offshore (see *Photo A1*) on January 31, but landing was hampered by high winds and high seas that made helicopter operations impossible. Over the next several days, the bad weather continued and showed no signs of improving, according to updates posted on the BouvetDX.org website. Then, on February 2, the ship developed engine troubles and the following day, "the captain of the vessel declared it unsafe to continue with our project and aborted the DXpedition," organizers K4UEE, KØIR, and LA6VM reported on the group's website.

Original plans to return to the departure location of Punta Arenas, Chile, were changed to head for the closer port of Cape Town, South Africa, "in the interest of safety and expediency." The ship arrived in Cape Town on February 17, greeted by a contingent of ZS hams on a 37-foot ketch (see *Photo A2*)! Team members quickly cleared customs and were hosted to a reception by local hams before splitting up to head home. Co-leader Bob Allphin, K4UEE, said there would be future updates "as we begin to unravel this attempt and plan our subsequent strategy."

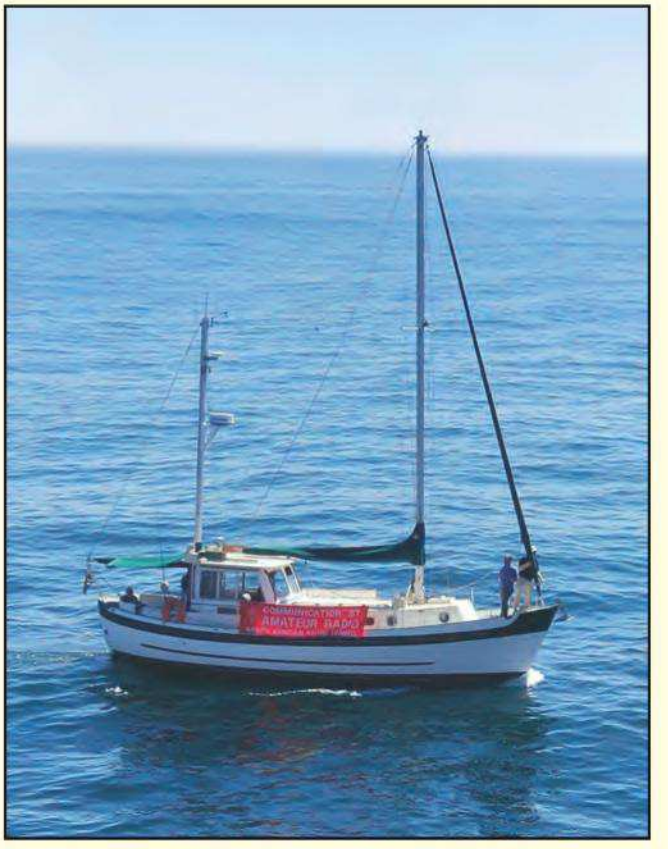


Photo A2. The 3YØZ team was welcomed to Cape Town Harbor by a delegation from the South African Radio League (see banner) aboard a 37-foot ketch, sending "CQ" on the boat's horn! (Photo by 3YØZ team member George Nicholson, N4GRN)

DXpedition was re-planned 10 days before the start and a complete set of equipment for 12 stations was hand-carried by air to the island. The total of 213,022 QSOs — with the now-familiar high level of uniques — set a world record for a DXpedition that still stands today. Indeed at the end of the DXpedition 11 world records had been broken, seven of which still stand today. There was even time for a little non-radio fun, as seen in *Photo C*.

Ambitions Achieved

If any proof were needed that Neville achieved his ambitions as a DXpedition organizer, one needs only to look at GDXF's DXpedition Honor Roll, where the Five Star DXpeditions occupy positions 1, 5, 7, and 10 in terms of QSO totals, and still hold the world record for uniques worked on a DXpedition. Over 100 different operators have been on a Five Star DXpedition and many earned their spurs with Neville.

Much of the experience gained in setting up and running these trips is documented in the DXpeditioning manual he co-authored, *DXpeditioning Behind the Scenes,* which is still in print.

When not organizing or being on DXpeditions, Neville was Chairman of CDXC: The UK DX Foundation. He served in that role for seven years, followed by 14 years as President. He stood down in 2015, whereupon he was made an Honorary Life Member of the club. During his time on the committee, Neville grew CDXC into the internationally-recognized organization that it now is.

Neville and his wife, Trish, hosted the AGM (annual general meeting) and Summer Social for eight years at their home, 'Lower Withers Barns' in the Herefordshire countryside (*Photos D and E*), and prior to that, at their previous home in Hertfordshire. Many have recalled those great garden parties and the superb hospitality provided by Trish.

As if all of this was not enough, Neville was a Director of IREF, a member of RSGB, ARRL, INDEXA, NCDXF, and RRC; and held honorary memberships of the Southern California DX Club and the Southeastern DX Club. He was a former member of RSGB Council and RSGB Management Committee, former Chairman of RSGB HF Committee and organised the HF Convention in its "Beaumont days." In recognition of his contributions to amateur radio DXing, Neville was inducted into the CQ DX Hall of Fame in 2009.

Neville and Trish sold Lower Withers Barns last year and moved to a new home in the South Hams region of Devon, where Neville intended to take up sea fishing, travel more widely, and watch cricket. Alas, it was not to be. He is survived by Trish and his three sons.

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 340 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by an SASE if confirmation of total is required. The fee for endorsement stickers is $1.00 each plus SASE. (Stickers for the 340 level and Honor Roll are available.) Please make checks payable to the Award Manager, Keith Gilbertson. Mail all updates to Keith Gilbertson, KØKG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604 USA.

CW

DL3DXX 339
HB9DDZ 339
K4IQJ 339
K9MM 339
N4MM 339
WB4UBD 339
WS9V 339
EA2IA 339
F3TH 339
K2FL 339
K2TQC 339
K3JGJ 339
K3UA 339
K4CN 339
K4JLD 339
K4MQG 339
K5RT 339
K7LAY 339
K7VV 339
K8SIX 339
N4AH 339
N4CH 339
N4JF 339
N4NX 339
N5ZM 339
N7FU 339
N7RO 339
NØFW 339
OK1MP 339
W3GH 339
W4OEL 339
W5BOS 339
W7CNL 339
W7OM 339
W8XD 339
WK3N 339
WØJLC 339
YU1AB 339
K8LJG 338
KA7T 338
WA5VGI 338
W1DF 338
W9RPM 338
G3KMQ 337
W7IIT 337
K8ME 336
KØKG 336
W6OUL 336
JA7XBG 335
F6HMJ 334
K1FK 334
K9OW 334
PY2YP 334
WG5G/QRPp 334
WD9DZV 334
K2OWE 333
K5UO 333
N6AW 333
W4MPY 333
K6LEB 331
N7WO 331
K6YK 329
W9IL 329
IKØADY 328
OZ5UR 328
AB4IQ 326
K6CU 326
KE3A 326
EA5BY 325
KA3S 325
N3RC 324
N7W0 324
YT1VM 322
4Z5SG 321
N2LM 321
ON4CAS 321
HB9DAX/QRPp 319
HA1ZH 318
N6PEQ 318
W6YQ 318
CT1YH 316
EA3ALV 315
K4IE 295
RA1AOB 313
WA4DOU 312
YO9HP 312
W6WF 309
KT2C 307
W4ABW 306
K7ZM 305
K8IHQ 301
HA5LQ 301
RN3AKK 300
WA9PIE 298
YU1YO 295
WA2VQV 290
K7CU 282
PP7LL 282
WR7Q 282
N2VW 280
K4EQ 280
WB5STV 277
YO6HSU 275

SSB

AB4IQ 340
DJ9ZB 340
DL3DXX 340
DU9RG 340
EA2IA 340
EA4DO 340
HB9DDZ 340
I8KCI 340
IK1GPG 340
IN3DEI 340
K2FL 340
K2TQC 340
K3JGJ 340
K4CN 340
K4IQJ 340
K4JLD 340
K4MQG 340
K4MZU 340
K5OVC 340
K5RT 340
K5TVC 340
K6YRA 340
K7VV 340
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VE2GHZ 340
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W3AZD 340
W3GH 340
W4ABW 340
W5BOS 340
W6BCQ 340
W6DPD 340
W7BJN 340
W7OM 340
W8ILC 340
W9SS 340
WB4UBD 340
WK3N 340
WS9V 340
XE1AE 340
YU3AA 340
JA7XBG 339
KØKG 339
W4UNP 339
K3UA 338
K7LAY 338
K9HQM 338
N4NX 338
W9RPM 338
YU1AB 338
4Z4DX 338
K1UO 338
K8LJG 338
N7WR 338
WA5VGI 338
W2CC 338
W2FKF 338
W7FP 338
W9IL 338
IØZV 336
K3LC 336
K8ME 336
EA3BMT 335
F6HMJ 335
HB9DQD 335
IKØAZG 335
IW3YGW 335
OE2EGL 335
VK2HV 335
W4WX 335
WB3D 335
AA4S 334
EA5BY 334
K9OW 334
PY2YP 334
VK4LC 334
W8AXI 334
XE1J 334
CT3BM 333
IK8CNT 333
K8LJG 333
N6AW 333
OE3WWB 333
WD9DZV 333
AA1VX 332
KE3A 332
N2VW 332
N5YY 332
K5UO 331
KC2Q 331
SV3AQR 331
WØROB 331
W6OUL 331
XE1MEX 331
KD5ZD 330
WA4WTG 330
WØYDB 330
ZL1BOQ 330
AD7J 329
N3RC 329
VE7SMP 329
CT1AHU 328
N1ALR 328
N2LM 328
AE9DX 327
K7HG 327
K6GFJ 326
KE4SCY 326
KF4NEF 325
W6WF 325
W9GD 325
WØULU 324
VE7EDZ 324
F6BFI 323
ON4CAS 323
VE6MRT 323
W5GT 323
N6PEQ 322
W4MPY 322
K8IHQ 321
KW3W 320
TI8II 320
YO9HP 320
W1DF 318
XE1RBV 317
IV3GOW 312
N8SHZ 312
KU4BP 310
W6NW 310
I3ZSX 309
G3KMQ 308
KA1LMR 308
RA1AOB 308
XE1MEX 308
IK5ZUK 307
IØYKN 306
XE1MW 305
K4IE 304
K4ZZR 304
K7ZM 303
4Z5FL/M 302
K7SAM 301
KA8YYZ 301
4X6DK 298
K2HJB 295
F5MSB 293
W9ACE 291
N3KV 289
W6MAC 289
K7CU 287
IZ1JLG 282
WA9PIE 282
WD8EOL 281
IWØHOU 277
N5KAE 276
WA5UA 276
NØAZZ 275
SQ7B 275

RTTY

NI4H. 338
WB4UBD . . . 338
WK3N. 338
N5ZM. 338
OK1MP 337
K4CN 334
K8SIX. 333
W3GH 333
K3UA 332
W9RPM 330
K4WW 323
AB4IQ 317
K4IQJ. 290
N4MM 290
K8ME 278
IN3YGW. . . . 275

BY DAVID SIDDALL,* K3ZJ

Spring Contest Activities and Contest Success with Wire Antennas

This month, we shine the CQ spotlight on the CQWW WPX CW, ARI, and CQ-M International DX Contests; European Youth Contest Program Continues in May at ES5TV and 9A1A; Hams in Japan Begin Youth Initiatives; IARU Reg. 1 YOTA "Summer" Camp Next August heads to South Africa for a "Winter" Camp; What's Up With "4U" Stations; and Contest Success With Wire Antennas

April signifies spring, and for the active contester, spring signals the start of less intense contest operating time inside and more maintenance and new construction time outside.

Spring also is a time to gather with fellow contesters face-to-face and perhaps exchange contest stories and gather new ideas. The first big meeting is in Visalia on the weekend of April 20. This is followed by Dayton on the weekend of May 18. Details of contest-related activities at both venues were in last month's column.

The only major contest on the calendar is the CQWW WPX CW on Memorial Day weekend in the U.S., May 26-27. But there are multiple minor con-

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Calendar of Events

All Year	**CQ DX Marathon**	**http://bit.ly/vEKMWD**
Mar. 24-25	**CQWW WPX SSB Contest**	**http://www.cqwpx.com/**
Mar. 28	UKEICC 80m Contests CW	http://bit.ly/2cv97YF
Mar. 31- Apr. 1	Russian WW MultiMode Contest	http://bit.ly/2CMbWOM
Apr. 1	RSGB RoLo SSB Contest	www.rsgbcc.org/hf/rules/2018/rolo.shtml
Apr. 4	UKEICC 80m Contests SSB	http://bit.ly/2cv97YF
Apr. 5	SARL 80m QSO Party	http://bit.ly/H0IqQf
Apr. 7	LZ Open 40m Sprint Contest	www.lzopen.com/
Apr. 8	North American SSB Sprint	http://ssbsprint.com/rules/
Apr. 7-8	EA RTTY Contest	http://concursos.ure.es/en/eartty/bases/
Apr. 7-8	Mississippi QSO Party	www.arrlmiss.org/
Apr. 7-8	Missouri QSO Party	www.w0ma.org/index.php/missouri-qso-party
Apr. 7-8	SP DX Contest	www.spdxcontest.pzk.org.pl/reg/reg_g.html
April 14	QRP Spring QSO Party	www.qrparci.org/contests
Apr. 14-15	New Mexico QSO Party	www.newmexicoqsoparty.org/wp/
Apr. 14-15	JIDX CW Contest	www.jidx.org
Apr. 14-15	Georgia QSO Party	http://georgiaqsoparty.org
Apr. 15	ARRL Rookie Roundup, SSB	www.arrl.org/rookie-roundup
Apr. 15	Hungarian Straight Key Contest	http://hskc.ha8kux.com/
Apr. 20-21	Holyland DX Contest	www.iarc.org/iarc/#HolylandContest
Apr. 21	ES Open HF Championship	http://bit.ly/2jXalqs
Apr. 21-22	Michigan QSO Party	www.miqp.org/index.html
Apr. 21-22	Ontario QSO Party	www.va3cco.com/oqp/rules.htm
Apr. 21-22	YU DX Contest	http://yudx.yu1srs.org.rs/
Apr. 21-22	CQ Manchester Mineira DX Contest	www.cqmmdx.com/rules/
Apr. 21-22	Nebraska QSO Party	www.qcwa.org/chapter025.htm
Apr. 25	UKEICC 80m Contests CW	http://bit.ly/2cv97YF
Apr. 28-29	SP DX RTTY Contest	www.pkrvg.org/strona,spdxrttyen.html
Apr. 28-29	10-10 Spring Digital Contest	http://bit.ly/1FrFeBc
Apr. 28-29	Helvetia Contest	http://bit.ly/2lR2L8v
Apr. 28-29	Florida QSO Party	http://www.floridaqsoparty.org/
May 1	AGCW QRP/QRP Party	http://bit.ly/1gnVDX0
May 5	FISTS Spring Slow Speed Sprint	http://fistsna.org/operating.html
May 5-6	7th Area QSO Party	http://ws7n.net/7QP/new/Page.asp?content=rules
May 5-6	10-10 Spring CW Contest	http://bit.ly/1FrFeBc
May 5-6	ARI DX Contest	www.ari.it/
May 5-6	Delaware QSO Party	www.fsarc.org/index.htm
May 5-6	Indiana QSO Party	www.hdxcc.org/inqp/rules.html
May 5-6	New England QSO Party	www.neqp.org/rules.html
May 12	FISTS Spring Unlimited Sprint	http://fistsna.org/operating.html
May 12-13	Arkansas QSO Party	http://www.arkqp.com/operating-aids/
May 12-13	**CQWW Foxhunting Weekend**	**www.homingin.com/joek0ov/nfw.html**
May 12-13	CQ-M International DX Contest	http://bit.ly/2EB4IgC
May 12-13	MARAC USA QSO Party	www.marac.org/contestrules.htm
May 12-13	Volta WW RTTY Contest	www.contestvolta.it/
May 19-20	His Majesty King of Spain CW Contest	http://concursos.ure.es/en/
May 19-20	Baltic Contest	www.lrsf.lt/bcontest/english/rules_html.htm
May 19-20	EU PSK DX Contest	www.eupsk.com/
May 26-27	**CQWW WPX CW Contest**	**www.cqwpx.com/**
May 27	QRP ARCI Hoot Owl Sprint	www.qrparci.org/contests

tests, several of which are notable. We focus below on the two for which the IARU Region 1 Youth Contest Program (YCP) in Europe is sponsoring youngsters at "superstations." These are the ARI International DX Contest on May 5-6 and the CQ-M International DX Contest on May 12-13.

Recently there has been some confusion in contests about the multiplier status and location of amateur stations licensed by the United Nations (U.N.). Don't let the U.N. stations throw you off your game in a contest. The contest sponsors know how these stations count and will score your log correctly. If in doubt about the location of a "4U" station, work it and let the contest sponsor's log checking software calculate your correct score. The sponsor checks multipliers anyway, so don't sweat it.

This month, we also focus on two operators who regularly participate in contests and accomplish very respectable scores with modest stations and only zero-gain wire antennas. It might surprise you that one of them wrote this column for 25+ years, is a familiar face on the contest scene, and is a two-time WRTC medal winner. The other operator is a newer face on the contest scene, but one who has honed his skills with many hours on the air with his modest station and single wire antenna on a small suburban lot.

ARI International DX Contest

The annual Associazione Radioamatori Italiani (ARI) International DX Contest will be found on the bands from 1200 UTC on Saturday, May 5, through 1159 UTC on Sunday, May 6. This contest tends to be fast-moving when the bands are open to Europe. Everyone can work everyone outside one's own country for points, not just Italian stations. Only 80-10 meters are employed, no 160 meters (also no 60, 30, 17 or 12 meters). Each station may be worked on each band in three contest modes — SSB, CW, and RTTY — for a total of 15 possible contacts with each station.

Italian stations send their province as the exchange, including IT9 (Sicily) and ISØ (Sardinia). Stations located outside Italy send a consecutive serial number. Multipliers consist of DXCC countries worked plus Italian provinces worked on each band. Note that although the same station may be worked in each mode on the same band, multipliers are calculated by band only, not mode.

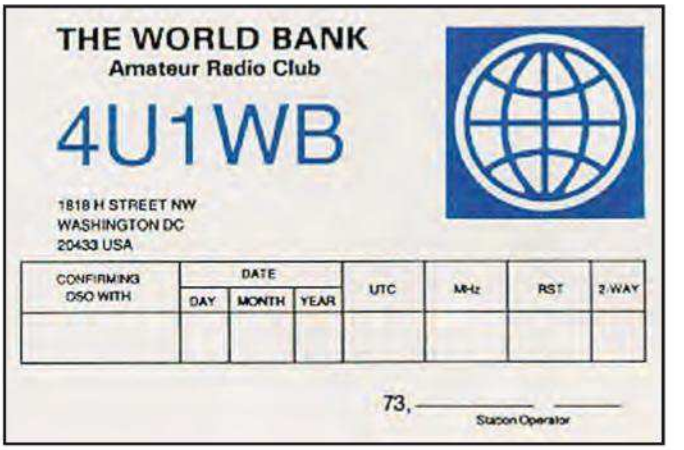
Entry categories include single modes and mixed mode. Each contact with an Italian station counts 10 points. Each contact with a non-Italian station on a different continent than that of the entrant counts 3 points. And each contact with a station in a different country but on the same continent as the entrant counts 1 point. Thankfully, contest logging programs figure all this out for us! Logs are due no later than 5 days after the contest ends. Information is at <http://bit.ly/2BDRelY>.

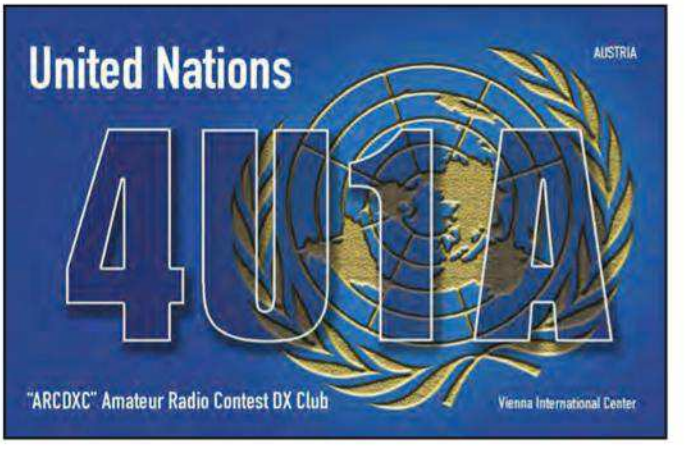
Look for the youth contesters who are expected to be operating from ES5TV in this contest and say "hi."

CQ-M International DX Contest

This will be the 62nd running of the CQ-M International DX Contest, organized by the Russian association Soyuz Radiolyubiteley Rossii (SRR). (This contest is not to be confused with the CQMM contest based in Brazil that runs in April.) Some of the websites associated with this contest were not functional as of early February, but hopefully they will be fixed. The contest has been held every year since 1957.

The contest period runs from 1200 UTC on Saturday, May 12 through 1159 UTC on Sunday, May 13. Each station may be contacted twice on each band, once using CW and once using SSB. Consecutive serial numbers are exchanged.





Photos A and B. The 4U prefix designates a United Nations station. DXCC lists 4U1ITU and 4U1UN as separate DXCC entities. All other U.N. stations count for the DXCC country in which they are located. Depicted are QSLs from 4U1WB at the World Bank in Washington, D.C. and 4U1A at the Vienna International Center in Vienna, Austria. Both stations entered this year's CQ WPX RTTY contest. Despite being in two different DXCC countries, they count for the same "4U1" multiplier for WPX purposes.

Multipliers are the DXCC list plus the R5-150-C list. Multipliers are counted once per band regardless of mode. Don't panic. Your logging software will figure it out, and the sponsors run your final log through their software so that everyone's multipliers derive from the same database.

Youth participants in the YCP program are expected to be on the air from 9A1A for this contest, so look for them. Contest details are at <http://bit.ly/2EB4IgC>.

Young Contesting Program (YCP) Continues in IARU Region 1

Lisa Leanders, PA2LS, announced that the Young Contesters Program (YCP) will continue as an IARU Region 1-sponsored program in 2018. Youth are invited to apply to operate one of the four selected contests. As noted above, two of the four are in May: The ARI International DX Contest (May 5-6) and the CQ-M International DX Contest (May 12-13).

During the ARI contest, youth operators will be invited to operate at ES5TV. The next weekend, up to six young operators also will be selected to operate at 9A1A during the CQ-M competition. As we have written in previous columns, these two stations have hosted youth teams in past years.

Two past YCP contest weekend participants, Tomi, HA8RT, and Philipp, DK6SP, will be competing in Germany at this summer's WRTC2018 as youth team operators. They both also are alumni of the Region 1 YOTA (Youth On The Air) summer camps. See January 2018 *CQ* magazine at p.103 for pictures of the youngest participants at WRTC2018.

Japan Initiates Youth Activities

The successful summer camps conducted in Europe for young operators have been noted in past columns. IARU Region 1 now sponsors the YOTA camps as well as the YCP program discussed above, and in 2016 and 2017, several youth participants from Regions 2 and 3 were invited to attend. Now a similar youth initiative is being undertaken in Japan. It appears from the new YOTA Japan website that a youth contesting program similar to the YCP in Region 1 will be a component in the Japanese effort in addition to a YOTA camp. Well-known contester and DXer Tack, JE1CKA, is among the listed organizers. See more at <http://jouban.jp/yota-ja/>.

2019 YOTA Camp in South Africa

As noted above, since 2014, the "Youth on the Air" (YOTA) camps in Europe have been sponsored annually by Region 1 of the International Amateur Radio Union (IARU). Next year, for the first time, the annual camp will be held outside of Europe. It will be hosted by the South African Radio League (SARL) in South Africa, so it will be the first "Winter" YOTA camp! It should be quite an adventure for the youngsters lucky enough to attend, and may attract more African participants as well.

United Nations Amateur Stations

Recently Masa, AJ3M, and long-time operator at 4U1WB at the World Bank in Washington, D.C., ran into some difficulties when a close look at the rules of several contests seemed to indicate that his license must be issued by the country from which he is operating and his callsign reflect that country. However, The United Nations (U.N.) considers the whole world to be its "country" and assigns 4U callsigns anywhere, so what to do? The World Bank is a U.N. agency, so 4U1WB is a U.N. station located in the United States.

Of course, this problem is an unforeseen circumstance, and after some backs-and-forths — including initial DQs from CQ's own WPX contests — the matter was straightened out. The CQ WPX rules were amended and the DQs reversed. The ARRL contest desk now also has clarified that its analogous rule was not meant to apply to U.N. amateur stations. Everything has returned to normal.

In this process it became apparent that many competitors are not aware that the U.N. can (and does) exercise licensing authority for amateur stations in areas that it controls.

U.N. headquarters in New York (4U1UN and its related callsigns) and the International Telecommunications Union (ITU) in Geneva, Switzerland (4U1ITU and its related callsigns) were granted DXCC status based on earlier DXCC rules and grandfathered when the rules were changed. As a consequence of the rules change, today U.N. stations not located at the U.N. headquarters or ITU in Geneva simply count the same as other stations within their host DXCC country.

One location, the Vienna (Austria) International Center (VIC) (4U1VIC and other related callsigns) has unique status. It is NOT on the DXCC list, but IS on the German Worked All Europe (WAE) country list. So stations at that location count as a multiplier in the WAE contests (and in the CQ World Wide contests because CQ uses the DXCC list plus the WAE list for counting multipliers, plus IG9/IH9, which are located in a different CQ zone than Italy proper) for counting multipliers.

In early February in the CQ WPX RTTY contest, operators at both 4U1WB in Washington, D.C. and 4U1A at the VIC participated and submitted entries. This demonstrates an exception to the rule that a prefix denotes the country of operation. In this case both stations have the same prefix and are counted as the same multiplier in the WPX contest notwithstanding that they are located in different DXCC countries separated by the Atlantic Ocean and a lot of land.

A minor difficulty may arise in contests focused on working only certain countries, such as during the ARRL DX and the DARC WAE contests. It helps if you know that 4U1WB is in the U.S., so no points are gained by working it from stateside in either contest; but 4U1A is at the VIC and should be worked for points in both contests. 4U1A counts as Austria in the ARRL DX and as 4U1V for the WAE.

In addition to 4U1WB and 4U1A, U.N. stations actively on the air in the last six months include 4UØR at the VIC and 4U1GSC in Italy. 4U1VIC also sometimes is active. Historically, there also have been 4U stations operated "4U portable" by members of U.N. peacekeeping forces or staff, although I haven't heard such stations on the air recently.

Behind the Bylines…

…a little bit about some of the authors whose articles appear in this issue…

Doug Zwiebel, KR2Q (SSB Results, 2017 CQWW DX Contest, p. 10) is one of three co-directors of the CQ World Wide DX Contest. A member of the CQWW Contest Committee since 1979, Doug is a world-class QRP contester, having multiple first-place world, North America and U.S. finishes to his credit, stretching back to 1988. Professionally, he is an administrator at New York Presbyterian Hospital in New York City.

Mike Charteris, VK4QS ("The CQ World Wide DX Contest: What's In It For Me?" p. 20), has a varied background that extends from managing a Tandy Electronics (the Australian version of RadioShack) store, to working in electronic warfare in the Royal Australian Navy (for which he was awarded the Australian Defence Medal) and serving as an electrician for the Queensland Railway. An amateur since 1985, Mike has been very active in the Wireless Institute of Australia (the VK national ham radio society) and wrote the VK4 News column for WIA's Amateur Radio magazine for two years. His perspective on operating the CQWW SSB Contest as a non-contester will be followed next month by a discussion of his experiences during the CQWW CW weekend.

Bob Locher, W9KNI ("CQ Reviews: Elecraft KPA1500 Solid-State Amplifier," p. 28), is an accomplished DXer and ham radio institution. A co-founder of Bencher (manufacturer of paddles and antennas) and former owner of Butternut Antennas, as well as founder of Idiom Press, Bob has also written two books, *The Complete DXer and A Year of DX*, which chronicles his successful quest to win the CQ DX Marathon, for which he provided major inspiration. Bob lives (and chases DX) in Grants Pass, Oregon.

Professor Emil Heisseluft of the Lauton Institute in Grossmaulan Der Donau, Austria ("Worked All Rivers and Tributaries," p. 25), has contributed to the April issue of *CQ* for 33 of the past 42 years. He has, among other notable achievements, successfully predicted the advent of stealth technology and cloaking techniques, which were the subject of a recent patent.

The website maintained by the U.N. Amateur Radio Contest Club has a lot of historical information on "4U" stations and scheduled future operations using special prefixes. It is at <www.cqdx.ru/4u1a/>.

If in the heat of a contest you hear a 4U prefix but don't know where the U.N. station is located, just work it. The operators of these stations more likely than not are well acquainted with other operators' confusion and used to dealing with it. Many logging software programs correctly account for the known U.N. stations, so usually such stations will be accounted for correctly on your screen score. But if not, it still is no problem. You can be sure that the contest organizer will know of any such operation and that their software will handle your log correctly.

Finally, in addition to the "4U" prefix, there are two other prefixes assigned by the ITU to U.N. agencies. C7 is the prefix for the World Meteorological Organization (WMO), and 4Y is the prefix assigned to the International Civil Aviation Organization (ICAO). Both C7A and 4Y1A have been active on the ham bands from the VIC, and therefore count for WAE but not for DXCC.

These prefixes used for amateur stations are identical to those used for other communications purposes. They also form the basis for, but may not exactly match, aircraft registration identifiers.

Contest Success With Wire Antennas

An oft-asked question is "what is the most important element for contest success?" Many competitors focus (obsess?) on having the latest and best transceiver with the highest numbers in laboratory testing, a large array of multiple beam antennas at varying heights in order to cover all the propagation angles, or a carefully-selected location such as an oceanside cliff or mountaintop.

I suggest that it is most important to get on the air and hone skills with whatever equipment and antennas you have available. Not only does operating improve your skills, but it also may keep you interested long enough to acquire that new SDR, towers and antennas, and new location that will rival Marconi's out on Cape Cod. A second suggestion is to join some more experienced competitors in a multi-operator effort for at least a few contests. You might express your interest to a member of an existing group that might welcome some help, or you might invite several operators to your station.

Bigger and better antennas, improved equipment, and ideal locations will improve bottom line results. But it is a BIG mistake to put off competing until you have an ideal station that may or may not ever materialize. If and when you finally attain your dream QTH, equipment, and antennas, suddenly you'll realize that others easily are beating you. Do not underestimate the importance of skill. It is just too easy to not get on the air because "I could only put up a dipole" or "the new radio hasn't arrived yet," or "I can't beat so-and-so."

This month we focus on two operators who regularly get on and accomplish very respectable scores with modest stations and only wire antennas and a tuner. On paper, if you have a tribander at your station, you already have more firepower. But try to beat these guys.

It might surprise you that one of these guys wrote this column for over 25 years, is a familiar face on the contest scene, and a two-time WRTC medal winner. The other is a newer contest operator who has honed his skills with many hours on the air using his single wire antenna and modest station on a small suburban lot. The similarity between the two is that it is very difficult to beat either one of them, even with much better stations.

Photo C. John Dorr, K1AR (standing) and visitor Sandy Raeker, DL1QQ, at John's station in Windham, New Hampshire. (Courtesy of K1AR)

Meet John Dorr, K1AR (*Photo C*). You probably have heard of him and maybe even met him. CQ Contest Hall of Fame member, four-time WRTC participant with two WRTC medals to show for it, holder of multiple contest records, and many more ham radio contest accomplishments.

What many may not know is that when John moved to New Hampshire, he dispensed with all of his "gain" antennas. For years, when operating from home, it has been with his trusty Drake MN2000 tuner and a couple of wires in the trees. Specifically, John has three wire antennas: An inverted-L for 160 meters; an inverted-V for 40 meters at 70 feet; and a dipole for 80 meters at 60 feet that he uses with his MN2000 for 10, 15, and 20 meters as well. The equipment in the shack is an ICOM 781 transceiver and Ameritron AL-1200 amplifier. Are you impressed? I didn't think so. But you will be.

Being in New Hampshire at a good location is helpful, but John has employed this rather basic station (by today's contest standards) for CQWW CW every year since 2011 to go up against the beams and wire arrays that abound in New England and elsewhere.

Not to over-emphasize John's success, but since 2011, except for 2016, he has placed in the top 10 for North America in the single-operator all band assisted category every year. John was number 3 in North America and 8th in the world the first time he used his wire antennas at home. I would add that, in some of those years, power outages took hours off his operating time.

The piece of John's advice that sticks with me as underappreciated wisdom comes from comments he made right after the first time he used his wire antennas in a major contest, the 2011 CQWW CW. "I'm now convinced that much of the small station behavior is in the operator's head."

What does that mean? Act like you have a big station, even if you don't. Call CQ a lot, trying to get runs going, and sometimes that will be very successful. Use all your skills when trying a break a pile-up; don't just assume you can't break it.

Appreciate that your dipole will detect signals from directions that your beam would exclude.

John has kept his "big station" mojo by doing regular stints at K3LR. My advice to anyone with a small station is to gain experience at a bigger station with top operators. If you do this, you will learn many tricks even if all you do is help out at one of multiplier stations. I had a similar experience in the 1970s at W3AU, then one of the largest multi-multis in the world. My scores miraculously increased when I operated at my tribander-and-wires little club station. Inevitably I had acquired some new operating skills while at the W3AU superstation.

Looking South

Can someone outside New England also have success? Success should be measured against your peers in your own geographic area. Having just wires to take on the beams and wire arrays in your vicinity may seem to be a losing proposition, but it isn't if you develop sufficient skill.

Tim Shoppa, N3QE (*Photo D*), operates from his Bethesda, Maryland, home with just one single wire in the trees at his suburban lot. It is a 130-foot doublet hung between some trees at 80 feet high and fed through tuners and ladder line from his basement (*Photo E*). His station equipment, like that of K1AR, is modest. He uses two Ten-Tec Eagle transceivers feeding an Ameritron AL-1500 amplifier. His tuners are home brew and switched through a homebrew relay matrix so that he doesn't have to adjust the tuners each time he changes bands.

Like John, Tim also puts in operating time at superstations. In his case, some contest weekends he operates at W3LPL and N3HBX. As a newer contester located in suburban Maryland just outside of Washington, D.C., Tim has been constantly increasing his scores against stations equipped with beams and phased arrays. In the CQ WPX RTTY contest, with the single wire doublet in the trees, he has climbed from number 11 in North America in 2015 to number 8 in 2017 in the competitive single-operator high-power category. In the just-completed 2018 contest he had an even higher score than in previous years. Not bad for 130 feet of wire and some ladder line!

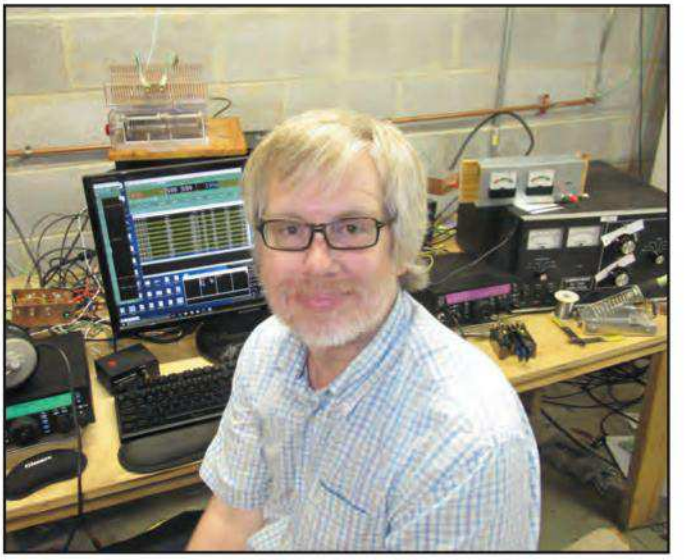


Photo D. Tim Shoppa, N3QE, at his station in Bethesda, Maryland. (Courtesy of N3QE)

John and Tim are getting their money's worth out of their copper wire. For us, their operating accomplishments demonstrate how well one can do with a simple wire antenna and modest station equipment. Now it's your turn!

–Until next month, 73, Dave, K3ZJ

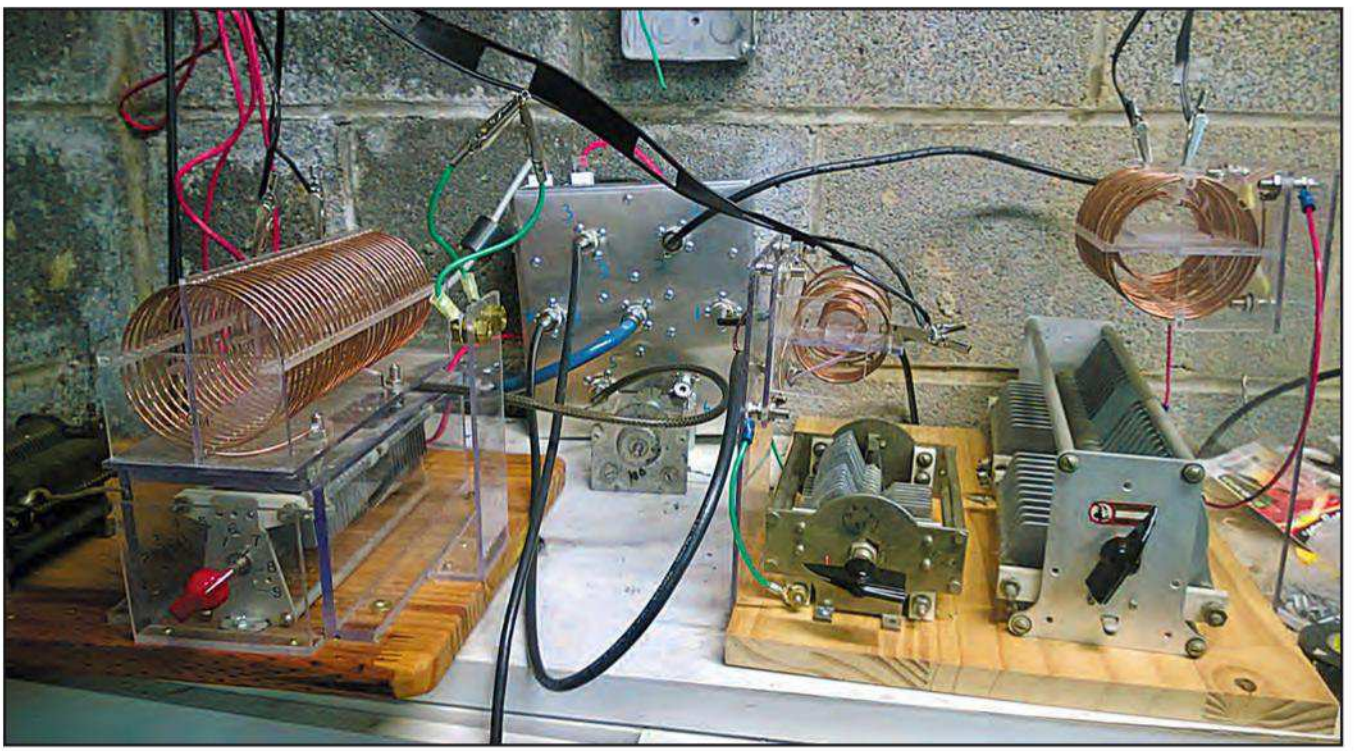


Photo E. N3QE uses multiple matching networks to load his single 130-foot Windom antenna on 160-10 meters. On 160 meters, the ladder line is shorted at the end and fed against ground to form a "Tee" radiator. (Courtesy of N3QE)

NASA Detects Solar Flare Pulses at Sun and Earth

BY TOMAS HOOD,* NW7US

A Quick Look at Current Cycle 24 Conditions
(Data rounded to nearest whole number)

Sunspots:
Observed Monthly, January 2018: 4
12-month smoothed, July 2017: 13

10.7 cm Flux (current):
Observed Monthly, January 2018: 70
12-month smoothed, July 2017: 77

A_p Index:
Observed Monthly, January 2018: 6
12-month smoothed, July 2017: 11

***One Year Ago:* A Quick Look at Solar Cycle Conditions**
(Data rounded to nearest whole number)

Sunspots:
Observed Monthly, January 2017: 16
12-month smoothed, July 2016: 23

10.7 cm Flux (current):
Observed Monthly, January 2017: 77
12-month smoothed, July 2016: 88

A_p Index:
Observed Monthly, January 2017: 10
12-month smoothed, July 2016: 11

In past editions of this column, I discussed the difference in the numbers of terrestrial weather sensors and of space weather-sensing instruments. There are thousands upon thousands of terrestrial weather-sensing instruments all over the Earth, oceans, and even in the sky. Monitoring space weather, on the other hand, is limited to a very small number of spacecraft armed with instruments capable of monitoring the Sun-Earth connection, from the Sun to the Magnetosphere and the Earth's geomagnetic environment.

When huge explosions, or solar flares, erupt on the Sun, we have observed their impact throughout the solar system as well as near Earth. But those observations are limited in scope because of the difficulty in deploying capable monitoring equipment in any significant numbers. If we could have the same vast number of space-weather monitors between the Sun and Earth, and throughout the solar system, we would better learn and model how space weather works.

We are slowly improving our data points, as new space-weather research spacecraft are engineered and deployed. During the last decade, some very capable payloads were sent into space and have provided huge amounts of new data, much of it in real time.

Two recent studies utilizing the data from two such space weather observatories show how solar flares exhibit pulses or oscillations in the amounts of energy emitted. This kind of new research provides new and valuable insight on the origins of solar flares as well as the space weather it creates.

One of these two studies unexpectedly revealed oscillations in the measurements of the Sun's total output of extreme ultraviolet (EUV, or XUM) energy — invisible to the unaided eye — during a very powerful flare. On February 15, 2011, an X-class solar flare exploded from the Sun. X-class flares are the most powerful kind of solar flares. Since multiple instruments observed the event, researchers were able to track the flare's radiation oscillations happening simultaneously in several different sets of observations.

"Any type of oscillation on the Sun can tell us a lot about the environment the oscillations are taking

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LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for April 2018

	Expected Signal Quality			
Propagation Index	**(4)**	**(3)**	**(2)**	**(1)**
Above Normal: 1-10,12-13,15-30	A	A	B	C
High Normal: 11,14	A	B	C	C-D
Low Normal: n/a	B	C-B	C-D	D-E
Below Normal: n/a	C	C-D	D-E	E
Disturbed: na	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.

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 on April 1 through April 10, fair on April 11, then good on April 12 and 13, then fair on April 14, and so forth.

3. Alternatively, 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 supported ionospherically.

place in, or about the physical mechanism responsible for driving changes in emission," said Ryan Milligan, lead author of this first study, and a solar physicist at NASA's Goddard Space Flight Center and the University of Glasgow in Scotland. During this flare under study, the regular pulses of extreme ultraviolet light indicated disturbances were rippling through the chromosphere, the base of the Sun's outer atmosphere. These chromospheric ripples are like earthquake waves that spread out away from a quake's epicenter.

What surprised Milligan about the oscillations was the fact that they were observed first in EUV data from NOAA's Geostationary Operation Environmental Satellite (GOES; see <www.nasa.gov/content/goes/>). GOES is positioned to orbit in near-Earth space. The mission collects X-ray and extreme ultraviolet irradiance data from the perspective of Earth, allowing scientists to study the total amount of the Sun's energy that reaches Earth's atmosphere over time.

The GOES measurements and observations of the February 2011 flare were not a typical data set for Milligan. While the satellite helps monitor the effects of solar eruptions in Earth's space environment (what we call space weather), the initial design of the satellite wasn't to detect fine details like these oscillations.

Typically, Milligan studies solar flares using high-resolution data on a specific active sunspot region in the Sun's atmosphere to research the physical processes involved in solar flares. If scientists don't zoom in on the area involved in a flare event, the measurements can easily be obscured by the Sun's constant, intense radiation coming from the entire observable solar disc.

"Flares themselves are very localized, so for the oscillations to be detected above the background noise of the Sun's regular emissions and show up in the irradiance data was very striking," Milligan said.

There have been previous reports of oscillations in GOES X-ray data coming from the Sun's upper atmosphere, called the corona, during solar flares. What's unique in this case is that the pulses were observed in extreme ultraviolet emission at frequencies that show they originated lower, in the chromosphere, providing more information about how a flare's energy travels through the Sun's atmosphere.

Milligan and his colleagues checked corresponding data from other Sun-observing instruments on board NASA's Solar Dynamics Observatory spacecraft (SDO; see <http://g.nw7us.us/2BDRb9u>), just to make sure that the oscillations revealed by the GOES data were really happening. One instrument aboard SDO collects EUV irradiance data just like GOES. Another SDO instrument captures images of the corona in different wavelengths of light. The research group found the exact same pulses in those data sets, confirming that these oscillations were a phenomenon with its source at the Sun. Their findings are summarized in a paper published in *The Astrophysical Journal Letters* on October 9, 2017 (see, <http://g.nw7us.us/2BB9Se9>).

These oscillations interest the scientists because they may be the result of a mechanism by which flares emit energy into space — a process we don't yet fully understand. Additionally, that the oscillations appeared in data sets typically used to monitor larger space patterns suggests they could play a role in driving space weather effects.

In the second study, scientists investigated a connection between solar flares and activity in Earth's atmosphere. The team discovered that pulses in the ionosphere mirrored X-ray oscillations during a July 24, 2016, C-class flare. C-class flares are of mid-to-low intensity, and about 100 times weaker than X-class flares.

Stretching from roughly 30 to 600 miles above Earth's surface, the ionosphere is an ever-changing region of the atmosphere that reacts to changes from geomagnetic activity as well as terrestrial weather from below and space weather from above. It becomes energized in response to incoming solar radiation, which ionizes atmospheric gases; it expands

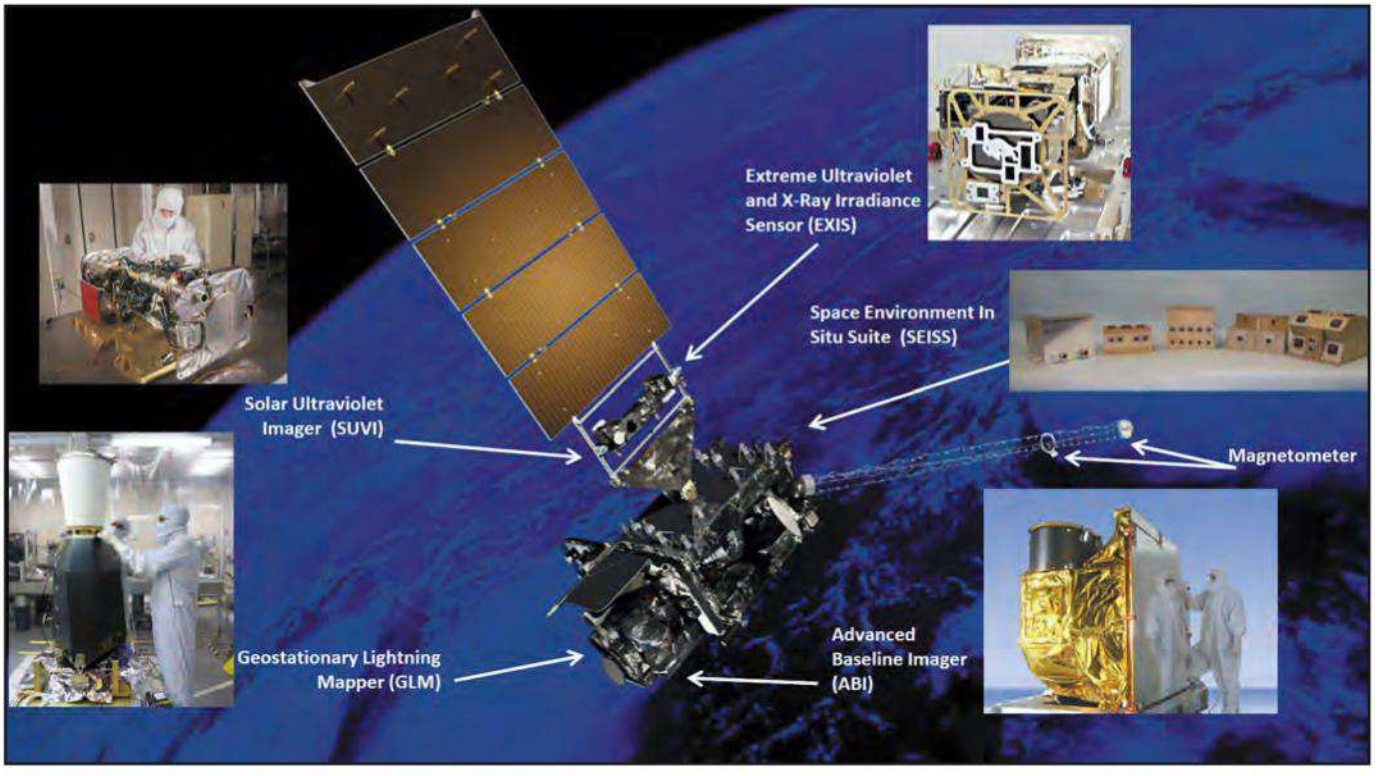


Figure 1. GOES-R Project.

when heated by solar radiation, and then deenergizes and contracts at night as the charged particles gradually recombine and the layers cool without the solar radiation.

In this second study, a team of scientists led by Laura Hayes, a solar physicist who splits her time between NASA Goddard and Trinity College in Dublin, Ireland, and her thesis adviser Peter Gallagher, investigated how the lowest layer of the ionosphere, the D-region, responded to pulsations in a solar flare.

"This is the region of the ionosphere that affects high-frequency communications and navigation signals," Hayes said. "Signals travel through the D-region, and changes in the electron density affect whether the signal is absorbed or degraded."

The scientists used data from very low frequency, or VLF, radio signals to probe the flare's effects on the D-region. These were standard communication signals transmitted from Maine and received in Ireland. The denser the ionosphere, the more likely these signals are to run into charged particles along their way from a signal transmitter to its receiver. By monitoring how the VLF signals propagate from one end of a path to the other, scientists can map out changes in electron density.

Pooling the VLF data with X-ray and extreme ultraviolet observations from GOES and SDO, the team found the D-region's electron density was pulsing in concert with X-ray pulses on the Sun. They published their results in the *Journal of Geophysical Research* on October 17, 2017 (see, <http://g.nw7us.us/2C9py9w>).

"X-rays impinge on the ionosphere and because the amount of X-ray radiation coming in is changing, the amount of ionization in the ionosphere changes, too," said Jack Ireland, a co-author on both studies and a Goddard solar physicist. "We've seen X-ray oscillations before, but the oscillating ionosphere response hasn't been detected in the past."

Hayes and her colleagues used a model to determine just how much the electron density changed during the flare. In response to incoming radiation, they discovered the density increased as much as 100 times in just 20 minutes during the pulses! This is an exciting observation for the scientists who didn't expect oscillating signals in a flare would have such a noticeable effect in the ionosphere. With further study, the team hopes to understand how the ionosphere responds to X-ray oscillations at different timescales, and whether other solar flares induce this response.

"This is an exciting result, showing Earth's atmosphere is more closely linked to solar X-ray variability than previously thought," Hayes said. "Now we plan to further explore this dynamic relationship between the Sun and Earth's atmosphere."

As you can see, these two studies were possible only because we are increasingly able to track solar activity and space weather from many vantage points — and the more spacecraft deployed to various locations in the space between and around the Sun and Earth, with sensors trained on space weather, the better we can analyze and research the Sun-Earth connection. Understanding the space weather that affects us at Earth requires understanding a dynamic system that stretches from the Sun all the way to our upper atmosphere. [*Editor's note: Along similar lines, the concept of building a home space weather station was a major topic of February's "HamSci" workshop at the New Jersey Institute of Technology, on which we'll be reporting in an upcoming issue. – W2VU*]

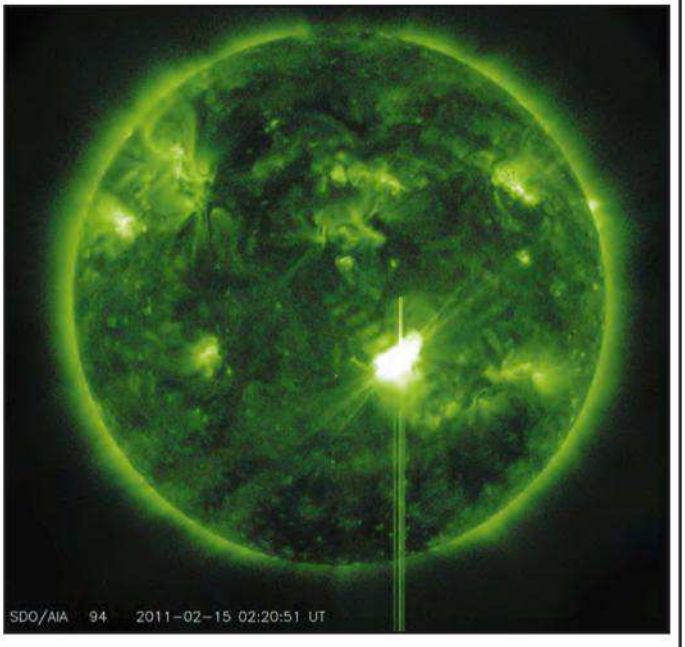


Figure 2. A massively-strong X-class x-ray flare erupted on February 15, 2011, and was a focus of studies by scientists interested in space weather (see text). (Courtesy of SDO AIA/NASA)

HF Propagation

As we move into spring in the Northern Hemisphere, we experience great DX openings from around the world on HF. This

Oops…

The 2018-2019 CQ Amateur Radio Calendar shows incorrect dates for the CQ World Wide RTTY DX Contest, which is the last full weekend in September, not the fourth full weekend (September has five full weekends this year). The correct dates for the CQWW RTTY DX Contest are **September 29-30, 2018**. We apologize for any confusion.

A Different Kind of Tap Shoe

Work boots that are also two-way radios of sorts. The BBC report explains. (Screenshot from BBC website)

Antennas Editor WA5VJB passed this along to us — the BBC had a report from the 2018 Mobile World Congress in Barcelona about a "smart" work boot that allows a worker to send or receive basic safety alerts by using a Morse-inspired code and either tapping his/her toe on the front of the boot or pressing a "key" pad in the back. The boot includes a SIM card and wireless card. The report is online at <http://bbc.in/2oDkMHU>. Bonus points for copying the real Morse code at the beginning of the piece.

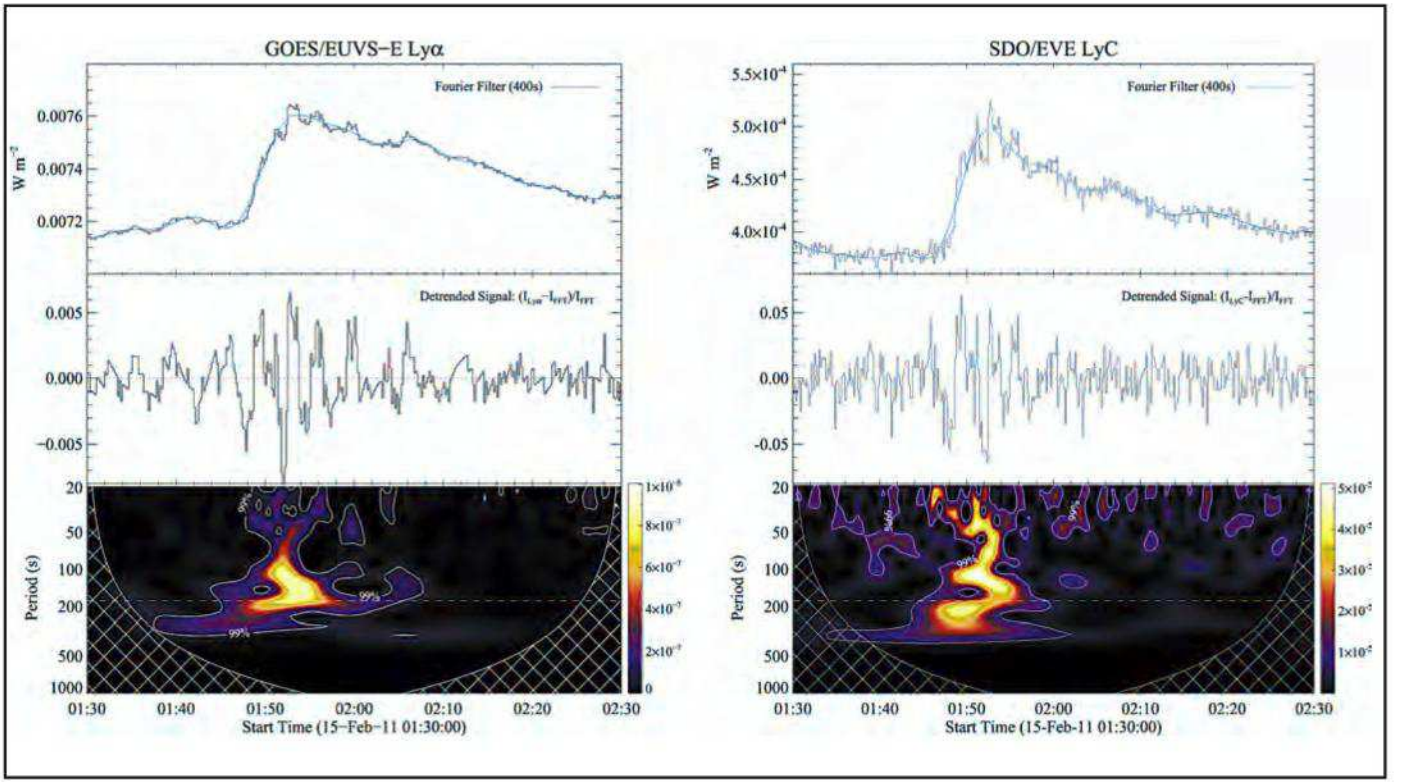


Figure 3. Analysis of the Lya (left) and LyC (right) emission during the 2011 February 15 flare. Top panels: Full-disk irradiance lightcurves with a 400-second FFT high-pass filter overlaid in cyan. Middle panels: The detrended time profiles after subtracting the filtered profiles. Bottom panels: Wavelet spectra (power per unit time) of the detrended profiles with 99% significance levels overlaid. The horizontal dashed white line denotes a period of 180 seconds. (Courtesy of Ryan O. Milligan, Bernhard Fleck, Jack Ireland, Lyndsay Fletcher, and Brian R. Dennis / <http://g.nw7us.us/2BB9Se9>

is because the sun is mostly overhead above the equator, creating equal day and night periods in both hemispheres. An improvement in propagation is most noticeable on long circuits between the northern and southern hemispheres. During this season, conditions are optimum for long-path as well as short-path openings, and during gray line twilight periods associated with sunrise and sunset.

Expect fewer openings on the higher shortwave frequencies compared to the openings seen during the winter months. While normal seasonal changes in propagation will result in fewer east-west openings, conditions towards southern and tropical areas are expected to hold up very well. Look for peak signal levels to most areas of the world during the late afternoon hours.

Expect 20 and 15 meters (14 and 21 MHz) to be the best bands for daylight DX during April. These bands should be reasonably active with DX signals from just after sunrise to well beyond sunset. Signals should be strongest to most areas of the world during the afternoon hours, but look for good, solid openings towards the southern and tropical areas well into the early evening hours.

Thirty, 20, and 17 meters are expected to be 24-hour DX bands for most of the month between mid- to low-latitude regions. Strongest signals, with DX openings to just about every area of the world, should occur during a two-hour window after local sunrise and again during the late afternoon and through the evening hours to as late as midnight.

Shorter hours of darkness and increasing static levels in the Northern Hemisphere will result in somewhat poorer DX conditions on the mid to low shortwave bands as we move closer to summer. Nevertheless, strong, stable signals should be possible to many areas of the world on 30, 40, and 60 meters during the hours of darkness. Signals should peak from an easterly direction about an hour or two before midnight and from most other directions about an hour or so before local sunrise at the U.S. end of the path. Some fairly good DX should also be possible on 40 and 75/80 meters during the hours of darkness. Propagation patterns on 75 and 80 meters should be similar to those observed on 40 meters, but openings will be weaker and noisier. There is a chance for some DX openings on 160 meters during the hours of darkness but expect to encounter increasingly high static levels. Thunderstorm activity is expected to increase during April in the Northern Hemisphere, and this should add to the static levels on all HF bands, but especially on 40 through 160 meters.

Bottom line? Check both long- and short-path openings during the sunrise and sunset periods on all bands between 10 and 80 meters for all paths between the northern and southern hemispheres.

For short-skip openings up to approximately 250 miles, check 75 and 80 meters during the day and 160 meters at night. For distances between 250 and 750 miles, 30 and 40 meters should be the best during the day, 40 and 75/80 meters from sundown to midnight, and 75/80 meters from midnight to sunrise. For openings between distances of 750 and 1,300 miles, try 20 and 30 meters during the day, with 30, 40, 60, and 75/80 meters best during the hours of darkness. Between 1,300 and 2,300 miles check 15, 17, and 20 meters during the day; 20, 30, and 40 meters from sundown

to midnight; and 40 meters from midnight to sunrise. Short-skip openings beyond 1,300 miles may also be possible on 10 and 12 meters during most of the afternoon hours.

VHF Ionospheric Openings

The Lyrids, a major meteor shower, should take place mid to late April. The unpredictability of the shower in any given year always makes the Lyrids worth watching, since we cannot say when the next unusual return may occur. If this year's event is average or better (if we get 30 to 60 good-sized meteors entering the atmosphere every hour), expect great meteor-scatter type openings on the VHF bands.

Widespread auroral displays can occur during April, bringing with them unusual ionospheric short-skip openings on the VHF bands. Best times for these to occur are during periods of radio storminess on the HF bands. Look for days with high planetary K (K_p of 5 or higher) and A (A_p of 20 or higher) figures.

Current Solar Cycle Progress

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports a monthly mean sunspot number of 4.0 for January 2018. The highest daily sunspot count was 22 on January 10, while the lowest was 0 (zero) on January 1-3, 12-13, and 20-29 (a total of 12 days with zero sunspots). The 12-month running smoothed sunspot number centered on July 2017 is 12.6, down from 13.3 for June. Following the curve of the 13-month running smoothed values, a smoothed sunspot level of 11 is expected for April 2018, plus or minus 14 points.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 70.0 for January 2018. The 12-month smoothed 10.7-cm flux centered on July 2017 is 76.8. A smoothed 10.7-cm solar flux of about 72 is predicted for April 2018.

The geomagnetic activity as measured by the Planetary-A index (A_p) for January 2018 is 6, continuing a downward trend since September 2017. The 12-month smoothed A_p index centered on July 2017 is 11.0. Geomagnetic activity this month should be mostly quiet with fair to good propagation conditions. Refer to the Last-Minute Forecast for the outlook on what days that this might occur (remember that you can get an up-to-the-day Last-Minute Forecast at <http://sunspotwatch.com> on the main page).

Don't forget to check out this columnist's educational tweets on Twitter.com; you can follow @hfradiospacewx <https://Twitter.com/hfradiospacewx> for hourly updates that include the K index numbers, as well as @NW7US <https://Twitter.com/nw7us> which will provide the daily dose of educational tidbits about the Sun and propagation. You can also check <http://SunSpotWatch.com> for the latest numbers.

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. You may email me, write me a letter, or catch me on the HF amateur bands. If you are on Facebook, check out <www.facebook.com/spacewx.hfradio> and <www.facebook.com/NW7US>. Speaking of Facebook — check out the *CQ Amateur Radio* Magazine fan page at <www.facebook.com/CQMag>.

I'll be keeping my ears to the radio, hoping to hear you on the air. Happy DX!

– 73, Tomas, NW7US

ham radio news *(from page 3)*

Milestones: KA1FZQ Named President of Harvard; VK3PC SK

Longtime educator and radio amateur Lawrence S. Bacow, KA1FZQ, has been named as the next president of Harvard University. The *ARRL Letter* reports that Bacow grew up building Heathkits and reading ham magazines (his late father was also a ham). Currently the Hauser Leader-in-Residence at Harvard's Center for Public Leadership, Bacow was previously president of Tufts University and chancellor of MIT, where he was also a professor. He begins his new job on July 1.

Jim Linton, VK3PC, became a Silent Key in late February after a battle with thyroid cancer. He was best-known in the amateur radio community as the chairman of the Disaster Communications Committee for Region 3 of the International Amateur Radio Union and a well-regarded source of news and information about amateur radio activities in response to disasters in the Region 3 coverage area of Asia and Oceania. According to the *ARRL Letter,* he was also heavily involved in leadership of various activities of the Wireless Institute of Australia, which awarded him its highest honor in 2011.

ARRL Introduces Mobile DXCC Award

Coupled with a warning to avoid distracted driving, the ARRL in February announced a new Mobile DXCC Award, issued for making confirmed contacts with at least 100 DXCC entities while operating "from a working vehicle, with antennas and power source capable of operating while in motion." According to the *ARRL Letter*, the mobile DXCC is a one-time award, is not endorsable, and is available only for contacts made from land-based vehicles. Contacts made from boats or aircraft do not count. The League's announcement reminded amateurs to always put safety first and said "we hope all mobile operators exercise care when operating from a moving vehicle."

Unlike the standard DXCC award, one does not have to be an ARRL member to qualify. Certificates are $16. Complete rules are on the ARRL website at <www.arrl.org/mobile-dxcc>.

HamSci Workshop Brings Together Amateurs, Scientists

Radio amateurs and scientists from across the U.S. and beyond met to compare notes in late February at a workshop sponsored by HamSci, the Ham Radio Science Citizen Initiative. Held at the New Jersey Institute of Technology, where HamSci coordinator Nathaniel Frissell, W2NAF, works as a research professor, the workshop brought together some 60 hams and ionospheric scientists for two days of presentations. Last summer's solar eclipse was the focus of the first day, with members of both groups (which sometimes overlapped) sharing their findings about propagation changes resulting from the temporary lack of solar energy in the ionosphere. Most of the findings were consistent with each other and with predictions. However, one unexpected — and as yet unexplained — observation was that propagation seemed to recover after the eclipse much more quickly than it had declined as the eclipse began. The second day focused on building personal space weather stations to help provide ionospheric scientists with many more points of observation from which to collect and analyze data. *CQ* attended the conference and will report on it in more detail in an upcoming issue.

Number groups after call letters denote following: Band (A = all), Final Score, Number of QSOs, Zones, and Countries. An asterisk (*) before a call indicates low power. An A after the band indicates an Assisted category. Certificate winners are listed in bold. Late logs and logs not eligble for an award are listed in italics. (All country terminology reflects the DXCC list at the time of the contest.)

2017 CQWW DX SSB RESULTS

SINGLE OPERATOR NORTH AMERICA

United States

District 1

K1DG	A	6,769,048	4389	123	449
W2RE	"	6,692,379	4549	113	416
NR3X	"	5,905,782	4066	114	417
(OP:N4YDU)					
N1UR	"	4,848,096	3392	117	411
KQ2M	"	2,367,480	2498	82	280
W1WEF	"	921,633	976	84	277
W3EP	"	617,050	786	70	231
K1RM	"	421,223	596	63	194
AA1SU	"	253,761	402	62	189
K1CN	"	232,624	407	49	168
K1LU	"	207,835	383	48	163
W1KM	"	199,800	325	57	168
W1AO	"	151,096	297	46	141
K7GM	"	137,280	254	49	143
K1VLB	"	64,183	168	40	133
N1SEP	"	61,608	172	42	109
KB1WXM	"	48,951	190	29	82
W1MAW	"	44,805	183	18	69
WA2HIP	"	40,293	182	24	75
K1GMM	"	33,630	130	21	74
W1FQ	"	23,463	101	28	71
W1GXZ	"	15,433	87	17	44
KE1Q	"	12,480	70	21	43
W1KMA	"	4,250	30	22	28
N1JEZ	14	43,343	175	17	72
K1DVL	"	2,668	39	9	20
W1XX	7	119,068	433	22	81
*N1PGA	A	1,036,480	980	85	310
*K1HT	"	353,438	485	64	198
*K1BX	"	274,950	422	50	185
*K1VSJ	"	208,832	363	48	160
*W1JQ	"	185,370	324	61	161
*N1DC	"	126,040	266	54	130
*K1IX	"	118,161	273	46	125
*W1DAD	"	89,324	203	47	116
*KG1V	"	54,576	155	43	101
*WA1T	"	48,732	147	39	92
*KC1SS	"	23,142	109	22	65
*N1STN	"	21,855	111	30	63
*KB1WLB	"	21,141	102	18	63
*N1FTP	"	20,550	97	22	53
*W1JGM	"	19,838	121	32	77
*K1JSM	"	19,425	96	19	56
*AB1NS	"	19,404	99	25	59
*KG6CIH	"	19,256	92	27	56
*AB1BX	"	16,192	91	33	59
*AB1YK	"	10,880	70	19	45
*K1ARR	"	10,010	57	23	47
*K1WCC	"	8,540	56	21	40
*WA1OTZ	"	8,509	56	22	45
*WA1N	"	6,731	50	16	37
*N1TYH	"	5,400	47	19	31
*KC1CRS	"	4,465	39	16	31
*KB1FRK	"	3,800	34	10	28
*K1TR	"	3,705	34	15	24
*W1MJ	"	3,626	38	14	23
*W1CRK	"	2,961	41	17	30
*KU1N	"	2,911	29	17	24
*K1MTD	"	2,604	32	9	22
*N1DM	"	2,555	26	12	23
*K1XS	"	2,542	25	16	25
*N1GSA	"	2,170	32	12	23
*W1FOY	"	1,820	22	9	19
*KG1RY	"	792	18	10	14
*W1VCM	"	480	11	9	11
(OP:N1WKO)					
*KD1O	"	408	11	8	9
*W4FEB	"	176	15	11	11
*W3SM	21	51,796	200	19	73
*W1OHM	"	2,604	34	8	23
*KC1GOJ	"	2,072	32	9	19
*W1ADX	"	432	12	7	11
*N1KWF	14	8,268	61	14	39
*W1LEM	"	1,342	25	5	17
*K1MVM	"	336	11	7	7
*W1FEB	"	322	11	5	9
*KC1FYB	7	135	5	4	5
K5ZD	AA	4,570,185	2870	120	437
W3UA	"	4,341,753	2854	115	444
K1ZZ	"	3,346,460	1925	129	481
W1NT	"	2,608,398	1993	108	363
W1GD	"	2,533,960	1722	109	411
AA1ON	"	2,018,856	1503	103	385
W1CTN	"	1,537,445	1244	92	363
K1KA	"	1,136,646	1019	89	345
N9NC	"	813,278	788	73	309
K1RX	"	767,488	1102	64	192
WK1J	"	669,864	747	68	271
K1ESE	"	667,212	728	79	259
KV1J	"	580,242	609	85	261
NF1O	"	572,600	602	77	273
KA1IOR	"	539,010	575	76	263
NB1N	"	536,364	692	59	223
AB1XX	"	486,717	577	65	236
KA2KON	"	461,390	584	62	228
K1RV	"	372,592	431	66	253
W1ZZ	"	324,937	412	69	224
K1RO	"	318,330	423	65	205
W1HS	"	277,728	445	59	204
NV1Q	"	272,844	460	53	181
W1ASB	"	249,550	481	54	163
AA1V	"	230,822	315	62	200
WA1DRQ	"	230,527	385	46	163
N1MD	"	220,704	326	56	186
KA1EKR	"	192,400	349	47	161
NE1F	"	181,629	303	53	164
W1NG	"	127,730	205	56	185
W2JU	"	115,736	231	38	146
W1NK	"	114,192	220	49	134
WV1M	"	112,133	221	47	146
W8TOM	"	100,035	229	46	125
W1UK	"	99,134	194	48	146
W1DX	"	92,232	223	42	126
(OP:KC1FUU)					
K1SM	"	91,656	229	37	115
K1GJY	"	87,412	254	44	120
K1QX	"	66,767	138	47	132
WØJAY	"	49,640	220	45	91
W1VEM	"	44,891	146	32	89
K1DBO	"	44,352	140	33	79
NC1I	"	35,816	147	20	68
WM4CH	"	35,168	126	29	83
KA1J	"	31,860	115	28	80
WO1N	"	31,779	114	31	68
KB1W	"	26,522	107	17	72
W1RM	"	20,670	74	40	66
K1TH	"	20,368	98	20	56
K1NOK	"	17,710	96	24	53
N2GZ	"	10,350	52	30	45
WA1ZYX	"	8,533	59	15	38
K1KQC	"	8,151	54	15	42
NU1G	"	6,384	44	17	39
NF1A	"	4,576	39	18	34
W1ZR	"	3,528	30	15	27
KX1X	"	2,494	29	8	21
W1PEF	"	572	13	11	11
W1EBI	7A	24,409	131	16	61
K1JB	"	15,680	87	16	54
K2RR	3.7A	52,668	265	16	68
*KS1J	AA	1,115,926	1045	82	304
*W1AEC	"	456,672	638	63	205
(OP:WA1BXY)					
*N1API	"	438,212	564	59	225
*K1DJ	"	256,560	392	63	177
*AE1EZ	"	226,499	374	58	189
*W1ARY	"	222,600	404	52	160
*W1DYJ	"	180,405	332	54	157
*N1SV	"	141,904	292	38	143
*AK1X	"	49,981	124	41	110
*NJ1T	"	47,414	138	46	111
*N1FI	"	38,376	147	38	79
*KC1ELF	"	22,698	86	29	68
*K1TW	"	22,560	98	23	57
*K1FUG	"	16,185	78	28	55
*AB1NG	"	14,432	76	30	52
*K1ECU	"	11,322	63	23	51
*N1ERS	"	7,965	49	17	42
*NE1B	"	7,260	54	17	38
*W1AKI	"	6,210	53	18	36
*KD1YV	"	2,898	32	15	27
*WQ1H	"	2,301	25	16	23
*KG4V	"	2,277	26	15	18
(OP:N1EN)					
*AE1T	"	2,268	28	9	19
*AB1YH	"	690	15	10	13
*W1JR	"	660	19	16	14
*AB1WV	"	24	2	2	2
*AB1J	21A	19,912	99	16	60
*N1WRK	"	6,235	51	11	32
*N1HEN	"	4,859	54	11	32
*W1VP	"	96	7	3	5
*KG1E	14A	39,100	167	20	65

District 2

N5DX	A	5,825,913	3621	118	453
KD2RD	"	1,513,673	1490	79	282
KZ2I	"	1,055,548	1010	90	293
NX2X	"	648,128	730	73	255
K2XA	"	581,856	624	88	264
WB2WPM	"	217,568	397	48	160
W2LU	"	215,138	380	68	186
N2JJ	"	190,688	350	44	158
WS9M	"	162,384	328	54	150
KB2FMH	"	147,840	281	52	158
KO2E	"	146,560	255	56	173
N2ZN	"	121,776	261	47	125
WB2WGH	"	58,794	174	30	93
N2ZL	"	36,400	147	23	68
KD2NE	"	26,820	116	22	68
WB2NFL	"	26,235	105	34	65
NN2NN	"	26,125	117	22	73
N2YB	"	22,533	96	27	60
W3PR	"	15,960	67	25	59
N2CG	"	15,810	76	32	53
KD2NXM	"	8,307	73	23	48
KC2KZJ	"	5,684	44	23	35
WA2GSL	"	5,046	44	21	37
AC2MT	"	3,999	36	16	27
W2FB	"	1,848	27	8	16
KD2LMW	"	1,410	37	17	30
NY9A	"	54	10	9	9
W2RR	28	16,317	174	12	25
(OP:WA2AOG)					
KU2M	21	591,840	1461	26	118
W2VO	1.8	3,636	44	10	26
*N2GA	A	320,320	524	46	174
*AC2RL	"	193,536	326	58	166
*K1PTF	"	171,678	330	60	153
*WA2QAU	"	159,840	285	53	163
*N2BEG	"	151,439	276	56	143
*AB2TC	"	120,000	270	40	120
*N2MTG	"	101,920	224	50	132
*K2ZR	"	89,958	227	50	124
*K2SDS	"	74,798	196	41	108
*N2HMM	"	73,002	212	37	101
*NT2I	"	39,474	163	26	76
*NO2N	"	37,164	140	33	81
*K2MV	"	35,310	123	31	76
*K2TV	"	32,806	130	26	68
*W2MWH	"	28,288	110	30	74
*WA2ALY	"	25,410	116	32	73
*W2MKW	"	24,064	100	32	62
*KC2MBV	"	23,128	115	32	66
*NG2D	"	20,010	113	16	53
*NU2Q	"	19,530	88	27	63
*K2DV	"	13,430	83	27	52
*N2PTF	"	12,848	86	32	56
*AD2SH	"	12,709	72	22	49
*KB2SDF	"	10,472	64	29	48
*K2DLS	"	10,366	62	26	45
*AC2VE	"	8,694	61	24	45
*KC2PDO	"	7,920	51	15	40
*N2IVN	"	7,812	47	21	42
*W2TT	"	7,497	64	25	38
*KF2Y	"	7,137	51	24	37
*W2TF	"	6,960	46	19	39
*KJ6GHN	"	5,808	49	14	34
*KD2GXL	"	5,625	46	14	31
*KG2DWS	"	3,588	37	11	28
*W2VDZ	"	3,060	37	17	34
*K2JF	"	2,765	34	9	26
*KD2IZQ	"	2,760	38	17	29
*NV2K	"	2,684	33	16	28
*K2KU	"	2,320	41	19	21
*KC2QNK	"	2,244	35	17	34
*K2AN	"	1,856	28	14	18
*KD2EFK	"	1,769	26	9	20
*W2JAT	"	1,380	26	13	17
*N2UJN	"	1,350	25	9	21
*NW2K	"	1,316	21	11	17
*K2ND	"	880	14	10	12
*KF2UJ	"	814	16	9	13
*KD2FQQ	"	792	15	6	12
*KV2X	"	532	17	11	17
*N2PEZ	"	494	13	5	8
*KD2GUT	"	450	11	8	10
*W2LPL	"	176	8	8	8
*N2VIG	28	1,680	34	6	15
*KD2JQG	"	30	3	2	3
*W2AW	21	124,956	398	22	95
(OP:N2GM)					
*K2SZ	"	4,708	51	11	33
*KC2JRQ	"	1,652	23	9	19
*W2PIP	14	1,260	24	6	15
*W3EH	"	504	15	7	14
*K2HVE	"	312	11	4	9
*AB2IO	"	84	4	3	4
*KC2JYD	"	66	6	5	6
*KA6WBQ	"	42	3	3	3
*W2AAB	7	10,914	78	10	41
*K2GG	"	256	12	6	10
*WY1LIE	"	0	1	1	1
AB3CX	AA	3,924,195	2480	115	446
N2RJ	"	3,168,662	2432	103	375
N2SR	"	2,838,112	2048	108	388
N2MM	"	2,683,652	1901	109	417
W2IRT	"	2,082,024	1491	103	401
N2TK	"	1,853,408	1253	118	426
W2RD	"	1,345,960	1048	102	358
KF2O	"	1,315,825	942	114	401
KE2TR	"	1,164,820	1043	88	331
WA2OAX	"	966,280	858	88	318
W2GDJ	"	855,729	732	94	329
WA2FZB	"	811,776	757	84	300
K6DTT	"	800,394	820	85	272
W2LE	"	676,016	727	78	256
K2RET	"	659,104	698	73	271
K2EP	"	639,019	649	77	272
N2ZX	"	588,072	489	100	358
KM2O	"	584,988	603	81	267
W2CCC	"	584,136	626	79	263
(OP:K2CS)					
N2VW	"	546,964	612	78	263
WW2Y	"	500,782	584	73	264
W2TV	"	493,941	581	67	234
KE1IH	"	490,028	661	70	238
W2NO	"	362,896	476	68	228
N1JP	"	343,176	539	48	189
N2CU	"	242,028	357	55	194
WB2PJH	"	231,248	448	43	151
K2CJ	"	201,474	309	62	172
WB2NVR	"	199,332	372	45	151
K2KQ	"	195,440	270	65	215
W6XR	"	176,202	295	73	161
WA3AFS	"	157,800	237	74	226
K2RB	"	145,908	328	44	145
N1IBM	"	144,096	245	49	179
KD2IWW	"	126,100	255	48	146
WC2L	"	118,845	262	44	127
K2QMF	"	102,753	246	23	124
K2RYD	"	92,184	220	47	120
K2QY	"	68,499	194	29	100
N2NKX	"	53,046	162	38	88
K2TRD	"	52,680	153	27	93
NO2C	"	37,680	124	43	77
K2QPN	"	36,720	125	28	74
K2CYE	"	30,552	100	36	78
K2UNI	"	29,468	106	26	80
KC2LST	"	21,600	77	38	70
N2ROQ	"	15,738	76	28	58
AK2S	"	11,600	62	30	50
K2CBI	"	3,588	28	18	28
N2KA	"	2,940	32	15	27
KA2BXH	"	2,584	34	16	22
K2YR	"	805	18	7	16
N2GC	21A	2,070	30	8	22
N2PP	14A	522,668	1155	34	130
WR2G	"	213,598	597	28	105
N2MUN	"	89,856	303	21	83
K2MFW	"	54,863	255	15	68
W2OSR	"	14,420	112	20	50
KM2G	3.7A	12,155	96	10	45
W2MF	1.8A	10,835	83	11	44
*N2SQW	AA	765,360	786	78	282
*N2FF	"	254,727	369	60	189
*KD2JOE	"	194,224	366	49	150
*KC2QJB	"	152,100	261	52	173
*K4RUM	"	140,000	288	44	131
*W2XK	"	114,774	295	27	114
*KB2KDP	"	48,300	131	46	104
*KS2G	"	46,443	153	29	84
*K2MFY	"	42,090	140	34	81
*W2YK	"	36,058	104	32	89
*NM2O	"	27,000	109	32	68
*N2CQ	"	23,859	86	16	83
*KC2OSR	"	19,729	111	30	79
*KA2FIR	"	17,391	76	33	60
*N2VM	"	13,050	96	24	66
*K2SI	"	8,509	56	27	40
*K2NV	"	7,535	49	21	34
*W2LB	"	6,490	56	18	37
*K2YYD	"	5,136	55	12	36
*W2FDJ	"	3,600	37	15	33
*KD2EIM	"	1,540	26	9	19
*N2AJO	"	1,260	20	14	16

District 3

AA1K	A	3,715,191	2648	112	397
K3ZO	"	2,295,306	1827	91	351
W3LL	"	1,947,330	1527	106	356
K3UL	"	1,093,920	1023	104	320
K3TC	"	1,038,780	967	87	311
K1BZ	"	300,575	427	73	202
KY3W	"	240,240	391	58	173
K4JLD	"	210,875	409	61	180
N3CB	"	191,148	346	48	156
K3EJJ	"	129,792	323	55	153
K3CWF	"	110,526	247	41	128
K2CD	"	109,740	216	47	130
N3TWM	"	67,734	188	46	96
N3DUE	"	57,810	208	43	98
4U1WB	"	39,312	345	34	74
(OP:AJ3M)					
W3IUU	"	23,232	91	30	66
N3KBF	"	15,276	82	21	55
N3XL	"	11,109	80	23	46
KF3EB	"	6,786	48	23	35
K2OF	21	1,360	23	7	13
NN3W	14	591,680	1380	37	123
(OP:N6GQ @N3HBX)					
W4KV	"	1,134	20	8	13
NC3Y	7	684	19	3	9
W3BGN	3.7	88,032	450	18	78
KE3FG	1.8	72	15	3	3
*K3SU	A	295,456	491	54	170
*W3MMM	"	252,572	404	54	179
*N8NA	"	107,663	264	36	115
*WA2VUM	"	97,461	266	34	119
*WS3C	"	76,788	203	45	113
*N2EM	"	61,600	177	53	107
*KS3D	"	57,354	142	47	111
(OP:KJ3N)					
*W6YTG	"	40,020	139	33	82
*K3URT	"	39,022	147	30	79
*KE5NJ	"	24,424	114	21	65
*AI3Z	"	22,080	100	29	67
*KC3HJP	"	18,865	90	21	56
*K2LNS	"	18,834	108	23	50
*K2CQW	"	15,540	75	28	56
*K3JD	"	15,440	76	26	54
*AB3JF	"	15,368	82	20	48
*K3JAG	"	14,094	86	29	52
*N3OJL	"	12,284	67	26	48
*K3SI	"	5,616	48	15	33
*KC3IVS	"	4,560	36	16	32
*KT3P	"	4,300	41	20	30
*W3WHK	"	4,085	41	13	30
*KC3EWJ	"	3,854	33	14	33
*KC3HEO	"	3,555	40	19	26
*KE3O	"	3,311	34	15	28
*AC3BQ	"	1,904	24	13	21
*AJ3DI	"	1,786	28	16	22
*W3RLO	"	1,540	22	11	17
*WB3DEL	"	1,537	21	11	18
*ND3R	"	1,456	23	8	18
*W3AYT	"	1,368	21	9	15
*W3MSR	"	754	19	9	17
*KG4USN	"	567	15	8	13
*KE3GK	"	322	16	11	12
*N9GG	"	294	8	6	8
*N3MYB	"	289	10	7	10
*N3ZP	"	256	9	7	9
*KB3IPZ	"	64	5	4	4
*KA3MZR	28	1,800	32	7	18
*WA3DMD	"	867	18	5	12
*AI1W	21	27,690	144	18	60
*K3SWZ	14	56,352	219	19	77
*K3LT	"	3,640	40	10	25
K3WW	AA	4,558,642	2820	118	469
AA3B	"	3,771,632	2478	111	443
N3RS	"	3,326,904	2034	125	463
NW3Y	"	2,061,840	1538	102	382
N3AD	"	1,925,836	1480	113	393
K3PP	"	1,792,150	1352	108	383
W3FV	"	1,642,656	1275	102	380
K3MD	"	1,608,160	1418	98	362
K3CT	"	1,589,070	1213	102	388
WY3A	"	1,563,617	1277	92	359
W3FIZ	"	1,450,053	1208	103	350
NK8Q	"	1,363,173	1216	94	323
NN3Q	"	1,332,544	1097	95	348
K2PLF	"	1,233,402	1144	87	311
K9RS	"	1,193,130	903	103	383
KU2C	"	1,169,645	978	96	353
WB2ZAB	"	1,112,590	1083	81	289
K3WI	"	1,020,455	898	82	327
W3GM	"	979,776	836	101	331
(OP:K3ND)					
K2XR	"	977,142	809	100	347
K3OO	"	957,825	741	107	366
N3ZA	"	947,653	857	86	323
K3WJV	"	938,520	798	99	341
NG3J	"	908,676	844	80	307
WC3N	"	850,410	925	73	257
N3ED	"	821,940	845	85	314
W3JX	"	722,874	730	84	289
N3FJP	"	690,426	801	77	240
KB3Z	"	663,576	716	84	260
W2GPS	"	649,701	700	77	274
K3ZU	"	614,704	599	98	314
N3RJ	"	606,204	740	76	248
NK3Y	"	514,304	740	50	206
NY3C	"	484,785	573	72	243
K3FMQ	"	484,008	585	65	236
NZ3O	"	471,324	495	75	287
K1RH	"	470,288	552	64	240
K3UW	"	414,680	545	58	222
K3ATO	"	377,034	537	64	218
NF3R	"	365,844	539	61	197
AA3S	"	307,746	472	62	184
W3GVX	"	300,852	448	63	181
NA3M	"	284,592	391	62	202
KC3WX	"	276,660	397	66	195
NG3R	"	266,783	329	78	229
(OP:N3DXX)					
W3OU	"	260,760	367	61	204
N3FM	"	256,760	399	68	194
N3AM	"	214,488	365	51	165
W8FJ	"	208,915	327	55	180
KW3Z	"	197,005	377	49	156
WØBR	"	187,230	292	58	179
N3YPJ	"	185,928	310	62	192
N3OZT	"	185,079	365	50	141
W3RGA	"	163,812	321	42	145
W3EA	"	161,126	264	67	171
K3WGR	"	157,311	264	58	173
N3FCP	"	145,386	286	47	150
W3XOX	"	132,111	291	53	136
K3AU	"	131,396	233	49	165
(OP:K2YWE)					
WA3AER	"	131,376	300	40	128
K3SOM	"	123,710	252	46	132
W3PA	"	117,645	278	30	125
W3OD	"	103,206	186	50	156
K4JDF	"	97,825	215	45	130
KA3YJM	"	64,170	194	37	101
N3NR	"	55,488	150	39	97
NN3RP	"	48,720	166	31	85
W3NRJ	"	45,844	148	42	104
WA3AAN	"	42,944	134	37	85
W7IGC	"	32,445	124	33	72
WB3IWC	"	31,464	183	14	58
W3LES	"	23,838	132	23	64
WV2M	"	21,513	80	31	70
WA3WNT	"	20,739	87	31	62
K3TN	"	20,503	84	36	65
K3RON	"	17,686	97	22	52
N3NBT	"	11,704	55	21	55
K3ABE	"	9,996	82	14	37
KE3X	"	6,527	49	24	37
W3ON	"	5,418	49	13	29
K3DCW	"	1,482	20	8	18
NR3C	"	836	17	8	11
W3BW	"	390	11	5	10
NT2DR	"	36	3	2	2
N3TTT	14A	24,321	130	16	51
K3MA	7A	124,084	385	30	104
W3NO	3.7A	68,706	253	20	79
K3LA	"	504	15	8	10
N3QE	"	6	1	1	1
*W3KB	AA	957,600	880	86	314
*K3TUF	"	113,984	215	64	144
*W3MBC	"	76,459	190	40	117
*KW3F	"	66,708	164	38	115
*N3WMC	"	66,654	198	40	98
*K3NDM	"	50,560	167	33	95
*W3ZR	"	48,363	148	39	102
*W3VYK	"	44,861	159	30	83
*NE3I	"	39,788	127	30	86
*K3MAW	"	26,964	111	36	71
*AG3Q	"	14,630	71	24	53
*N3ATE	"	14,175	70	22	53
*NE3K	"	13,056	76	15	49
*K3UHU	"	11,960	90	16	49
*KN3A	"	9,610	55	20	42
*WA3LWR	"	7,739	68	23	48
*N3JON	"	3,886	40	21	37
*W4WW	"	3,570	39	9	26
*WA3ZMH	"	2,993	33	15	26
*N4ZR	"	1,170	19	10	16
*W3FA	"	1,152	21	9	15
*K3GTX	"	1,102	18	12	17
*K3FH	"	540	11	7	11
*AE3D	"	384	24	13	19
*K4VDX	"	140	5	5	5
*N3TD	21A	48,208	199	18	74
*K3HW	14A	21,746	154	18	65
*KC3JUZ	"	350	9	7	7
*KB3LIX	7A	9,024	73	10	38
*N4OC	1.8A	1,403	49	8	15

District 4

KØEJ	A	2,310,120	1843	112	353
W5MX	"	1,400,448	1333	92	292
K4PV	"	795,972	1288	89	250
AB4GG	"	686,169	810	79	240
W4KW	"	537,230	682	79	231
AC4G	"	501,334	549	85	249
WB4YDY	"	470,316	571	73	235
KA8Q	"	441,925	562	59	216
N4CW	"	421,208	529	71	225
N4NO	"	411,340	636	61	201
K4FYM	"	190,960	318	58	162
K4CEB	"	173,224	292	66	170
W1GKT	"	153,824	323	45	139
K4KAY	"	109,782	331	43	128
NE4EA	"	95,580	219	55	125
WB5WAJ	"	93,280	276	38	122
WA3DQS	"	87,552	251	33	111
AI4CJ	"	85,824	237	41	108
N3JT	"	84,672	199	37	110
AD4TJ	"	65,928	190	35	99
NC4VA	"	65,850	187	49	101
KE4PLT	"	65,534	174	38	113
K4RO	"	63,024	154	50	106
KW4J	"	56,000	199	52	108
W4ANT	"	52,593	144	45	96
K4LTE	"	47,600	169	43	93
W4GHS	"	45,240	159	32	98
N7KDT	"	43,554	169	37	82
K7OM	"	40,986	141	47	91
KD4ISM	"	38,412	163	38	94
W2WCM	"	37,516	124	31	82
N4CU	"	33,274	143	44	83
W4UT	"	32,574	132	27	62
W1IE	"	31,413	129	36	75
K4BAI	"	27,808	121	30	58
N2NYR	"	24,480	129	37	65
KM4IK	"	23,600	99	36	64
WA9TTC	"	20,056	87	28	64
WF4W	"	18,584	89	30	62
N4ZY	"	17,754	100	23	43
NR4C	"	17,658	94	27	54
W2ARP	"	15,520	92	22	58
KA2NFG	"	14,136	76	29	47
KG4VDZ	"	13,833	80	32	55
N4GDX	"	10,650	59	25	46
K4KZ	"	9,000	50	28	44
W4XMT	"	8,470	84	26	44
WI4MPY	"	6,901	60	19	48
W3CL	"	6,264	49	18	36
N2UK	"	5,141	52	21	32
W4OM	"	4,107	51	11	26
K4XG	"	3,555	30	15	30
N4QBS	"	3,060	31	17	28
K4JZQ	"	1,377	28	10	17
W4CB	"	1,305	25	12	17
(OP:W2RU)					
KX4BE	"	960	17	9	15
NC3Z	"	558	11	7	11
N4DWM	"	506	12	10	12
W4WAV	"	340	12	8	9
K4WI	28	19,812	180	12	27
W4DD	"	18,241	174	10	27
W4SLT	"	9,240	98	10	25
K4JC	"	2,546	52	8	11
N4OX	21	303,298	870	30	109
N4LZ	"	23,430	119	18	53
KJ4QHL	14	150,414	647	26	80
W2IKN	"	6,923	64	12	31
KU8E	7	29,360	139	21	59
N2YO	"	5,109	48	11	28
NX4N	"	858	14	9	13
WA2PCN	"	589	14	7	12
K4ZW	3.7	128,594	553	23	90
W4QNW	"	22,536	159	15	57
WM3X	"	900	20	7	13
AG4W	1.8	5,838	153	14	28
*K4SXT	A	161,352	241	68	181
*KC4TEO	"	159,399	305	54	145
*KK4RV	"	139,815	287	53	142
*N4EK	"	99,572	248	34	112
*KN4KL	"	81,220	198	43	112
*KJ4KKD	"	80,535	237	55	122
*AI4DB	"	73,950	197	50	100
*N2JF	"	70,886	234	31	103
*NC4MI	"	57,785	179	41	86
*KD4QMY	"	56,515	161	37	90
*W4BBT	"	49,790	173	38	92
*KD4NEM	"	45,820	136	29	87
*WN4AFP	"	42,126	148	33	86
*WI4R	"	40,713	127	43	80
*KA3MTT	"	39,389	129	40	79
*K4BC	"	37,604	120	42	77
*KC4EZN	"	37,296	124	40	86
*WA4EMU	"	33,448	133	36	77
*KF4EKA	"	32,946	125	37	77
*W9NWY	"	32,032	139	30	74

*AE4M	"	32,012	124	33	73
*KO4OL	"	29,853	119	32	75
*K8LBQ	"	28,188	113	40	76
*K4FTO	"	27,499	125	32	75
*K4YCR	"	26,967	104	29	72
*K4ORD	"	26,214	104	38	64
*W4YE	"	26,100	115	23	64
*KJ4AOM	"	25,056	106	31	65
*KK4WX	"	24,465	117	36	69
*AI4GR	"	23,715	103	33	60
*K4GOP	"	23,712	109	29	75
*K4VBM	"	23,157	111	35	58
*KV4KY	"	22,946	109	21	56
*N7TTO	"	18,732	91	29	55
*W5VS	"	18,732	87	24	60
*AD4XT	"	17,982	109	30	51
*WA4IPU	"	16,848	131	27	51
*W4HCW	"	16,405	70	26	59
*KB8ABJ	"	16,290	72	29	61
*KN4EWI	"	15,870	86	19	50
*KM4ODS	"	15,738	72	27	59
*KB4MRX	"	15,288	66	32	59
*KM4FLU	"	13,776	111	26	58
*AE4TI	"	13,728	86	27	51
*K4LPQ	"	12,775	77	25	48
*WA4PKL	"	11,765	98	19	46
*KJ4IEU	"	11,152	64	24	44
*AK4D	"	10,626	96	22	47
*K4ML	"	9,450	63	19	44
*WG8S	"	8,568	52	29	43
*KW4NN	"	8,255	52	20	45
*KE4HTS	"	7,812	71	26	36
*W4GFY	"	7,564	54	23	39
*N4WQH	"	7,280	62	23	33
*KM4TYV	"	7,232	61	22	42
*NT4Z	"	7,208	50	17	36
*W4BRG	"	6,762	50	12	34
*KD4YDD	"	6,696	41	22	40
*KE4QCM	"	6,527	47	22	39
*W7CSA	"	6,432	44	27	40
*N4JRP	"	6,327	50	21	36
*K3NP	"	5,928	56	22	30
*KA4CDN	"	5,922	39	27	36
*NJ8J	"	5,876	47	21	31
*KK4MJA	"	5,150	38	19	31
*WD5DAX	"	5,150	40	16	34
*NØDIM	"	5,063	45	22	39
*WB4MM	"	4,732	42	22	30
*NN4RB	"	4,370	37	18	28
*K4CGA	"	4,305	59	15	26
*AJ5E	"	3,960	41	15	29
*N4YHC	"	3,696	32	19	25
*KM4SLW	"	3,432	33	17	27
*K4GRE	"	3,384	28	21	26
*K4RPD	"	3,000	31	14	26
*K4IDT	"	2,960	48	12	25
*KZ4M	"	2,508	35	17	27
*W5DRR	"	2,432	34	16	22
*W4GOT	"	2,318	28	16	22
*W4CWM	"	2,268	37	16	26
*KM4IIZ	"	1,961	26	14	23
*W4POT	"	1,927	30	18	23
*AI4QQ	"	1,890	26	12	23
*N4HWH	"	1,755	40	16	29
*N4LKB	"	1,711	20	10	19
*W4HAW	"	1,711	24	11	18
		(OP:KS3K)			
*KM4WII	"	1,581	27	12	19
*KW4LY	"	1,560	26	13	17
*WA3RWP	"	1,456	18	12	16
*KC2FQ	"	1,295	25	17	20
*K3WL	"	1,080	31	12	28
*N4NTO	"	975	21	10	15
*K9DY	"	880	17	8	14
*KN4CNU	"	598	23	11	15
*WD4KTF	"	560	12	8	12
*AK4VQ	"	552	15	9	14
*KG4WOJ	"	416	11	7	9
*WA4JA	"	399	13	9	12
*KM4SYN	"	391	9	8	9
*WB4KFO	"	374	10	7	10
*AA4OM	"	360	11	10	10
*KE4FVU	"	231	13	10	11
*AI4UN	"	210	9	6	8
*K4AKY	"	204	10	7	5
*WB2DHY	"	192	6	6	6
*KI4JEK	"	190	13	8	11
*KM4HVE	"	55	4	2	3
*K4EOR	"	48	14	7	9
*K4ME	"	18	4	3	3
***NV4B**	**28**	**4,896**	**69**	**8**	**16**
*W4JOR	"	1,007	19	7	12
*KB4DPH	"	1,000	22	9	11
*KW4LU	"	189	9	3	6
***W6DVS**	**21**	**27,306**	**123**	**16**	**66**
*W4LID	"	20,460	118	17	49
*AA4NP	"	12,980	88	15	40
*K3YDX	"	11,780	73	16	46
*KT4FQ	"	8,832	71	15	33
*K4WLG	"	8,008	55	16	40
*NQ4K	"	1,215	22	10	17
*WØPV	"	630	12	7	11
*KW1K	"	280	8	6	8
***K4QR**	**14**	**6,400**	**51**	**16**	**34**
*KBØPGJ	"	3,042	38	15	24
*N4EDI	"	2,624	30	11	21
*KB4MG	"	988	25	10	16
*KM4GIY	"	544	16	7	10
*KK4RT	"	483	22	7	14
*KQ4Y	"	299	11	5	8
*K1HG	"	294	8	6	8
*WB4GLJ	"	42	5	3	4
***KE4KVC**	**7**	**2,370**	**48**	**8**	**22**
***W4PGM**	**3.7**	**1,288**	**23**	**7**	**16**
K5EK	**AA**	**1,705,860**	**1283**	**110**	**376**
K3IE	"	1,569,540	1314	101	343
N4HU	"	1,312,656	994	117	375
WJ2D	"	1,179,528	1053	89	319
N6AR	"	1,176,385	1050	97	330
W3OA	"	1,111,932	1005	97	305
N4PQX	"	1,091,850	894	94	341
N4KG	"	1,069,650	880	105	345
K4OV	"	1,020,768	972	93	299
K4XL	"	987,390	886	86	319
W4ML	"	892,316	842	93	305
		(OP:W4MYA)			
W4JAM	"	835,212	845	84	282
KE4S	"	812,625	796	93	282
W4TTY	"	753,348	680	94	308
K5VIP	"	750,440	758	79	286
N4LU	"	714,240	802	73	247
N4LA	"	689,628	621	94	310
N4PSE	"	620,289	648	87	282
N4YA	"	613,890	676	85	274
W4EEY	"	567,536	678	77	239
KC3D	"	566,040	679	72	246
N4MM	"	536,256	627	74	262
W4VIC	"	513,300	679	67	233
K4CAE	"	510,380	617	78	260
KM4HI	"	493,608	595	81	233
N4FY	"	455,088	608	78	226
AJ4A	"	445,500	469	95	280
N4GG	"	427,851	471	85	262
WS4WW	"	409,955	579	64	201
K4NPC	"	356,624	588	55	193
K4PI	"	341,033	418	78	223
K4BBH	"	325,680	484	71	205
ND7J	"	323,403	465	75	252
K8YC	"	295,510	385	66	224
K4AKK	"	289,712	419	77	227
W2YE	"	247,312	392	57	175
N4UK	"	242,865	346	59	198
NO9E	"	235,450	325	71	206
KC4NX	"	227,454	370	59	168
N4QS	"	223,421	395	52	157
N4KC	"	215,050	321	65	188
W4LT	"	214,642	396	57	157
NA4K	"	200,994	309	62	179
NR4M	"	191,100	358	43	152
W4XO	"	184,158	312	54	180
K4FS	"	181,074	310	55	151
K2SD	"	176,754	381	41	137
KF4WSN	"	151,298	303	52	150
NN4X	"	136,512	219	58	158
KM4JA	"	131,364	302	44	120
KY4NA	"	130,200	302	39	111
		(OP:KE4KY)			
WK4Y	"	127,330	229	50	164
KE4YOG	"	120,780	237	57	141
W3TB	"	114,835	234	51	142
WA4MSU	"	113,520	237	53	123
N4BCD	"	105,468	210	61	127
K2SX	"	97,744	248	47	117
NF4A	"	93,600	218	46	114
AD4ES	"	89,414	187	61	120
N4KH	"	88,872	222	49	112
K3KO	"	82,498	195	42	125
NO4J	"	81,732	178	53	143
WX4G	"	78,147	187	49	122
K3JWI	"	76,314	182	44	114
KM4EOG	"	71,500	209	35	108
WU2T	"	71,230	178	46	124
N4UEZ	"	50,160	142	38	94
W4NZ	"	48,020	122	44	96
AD4IE	"	46,440	166	27	81
N4TL	"	44,253	152	23	76
W4TZ	"	44,187	125	44	99
K1ZW	"	37,654	105	32	102
KA4RRU	"	35,860	139	35	75
N4XYZ	"	35,017	132	28	69
AI4WU	"	34,013	121	37	76
KU4FX	"	33,495	101	49	96
K4SBZ	"	33,408	137	40	88
K4SPE	"	31,124	139	43	81
N4VLK	"	30,186	104	34	83
ND2O	"	28,302	103	27	79
N3KN	"	22,308	108	22	56
N4DXS	"	22,244	117	20	63
N4BYY	"	18,358	97	16	51
K8KI	"	17,661	79	28	59
K4AFE	"	17,550	74	31	59
WB4TOM	"	16,245	65	34	61
KZ5ED	"	15,834	63	29	58
K7LES	"	15,200	74	32	48
W4WT	"	12,530	72	20	50
K2WK	"	11,993	65	21	46
W2TA	"	11,165	55	28	49
N4EEB	"	9,648	61	21	51
KB2AS	"	8,010	62	11	34
KS4VOL	"	7,668	47	29	42
W4GHV	"	7,553	78	31	52
WB3ILX	"	7,140	48	20	40
WR4K	"	5,500	45	18	26
N7EO	"	3,608	38	16	28
W4PF	"	2,150	24	20	23
KE4KMG	"	1,092	20	13	15
WU5E	"	1,058	21	8	15
K1GG	"	900	23	11	14
AB4IQ	"	828	40	19	27
KF4TC	"	805	15	11	12
W3JRD	"	720	13	9	11
KM4HQE	"	468	12	7	11
K2CIB	"	299	9	5	8
AF3K	"	294	11	10	11
N4DCT	"	2,523	32	9	20
K4YYL	**28A**	**3,900**	**46**	**9**	**21**
W3IP	"	98,375	296	27	98
WB3D	**21A**	**87,494**	**321**	**23**	**74**
N4BP	"	59,081	180	31	100
KV4T	"	475,244	1329	32	122
N4PN	**14A**	**359,531**	**884**	**32**	**119**
KU1CW	"	122,850	386	29	97
W6KW	"	64,575	239	23	82
WA4JUK	"	11,748	96	19	47
KM4IZZ	"	216	9	4	8
AF4RK	"	216	6	6	6
KM4ALL	"	195	11	5	10
K4KRK	"	36,935	172	24	65
KD4RH	**7A**	**6,345**	**50**	**12**	**33**
K3SV	"	49,588	212	19	73
K1KNQ	**3.7A**	**1,876**	**25**	**5**	**23**
WB6RAB	"	504	16	6	12
WA4HXC	"	4,040	48	11	29
N4RJ	**1.8A**	**481,901**	**587**	**71**	**230**
***W4ZAO**	**AA**	**299,450**	**440**	**63**	**202**
*AA4R	"	257,500	392	58	192
*N4XL	"	229,648	334	62	186
*N2ESP	"	222,642	396	51	166
*KM4SII	"	175,980	327	52	158
*K4ELI	"	130,302	219	64	190
*W3CF	"	122,996	239	53	141
*KG4IGC	"	119,180	234	58	144
*WF7T	"	102,510	242	64	137
*NN2T	"	95,407	212	49	130
*WUØB	"	93,399	223	46	117
*W3ZL	"	91,512	222	47	117
*KX4FR	"	78,144	196	42	106
*K7SV	"	72,004	148	58	130
*N1ADM	"	63,900	163	47	103
*N4CF	"	58,830	153	59	126
*W4YN	"	52,998	154	38	108
*K2TE	"	51,408	151	38	88
*N4WO	"	51,356	136	48	100
*KU4V	"	47,872	132	45	91
*KK4AND	"	46,574	151	48	98
*AB4GR	"	45,672	147	37	95
*KM4IAJ	"	41,715	121	39	96
*N2TU	"	36,076	133	36	80
*KM4VTE	"				

*K4LDC	"	33,480	119	41	79
*N2OHP	"	32,450	121	35	75
*AA4DD	"	30,281	122	32	75
*AJ4VE	"	28,028	113	23	68
*KM4RKT	"	23,072	96	37	66
*WD9GMK	"	20,970	97	25	65
*N2WWD	"	13,776	83	23	61
*KK4TJP	"	13,680	70	26	50
*KM4SEG	"	10,530	58	19	46
*W4JUU	"	9,711	67	31	52
*KO9V	"	8,448	48	24	40
*KG3V	"	8,296	53	20	41
*AC6WI	"	7,869	52	22	39
*KM4ZMW	"	7,546	48	30	47
*KN8F	"	7,228	54	16	36
*N4JBN	"	7,128	48	20	34
*KD4ACG	"	7,020	53	14	40
*W4BTA	"	6,417	48	30	39
*W4HRL	"	6,344	49	19	33
*W4DTO	"	5,846	63	26	48
*KK4YYS	"	5,777	44	16	37
*NR4N	"	4,900	40	20	29
*K3WR	"	3,876	36	20	31
*NZ6T	"	3,854	31	19	28
*N3UA	"	3,584	38	9	23
*AA4LR	"	2,920	36	14	26
*W4WNT	"	2,840	31	15	25
*W4TTM	"	2,788	31	13	21
*W4OEP	"	2,535	24	17	22
*NC4RY	"	2,438	38	19	27
*AJ4JJ	"	2,016	23	15	21
*W1MKW	"	1,665	23	14	23
*KF4AV	"	1,230	21	12	18
*K8SYH	"	1,219	18	8	15
*N7BU	"	1,120	18	12	16
*WR1TR	"	1,058	18	8	15
*W4MDF	"	836	14	8	14
*KE4GVO	"	750	20	6	19
*W4LAN	"	480	16	10	14
*N4BFR	"	380	11	9	11
*K4KGM	"	289	10	7	10
*N1SER	"	42	18	8	6
***W4LC**	**14A**	**54,435**	**208**	**22**	**73**
*NR3N	"	1,197	22	4	17
*KK4CBL	"	989	19	5	18
*N4MQU	"	468	13	7	11
*KK4VA	"	18	2	1	2
***WA1FCN**	**7A**	**43,022**	**194**	**24**	**74**
*WZ4K	"	200	7	4	6
*KN4EUM	"	90	12	7	8
***AB4B**	**3.7A**	**26,714**	**141**	**16**	**58**
*KK4BZ	"	3,876	53	9	25

District 5

N2IC	**A**	**1,955,766**	**1733**	**123**	**303**
N5AW	"	1,296,120	1176	106	314
AD5XD	"	636,944	741	86	243
AI5SF	"	212,420	384	62	153
K5LAD	"	202,725	385	60	165
N5TGL	"	170,156	337	67	139
WE6EZ	"	164,971	344	62	137
KD5UVV	"	134,200	265	60	140
WM5Q	"	119,972	255	53	125
AC4CA	"	113,344	293	41	113
W5WI	"	106,760	260	47	123
WD5R	"	102,330	345	33	102
KD5JRY	"	75,582	267	28	89
WQ5R	"	42,656	133	40	84
N5KF	"	42,375	146	42	83
K5YM	"	42,051	147	31	76
N5GD	"	20,097	77	32	67
K9ING	"	18,900	105	40	65
W5RCG	"	15,210	93	32	46
KI7AY	"	7,524	51	25	41
KD5AFS	"	7,316	50	20	39
KJ5MA	"	7,072	53	28	40
W5RYC	"	6,468	49	21	28
K5IX	"	3,483	32	19	24
K5ABB	"	3,283	45	29	38
K5WSW	"	2,331	32	13	24
K5QY	"	2,146	26	14	23
KG5SER	"	1,980	32	18	26
K5RX	"	1,325	24	8	17
KG5RXE	"	1,260	19	12	18
KG5IIS	"	1,035	22	11	12
KF5MLP	"	1,014	31	12	14
W5CO	"	676	34	11	15
W5PR	**28**	**32,760**	**255**	**17**	**35**
WD5K	**21**	**124,200**	**420**	**27**	**88**
N5KDA	"	41,296	180	22	67
W5KU	"	14,579	114	18	43
N5RMS	"	2,886	32	12	25
KM5VI	**7**	**29,842**	**177**	**21**	**65**
***K5FUV**	**A**	**415,584**	**557**	**73**	**215**
*KF5VDX	"	290,440	441	70	195
*K5XU	"	106,428	211	50	131
*W1JCW	"	104,799	240	58	135
*KE5LQ	"	74,892	190	54	104
*NW5Q	"	60,382	178	45	88
*NN5T	"	47,092	150	44	78
*KC7QY	"	32,318	116	41	72
*WA5DSS	"	31,746	136	41	70
*AA5DX	"	31,242	134	43	80
*N5ZY	"	27,104	133	45	67
*K5YVY	"	26,765	124	37	64
*KØBWQ	"	21,760	102	26	59
*K5IB	"	20,169	100	29	52
*WA5IEK	"	12,996	73	27	49
*N5KXI	"	12,090	62	26	52
*W4WLF	"	12,069	91	26	55
*W5YBT	"	11,704	65	31	46
*K5BZI	"	8,614	57	28	45
*KD2KW	"	8,601	67	27	34
*KB5QR	"	8,142	56	26	43
*AG5DB	"	7,930	57	27	38
*KG5IQU	"	7,740	50	20	40
*N5KAE	"	6,960	46	19	39
*W5PKK	"	6,696	62	27	35
*N5LXI	"	6,298	61	31	36
*KC5SDY	"	4,747	51	20	27
*N6RH	"	4,582	45	26	32
*KG5COF	"	3,408	36	19	29
*WD5BHS	"	2,990	46	13	33
*KB6OJE	"	2,352	32	20	28
*W5YYA	"	2,080	29	11	21
*KG5GCC	"	1,972	24	11	18
*AF5FX	"	1,590	20	12	18
*KI5EE	"	1,485	20	10	17
*K5KMM	"	812	24	12	16
*N5AJD	"	800	16	9	11
*KC5DCT	"	713	21	14	17
*KF5YAF	"	575	19	11	14
*AB5GQ	"	574	28	21	20
*KF5WXY	"	361	14	10	9
*K5DSM	"	220	14	10	12
*KF5HIQ	"	130	8	5	5
*KG5UBX	28	1,071	22	5	12
***K5KJ**	**21**	**111,531**	**386**	**25**	**88**
*N5OCO	"	7,875	62	14	31
***N5JJ**	**14**	**69,720**	**261**	**26**	**79**
*AD5MD	"	1,584	45	9	13
*KF5TXU	"	738	18	6	12
K5LLA	**AA**	**1,197,243**	**1060**	**103**	**308**
N5HC	"	703,704	792	89	238
N5XJ	"	502,945	583	78	227
NT5V	"	434,186	524	74	224
N5VU	"	406,146	617	62	192
N5GI	"	327,900	442	77	223
W5GN	"	271,906	451	68	189
W2GS	"	187,055	327	52	157
W5THT	"	120,213	268	49	122
N5WNG	"	49,125	163	41	84
WA5LFD	"	48,034	167	52	94
KE5OG	"	38,675	129	43	76
WV5Y	"	28,449	124	42	67
K5JTH	"	14,204	76	23	44
AA5JD	"	11,152	88	24	44
KE5ITH	"	11,026	62	28	46
K5CI	"	7,344	55	19	35
KF8PD	"	6,549	89	21	38
N3XKB	"	5,778	43	22	32
W5JDF	"	4,752	35	20	34
AB5J	"	4,368	67	32	59
N5SJ	"	3,180	47	21	32
W7ZCU	"	1,512	24	13	15
AF5CC	**21A**	**9,519**	**70**	**19**	**38**
K5QR	"	7,200	55	15	30
K6RAH	"	2,880	34	10	22
***W5GZ**	**AA**	**231,767**	**418**	**62**	**165**
*NA5J	"	150,750	269	55	146
*AB5NX	"	115,993	249	56	137
*N5AYB	"	56,474	144	51	100
*WA8ZBT	"	43,860	160	36	66
*AB5TH	"	36,418	120	46	85
*KV5W	"	36,176	116	43	90
*NO5V	"	28,028	121	35	63
*NQ5M	"	27,192	135	30	58
*N5PD	"	25,752	110	41	70
*KN5S	"	18,396	85	32	52
*W5PAA	"	15,072	79	40	56
		(OP:KF5GTX)			
*KG5KRZ	"	14,720	73	29	51
*K5LGX	"	11,398	73	35	47
*W5RIR	"	9,717	73	32	47
*K5QW	"	8,625	48	22	47
*W5ANE	"	8,556	66	22	40
*K5SVV	"	8,109	61	22	31
*WD5HJF	"	7,630	54	26	44
*NT5SM	"	7,140	53	21	30
*N5OF	"	6,136	52	26	33
*K5NMT	"	5,568	45	24	34
*NØIPW	"	5,406	45	18	33
*NT5I	"	3,636	36	11	25
*KF5WVJ	"	2,200	23	18	22
*AK5SD	"	1,334	18	11	18
*KF5BA	"	868	15	14	14
*N4IL	"	630	12	9	12
*WB5QLD	"	408	13	8	9
*KN6Q	"	221	10	6	7
***WA5WFE**	**21A**	**40,362**	**167**	**22**	**71**
*W5DLP	"	500	15	8	12
***N4IJ**	**14A**	**144,988**	**469**	**29**	**105**

District 6

K6XX	**A**	**1,995,490**	**1880**	**118**	**288**
W6TK	"	834,912	1003	93	219
W6AFA	"	636,350	990	87	188
K6NA	"	553,581	678	94	209
N6KN	"	511,812	789	72	180
W6XB	"	373,856	640	74	150
NN6DX	"	250,920	442	61	144
		(OP:W1PR)			
K6JAT	"	186,208	396	64	120
N6JS	"	136,850	455	57	118
KW6S	"	126,672	298	58	116
N9BD/6	"	123,442	264	60	121
AI6LY	"	96,855	227	57	108
W6JCW	"	88,086	227	53	106
		(OP:K6XN)			
N6CCL	"	80,238	233	38	91
NC6R	"	74,087	315	47	92
K6YK	"	68,040	209	48	78
WA6MRK	"	53,975	174	47	80
K6LRN	"	43,896	145	41	83
K6BEW	"	43,078	144	47	72
WA6URY	"	39,405	136	44	67
W6FA	"	26,880	117	34	62
N6AJ	"	25,784	141	33	55
KG6SVF	"	23,166	116	32	49
K6ME	"	8,733	56	30	41
K1VRF	"	6,713	55	22	27
KB6A	"	4,212	53	17	19
K6ELE	"	4,187	56	20	33
KK6ZUU	"	3,698	38	20	23
K6SBA	"	3,225	27	18	25
K6GZ	"	2,850	31	17	21
KF6QH	"	2,576	41	22	34
N5KO	"	1,232	18	13	15
AK6TR	"	812	20	14	14
KM6I	"	756	16	10	11
KJ6UVQ	"	735	13	9	12
N6XI	"	630	12	10	11
N6YFM	"	627	17	10	9
KR6D	"	480	13	8	8
WA6FWN	"	364	10	7	7
N6FVY	"	272	27	15	19
WB6NER	"	168	28	14	14
W6MKO	"	104	11	7	6
KØAU	**21**	**34,086**	**176**	**24**	**54**
AI6JZ	"	6,324	111	12	19
K2YY/6	**14**	**154,810**	**579**	**30**	**83**
W6NYA	"	5,964	69	15	27
W6RBC	"	1,650	30	13	20
K5KT	7	19,068	101	26	58
***N6RV**	**A**	**457,056**	**611**	**84**	**204**
*WN6K	"	190,872	378	73	125
*WZ6ZZ	"	51,646	169	48	71
*KE8FT	"	44,760	144	51	69
*K6PGH	"	30,210	119	34	61
*KD6RMS	"	29,498	125	38	48
*WB6CZG	"	26,076	112	44	62
*W6JK	"	25,800	110	37	49
*KA6MIB	"	23,114	99	37	54
*K6MUG	"	21,000	99	35	49
*K6ICS	"	19,380	111	45	50
*K6TER	"	16,686	98	33	48
*N6UTC	"	12,988	86	29	39
*K6VN	"	12,880	79	31	39
*NJ6W	"	9,943	63	23	38
*KE6WC	"	8,268	55	25	28
*W6SFI	"	5,546	45	24	23
*KQ6ES	"	5,335	36	25	30
*W6WG	"	5,217	45	21	26
*K6OWS	"	4,335	38	24	27
*WB6BET	"	3,036	37	21	23
*KI6UDZ	"	2,484	40	17	19
*K6SDW	"	2,120	34	19	21
*N6REK	"	2,006	28	15	19
*W6LU	"	1,748	32	17	21
*W6VXP	"	1,075	17	10	15
*NU6Y	"	1,029	21	10	11
*AI6IN	"	989	21	12	11
*K6AA	"	792	15	11	11
		(OP:K6ZNL)			
*W6DLK	"	684	13	9	9
*WZ6W	"	680	23	16	18
*KM6AAI	"	672	14	10	11
*W9EO	"	600	33	14	16
*KE6IUE	"	504	13	9	9
*AI6UW	"	442	16	13	13
*N9DK	"	224	13	4	4
*KK6VZI	"	216	18	10	8
*KQ6BN	"	189	21	14	13
*NA6NA	"	160	10	5	5
*W6BDX	"	156	6	6	6
*AA6MU	"	8	5	4	4
*WA7BNM/6	21	56,079	217	24	69
*W6ZL	"	31,575	147	21	54
*K7XE	"	27,761	150	21	50
*AE6YB	"	13,038	111	17	36
*N6GP	"	6,811	49	18	31
*AE6XC	"	2,280	39	14	26
***K6QCB**	**14**	**7,656**	**75**	**17**	**27**
*N6BHX	"	3,069	48	13	18
*N6DBI	"	527	17	8	9
*N6SAC	"	338	17	6	7
*N6PS	"	187	17	6	5
*KK6VZE	"	160	8	5	5
*AG6JA	"	144	8	3	3
*KM6AKK	"	117	7	4	5
*K6VUG	"	50	12	5	5
*K6KQV	"	48	3	3	3
*AG6VH	"	42	10	4	3
*K6EGF	7	693	14	9	12
***KD6GWH**	**"**	**54**	**3**	**3**	**3**
W6PH	**AA**	**1,296,867**	**1132**	**113**	**316**
NW6P	"	474,888	828	80	202
		(OP:W9KKN)			
N6WIN	"	414,137	528	85	204
W6YI	"	281,748	352	84	234
W1SRD	"	231,849	304	82	197
NJ6G	"	211,358	355	67	150
K6SRZ	"	209,764	363	70	159
N5ZO	"	204,530	334	70	156
N6QQ	"	186,381	316	74	169
N6ED	"	184,338	261	71	195
N6WS	"	181,832	273	63	175
WA6KHK	"	174,960	315	75	141
K6MM	"	139,008	294	58	123
KR6N	"	124,916	303	52	115
KG6WIK	"	99,932	239	57	109
K6RIM	"	73,660	200	51	94
KG6AO	"	66,171	186	57	80
W1RH	"	64,224	174	38	106
W6SR	"	61,239	157	42	107
K6RR	"	52,124	174	60	97
W6MOB	"	40,576	142	48	80
W6ZM	"	40,192	124	47	110
W6SC	"	38,430	131	33	72
K6DLB	"	35,880	126	41	74
WB6JJJ	"	32,900	127	37	57
NC6B	"	28,865	87	44	71
K6GFJ	"	21,012	109	28	40
W6JBR	"	18,675	102	29	46
WB6HVW	"	18,486	98	31	48
N6ETO	"	16,456	99	30	38
ND2T	"	10,010	56	27	38
K6KMH	"	8,514	49	28	38
W6UZ	"	7,680	79	34	46
W8KA	"	6,384	43	23	34
WX6G	"	4,850	38	20	30
AF6F	"	3,552	32	21	27
W6HYI	"	750	14	12	13
AF6SA	"	437	12	8	11
N6YG	**28A**	**930**	**21**	**7**	**8**
N6WM	**21A**	**191,280**	**612**	**27**	**93**
NA6O	"	76,560	331	23	64
NK6A	"	28,840	155	21	49
N2NS	"	25,944	112	25	69
N6IC	"	21,056	143	20	44
KI6X	"	4,554	50	14	19
WX5S	**14A**	**274,344**	**774**	**33**	**109**
K3EST	**7A**	**242,296**	**844**	**35**	**89**
N6RO	1.8A	551	20	8	11
***W6OAT**	**AA**	**64,042**	**177**	**49**	**93**
*N6ORB	"	37,673	142	35	66
*W6RJM	"	30,012	104	37	86
*KE6PLA	"	22,185	104	35	52
*N6CW	"	20,184	96	38	49
*N6GEO	"	16,683	90	37	46
*W6IA	"	13,050	78	33	42
*N6JNL	"	10,400	71	31	34
*K6RIG	"	9,858	61	30	32
*KJ6LJI	"	9,234	62	25	32
*W6IFN	"	6,909	52	24	25
*KE6QR	"	5,886	55	25	29
*W6ZAR	"	4,326	37	14	28
*W6JWP	"	3,710	47	18	17
*W6KY	"	2,541	29	14	19
*KF6I	"	2,349	33	15	14
*K6XV	"	1,886	30	18	23
*WW6G	"	875	20	11	14
*K6KHB	"	864	20	15	17
*AE6PL	"	840	19	11	13
*W6YXY	"	819	14	9	12
***W7TR**	**14A**	**612**	**13**	**7**	**10**
		(OP:KH2TJ)			
*AG6TS	"	225	12	8	7

District 7

N9RV	**A**	**2,481,972**	**2209**	**120**	**308**
N7ZG	"	748,880	1003	90	206
NX1P	"	604,920	823	98	186
W7AT	"	535,748	691	95	207
		(OP:W7EW)			
KD7RF	"	371,882	522	78	185
W9FI	"	314,766	469	77	184
K7ABV	"	251,990	415	63	160
W7RN	"	244,260	417	74	156
		(OP:K5RC)			
KS7T	"	140,940	307	60	120

AD7XG	"	99,372	247	51	105
WB7BBQ	"	97,361	235	59	108
KE2VB	"	96,696	234	59	99
KM6JD	"	83,948	285	46	78
KB7AZ	"	73,154	193	52	106
WA8WZG	"	62,440	222	57	83
K6UM	"	44,928	131	47	81
W7WDX	"	43,660	146	44	74
NK7L	"	40,986	157	46	92
N7XCZ	"	40,293	142	38	73
AK7MG	"	30,709	116	37	70
W7CAR	"	30,660	146	34	50
WA6NFJ	"	27,224	118	34	49
K7SID	"	24,948	97	38	61
W7GTF	"	23,406	112	34	60
KI7DG	"	20,584	104	25	58
WG7X	"	20,250	97	32	58
K7HPT	"	18,788	109	29	48
W7PV	"	16,826	75	32	62
K9JDV	"	15,884	106	27	49
KG7JWD	"	10,740	67	21	39
KH6VM	"	10,710	82	26	44
WB7S	"	10,440	63	29	43
W7WVF	"	7,938	51	23	40
KF7CYG	"	5,767	88	32	41
N7DK	"	5,720	45	25	27
W7JHR	"	5,100	63	21	30
N2OML	"	5,074	57	25	34
KØIP	"	4,028	36	16	22
K9QJS	"	3,567	48	18	23
N7LR	"	1,210	22	10	12
W7AUM	"	828	22	11	12
N7QS	"	690	17	7	8
W6OLA	"	648	16	11	13
KF6HI	28	7,416	82	12	24
W7KNX	21	26,491	173	19	40
K7MY	"	20,945	126	20	51
NE7D	"	20,064	113	20	46
N5CR	14	184,800	549	31	101
W7IL	"	36,646	202	19	54
W7PU	"	21,440	159	21	59
KI7CKE	"	10,920	74	20	40
W5UJ	"	1,403	27	6	17
KC7ZZ	"	861	46	18	23
W7CKW	"	56	6	4	4
W7WA	7	251,505	703	35	100
NF7E	"	11,532	81	23	39
N7RK	"	4,158	41	17	25
AL7RF	3.7	5,439	60	18	31
W7EEH	"	1,127	27	9	14
K7CW	1.8	585	22	7	8
N7AU	"	273	49	7	6
***N7IR**	A	456,494	568	88	205
*K7ACZ	"	365,638	482	86	201
*WZ8T/7	"	272,748	503	65	139
*W6US	"	149,150	323	62	128
*W8BFX	"	42,188	149	40	66
*N7MZW	"	39,820	152	43	67
*N7ZUF	"	36,015	146	32	73
*N7IOD	"	34,556	123	41	65
*N7VZU	"	32,207	118	34	73
*W7GSV	"	24,206	103	38	60
**KG7OH*	"	22,705	115	40	55
*K7EPH	"	18,450	90	37	53
*KNØW	"	17,864	97	35	53
*W7ZI	"	16,289	78	34	57
**AA7TV*	"	14,535	72	37	48
*WA7BAM	"	14,014	88	30	47
*WØBF	"	13,425	70	35	40
**K6QOQ*	"	10,836	64	27	36
*KW7WP	"	10,430	63	26	44
**W8WOM*	"	8,208	66	31	41
**KF7EB*	"	7,366	69	24	34
*KF7OJA	"	5,247	64	26	27
*N1RWY	"	5,104	58	26	32
*N7AME	"	4,784	47	25	27
*NØKVN	"	4,400	35	24	26
*N6LB	"	4,284	44	16	26
**WA7RLL*	"	4,000	35	15	25
*K7QA	"	3,969	59	18	31
*W4BH	"	3,900	42	23	27
**W7OXB*	"	3,825	40	19	26
*K7AZT	"	3,569	38	20	23
**KF7RU*	"	3,410	33	23	32
*KE7ZAC	"	2,583	31	21	20
*N7JI	"	2,294	36	15	16
*K7EAZ	"	2,120	31	19	21
**KC7ITP*	"	1,920	24	16	16
*KE7WNB	"	1,350	20	13	14
**K7OVW*	"	1,232	24	11	11
*N7MOT	"	988	21	10	16
**AA7UN*	"	814	13	9	13
**WA9MSR*	"	782	12	11	12
**N8WCR*	"	748	26	9	8
**KO6UW*	"	570	14	7	8
*KM7N	"	493	11	7	10
*K1AUS	"	414	23	12	11
*AD6ZR	"	408	18	13	11
*W7FZY	"	361	17	11	8
*NG7Z	"	350	11	8	6
*K7ALO	"	320	12	8	8
*K7DBN	"	308	12	7	7
**KI7PKL*	"	272	9	8	8
*WB7CYO	"	255	11	7	8
*K7JKM	"	200	8	5	5
*AG7GB	"	189	11	5	4
*K7VNC	"	156	6	6	6
*K7RMZ	"	120	7	7	5
**KT9X*	"	108	13	9	9
*WA7JBM	"	96	10	8	8
*K7EEX	"	48	9	6	6
*KI7MAT	"	40	4	3	2
*WA7CPA	"	20	11	10	10
**W7USA*	28	2,684	57	10	12
***K7ULS**	"	48	4	2	2
***W7UPF**	21	30,294	165	23	58
*WB7FJG	"	12,031	92	18	35
**WB7FDQ*	"	8,235	78	15	30
**N7MWV*	"	738	15	6	12
***N7FLT**	14	51,980	207	24	68
*KD6TR	"	20,320	117	23	57
**N7TNT*	"	9,078	76	19	32
**N7RVD*	"	6,972	70	15	27
*AG7AA	"	4,294	66	14	24
*WV7S	"	2,464	33	11	21
**N7BK*	"	1,750	25	11	14
*KC7FCW	"	527	13	9	8
**AF7LZ*	"	429	23	7	6
*K7PCB	"	216	12	5	4
*WA7CC	"	12	2	2	2
*N2KND	"	0	1	1	1
***WA7NWL**	7	2,700	36	13	23
K7RL	AA	1,375,584	1394	96	272

W7ZR	"	1,256,346	1237	114	299
WA7LNW	"	567,333	604	104	269
WA7AN	"	359,015	491	83	212
		(OP:K9DR)			
K7XC	"	350,354	466	87	196
K7UT	"	350,280	560	67	185
K7AR	"	337,144	474	79	189
N7GCO	"	322,260	474	77	185
K7HP	"	306,540	455	78	184
KF7U	"	302,175	501	68	169
K6KR	"	245,232	392	68	166
AE7VA	"	213,342	391	74	148
N7VF	"	195,936	389	60	148
N9NA	"	190,944	336	82	152
KI7M	"	167,388	363	77	145
W7MEM	"	146,028	320	52	120
NA7DX	"	110,704	230	53	134
K7JQ	"	101,486	249	50	104
W7YED	"	95,424	283	46	96
K7OX	"	83,681	201	45	112
K7VIT	"	76,845	200	55	86
K2PO	"	74,980	169	50	113
W7WW	"	65,661	198	35	94
KN7K	"	60,776	250	37	70
K7STO	"	57,023	192	41	86
K7SS	"	50,268	176	40	78
W7RIS	"	43,225	156	46	87
K7BVT	"	27,126	119	38	61
KJ7EP	"	18,960	99	28	52
K7CF	"	18,360	95	40	62
KX7YT	"	17,160	93	27	51
NG7M	"	15,801	87	33	36
KT7G	"	13,580	74	26	44
K7AHF	"	11,692	94	28	46
KF7ZN	"	9,100	57	29	41
W7GDK	"	4,680	35	26	34
K7HI	"	2,958	46	22	29
NA2U	"	2,109	25	17	20
KC7OO	"	2,016	29	14	18
AD7BI	"	1,767	52	26	31
N6RC	"	1,764	24	16	20
W7VM	"	154	10	5	9
N6SS	28A	23,952	183	14	34
N7CW	21A	44,700	165	25	75
N7DD	14A	495,680	1227	36	124
K7RI	"	219,105	644	30	105
		(OP:K7ZQ)			
K7ABL	"	53,251	214	25	78
KA6BIM	"	23,688	103	24	60
W7WHY	"	4,173	37	12	27
WAØPFC	"	3,698	40	15	28
K2RD	7A	102,360	356	33	87
WA2BFW	"	3,813	57	19	22
***K7WP**	AA	497,777	592	92	237
*W7OM	"	176,928	361	63	131
*WA7DUH	"	108,108	226	54	128
*KB7HDX	"	96,135	238	41	104
*K6WSC	"	89,386	175	59	128
*NA7OM	"	75,790	204	49	94
*K7TQ	"	74,949	225	41	88
*NW7E	"	74,314	186	50	96
*K7HKR	"	50,310	160	49	80
*KF7DUR	"	47,104	156	50	78
*KD7PCE	"	44,178	155	42	69
*WØPAN	"	18,122	99	35	47
*AD7MM	"	12,950	80	28	42
*W7SO	"	12,012	65	21	45
**NF7T*	"	10,902	62	28	41
*KM6CQ	"	6,732	62	22	29
*WAØWWW	"	5,977	50	15	28
*NO7E	"	3,600	54	22	26
*AA7EA	"	1,870	45	17	17
*N3KCJ	"	1,372	29	10	18
*WM5F	"	1,350	20	12	13
**N7WRO*	"	1,156	25	8	9
**KC5EGZ*	"	120	8	5	5
**KI7PYH*	"	70	11	7	7
***K7GS**	14A	8,664	62	16	41
*W7PT	"	7,089	59	16	35
*WB1KE	"	867	27	9	8
*KG7DMI	"	294	10	6	8
		(OP:KI7OAL)			
***AG7RT**	7A	0	1	1	1

District 8

NA8V	A	937,408	914	84	304
WA8RCN	"	306,540	512	63	197
K8PGJ	"	294,056	451	58	178
KB8KMH	"	89,590	213	55	115
K8DIL	"	77,679	222	33	104
NS8O	"	64,079	195	40	99
K3ZJ	"	63,500	182	40	87
AC8XU	"	18,190	101	28	57
AB8DS	"	17,958	85	24	58
W8AB	"	16,195	83	25	42
KD8BXE	"	9,729	65	26	43
K8EAW	"	9,639	61	20	43
WA8TM	"	8,758	66	16	42
WA8LE	"	7,659	59	22	47
WA8ZIP	"	7,590	51	26	43
W8LMG	"	2,184	30	15	24
W8MSP	"	1,680	28	12	18
KE8Y	21	2,142	31	11	23
AA8DC	14	45,985	196	19	66
KW1HF	"	5,355	45	13	32
K8AO	7	7,285	62	14	33
KG9Z	1.8	252	28	6	6
***N8II**	A	1,009,896	1040	82	266
*K8YSE	"	293,210	489	51	167
*N8MWK	"	135,056	268	50	134
*N8GLS	"	116,232	255	43	124
*WT8E	"	99,876	250	49	125
*W8GX	"	92,442	244	35	107
*W8MHS	"	57,441	196	33	90
		(OP:KØACP)			
*K8ZZU	"	51,569	158	42	97
**K3DMG*	"	50,576	163	31	85
*W8TM	"	44,764	133	32	92
*KD8DZO	"	43,148	157	42	92
*N8PPF	"	36,822	129	41	73
*AB8OU	"	33,048	127	33	69
**KD8JAM*	"	25,854	116	30	63
*W8KNO	"	24,200	120	31	57
*WB8JUI	"	19,046	82	29	60
*K7DR	"	18,468	88	26	55
*N8SBE	"	14,880	100	24	56
*K8RGI	"	13,122	97	31	50
*KD8VMM	"	8,704	58	18	46
*AD8Y	"	8,643	57	21	46
*WA8MXJ	"	8,052	57	18	43
**N8RJP*	"	7,308	51	23	35
*KD8JQE	"	7,168	64	21	43
*N6YEU/8	"	6,210	52	13	32

*N8TCP	"	6,042	52	14	39
*W8LDR	"	5,252	45	17	35
*KB8OTK	"	5,208	45	29	33
*KG8FE	"	5,184	48	21	33
*K8WAY	"	4,750	43	19	31
*WE8UPJ	"	4,000	44	22	28
**AC8AZ*	"	3,570	34	17	25
**AC8FG*	"	3,384	35	18	29
*AC8NP	"	3,315	39	13	26
*K8PJK	"	3,157	38	17	24
*W8IDM	"	2,730	34	15	20
**W3CRZ*	"	2,340	26	13	26
**KE8DNV*	"	2,080	31	15	25
**W8DFW*	"	1,312	24	13	19
*W8AHT	"	988	19	11	15
**W8AYL*	"	936	14	10	14
*N8NFE	"	748	19	9	13
**KE8BNE*	"	697	14	5	12
*NS8H	"	494	11	9	10
*AE8TF	"	425	10	7	10
**NA8B*	"	330	13	10	12
*N8BGR	"	256	8	8	8
*KE8EAS	"	168	8	5	7
*NF8M	"	156	8	7	6
*KC8BB	"	30	4	3	3
*N8OVY	"	14	4	3	4
***KJ8O**	21	12,934	84	14	44
**K8QH*	"	2,048	26	11	21
***AF8C**	14	20,850	126	20	55
*K8AJS	"	5,304	49	8	31
*AB8XU	"	425	10	8	9
***N8YRE**	7	8	4	2	2
N8BI	AA	1,108,233	985	99	342
N4RA	"	1,089,440	928	100	340
N8CWU	"	658,050	822	78	243
W8MJ	"	503,004	555	72	262
ND8L	"	457,065	542	73	242
KC8QDQ	"	302,775	405	66	209
K8ROX	"	298,650	336	79	251
W8HPJ	"	298,278	499	52	167
WA8Y	"	276,393	435	66	181
W8GNM	"	225,225	360	61	170
KA8G	"	172,200	313	57	148
K8BZ	"	171,580	293	62	168
N8LCU	"	154,224	321	43	146
N8HP	"	118,668	257	47	127
W8VI	"	96,534	217	45	128
KC8YVP	"	69,958	207	40	93
W8UF	"	61,612	168	39	107
N8GAS	"	24,864	103	34	77
AA8GP	"	17,138	87	23	59
KE9L	"	11,466	59	24	54
KD8ZCH	"	10,744	57	26	53
N8XCO	"	5,586	43	21	28
K8YE	"	3,888	37	23	31
W8EH	"	3,864	30	19	27
KE8AME	"	2,584	28	15	23
KD8ZQZ	"	1,872	22	15	21
N9RC	"	1,452	21	13	20
N8VAR	"	600	18	10	14
WA3C/8	21A	99,036	280	28	103
W8CZN	14A	318,978	783	36	126
AC8G	"	139,875	422	25	100
AE8U	"	306	12	8	9
N8NB	1.8A	629	16	7	10
***K8LY**	AA	422,406	553	64	215
*N8VV	"	108,360	224	39	133
*WD8S	"	86,100	220	40	110
*N8BV	"	19,224	106	29	60
*KC8YDS	"	13,612	61	22	61
*WS6K	"	13,072	60	32	54
*N8XTH	"	12,441	55	36	51
**N8OH*	"	9,648	57	24	43
*N8FYL	"	9,088	56	24	40
*KC9LVT	"	8,976	54	24	44
**NW8F*	"	2,640	26	16	24
**W8WDW*	"	1,026	18	12	15
**KD8YNG*	"	957	17	13	16
**W8NSA*	"	690	17	9	14
*N5MKY	"	512	18	14	18
*N8DKA	"	448	11	6	10
***N8DE**	21A	26,128	105	19	73
*N8BJQ	"	20,944	111	20	48
***N8QNM**	14A	2,048	23	9	23
*KM8V	"	35	3	3	2

District 9

W9RE	A	3,925,128	2840	125	411
W9GT	"	395,079	610	50	187
K9BGL	"	151,524	305	61	122
K9ZO	"	135,548	264	65	141
KF9US	"	133,578	277	51	130
K9RU	"	123,025	295	51	134
K9RZ	"	102,992	259	47	110
KD9MS	"	59,492	156	43	96
N9SJA	"	59,451	182	40	93
WA9VGI	"	35,742	127	33	78
K9DUR	"	31,411	126	25	76
N9KR	"	31,200	115	34	70
N9LYE	"	30,888	109	38	79
KE9UA	"	29,946	158	32	61
W9KXQ	"	29,795	116	38	63
K9AMP	"	22,533	101	29	58
K9GWS	"	20,739	105	36	57
WA5LOU	"	19,834	99	31	63
N9CO	"	11,977	72	18	41
WA9ZVF	"	10,764	78	28	50
W9TC	"	5,198	41	15	31
KE9NS	"	289	11	8	9
W9VA	21	18,827	103	18	49
W9OP	14	75,366	264	24	82
W9BGX	"	10,904	90	14	44
		(OP:WA9LKZ)			
W9YM	"	420	12	6	9
K9CJ	7	9,450	70	17	37
AA9BD	3.7	4,880	44	8	32
W9SE	1.8	207	11	4	5
***NJ9R**	A	177,408	350	50	148
*W9RF	"	144,358	314	53	125
*K9WD	"	69,412	215	40	94
*N4TZ	"	64,437	173	41	100
*WB9HFK	"	47,214	150	46	83
*WD9CIR	"	33,408	131	29	67
*AC9GK	"	30,935	135	40	75
*KOØZ	"	30,193	130	40	69
*AA5UK	"	23,460	106	24	68
*W9KG	"	14,420	81	25	45
*N9EAX	"	13,756	79	26	50
**N9AI*	"	13,104	70	22	50
*K9EGS	"	7,581	57	22	35
**N9YLE*	"	7,564	46	22	39
*KD9AC	"	6,850	57	13	37
*AC9AK	"	6,156	45	17	37

*WB9LRK	"	6,144	51	15	33
*WB9BWP	"	5,850	45	17	33
*K9BBQ	"	5,593	50	18	29
*WO9S	"	5,499	46	16	31
*N9YLZ	"	3,276	40	19	23
**KA9O*	"	3,240	32	16	29
*W9SUN	"	2,849	34	14	23
*KC9ZTY	"	2,520	27	15	21
*WB9NOO	"	2,520	30	17	28
*W8NWG	"	1,998	36	15	22
*W9AT	"	1,248	19	9	15
*N9BT	"	493	12	9	8
*K9WPV	"	462	13	9	13
**N9AFU*	"	456	14	9	10
*K9HMX	"	198	7	5	6
*KC9PKF	"	8	2	2	2
***W9EAU**	21	3,293	35	13	24
		(OP:KB9S)			
***W9GYK**	14	9,858	82	15	38
*KC9VYX	"	5,236	52	12	32
**AA9L*	7	266	20	9	10
*N9WKU	"	30	5	2	3
W9PA	AA	1,796,505	1347	118	405
N2BJ	"	1,385,270	1255	94	321
AG9S	"	1,100,745	1001	91	310
N9MW	"	797,616	791	88	294
ND9G	"	749,710	748	87	278
K9IMM	"	667,704	749	89	255
N9ZM	"	569,400	639	84	241
AC9S	"	534,300	665	79	221
W9IU	"	412,383	505	67	236
K9KE	"	397,670	496	80	219
WO9Z	"	387,195	472	86	225
KC9WAV	"	308,646	452	54	180
W9MK	"	307,458	414	69	210
WT9U	"	281,415	431	71	186
NA9RB	"	272,916	385	72	194
NT9E	"	190,442	374	61	162
KC9K	"	182,584	324	62	170
K9EXY	"	134,048	251	59	177
N5RP	"	115,596	267	39	130
N9LQ	"	100,254	206	57	129
K9YX	"	99,532	282	38	111
W9YK	"	90,882	202	60	127
K9MMS	"	82,593	192	55	116
K9PY	"	82,050	213	49	101
NQ9A	"	41,511	144	24	77
KR9E	"	37,500	136	42	83
KC9BG	"	34,191	140	40	91
KC9EOQ	"	31,122	116	35	82
K9LA	"	30,388	107	39	89
K9DJT	"	25,347	99	45	74
NA9A	"	24,976	84	34	78
N9MS	"	13,203	69	31	50
N9NBC	"	8,646	62	28	38
AA9DU	"	6,370	51	24	41
N9GUN	"	4,371	36	19	28
N9EP	"	2,079	25	14	19
WI9WI	"	1,500	22	11	14
KA9FOX	"	1,080	17	10	17
KA9EAK	"	750	15	12	13
N9YK	"	627	14	8	11
K2UR	21A	143,374	391	28	105
W9IIX	"	44,730	189	17	73
N9WK	14A	8,844	50	18	48
W9RN	7A	21,460	117	20	54
***K9PG**	AA	238,506	351	67	187
*WA9LT	"	127,100	308	45	119
*KC9UJS	"	68,558	171	60	106
*W9VQ	"	63,280	171	39	101
*WT9Q	"	49,623	167	36	83
*AE9LL	"	28,558	118	35	74
**N9UDO*	"	28,120	123	32	63
*N9SB	"	26,334	102	38	61
*WA9LEY	"	22,971	105	30	63
**N9HQ*	"	18,920	93	29	59
*N9VPV	"	15,552	73	31	50
*NR9K	"	10,880	74	24	44
*N9WEW	"	6,042	43	21	36
*KB9O	"	1,887	28	14	23
*WB9VPG	"	1,880	24	16	24
**AC9KQ*	"	1,020	23	12	18
*W9WB	"	528	15	10	12
*KD9DZT	"	361	10	9	10
*K9SOU	"	117	5	4	5
***W9ILY**	21A	53,865	186	23	82
*N9TF	"	46,812	179	19	75
***N9TGR**	14A	93,360	303	25	95
*WK9U	"	78,600	285	21	79
*KC9ZDA	"	66	4	3	3
***NM9P**	3.7A	2,349	36	9	20

District Ø

NCØB	A	525,343	656	77	222
N7BD	"	457,821	607	76	225
N7WY	"	401,310	599	55	190
NEØU	"	372,842	548	75	202
KØJJR	"	334,068	511	65	181
NØOST	"	239,610	430	58	152
KØVXU	"	210,456	353	65	172
KØTRL	"	145,638	294	58	128
NØUU	"	50,470	200	30	73
ACØDQ	"	39,480	124	32	88
ADØH	"	38,875	141	46	79
NUØC	"	37,504	125	45	83
NFØN	"	31,924	125	27	65
KØSIX	"	31,209	116	32	69
NØFY	"	30,780	125	24	71
KØHCV	"	27,604	116	39	64
KAØLDG	"	27,257	110	35	62
KEØCRP	"	23,051	105	29	60
NGØZ	"	21,951	106	25	56
WB9QAF	"	17,745	88	36	55
W6IR	"	16,038	77	27	54
NJØL	"	14,850	73	36	54
WØOVM	"	13,266	72	25	42
WBØWIV	"	10,270	69	23	42
KJØI	"	5,824	45	24	32
ADØAB	"	5,124	51	25	36
K9TWW	"	3,888	33	18	30
KEØCZQ	"	3,552	35	16	21
AJ2E	"	3,320	88	35	48
NØKEG	"	3,239	34	17	24
KCØUUT	"	2,832	38	19	29
KDØNPT	"	2,142	25	11	23
KEØIMB	"	1,887	28	16	21
NYØT	"	1,110	27	16	21
KØVG	"	924	17	10	12
K5EMI	"	840	16	10	10
K8PVD	"	819	14	10	11
KIØHA	"	690	13	11	12
KØFA	"	437	12	7	12
NØLBY	"	247	11	6	7

NØOK	21	48,875	212	21	64
NØWRK	"	13,975	102	20	45
KØZX	"	5,805	50	17	28
KØGXI	"	2,944	50	15	31
KØSRL	14	51,975	218	22	83
WØSHL	"	3,298	47	9	25
WØPPF	"	1,176	44	13	29
WØVB	"	30	3	3	3
WØQC	7	6,800	73	18	50
KØTT	3.7	14,336	131	12	44
KIØF	1.8	250	58	5	5
***ACØW**	A	513,264	674	79	217
*WØETT	"	146,306	310	62	129
*NGØT	"	70,664	178	43	103
*N6JRL	"	34,684	156	35	81
*WAØLJM	"	32,844	142	32	60
*WA2JQZ	"	24,934	101	38	53
*KØNR	"	24,722	100	30	64
*WØRX	"	23,562	84	35	64
*KCØJRW	"	22,116	110	28	48
**KØFX*	"	18,031	120	22	51
*AFØZ	"	14,430	92	31	47
*KEØITC	"	14,080	85	31	57
*KJ5CI	"	11,346	70	23	39
*KØSCO	"	9,344	54	29	44
*KDØFZT	"	9,272	77	29	47
*KEØCAZ	"	7,749	73	27	36
*KØTC	"	7,296	56	19	38
**WRØU*	"	5,782	48	21	28
*KEØJFZ	"	4,998	51	18	33
**WA3YNF*	"	4,794	40	22	25
*KØUA	"	4,455	45	17	28
*NØEMU	"	4,320	78	25	35
**WBØFTY*	"	4,320	42	16	32
*KDØRSX	"	3,792	39	22	26
*WØHBH	"	3,666	35	15	24
**KDØWAN*	"	3,375	28	18	27
*WØJSL	"	3,256	62	17	20
*AAØCW	"	2,860	40	16	28
*WAØLIF	"	2,440	28	17	23
**NØDH*	"	2,418	35	16	23
*WØNFS	"	1,862	26	17	21
*KEØOR	"	1,836	39	14	20
*KEØJYJ	"	1,708	22	8	20
**KGØEW*	"	1,519	22	15	16
*K8MCN	"	1,296	26	11	16
*AEØDM	"	1,248	31	11	15
*ADØSZ	"	1,225	18	11	14
**KBØYUV*	"	1,200	21	14	16
*NØUK	"	1,026	17	11	16
*NNØJS	"	962	19	11	15
*N2SRK	"	684	19	9	10
*KDØCVZ	"	648	20	12	12
**KDØYWZ*	"	576	12	8	10
**KJ6TQ*	"	380	11	10	9
**NØWKR*	"	375	14	8	7
*WØWTF	"	198	7	5	6
***KØBBB**	21	67,288	260	25	79
**WØJIM*	"	7,644	70	9	33
***KØSV**	14	2,080	29	13	19
**WAØILD*	"	540	19	9	11
*WØDDP	"	161	15	4	3
KØKX	AA	2,210,385	1601	119	386
K7SCX	"	848,166	860	91	271
KQØC	"	670,122	715	98	256
WØJM	"	516,137	651	82	231
NØAT	"	480,240	519	86	262
KØOU	"	445,150	651	75	215
KØYR	"	416,318	603	69	193
NØKE	"	360,858	536	89	185
WØBM	"	353,452	474	67	210
KBØEO	"	307,440	381	86	219
WBØN	"	299,481	417	80	193
KØAD	"	272,400	429	65	175
KØBJ	"	259,191	349	74	205
NØBK	"	259,173	369	63	198
KC6R/Ø	"	253,044	461	49	164
WØMB	"	212,058	355	70	161
WØWDF	"	207,399	343	64	193
KØMD	"	158,288	280	57	151
KØPC	"	151,678	300	43	138
K1KD	"	145,530	330	44	121
WGØU	"	144,313	257	61	160
NØBUI	"	142,202	268	46	148
WØKIT	"	139,239	298	60	131
NWØM	"	125,999	277	40	123
WB9KPT	"	121,968	274	57	111
WAØMHJ	"	106,020	176	59	169
KØOB	"	99,345	213	52	127
NØODK	"	97,695	219	50	117
K3WT	"	96,624	234	44	132
WØOR	"	94,154	225	54	125
WØAD	"	87,538	197	46	127
WGØM	"	71,232	170	41	118
WØCP	"	70,452	258	34	80
KEØMF	"	51,858	149	42	87
KØUK	"	49,861	158	47	72
N7IV	"	44,544	146	34	82
ADØRW	"	40,704	138	32	74
KØARY	"	39,663	126	33	80
KØJPL	"	28,830	113	35	58
KØTLG	"	24,662	93	33	85
WØZQ	"	16,646	76	29	53
KØAE	"	12,096	73	30	42
N5TU	"	7,383	52	28	41
KBØVHA	"	3,700	32	23	27
WB2UFO	"	2,911	30	12	29
WØGJ	"	1,881	28	15	18
KØAP	"	1,586	21	8	18
KBØEL	"	1,500	17	15	15
NØNZG	"	1,161	32	16	27
KØEV	"	840	22	16	19
KBØXY	"	775	14	12	13
NØMK	"	16	2	2	2
WAØJZK	21A	22,152	118	20	51
KSØAA	"	11,385	104	18	37
KVØQ	14A	426,952	1044	37	129
KYØR	"	2,187	29	8	19
NJØF	7A	45,656	201	29	75
KØCN	"	6	1	1	1
***AAØAI**	AA	369,642	498	61	212
*AD1C	"	127,721	259	56	131
*WXØZ	"	115,204	267	46	120
*WØYJT	"	81,030	226	41	105
*NXØI	"	48,789	146	41	98
*WØSEI	"	39,446	143	44	77
*NØKK	"	30,458	118	24	73
**KEØEBW*	"	15,678	100	28	50
*KCØFOT	"	9,730	52	26	44
*KBØGUS	"	9,652	58	27	49
*KØRC	"	8,375	52	22	45
**AKØM*	"	4,750	37	20	30
**AAØA*	"	2,940	27	16	26

*NØEO " 1,144 20 12 14
(OP:AAØAW)
*KØLAF " 888 17 11 13
*KØLBR " 420 14 7 13
*KFØIQ 14A 3,822 37 14 28

Alaska
AL1G A 136,895 662 37 58
AL7LO " 127,194 407 42 87
KL7IH " 986 18 13 16
*W7EIK A 54 4 3 3
AL7KC 14A 79,184 349 27 71
*KL7TH AA 8,610 103 20 22
*AL4Y " 1,909 33 12 11
*KL1JP 21A 36 6 2 1
*WL7F 14A 980 69 4 3

Bahamas
*C6ARW A 1,897,350 2696 84 241
(OP:NØHJZ)

Barbados
8P5A A 13,794,654 9034 146 496
(OP:W2SC)
*8P2K 14 8,619 83 10 29
*8P1W AA 173,316 597 50 82

Belize
*V3A A 1,547,808 2726 81 195
(OP:V31MA)
V31VP 21A 984,870 2759 32 123

Bermuda
*VP9/K3SW AA 393,705 1005 55 140
*VP9AD " 28,704 105 34 70

Canada
District 1
VY2ZM A 8,514,880 5509 120 470
(OP:K1ZM)
VE9CB " 5,714,490 4564 97 381
VA1XH " 213,405 391 47 158
VO1KVT " 164,960 424 47 113
VO1BQ " 154,960 395 35 114
VE1JBC " 54,029 197 19 78
CG9ZZ " 21,000 101 19 56
(OP:VE9ZZ)
VO2ET " 9,169 87 21 32
*VE9HF A 683,880 1099 62 184
*VA1SEA " 152,460 314 47 133
*VE1SQ " 97,644 253 42 116
*VY2GF " 31,395 140 23 68
*CG1JS " 27,300 120 28 72
(OP:VE1JS)
*VE1AOE " 2,176 23 15 19
*VE1TWM 21 4,257 40 12 31
VO2RAC AA 677,525 1567 55 150
VY2TT " 253,748 565 34 124
(OP:K6LA)
VE9MY " 242,880 326 57 219
VO1MP " 16,131 99 18 39
*VO1PIB AA 405 10 6 9
*VA1QLE 14A 2,475 39 10 23

District 2
VA2WA A 3,021,744 2883 82 306
VE2IDX " 2,526,061 2830 86 281
(OP:VE3ZF)
VE2GSO " 502,077 1096 53 146
VE2TSM " 91,732 254 34 108
VA2OBW " 14,656 96 22 42
VA2LGQ 21 2,074 26 11 23
VE2VIA 14 1,088 47 11 23
VA2ES 7 560 16 7 13
(OP:VE2AXO)
*VE2HIT A 165,020 381 44 141
*VA2BN " 130,830 303 48 130
*VE2ZT " 51,415 206 36 77
*VE2DJC " 20,826 96 29 60
*VA2RIO " 12,444 91 21 40
*VA2SG " 7,803 61 15 36
*VE2SCA " 135 9 6 9
*VA2BS 14 190 8 5 5
VE2AED AA 431,056 706 58 174
VA2AGW " 83,887 232 27 122
VA2MM 14A 44,730 160 22 83
*VA2CZ AA 1,031,772 1266 76 270
*VE2CJR " 145,080 277 57 177
*VE2DX " 64,260 226 26 93
*VE2KTA " 42,718 186 28 78
*VA2AFH 21A 17,680 99 17 48
*VA2HKR 14A 4,280 47 10 30
*VA2EI " 2,496 32 8 24
*VE2GT 7A 200 10 2 8

District 3
XL3T A 7,343,728 5643 119 413
(OP:VE3AT)
VC3X " 1,787,700 2104 84 270
(OP:VE7VR)
VE3KZ " 1,422,288 1481 82 275
VE3CR " 406,080 520 63 219
VE3TW " 391,811 615 58 193
VE3PN " 354,744 712 66 168
VE3KP " 334,010 504 62 192
VA3TIC " 326,839 758 57 154
VE3BR " 172,144 285 61 171
VE3KKQ " 148,216 314 50 144
VE3HED " 66,415 136 52 133
VE3MT " 63,072 184 42 102
VE3AD " 48,671 149 31 88
VE3GYL " 31,255 132 28 67
VE3FTM " 15,678 96 18 49
VE3EEJ " 1,792 25 10 22
*VE3VN A 337,953 527 54 177
*VA3UG " 323,475 550 59 168
*VE3SST " 168,454 303 57 152
*VE3VY " 160,734 392 46 132
*VE3MH " 159,988 339 50 138
*VA3TPS " 151,353 325 61 140
*VA3GD " 103,194 251 44 118
*VA3TTB " 71,995 237 34 87
*VE3IDT " 71,925 203 42 95
*VE3RUA " 66,096 197 48 96
*VE3SD " 60,125 217 40 85
*VE3LMS " 40,140 178 23 67
*VE3WG " 39,625 144 42 83
*VE3RX " 36,414 117 43 76
*VA3NW " 32,118 132 35 66
*VA3XDU " 28,975 135 31 64
(OP:VA3DBT)
*VE3IQZ " 26,677 115 31 72
*VA3EC " 26,307 122 23 56
*VE3RCN " 25,080 103 31 64
*VE3RR " 23,421 92 37 74
*VE3VSA " 22,800 109 22 58
*VE3SCN " 16,926 88 25 53
*VA3FN " 16,692 92 30 48
*VE3KPV " 13,266 85 25 42
*VE3DQN " 6,554 50 22 36
*VE3ISO " 2,555 33 11 24
*VE3PQ " 2,205 28 13 22
*VE3MEW " 1,683 29 13 20
*VA3ROC " 1,581 32 14 17
*VE3LDY " 1,242 21 10 17
*VE3NQM " 1,066 17 11 15
*VE3RXH " 312 14 6 6
*VE3PYJ " 310 17 5 5
*VE3LBG " 252 10 5 9
*VE3TG 14 29,212 155 14 53
*VA3TTZ " 104 10 7 6
*VA3AC 1.8 4,550 217 7 6
VE3RZ AA 1,170,304 977 101 345
VA3MW " 142,390 483 44 101
VA3QB " 22,440 116 30 80
VE3QN " 5,828 53 20 42
VE3UTT 21A 571,050 1397 27 123
VE3VEE 14A 715,560 1554 38 140
*VA3DF AA 1,899,235 1518 104 375
*VE3PJ " 871,992 990 85 282
*VE3JAQ " 352,800 690 58 166
*VE3CV " 211,650 325 74 181
*VE3MZD " 99,000 193 51 149
*VE3HG " 88,335 207 35 116
*VE3LVW " 28,812 108 25 73
*VE3XKZ " 26,290 128 34 76
*VE3JSQ " 16,632 93 25 59
*VE3MJD " 12,012 68 28 50
*VE3XAT " 8,509 46 22 45
*VE3XD " 8,000 64 21 43
*VA3ASE " 7,680 75 22 42
*VA3WNO " 6,426 46 20 34
*VA3XFC " 4,089 36 17 30
*VE3NR " 4,000 34 13 27
*VE3EZB " 2,684 28 16 28
*VE3ISG " 42 3 3 3
*VE3CWU 21A 22,922 131 16 57
*VE3MGY 1.8A 13,414 408 8 11

District 4
*VE4EV A 16,478 155 30 47
(OP:VE4DRK)
*VA4HZ " 14,673 120 31 36
(OP:VE4HAZ)
VE4VT AA 1,406,860 1746 99 265
*VE4MAD AA 820 18 8 12

District 5
*VE5DLC A 729 17 14 13
*VE5VG 14 6,681 47 14 37
*CG5AAD 7 198 20 3 3
(OP:VE5AAD)
VE5ZX AA 73,315 190 43 112
*VE5SF AA 102,971 304 32 89
*VA5LD " 1,512 28 12 15

District 6
VE6WZL A 213,530 820 52 79
VE6TK " 31,866 139 32 62
VE6FT " 13,199 92 31 36
VE6GD " 8,554 84 19 28
*VA6AN A 14,874 101 33 34
*VE6ZC " 2,093 50 12 11
*VA6IKR 14 495 20 6 5
VE6WZ AA 424,432 506 86 242
VE6KD " 41,234 142 38 68
CG6LB " 39,396 144 50 84
(OP:VE6LB)
VE6IKR " 572 16 6 7
VA6CV 21A 60,298 374 19 54
(OP:VE6CMV)
VA6UK " 1,260 26 6 14
VE6WQ 14A 839,676 2181 37 130
VE6CSX " 4 1 1 1
*VE6NS AA 41,789 135 42 89
*CG6SPS " 11,825 148 21 22
(OP:VE6SPS)
*VE6FRD " 1,323 29 14 13

District 7
VA7ST A 439,524 1190 53 121
VE7WO " 175,489 758 41 72
VE7NY " 142,803 581 41 82
VE7BC " 71,554 213 46 87
CF7XNL " 33,228 204 36 42
CF7RR 14 923,580 2910 35 105
(OP:VA7RR)
VE7WGJ " 6 4 3 3
VE7SO 7 13,224 107 20 38
*VA7CRZ A 186,308 400 62 126
*VA7GI " 5,832 47 25 29
*VE7BGP " 4,611 40 25 28
*VE7XNC " 175 29 16 19
*VA7AM 14 2,184 48 10 14
*VE7XH " 170 6 5 5
CF7FC AA 688,320 1362 75 164
(OP:VA7FC)
VE7XF " 283,440 468 71 169
VE7FE " 43,792 163 42 70
VA7JW " 8,850 54 20 39
VE7RK " 8,400 69 18 32
VE7SZ 7A 56,000 511 19 37
VE7GL " 24,486 316 16 26
*VA7BEC AA 151,354 519 42 91
*VE7CKZ " 24,480 108 35 55
*VA7DXC " 3,834 61 14 13
*CF7JC " 885 30 8 7
*CG7CXZ 14A 629 19 9 8
(OP:VE7CXZ)

District 8
*VE8NSD A 20,828 131 32 50
*VE8GER " 3,626 44 15 22

Cayman Islands
ZF9CW A 6,564,075 5574 133 392
(OP:K5GO)
ZF2AH " 656,964 2131 46 108
(OP:W6VNR)

Costa Rica
TI2OY A 532,776 1020 65 172
TI2CDA " 2,054 30 9 17
TI5W AA 1,258,222 2222 78 181
(OP:N3KS)
*TI7/W5AP AA 144,205 463 55 96

Cuba
*CO2RQ A 157,251 493 54 105
*CO8ZV " 133,937 433 47 104
*CO2VDD " 91,949 261 39 104
*CO8SJ " 83,139 416 39 68
*CO6HZ " 78,645 242 43 104
*CO2SG " 67,725 329 36 69
*CO8TH " 32,028 176 26 76
*CO7RR " 28,840 135 40 63
*CO2ER " 28,548 121 37 80
*CO2YT " 10,980 84 20 40
*CO8RH 28 16,992 275 11 21
*CO6EC " 1,431 36 10 17
*CO8WAL " 450 11 7 8
*CO6HLP 21 600,210 2079 29 101
*CO6LC " 382,145 1545 24 91
*CO6LE " 356,520 1488 25 95
*CO8AW " 42,813 370 17 50
*CM2RSV " 28,536 227 18 40
*CO8ZZ 7 68,931 496 16 53
*CM2MM " 35,496 259 17 51
*CO8RRM " 10,335 151 12 27
*CM7ZA " 8,234 79 12 34
*CM8NMN " 136 7 4 4
*CO8XN " 70 8 3 7
*CM2XN 3.7 46,915 438 14 41

Dominican Republic
*HI3T A 3,303,664 4165 91 273
*HI8PJP 28 5,220 112 7 11
*HI8KW 7 4,356 44 8 28
*HI8PAP AA 75,651 189 48 119
*HI7SBR " 805 14 9 14
*HI8JSG 21A 191,200 965 21 79

Guadeloupe
FG4KH A 22,754 166 28 34
(OP:F1DUZ)
FG5GP " 4,290 53 15 18

Guatemala
*TG9IIN 21A 296,612 1203 24 92
*TG9ANF 14A 171,190 862 22 73

Martinique
FM5BH A 4,135,780 3670 113 371
FM5AN AA 181,792 418 59 125
*FM1HN 14A 311,124 977 28 104

Mexico
XE2ST A 193,518 813 53 64
XE1TD " 840 15 10 14
(OP:XE1FXF)
XE1B 14 118,690 1088 15 40
XE2S 7 24,960 264 21 27
*XE2AU A 32,571 140 38 61
*XE3TT " 21,560 98 28 60
*XE2YWB " 12,580 74 32 42
*XE3WM " 4,015 38 24 31
*XE2KJ " 2,457 26 18 21
*XE2NBL " 1,008 21 11 13
*XE1H 28 5,382 103 10 13
*XE2PDZ 14 1,440 61 6 6
XE1MEX AA 339,542 406 78 229
*XE1IM 21A 2,492 34 8 20

Panama
*HP2BWJ A 13,064 135 20 26
*HP1RIS 28 32,766 312 15 28
HP1XT AA 431,396 942 69 148

Puerto Rico
WP4OFO A 159,840 663 36 75
*NP4AW A 199,320 679 33 99
*NP4ET " 140,146 416 44 114
*KP4JFR 21 1,368 25 8 11
*WP4WW 7 1,188 20 8 14
(OP:KP4JRS)

St. Kitts & Nevis
V47JA AA 223,788 462 61 143
(OP:W5JON)

St. Lucia
J68GD A 993,475 1846 66 179
(OP:K9AW)

AFRICA
Algeria
IG9/I2ADN 28 156,576 601 23 73

Algeria
*7X2JV A 107,625 357 21 84

Canary Islands
EA8DET A 186,202 495 42 115
EA8OG " 12,852 76 25 43
EA8DED 28 322,812 906 23 103
(OP:OH2BP)
EA8CMX 21 419,160 1248 25 95
(OP:OH2BYS)
EA8AM " 266,916 1186 20 58
EA8/OH1RY " 6 1 1 1
(OP:EA8AH)
*EA8AQV A 254,204 439 51 155
*EA8BQM " 151,340 357 43 118
*EA8/DJ6HL " 41,760 155 27 69
*EA8/DL4KCA " 1,848 25 12 16
*ED8B " 16 2 2 2
*EA8TX 28 400,710 1221 22 92
*EA8BOA " 10,252 131 15 29
*EA8CTK 21 3,584 57 10 22
*EA8BGO 14 32,300 200 15 53
*EA8AD " 2,150 35 11 14
*EA8BPX 7 61,938 236 19 74
*EA8CSB 3.7 363 14 3 8
EA8KY 21A 552,288 1436 26 106
EA8JR 14A 1,255,464 2599 36 132
EA8NF " 170,877 630 27 76
ED8W 1.8A 14,763 112 13 44
(OP:EA8DO)
*EA8ZT AA 615,252 648 77 277
*EC8AQQ 14A 114,948 450 16 77

Cape Verde
D4Z 21 2,954,982 5511 38 148
(OP:SQ9D)
D4C 14A 2,327,904 4540 39 138
(OP:SQ9CNN)

Cueta & Melilla
EA9KB 21A 1,268,540 2725 36 128

Dem. Rep. of the Congo
9Q6BB A 173,230 378 48 122

Djibouti
*J28ND A 540 12 9 11

Egypt
*SU9JG 21 29,376 158 19 49
(OP:EA7TN)

Kenya
*5Z4/LZ4NM A 4,158 46 17 25

Madeira Islands
CT3HF AA 2,226,187 1881 90 319
CT9/DJ2YA 28A 434,343 1190 25 104
CQ3W 21A 1,603,296 3277 37 134
(OP:DF7ZS)
CR3W 14A 806,820 2026 31 109
*CT3FW 14A 68,607 293 20 79
*CT3HY 7A 17,112 100 13 49

Morocco
*CN2AL A 19,669 100 34 55
*CN8VO AA 302,400 619 45 130
*CN2BW " 228,932 391 60 182

Mozambique
C93PA AA 235,620 447 49 149

Namibia
*V51/TA1HZ 28A 41,904 221 13 59

Reunion Island
FR4QT A 1,757,142 2266 59 223
FR5DN 7 11,032 75 20 36
*FR4QK A 6,710 53 19 36
FR4NT AA 353,769 685 52 141

Senegal
6W1SU 21 127,448 488 19 70

South Africa
ZS1TMJ A 122,106 350 50 91
ZS2ABE " 60,391 204 44 87
ZS1XG " 14,960 72 32 56
ZS2HR " 11,926 74 32 35
ZS2MAC " 1,320 20 9 13
ZS9Z 21 46,230 249 17 52
(OP:ZS1OIN)
ZS6BRZ " 24,528 130 25 59
*ZS2NF A 60,140 172 39 85
*ZS1S " 46,494 135 37 89
*ZS6RKE " 1,350 21 11 16
ZR6GR AA 137,274 301 52 115
*ZS5SAM AA 154,105 307 53 132

Tanzania
5H3EE 14 75,060 247 29 79

Maritime Mobile Africa
*FT5WQ/MM A 83,424 265 43 89
*UT5EKF/MM " 9,798 59 25 44

ASIA
Armenia
*EK6SI A 201,112 462 45 139
*EK7DX " 105,000 342 29 91
*EK8ZZ " 47,385 226 18 63
*EK4JJ 21 3,535 44 16 19

Asiatic Russia
District 9
RT9S A 2,325,724 1859 107 351
R8WF " 1,508,420 1454 88 291
RJ9U " 280,544 749 48 128
RU9CC " 249,944 553 53 146
RZ9YI " 228,942 435 67 170
R9UA " 208,208 348 81 205
UA9CAW " 170,321 481 45 136
RK8I " 159,360 491 26 94
RC9AR " 104,859 234 55 136
RA9UAD " 60,480 218 42 93
RX9WN " 40,515 164 37 74
RL8C " 11,023 67 17 56
UA8WAA " 4,914 46 11 31
UA9BA " 4,606 40 13 34
RO9S 21 62,055 271 24 81
RV9CQ " 25,662 135 25 66
RZ9OQ 14 96,960 418 25 76
RD9SA " 85,995 303 23 82
R9RA " 84,916 359 22 70
R9CZ " 1,380 22 5 18
RD9U 7 72,080 327 24 82
RX9UKF 3.7 7,544 65 13 33
*RU9AC A 483,531 604 77 246
*RK9DC " 370,225 546 59 192
*UA9URI " 367,536 757 61 167
*UA9ZZ " 239,560 506 59 153
*UA9SUV/8 " 183,438 487 37 121
*RA9YE " 81,774 219 47 107
*RZ9AD " 73,538 193 47 119
*R9TV " 59,690 203 35 92
*R8UT " 35,490 167 17 61
*UA9JNT " 35,404 154 33 73
*R9AAL " 16,377 104 30 73
*R9VK " 15,776 101 14 44
*R9OCP " 12,328 83 22 45
*RD8O " 9,802 75 20 38
*RL9I " 9,350 66 15 40
*RX9DJ " 1,215 20 8 19
*RAØUF/8 " 984 24 8 16
*R8OD " 624 22 7 6
*RZ8U 21 132,966 681 20 69
*RA9CCK " 87,138 336 24 79
*RX9CCJ " 35,742 195 16 58
*R9QQ " 7,093 62 8 33
*RZ9OW " 760 24 5 14
*RA9APG 14 91,488 370 20 76
*UA9OMT " 15,680 110 16 40
*RT9O " 105 5 3 4
*UA9SMU 7 51,538 264 14 59
*RZ9YN 1.8 320 10 6 10
RC9A AA 1,582,986 1636 93 293
UA9TF " 1,203,624 1083 106 332
UA9CDC " 858,627 818 96 317
RO9A " 558,207 612 87 280
RK9AX " 212,544 596 36 108
UA9UR " 77,928 155 63 141
R9MJ " 45,981 156 35 96
RM8L " 35,280 145 18 66
RK9ULD " 18,492 126 33 59
UA9CGL " 4,264 47 20 32
UC9A " 4,200 37 16 34
RK9CR " 36 3 3 3
RZ9U 28A 39,650 237 19 46
R9VA 21A 77,740 338 24 68
RK9DM 14A 71,760 298 21 71
RA9JM " 18,150 112 16 50
RL9O " 1,485 24 7 20
RT8U 7A 449,752 1464 30 106
(OP:RZ9UN)
RL9Y " 385,044 1150 29 103
RN9N " 32,445 122 27 78
RW9CD 3.7A 37,876 214 12 56
*UA9R AA 922,208 1003 90 278
*RV9UP " 723,840 821 101 276
*R9AM " 98,640 284 32 105
*RA9MX " 83,226 170 44 150
*RT9YT " 74,947 267 50 99
*RZ9WU " 35,530 139 35 75
*RX9UK " 34,300 129 43 97
*RU9YF " 21,538 107 31 58
*RX9SR " 9,464 70 16 36
*RC9W " 8,175 64 26 49
*RK9JD " 4,859 40 11 32
*R9UP " 2,925 29 20 25
*RV9DC " 2,208 36 22 26
*UF8T " 741 16 6 13
*UA9AGX " 56 4 3 4
*R8LA 28A 2,214 38 6 21
*RW9QA 21A 55,566 188 27 99
*UA9CUA 14A 240,096 709 28 95
*RD8D " 10,506 79 9 42
(OP:UB8CGO)
*R9LM 7A 4,884 49 9 28
*RK9LWA " 216 9 4 5
(OP:RA9J)
*RK9DO 3.7A 7,584 67 11 37

District Ø
UAØXAK A 43,912 281 38 50
UAØACG " 30,240 135 48 72
RAØSMS " 1,056 19 15 18
RØAA 21 170,291 627 23 90
RTØF 14 718,425 2053 37 118
RNØCT " 336,420 1371 34 92
RWØUM " 1,100 33 11 14
RØWC 7 300 17 6 9
*RCØAAB A 159,852 426 49 124
*UAØUK " 115,588 519 46 102
*RZØA " 114,030 375 35 91
*RØCW " 63,728 338 43 69
*RØCAF " 52,890 232 56 73
*RAØLE " 13,122 100 34 47
*UAØIHY " 10,010 146 22 33
*RØAB " 6,625 57 17 36
*UAØUY 21 32,287 232 20 63
*RAØUJ " 21,358 193 14 45
RXØAE AA 817,735 1032 85 250
UAØSE " 528,513 936 61 180
UAØSR " 499,035 731 98 225
RUØLL " 29,376 143 35 61
RUØLAX " 25,662 107 31 63
UAØZC " 3,213 31 23 28
RAØZHM " 1,776 84 24 24
UAØW " 999 15 13 14
RYØA 28A 17,640 179 10 25
UCØA 21A 170,190 533 27 95
RKØUT " 137,402 805 24 79
UBØA 7A 113,904 515 29 84
RMØW " 38,540 221 20 62
RMØF 3.7A 25,134 207 25 46
*RL5G/Ø AA 345,450 1092 76 134
(OP:RW3GW)
*RØAS " 154,960 472 34 115
*RDØL " 5,208 47 27 35

Asiatic Turkey
TAØACL A 840 20 9 15
TA3LKU " 612 24 4 13
TA2OQ 28 1,664 28 12 20
TA2DE 21 6 1 1 1
TA2RG 14 31,758 220 11 56
TC1ØR 7 114,144 433 17 79
(OP:TA3D)
*TA4LYL A 240,734 484 45 152
*TA2EJ " 170,688 395 36 132
*TA2LP " 71,024 189 48 136
*TA5ADK " 36,138 155 31 83
*TA2OTT " 34,744 128 26 75
*TA2BS " 27,380 138 16 58
*TA2ACW " 24,276 103 20 64
*TC1ØK " 14,491 117 8 35
(OP:TA4CS)
*TA3EP " 11,799 101 15 42
*TA2D " 10,962 69 22 41
*TA2XX " 6,096 50 14 34
*TA4IBS " 4,872 47 12 30
*TA2RN " 80 4 4 4
*TA2TR 28 221 12 5 8
*TA2IB 21 28,084 165 18 50
*TA2MN " 19,282 151 15 47
*TA7AO " 1,180 25 7 13
*TA4AWS 14 28,674 181 8 51
*TA2AWM " 11,560 112 7 33
*TA9J " 3,696 52 7 26
*TA4PR " 2,268 40 4 17
*TC4A 7 275 9 3 8
(OP:TA4CS)
*TA2BW " 18 2 1 2
(OP:TA2BV)
*TA4ALQ " 12 2 2 2
TC3T 14A 27 3 1 2
(OP:TA3EL)
*TA4RC AA 424,704 631 58 198
*TA3ODG " 3,680 49 11 29
*TA7SO " 540 11 8 10
*TA7X 14A 918 18 3 14

Bahrain
A92GE A 546,336 785 58 194
A92GR 21 217,496 618 30 94
*A92AA AA 204,020 402 45 157
*A92FQ " 68,112 244 34 98

China
BH4LGE A 411,928 806 71 177
BH4UVN " 130,845 527 63 132
BG2VIA " 29,422 286 39 55
BA3MC " 3,168 43 20 24
BG5HEW 14 9,348 184 17 24

*BH3SCC	A	137,711	396	66	125
*BD7KBB	"	78,588	536	44	74
*BGØAXS	"	58,716	218	35	91
*BD3QT	"	20,493	139	29	52
*BG8DMY	"	8,040	87	28	39
*BD7PCA	"	6,517	77	21	28
*BD2IAQ	"	5,400	67	25	35
*BH1RWJ	"	4,928	66	27	29
*BH1NGG	"	3,504	60	23	25
*BG4JO	"	2,139	74	32	37
*BI4TGJ	"	1,520	47	17	21
*BD9ALM	"	1,512	26	10	17
*BG2TAA	"	1,480	48	17	20
*BH3DHE	"	1,394	28	16	18
*BG5NKC	"	735	19	9	12
*BH4DCL	"	667	26	12	17
*BG5BAA	"	657	93	32	41
*BD7LPD	"	598	17	13	13
*BD7BW	"	228	12	9	10
*BH2RAX	"	104	18	7	6
*BG8INK	21	45,900	226	24	66
*BG6AHD	"	36,975	191	24	61
*BG8IL	"	25,600	143	23	57
*BI4VXX	"	9,860	80	22	36
*BD7IBN	"	5,720	77	17	27
*BH4WOP	"	1,525	41	11	14
*BD5IQ	"	360	30	5	7
*BG2QMO	14	2,183	64	16	21
*BA3NQ	"	588	20	8	13
*BH4LFG	"	140	14	5	5
*BH4AYG	7	324	13	8	10
*BA9BF/6	"	0	0	0	0
*BG5TOX	3.7	960	37	9	11
BD3CB	AA	331,660	723	63	167
BD5FFK	"	13,896	130	31	41
BD4QA	"	1,653	62	14	15
BD4RQ	21A	33,187	188	21	56
BD4IJ	"	6	1	1	1
B7K	14A	209,207	923	31	100
(OP:BA7JA)					
BA4DL	"	175,980	879	30	75
BH1SCW	"	29,072	228	24	55
BG5EFD	"	18,920	344	19	24
BH1EBF	"	11,055	87	22	45
BD4WN	3.7A	496	37	8	8
*BH6KOK	AA	125,904	381	60	123
*BG5HEK	"	125,607	486	56	93
*BG3IAY	"	99,072	310	54	118
*BI4SHV	"	26,400	172	33	63
*BG8SXC	"	21,242	135	26	60
*BD7OB	"	20,736	106	45	63
*BA1PK	"	14,744	74	38	59
*BD3PXM	"	13,596	121	26	40
*BH4BQI	"	10,432	98	24	40
*BH8ASZ	"	10,191	125	36	43
*BD4KM	"	9,540	87	24	36
*BG5TZP	"	9,310	121	30	40
*BG9OF	"	9,028	80	22	39
*BH4TQX	"	5,015	66	28	31
*BG5IFW	"	4,672	95	27	46
*BG4HUL	"	3,952	69	20	32
*BG6SNJ	"	3,283	45	21	28
*BI4QGZ	"	2,704	42	23	29
*BI4OJF	"	1,116	22	15	16
*BG3UTD	"	1,080	22	14	16
*BH4TXN	"	748	37	16	18
*BG6CKV	"	520	24	11	15
*BG5JNT	"	380	16	9	11
*BG5OA	"	351	18	13	14
*BH4TNQ	"	88	11	5	6
*BD7BM	21A	486,286	1595	31	103
*BH4OUF	"	20,167	133	18	49
*BG9NJY	"	19,592	146	21	58
*BG7DOD	"	12,600	164	15	35
*BA4SD	"	11,700	80	19	41
*BH4OEW	"	464	20	8	8
*BH4TYL	"	240	11	5	7
*BH1BOQ	"	60	7	5	5
*BG7BES	14A	80,250	455	30	77
*BD9XE	"	16,356	205	17	41
*BG4GOV	"	2,760	36	9	21
*BH1HUK	"	1,200	39	11	14
*BH1KTL	"	140	12	7	7
*BG9FFP	"	-135	13	7	8
*BH4WPN	7A	54,230	363	24	61
*BA2BI	3.7A	672	36	8	8

Cyprus

H2T	A	3,572,603	3221	81	316
(OP:5B4XF)					
P33W	AA	13,936,272	6417	159	618
(OP:LZ2HM)					
C44C	"	1,107,200	1288	70	250
(OP:5B4AHJ)					
5B4AIF	1.8A	117,180	496	14	70
(OP:5B4AIE)					

Georgia

4LØA	A	5,415,824	3995	102	394
(OP:4L4WW)					
4L2M	14	895,350	2156	35	115
4L5O	3.7	29,925	206	11	46

Hong Kong

VR2CO	A	39,096	259	40	68
VR2ØC	7	8,365	156	12	23
(OP:BD7IS)					
VR2XAN	1.8	396	11	9	9
*VR2WOA	A	16,549	148	30	37
*VR2ØZQZ	21	381,577	1551	34	99
*VR2ZRE	14	525	20	4	11

India

VU2RCT	A	2,136,432	2187	96	280
VU2CVS	"	7,938	56	19	44
VU2EKJ	"	2,870	32	15	26
VU2UPX	"	1,440	46	15	30
*VU2IVV	A	104,528	248	59	129
*VU2LOC	"	72,345	205	50	109
*VU3ESV	"	61,490	235	42	101
*VU2CMI	"	54,683	187	48	101
*AT2FI	"	45,990	183	40	86
(OP:VU2YQ)					
*VU2DCC	"	32,219	126	32	69
*VU2SGW	"	11,904	74	21	43
*VU2KWJ	"	7,812	74	23	40
*VU2JOS	"	6,392	79	29	39
*VU2NXM	"	5,917	64	25	36
*AT1FI	"	4,505	79	18	35
(OP:VU2SMS)					
*VU2QDX	"	3,870	42	19	26
*VU2NSL	"	2,706	38	17	24
*VU2BL	"	1,620	46	16	29
*VU3NPI	"	648	22	13	14
*VU2BOT	"	500	25	10	15
*VU3LMS	"	464	21	13	16
*VU2ISH	"	320	20	8	12
*VU3OXH	"	260	22	11	15
*VU2HNN	"	18	3	3	3
*VU2MXE	"	-54	24	11	16
*VU3WBB	28	6,048	63	20	34
*VU2NEP	14	119	10	3	4
*VU3YJB	"	70	10	5	5
*VU2JFA	"	12	3	2	2
*VU2JFB	"	2	1	1	1
*VU3JFE	"	2	1	1	1
VU2YVK	AA	830,180	1262	74	236
VU2CPL	"	73,656	232	40	92
VU2ZMK	"	62,514	217	42	96
VU2IBI	21A	21,535	136	19	54
AT5X	"	8,178	64	15	32
(OP:VU2CDP)					
*VU3NXI	AA	309,312	596	46	146
*VU2DED	"	83,130	245	58	112
*VU2GRM	"	51,025	160	57	100
*VU2ABS	"	34,322	135	46	85
*VU2AE	"	32,912	116	43	78
*VU2HOT	"	5,100	53	21	30
*VU3SXL	"	1,656	41	16	20
*VU2TO	"	1,320	31	13	17
*VU2UI	"	18	3	3	3
*VU3XIO	21A	2	1	1	1
*VU2GRR	7A	1,311	24	7	16

Israel

4Z5LY	A	1,675,320	1935	74	271
4XØA	21	145,209	538	23	74
(OP:4X1VF)					
4X2M	7	632,392	1664	29	108
*4X4LF	A	33,695	122	25	90
*4Z5FW	28	1,782	78	9	24
*4XØT	7	50,463	254	17	64
(OP:4Z5FI)					
4X1IM	AA	298,352	527	62	170
4Z5UN	"	50,085	198	30	75
*4X1KS	AA	189,846	440	39	120
*4Z5LA	28A	7,144	68	10	28

Japan
District 1

JR1GSE	A	693,528	992	101	183
JH1QDB	"	496,349	648	99	202
JF1OPL	"	447,078	710	96	181
JE1BMJ	"	364,716	564	103	194
JA1XEC	"	209,520	367	69	147
JH1FNU	"	209,188	435	75	142
JE1RXJ	"	202,522	436	76	142
JA1DCO	"	195,000	318	93	167
JH1EVD	"	191,070	402	64	134
JH1OLB	"	153,550	412	52	114
JG1FML	"	77,055	192	62	103
JH1LEM	"	71,360	185	58	102
JH1MDJ	"	54,610	159	49	78
JR1JCB	"	54,131	205	54	79
JA1CRJ	"	47,601	152	52	77
JQ1LPT	"	39,125	136	47	78
JR1IJV	"	38,055	130	49	80
JA1IAW	"	36,330	155	38	67
JA1GVM	"	36,180	134	38	70
JA1FWS	"	35,860	152	38	72
JI1LNR	"	22,944	97	40	56
JA1KIH	"	18,564	94	34	50
JG1RET	"	18,228	91	38	46
JH1CTV	"	12,920	100	34	51
JI1JPJ	"	12,768	74	31	45
JA1UXV	"	9,600	57	24	40
JO1SIM	"	7,752	87	21	36
JA1RTX	"	6,642	55	20	34
JS1MRA	"	4,655	35	22	27
JI1NIK	"	4,272	51	21	27
JS1BIB	"	3,700	40	15	22
JR1FBA	"	2,610	29	12	18
JJ1ILR	"	2,272	34	14	18
JA1GHR	"	1,530	19	13	17
JH1DGJ	"	322	15	11	12
JJ1VFE	"	288	10	5	7
JP1NWZ	"	24	2	2	2
JJ1LBJ	28	8,550	79	18	32
JA1UXC	"	8,160	95	16	32
JE1VTZ	"	1,431	30	9	18
JA1NFD	21	24,912	146	22	50
JH1APK	"	12,470	80	18	40
JG1ITH	"	10,192	94	18	31
JG1TUC	"	2,550	31	13	21
JA1TEG	"	240	11	3	7
JH1PHK	"	189	7	4	5
JA1NQU	14	60,120	262	29	61
JK1WSH	"	20,097	115	25	52
JK1NJH	"	14,976	99	24	40
JA1UOA	"	13,167	100	23	40
JF1NZW	"	1,679	25	11	12
JA1PLL	"	1,518	23	7	15
JK1OPL	7	21,164	120	25	49
JA1NFB	"	1,425	22	11	14
JA1JRS	"	2	1	1	1
*JH1EAQ	A	548,457	644	110	233
*JS1KKY	"	222,072	406	76	152
*JA1GLE	"	157,334	372	73	121
*JF1WNT	"	116,064	251	75	111
*JM1UTT	"	85,800	222	61	104
*JA1BNW	"	67,950	205	52	99
*JE1RRK	"	63,232	226	47	81
*JA1SCE	"	57,460	203	48	82
*JH1LZU	"	55,480	184	51	95
*JR1QBA	"	47,492	175	53	71
*JR1LEV	"	42,240	183	45	65
*JK1NSR	"	41,128	154	40	66
*JR1EMT	"	35,947	145	39	64
*7K1MAG/2	"	33,900	146	35	65
*JK1LSE	"	21,960	107	42	48
*JA1BJI	"	19,116	86	49	59
*JA1CCX	"	15,387	107	29	40
*JH1SUU	"	13,286	83	39	52
*JH1JNJ	"	12,561	76	29	50
*JE1GZB	"	11,403	84	28	35
*JA1AZR	"	9,702	72	26	37
*JG6XYS/1	"	8,184	61	28	34
*JI1LAI	"	7,750	47	25	37
*JA1QIF	"	6,804	51	27	36
*JF1DWJ	"	6,696	57	23	31
*JF1RFZ	"	6,160	47	22	34
*JJ1SLW	"	5,096	46	21	31
*JR1CAD	"	4,947	43	23	28
*JHØROS/1	"	4,860	49	17	28
*JR1JRW	"	4,752	53	19	25
*JR1MRG	"	3,784	40	18	25
*JA1PCM	"	3,380	37	24	28
*JA1QML	"	3,268	32	18	25
*JH1EJB	"	2,640	49	21	27
*JI1WSZ	"	2,613	33	16	23
*JK1PIU	"	2,304	28	15	17
*JI1RWG	"	2,006	27	15	19
*JI1FLB	"	1,247	22	12	17
*JH1EYM	"	1,188	16	12	15
*JN1DNV	"	975	17	11	14
*JK1EXF	"	836	14	9	13
*JF1WLK	"	756	14	9	9
*JL1LGX	"	589	13	9	10
*JI1XOH	"	576	16	7	11
*JE1REU	"	529	14	11	12
*JH1DGB	"	504	13	7	11
*7L4IKF	"	494	16	7	12
*7L3OBQ	"	460	15	10	13
*JG1XAJ	"	432	12	8	10
*7N4JXR	"	408	10	8	9
*JF1KWG	"	364	14	6	7
*JA1UNS	"	273	10	7	6
*7L2DOP	"	209	7	5	6
*JR1USU	"	60	4	3	3
*JJ1HHJ	"	48	4	4	4
*JA1NEZ	28	6,525	72	16	29
*JA1WWE	"	5,633	55	14	29
*7N2UQC	"	4,945	56	16	27
*JF1OVA	"	4,410	53	13	22
*JA1MYW	"	4,403	48	14	23
*JA8KSW/1	"	1,800	31	8	16
*JR1MEG/1	21	51,612	258	30	62
*JA1RYC	"	12,528	103	20	34
*JJ1KZZ	"	12,483	79	21	36
*JM1LRA	"	11,388	92	18	34
*JH1GLJ	"	9,537	84	18	33
*JI1NZA	"	4,392	55	16	20
*JA3WNJ/1	"	3,672	53	14	22
*JK1BII	"	3,404	50	15	22
*JA1FFB	"	2,400	44	12	18
*7L1DST	"	2,240	30	13	19
*JH1HHP	"	1,431	21	13	14
*JR1EEP	"	1,360	26	8	12
*JA1GZK	"	1,044	20	8	10
*JA1DSW	"	902	19	10	12
*JA1DBG	"	665	17	8	11
*JA1OHP	"	180	8	4	5
*7K4TKB	"	144	6	4	4
*JG1MIJ	"	48	5	3	3
*JF1LKL	"	45	3	2	3
*JR6HYO/1	"	24	10	4	8
*JF1TEU	14	6,232	65	17	21
*JH1BHW	"	5,891	61	18	25
*JA1ALE	"	1,265	30	10	13
*JI1AFU	"	1,104	16	8	15
*JG1GCO	"	325	16	5	8
*JA1DDZ	7	5,888	64	17	29
*JH1RDU	"	288	11	9	9
*JE1CTL	"	30	3	3	3
*JA1QAD	"	6	1	1	1
*JE1SPY	3.7	714	28	8	9
JE1LFX	AA	507,080	705	93	187
JH1RFM	"	282,960	456	91	171
JQ1ABC	"	255,450	441	92	170
JN1THL	"	194,423	407	62	137
JR1EMO	"	157,728	344	72	140
JH1OVY	"	156,876	300	70	134
JA1WWO	"	119,355	235	79	140
JH1OAI	"	68,242	166	56	93
JH1ACA	"	57,128	170	54	94
JA1CJP	"	51,221	169	54	77
JE1NVD	"	43,080	150	46	74
JO1COV	"	39,336	135	49	83
JA1ADU	"	33,027	130	36	73
JN1BMX	"	31,350	107	51	63
JA1LNZ	"	11,725	61	25	42
JI1TYA	"	3,608	41	20	24
JS1KQQ	"	2,623	32	19	24
JQ1TIV	"	1,750	22	17	18
JQ1PCT	"	780	19	12	14
JH1CML	28A	10,140	116	18	34
JH1SJN	"	6,815	75	15	32
JJ1RDX	"	6,560	87	14	27
7L3SQL	"	2,920	40	16	24
(OP:JH3LCU)					
JE1CKA	21A	232,530	630	35	103
7K4VPV	"	29,110	139	24	58
7N4GIB	"	1,378	22	10	16
JA1XZF	"	117	5	4	5
JP1LRT	7A	5,535	56	17	24
8N1NIT	"	2,277	49	13	20
(OP:JG1WBB)					
JF1RYU	3.7A	2,940	44	16	19
*JA1UII	AA	109,867	254	63	118
*JF1LMB	"	54,080	197	46	84
*JE1COB	"	31,500	135	40	65
*JG1VHA	"	26,361	105	39	62
*JH1UBK	"	17,127	103	40	59
*JA1JNM	"	15,326	89	32	47
*JR1MEU	"	9,324	62	29	34
*JI1KOA	"	8,736	46	35	43
*JI1RSF	"	6,254	50	27	32
*JQ1EPD	"	700	16	8	12
*JQ1COB	28A	3,400	49	11	23
*JL1EEI	21A	14,885	94	25	40
*JI1ALP	"	6,050	45	17	33
*JN1PRB	"	1,035	20	10	13
*JE1KDI	"	920	21	9	14
*JQ1ARQ	7A	2	1	1	1
*JG1LFR	3.7A	594	18	9	9

District 2

JE2DJC	A	225,456	429	73	158
JH2KKW	"	190,712	360	86	162
JH2XQY	"	187,220	347	80	150
JA2KPW	"	112,926	278	64	110
JA2BNN	"	97,980	340	59	83
JA2JWH	"	63,420	211	58	93
JA2HOL	"	49,640	151	46	90
JR2PAU	"	47,360	154	57	91
JA2HYD	"	43,656	163	52	84
JH2BTM	"	34,743	149	44	67
JA2VHO	"	28,620	161	30	60
JR2BCF	"	22,752	102	39	57
JA2DHF	"	9,048	66	37	41
JA2FLA	"	6,902	48	25	33
JA2ATE	"	1,472	21	14	18
JE2OTM	28	8,928	91	18	30
JA2HBK	21	600	20	11	13
JF2IWL	14	2	1	1	1
JG2REJ	3.7	96	14	6	6
*JA2GHP	A	84,666	284	50	87
*JG2RFJ	"	62,868	212	45	79
*JA2KKA	"	10,004	74	23	38
*JS2DLR	"	3,645	35	20	25
*JA2IXS	"	2,829	39	18	23
*JF2FIU	"	2,772	31	19	23
*JR2KQE	"	1,650	28	15	18
*JE2BOM	"	1,104	18	11	13
*JA2QVP	"	1,012	20	11	11
*JJ2TKX	"	1,008	18	12	16
*JF2CTY	"	896	18	12	16
*JR2EUE	"	648	16	7	11
*JA2HZA	28	56	4	3	4
*JF2WXS	21	63,116	216	30	94
*JH2JNU	"	9,548	72	22	40
*JR2FJC	"	9,537	70	17	34
*JR2AAN/2	"	9,360	74	19	33
*JE2EVX	"	8,456	77	19	37
*JH2UVB	"	8,413	114	16	31
*JA2QPD	"	1,209	33	13	18
*JS2PHO	"	1,170	23	6	12
*JF2KWM	"	104	5	4	4
*JR2MIN	14	5,544	72	18	24
*JR2MIO/2	"	2,000	38	11	14
*JH2GZY	3.7	108	7	4	5
JF2QNM	AA	1,459,416	1504	121	271
JA2XCR	"	596,904	717	94	229
JR2PMT	"	324,318	480	93	190
JR2SCJ	"	309,708	532	94	158
(OP:JA8RWU)					
JH2FXK	"	10,192	71	22	30
JF2OZH	"	9,348	56	16	41
JK2TTP	"	3,555	31	21	24
JH2RMU	28A	7,200	78	16	29
JR2WLQ	14A	6,600	76	17	27
JA2GTW	7A	660	19	14	19
*JA2PFO	7A	14,260	110	22	40
*JH9DRL/2	3.7A	8	2	2	2

District 3

JH3CUL	A	737,704	918	97	235
JR3NZC	"	396,864	825	69	123
JH3OXM	"	137,802	352	70	123
JA3AER	"	97,544	250	67	111
JH3KCW	"	51,040	152	52	93
JA3LEZ	"	50,176	190	44	68
JA3FRI	"	35,088	123	53	76
JN3QNG	"	33,695	142	50	65
JA3QOS	"	18,468	102	31	50
JA3XOG	"	2,665	39	18	23
JA3HIL	"	1,344	25	20	22
JA3ENN	"	198	6	5	6
JR3RIY	21	170,847	548	32	91
JR3RIU	14	10,920	72	19	37
JA3HBF	3.7	840	21	11	13
*JL3RNZ	A	339,136	636	73	151
*JA3EBT	"	37,387	165	42	67
*JA3KDJ	"	18,490	125	36	50
*JO3QVT	"	13,200	100	35	53
*JP3MFV	"	9,666	72	23	31
*JA3PFY	"	9,520	77	29	39
*JR3JRI	"	9,295	67	29	36
*JH3JSJ	"	8,418	64	27	34
*JA3YEA	"	4,738	49	21	25
(OP:JP3HZM)					
*JH3GMI	"	2,400	31	18	22
*JA3MAT	"	2,262	35	18	21
*JF3FYD	"	700	15	9	11
*JH3PTC	"	187	9	5	6
*JG3EHD	"	40	4	4	4
*JF3BFS	21	175,460	554	33	91
*JA3JRI	"	9,845	88	19	36
*JA3BBG	"	3,959	52	15	22
*JP3KPJ	"	2,821	41	11	20
*JA3EGE	"	1,650	28	10	12
*JA3RAZ	"	98	6	2	5
*JF3JSZ	"	42	3	3	3
*JA3DAY	14	912	24	9	10
JA3AOP	AA	211,898	426	64	138
JN3TMW	"	209,592	375	85	161
JN3SAC	"	113,122	291	57	106
JS3CTQ	"	37,842	148	36	70
JJ3JJL	"	8,804	52	28	34
JH3EQP	"	4,928	66	18	26
JH3FUK	"	3,330	30	16	21
JO3DDD	14A	110,136	497	29	75
JF3LOP	"	42,720	191	27	69
*JL3MCM	AA	190,944	378	80	141
*JF3EIG	"	82,128	208	68	106
*JL3VUL/3	"	71,780	237	56	92
*JM3UJJ	"	45,000	163	49	76
*JH4PUL/3	"	38,068	121	49	75
*JA4XHF/3	"	99	5	4	5
*JR3RWB	28A	6,930	77	14	28
*JN3DSH	21A	56,745	238	29	68
*JM3QIS	"	1,204	30	11	17

District 4

JH4UYB	A	3,479,617	2978	132	335
JA4DWG	"	172,480	326	73	147
JA4EVN	"	19,690	142	38	72
JA4ESR	"	14,454	86	30	43
JA4UDN	"	3,850	40	22	28
JR4CTF	"	1,887	28	14	23
JE4ADO	"	486	9	9	9
JG4AKL	14	109,044	381	32	85
JA4EZP	7	1,026	27	13	14
*JA4RWN	A	41,300	159	45	73
*JE4MHL	"	14,742	73	35	43
*JE4NAN	"	5,236	40	31	37
*JA4JBT	"	825	13	12	13
*JA4TUJ	"	12	2	2	2
*JR4INQ	28	250	10	4	6
*JR4LRY	21	6,556	72	16	28
*JF4XUT	"	4,218	51	14	23
*JA4AQR	14	375	12	7	8
*JR4PDP	7	504	18	10	11
JR4OZR	AA	2,180,887	1837	125	354
JH4ADK	"	156,880	290	75	137
JO4CFV	"	133,144	324	73	114
JA4OPW	"	36,036	137	48	78
JA4GXS	"	9,145	64	25	34
JR4VEV	"	3,652	35	20	24
JA4BEV	"	836	21	7	12
JH4UTP	21A	342,489	955	34	107
JM4WUZ	7A	12,096	103	20	36
*JI4WHS	21A	35,392	201	26	53
*JH4CES	3.7A	2,130	37	13	17

District 5

JI5SKS	A	53,992	184	52	84
JA5FDJ	21	377,578	1008	35	107
*JG5UWK	A	101,150	263	68	107
*JJ5JLD	21	13,860	98	21	42
JH5MXB	AA	33,376	129	43	69
JA5FNX	"	2,040	27	16	18
JJ5GSY	28A	1,080	29	7	13

District 6

JE6RPM	A	1,823,290	1757	125	302
(OP:JH5GHM)					
JA6EML	"	140,085	343	52	113
JA6LCJ	"	94,605	260	57	102
JG6SRB	"	16,781	87	38	59
JA6FFO	"	10,650	64	28	47
JA6LJN	21	1,152	23	9	15
*JA6CVR	A	77,000	260	56	84
*JA6ONQ	"	11,918	88	18	41
*JA6GPR	"	510	10	7	10
*JG1NCL/6	"	408	10	8	9
*JA6EFT	21	8,904	97	19	34
*JA6DJS	"	6,400	66	16	24
*JH6SCA	"	3,927	50	14	19
*JN6AVV	"	3,132	43	14	22
*JS6SRY	"	1,239	24	8	13
*JE6ETZ	"	817	19	8	11
*JE6TUP	"	480	15	8	12
*JE6PVG	"	6	1	1	1
JA6GMC	AA	266,445	427	92	187
JA6BZI	"	214,965	349	89	166
*JH6QIL	AA	8,220	52	27	33
*JS6RTJ	28A	6	1	1	1

District 7

JA7NVF	A	1,167,790	1425	106	232
JA7BME	"	317,475	503	90	159
JA7VEI	"	75,972	186	57	99
JO7KMB	"	54,120	177	45	87
JA7AKH	"	43,882	225	27	47
JI7UUO	"	19,266	100	29	49
JP7PYI	"	14,972	91	34	42
JJ7PMS	"	11,573	88	33	38
JO7GVC	"	1,504	19	16	16
JG7AMD	21	11,310	79	21	44
JA7QVI	14	115,536	519	29	54
JA7LLL	"	4,879	52	13	28
JA7DOT	3.7	2,077	28	13	18
*JA7BEW	A	272,406	468	82	167
*JA7HYS	"	147,784	328	70	126
*JA7KQC	"	20,412	75	46	62
*JK7UST	"	4,429	37	19	24
*JP7GRU	"	2,415	31	17	18
*JR7ASO	"	273	9	6	7
*JE7KJG	21	23,826	144	22	44
*JF7GDF	"	288	8	6	6
*JI7EMD	14	8,996	80	19	33
*JE7LHT	"	6,431	45	19	40
*JA7KED	"	189	15	4	5
*JM7WWH	"	16	2	2	2
*JH8CLC/7	"	2	1	1	1
JH7RTQ	AA	307,757	497	72	169
JF7PHE	"	118,250	235	78	137
JA7OWD	28A	43,776	271	23	53
*JA7RPC	AA	157,056	328	64	128
*JL7CTR	"	5,831	53	21	28
*JH7SSJ	28A	9,275	87	18	35

District 8

JA8TGD	A	19,228	92	37	55
JA8CMC	"	3,264	40	16	18
JH8GEU	21	24,310	139	27	58
*JA8IJI	A	93,092	265	57	91
*JK8CEE	"	18,407	101	33	46
*JM8FEI	"	7,020	51	31	34
*JI8XLD	"	1,802	19	15	19
*JK8PBO	"	924	18	10	12
*JH8IYN	"	800	16	9	11
*JM8BYN	"	90	5	5	5
*JA8DJY	21	8,584	52	23	51
*JI8BUR	"	748	19	9	13
*JL8LTI	"	396	12	7	11
*JH8RXM	14	13,554	105	23	31
JH8SLS	AA	40,119	127	50	79
JH8CXW	"	21,420	97	33	52
JR8ORC	"	17,388	85	34	50
JH8SGR	28A	2,109	25	14	23
JH8DBJ	14A	45,980	183	28	67
*JA8CXY	AA	9,920	70	24	38
*JM8GJB	21A	392	10	5	9
*JK8VPQ	14A	3,348	57	11	16

District 9

JA9CCG	A	103,240	278	48	97
*JA9KBS	A	14,322	75	32	45
*JA9EJG	"	8,460	65	26	34
*JA9XAT	28	144	6	4	4
*JA9GEW	21	16,359	119	20	37
JF9JTS	AA	378,995	608	76	153
JR9GMS	"	17,974	78	38	48
*JH9KVF	21A	24,253	134	22	57

District Ø

JHØILL	A	103,020	260	62	108
JJØPJD	"	65,560	183	59	90
JAØLBE	"	47,200	290	31	28
JHØMXV	"	21,120	93	41	55
JRØWZR	"	12,561	74	34	45
JAØCLB	"	10,692	82	25	29
JAØLNS	"	4,141	35	15	26
JAØIXW	"	3,036	32	14	19
JAØAVS	"	2,916	37	17	19
*JHØNEC	A	342,689	536	87	176
*JRØGXA	"	18,832	82	38	50
*JRØDZH	"	12,006	77	31	38
*JAØBJY	"	9,920	70	25	37
*JHØCCK	"	8,778	57	25	41
*JGØGGI	"	3,783	44	16	23
*JAØRCK	"	2,160	22	16	20
*JRØJOW	21	2,449	30	9	22
*JJØNSL	14	43,589	204	29	62
*JHØEPI	"	36,774	187	24	57
JHØTIS	AA	356,697	532	104	193
JJØJML	"	270,107	451	93	164
JHØKHR	"	45,633	159	52	71
JAØFVU	"	8,316	51	31	46
JAØGCI	28A	3,198	45	14	27
*JA5QJX/Ø	AA	32,700	145	49	60

Kazakhstan

UN7FW	A	49,022	173	42	85
UN2E	"	39,990	164	22	71
UN7QF	"	27,945	124	24	57
UN7GDV	"	12,087	129	23	56
*UN9GD	A	39,324	150	43	73
*UN6G	"	8,820	76	25	38
*UN7CN	14	25,854	174	13	49
*UNØLM	"	23,358	174	10	41
*UN7ZZ	"	16,692	128	11	41
UN7LZ	AA	314,743	408	76	265
UN9L	"	21,910	126	23	47

UPØL	7A	1,018,720	2544	31	129
(OP:UN9LW)					
UN5GM	"	149,544	467	27	97
UN7JX	"	49,632	219	21	75
*UN8PT	AA	625,373	898	71	216
*UN7LAN	"	81,900	211	42	114
*UN7JID	"	2,537	32	21	22
*UN4PG	21A	47,740	195	25	85
*UP2F	"	5,330	48	9	32
(OP:UN8FM)					
*UN9LAB	14A	1,647	26	8	19

Kyrgyzstan

*EX7ML	21	59,976	345	19	65

Lebanon

*OD5TX	A	6,420	59	21	39
OD5ZZ	AA	1,167,687	2007	48	159
*OD5PY	AA	216,796	495	37	129
*OD5YA	"	5,740	56	26	44

Ogasawara

*JD1BIA	A	3,800	60	18	22

Oman

A41KT	AA	338	14	12	14
*A41ZZ	AA	1,989	21	18	21
*A41MS	14A	12	2	2	2

Qatar

A71AM	7A	419,020	1139	30	110

Republic of Korea

HL2ZDA	A	478,020	990	82	175
(OP:JH4RHF)					
HL4CJG	"	29,975	136	44	65
HL3EHK	"	1,770	21	11	19
*DS3EXX	A	96,912	362	55	89
*DS2CYI	"	56,277	306	48	69
*HL2CFY	"	7,280	62	28	37
*HL4CCM	"	7,137	56	24	37
*HL2VXK	"	6,887	66	33	38
HL2DBP	AA	26,529	100	50	61
*HL1ZII	AA	3,800	49	20	20
(OP:W4JSG)					
*HL3AMO	"	1,014	20	12	14

Saudi Arabia

*HZ1BW	A	478,656	690	73	215
7Z1SJ	AA	1,976,106	1619	123	351
HZ1FI	"	911,248	1022	74	263
(OP:DL2RMC)					
HZ1HZ	"	843,755	1190	68	185
*HZ1TL	AA	653,716	1001	68	191
*HZ1SK	28A	135,622	555	15	71
*HZ1DG	21A	193,612	711	21	76

Singapore

9V1YC	7	167,943	726	27	84
*9V1OW	A	7,191	89	21	26
*9V1XX	21A	16,074	221	19	38

Sri Lanka

4S7BHG	A	1,072,210	1294	90	268
*4S7AB	A	146,688	324	54	138
*4S6RYD	"	962	18	12	14

Taiwan

BV1EK	A	145,134	307	71	127
BW/JP3PZG	14	225	32	5	4
*BX8AAD	A	4,264	44	23	29
*BW/JL3RDC	"	2,200	85	13	12
*BV4WP	21	12,880	104	17	39
*BU2BE	AA	83,304	565	32	57
*BVØTW	"	10,431	101	22	35
*BU2EC	"	3,040	52	17	23
*BV1EP	14A	1,152	26	6	10
*BV9AA	"	1,029	32	7	14

Tajikistan

EY8MM	AA	253,512	548	39	129

Thailand

HSØZDX	A	77,616	206	41	106
HS6VW	"	3,584	49	23	33
HS5YLK	28	51,200	460	22	58
HSØZDR	21	11,648	88	13	43
*E23XOT	A	308,256	803	56	152
*E23HSW	"	21,364	102	39	59
*HS8LVC	"	14,308	93	28	45
*E27AH	"	1,188	34	11	16
(OP:HS4WLA)					
*E2ØSJC	"	756	55	16	26
*E2ØWXA	28	57,988	515	21	55
*HS5ZLD	"	1,920	34	11	19
*HS3LSE	21	28,944	227	21	46
*E2ØPFE	"	24,940	246	20	38
*HS8GLR	"	13,250	185	16	34
*HS3ANP	14	25,024	204	20	48
*E2ØNGF	"	23,616	187	21	51
*HSØZIA	7	73,854	302	25	74
*HS5FAI	3.7	8	2	2	2
HS5SRH	AA	1,638,904	2126	89	260
HSØZCW	"	797,951	1491	86	215
E2ØHHK	"	151,125	348	55	140
E2ØWUE	"	24,700	124	35	65
E2T	21A	3,103	70	12	17
(OP:E21IZC)					
HS3NBR	14A	3,400	68	12	22
*HS8HEX	AA	18,984	113	29	55
*HS8JWH	"	7,923	79	23	34
*HS1JZT	"	3,731	43	15	26
*HS1IWX	"	1,716	43	14	19
*HS3PJF	"	1,012	21	9	13
*HS8JYX	21A	6,533	70	16	31
*HS8JCV	14A	28,324	187	21	52

United Arab Emirates

A61QQ	A	2,199,952	2263	82	301
*A65CR	14	8,313	73	12	39
A61ET	AA	21,228	133	15	43
A61SM	21A	37,642	263	10	48

Uzbekistan

UK7AL	A	1,485	29	12	21
*UK8OM	14	16,571	99	16	57
*UK9AA	3.7A	120,951	516	15	74

Vietnam

*XV9NPS	A	30,358	240	31	55
*XV9JM	28	225	48	2	3

West Malaysia

9M4CJS	A	252	14	9	12
*9M2X	A	128,310	593	45	85
(OP:9M2MDX)					
*9M4CHM	"	3,842	45	14	20
(OP:9M2NAL)					
*9W2JMW	"	1,935	60	5	10
*9M2TSM	"	690	18	11	12
*9W2GEE	"	432	21	5	11
*9M4CKB	"	176	14	7	9
(OP:9W2KEY)					
*9M2AIM	"	128	8	3	5
*9W2OPB	28	600	64	4	6
*9W2JOH	"	294	14	7	7
*9M2DRL	14	96	6	3	3
*9W2VRD	7	23,815	188	17	38
*9W2VGR	"	16,192	156	17	29
*9W2SAF	"	16,120	208	15	25
*9W2HXP	"	7,584	102	11	21
*9W2DQM	"	5,832	81	12	24
*9W2DCW	"	5,270	87	11	20
*9W2LRN	"	4,625	78	13	24
*9W2AN	"	2,730	53	7	14
*9W2SAN	"	2,703	76	6	11
*9W2BDG	"	2,380	49	8	12
*9W2TNY	"	1,750	54	4	10
*9W2VMW	"	594	35	4	7
*9W2VWT	"	518	32	2	5
*9W2VPZ	"	441	20	3	6
*9W2JE	"	336	12	5	7
*9W2ZOW	"	119	17	2	5
*9W2MWZ	"	100	22	4	6
*9W2ZKU	"	88	9	1	3
*9W2WPZ	AA	25,300	225	20	35
(OP:9W2VTW)					
*9M2/JE1SCJ	14A	2,988	52	12	24
*9W2XTK	7A	2,816	55	9	13

EUROPE

Aland Islands

*OFØRJ	A	3,264	63	13	38
(OP:OHØRJ)					
OHØV	AA	3,752,611	3186	142	535
(OP:OH6LI)					
OHØX	"	1,023,852	1134	128	364
(OP:OH6KZP)					

Albania

*ZA1F	A	56	8	6	8

Austria

OE5WHN	A	75,852	281	46	126
OE3NEC	"	71,487	305	50	119
OE3KNC	"	59,660	254	44	113
OE6HWF	"	32,940	175	35	87
OE3ILW	"	15,088	117	31	61
*OE1HHB	A	388,375	815	71	254
*OE1CIW	"	140,817	440	49	170
*OE2IJL	"	43,040	196	37	123
*OE1GAQ	"	33,284	307	25	81
*OE4NKB	"	18,645	154	29	84
*OE1KFR	"	17,952	139	25	71
*OE9SEV	"	14,632	250	11	48
*OE3OSB	"	12,069	110	21	60
*OE3TWA	"	8,640	109	17	55
*OE3TPB	"	1,804	50	9	32
*OE3ULA	"	884	23	15	19
*OE5OEM	"	714	16	8	13
*OE/OM1WS/P	"	288	16	6	12
*OE5FPL	28	7,774	69	15	31
*OE3VET	21	1,617	39	7	14
*OE5HIL	"	520	16	9	11
*OE2ROL	14	4,257	68	9	34
*OE7AJT	7	12,150	225	8	42
OE6Z	AA	909,360	1051	98	334
(OP:OE6MBG)					
OE9MON	"	895,168	1440	81	313
OE2LCM	"	527,137	1133	75	224
OE5CSP	"	294,580	733	59	227
OE1H	"	146,910	372	67	182
(OP:OE1TKW)					
OE5JSL	"	100,492	278	56	138
OE3IDE	"	49,777	234	30	61
OE9GHV	"	37,905	157	38	95
OE9LWV	"	6,240	63	23	37
OE9TZV	"	5,500	43	15	29
OE5UAL	28A	35,120	184	22	58
OE2S	7A	292,034	1252	31	120
(OP:OE2VEL)					
*OE6TQG	AA	106,358	316	54	160
*OE1VMC	"	9,044	85	20	56
*OE1PPA	"	5,355	49	19	26
*OE4LQK	"	1,980	37	19	26
*OE7KUT	"	918	16	12	15
*OE3KPC	"	420	14	9	11
*OE6RAD	21A	35,342	208	23	59
*OE3MDB	3.7A	1,596	55	5	23

Azores

CU2AF	28	51,516	413	18	63
*CU4AT	A	84,402	255	42	120

Balearic Islands

*EA6/DK5IR	A	172,996	658	50	194
*EA6EA	"	17,700	112	28	72
EF6T	AA	745,128	1119	83	233
(OP:EA3AIR)					
EA6EE	"	49,368	196	37	95
EC6AAE	3.7A	155,652	1266	19	90
*EA6AMM	AA	97,016	306	45	136

Belarus

EW2W	A	841,320	2008	77	265
EW3LN	"	57,122	231	50	119
EU3AA	"	11,625	111	17	58
EW1TZ	21	114,075	395	32	103
EW8OW	14	8,925	77	17	58
EW8BQ	"	3,731	137	8	33
*EU3A	A	342,228	610	81	280
*EW7BA	"	267,850	728	63	212
*EW4W	"	117,448	370	58	154
*EW8G	"	26,550	171	31	87
*EU1ADH	"	21,080	186	21	64
*EU1EU	"	11,020	131	16	60
*EW7A	28	3,237	37	13	26
*EW1KV	"	435	19	6	9
*EW6AF	21	13,080	120	19	41
*EW7DK	"	132	10	4	7
*EW6M	7	23,856	318	15	56
*EW8DX	3.7	11,956	192	10	51
*EU6DX	"	6,731	117	8	45
*EW8RR	1.8	1,040	37	6	20
EU1A	AA	1,920,905	2171	118	379
EW4CD	"	71,668	349	35	129
EW7M	"	36,062	112	53	93
EW6F	"	20,202	185	17	61
(OP:EW6GF)					
EW8OM	21A	9,010	91	17	36
EV1R	14A	328,489	1387	36	131
EW8W	7A	350,455	1594	30	125
EU4A	1.8A	80,388	917	13	71
EW8R	"	16,902	308	8	46
*EW1P	AA	1,200,870	1439	117	378
*EW4R	"	215,090	513	69	205
*EW4C	"	151,514	462	52	142
*EU4T	"	57,428	204	48	148
*EU4U	"	10,780	121	17	53
*EW4DDC	"	40	4	4	4
*EU1DX	21A	48,280	178	33	103
*EW4RF	7A	16,974	200	14	55
*EU2EU	3.7A	94,738	901	17	84
*EW4GL	"	11,343	194	8	49

Belgium

OR1Z	A	465,300	1365	69	213
ON7HLU	"	441,640	967	65	240
ON4MW	"	277,277	504	78	199
OR4T	"	7,504	72	19	37
OP1A	14	77,605	607	24	61
*ON5UJ	A	289,152	532	75	213
*ON3AR	"	242,865	574	67	190
*ON3ND	"	168,715	556	46	159
*ON4CT	"	167,960	363	65	156
*ON6AT	"	100,192	353	47	155
*ON3SAT	"	93,290	384	50	140
*ON3WM	"	78,196	348	42	131
*ON3VS	"	54,849	292	37	104
*ON8ZA	"	53,628	326	32	132
*OT7E	"	47,770	218	42	128
*ON3PGL	"	31,008	204	28	86
*ON4AYM	"	28,012	132	34	60
*ON4KMB	"	16,632	155	26	73
*ON5WL	"	12,474	89	27	54
*ON7RR	"	12,375	119	22	53
*OT4R	"	10,836	137	16	47
*ON2XXX	"	7,128	79	17	49
*ON4CBN	"	6,572	77	16	46
*ON3GDM	"	5,478	61	22	44
*OO7R	"	4,380	63	17	43
(OP:ON6OM)					
*ON3PH	"	1,794	31	16	23
*ON3JMV	"	1,333	29	13	18
*ON6FDP	"	1,092	24	13	15
*ON5SDF	"	728	26	7	19
*ON2LMP	"	26	9	6	7
*ON4APU	21	71,040	269	30	90
*ON6VOX	14	5,628	123	8	34
*ON5IA	7	9,169	164	8	45
OO7P	AA	1,860,060	1631	120	460
OT4A	"	449,132	1347	43	145
OT1L	"	44,408	316	29	93
(OP:ON4MHO)					
OR3A	"	39,567	222	31	90
ON5PV	"	37,454	205	28	94
ON4VDV	"	28,208	137	32	50
ON4AHF	"	17,640	96	23	47
ON4ON	"	609	20	6	15
ON4BR	28A	13,794	100	17	49
OQ4Q	21A	121,380	417	34	106
ON4PJA	"	2,414	31	13	21
ON4TO	14A	72,710	400	26	84
OS8A	3.7A	113,520	1004	15	73
OQ5M	"	108,870	868	15	80
(OP:ON5ZO)					
ON4LG	"	15,663	187	11	58
*ON8UK	AA	179,304	485	57	184
*ON6LR	"	122,175	391	53	172
*OT9Z	"	43,148	203	36	98
(OP:ON8ZZ)					
*ON4MD	"	41,656	238	35	92
*OT1V	"	20,928	107	31	78
*ON7QL	"	8,732	58	28	46
*ON1DU	"	4,514	42	22	39
*ON6LO	"	2,478	48	12	30
*ON4FG	"	1,300	30	20	30

Bosnia-Herzegovina

E74MG	A	23,283	223	30	87
E7ØT	3.7	280,245	1900	25	94
*E73SDM	A	4,730	79	14	41
*E74KM	7	5,704	99	10	36
E78DX	AA	30,765	135	35	70
E78T	7A	124,032	1057	22	92
*E72JG	AA	65,520	302	48	120
*E74Y	14A	216,189	886	35	122
*E72MM	"	5,980	80	12	40
*E77EA	7A	36,630	446	13	61
*E74R	1.8A	43,200	593	9	63

Bulgaria

LZ7J	A	200,900	526	61	184
(OP:LZ1CDJ)					
LZ5DB	"	6,650	106	16	34
LZ1RW	"	465	16	7	8
LZ8A	7	579,810	2613	34	120
*LZ3SD	A	103,596	390	45	149
*LZ2ZY	"	75,744	249	46	98
*LZ1QZ	"	31,752	207	29	97
*LZ1ZX	"	18,957	124	21	68
*LZ2EHO	"	11,552	138	18	58
*LZ1BY	"	11,544	124	20	54
*LZ8Z	"	10,160	99	20	60
(OP:LZ2HT)					
*LZ4SU	"	2,436	26	19	23
*LZ1SW	"	1,148	19	11	17
*LZ1VKI	"	936	34	8	16
*LZ2HR	28	26,880	176	19	51
*LZ1DQ	"	4,386	55	15	28
*LZ2GS	"	1,220	21	7	13
*LZ9V	21	162,440	929	32	99
*LZ3DJ	"	20,800	175	19	46
*LZ7MM	"	6,751	103	12	31
*LZ2JOW	14	6,713	123	10	39
*LZ5PL	7	1,848	54	8	25
*LZ7V	"	238	10	6	8
(OP:LZ3GH)					
*LZ2ND	1.8	117	12	4	9
LZ2YO	AA	992,940	1706	87	293
LZ3ZZ	"	373,216	1202	56	162
LZ2HN	"	291,893	446	77	266
LZ1YE	"	152,073	544	46	137
LZ4AW	"	142,302	508	51	171
LZ1MC	"	44,370	177	44	101
LZ3FN	"	33,078	200	31	80
LZ4AA	"	24,753	147	27	84
LZ1ST	"	21,109	123	27	74
LZ3CC	"	10,362	75	25	41
LZ1HW	"	3,800	40	14	24
LZ1NG	28A	54,432	290	25	71
LZ8R	"	31,416	180	23	61
LZ5K	7A	162,710	1076	21	85
(OP:LZ1RAY)					
LZ6F	"	6,237	81	15	48
LZ1AQ	3.7A	22,152	283	10	61
*LZ1VCT	AA	47,808	214	41	103
*LZ7EP	"	17,820	101	33	75
*LZ5Z	14A	188,800	951	36	124
(OP:LZ3DX)					
*LZ2JE	1.8A	34,050	442	11	64

Corsica

TK9R	A	5,839,788	5286	120	462
(OP:IK8UND)					
TK4RB	"	631,736	1280	86	303

Crete

SV9OFS	AA	27,604	242	19	84
SV9RGI	21A	473,040	2092	36	126
SV9COL	"	114,777	780	26	91
*SV9GPV	28A	121,968	666	28	98

Croatia

9A3B	3.7	122,136	1327	14	70
(OP:9A2VR)					
9A1AR	"	73,710	910	11	67
*9A9Z	A	409,750	838	64	211
(OP:9AØW)					
*9A3BSE	"	36,112	197	32	90
*9A1EA	"	12,798	86	28	51
*9A3DOS	"	12,166	96	27	50
*9A3GSV	"	9,504	120	15	57
*9A3EJZ	"	5,671	53	19	34
*9A6DZ	"	4,050	45	20	30
*9A7DD	"	2,208	60	10	36
*9A4GD	"	1,505	27	12	23
*9A6BMJ	"	868	25	10	18
*9A9RR	21	41,038	271	15	56
*9A6KZH	"	21,060	157	18	42
*9A4W	"	9,850	73	20	30
*9A2EY	14	38,688	360	15	63
*9A6RMI	"	21,450	207	17	49
*9A6ZZ	"	17,874	135	22	32
*9A2VX	"	8,321	113	12	41
*9A2TE	7	26,623	303	14	65
*9A3CJW	"	2,772	64	8	36
*9A3ERP	"	1,271	41	7	24
*9A1MM	1.8	3,400	108	4	30
9A8A	AA	156,950	458	64	151
9A6OY	"	45,264	238	32	106
9A2JK	"	31,122	126	39	78
9A7R	"	19,068	130	29	55
9A3XV	"	9,928	97	18	55
9A9A	21A	1,495,239	3098	38	163
9A4M	14A	435,680	1429	37	123
9A1CFR	"	65,962	327	26	92
(OP:9A2NO)					
9A3AG	7A	154,985	746	32	107
9A7Y	"	24,910	179	17	77
9A8M	3.7A	306,652	1959	23	101
(OP:9A7DM)					
*9A2EU	AA	1,092,264	988	128	440
*9A6DJX	"	92,584	453	35	128
*9A5F	"	27,032	142	31	93
*9A6IND	"	3,168	59	13	31
*9A5N	"	650	13	12	13
*9A5YY	"	558	11	8	10
*9A1AA	21A	95,608	344	32	104
*9A3ST	"	18,144	90	25	56
*9A1AD	14A	195,455	767	36	119
*9A5KIR	"	8,904	118	11	45
*9A5Y	7A	286,800	1545	29	121
*9A1CBM	"	107,068	776	22	94
(OP:9A5ST)					
*9A1CC	"	14,824	199	9	59
*9A2B	3.7A	1,392	46	5	24

Czech Republic

OK2SFP	A	155,085	554	45	166
OK1MSP	"	84,630	276	51	144
OK2ABU	28	1,242	22	7	16
OK1XC	21	57,888	329	25	71
OK4NN	"	47,846	237	29	65
OK2EQ	"	42,195	221	25	72
OK7W	14	470,020	1721	38	104
OK1C	"	350,446	1318	36	101
OK1KMU	7	30,966	374	15	63
(OP:OK1HFP)					
OK8WW	3.7	199,662	1508	18	89
OK1FIG	"	12,240	298	6	39
*OK1MKU	A	256,041	468	81	246
*OK1MNV	"	168,190	523	52	190
*OK1DKR	"	139,551	361	62	195
*OK2BRX	"	139,293	493	44	157
*OK1HEH	"	114,835	506	41	152
*OK2TS	"	79,124	326	36	95
*OK2TC	"	69,080	385	34	123
*OK1PMA	"	59,892	397	28	110
*OK1XBF	"	41,035	244	33	112
*OK1BJ	"	39,440	235	31	114
*OK2VV	"	36,549	200	37	94
*OK2IH	"	36,156	203	34	104
*OK2VIR	"	33,396	202	33	99
*OK1DXW	"	29,250	170	32	85
*OK1LST	"	24,180	143	38	92
*OK2BEN	"	21,060	136	36	81
*OK1DZD	"	18,382	188	22	79
*OK2PBG	"	18,291	118	33	58
*OK1SI	"	15,895	158	16	69
*OK1TFH	"	10,725	82	23	52
*OK2KG	"	10,184	73	27	40
*OK2WKW	"	5,880	49	19	30
*OK2AK	"	4,526	63	22	40
*OK1TVL	"	3,080	52	17	38
*OK1DVA	"	2,736	64	11	37
*OK2SWD	"	2,709	55	13	30
*OK1PFM	"	728	26	7	21
*OK2TBC	21	3,358	64	15	31
*OK1PX	"	506	32	8	14
*OK1VTR	14	2,240	48	11	21
*OK1UVH	"	2,048	57	7	25
*OK2GU	"	726	24	6	16
*OK2BRS	7	12,644	198	11	47
*OK1RZ	3.7	36,790	575	9	56
*OK1FPS	"	32,538	523	11	55
*OK2HBR	"	18,113	316	9	50
*OK1DEZ	"	9,312	210	6	42
*OK7PY	"	6,248	138	7	37
*OK2BRQ	"	3,885	104	5	32
*OK1JOK	1.8	9,776	213	5	42
OK1NP	AA	3,577,882	3841	113	426
OK2QA	"	245,904	578	67	215
OK2PCL	"	109,480	290	54	107
OK1DOY	"	106,743	242	61	160
OK5OK	"	49,257	277	24	93
OK1BLU	"	15,488	84	28	60
OK7JR	"	14,355	64	42	57
OK1FIM	"	13,205	62	35	60
OK4A	"	4,095	45	17	28
(OP:OK1DXR)					
OK7R	28A	29,028	169	19	63
(OP:OK1TNM)					
OK7Z	21A	733,200	1630	38	157
(OP:OK2ZI)					
OLØM	"	423,640	1201	37	133
OLØW	14A	169,164	628	34	114
(OP:OK1DSZ)					
OK7K	7A	796,854	2891	35	142
(OP:OK1BN)					
OK1T	1.8A	58,140	786	10	66
*OK1DPU	AA	320,866	661	67	234
*OK4DZ	"	200,564	386	78	169
*OK2DM	"	31,047	185	30	101
*OK2PF	"	24,704	143	36	92
*OK2UHP	"	10,816	99	22	42
*OK1K	21A	68,244	240	34	87
(OP:OK1XOE)					
*OK6AA	"	29,862	165	24	55
*OK1DUG	14A	3,192	67	7	31
*OL9R	7A	198,648	1528	25	99
(OP:OK6RA)					
*OK4K	"	132,480	795	30	108
(OP:OK1BOA)					
*OK1AY	3.7A	40,404	529	11	63

Denmark

OZ1ZD	A	180,930	502	61	161
OZ7EA	"	35,090	174	36	85
OZ3SM	"	13,464	123	24	78
OZ3BJ	28	9,152	74	17	35
*OZ4NA	A	175,617	588	47	190
*OZ8CT	"	119,853	498	41	152
*OZ1KKH	"	77,437	224	49	162
*OZ1DYI	"	60,632	289	33	110
*OZ8ZS	"	54,240	268	37	123
*OV1RR	"	19,602	104	34	87
(OP:OZ1HHH)					
*OZ7DK	"	18,404	156	26	60
*OZ1D	"	12,213	78	25	44
*OV2B	"	6,678	44	25	38
*OZ5AGJ	"	5,963	96	21	46
*OZ1PGB	"	4,216	54	21	41
*OZ7SG	"	783	21	10	17
*OZ5DX	28	1,581	36	6	11
*OZ8UW	"	918	23	7	11
*OZ9V	21	15,687	143	16	47
*OZ1LFI	14	16,520	219	10	49
*OZ1SWL	"	42	6	3	4
(OP:OZ1G)					
*OZ1RE	7	5,586	120	7	42
5Q2J	AA	342,705	645	77	258
OZ4O	"	196,384	433	64	208
OZ5BD	"	102,612	312	52	152
OZ1BZJ	"	64,517	270	38	111
OZ1DWK	"	8,554	68	26	65
OZ1GNN	"	8,112	57	30	48
OZØJ	"	2,337	24	18	23
OZ1JVX	21A	10,206	93	15	39
OZ7X	14A	895,608	2521	37	131
OZ1ADL	"	77,119	213	37	124
OZ5E	3.7A	57,428	485	15	83
*OZ1KVM	AA	167,526	596	47	180
*OZ4VW	"	126,540	330	54	168
*OV9ØEDR	"	103,259	551	44	125
(OP:OZ1NLD)					
*OU2P	"	11,550	126	21	54
*OZ1KIH	"	2,552	61	20	38

Dodecanese

SV5DKL	14A	368,640	1743	34	126

England

MØMCV	A	573,040	1453	64	240
G6T	"	285,768	724	56	160
(OP:G4MKP)					
MØKPD	"	162,909	383	59	148
G3WZD	"	138,516	453	43	151
G6GLP	"	111,888	336	43	146
G4IUF	"	106,074	259	49	164
MØRBE	"	97,559	382	40	141
MØNPT	"	76,032	343	41	91
G1SCT	"	54,955	245	36	109
G4PWO	"	50,688	176	37	95
MØDDT	"	24,600	130	36	84
MØHHG	"	6,014	110	15	47
GØMTN	"	840	24	7	8
G4FKA	21	129,732	597	25	89
MØMJA	7	33,948	363	15	67
M4J	"	16,416	331	9	45
(OP:GØDVJ)					
G3ZGC	"	15,164	171	13	55
M1DDD	"	12,610	159	11	54
G4L	1.8	24,750	352	9	57
(OP:G4LDL)					
*M1U	A	621,569	1075	79	270
(OP:MØUTD)					
*M4M	"	157,718	534	46	168
(OP:MØPNN)					
*MØYKS	"	119,944	363	47	141
*G4ADJ	"	110,725	393	47	168
*MØACM/P	"	94,245	354	41	142
*GØOOF	"	93,258	346	38	119
*G4DDL	"	90,574	352	40	139
*G1PCR	"	89,088	391	37	137
*G4NBS	"	70,144	354	29	99
*G4OZG	"	69,012	324	33	129
*G8ZRE	"	65,469	345	34	123
*2EØEFS	"	48,246	388	21	108
*MØSDY	"	45,260	268	28	96
*M3ZZF	"	38,418	193	32	82
*G8GHD	"	35,696	189	24	73
*MØRGZ	"	35,030	204	27	86
*MØAUG	"	33,024	213	23	63
*MØP	"	32,860	171	33	91
(OP:MØRYB)					
*G4IDF	"	32,545	168	27	88
*MØNPQ	"	31,408	285	22	82
*MØPKZ	"	29,502	198	25	74
*GØPBE	"	29,290	235	22	79
*MØSDM	"	28,060	197	28	87

*GØTAN	"	27,324	199	26	82
*GØBBO	"	25,122	211	22	84
*G4WWG	"	23,714	160	22	49
*MØGKC	"	19,503	150	25	74
*GØCPA	"	19,303	174	23	74
*G1EIX	"	17,177	137	26	63
*MØKED	"	15,980	109	26	59
*MØLDW	"	15,640	111	27	65
*MØGVZ	"	13,674	109	24	62
*G3YZO	"	13,064	140	22	70
*G4FFN	"	13,050	105	25	65
*M6YTU	"	12,212	99	21	50
*G8CYK	"	11,592	84	34	50
*2EØFTD	"	11,400	108	21	54
*G4BEE	"	10,530	83	22	56
*G5BBL	"	10,428	101	23	56
*2EØIQW	"	10,270	115	20	59
*GØOFD	"	8,991	115	17	64
*GØMCV	"	8,968	93	18	58
*MØSPA	"	8,349	82	22	47
*2EØLMD	"	7,885	100	25	58
*G8NVX	"	7,875	97	17	46
*MØTKM	"	4,757	69	24	47
*GØUKZ	"	4,424	77	9	47
*G2BKZ	"	4,131	43	19	32
*MØNRD	"	4,004	64	15	37
*GØBVD	"	3,885	51	13	22
*MØCVO	"	3,392	75	12	41
*2E1BRT	"	2,784	46	11	37
*MØKDT	"	2,775	40	13	24
*G8ZZK	"	2,000	48	9	31
*MØHMS	"	1,680	32	15	25
*MØIMM	"	1,457	28	13	18
*MØPSC	"	966	36	14	28
*M6RVA	"	950	44	6	19
*2EØHCL	"	910	27	10	16
*G3RSD	"	870	33	10	19
*2EØPVM	"	800	24	11	21
*G3XYF	"	528	11	11	11
*2EØTUE	"	405	11	7	8
*MØIHT	"	360	16	6	14
*MØTGC	"	315	14	8	13
*2EØEDF	"	304	36	14	24
*MØXJP/P	"	304	30	14	24
*M6LVC	"	252	18	12	16
*GØFPU	"	168	6	6	6
*MØYRX	21	13,333	100	18	49
*MØOSA/M	"	10,908	86	17	37
*G1M	"	3,502	71	9	25
*G1HYD	"	920	25	9	14
*G3Y	14	108,014	592	25	81
(OP:G3YBY)					
*GØRAH	"	38,325	351	17	58
*G3YRZ	"	22,104	234	16	56
*MØLTE	"	2,343	60	6	27
*M5Z	"	496	27	5	11
(OP:JK3GAD)					
*2EØVCC	7	8,056	149	9	44
*M2E	"	8,046	126	11	43
*GØRRM	1.8	1,900	98	5	33
*GØNVN	"	168	14	3	11
MØNKR	AA	1,171,236	1477	93	325
G3XSV	"	403,240	600	82	258
MØVCB	"	304,794	677	65	222
G3PXT	"	202,860	783	50	157
G4RRM	"	168,086	358	68	161
MØTAZ	"	160,631	408	59	132
G4LPD	"	158,631	476	52	157
G4DRS	"	24,516	114	31	77
G3PHO	"	17,138	76	32	50
G4WWS	"	13,396	99	20	48
G2Z	"	12,540	171	14	62
G4IRN	"	7,137	52	22	39
G4PEO	"	4,760	33	23	33
G5Q	"	3,337	43	14	33
(OP:G3SVL)					
G5K	21A	347,096	943	35	137
(OP:GØBNR)					
M1C	"	318,560	1189	33	127
G3TBK	"	235,012	669	34	130
G6XX	14A	340,219	1400	38	119
(OP:2EØNCN)					
M7O	"	313,551	1198	34	113
(OP:MØVKY)					
G2F	"	235,575	1112	29	106
M5B	"	200,405	934	33	116
(OP:G3WVG)					
MØPLX	"	76,629	593	19	70
MØOSH	"	13,965	199	11	46
G3TXF	7A	369,460	1984	28	117
M3W	3.7A	160,775	1003	18	91
(OP:G4FAL)					
G4IIY	1.8A	26,082	369	11	58
G3Q	"	7,889	167	6	43
(OP:G3RXQ)					
*G8KEK	AA	243,538	622	55	208
*G6BDV	"	170,023	489	52	175
*G8OO	"	160,200	689	42	183
*G4PVM	"	157,686	366	59	187
*G4P	"	129,948	504	40	156
(OP:G3YPP)					
*M6ETL	"	122,012	366	44	144
*MØTWB	"	121,326	467	44	175
*G1PPA	"	86,130	452	29	136
*2EØIFC	"	68,510	286	38	117
*G4HCC	"	66,051	319	39	140
*G4WGE	"	64,090	300	35	110
*MØPGX	"	53,690	379	28	90
*MØTQR	"	52,245	271	30	105
*2EØWET	"	45,966	293	35	106
*MØJSX	"	35,990	273	22	96
*G8XTJ	"	26,040	180	28	96
*MØMPM	"	25,116	149	26	65
*G7SYW	"	19,314	144	29	82
*2EØMNG	"	14,755	85	27	38
*MØDCD	"	10,665	124	18	61
*MØBWY	"	5,940	68	21	39
*G8AJM	"	5,766	75	14	48
*2EØLYF	"	4,635	79	13	32
*2EØUDX	"	1,386	23	15	18
*G4PDF	"	858	28	5	28
*G4A	"	396	13	6	12
(OP:G4TSH)					
*G4JFS	"	16	2	2	2
*G6NHU	21A	44,268	260	19	65
*M6XAT	"	8,448	67	17	49
*MØRHS	"	990	15	10	12
*MØTRJ	"	738	15	7	11
*M1N	14A	53,865	399	18	77
(OP:M1DST)					
*G7Y	"	37,887	313	16	57
(OP:MØZDZ)					
*G8X	7A	76,300	634	16	84
(OP:G4FJK)					

Estonia

ES6RW	A	2,956,115	3078	131	420
(OP:ES5RW)					
ES5MG	"	330,309	627	84	259
ESØIA	"	223,020	585	65	205
ES1BH	"	92,288	299	50	156
ES4RD	14	81,302	601	24	82
*ES6RMR	A	65,275	282	45	130
*ES1ACS	"	15,498	151	24	58
*ES4RLH	"	14,444	109	24	68
*ES1N	28	396	20	7	11
*ES8AS	21	54	9	2	4
*ES1LS	7	6,063	120	8	35
*ES8SX	"	5,029	84	10	37
ES2EZ	28A	7,800	79	15	37
*ES6PA	7A	24,024	228	19	59
*ESØDJ	3.7A	24,612	241	14	70

European Russia

District 1

RW1CW	A	582,912	971	88	308
U1BD	"	95,586	530	40	139
UA1AAF	"	54,670	260	39	115
R1FZ	14	44,599	279	23	80
UA1ORK	"	35,200	252	21	67
RU1A	7	671,974	2741	32	126
(OP:RV1AW)					
*UA1CUR	A	332,160	766	65	255
*R1BCE	"	187,680	474	67	188
*RZ1AU	"	151,632	357	57	159
*UF1M	"	95,090	397	45	140
*RV1CB	"	72,000	226	49	143
*U1BA	"	44,063	242	31	108
*R1BBL	"	25,109	182	33	86
*UA1ZJV	"	24,948	114	37	71
*R1AI	"	19,690	130	30	80
*RU1ZC	"	11,297	110	25	54
*RW1AI	"	10,920	93	24	67
*RA1OHX	"	7,784	145	14	42
*R1CAA	"	4,788	54	22	41
*R1BAH	"	1,440	30	15	25
*UB1CCA	"	1,053	42	13	26
*RV1CC	"	675	17	10	15
*R1CAM	14	15,576	165	15	51
*R1TE	"	3,234	71	8	34
RD1AH	AA	432,564	891	77	271
RW1C	"	423,504	668	81	265
RU1AB	"	395,264	604	92	294
RO1M	"	331,782	549	89	274
RA1AL	"	254,130	734	71	187
RA1QD	"	229,944	516	73	239
RA1AO	"	2,162	34	15	32
R1AK	21A	180,468	707	34	128
(OP:UA1ANA)					
UA1OMS	1.8A	26,358	365	11	58
*R1ZM	AA	24,852	211	24	90
*RA1ANM	"	1,216	37	12	26
*R1CX	14A	165	11	4	7

District 3

RM2U	A	1,073,550	1438	105	320
(OP:RU3RU)					
UA3VFS	"	689,070	1116	97	349
RU3Q	"	499,768	984	84	274
R3GZ	"	467,808	888	95	257
RT2H	"	252,859	625	67	226
R3OM	"	237,150	612	64	215
UA3KW	"	197,145	409	64	131
RM2H	"	176,660	487	71	221
RA3NC	"	175,341	418	65	212
UA3AGW	"	158,160	387	72	168
RL3QI	"	120,060	361	58	149
R2GB	"	119,840	375	46	168
R3RZ	"	114,400	545	42	118
R2DS	"	69,696	371	38	138
RK3IT	"	39,760	146	41	101
RA3BQ	"	28,350	92	50	85
R3MS	"	25,252	135	30	88
RZ3DAB	"	24,970	128	37	73
RX3Q	"	17,640	142	34	86
UG3G	"	7,280	87	18	52
R2AOQ	"	3,526	30	20	23
R3QF	"	3,240	26	19	26
RV3FF	21	365,148	1526	32	115
RT5A	"	59,100	318	23	77
RT5K	14	814,320	2722	37	137
RW3FY	3.7	21,942	271	11	58
RZ3MM	1.8	10,835	266	9	46
*UA3RKK	A	377,146	675	78	263
*UA3BL	"	320,736	747	67	245
*UA5F	"	231,492	494	77	226
*R3AQ	"	136,220	377	49	196
*RZ3QM	"	75,144	347	46	140
*R2ZCA	"	71,621	265	45	142
*RZ5D	"	60,962	179	49	138
*RW3ZA	"	56,782	180	50	128
*R2AOD	"	50,876	298	36	122
*RX3VF	"	49,767	250	37	122
*RW3VM	"	47,854	171	36	106
*RV3LO	"	43,790	130	40	105
*R3WZ	"	39,102	159	42	105
*RA3DQP	"	36,960	228	31	89
*RD3FV	"	36,942	217	32	109
*RV3VR	"	28,620	204	25	81
*RU3UB	"	27,056	138	41	111
*RZ3DOT	"	25,175	94	45	50
*UA3Z	"	23,046	188	35	103
*RQ2Q	"	20,100	149	25	75
*RC2SB	"	18,240	101	28	52
*R2AHS	"	16,660	143	24	74
*R3THA	"	14,151	108	32	57
*RU3XY	"	11,921	86	29	62
*R2GAP	"	6,305	98	15	50
*R3EE	"	6,076	42	23	39
*RA3AGF	"	4,585	104	20	15
*UA5R	"	4,556	60	22	45
*R5DZ	"	3,190	79	15	43
*R2ADF	"	2,520	45	15	30
*R2DAW	"	2,244	32	19	25
*UA3EUW	"	2,160	53	10	30
*UA3DSS	"	1,892	37	15	28
*RA3EA	28	2,821	37	11	20
*R2PT	"	352	21	5	11
*R2AD	21	58,829	496	22	67
*RN3Z	"	26,910	149	21	69
*RA3DGH	"	6,840	140	8	37
*RA3RLJ	"	1,512	64	4	20
*UA3IHJ	"	1,152	18	11	13
*R2EL	"	345	22	4	11
*RA3XM	14	127,800	621	34	108
*UA3ABJ	"	47,808	440	21	75
*RN5A	"	7,316	175	12	47
*R3PIQ	"	600	31	6	18
*RK3E	7	41,679	362	19	80
*R2OFF	"	3,880	72	8	32
*UB3GCV	"	6	1	1	1
*R3DL	3.7	2,993	74	9	32
*RV3A	1.8	575	32	5	20
RM3DA	AA	2,008,242	2473	119	439
RA3BL	"	478,728	605	95	271
RT9T/3	"	372,092	1075	62	212
RM3A	"	230,692	787	57	139
(OP:RN3AC)					
RA3R	"	223,232	366	65	191
RU3FM	"	219,520	315	100	220
RU5A	"	217,775	558	65	216
R5FU	"	151,218	329	67	212
R5AJ	"	121,660	602	38	116
RU5TT	"	119,757	338	54	155
(OP:UA3TW)					
RA3TT	"	62,266	254	38	125
RV3EFR	"	54,150	270	33	81
RU3GF	"	39,680	151	49	106
RU3DX	"	30,736	197	26	87
R3QX	"	27,060	114	45	87
RU3SD	"	23,940	97	36	69
RN3B	"	13,260	77	30	48
RT5C	"	8,500	75	19	49
R3SV	"	2,911	30	16	25
UA3GAF	"	2,112	39	11	37
(OP:RT5G)					
RO5D	28A	22,630	219	18	55
UA3EDQ	"	19,275	125	23	52
UA3R	21A	272,866	1234	33	124
(OP:UA3RC)					
RW3DU	"	215,660	808	35	129
RK3DT	"	126,861	498	33	114
RA3DNC	"	31,416	164	28	74
R2DX	"	30,124	316	17	51
RX3DPK	14A	61,992	277	30	96
RT3M	"	30,600	180	20	80
RT3F	7A	151,938	786	28	110
(OP:R2DA)					
RL5A	"	25,025	306	18	59
RN3DKQ	"	592	13	6	10
R3ST	3.7A	57,216	581	17	79
RA3OA	"	15,180	208	13	56
R3LA	1.8A	5,700	99	9	48
*RA3Y	AA	1,376,000	1980	106	394
*RA3DAD	"	444,174	729	87	275
*R3RT	"	331,344	677	74	280
*R3WR	"	232,356	504	74	215
*RA3SI	"	196,504	316	87	221
*R3AAA	"	166,137	502	61	176
*RK2M	"	95,888	309	54	154
*R2SAZ	"	73,060	203	71	189
*RA3RBL	"	69,530	338	45	125
*RJ3F	"	64,960	261	38	122
*RA3S	"	59,400	195	60	120
*UA3PI	"	58,608	338	30	118
*RN3TT	"	51,004	131	63	101
*UA3DVB	"	39,634	180	41	108
*UA3DUJ	"	28,536	135	39	77
*R2ADC	"	18,620	79	41	57
*RL3AW	"	17,388	96	26	82
*R2AX	"	5,934	67	21	48
*R2SA	"	1,479	38	7	22
*R3LC	28A	8,976	79	16	32
*RW3FR	"	7,526	56	18	35
*RL3QDD	"	1,127	26	10	13
*RM3F	21A	273,652	1017	36	136
(OP:UA4LCQ)					
*RZ3LC	"	16,500	157	23	52
*UA3IVF	"	1,092	44	4	17
*R3IAQ	14A	81	5	4	5
*RD3K	1.8A	14,112	195	10	53

District 4

RM4HZ	A	1,085,077	2239	84	295
RD4F	"	875,655	1070	114	381
RN4W	"	175,066	323	74	197
UA4NC	"	38,250	196	40	110
RA4AR	"	33,674	327	29	84
UA4AAC	"	16,910	107	28	61
RA4CX	"	14,194	79	37	57
RA4HL	"	475	26	13	12
RN4HKH	7	30,264	176	23	81
UA4PN	"	12,155	137	15	50
RW4M	"	3,854	42	13	34
RA4HMT	3.7	2,574	45	8	25
*R4FA	A	395,556	805	83	274
*RN4HAB	"	239,632	682	53	219
*RA4ACX	"	219,396	463	77	205
*RA4WAB	"	143,808	501	54	160
*RN4SC	"	103,206	367	47	159
*RW4HD	"	95,693	251	67	154
*RU4AA	"	49,248	206	48	123
*UA4WGM	"	30,916	201	28	90
*R4IB	"	25,350	140	43	87
*UB4RDB	"	19,425	147	27	78
*RK4R	"	16,102	122	30	67
*R4MM	"	7,918	50	29	45
*R4CO	"	7,544	78	24	58
*R4AC	"	6,532	70	22	49
*RA4L	"	3,792	76	10	38
*R4HBM	"	3,328	74	15	37
*RU4PAA	"	3,036	65	19	50
*RA4LY	"	2,280	25	17	23
*R4PCI	"	2,068	53	11	33
*UA4HAD	"	696	15	10	14
*RA4UAT	"	198	6	5	6
*RA4FUN	"	156	10	5	8
*UA4ACP	21	28,440	274	22	57
*UA4SJO	14	18,225	209	14	61
*R4LAK	"	16,116	215	15	53
*RA4LPC	"	336	11	6	10
*RU4HU	7	9,747	110	12	45
*UA4QK	3.7	480	19	6	14
RJ4P	AA	2,632,608	3038	124	470
RL4A	"	2,359,588	2229	139	513
R4FD	"	926,208	1415	104	328
UD4F	"	594,484	886	102	356
R4BZ	"	570,375	1189	81	244
RM4R	"	260,306	475	76	238
R4RM	"	217,627	464	73	210
RT4M	"	201,960	408	74	190
RA4W	"	123,050	392	55	175
RW4O	"	86,478	200	71	142
RW4WZ	"	55,755	192	35	142
R4RT	"	21,538	127	37	84
RW4CLF	"	11,172	103	22	62
UA4HBW	"	10,220	53	32	41
RG4A	28A	11,904	86	17	47
UD4FD	14A	287,073	1119	38	129
*RW4WA	AA	737,031	1148	98	355
*R4FAN	"	431,862	729	78	256
*RK4FAO	"	182,280	563	48	169
*RA4PBE	"	127,534	412	56	186
*UC4I	"	31,692	156	39	100
*RU4LM	"	30,849	113	37	76
*R4LR	7A	26,166	214	21	77
*RM4W	3.7A	20,436	210	13	65

District 6

R7KZ	A	92,787	389	45	152
RK7T	"	18,084	197	19	47
RX6CC	"	6,240	56	22	38
RX6LN	"	5,456	67	17	45
UA6AK	28	952	31	10	18
UC7C	7	9,450	119	12	51
(OP:RA6ABC)					
*UA6GO	A	271,908	668	83	249
*RM7M	"	185,700	299	88	212
*UA6LN	"	100,107	318	61	166
*R6DBT	"	99,893	378	50	141
*RV7M	"	91,857	383	44	157
*RK7M	"	71,622	172	57	116
*RM7C	"	71,360	401	28	132
*UA6HLN	"	70,818	301	40	134
*RJ7A	"	42,280	158	45	106
*RA6LIS	"	41,776	307	22	90
*R7AX	"	40,905	161	44	91
*R6LBK	"	35,640	230	26	94
*RA6DT	"	30,464	96	51	77
*R6DHO	"	26,559	213	25	92
*R6DFR	"	19,701	155	22	77
*RZ7L	"	13,750	101	33	77
*UA6ART	"	4,950	48	21	34
*RT6DX	"	4,860	69	17	43
*UA6AAK	"	2,356	32	15	16
*RZ6DX	"	1,989	23	17	22
*R7TO	"	1,518	22	10	13
*R7KX	28	2,146	33	11	18
*RU6YK	14	44,109	349	20	67
*RT6N	"	12,980	176	10	49
*R6AW	"	736	16	9	7
*UA4ASE/6	"	600	24	5	15
*UA6HFI	7	144	9	4	8
*RN6BP	3.7	8,385	179	9	56
*RA6XB	1.8	621	38	6	17
*R7IA	"	280	14	6	14
RC6U	AA	2,644,596	3173	117	447
RC7A	"	658,137	977	104	327
RX7K	"	593,232	1146	71	201
RA6GW	"	399,669	519	96	285
RC7LI	"	285,600	560	71	209
RU6K	"	117,342	208	80	166
RQ7M	"	26,304	202	20	76
UB7A	"	14,706	83	33	53
(OP:RM6AA)					
R6MR	"	8,282	54	29	53
R7RF	14A	2,058	34	8	34
UB6B	7A	385,169	1853	33	130
(OP:R7DA)					
*RL6M	AA	1,196,848	1705	110	398
*R7MM	"	717,066	989	102	339
*UA6GF	"	134,237	346	60	181
*R7GA	"	102,711	332	52	167
*RU6B	"	100,724	228	67	102
*UA6FZ	"	57,951	306	32	105
*R7TU	"	32,095	126	48	83
*R6FY	"	27,120	104	48	72
*RK6AQP	"	23,180	133	32	90
*RA6AAW	"	10,500	74	30	54
*RA7M	"	8,060	59	29	36
*UI7C	"	6,794	99	20	59
*R7RAN	"	221	9	6	7
*RL6K	"	96	4	4	4
*RT6C	28A	2,145	30	14	19
*R7AM	21A	68,186	425	26	77
*RQ6M	"	53,040	190	33	69
*R7GU	14A	5,376	61	11	37
(OP:R7TJ)					

District 9

UA9FLK	A	660,955	1625	73	262
UA9XMC	"	469,027	900	75	256
RW9XU	14	4,232	89	11	35
*UA9XF	A	103,950	384	41	157
*RA9XSL	"	3,240	50	14	26
*RA9FEL	21	35,721	355	15	66
*UA9FGJ	"	5,656	50	14	42
*R9XS	"	5,324	99	12	32
R9FM	AA	334,593	554	89	250
R9XM	"	44,712	121	52	86
RC9F	21A	110,700	638	29	106
UA9FAR	"	91,656	484	28	106
R9GM	3.7A	68,052	572	21	85
*UA9XL	AA	333,585	819	73	242
*UA9FKH	14A	5,145	94	10	39

European Turkey

TA1API	A	60,941	301	33	116
TA1CQ	21	11,716	127	16	42
*TA1HF	A	24,966	147	30	84
*TA1UIG	"	2,146	77	17	41
*TA1LHJ	"	546	18	9	17
TA1ED	AA	514,692	1103	84	264
*TA1L	AA	41,820	138	51	113

Finland

OG7O	A	1,155,303	1541	108	351
(OP:OH1VR)					
OH1KF	"	277,173	556	77	232
OH5NZ	"	131,879	318	58	151
OH1LAR	"	108,810	402	55	179
OH8WR	"	93,000	340	47	108
OH1MA	"	72,408	256	57	111
OH2GBA	"	62,730	199	48	105
OG7M	"	61,152	198	42	114
(OP:OH1FIX)					
OH6JE	"	23,112	168	28	80
OH3KX	"	9,009	94	23	54
OH2DK	"	5,856	41	22	39
OH4BW	"	1,394	21	15	19
OH1EB	"	80	4	4	4
OF3BCX	28	16,510	161	14	51
(OP:OH1ZAA)					
OF9A	"	4,578	58	10	32
(OP:OH1NOA)					
OH6QU	21	138,719	401	32	117
OH8X	14	408,520	1714	36	104
(OP:OHØXX)					
OF2IPA	"	223,800	1375	29	91
(OP:OH4MDY)					
OH6IO	"	24	2	2	2
OF5C	7	1,290	22	12	18
(OP:OH5CW)					
*OH6ECM	A	580,986	1007	77	301
*OH9GGY	"	276,962	621	66	205
*OH1XFE	"	176,484	503	52	179
*OH6LW	"	28,527	229	29	82
*OH6UX	"	20,868	121	32	79
*OH2HZ	"	19,136	180	20	72
*OH5BK	"	10,640	124	19	61
*OH6EPM	"	10,160	93	24	56
*OH1TS	"	6,160	148	17	53
*OH2LIR	"	4,284	47	23	40
*OH2BSY	"	726	16	11	11
*OF7EML	"	18	3	3	3
*OH3WR	21	21,084	129	22	62
*OF2MZA	"	1,152	35	7	17
(OP:OH1ZAA)					
*OH1QX	14	22,494	230	15	54
(OP:OH1ZAA)					
*OF8JIX	7	2,772	88	6	30
(OP:OH8JIX)					
OF6MW	AA	2,638,454	2328	131	506
(OP:OH6MW)					
OG6N	"	2,145,618	1986	120	477
(OP:OH6NIO)					
OF1Z	"	1,256,560	1572	123	433
(OP:OH1LEG)					
OH2PM	"	1,151,748	1090	125	473
OH8WW	"	878,237	1686	70	253
OG3MS	"	723,240	1384	90	302
OH6RE	"	651,480	796	93	352
OH3Z	"	410,922	671	93	240
(OP:OH1NX)					
OH2PQ	"	374,517	630	88	209
OH2KW	"	363,204	813	80	244
OH7MFO	"	175,440	507	58	200
OF1RX	"	155,583	310	80	213
OH5KW	"	76,050	156	70	125
OH2BR	"	72,162	286	43	128
OH5BW	"	59,503	289	39	118
OH3RT	"	46,748	162	45	79
OH1ND	"	33,495	105	56	89
OF7KA	"	33,327	125	36	125
(OP:OH3KAV)					
OH7HM	"	23,587	194	23	80
OF3FM	"	23,490	112	36	109
(OP:OH3FM)					
OH3UU	"	12,312	65	24	52
OH2KI	"	9,384	58	29	39
OH3RB	"	6,270	45	27	39
OH6BG	"	5,187	39	21	36
OH5XB	"	2,436	22	20	22
OH4KA	"	2,303	46	14	33
OH1HD	"	400	9	7	9
OH3EX	21A	97,669	332	31	112
OH1HB	"	11,934	75	22	56
OH1MN	"	4,600	39	18	28
OH6TN	"	3,672	39	15	21
OF1F	14A	1,020,181	2966	37	136
(OP:OH1TM)					
OF8L	"	619,340	2047	38	135
(OP:OH8LQ)					
OF2K	"	112,377	482	30	111
(OP:OH6VDA)					
OH2CK	"	90,146	361	32	105
OF1TD	"	26,578	119	23	74
OH8GT	"	7,480	76	13	31
OF1AF	7A	26,499	263	16	57
(OP:OH1TM)					
OH5UQ	"	6,726	77	16	43
OH3JR	3.7A	11,745	118	15	66
OH2BO	1.8A	12,168	136	13	59
*OH7GGX	AA	252,057	505	75	206
*OH5Y	"	143,060	557	50	180
(OP:OH5EUY)					
*OH2FTA	"	54,257	293	37	124
*OF1ØA	"	45,632	155	46	138
(OP:OH1HS)					
*OH8EJW	"	29,520	183	30	93
*OH2ECG	"	27,360	180	34	86
*OH3NAQ	"	8,140	86	20	54
*OH7EBA	"	6,365	58	22	45
*OH6LDJ	"	1,188	29	12	24
*OH2MGA	"	1,064	26	10	18
*OH2EV	"	990	22	11	22
*OH8KVY	14A	26,448	199	20	56
*OH5BM	3.7A	68,200	627	18	82

France

F5OHM	A	531,360	1192	71	253
F4FEP	"	324,465	512	68	223
F1AGR	"	271,460	525	69	176
F5PAL	"	221,832	609	52	164
F6GOX	"	184,926	417	62	176
F6CXJ	"	105,575	405	49	156
F5HX	"	86,879	224	55	108
F4FXH	"	52,932	236	35	97
TM5N	"	30,210	239	25	70
F1PNJ	"	18,450	167	22	68
F6BVY	"	6,396	49	18	34
F5MMF	"	1,666	31	13	21
F5SDD	"	450	10	6	9
F4FQZ	28	13,338	99	15	39
F8ARK	14	1,210,440	3590	39	126
F8DVD	"	506,240	1715	36	124
F5JY	"	15,477	182	14	53
F4DVX	7	172,400	1204	26	74
F4FLF	"	57,500	538	16	76
TMØR	3.7	99,138	1022	15	63
F4HJC/P	"	64,328	972	10	58
*F4FTA	A	543,256	838	97	259
*F5LIW	"	459,428	758	78	253
*F2AR	"	319,968	730	65	238
*F4AYI	"	308,406	715	69	225
*F4CDR	"	277,984	672	65	227
*F6FTB	"	272,272	641	62	224
*F4GVZ	"	250,217	645	60	193
*F5TLZ	"	215,378	732	52	174
*F6DRP	"	205,313	635	42	137
*F4ETG	"	190,460	494	52	162
*F5JU	"	169,796	432	53	174
*F6BQG	"	156,954	364	55	167
*F4DXP	"	130,652	413	42	136
*F1RCH	"	118,944	417	52	172
*F5PNI	"	101,652	338	46	151
*F4HXJ	"	98,384	329	49	127
*F6FET	"	71,136	207	50	121
*F4GLK	"	69,012	287	36	106
*F6GGA	"	66,030	304	35	107
*F8DNX	"	60,912	248	45	117
*F5MLJ	"	60,738	243	42	117
*F4EMG	"	57,750	173	56	94
*F6BNX	"	42,728	169	37	72
*F6FNA	"	34,584	191	30	102
*F1GKS	"	33,109	204	28	85
*F4HNP	"	18,810	163	22	73
*F8AAB	"	18,146	90	34	52
*F4FLO	"	17,766	84	34	60
*F5IPE	"	17,127	201	19	80
*F6CYT	"	16,686	119	25	56

*F1MLN	"	16,430	126	19	34
*F6ARC	"	14,444	64	34	58
*F4FHV	"	13,300	96	34	61
*F5ROW	"	13,193	96	24	55
*F8DEG	"	10,512	94	22	50
*F1GYX	"	8,220	92	16	44
*F4GYM	"	6,272	64	21	35
*F5MA	"	5,994	70	12	25
*F8CPA	"	5,152	50	22	34
*F5SGI	"	5,076	67	15	39
*F5OCL	"	5,044	98	11	41
*F5TRB	"	4,940	51	19	33
*F6CHF	"	4,794	43	21	30
*F8DYD	"	3,901	46	14	33
*F1PYN	"	3,864	63	16	40
*F5BTH	"	3,483	44	18	25
*F1TZM	"	3,479	63	15	34
*F4GYI	"	810	19	12	15
*F1IJP	"	780	23	11	19
*F4HXC	"	640	12	10	10
*F4GMW	"	552	18	11	12
*F5OHH	"	464	23	9	20
*F4HQO	"	400	14	5	5
*F6BXD	"	247	12	9	10
*F1IWH	"	77	10	4	7
*F5OPR	"	70	10	3	7
*F4BRV	28	725	18	9	16
*F5VMN	21	76,736	458	26	83
*F8CGL	"	45,198	233	26	67
*F4EIH	14	36,894	305	16	70
*F5PWK	"	28,361	189	20	59
*F6EWX	"	18,504	185	14	58
*F1MQJ	"	11,322	186	9	42
*F6HXE	"	1,484	31	10	18
*F4HWL	7	3,034	100	6	35
*F4EFI	"	2,052	55	9	29
*F4FSB	"	580	35	3	17
*F5BEG	3.7	61,688	593	14	74
*F8DHE	"	8,413	149	10	37
F6DZU	AA	941,744	1669	69	215
F5RAG	"	496,926	847	74	268
F5PHW	"	426,123	495	104	315
F4HRM	"	359,060	706	61	199
F1NZC	"	329,272	737	72	244
F6BEE	"	206,124	393	74	193
F1UIJ	"	146,583	394	54	129
F4EUG	"	115,934	437	37	61
F5JFU	"	95,598	247	58	168
F8VNU	"	95,460	310	42	143
F5CQ	"	82,665	238	45	122
F4GPB	"	70,070	329	33	121
F6BLP	"	6,579	60	15	28
F1ULQ	"	5,832	70	19	35
F2FZ	"	418	11	11	11
F1EBN	28A	32,025	168	19	56
TM4Q	21A	616,056	1649	34	134
F4GGQ	"	512,736	1342	36	132
F4CPF	"	9,514	60	20	47
F4ENK	14A	537,901	1760	38	123
F4FFZ	"	343,980	1336	34	113
F4HUA	"	8,624	112	10	34
F4BKV	3.7A	178,088	1065	20	93
*TM3Z	AA	2,356,263	2283	125	512
(OP:F4DSK)					
*F8ATM	"	541,660	548	111	400
*F5DRD	"	283,176	638	62	214
*F4GOT	"	127,510	510	38	167
*F4BWJ	"	106,118	287	54	140
*F4VSE	"	88,275	266	48	117
*F1SKH	"	83,634	238	50	109
*F1ROA	"	75,818	324	36	131
*F8DSN	"	75,060	244	49	131
*F4KKE	"	40,014	226	31	86
(OP:F6JSZ)					
*F4FRF	"	23,028	123	37	77
*F4DZF	"	20,273	105	35	62
*F1TRE	"	15,540	81	30	54
*F4HSE	"	7,897	108	14	39
*F5MVB	"	1,848	26	19	25
*F4EPU	"	1,035	15	11	12
*F4GDO	21A	11,592	147	15	41
*F4GLD	"	8,040	94	17	43
*F5TGR	14A	39,456	212	21	75
*F3WT	"	189	12	4	3

Germany

DJ5MW	A	3,047,198	2870	118	399
DL7BC	"	1,177,908	1380	95	317
DL1WA	"	1,057,680	1487	94	358
DHØGHU	"	415,584	748	79	254
DLØESA	"	354,416	882	68	204
(OP:EA1HEO)					
DL1DTL	"	325,042	582	73	258
DK4VW	"	308,858	641	70	208
DL2CC	"	304,836	838	50	83
DL4WA	"	270,050	622	70	205
DH1PAL	"	262,542	599	63	219
DLØWW	"	255,312	502	66	150
DK5EZ	"	247,361	450	63	214
DK3BK	"	237,636	668	60	186
DK5RL	"	209,884	490	67	207
DL1JGO	"	186,979	470	63	184
DL1TRK	"	186,594	482	58	216
DDØVE	"	132,012	417	51	177
DJ2YE	"	120,204	492	41	171
DK4IO	"	118,003	331	52	145
DL1EJA	"	114,816	462	36	68
DLØKA	"	109,417	298	51	152
(OP:DF3TE)					
DL3SKF	"	87,978	257	55	131
DL7UXG	"	77,406	251	39	94
DF9TW	"	74,382	268	47	100
DL4RCE	"	68,882	195	52	150
DF5BX	"	58,947	299	33	114
DAØAA	"	57,780	333	30	78
(OP:DL4NAC)					
DKØUU	"	56,712	182	44	92
(OP:DF2CD)					
DJ2IA	"	51,381	211	45	128
DL6MIG	"	50,657	235	39	140
DC9ZP	"	50,434	211	42	125
DKØSU	"	47,760	201	37	83
(OP:DF7SA)					
DK6CQ	"	42,471	170	33	88
DC7DX	"	38,753	122	52	91
DL3FDL	"	37,536	155	37	99
DL7LX	"	33,499	169	36	103
DJ7WG	"	32,292	142	43	95
DL1YCF	"	30,870	185	32	94
DF4ZS	"	30,315	183	35	94
DF3QG	"	29,925	118	35	70
DL1AOB	"	29,337	176	31	96
DG7HL	"	28,560	176	29	91
DL5DTG	"	25,925	117	31	54
DL7NV	"	23,072	184	29	83
DF6RI	"	20,336	197	20	62
DJ8QA	"	18,216	138	27	72
DC2TL	"	17,654	152	24	73
DL9CP	"	17,336	96	30	58
DG7FB	"	14,430	127	23	55
DL4LT	"	13,667	115	22	57
DB1BW	"	12,298	127	22	64
DL2ZBO	"	9,240	98	22	48
DL6PO	"	5,772	93	20	54
DK3AX	"	5,016	56	20	37
DK8FG	"	4,826	53	20	18
DL2QB	"	4,212	38	14	25
DM9JM	"	3,920	50	15	41
DL5RDQ	"	1,710	28	13	25
DF9RD	"	1,050	21	12	13
DL9NC	"	660	11	9	11
DL3BZ	"	638	25	10	19
DK9MW	"	414	17	9	14
DL2RSA	"	361	15	7	12
DO1RGI	"	328	58	9	32
DJ6TK	21	58,315	284	27	82
DF6PB	"	28,923	134	26	67
DL9LM	14	19,170	238	15	56
DL8DAW	"	15,219	235	10	47
DG2SDK	"	703	27	5	14
DL5RU	7	35,599	332	17	80
DL6MFK	"	2,128	47	13	25
DL1BA	3.7	9,405	153	9	48
DL6DQW	1.8	1,836	52	6	28
*DL1MAJ	A	503,076	743	82	289
*DG2JA	"	396,321	802	67	256
*DL4ZA	"	358,360	810	65	245
*DL1ATZ	"	354,576	743	73	259
*DJ3HW	"	265,122	540	71	215
*DG5MLA	"	210,140	488	66	200
*DK2WU	"	206,245	555	58	189
*DF3IS	"	205,860	559	58	177
*DK3WN	"	188,082	528	57	201
*DF5BM	"	173,753	531	49	190
*DF5RF	"	168,448	396	64	192
*DM5BB	"	160,328	494	45	151
*DB1VQ	"	152,570	390	52	157
*DL8ULO	"	151,680	538	47	190
*DG1IU	"	149,002	523	46	157
*DK6QW	"	147,256	362	56	177
*DL9GWD	"	125,268	447	46	173
*DL5JS	"	118,494	423	40	134
*DM2GG	"	118,080	338	56	190
*DL4MFR	"	117,208	400	45	151
*DL7VX	"	108,454	397	50	161
*DJ6HR	"	104,520	356	42	153
*DF6QC	"	94,512	451	37	142
*DLØGH	"	94,488	440	42	144
(OP:DL2FDL)					
*DH4PSG	"	92,796	322	50	159
*DH7FA	"	82,665	349	41	126
*DL9HB	"	77,770	239	48	154
*DK7CH	"	76,788	430	34	128
*DLØRD	"	67,402	257	44	90
(OP:DL3ECQ)					
*DK8HE	"	65,741	309	42	127
*DL5LB	"	62,928	364	33	111
*DD1OP	"	60,915	258	35	120
*DL1DF	"	56,322	233	38	111
*DD5MA	"	55,968	239	38	121
*DJ3GE	"	54,540	250	34	101
*DK4EF	"	53,949	197	46	101
*DJ4DN	"	52,752	225	41	116
*DL1RTO	"	47,724	228	34	89
*DF9IX	"	41,418	192	34	84
*DF1ASG	"	40,108	256	34	114
*DL3BCR	"	39,902	169	36	106
*DL5KBO	"	37,719	223	34	93
*DL5AWE	"	36,751	215	37	106
*DL3DRN	"	35,328	158	42	96
*DM2AWM	"	34,526	209	34	88
*DG1YBN	"	33,592	192	31	105
*DD6DR	"	32,421	193	31	76
*DJ4WM	"	29,736	223	27	91
*DL1EHG	"	29,493	187	28	85
*DO9SR	"	27,930	188	21	77
*DL4HWM	"	27,840	257	21	99
*DK7MCX	"	26,750	169	33	74
*DK5OCE	"	26,640	194	30	81
*DK2TS	"	26,287	178	27	70
*DL1AWC	"	26,257	198	28	93
*DO1CS	"	25,908	156	26	76
*DL4ZAA	"	25,300	167	30	80
*DL5CK	"	25,228	137	31	75
*DL1ALN	"	24,570	110	42	75
*DK4HH	"	24,420	168	35	97
*DJØYI	"	23,644	146	26	66
*DL2AWA	"	23,575	151	33	82
*DL2GMI	"	23,540	169	27	80
*DL4GBA	"	22,601	124	32	65
*DL9LF	"	22,330	106	29	81
*DO6NI	"	19,968	204	21	75
*DA9A	"	19,840	155	23	57
(OP:DO1NPF)					
*DL8AX	"	19,594	113	31	70
*DL8OAZ	"	18,952	149	30	73
*DJ3CS	"	17,050	100	27	83
*DD9NT	"	16,459	126	30	79
*DO1PGR	"	15,275	134	19	46
*DF6QE	"	15,106	96	32	59
*DL6AL	"	14,352	142	26	78
*DL8ZU	"	13,940	87	27	58
*DO5HCS	"	13,160	132	21	49
*DO1FPT	"	13,124	135	17	51
*DL7FUA	"	12,870	113	24	66
*DL6EZ	"	12,792	100	25	57
*DG5OBB	"	12,556	109	26	60
*DL7NDS	"	12,036	107	22	37
*DL9FB	"	11,952	106	24	59
*DL9ZWG	"	11,520	100	26	64
*DL3TVI	"	11,055	68	27	40
*DO7KMH	"	11,016	129	15	53
*DL4JMN	"	10,672	72	25	67
*DL4SZB	"	9,960	82	26	57
*DO1TOM	"	9,765	158	14	49
*DL1MFZ	"	9,288	135	24	62
*DL7UPN	"	8,232	72	22	62
*DL7ED	"	8,160	100	26	70
*DF4SR	"	7,973	131	22	45
*DG8KAD	"	7,597	74	26	45
*DG7DBR	"	7,592	136	15	58
*DF1YY	"	7,344	105	16	52
*DL6BS	"	7,254	97	21	57
*DM5FJ	"	6,962	47	17	42
*DG1VR	"	6,944	99	14	48
*DK1TUX	"	6,840	78	20	52
*DL8DXL	"	6,800	63	22	46
*DB9RZ	"	6,510	75	23	39
*DD1TT	"	6,438	73	23	51
*DL6KVB/P	"	5,700	102	15	45
*DL1FW	"	5,402	83	20	54
*DO2HEY	"	5,346	103	17	49
*DK9OS	"	5,280	76	16	50
*DK4VF	"	5,246	63	20	41
*DL1XA	"	5,104	80	18	40
*DL9HCO	"	4,964	78	18	50
*DL9NAI	"	4,949	44	22	27
*DL6DJ	"	4,675	89	12	43
*DF9DH	"	4,656	45	18	30
*DL1VJL	"	4,500	41	17	33
*DO5AL	"	3,960	48	17	28
*DL3NDD	"	3,729	42	11	22
*DM4DS	"	3,526	52	13	28
*DL9GTD	"	3,504	64	14	34
*DM6HK	"	3,486	50	14	28
*DL4JG	"	3,440	63	12	31
*DLØBV	"	3,081	112	6	33
(OP:DJ3JD)					
*DK9MOS	"	3,080	59	19	51
*DL1BDU/P	"	2,964	76	9	43
*DC8SP	"	2,898	61	13	33
*DM2AJK	"	2,320	41	13	27
*DL7ET	"	2,193	57	8	35
*DG1RPU	"	2,132	31	19	22
*DL7CU	"	2,074	43	12	22
*DO7DOC	"	1,800	80	8	37
*DO3GE	"	1,720	35	12	28
*DLØRO	"	1,666	19	16	18
(OP:DD3SAT)					
*DL7LL	"	1,632	40	11	23
*DL1JPF	"	1,600	29	16	24
*DL2ADI	"	1,485	27	11	16
*DJ4PK	"	1,482	29	15	23
*DL2DYL	"	1,290	19	12	18
*DO1RWM	"	1,280	40	8	24
*DL1PF	"	1,131	34	10	19
*DO2JX	"	1,122	20	15	18
*DF2GL	"	1,107	38	10	17
*DM1MA	"	1,088	34	10	22
*DL7LZ	"	968	17	10	12
*DK2MB	"	945	17	10	11
*DB7MA	"	870	18	14	16
*DK7AC	"	775	25	7	24
*DH4RJ	"	750	31	6	24
*DD9PS	"	672	12	10	11
*DL/LX2LX	"	638	24	9	20
*DL5KUA	"	621	17	11	16
*DG5AAP	"	546	25	7	19
*DL5TW	"	506	14	10	12
*DG1FN	"	494	18	10	16
*DL8ME	"	464	23	4	12
*DL2LMS	"	456	11	10	9
*DL1LSW	"	441	17	7	14
*DL6AAO	"	429	19	6	5
*DL8NFA	"	306	11	7	10
*DL2MHO	"	300	15	9	11
*DM3BN	"	297	16	12	15
*DH7OM	"	231	7	4	7
*DF4BM	"	182	9	5	9
*DO4HMS	"	154	25	5	17
*DL5BBN	"	147	7	3	4
*DKØBRM	"	140	14	5	9
(OP:DL6BCS)					
*DM5HR	"	132	7	5	7
*DO2VV	"	45	4	2	3
*DL4PAC	"	16	9	7	9
*DLØXX	"	12	2	2	2
(OP:DL2YE)					
*DO1PCD	21	19,944	132	22	50
*DK3CC	"	14,421	116	18	39
*DO2MS	"	7,701	67	15	36
*DO9CW	"	4,469	69	13	28
*DO7ES	"	3,914	42	19	19
*DL1RPR	"	3,604	52	13	21
*DL3KDP	"	2,992	38	12	22
*DH5WB	"	1,248	23	10	16
*DL9ZP	14	56,306	395	20	74
*DLØGEO	"	19,282	243	12	50
(OP:DL2YAK)					
*DL7FB	"	18,056	209	13	48
*DM9KC	"	10,962	120	13	45
*DL2QT	"	3,705	67	12	27
*DJ1NI	"	3,268	65	9	29
*DL7BTW	"	1,782	66	8	25
*DF1GRA	"	1,550	38	9	16
*DK6HM	"	602	18	7	7
*DL4EDC	"	64	6	3	5
*DL1STV	"	50	8	4	6
*DF8HS	"	0	0	0	0
*DL8AKA	7	26,700	327	14	61
*DD2TC	"	2,590	82	7	28
*DL9EAH	"	2,340	103	7	38
*DF1MB	"	2	1	1	1
*DL3EAZ	1.8	2,660	78	4	31
*DL2RZG	"	2,556	75	4	32
*DL6JH	"	378	27	3	15
DL6FBL	AA	9,525,360	5527	158	622
DJ8OG	"	3,213,945	2360	143	522
DF9XV	"	2,541,779	2103	138	505
DJ7UC	"	2,394,776	1601	141	500
DJ5AN	"	1,555,281	1564	119	448
DL5GAC	"	1,381,458	1547	116	418
DL7CX	"	1,308,480	1412	123	457
DL1NKS	"	1,198,937	1612	94	385
DL6NDW	"	1,072,029	1388	102	395
DL5KUT	"	1,048,575	1131	107	344
DL7ON	"	1,019,655	917	128	453
DL7URH	"	1,005,452	1244	112	370
DK1KC	"	975,598	1153	96	382
DF6JC	"	883,220	1345	87	229
DKØRX	"	851,660	1238	98	341
(OP:DL1GWS)					
DF2LH	"	718,146	898	110	319
DJ9MH	"	672,750	813	101	349
DK6MP	"	642,200	1042	87	293
DK2LO	"	615,780	901	93	303
DF2RG	"	600,650	796	96	314
DL6DH	"	525,965	845	81	284
DL4YAO	"	512,946	669	90	288
DL2QV	"	493,615	647	95	272
DL5MEV	"	446,384	649	96	272
DL1STG	"	443,716	656	96	275
DL4JLM	"	425,225	644	89	276
DL1SEH	"	380,656	628	78	218
DJ7JC	"	315,882	494	91	231
DF9VJ	"	313,317	624	67	212
DK7TX	"	313,208	466	104	272
DJ3WE	"	290,376	575	67	260
DK2AT	"	265,620	539	67	218
DL8RDL	"	250,800	446	67	233
DK6VCO	"	232,405	595	61	204
DL1QW	"	230,510	330	92	278
DK5DQ	"	227,448	291	97	254
DL1NEO	"	224,826	424	76	227
DL4SKF	"	213,993	493	69	210
DJ7YP	"	192,924	389	59	174
DJ6TB	"	172,939	400	68	183
DK7ZT	"	168,795	415	66	213
DJ5LA	"	161,044	350	59	188
DL5AXX	"	159,285	242	84	175
DL7AA	"	152,685	299	80	181
DG7JB	"	152,390	454	50	195
DK6AH	"	146,292	399	56	163
DL9BBE	"	142,120	431	52	168
DM5TI	"	139,748	294	72	145
DL1CG	"	138,480	399	58	182
DR7B	"	121,440	531	44	140
(OP:DL2JRM)					
DM5TS	"	119,992	450	55	157
DJ5IW	"	108,000	323	53	172
DL5NEB	"	97,079	324	49	144
DB4MM	"	95,735	266	54	151
DC4A	"	94,333	295	56	123
(OP:DL4NAC)					
DL2VM	"	93,720	227	67	153
DL1LOD	"	78,764	226	51	143
DL5NAM	"	70,560	203	43	125
DL2OE	"	70,080	201	50	110
DL7ATR	"	64,800	256	40	122
DH4JQ	"	64,798	240	49	130
DF8XC	"	61,605	150	61	124
DR1E	"	56,700	239	36	104
(OP:DB1WA)					
DK1AX	"	55,942	230	44	122
DK2MC	"	54,720	249	41	111
DG9SEH	"	49,491	262	31	86
DK2CX	"	48,100	176	39	109
DG2MEL	"	43,520	177	42	86
DK4QT	"	40,836	138	44	79
DM2AA	"	32,132	114	42	74
DL5RDO	"	31,640	149	37	76
DL1CBQ	"	31,070	150	39	91
DL1DBR	"	30,420	164	35	95
DM1MF	"	28,634	122	44	95
DH8WR	"	27,508	202	23	69
DC1HR	"	26,536	131	43	81
DG2NMH	"	25,610	136	35	95
DK1MM	"	24,648	129	24	55
DF3NBM	"	20,003	97	28	55
DL1MEV	"	17,675	70	44	57
DF8ZH	"	14,418	93	31	58
DJ9YL	"	14,344	104	29	59
DG3MR	"	12,596	72	27	40
DL5ST	"	11,375	80	25	66
DJ1TO	"	11,360	88	27	53
DL7LIN	"	9,984	74	23	29
DF1LON	"	9,563	106	18	55
DK3WE	"	7,584	62	19	29
DR4W	"	6,104	80	14	42
(OP:DL4NAC)					
DM5EE	"	5,928	36	28	29
DJ8QP	"	5,192	58	16	43
DL1KID	"	5,133	41	19	40
DL4NAC	"	4,335	38	18	33
DL6GV	"	4,224	37	18	26
DG7RO	"	3,713	51	29	50
DL8BFV	"	3,087	33	21	28
DF8AA	"	2,350	43	17	30
DM3VL	"	2,040	26	16	18
DJ9HX	"	1,984	24	15	16
DL7YS	"	1,881	27	11	22
DL7USM	"	1,326	24	15	24
DD8SM	"	528	16	9	7
DF6QP	"	360	11	8	10
DL7VOG	"	160	10	5	5
DL2AMD	"	154	13	5	9
DL5L	28A	95,355	407	25	92
(OP:DGØOKW)					
DL2VK	"	2,204	31	11	18
DH8BQA	21A	356,224	889	38	138
DL6RDM	"	57,630	241	31	82
DJ2ST	"	1,188	32	9	9
DL1SVA	"	1,083	21	7	12
DL2ARD	14A	1,070,016	2636	40	152
DMØY	"	428,040	1421	36	128
(OP:DL3BQA)					
DL9FCR	"	9,845	125	12	43
DJ8VH	7A	66,348	404	22	92
DKØAE	3.7A	101,614	1103	15	79
(OP:DJ1AA)					
DL2SAX	1.8A	20,838	275	11	58
DL9NDV	"	728	27	4	24
DL9NBD	"	672	33	4	20
*DF2AJ	AA	741,836	975	103	351
*DQ1P	"	487,606	590	102	304
(OP:DK1IP)					
*DL8MAS	"	407,886	783	66	248
*DL1GME	"	372,242	708	72	206
*DK5D	"	310,068	434	80	244
(OP:DK5DC)					
*DJ6OZ	"	233,562	502	66	183
*DO4DD	"	229,614	640	50	181
*DL4VAI	"	200,725	520	62	197
*DLØNG	"	193,809	511	56	175
(OP:DK8NC)					
*DM5Z	"	186,400	447	59	174
(OP:DM5JBN)					
*DL2SWR	"	154,476	371	69	183
*DL5ALW	"	142,835	363	56	209
*DK5WO	"	130,204	428	45	127
*DG4DX	"	123,078	484	44	175
*DF2FM	"	98,175	285	51	136
*DL1EHR	"	96,460	340	43	139
*DK8AX	"	96,248	247	55	157
*DL3SBD	"	94,599	260	50	157
*DC1MAS	"	91,868	236	57	181
*DO5JD	"	89,712	486	33	145
*DL1HAZ	"	75,656	278	50	146
*DO9ST	"	70,148	332	33	109
*DK2YL	"	59,187	214	42	139
*DJ9SN	"	53,515	204	37	102
*DK2BJ	"	50,880	224	41	118
*DL6RBH	"	49,452	212	44	112
*DM5CQ	"	48,106	304	29	105
*DL8ZAJ	"	40,848	174	40	98
*DJ6DO	"	37,465	186	38	89
*DO6AN	"	36,600	217	32	90
*DK9OV	"	36,046	227	33	101
*DD5M	"	35,282	132	37	81
(OP:DJØZY)					
*DL4EAX	"	33,957	177	32	67
*DL6ON	"	32,568	139	37	101
*DL9UP	"	31,500	230	22	83
*DG3FK	"	29,952	166	40	88
*DF5EM	"	27,956	177	32	84
*DL5RDP	"	27,625	99	42	83
*DH1TST	"	26,474	118	34	88
*DM2XM	"	24,190	190	27	91
*DO7EE	"	23,766	174	26	76
*DL9FBF	"	23,716	132	28	70
*DG2BHB	"	22,386	149	25	66
*DL1SO	"	21,318	139	26	76
*DO3ME	"	20,967	177	26	61
*DL5JAG	"	20,790	130	26	64
*DL8RB	"	19,840	125	29	99
*DK1FT	"	19,012	156	24	73
*DGØERS	"	12,320	78	31	57
*DK8AP	"	12,065	120	24	71
*DGØOJO	"	11,613	99	25	54
*DL2ART	"	11,172	99	21	55
*DL1TS	"	8,547	64	27	50
*DL2YCD	"	8,500	58	26	42
*DD7BW	"	7,490	99	14	56
*DD1UN	"	6,942	80	25	53
*DM6CS	"	6,784	62	21	32
*DO1SJF	"	6,438	52	20	38
*DLØHDB	"	5,406	70	13	40
(OP:DO8FD)					
*DL7AOS	"	5,382	82	11	35
*DL9IM	"	4,959	42	23	34
*DO1KUB	"	4,896	90	12	39
*DL1ONI	"	4,096	40	25	39
*DM6RAC	"	3,920	61	20	50
*DF6YC	"	3,660	55	21	40
*DO1MPR	"	3,116	76	23	59
*DL1NKB	"	2,656	47	10	22
*DK7NC	"	2,397	33	18	29
*DC2CL	"	2,352	59	12	30
*DD9WL	"	2,349	30	13	16
*DK2DQ	"	1,833	32	13	26
*DF2AP	"	1,479	25	12	17
*DGØLFG	"	1,458	20	11	16
*DL8JDX	"	1,350	18	11	16
*DK6WA	"	1,176	20	10	11
*DJ2FR	"	1,156	35	11	23
*DG5BRE	"	1,040	20	12	14
*DL6MPG	"	800	15	10	15
*DL9NEI	"	754	13	13	13
*DL5ZB	"	620	11	9	11
*DG8MG	"	462	16	9	13
*DC2CT	"	320	9	8	8
*DG1UAE	"	255	9	8	9
*DL7FP	"	204	13	6	11
*DL9OHA	"	168	7	7	7
*DO4TP	21A	8,823	74	16	35
*DO3EF	"	5,280	53	17	31
*DG7NFX	14A	13,671	145	17	46
*DF4JM	"	4,025	91	6	29
*DK8XX	"	1,891	42	9	22

Gibraltar

*ZB2TT	AA	771,540	2051	64	244

Greece

SV2BXA	A	81,270	235	59	130
SV8RX	"	6,480	46	21	39
SV2KF	"	936	16	9	15
SV8DTD	21	164,100	1019	26	74
SV6JHA	"	65,152	249	34	94
SX1Z	14	138,544	1069	26	86
(OP:SV1PMR)					
SV8RMA	3.7	12,800	181	10	54
*SV2HJQ	A	269,868	877	60	198
*SV1RMB	"	124,047	471	42	137
*SV2HJW	"	70,044	262	47	109
*SV2AIU	"	44,940	181	33	74
*SV1CEI	"	35,968	117	43	85
*SV2KGA	"	17,952	79	35	53
*SV1DOO	"	14,194	93	29	65
*SV7CUD	"	3,990	48	18	39
*SV1PMZ	"	3,976	54	19	37
*SV1RVJ	"	2,310	37	11	19
*SV1VJ	"	2,120	25	16	24
*SV1VN	"	675	16	11	14
*SV1OBN	"	108	10	5	7
*SV2YC	14	30,295	265	17	66
*SV1HER	1.8	60	10	3	9
SV1BFW	AA	262,860	316	111	279
SV1KYC	"	76,505	273	36	107
SV4LQW	"	48,488	251	37	115
SV2ESW	"	32,025	241	26	79
SV3EXU	"	1,350	22	12	13
SV1JG	21A	202,373	811	35	122
SV2GJV	1.8A	10,528	173	8	48
*SV3RPQ	AA	250,306	700	55	211
*SV2DFK	"	94,010	295	50	120
*SV1AAK	"	64,125	181	52	119
*SY1BFI	"	62,720	247	40	120
*SV8PMM	"	7,808	86	14	50
*SV2TX	"	6,565	46	24	41
*SV1XV	28A	1,680	28	8	16
*SV3GKW	14A	5,842	103	9	37

Guernsey

*GU3HFN	A	532,092	1145	68	280
(OP:RL5D)					
*MUØGSY	21	88,998	556	20	71
GU4EON	7A	12,152	174	11	51
*MUØFAL	AA	52,542	187	38	88

Hungary

HA5UA	A	70,794	379	40	98
HG1VN	"	10,032	139	20	68
HG5F	"	4,928	97	15	41
HA1AD	7	43,860	286	21	81
HG5R	3.7	59,982	781	12	66
(OP:HA8JP)					
HG8R	1.8	95,459	959	15	76
(OP:HA8JV)					
*HA3NU	A	1,418,480	1416	111	365
*HA1IO	"	55,986	321	29	100
*HA3FHH	"	37,800	142	30	96
*HA7MS	"	28,841	122	40	111
*HG5ØØU	"	27,285	265	21	86
(OP:HA5FQ)					
*HA7LW	"	18,109	111	30	61
*HA5FQ	"	1,254	29	10	23
*HG2UK	"	1,160	24	8	12
*HA5JA	"	77	6	5	6
HA3OU	AA	197,250	404	65	198
HA5TOP	"	111,108	384	51	137
(OP:HA5BI)					
HA5X	"	69,795	274	42	123
HA9A	21A	263,511	797	37	134
HG4F	14A	189,140	911	34	106
(OP:HA4FF)					
HG8YKO	3.7A	13,869	215	9	58
*HA4XH	AA	2,047,222	2343	130	436
*HA4FB	"	224,553	728	58	231
*HA1ZH	"	150,911	375	61	168

*HG5ØØE	"	142,888	585	51	161	(OP:HA6NL)
*HA8CQ	"	74,727	319	40	131	
*HA5DDX	"	21,472	111	31	91	
*HA3LN	"	1,320	22	10	12	
*HG8C	14A	25,542	308	19	47	(OP:HA8EK)
*HGØR	3.7A	95,056	873	19	85	(OP:HAØNAR)
*HA8AR	"	7,800	212	5	35	

Iceland

TF3SG	A	2,970	44	19	36	
TF3CW	7	126,635	950	19	76	
TF2LL	"	60,687	508	19	80	
TF3T	3.7	62,080	736	13	67	
*TF8KY	A	110,722	430	41	125	
*TF2MSN	"	97,728	341	43	149	
TF3DT	AA	51,042	288	27	114	
TF3AO	14A	54,112	595	15	61	
TF3JB	3.7A	31,360	398	12	58	
*TF3DC	AA	8,613	76	20	67	

Ireland

EI5KG	A	150,380	416	55	151	
EI7CC	21	54,144	284	22	74	
EI7M	14	1,388,640	3875	38	127	(OP:EI3JZ)
*EI1A	A	1,797,582	2482	80	313	(OP:ON4EI)
*EI4GNB	"	555,632	1250	63	245	
*EI5HZB	"	5,934	69	19	27	
*EI4II	"	3,871	57	15	34	
EI8KF	AA	13,188	70	30	54	
EI6JK	14A	574,080	2075	39	121	
EI5KF	1.8A	11,448	219	8	45	
EI5GUB	"	10,602	209	7	50	
*EI3CTB	21A	12,150	138	12	42	

Isle of Man

*GDØTEP	A	828	12	11	12	
*GD7RVP	"	323	14	8	9	
MD2C	AA	1,009,340	1044	94	342	(OP:MDØCCE)

Italy

IO2X	A	2,733,805	2890	119	384	(OP:IK2NCJ)
IØLYO	"	832,374	1331	85	308	
I4XNN	"	539,410	900	81	253	
IK5ZWU	"	515,968	1385	71	207	
IK7NXU	"	389,820	543	92	264	
IZ5WTV	"	378,684	782	78	236	
IK8NSR	"	320,489	782	70	207	
II4A	"	310,156	751	69	197	(OP:IK4ADE)
IZ5MXA	"	205,716	980	42	144	
IZ4TOA	"	193,140	460	83	207	
IZ6OUX	"	181,350	717	60	174	
IØBYR	"	165,648	568	49	183	
IWØGTA/5	"	147,516	496	44	184	
IQ2XZ	"	137,598	485	50	163	(OP:IW2ETR)
IK3SSW	"	119,700	403	44	146	
IW4EGX	"	96,350	414	39	43	
IZ4JMU	"	86,436	366	55	141	
IU4AOS	"	59,800	218	40	90	
IU5DBS	"	56,541	182	44	97	
IU5BKR	"	40,119	203	30	99	
IQ3ME	"	37,089	262	29	88	(OP:IW3GST)
IK2YFT	"	26,718	126	35	87	
IZ4IRX	"	25,920	142	30	66	
IZ4RCQ	"	20,592	91	30	48	
IK7IMP	"	17,600	132	26	62	
IZØIRH	"	17,190	114	25	65	
IR7R	"	14,490	99	24	46	(OP:IZ7GXB)
IWØBLW	"	12,150	120	19	35	
IK7UKF	"	5,494	84	21	46	
IK2OLJ	"	1,938	40	21	30	
IZ6KPR	"	1,702	20	17	20	
IU3FCM	"	880	18	9	13	
IUØCNI	"	144	11	7	9	(OP:TED)
IZ5TJD/7	28	41,175	247	21	54	
IZ3DVU	"	15,064	106	16	40	
IU4AZC	21	194,114	658	32	110	
IF3GX	"	114,114	385	35	108	
IZ5HZO	"	8,710	57	20	45	
IU5FFM	"	2,212	39	10	18	
IW1RLS	"	391	11	8	9	
IU4HMP	14	157,180	697	30	86	
IU2DUP	"	19,520	161	17	63	
IU4FIT	"	17,956	180	16	51	
IV3WMS	"	17,608	148	16	46	
IZ1GAR	7	142,848	995	31	93	
IN3AHO	"	29,970	332	16	65	
IU8FCQ	"	17,490	349	10	45	
IU3EES	"	24	3	3	3	
IK2MPR	3.7	9,636	155	14	59	
*IZ8FBU	A	329,256	794	53	216	
*IK1JJM	"	261,807	593	60	213	
*IK1RGK	"	207,930	484	63	176	
*IK3ZBM	"	201,552	440	55	192	
*IZ5NFD	"	194,310	501	59	195	
*IV3ARJ	"	173,964	440	57	161	
*IU4APB	"	163,548	471	55	181	
*IU4HMY	"	133,749	452	54	177	
*IN3EIS	"	113,307	518	48	163	
*IZ2SXZ	"	112,140	321	49	129	
*IZØHLY	"	109,616	336	59	162	
*IU8FUN	"	103,383	390	45	144	
*IZ2OOS	"	103,029	383	45	138	
*IV3UHL	"	96,236	354	46	150	
*IZ2BKA	"	93,537	324	42	129	
*IZ2SMQ	"	91,254	262	57	144	
*IW2FUT	"	84,108	338	37	126	
*IK4BEI	"	74,620	294	42	122	
*IUØAPV	"	73,899	208	56	133	
*IU8DSP	"	72,180	294	42	138	
*IZ2NZQ	"	63,750	232	46	124	
*IK7RVY	"	62,952	208	36	93	
*IK8SVQ	"	56,848	195	54	122	
*IZ2BZP	"	54,870	251	38	117	
*IU4DAF	"	53,953	183	48	115	
*IK2AQZ	"	51,898	331	33	121	
*IW8DQY	"	47,450	289	30	100	
*IWØQO	"	46,665	197	39	114	
*IU2GGD	"	43,292	220	34	103	
*IZ8YAA	"	43,148	185	39	95	
*IK3XTT	"	43,112	217	41	95	
*IW7EFJ	"	39,140	236	26	77	
*IZ7VII	"	38,622	188	33	90	
*IN3EOV	"	37,089	199	29	88	
*IQ2XI	"	36,801	170	37	104	(OP:IK2VUD)
*IU1FIB	"	34,408	183	38	98	
*IU1HCC	"	34,077	168	31	80	
*IN3ADW	"	32,996	245	25	88	
*I1RB	"	32,163	236	41	110	
*IZ2QCP	"	32,004	198	32	95	
*IU2EFB	"	30,056	109	42	62	
*IN3UFW	"	29,601	250	23	94	
*IZ3VTH	"	29,500	200	32	93	
*IK4MGJ	"	29,493	159	33	80	
*IN3GYN	"	29,430	199	31	78	
*IZ1RDQ	"	29,394	154	40	98	
*IKØVWH	"	28,033	172	24	73	
*IZ8CLM	"	27,025	95	37	78	
*IZ2SNI	"	24,157	118	31	88	
*IW2NEF	"	22,000	113	30	50	
*IZ5UGE	"	21,489	159	24	63	
*IZ1HBC	"	20,670	124	24	54	
*IK2AUK	"	20,496	140	30	82	
*IZ8QNS	"	20,460	120	29	81	
*IK6UBY	"	20,188	140	23	80	
*IZ1BZV	"	19,135	114	29	60	
*IV3JVJ	"	19,092	101	29	57	
*IZ2GRG	"	19,071	100	38	79	
*IK6SBW	"	17,958	113	29	53	
*IU1FSL	"	17,150	155	27	71	
*IK2YSJ	"	17,052	155	26	72	
*IU6FUB	"	15,794	110	27	79	
*IZ2EEV	"	13,398	147	21	56	
*IK8ARF	"	13,167	114	27	72	
*IZ4EFP	"	13,158	98	29	57	
*IW4CNY	"	13,112	182	17	71	
*IK3XJP	"	12,978	84	24	39	
*IZ4UFB	"	12,972	145	23	71	
*IN3JRZ	"	12,719	191	18	61	
*I2BZN	"	10,218	85	25	53	
*IK1TNU	"	10,164	109	18	59	
*IQØFO	"	9,348	198	25	89	
*IK3MLF	"	9,102	65	27	47	
*IK2REA	"	9,028	103	20	54	
*IU8DSS	"	8,848	112	21	58	
*IK4JQQ	"	8,658	72	28	46	
*IU2BZE	"	8,352	111	24	63	
*IZ5HQB	"	7,598	72	21	37	
*IK5MEP	"	7,345	80	20	45	
*IK7HPG	"	7,169	44	28	39	
*IU5HES	"	7,128	97	23	49	
*IZ1MHY	"	6,912	56	24	30	
*IQ2LS	"	6,464	58	24	40	
*IK8DYM	"	6,431	66	21	38	
*IW2DFS	"	6,188	63	24	44	
*IKØVSY	"	6,042	60	18	20	
*IWØAEN	"	5,917	65	21	40	
*IZ2RBR	"	5,459	41	22	31	
*IK4XQT	"	4,992	73	13	35	
*IK2AHB	"	4,746	62	16	26	
*IN3EQV	"	4,510	78	15	40	
*IZ5WNW	"	4,416	48	21	27	
*IQØWV	"	4,176	84	14	34	
*IU2ACI	"	3,876	34	23	34	
*I1DXD	"	3,864	34	23	33	
*IZ1UGZ	"	3,744	70	17	35	
*IZ3ZLE	"	3,196	30	22	25	
*IX1CVF	"	3,172	68	12	40	
*IU2GDC	"	3,015	33	18	27	
*IWØEWI	"	2,920	25	19	21	
*IU4BUQ	"	2,850	51	12	38	
*IU4CSS	"	2,769	38	15	24	
*IN3XSK	"	2,208	62	14	34	
*IK2IKW	"	2,024	36	15	29	
*IW3IJP	"	1,932	32	16	30	
*IZ1DXS	"	1,800	22	14	16	
*IZ1RHY	"	1,488	20	15	16	
*IZ8FCA	"	1,480	44	12	25	
*IU2BFT	"	1,406	45	10	28	
*I1GXV	"	1,095	28	7	8	
*IK8YFW	"	899	21	12	19	
*IN3MNS	"	891	23	11	16	
*IZ1FRM	"	825	15	11	14	
*IZ3AYS	"	675	18	11	14	
*IW5EHL	"	594	15	11	11	
*I5FIP	"	460	15	7	13	
*IZ3WFD	"	456	12	8	11	
*IU4CZW	"	432	22	8	16	
*IK5VQI	"	425	18	8	17	
*IK7LMX	"	378	14	8	10	
*IU3GJD	"	280	10	5	5	
*IW1RHX	"	252	10	3	9	
*IK8WEI	"	240	19	6	14	
*IØKJX	"	208	10	7	9	
*IZ4DYQ	"	165	9	6	9	
*IK8RJS	"	132	8	5	7	
*IZ1ZJO	"	112	20	10	18	
*IQ1KZ	"	0	6	6	6	
*IZ8DFO	28	5,687	59	12	35	
*IKØEBA	"	1,500	39	12	18	
*IK4VFB	"	832	22	6	10	
*IU1LIT	"	378	25	9	18	
*IV3ZNK	21	9,425	70	24	41	
*I4VIL	"	5,200	54	15	25	
*IK1ZNM	"	2,618	38	12	22	
*IK4NZD	"	1,736	45	10	18	
*IZ6MPZ	"	1,357	29	8	15	
*IZ8GUQ	14	46,300	336	22	78	
*IK5BSC	"	32,536	225	18	65	
*IV3AEB	"	20,224	198	14	50	
*IZ2ABI	"	17,216	168	18	46	
*IZ7FLQ	"	15,255	165	15	30	
*IKØFMB	"	6,987	127	10	41	
*IU2JMZ	"	5,724	113	10	43	
*IN3EMI	"	3,510	86	7	32	
*IU4FEI	"	1,666	30	10	24	
*IU2HEE	"	1,380	24	10	20	
*I5JHW	"	702	13	7	11	
*IZ8DUD	"	266	15	3	4	
*IUØJFZ	"	12	2	1	1	
*IZ7NMD	7	31,756	541	12	56	
*IZ4AIF	"	23,800	285	11	59	
*IW5ECP	"	19,516	169	15	67	
*IK4OMO	"	14,673	216	10	57	
*IU5ICR	"	8,932	172	10	48	
*IZ1YCG	"	380	20	5	15	
*IWØHLZ	"	60	9	4	6	
*IK3AVM	3.7	4,120	119	5	35	
*IZ1WIX	1.8	1,230	47	4	26	
*IW1CBG	"	88	13	3	8	
I2WIJ	AA	1,768,390	1551	134	476	
IZ2SVA	"	973,323	1297	90	333	
IKØPHY	"	942,205	1174	108	299	
IZØBVU	"	570,766	858	107	306	
IV3JCC	"	373,240	534	91	219	
IZ7XUQ	"	367,926	811	72	246	
IU4FLO	"	336,974	514	105	269	
IKØXBX	"	315,185	505	87	286	
I1MRH	"	240,948	397	89	202	
IK1TAZ	"	214,281	339	86	175	
IK5PWS	"	211,932	554	58	194	
IZ3XEF	"	207,417	343	83	166	
IZ5DKJ	"	153,258	274	81	186	
IK1BPL	"	137,816	406	59	155	
I4JED	"	121,450	247	66	109	
IZ1KGY	"	116,261	343	53	158	
IU8HEP	"	113,126	326	56	173	
II3E	"	103,680	385	44	118	(OP:IZ3EAW)
IZØOTV	"	102,480	261	59	151	
IW5EDI	"	83,650	313	40	135	
IK2QIN	"	81,432	203	69	147	
IZ2BVC	"	54,901	269	41	120	
IKØYUT	"	48,931	184	56	111	
IK3SCB	"	39,396	121	49	85	
IZ5BRW	"	37,128	139	34	68	
IWØSAF	"	29,403	162	38	83	
IK2SAR	"	27,250	102	46	63	
IKØUTM	"	27,040	129	34	70	
IØWBX	"	21,837	146	29	58	
IU8CEC	"	19,190	105	33	62	
IØPNM	"	16,716	80	35	49	
IC8POF	"	11,718	72	26	37	
IZ5FFI	"	10,614	59	35	52	
IZØUIN	"	2,480	56	12	28	
IZ2ZRT	"	1,292	36	11	27	
IZ2CSX	"	1,140	20	13	17	
IW4DQY	"	672	12	9	12	
IZ5YHD	"	168	15	10	14	
I4AUM	28A	21,978	156	17	57	
IZ2ODM	"	14,896	117	15	41	
IQ5JA	"	13,552	104	16	40	(OP:IZ5ILF)
IB4X	21A	455,400	1173	38	142	(OP:IZ4ORO)
IO7T	"	402,017	1173	35	126	(OP:IZ7ECL)
IZ5CML	"	130,707	384	36	105	
IZ4VUS	"	109,920	450	36	124	
IZ8DSX	"	105,432	433	32	106	
IU4CHE	"	83,421	382	32	61	
IK4RAS	"	19,176	203	23	45	
IU2DXF	"	9,016	68	21	35	
IB4A	14A	710,589	2067	38	145	(OP:IZ4VYY)
IB4K	"	435,175	1434	36	133	(OP:IZ4COW)
IW1CHX	"	215,818	1087	29	93	
IIØI	"	127,059	772	32	91	(OP:IZØPAU)
I1NVU	"	54,400	250	31	105	
IU3BTY	"	41,008	369	20	68	
IWØBCF	"	40,768	189	22	76	
IZ1PMC	"	1,044	29	7	22	
I7CSB	7A	51,681	363	20	87	
I8UZA	"	15,548	115	18	74	
IR4E	"	4,743	55	13	38	(OP:IK4ZHH)
I1JTQ	3.7A	124,800	1064	16	80	
IZ4AKO	"	47,208	498	13	71	
IR8W	"	39,336	443	14	74	(OP:IK8YFU)
IZ1HDR	"	16,848	226	11	61	
*IQ2DN	AA	533,000	957	80	245	(OP:IZ2JQP)
*IZ3NYG	"	477,111	669	100	259	
*IK2XDE	"	374,535	645	75	240	
*IZØDXD	"	304,544	690	67	240	
*IZ4JMA	"	295,646	621	67	207	
*IZ3EIN	"	196,245	363	70	197	
*IZ7GEG	"	145,230	413	55	151	
*IQ5WT	"	108,900	295	66	176	(OP:IW5AB)
*IV3ONZ	"	100,061	464	33	146	
*IZ5EBL	"	93,288	318	44	112	
*IU1GNA	"	74,496	332	41	153	
*IK3XTV	"	69,536	277	43	121	
*IWØEAC	"	67,161	213	55	128	
*IKØBAL	"	65,612	258	53	135	
*IV3WMI	"	56,416	235	48	124	
*IU3EDK	"	53,605	262	37	114	
*I3LTT	"	50,508	241	40	98	
*IZ2BHQ	"	47,242	152	49	109	
*IZØFKE	"	41,847	162	37	74	
*IZ7VPK	"	39,861	205	42	87	
*IU1JCZ	"	30,368	269	18	86	
*IU4HRJ	"	29,252	259	36	106	
*IK1YFE	"	13,816	81	35	53	
*IK1TTD	"	11,776	123	26	66	
*IV3IDP	"	9,875	94	21	58	
*IZ4XAI	"	7,252	69	23	51	
*IU1DEI	"	6,324	45	22	29	
*IK1GPG	"	6,144	49	26	38	
*IK2WSJ	"	5,264	46	20	27	
*IU4FNQ	"	3,185	55	15	34	
*IK5YJK	"	3,159	42	15	24	
*IK3/DK5MB	"	2,860	43	14	30	
*IZØKBA	"	2,772	29	16	20	
*IZ2FNI	"	2,208	44	18	30	
*IZØTWS	"	1,470	24	20	22	
*IU8IZA	"	528	15	10	14	
*IU4DTV	"	120	11	5	10	
*IZ5ILK	28A	3,968	46	10	21	
*II8M	21A	401,301	1282	37	130	(OP:IZ8EYP)
*IK7JVE	"	22,570	199	21	53	
*IO2R	14A	83,265	490	25	80	(OP:IW2MJQ)
*IW2MXY	"	31,125	270	18	65	
*IK4OMU	"	18,389	161	15	56	
*IQ7YP	"	13,800	142	21	54	
*IU4JIC	"	7,752	113	12	39	
*IR4P	7A	56,745	505	17	80	(OP:IK4RVG)
*IU4HTM	"	7,788	199	12	54	
*IQ3UV	"	1,890	86	6	29	
*IB5B	1.8A	224	16	4	10	

Kaliningrad

UA2CZ	A	6,783	58	20	31	
R2FBK	7	22,320	291	12	60	(OP:UA2FCC)
*UA2FHZ	A	26,600	211	35	98	
*RA2FO	"	24,990	189	27	78	
*UA2FP	"	14,280	131	20	64	
*UA2K	"	5,811	61	18	21	
*UA2KW	"	1,540	28	10	12	
*R2FAT	"	510	31	13	21	
*RA2FX	21	957	38	12	17	
UA2FZ	AA	2,780,652	2615	124	464	
RW2F	7A	577,374	2158	36	141	
UA2F	3.7A	279,744	1859	24	100	(OP:UA2FB)
*RN2F	AA	206,100	617	56	169	
*RA2FF	14A	30,580	145	27	83	
*R2FAF	7A	2,664	64	9	27	

Kosovo

Z62FB	A	62,271	570	23	76	
Z61DX	AA	82,295	384	38	113	

Latvia

YL2GD	A	1,856,778	2540	114	348	
YL3HE	"	16,480	151	24	79	
YL2BJ	21	228,960	792	33	126	
YL3CU	"	6,394	78	15	31	
YL2CI	14	252,340	1105	35	120	
YL3CW	3.7	226,432	1537	26	102	
YL2PP	1.8	15,176	260	7	49	
*YL2LW	A	95,568	330	46	130	
*YL3GY	"	42,642	219	36	102	
*YL2JR	"	16,335	125	26	73	
*YL2KN	"	16,055	163	19	76	
*YL3AJI	21	13,975	153	18	47	
YL2SM	AA	3,830,931	3020	153	564	
YL3FT	"	1,013,013	1343	111	348	
YL2SW	"	904,057	1488	95	318	
YL2KO	"	568,519	810	87	250	
YL9T	"	24,087	259	24	69	
YL2KF	"	484	17	9	13	
YL2VW	28A	10,098	92	15	36	
YL2IP	14A	22,176	211	16	61	
*YL2GP	AA	38,634	173	38	99	
*YL2GUV	3.7A	15,309	244	9	54	

Lithuania

LY5W	A	444,540	886	76	234	
LY4T	"	346,653	720	80	253	
LY9Y	"	143,172	388	55	191	
LY2BIS	"	139,968	508	48	144	
LY3DA	"	6,300	80	16	44	
LY2AE	28	28,080	192	21	57	
LY2KA	21	57,834	269	26	76	
*LY1SR	A	300,909	994	53	214	
*LY2N	"	101,703	371	43	124	
*LY1FK	"	54,810	330	36	109	
*LY2VO	"	19,965	161	30	91	
*LY2NZ	"	15,687	177	21	62	
*LY2OM	"	6,708	113	19	59	
*LY3IV	14	18,768	211	14	55	
*LY2EW	"	16,720	245	9	46	
*LY1NDN	"	725	35	7	18	
*LY2BMX	3.7	61,965	715	13	72	
*LY5I	"	44,793	527	14	67	
*LY5S	"	5,520	168	7	39	
*LY5CB	1.8	2,145	81	4	29	
LY7Z	AA	5,520,064	4672	145	559	
LY5R	"	942,510	1193	111	334	
LY1R	"	906,910	1241	102	343	
LY2RJ	"	506,577	881	86	307	
LY2SA	"	488,973	845	90	299	
LY2NY	"	484,160	923	69	271	
LY2J	"	405,874	812	83	288	
LY4OO	"	186,686	380	74	195	
LY2XW	"	162,450	411	62	128	
LY3X	"	157,887	897	28	131	
LY3B	"	153,819	419	62	181	
LY2AX	"	97,812	268	58	170	
LY4BP	"	38,961	303	21	90	
LY5O	"	12,825	117	26	69	
LY7M	"	9,112	93	15	53	
LY5T	21A	261,954	738	36	126	
LY2W	14A	717,846	2111	38	143	(OP:LY1FW)
LY5Y	"	665,413	2259	36	125	
LY2DX	"	454,358	1610	36	121	
LY2MM	7A	258,217	1399	30	119	
LY4Q	"	110,054	1064	17	81	
LY8O	3.7A	150,998	1400	16	87	
LY2FN	"	109,940	849	21	94	
*LY2TS	AA	188,612	538	54	190	
*LY3AB	"	117,943	480	51	152	
*LY4MA	"	25,382	230	25	73	
*LY2BAA	"	21,816	173	23	85	
*LY2K	"	16,926	76	36	42	
*LY2ND	"	10,000	141	26	74	
*LY5AT	"	288	21	5	13	
*LY2OU	14A	127,136	670	30	107	
*LY2AJ	"	22,082	286	13	48	
*LY2BBF	"	21,608	225	17	56	
*LY2MC	3.7A	11,826	240	8	46	

Luxembourg

*LX1DKE	A	40,299	245	31	102	
LX1ER	AA	642,005	1026	92	323	
LX1HD	21A	30,880	223	21	59	

Macedonia

Z35M	A	111,834	539	36	135	
Z3B	21	79,240	293	31	109	(OP:Z33PB)
*Z33ST	A	10,656	104	19	53	
*Z35W	21	61,950	383	28	77	
*Z32U	7	8,379	105	13	44	
*Z35F	3.7	9,126	150	9	45	
*Z37ØM	AA	397,880	1044	63	217	(OP:Z36W)
*Z33C	3.7A	64,728	689	14	73	

Malta

*9H5DX	21A	58,497	246	28	83	

Moldova

*ER4LX	A	148,070	489	61	160	
*ER1BF	"	26,986	235	23	80	
*ER2OW	"	6,195	71	19	40	
*ER5DX	"	2,250	40	22	28	
*ER1OO	21	116,760	474	34	105	
ER4A	AA	1,858,590	2291	119	416	(OP:UT5UDX)
*ER3CT	AA	134,560	442	53	179	
*ER3DX	"	10,147	54	33	40	

Montenegro

4O7CC	AA	1,355,082	2402	92	357	

Netherlands

PC2T	A	956,352	1384	95	313	
PAØJNH	"	201,450	517	61	194	
PA2S	"	118,450	406	47	159	
PA3CJP	"	81,872	417	40	132	
PA5VK	"	34,968	161	39	85	
PB1HF	"	29,304	127	32	79	
PA3J	"	26,574	199	26	77	
PA1CWI	"	15,369	134	31	78	
PI4ZHE	"	12,040	124	27	59	(OP:PD2H)
PA4GDR	"	9,976	104	20	38	
PA3EKE	"	792	37	14	30	
PAØMIR	21	7,708	75	14	27	
PG9HF	"	5,546	62	19	28	
*PA3AT	A	117,923	386	48	145	
*PA1P	"	105,090	439	38	148	
*PG1R	"	97,722	420	41	142	
*PA2CVD	"	68,320	361	31	109	
*PA1TO	"	51,912	346	24	102	
*PDØMHZ	"	48,590	306	26	87	
*PA2Z	"	42,185	216	38	105	
*PA3DBS	"	40,656	273	30	91	
*PA4HM	"	39,627	252	28	83	
*PD1B	"	31,460	200	28	82	
*PA1X	"	26,448	153	33	83	
*PE2KM	"	25,704	183	28	80	
*PAØB	"	24,442	197	22	79	
*PAØTCA	"	20,444	117	25	51	
*PH4E	"	19,635	164	24	81	
*PC9F	"	19,109	225	21	76	
*PA3ARM	"	19,082	148	25	69	
*PE2HG	"	16,975	146	23	74	
*PD9MK	"	16,200	178	16	65	
*PD5ML	"	14,532	135	19	65	
*PAØACU	"	13,904	98	30	49	
*PC1PM	"	13,024	103	25	49	
*PDØWR	"	11,544	144	16	62	
*PD5MVH	"	11,529	148	15	48	
*PD7CJT	"	11,224	152	10	51	
*PD5S	"	10,692	90	18	48	
*PCØW	"	8,525	89	21	34	
*PA4DN	"	7,920	74	21	34	
*PDØPIW	"	7,504	99	14	42	
*PC2C	"	7,426	95	23	56	
*PB1S	"	6,955	100	15	50	
*PD5ISW	"	5,733	117	14	49	
*PDØWVB	"	5,720	81	12	43	
*PE2HLA	"	5,586	101	12	45	
*PD5WSQ	"	4,950	90	12	38	
*PA/SP5PY	"	4,848	83	12	36	
*PD1ABO	"	4,524	128	10	29	
*PA3HCC	"	4,332	79	15	42	
*PD9NR	"	4,141	79	10	31	
*PD9GD	"	3,555	77	8	37	
*PA3I	"	3,283	71	13	36	
*PAØLIE	"	2,968	49	17	36	
*PC7B	"	2,544	33	23	30	
*PE2JMR	"	2,254	34	11	12	
*PE1LTY	"	1,566	32	9	18	
*PC1Y	"	1,443	20	17	20	
*PI4DHG	"	1,360	21	16	18	(OP:PD7BDN)
*PA2PCH	"	980	26	9	19	
*PA3CVR	"	744	27	10	21	
*PD4BER	"	460	16	8	15	
*PD1ADK	"	416	12	5	8	
*PAØLPN	"	308	12	6	8	
*PA5P	"	285	18	7	12	
*PDØARY	"	180	22	6	14	
*PDØMGX	14	1,798	51	7	24	
*PD1WES	"	144	15	2	10	
*PA2CHM	7	510	29	3	14	
*PA9TT	"	60	16	2	8	
*PA2TMS	3.7	86,240	998	13	75	
*PAØZH	1.8	8,601	147	10	51	
*PA3DTR	"	580	45	5	24	
PA3AAV	AA	1,801,800	1893	117	433	
PA1T	"	794,656	1290	73	231	
PI4Z	"	221,424	652	40	128	(OP:PA5KM)
PC2D	"	145,801	391	61	150	
PA3EVY	"	115,640	291	60	136	
PA3DDP	"	114,808	350	54	172	
PA1BX	"	101,010	265	53	142	
PB5X	"	74,871	242	46	95	
PA1CA	"	49,080	232	33	87	
PA3GDD	"	24,255	147	32	67	
PF9W	"	19,669	105	31	58	
PA5SKY	"	13,680	144	24	56	
PA2KW	"	13,345	76	35	50	
PA7RA	"	9,954	105	21	58	
PB7TT	"	4,440	54	19	41	
PA3MRO	"	2,613	26	17	22	
PA8AD	"	638	23	10	19	
PA1CC	21A	308,885	870	34	129	
PA4WM	3.7A	179,564	1497	18	88	
PA9M	"	164,772	1646	14	78	
PA3C	"	14,190	193	10	56	
*PA8KW	AA	485,861	830	84	305	
*PA/PY2SEX	"	391,548	771	90	312	
*PH7A	"	322,260	435	104	289	
*PA3T	"	287,790	721	63	202	
*PA9S	"	242,795	517	66	179	
*PA1PE	"	224,419	427	76	207	
*PE1EWR	"	202,120	587	54	194	
*PA7WW	"	186,592	486	61	177	
*PE1FTV	"	121,549	465	41	156	
*PA3BUD	"	116,541	345	49	158	
*PC9DB	"	96,654	314	47	131	
*PD2TW	"	92,036	494	34	99	
*PD1RO	"	65,623	327	29	108	
*PD1AT	"	45,347	222	33	104	
*PA3MM	"	26,676	149	30	78	
*PE5JW	"	26,250	167	35	90	
*PA1MAR	"	24,510	196	35	79	
*PAØMJM	"	24,244	137	33	83	
*PA2GRU	"	16,200	204	15	66	
*PA2PKZ	"	15,912	184	18	50	
*PA7TT	"	14,220	116	27	63	
*PA3GEO	"	13,260	132	20	58	
*PDØME	"	10,325	123	15	44	
*PD2GSP	"	9,536	99	17	47	
*PA2DKW	"	8,908	104	17	51	
*PAØRRS	"	5,148	53	17	35	
*PA3DRL	"	4,700	41	19	31	
*PA7GMU	"	4,300	60	13	37	
*PE2W	"	2,664	59	10	26	
*PE4KH	"	1,855	50	11	24	
*PDØJMH	"	1,395	36	9	22	
*PA9ROB	"	462	17	9	13	
*PA3HGF	"	168	10	4	4	
*PD1DX	28A	2,603	53	6	13	
*PHØAS	14A	3,168	60	9	24	

Northern Ireland

MIØAIH	A	816	20	15	19	
*MIØOBC	A	77,430	382	34	111	
*MIØM	14	257,504	1257	24	80	(OP:MIØSAI)
GI4VHO	AA	157,170	520	46	149	
MIØTMW	"	5,238	47	20	34	

GI4T	7A	386,208	1814	33	116
(OP:MIØSMK)					
MIØSLE	3.7A	121,099	885	14	87
*MI4I	AA	273,456	581	54	162
(OP:GI4SJQ)					
*MI1M	14A	47,558	357	21	65
(OP:MIØLLG)					

Norway

LA6ZP	A	189,448	653	46	192
LA5UF	"	175,800	372	69	224
LA1PHA	"	92,536	318	43	129
LA6KOA	"	65,036	394	26	116
LA6SK	"	1,295	23	13	22
LA6ZFA	3.7	12,705	225	9	46
*LA2ONA	A	147,420	530	46	164
*LA2HFA	"	137,634	472	45	181
*LB5BG	"	105,820	452	40	145
*LB1LG	"	84,796	410	40	132
*LA8RTA	"	34,100	254	25	85
*LA8OKA	"	33,536	219	31	100
*LA3RNA	"	31,625	198	30	95
*LA6M	"	28,512	256	20	79
(OP:LA6GX)					
*LB2WG	"	11,400	147	13	47
*LA6PBA	"	10,508	110	21	50
*LA7IJ	"	8,142	116	14	45
*LA8MOA	"	6,144	94	16	48
*LA9PTA	"	5,500	58	19	36
*LA8OM	"	2,220	54	9	28
*LA2AB	7	114,466	872	28	93
(OP:LB4UH)					
*LA5FBA	"	16,038	225	12	54
LA6VQ	AA	1,065,405	1511	76	287
LB1AH	"	773,816	1217	85	309
LA3BPA	"	518,375	829	97	280
LA9TY	"	446,890	976	79	256
LA8HGA	"	223,929	844	40	139
LA6UL	"	111,612	315	49	164
LA8PDA	"	35,462	137	29	90
LA7GNA	"	33,598	196	34	73
LA9PJA	"	625	19	7	18
LB6KC	14A	41,574	360	19	63
LA5YJ	1.8A	48,111	615	11	68
*LA8CJ	AA	51,060	161	43	105
*LA2GKA	"	50,256	315	27	117
*LB4CD	"	957	25	10	23
*LA3CLA	14A	3,320	67	10	30

Poland

SP9DLY	A	337,350	681	86	260
SP6OUJ	"	174,096	455	55	161
SN5U	"	162,854	424	59	155
SP1JQJ	"	159,800	460	52	148
SQ3WW	"	125,775	381	50	175
SP9CLO	"	93,104	316	48	136
SP5ICS	"	72,333	282	47	124
SP9TPV	"	42,780	186	54	101
SP3CYY	"	38,065	244	23	92
SP4IGV	"	31,008	151	39	75
SP3RBG	"	18,624	74	35	61
SP9EJH	"	6,372	84	18	36
SO5N	"	1,406	36	14	24
SN6A	"	1,140	23	16	22
(OP:SP6CES)					
SQ9HZM	28	13,144	88	16	46
SQ9V	21	197,485	670	32	95
SP9LAW	"	10,915	83	19	40
SP9W	14	201,495	912	31	102
SQ7NSN	"	97,956	558	30	78
SP9NSJ	"	24,332	226	15	62
SP7MC	7	110,966	864	23	90
SQ1OD	3.7	32,928	382	14	70
SP9RHN	"	20,515	423	10	45
SP3CMX	"	495	19	6	9
SP9SDR	1.8	2,695	94	5	30
*SP7B	A	192,042	539	53	174
*SQ5PMB	"	185,238	622	51	195
*SN4EE	"	164,265	569	54	181
(OP:SP4AWE)					
*SQ3YAY	"	110,500	313	61	160
*SQ5NWA	"	95,616	428	50	142
*SP8EEX	"	93,888	299	46	146
*SP2GCE	"	86,271	379	45	148
*SQ9KDT	"	76,362	338	38	140
*SQ2SAT	"	69,797	262	49	120
*SP6LUV	"	62,608	200	48	124
*SP9YFF	"	61,744	315	34	102
*SP9RTL	"	56,265	352	31	124
*SP8CGU	"	54,071	288	29	110
*SP2JMR	"	51,744	181	53	101
*SP4GHL	"	47,310	196	49	117
*SP4DDS	"	46,545	293	34	111
*SP5DRE	"	45,108	243	32	94
*SQ3POS	"	43,248	217	37	99
*SQ2LID	"	40,300	334	23	101
*SQ9IWS	"	37,638	241	30	93
*SP8P	"	37,373	198	37	96
*SP1DMD	"	33,072	194	30	76
*SQ5SAA	"	33,062	218	27	95
*SQ9ANS	"	32,670	197	31	90
*SQ7ACP	"	32,643	188	35	82
*SQ9PUW	"	31,510	227	31	106
*SQ9DXT	"	25,425	195	25	88
*SP2CYK	"	23,660	206	19	72
*SP8GNF	"	23,607	150	36	93
*3Z6O	"	23,100	173	28	72
*SP9IHP	"	22,120	105	29	50
*SQ5TDZ	"	20,610	119	35	55
*SQ3MIS	"	19,594	180	26	75
*SP3BBS	"	19,080	160	25	65
*SP3LD	"	18,798	100	29	49
*SP8HPW	"	18,156	100	32	57
*SP6RTX	"	17,600	196	26	84
*SQ4FDK	"	16,008	159	21	66
*SP6TRH	"	15,440	129	19	61
*SQ3ESP	"	14,847	132	29	72
*SP3FSM	"	14,516	116	26	50
*SP9BMH	"	14,329	96	28	61
*SQ5SUL	"	13,892	116	23	69
*SQ6PTR	"	13,202	124	23	59
*SP5VIH	"	13,015	134	28	67
*SP4AAZ	"	11,837	110	23	66
*SP8HXN	"	11,520	83	27	53
*SP9SMD	"	10,922	182	19	67
*HF1D	"	10,560	99	22	66
*SQ6IYV	"	9,559	71	28	51
*SP3YM	"	8,550	51	32	43
*SP9XW	"	7,701	58	18	33
*SP2SV	"	7,611	61	20	39
*SP1I	"	7,104	69	21	43
*SO5T	"	7,008	102	16	57
*SQ5EXM	"	6,499	84	21	46
*SP7MJX	"	6,480	104	21	59
*SP2AWJ	"	6,370	73	20	45
*SP8BOZ	"	6,348	95	17	52
*SP3UCW	"	5,940	69	21	45
*SP2V	"	5,610	84	14	52
*SN5O	"	5,220	64	20	40
(OP:SP5BYC)					
*SQ9MCI	"	4,050	35	23	31
*SP5MBI	"	3,552	43	14	18
*SP2BLC	"	3,276	84	19	44
*SP5TOF	"	1,980	64	10	34
*SP5IOU	"	1,221	22	14	19
*SP9ODY	"	1,071	27	8	13
*SP9IKN	"	722	43	10	28
*SQ7KOT	"	342	18	6	13
*HF95OSP	"	162	16	7	11
*SO5MW	"	105	15	7	14
*SP3LWP	28	13,965	98	18	39
*SP7CVW	"	1,100	18	10	12
*SP4MPA	21	23,520	144	22	62
*SQ8BGR	"	12,600	83	21	39
*SQ5AAG	"	10,730	113	21	37
*SP9KJU	"	7,176	67	18	28
(OP:SP9MDY)					
*SQ8FEU	"	6,669	91	13	26
*SQ9GOL	"	6,480	74	16	32
*SP1II	"	3,772	39	15	26
*SQ8VPS	"	3,404	54	13	24
*SP3BES	"	2,688	56	9	19
*SP2HMN	"	1,872	32	11	15
*SP5TIM	"	1,273	31	7	12
*HF3T	"	1,100	32	9	16
(OP:SP3FYX)					
*SQ9LOJ	"	660	16	7	13
*SQ9ROT	"	273	9	6	7
*SP5LGN	"	18	3	1	1
*SP6DVP	14	82,256	498	23	83
*SP6RYD	"	59,534	381	24	79
*SP8IOV	"	29,797	284	19	64
*SP2MSF	"	29,325	199	20	65
*SP2AYC	"	8,967	153	11	38
*SP9GZW	"	5,900	99	11	39
*SQ2EAN	"	4,255	107	7	30
*SP5MMJ	"	3,572	102	8	30
*SP6LMQ	"	3,220	65	8	27
*SQ6ABC	"	2,184	50	8	20
*SP1FPG	7	58,401	465	18	85
*SP5ENA	"	38,184	387	16	70
*SP7MU	"	24,850	324	11	59
*SP1FRC	"	23,562	268	13	64
*SP6DHH	"	7,425	170	7	38
*SP5XXX	"	5,633	128	7	36
*SP5X	"	3,078	76	7	31
*SP9R	"	1,885	72	4	25
*SQ9ZAY	"	210	12	4	11
*SQ5NPX	"	108	10	4	5
*SQ7KVB	"	81	7	4	5
*SP4SHD	3.7	37,446	415	11	68
*SQ8NGV	"	32,093	525	10	57
*SO3O	"	21,866	410	9	49
*SQ8NGO	"	10,976	237	8	41
*SQ9BDB	"	1,827	74	4	25
*SP5ETS	"	1,260	38	5	25
*SQ9PPT	"	224	17	4	12
*SNØR	1.8	33,062	562	10	51
(OP:SQ9IAU)					
*SQ5GVY	"	18,468	351	8	46
*SP5CJY	"	13,395	228	9	48
*SP2NBV	"	1,188	48	4	23
SN7D	AA	2,342,038	2728	106	376
(OP:SQ7D)					
SQ8N	"	1,027,317	1408	106	337
SP6IXF	"	447,768	781	91	233
SP6JZL	"	415,035	592	99	246
SN1Y	"	309,166	807	57	229
SQ9MUO	"	229,436	804	55	109
(OP:SP1NY)					
SP9FUY	"	169,218	346	68	169
SQ8ERS	"	134,976	498	51	171
SN7Q	"	97,782	199	67	191
(OP:SP7GIQ)					
SO4R	"	83,032	326	45	149
SQ6LJV	"	78,680	220	49	91
SP9FOW	"	76,970	182	59	120
SP9IVD	"	48,600	221	43	107
SP9EML	"	35,378	164	42	91
SP1MWN	"	22,506	113	35	86
SP5XOV	"	16,000	76	31	49
SP9DEM	"	13,100	102	30	70
SP6RLK	"	9,112	46	25	42
SQ5AM	"	4,320	39	23	31
SP1MVW	"	1,520	50	13	25
SP3QDM	"	1,452	18	16	17
SQ9ITA	"	780	36	7	19
SP3PLD	"	180	6	5	5
(OP:SP3IBM)					
SP5GMM	28A	5,457	47	17	34
SP1O	21A	7,007	84	15	34
SP5BKA	"	54	3	3	3
SP3A	14A	104,654	400	33	109
SP4S	"	70,752	323	31	101
SN3A	7A	762,125	2738	35	140
(OP:SP3GEM)					
SP8K	"	156,944	728	27	109
SQ9C	"	119,772	988	20	88
SQ7PGP	"	55,247	512	18	83
SQ1BHH	"	16,827	132	13	66
3Z6QRO	"	8,372	188	8	38
(OP:SP6JIU)					
SP7Q	"	252	18	4	10
SP9RCL	3.7A	147,096	1122	20	88
SO4ØSONDA	"	16,644	344	9	48
(OP:SO5MAX)					
SP7UWL	"	2,380	72	5	29
SP3GTS	1.8A	24,500	341	10	60
*SQ6H	AA	589,332	1096	90	312
*SP8FB	"	190,242	484	58	213
*SP9FMP	"	166,019	399	65	194
*SQ1EIC	"	148,950	543	48	177
*SP5WIT	"	137,313	523	48	161
*SQ1BSY	"	131,104	377	58	183
*SN1S	"	115,166	680	37	141
*SP7TEX	"	111,616	348	55	163
*SP6CJK	"	111,020	214	64	180
*SQ8Z	"	84,448	227	60	143
*SP6DZ	"	59,328	360	33	111
*SQ1GQT	"	39,102	176	34	80
*SP6RLF	"	21,186	180	25	74
*SP3AYA	"	20,868	85	43	68
*SQ2DYL	"	19,074	139	26	76
*SP6FXY	"	13,838	106	23	51
*SP3SC	"	9,102	61	30	44
*SP3JDZ	"	7,905	77	23	62
*3Z3GF	"	6,955	72	22	43
*SP6EIY	"	6,068	49	25	49
*SP6SNJ	"	5,518	96	8	54
*SQ9S	"	3,240	39	16	24
*SQ6PA	"	837	30	10	17
*SP2DKI	"	442	15	6	11
*SP8BA	"	216	10	8	10
*SP1RKR	28A	6,895	75	10	25
*SQ6PLD	21A	21,978	125	21	53
*SQ3RX	"	18,265	142	16	49
*SP9HZW	"	15,323	98	23	54
*SP3P	14A	110,160	533	31	105
*SN5F	"	50,100	371	21	79
(OP:SP5LJP)					
*SP6A	"	34,736	236	19	85
*SQ8MZW	"	20,374	238	12	49
*SP9IBJ	"	18,624	227	11	53
*SN5L	"	60	16	4	11
*SPØT	7A	17,679	214	12	59
*SP5GNI	"	17,253	193	11	60
*SQ8AL	"	8,109	137	9	44
*SP5IVC	3.7A	27,588	327	12	64
*SQ5ASR	1.8A	360	22	4	16

Portugal

CT7AQS	A	247,752	548	65	214
CT1DSV	"	181,704	368	82	186
CT2HTM	"	34,992	164	30	78
CT1APN	"	20,500	104	40	85
CT1EAT	28	12,838	107	14	35
CR6T	21	1,356,736	4071	38	134
(OP:CT1ESV)					
CT2ITR	7	65,600	373	22	78
*CT2IBY	A	176,660	377	55	187
*CR7AMH	"	63,920	499	28	108
*CT2JBD	"	63,842	244	37	100
*CT1JRZ	"	50,456	256	33	103
*CT1EFT	"	1,763	31	17	26
*CS7AON	"	1,092	20	11	15
*CS7AGI	"	624	12	12	12
*CT7AIX	28	12,768	121	9	33
*CT1DZY	14	20,448	172	15	57
*CS7/DO3HK	"	4,410	89	8	34
*CS5LX	"	72	9	3	6
(OP:CR7ARB)					
CS2V	AA	295,515	581	72	225
CT7ABP	"	204,490	506	56	186
CT1ENV	"	191,015	350	73	180
CT1AGS	"	82,618	212	55	147
CT7ADH	"	46,835	181	39	106
*CT1FHL	AA	380,617	902	58	199
*CT2HPM	"	8,364	67	20	48
*CS7AFM	"	56	7	4	4
*CT5GOJ	28A	9,010	77	13	40
*CS5RPT	21A	20,325	169	17	58
(OP:CR7APD)					
*CT1GVN	3.7A	770	25	4	18

Romania

YPØC	A	3,398,771	4385	118	385
(OP:YO3CZW)					
YO3VU	"	727,659	1301	86	261
YO3RU	"	443,552	1076	74	258
YO3GNF	"	351,975	810	62	223
YO7CJB	"	196,912	629	54	194
YO9GVN	"	64,076	222	48	118
YO3CIY	"	22,015	168	32	87
YO9AYN	21	59,436	315	30	87
YO3JW	14	17,706	154	16	62
YO9HP	7	234,900	1274	28	107
YO5OHY	3.7	30,266	383	11	63
*YO3BY	A	159,537	572	51	162
*YO4AAC	"	151,249	494	49	168
*YO5DAS	"	112,924	346	53	165
*YO8THG	"	100,167	318	49	144
*YO6GUU	"	90,285	463	41	154
*YO8BDW	"	89,595	392	45	136
*YO7MPI	"	84,252	313	52	152
*YO6DBL	"	77,043	324	43	140
*YO6MT	"	73,839	309	38	113
*YO5BRE	"	58,800	397	24	96
*YO7NSP	"	47,804	278	37	111
*YO4SI	"	38,905	203	42	113
*YO8SJR	"	37,125	232	29	96
*YO7LYM	"	33,565	212	36	101
*YO7BPC	"	31,625	176	33	92
*YO3GGO	"	30,081	204	30	81
*YO9IOE	"	23,980	191	26	83
*YO7LDT	"	20,352	144	27	79
*YO2LXW	"	20,048	153	31	81
*YO9FEB	"	15,617	117	27	70
*YO9ADN	"	13,760	106	27	59
*YO7LPZ	"	13,689	122	20	61
*YO3GCL	"	13,362	123	33	69
*YO8RKP	"	11,040	139	31	84
*YO9FYP	"	10,906	91	23	59
*YO4GPC	"	7,130	98	16	46
*YO9BNP	"	7,070	83	21	49
*YO2BPZ	"	6,831	94	17	52
*YO9NCL	"	4,307	60	15	44
*YO7MSJ	"	3,894	77	17	49
*YO3IWZ	"	2,961	67	15	32
*YO3FGO	"	144	6	4	4
*YO2CMI	28	7,222	57	15	31
*YO2IS	21	30,660	203	19	54
*YO9RAO	"	6,280	95	12	28
*YO4DI	"	5,940	100	17	38
*YO9HG	"	3,920	79	12	28
*YO5AYT	"	3,520	62	13	27
*YO8TNB	14	36,176	352	15	61
*YO4BEX	"	15,750	198	11	52
*YO9CWY	"	8,836	155	8	39
*YO4MM	"	3,783	93	7	32
*YO2LFP	"	3,636	91	6	30
*YO7HGM	"	1,334	36	8	15
*YO7FEY	"	1,000	32	7	18
*YO5BQQ	7	12,931	166	13	54
*YO9AGI	"	7,682	144	8	38
*YO2MJZ	"	966	32	6	15
*YO9BXE	3.7	4,410	90	7	38
*YO8RZJ	1.8	7,872	173	6	42
*YO9DBP	"	550	27	4	18
YO3APJ	AA	883,407	1283	98	315
YO8RNI	"	827,216	1351	91	297
YO6BHN	"	804,016	967	109	387
YO7CVL	"	46,760	270	33	107
YO4CSL	"	7,031	92	25	64
YO2DFA	28A	3,354	35	17	26
YP3A	21A	268,128	1077	32	112
(OP:YO3GOD)					
YO9FLL	"	4,033	59	11	26
YR8D	14A	390,000	1699	36	120
(OP:YO8SSB)					
YO9XC	7A	21,945	256	15	62
YO3HOT	3.7A	52,596	393	18	90
*YO7SR	AA	1,180,848	1889	98	340
*YO5OBA	"	373,360	696	75	284
*YO4NF	"	328,248	941	55	227
*YO2MHJ	"	51,944	175	54	118
*YO6OEK	"	42,607	196	41	96
*YO2LLL	"	17,464	148	22	52
*YO9GDN	"	8,856	72	17	24
*YO9IAB	"	5,481	83	14	49
*YO8DOH	"	3,900	88	16	49
*YO3FRI	28A	6,762	59	14	28
*YR5N	7A	50,196	537	14	75
(OP:YO5PBF)					
*YO5CUQ	3.7A	14,892	194	10	58

Sardinia

ISØBSR	21	156,986	1023	25	81
ISØURA	14	460	25	6	17
*ISØHQJ	A	356,625	910	51	174
*ISØNHT	"	280,105	706	55	210
*ISØGRB	3.7	13,509	230	7	50
IMØDTF	AA	52,820	206	43	96
*ISØLYN	AA	5,472	55	19	38

Scotland

GM4FDM	A	397,980	1046	66	204
MM3T	"	78,672	395	30	119
GM3ZDH	"	24,745	155	25	76
MM2R	21	51,408	316	18	50
(OP:GM3YOR)					
GM8OFQ/MM	7	156	11	4	9
MMØCEZ	"	96	14	5	11
*MM1E	A	330,544	619	61	222
(OP:MMØGOR)					
*GM3TAL	"	100,962	361	39	119
*GM9C	"	33,276	228	30	88
(OP:MMØGHM)					
*2MØBEC	"	8,442	124	16	47
*GM2Y	"	4,959	71	17	40
(OP:MMØDXH)					
*MMØWOA	"	2,160	38	14	26
*MMØRYR	"	1,833	56	9	30
*GMØJHE	"	1,740	47	8	22
GM7R	28A	3,216	48	9	15
(OP:GMØNAI)					
*GMØBZS	AA	3,888	47	16	32

Serbia

YT6W	A	1,344,623	1722	96	331
YU7PEP	"	36,360	363	24	96
YU1RSV	"	27,900	266	26	98
YU7KW	"	11,476	93	22	54
YU3EYL	"	7,360	106	19	61
YT2ZZ	28	32,725	200	21	64
YT1A	14	758,472	2631	37	132
YT2ISM	"	93,003	996	19	68
YT1RK	"	10,034	160	11	47
YTØA	7	251,160	1356	30	110
(OP:YU1EL)					
*YU1YV	A	195,096	549	53	211
*YT2VP	"	84,564	429	37	137
*YTØW	"	48,972	265	33	121
(OP:YU1JW)					
*YU1TY	"	30,107	209	32	87
*YU4NSL	"	825	31	10	23
*YT1XN	28	4,830	64	12	30
*YU7HI	"	3,434	40	11	23
*YU1VG	21	109,200	424	31	99
*YU4LED	"	350	20	3	11
*YT5LD	14	30,710	337	15	59
*YT4B	"	29,536	336	13	58
(OP:YT2NOD)					
*YU5T	7	15,057	220	12	51
*YU1RA	"	5,610	87	11	40
*YT1TU	"	462	29	5	17
*YU4BBZ	"	375	33	5	20
*YU4DWW	"	22	10	3	8
YU1JW	AA	1,499,339	2083	89	312
YTØI	"	1,776	56	10	27
YU1AAX	28A	989	25	6	17
(OP:YT1BD)					
YT7R	21A	340,208	865	37	139
(OP:YU7BW)					
YU1UN	"	5,002	44	16	25
YT1X	14A	934,947	2726	38	145
YT7E	"	22,230	277	12	53
YU7U	7A	371,966	1409	35	128
YT8A	3.7A	205,390	1553	22	93
(OP:YU1EA)					
*YT5IVN	AA	545,392	1042	78	305
*YU2A	"	74,298	228	57	146
*YU3EEA	"	58,026	592	20	94
*YU3LAX	"	16,350	190	23	86
*YU4MLL	"	100	21	9	16
*YT2T	28A	30,690	203	24	69
*YT3TPS	"	1,920	48	13	27
*YT2RX	21A	29,874	195	21	57
*YU7KM	"	6,888	103	20	36
*YU7ZZ	14A	50,710	272	27	83
*YT5X	7A	239,496	1359	28	108
*YT8WW	"	54,145	538	15	70
*YU1UO	"	47,932	399	17	75
*YUØU	3.7A	60,775	671	13	72
*YU6DX	"	36,769	416	13	70
*YT1HA	"	22,800	268	10	65

Sicily

IR9Z	A	701,127	1490	75	284
(OP:IT9VCE)					
IT9FUN	"	68,310	234	45	120
IT9DGZ	"	7,935	95	15	54
IT9JQY	"	7,275	62	28	47
IT9CML	"	216	7	6	6
IW9FI	21	21,300	148	18	57
*IT9FRX	A	427,431	1229	57	232
*IT9PQJ	"	55,520	181	46	114
*IT9CTG	"	35,504	337	27	85
*IW9GRL	"	22,176	98	41	85
*IT9BII	"	9,540	139	13	47
*IT9AZK	"	6,175	101	28	67
*IT9NAN	28	9,116	94	15	38
*IT9DVZ	21	127,908	595	31	101
*IT9EWR	"	76,230	351	28	93
*IT9AXQ	"	1,674	36	13	18
*IT9PZM	7	37,680	392	14	66
IT9DGG	AA	88,740	295	53	151
IT9BUN	28A	128,934	781	29	88
IT9ACN	"	22,425	172	19	50
IR9W	21A	662,855	1985	37	148
(OP:IWØHBY)					
IT9RBW	14A	706,705	2422	36	137
IT9ESW	"	129,816	1004	26	82
IB9A	7A	163,150	971	27	103
(OP:IZ2WFL)					
*IT9GDN	AA	30,528	133	36	108
*IT9GCW	"	1,260	18	13	17
*IT9XTP	21A	331,032	1301	36	120
*IT9RKR	"	29,963	247	21	62
*IF9A	14A	334,050	1557	34	116
(OP:IT9WDC)					
*IT9STX	"	333,168	1537	28	104
*IT9RZU	1.8A	513	28	4	15

Slovak Republic

OM4M	A	497,041	1111	70	243
OM1DK	"	189,915	621	44	121
OM3CPF	"	184,888	629	50	192
OM7JG	"	110,208	418	53	139
OM8KD	"	4,964	97	18	50
OM8GT	21	3,420	49	10	20
OM2AGN	14	33,158	161	29	89
OMØWR	7	23,790	270	14	51
OM3IAG	3.7	74,958	758	16	77
*OM5WW	A	401,280	995	60	244
*OMØCS	"	139,518	548	37	170
*OM2DT	"	139,080	495	50	178
*OM8HG	"	139,072	431	50	162
*OM7ZM	"	138,180	304	65	145
*OM8AA	"	137,703	398	59	174
*OMØATP	"	88,788	374	42	154
*OM6AL	"	67,424	382	34	138
*OM4J	"	37,488	248	29	113
(OP:OM4JD)					
*OM7AG	"	20,460	185	29	103
*OM5NL	"	12,600	80	25	50
*OM4CI	"	10,414	101	26	56
*OM8ST	"	4,895	78	14	41
*OM8ADU	"	4,466	86	14	44
*OM6AM	"	2,296	40	16	25
*OM6DN	14	126,636	620	27	95
*OM8JP	"	26,180	225	16	61
*OM3RWB	7	44,370	466	13	72
(OP:OM3ZCK)					
*OM1DR	"	16,066	273	10	48
*OM8AHJ	3.7	10,252	264	6	38
*OM7AES	"	3,060	87	6	30
*OM3TWM	"	1,230	35	8	22
OM3GI	AA	1,023,888	1068	113	401
OM3BH	21A	427,680	1122	36	126
OM5CX	"	52,605	205	31	74
OM7PY	"	16,284	95	23	46
OM2VL	3.7A	398,130	2217	27	111
*OM7LW	AA	316,125	728	63	218
*OM5UM	"	61,985	313	34	127
*OM5AST	"	17,888	216	13	73
*OM1AST	"	15,604	203	12	71
*OM8ADM	"	15,336	187	14	57
*OM8KT	14A	55,300	370	24	76
*OM7YC	"	15,040	102	19	61
*OM6TX	3.7A	25,058	365	10	57
*OM1AVL	"	3,360	77	8	34

Slovenia

S56FE	A	60	5	5	5
S5ØA	28	136,192	532	29	104
S58D	"	128,466	577	26	96
S57S	14	257,298	975	29	93
S51F	7	447,678	1921	32	122
S57LR	3.7	83,658	1166	10	63
*S56WYB	A	184,338	592	49	182
*S52T	"	141,768	429	49	149
*S51JQ	"	85,377	248	50	99
*S59N	"	82,944	457	36	108
*S57YK	"	53,098	278	37	102
*S54MTB	"	21,935	168	27	80
*S51DD	"	20,979	113	37	74
*S51SK	"	13,419	82	23	48
*S54G	"	12,225	134	19	56
*S54ZO	"	9,072	137	13	50
*S57SWR	"	2,592	49	15	33
*S52WD	"	437	20	10	13
*S51WS	"	240	13	7	9
*S53NW	7	62,628	571	19	83
*S56AX	"	30,710	317	14	69
*S57NAW	3.7	30,294	362	12	69
*S51FO	"	736	34	4	19
*S59D	1.8	3,895	114	4	37
S57AL	AA	5,654,932	4294	150	553
S53M	"	5,162,560	3710	148	532
(OP:S53ZO)					
S52ZW	"	2,033,037	1888	121	448
S58N	"	1,104,027	1302	102	277
S52D	"	578,095	729	98	317
S53F	"	196,290	520	70	200
S53GO	"	157,323	386	54	175
S58M	"	140,895	598	41	114
S51Z	"	128,772	234	59	160
S58WW	"	89,052	273	47	134
S55OO	"	39,345	189	38	91
S58Q	"	32,445	214	25	80
S5ØR	"	16,430	170	17	36
S52WW	"	16,268	129	20	63
S51DX	21A	2,484	41	13	23
S5ØK	14A	1,297,405	3273	40	145
S57DX	"	1,079,190	2931	40	149
S5ØG	"	525,716	1521	38	129
(OP:S56M)					
S58Y	"	388,944	1500	35	113
S59ABC	"	3,654	60	9	12
(OP:S51DS)					
S53A	7A	538,603	1898	36	133
S56Y	"	488,748	2100	33	123
S54ZZ	"	481,260	2115	31	125
S57O	"	95,069	736	23	80
S51YI	3.7A	241,920	1865	19	86
S53O	1.8A	82,998	947	14	73
S58RU	"	1,564	58	5	29
*S52BT	AA	380,295	701	61	252
*S51I	"	156,275	381	62	173
*S55MZ	"	111,744	404	44	148
*S57KM	"	65,520	300	34	110
*S56LKP	"	5,481	87	14	49
*S55G	"	2,562	71	7	35
*S51CT	"	1,950	50	16	34
*S52ON	"	1,020	29	11	23
*S59A	21A	228,187	547	37	136
*S52OT	14A	402,744	1269	39	134
*S57K	"	178,640	792	33	112
*S57PKT	"	28,203	220	20	59
*S56A	7A	164,724	762	29	119
*S51RH	3.7A	10,146	233	8	49

Spain

EA5DFV	A	3,117,768	3911	92	352
EE3E	"	992,796	1373	101	345
(OP:EA3ELZ)					
EB1DJ	"	942,216	1662	72	272
EA2XR	"	317,282	681	59	203
EA2DMH	"	231,264	629	57	162
EA3HJO	"	151,470	637	44	143
EA1YC	"	127,998	384	58	176
EA2KV	"	117,040	388	46	130
EB4SM	"	72,839	205	54	115
EA1AA	"	62,084	242	49	117
EA3GHZ	"	61,516	515	23	68

EA5FIV " 57,378 238 35 96
EA1LQ " 26,499 159 32 89
EA1ABT " *18,040 221 13 42*
EA4LG " 15,485 100 36 59
EB1EWE " 12,956 113 29 53
EA1AT " 12,460 113 24 46
EA7GBH " 11,136 123 23 64
EA3OW " *9,520 97 19 51*
EA5CRC " *4,836 57 18 44*
EB5GGB " 3,120 48 14 26
EA7KAZ " *961 19 12 19*
EA1DFP " 60 6 5 5
EA1IVW " *55 8 4 7*
ED5T 14 66,240 687 18 62
(OP:EA5ON)
EA3GEG 7 122,500 898 23 75
EC5AC 3.7 28,016 291 12 56
***EA4MD A 208,534 490 58 196**
*EA4FJX " 187,680 444 59 213
*EA1JO " 171,592 390 60 181
*EA4DXP " 160,650 421 49 176
*EA5DNO " 126,060 431 35 156
*EA1EYG " 120,435 303 46 139
*EA3KT " 119,412 400 50 164
*EA4GSL " 111,735 417 42 149
*EA3NA " 107,144 348 54 173
*EB5CS " 104,134 354 40 138
*EA1ANB " 101,541 406 39 142
*EA1IQW " 101,462 328 46 148
*EE5H " 100,048 409 38 131
*EA3FUJ " 94,482 324 44 130
*EA5LH " 87,174 313 38 136
*EE2A " 85,646 298 43 144
(OP:EA2SN)
*EA1YD " 79,121 291 35 92
*EA3DJL " 75,508 253 47 125
*EA4CUN " 58,934 338 34 124
*EA1HTF " 56,156 397 49 153
*EA5HYJ " 53,404 218 45 124
*EA4GUU " 52,311 229 44 115
*EA5/UA9NP " 50,086 235 38 120
*EA3RP " 49,762 190 39 100
*EA4GUW " 49,170 244 32 117
*EA7VJ " 48,863 153 37 94
*EA4GWU " 48,280 227 39 131
*EA1DBX " 29,648 183 33 76
*EA4CWN " 27,510 116 36 95
*EA3HWC " 24,930 133 28 62
*EA3ARP " 24,592 163 24 82
*EA5BAH " 22,134 113 30 72
*EA4GYR " 22,110 195 37 97
EA3EYO " *21,632 137 27 77*
*EA3BRL " 20,592 152 25 79
*EA1NO " 17,472 114 25 59
*EC5EA " 16,380 105 25 35
EA4CFT " *16,000 108 30 70*
*EA1IXQ " 14,076 91 29 63
*EA4GMX " 13,617 96 29 60
*EB1IFK " 10,980 94 27 63
*EA3EAN " 10,260 123 20 56
EA3FZT " *10,074 72 26 47*
*EA2PLN " 9,990 87 19 35
*EA4GOK " 8,820 71 36 62
EA1GXR " *7,614 127 20 61*
*EA1ITX " 7,056 71 20 52
EA4LU " *3,672 65 13 41*
*EA1IMP " 3,358 73 23 50
*EA2RW " 2,346 35 16 30
EA1FEB " *1,960 46 20 36*
*EA7IIW " 1,862 36 12 26
*EA2DYJ " 1,836 46 10 26
*EA3GHS " 1,584 33 10 23
*EC1ABR " 1,118 21 7 19
EA5UU " *192 6 6 6*
*EA2XG " 108 8 5 7
*EA4AFP " 45 3 2 3
*EA3BE " 13 7 6 7
EA7AAF 28 32,589 234 15 56
*EA7MT " 4,836 60 9 22
*EA5GVZ " 903 20 7 14
EE7Y 21 200,868 1063 22 92
(OP:EC7WA)
EE1B " *137,150 493 27 103*
(OP:EA1YB)
*EE7R " 19,241 167 18 53
(OP:EA7IA)
*EA4FVT " 11,084 116 18 50
*EA7FRX " 9,516 84 14 38
*EA7/OG55W " 6,136 96 11 41
*EA3HKY " 3,652 54 13 31
*EA3HLM " 3,526 53 13 30
*EF5J " 840 23 6 14
(OP:EA5YJ)
EA1ASG 14 11,529 107 16 45
*EB3TR " 10,830 174 9 48
EA3OC " *143 9 4 7*
EA7RM 7 139,776 685 26 102
*EB4CMS " 88 19 6 16
EA2QU 1.8 6,435 120 6 49
*EA3FF " 999 29 5 22
EF1W AA 2,974,825 3538 98 347
(OP:EA1WS)
EA2VE " 1,546,520 2058 100 360
EF5T " 1,104,561 1808 74 247
(OP:EA5HT)
EA4ETN " 965,118 1326 106 356
ED3T " 718,080 1097 95 279
EA7TG " 340,384 491 77 275
EA4UV " 307,496 480 79 244
EF2O " 297,000 586 63 212
(OP:EA2AOO)
EA1TI " 274,012 530 62 182
ED4A " 251,937 513 68 211
(OP:EA4TV)
EA4SV " 221,184 667 66 190
EF5Y " 162,127 457 43 118
(OP:EA5FR)
EA7BUU " 104,340 256 58 130
EB1AC " 88,914 250 45 174
EC3AIT " *69,700 381 37 133*
EA2DDE " 30,653 118 48 103
EC5CSW " 26,260 102 45 85
EA3CEC " 17,928 94 33 75
EA3HCY " 11,868 69 32 54
EA4ESU " 3,304 61 24 32
EA1AAA " 2,162 35 16 31
EA3XL " 204 9 8 9
EE3A 28A 17,556 161 16 41
(OP:EA3ATM)
EA5KV 21A 633,328 1745 39 145
EE7P " 458,770 1989 30 100
(OP:EA7ATX)
EA7RU " 361,260 1159 35 127
EA7ZY " 310,752 1665 28 89
EA5TS " 302,265 1061 31 104
EA4EER " 217,350 810 31 107
EA5IGO " 164,556 806 31 95
EA7EU " *37,471 228 26 75*
EA2CCG " 23,952 208 12 36
EB1IC " 22,841 109 28 63
EA3KN " 14,432 71 23 59
EA2CNU " 6,888 64 12 44
EA3IN 14A 516,800 1830 35 125
EB5KT " 266,368 1517 28 100
EA1WX " 52,008 427 16 72
EA3QP 7A 391,845 1859 30 121
EC1AE " 19,380 167 12 64
EA2KB 3.7A 108,562 883 17 86
EA1DVY 1.8A 9,263 140 11 48
***ED7R AA 1,041,291 1843 76 257**
(OP:EA7GX)
*EE4A " 233,892 541 64 203
(OP:EA4IE)
*EA5IJG " 212,175 611 49 176
EA1GY " *185,535 630 43 176*
*EA1DAX " 132,620 323 51 139
*EA1AJV " 122,946 422 42 144
*EA1SB " 120,761 382 53 144
*ED1A " 120,227 501 30 79
(OP:EA1AST)
*EA1OL " 115,416 386 41 127
*EB3FLY " 112,716 410 49 137
*EA1AOQ " 84,630 326 43 143
*EA2BNU " 82,800 297 43 141
*EA4NI " 80,820 288 46 134
*EA2HW " 74,909 299 41 132
*EA4TA " 67,404 208 47 117
*EA1BP " 57,240 295 38 121
*EA1DOB " 30,303 211 27 84
*EA1CS " 29,666 155 29 62
*EA2AAE " 21,060 111 34 56
*EA1TL " 16,932 105 32 70
*EA5FCW " 15,400 97 26 62
*EA1IC " 11,210 105 28 67
EA3GZA " *9,213 64 30 53*
*EA3EZD " 5,626 58 18 40
*EA1EHW " 5,372 62 21 47
*EA2GM " 5,088 106 10 43
*EA3GEO " 4,800 37 17 31
EA4JJ " *3,420 38 19 26*
EA7AQR " *3,280 70 11 9*
*EA4EUW " 2,632 45 12 35
*EA5DIT " 1,584 26 14 19
*EA5INS " 558 21 6 12
EA4EUI 28A 49,128 300 20 72
*EA4AA " 40,000 276 17 63
EA1YG 21A 173,752 659 33 115
*ED5W " 38,121 319 25 72
(OP:EA5BB)
EA2DNR 14A 208,575 1235 30 105
*EA1DHB " 47,138 420 16 75
EA2CE 7A 3,542 85 10 36
EB3AM 3.7A 35 5 2 5
EA7JXZ 1.8A 2,772 69 5 39

Sweden

SM5Q A 728,688 1024 95 313
SM4EMO " 458,784 971 73 251
SMØT " 254,975 917 54 163
SMØO " 54,984 228 45 113
(OP:SAØDIJ)
SM6CMU " 32,777 157 28 45
SM2C " 32,665 150 38 101
(OP:SM2CFZ)
SB6W " 9,990 101 21 53
(OP:SA6RTJ)
SM5VFE " *4,992 47 18 34*
SM6R " 3,360 49 13 35
SM5CZQ " 3,150 48 16 29
SM2CEW 21 24,319 137 25 58
***SF5O A 230,720 666 62 218**
(OP:SMØEOS)
*7S5S " 120,170 377 52 145
(OP:SM5CSS)
*SE5L " 86,870 477 36 134
(OP:SM5ALJ)
*SM5KQS " 86,104 356 43 145
*SM5S " 68,529 329 37 122
(OP:SM5SIC)
*SM5DXR " 62,266 342 40 123
*SM5BS " 58,515 267 39 102
*SM4WKT " 46,506 200 38 100
*SM5ACQ " 35,376 200 36 96
*SM5NUZ " 31,369 201 29 98
*SF3A " 17,835 151 24 63
(OP:SM3CER)
*SA6SKA " 15,089 182 21 58
*SD6W " 6,240 98 17 48
(OP:SM6PVB)
***UX1UX A 896,080 2029 81 287**
*USØHZ " 545,445 948 93 298
*UW1GR " 353,600 760 77 248
*UY2UQ " 270,325 744 62 213
*UT3UZ " 265,060 599 60 230
*UWØK " 176,043 330 77 226
(OP:USØKW)
*UT3UFH " 168,103 756 39 154
*UT8IM " 163,639 504 54 187
*UR5AMJ " 131,022 307 52 122
*UT2MZ " 129,870 295 65 169
*UX1CL " 129,504 455 52 161
*UR5RP " 128,334 422 49 170
*UY5QJ " 127,088 429 44 144
UT8AL " *122,475 471 48 165*
*UTØCK " 119,280 432 47 163
*UR4QFP " 115,920 407 45 162
*US3EW " 106,914 378 47 126
*EO25PY " 103,600 429 42 158
(OP:UT5PY)
*UR5IPW " 87,842 398 36 131
*US7WW " 83,620 302 41 144
*UT5UN " 77,988 229 57 137
*UV5EEO " 70,688 330 45 143
*UY5TE " 66,990 318 37 128
*UR2LX " 59,675 234 45 110
UT4MM " *47,886 273 33 105*
*UR5WFP " 41,656 314 27 100
*US5LOD " 41,440 257 29 119
*UR5WFJ " 40,777 344 18 103
*UR5IFM " 38,220 257 28 102
*UR3ABQ " 37,996 275 35 126
*UT3UFI " 36,816 234 40 116
*UT7VR " 35,868 188 31 116
*UT2AA " 34,848 169 41 103
*UT3IA " 31,780 156 40 100
*UR3QTN " 28,672 216 27 85
SI9AM 7A 91,884 985 19 74
(OP:DD2CW)
***SE4E AA 370,656 990 59 229**
(OP:SM4DQE)
*SB7W " 189,773 507 54 169
*SM5NQB " 147,700 416 50 161
*SM6MVE " 96,222 395 40 163
*SD6M " 56,304 298 30 114
(OP:SA6BGR)
*SM8B " 48,312 313 32 100
(OP:SAØBVA)
*SA6CME " 16,443 168 23 64
*SE6N " 10,665 123 18 61
(OP:SA6AXR)
*7S7V " 5,270 72 18 44
(OP:SM7VZX)
*SMØBYO " 240 10 10 10
*SG6T " 225 11 7 8
(OP:SM6WET)
***SM3EAE 14A 1,254 24 9 10**

Switzerland

HB9TOC A 682,065 1384 75 270
HB9EFJ " 138,060 333 49 211
HB9AA 14 49,664 376 20 77
(OP:HB9ARF)
***HB9AWS A 347,387 833 69 242**
*HB9FLX " 17,748 128 28 59
*HB9MXY " 15,264 113 19 87
*HB9EXR " 13,360 114 20 60
*HB9TRR " 11,092 102 20 39
*HB3YGD " 9,804 100 16 41
*HB9FXU " 9,660 117 19 51
*HB9GKM " 6,656 94 15 49
HB9VAA " *4,956 64 18 41*
*HB9FSE " 3,400 36 18 22
HB9RDD " *2,600 35 17 33*
*HB9CNY " 1,740 35 10 10
HB9TQP " *775 15 11 14*
HB9GKP " *272 12 7 10*
HB9PVI " *238 15 6 11*
*HB9FVR " 234 19 4 14
HB9GKW 21 1,450 37 10 15
HB3YXD " *516 16 5 7*
HB9FZB 14 775 29 7 18
HB9GCE " *660 21 7 15*
HB9DR 7 352 92 9 35
HB9DUR AA 3,180,564 3437 124 488
HB2U " 2,035,954 2593 108 406
(OP:HB9EYP)
HB9DVH " 188,244 381 70 179
HB9HLI " *8,772 64 25 43*
HB9FWO " 6,789 52 28 45
HB9GNB " 1,505 27 19 24
HB9BPH " *1,050 19 11 14*
HB9KOG " *696 17 11 13*
HB9GPC " 176 6 5 6
HB9FKL 14A 768 21 7 17
(OP:PA3LEO)
HB9FKK 7A 8,580 88 15 51
(OP:IK1PMR)
***HB9FPS AA 29,430 273 21 69**
HB9DTV " *7,424 55 25 39*

Ukraine

US5D A 2,538,200 2856 120 398
(OP:UT7DX)
UT6UD " 631,750 1450 81 280
UT6EE " 572,088 845 92 302
UX3IT " 355,968 865 65 223
UT7NY " 352,846 696 85 246
US7IA " 310,873 696 69 224
UR4LRG " 239,800 663 64 211
US6IKF " 163,060 435 67 196
UW7RV " 108,488 338 53 138
UR5NLA " 95,823 352 50 139
UT5RB " 67,600 338 36 133
UZ5Q " 45,968 230 50 119
(OP:UY5QZ)
UX1VX " 30,195 248 21 78
UT3UV " 30,024 194 37 102
UR4EI " 29,500 199 32 86
UX4MX " 588 15 9 12
UT1QN " 540 25 7 20
UT5EL 28 55,510 345 24 67
UX3HA 21 68,530 367 26 84
UT5LO " *57,200 311 27 83*
USØU " 27,459 164 25 56
(OP:USØUX)
US7IID " 3,634 65 11 35
UR5QW " 162 9 5 4
US5UO 14 53,214 351 21 77
UR5WCQ " 30,624 265 18 48
UT9EZ 3.7 58,566 689 14 72
UY7AM 1.8 21,700 334 11 59
UX5IS " 7,943 177 7 40
***UX1UX A 896,080 2029 81 287**
*USØHZ " 545,445 948 93 298
*UW1GR " 353,600 760 77 248
*UY2UQ " 270,325 744 62 213
*UT3UZ " 265,060 599 60 230
*UWØK " 176,043 330 77 226
(OP:USØKW)
*UT3UFH " 168,103 756 39 154
*UT8IM " 163,639 504 54 187
*UR5AMJ " 131,022 307 52 122
*UT2MZ " 129,870 295 65 169
*UX1CL " 129,504 455 52 161
*UR5RP " 128,334 422 49 170
*UY5QJ " 127,088 429 44 144
UT8AL " *122,475 471 48 165*
*UTØCK " 119,280 432 47 163
*UR4QFP " 115,920 407 45 162
*US3EW " 106,914 378 47 126
*EO25PY " 103,600 429 42 158
(OP:UT5PY)
*UR5IPW " 87,842 398 36 131
*US7WW " 83,620 302 41 144
*UT5UN " 77,988 229 57 137
*UV5EEO " 70,688 330 45 143
*UY5TE " 66,990 318 37 128
*UR2LX " 59,675 234 45 110
UT4MM " *47,886 273 33 105*
*UR5WFP " 41,656 314 27 100
*US5LOD " 41,440 257 29 119
*UR5WFJ " 40,777 344 18 103
*UR5IFM " 38,220 257 28 102
*UR3ABQ " 37,996 275 35 126
*UT3UFI " 36,816 234 40 116
*UT7VR " 35,868 188 31 116
*UT2AA " 34,848 169 41 103
*UT3IA " 31,780 156 40 100
*UR3QTN " 28,672 216 27 85
*UR5ZDZ " 28,329 195 38 95
*UT1V " 27,270 174 34 101
(OP:US1VM)
*UY2ZZ " 23,968 170 27 85
*UX7QV " 22,788 128 30 78
*UT3UIX " 16,875 208 15 60
*US6IKV " 14,400 197 24 76
*UT3NA " 12,432 125 19 65
*UT1ZZ " 12,136 112 23 59
*UR5UKW " 10,260 107 20 56
*UT7IS " 8,184 91 17 49
*UT7UX " 8,051 73 29 54
UX7BA " *7,134 51 22 36*
*UR5WAT " 6,612 96 16 41
*UR5WHQ " 6,104 59 17 39
*UR1YAA " 5,452 112 12 46
*UR5VAA " 3,186 68 13 41
*UR4WWR " 2,730 54 12 30
(OP:UR5WLA)
UT4MW " *2,464 33 12 20*
US8QQ " *2,337 23 20 21*
*UT7KK " 1,395 20 13 18
*UR6QV " 120 18 7 13
***UT2AB 28 10,266 87 19 39**
*UT5UT " 7,052 64 15 28
***UY7MM 21 216,145 1149 30 109**
*US7IB " 23,600 168 20 60
*UT3QD " 14,848 125 20 44
*UTØNB " 11,328 100 19 45
*UR5EAF " 10,443 119 15 44
***UT3EV 14 107,640 808 28 102**
*UT8UF " 96,099 711 25 78
*UW2Q " 40,680 306 19 71
(OP:UR6QS)
*UR8QR " 28,836 262 16 65
*UX7U " 18,375 204 16 59
(OP:UX7UA)
*UR5EFL " 3,772 104 8 33
*UT8IAR " 2,562 44 9 33
*UR3QGJ " 987 17 7 14
***UY3CC 7 34,272 302 18 84**
*UV3QF " 20,306 228 13 58
*UX7UN " 15,980 187 13 55
*UT8AS " 12,470 172 11 47
*US8AR " 11,288 124 13 55
*UR2LM " 2,550 45 10 40
*UV5EUK " 2,240 60 10 25
***UT7QL 3.7 19,454 271 12 59**
*UX7UU " 6,664 139 10 39
*UY1IP " 5,593 105 8 39
*UY4W " 1,364 48 7 24
(OP:UT1WZ)
*UR5QBB " 320 12 6 10
*UR6LF " 156 14 4 8
***USØMS 1.8 5,328 102 10 38**
*UW1U " 2,040 69 5 25
*UT5CB " 700 34 4 21
UW5ZM AA 2,754,150 2975 129 481
UW1M " 2,409,010 2262 142 447
(OP:UR5MW)
UV5U " 1,637,013 1785 125 444
(OP:UX1UA)
UT7CR " 1,325,676 1967 101 383
UR7R " 921,800 1587 94 346
(OP:UX1RX)
UXØLL " 801,218 1205 119 342
UZ5ZU " 680,425 1181 92 333
UT2UU " 509,748 756 92 305
UXØRR " 445,536 814 83 281
UT1UL " 401,508 632 79 263
UX5UO " 287,937 512 85 214
US7IY " 214,880 592 57 215
UR5EPG " 176,205 368 65 190
UT8IO " 138,348 342 74 170
US2IR " 129,456 374 61 171
UT5ECZ " 117,992 317 54 142
UR5R " 73,440 261 50 120
(OP:UTØRM)
UT4XU " 21,473 132 30 79
UXØFF " *20,895 99 32 73*
UT5YY " 8,763 73 28 41
US1IV " *5,488 44 23 33*
UR5E " 4,187 52 14 39
(OP:UR5EDX)
UT7QF 28A 81,480 421 24 81
UY1HY 21A 295,750 915 35 134
UR6IJ " *105,480 583 29 91*
US8ICM " 2,208 40 12 20
UW3HM " 1,325 19 12 13
UT4U 14A 587,934 1848 38 140
UY5ZZ " 391,281 1578 36 131
US1I 7A 660,352 2560 35 141
(OP:UX2IO)
UR5AS 1.8A 68,400 673 17 78
***UW6E AA 1,867,020 2383 119 436**
(OP:UR6EA)
*UV7V " 740,728 1282 85 339
(OP:UX1VT)
*UT8EL " 334,314 664 72 230
*UT3RN " 279,300 657 63 222
*US5QUB " 170,232 469 53 193
*UX4CR " 162,168 501 49 183
*UR7HN " 127,232 372 54 170
*UR5XMM " 119,002 358 50 149
*UT7AT " 90,792 373 45 149
*UT8IK " 64,032 314 42 142
*UX7QG " 63,672 257 41 127
*UR7TT " 54,036 217 37 121
*UW5U " 49,800 227 35 85
(OP:UY2UA)
*UT9UZ " 48,620 277 39 131
*UT6HX " 42,951 168 40 99
*UT4UB " 39,040 200 33 95
*UT8IA " 30,132 201 25 99
*UTØNT " 23,805 143 32 83
*UT3WX " 19,776 198 15 81
*UT2HC " 1,716 32 11 28
UZ4U " *12 2 1 1*
***UT5CW 28A 16,491 122 19 50**
***UT3C 21A 202,896 704 34 110**
(OP:UR3CMA)
*UX7IW " 163,782 617 36 126
*UT1DX " 155,550 433 37 133
*UW7LL " 6,946 80 12 34
*UW5IM " 5,341 51 11 38
***UR3GU 14A 473,628 1795 38 136**
*UR2Y " 110,109 551 28 99
(OP:USØYW)
*UT3RS " 69,084 421 26 88
*UT1AA " 44,979 403 17 70
***UY5AR 7A 68,068 476 24 95**
*UU4JMN/A " 13,542 176 11 50
*UZ5ZV " 342 20 5 14

***UR5WIF 3.7A 29,792 364 11 65**
UV5EOZ " *25,542 343 11 55*

Wales

GW4BVJ A 234,434 732 53 198
GW3NAS " *129,822 335 63 168*
GW1YQM " 115,938 394 63 163
MWØJZE " 3,283 37 18 31
GW4W 14 45,838 364 16 66
(OP:GW4EVX)
GW4BKG 7 52,592 613 15 61
GW2X 1.8 23,313 405 7 50
***GW4SHF A 213,010 638 51 187**
*MW1MDH " 38,829 242 30 99
GW7ERI " *28,280 174 28 73*
*MW6OWO " 16,910 142 26 69
***GW4ZAR 14 64,741 478 25 76**
MWØCRI AA 287,226 974 60 183
GWØRHC/P 7A 25,578 266 21 77
MWØVRO " *2,278 55 7 27*
***GW4MVA AA 54,918 241 37 125**
*2WØWOD " 1,287 37 8 25

OCEANIA

Australia

VK4SDD A 798,080 1289 76 156
VK4QH " 173,290 495 52 78
VK3TZ " 82,485 262 43 74
VK2IR " *60,256 231 50 62*
VK7GN " 52,324 159 46 81
VK2GR " 42,660 160 47 61
VK2TTP " 34,013 134 45 68
VK5SA " *21,894 108 37 52*
VK2RT " 17,175 97 32 43
VK7QP " 14,400 78 30 45
VK4CL " 10,304 70 25 39
VK3IO " 10,089 68 21 38
VK6DW " 8,379 52 26 37
VK2YX " 5,980 50 20 31
VK5SFA " *1,025 15 11 14*
VK6GOM " *90 16 8 10*
VK2BJ 28 13,192 151 14 20
VK2XZ 21 375,386 1395 27 86
VK4TL " 154,232 617 29 75
VK2PN " 833 26 8 9
VK6TKR 7 238 10 8 6
***VK5PAS A 198,850 374 69 136**
*VK4PDX " 92,322 275 56 82
VK2AAH " *72,588 205 52 86*
*VK4ATH " 36,612 137 48 65
*VK4AFU " 10,089 79 28 31
VK3BY " *5,040 39 21 35*
VK5LTD " *3,740 36 17 27*
*VK3FMMB " 3,312 46 17 19
*VK2LEE " 3,311 32 20 23
VK3JLS " *720 14 11 13*
*VK3MHZ " 660 41 13 9
VK5WU " *644 14 11 12*
*VK3TNL " 459 11 9 8
*VK7DW " 300 12 6 6
*VK4LOD " 266 9 7 7
*VK6FMIT " 208 13 8 8
*VK2SVA " 192 10 8 8
VK2YD " *102 13 9 8*
*VK5UE " 12 3 2 2
***VK2CZ 28 4,175 75 11 14**
*VK2FSAV " 186 14 3 3
***VK6RT 14 42,282 216 25 62**
(OP:VK6SMK)
VK5MK " *90 7 5 4*
VK5GR AA 75,628 206 58 88
VK4ACN " 37,164 132 46 68
VK4HG " *35,765 141 43 72*
VK2BCQ " 27,104 146 35 42
VK5ZZ " 11,842 76 27 35
VK2IZ 28A 1,740 54 6 6
VK6HZ 21A 98,418 397 23 71
VK8RD " *3,344 90 8 11*
VK5MAV " *2,656 36 16 16*
VK3GK 7A 22,072 136 23 39
***VK3MEG AA 4,505 37 26 27**
VK2BNG " *3,040 29 18 22*
*VK2IO " 551 11 8 11
***VK4BRT 28A 6,768 99 10 14**

Brunei Darussalam

***V85T A 107,800 429 38 72**

Christmas Island

***VK9VKL AA 15,488 69 33 55**

East Malaysia

9M8K 28 58,684 302 18 50
(OP:JR3WXA)
9M6YBG 21 2,158 56 6 7
***9W6MUL A 73,632 330 37 67**
***9W6ZUL 28 4,147 51 11 18**
9W8DEN 7 4,384 77 11 21
***9W6VAT " 2,754 98 6 11**
*9W6AJA " 2,366 57 9 17
*9W6MOZ " 98 25 2 5
*9W8ZZK " 42 11 2 4
9M6XRO AA 314,820 581 68 130
***9W6EZ AA 19,779 138 23 34**

Guam

AC2AI/KH2 A 1,014,258 1751 78 139
(OP:JJ2CJB)
NH2DX AA 799,721 1079 81 190
(OP:KG6DX)

Hawaii

KH7M A 3,136,131 3063 131 238
(OP:N6TJ)
WH7W 21 54,285 405 19 28
***KH6CJJ A 496,272 887 76 120**
WH6WZ " *57,078 165 53 73*
*KH6DL " 6,612 67 28 30
*KH6XL " 5,289 47 21 22
*AH6KW " 4,675 55 26 29
*KH6DH " 4,140 48 21 24
*KH6HGP " 4,048 42 22 22
(OP:W7HJ)
*KH6MOI " 3,567 40 19 22
*KH7C " 1,431 29 15 12
KH6FHI " *704 17 11 11*
AC7N " *210 11 7 8*
NH7PE 28 80 5 4 4
NH6Y AA 37,152 147 37 59
KH7XS 14A 1,623,645 3356 37 134
(OP:K4XS)

KH6LC	"	777,189	2033	38	109
(OP:KH7BB)					
***WH6FAM**	AA	1,080	22	12	12

Indonesia

YB1AR	A	905,890	1130	86	228
YB3IZK	"	53,248	187	43	85
YB4ZLZ	"	48,416	214	35	54
(OP:YD4IRS)					
YCØLBT	"	46,440	165	40	68
YB4NY	"	12,797	105	28	39
YB8QF	"	5,940	61	24	36
YB3BX	"	4,005	43	19	26
YB2VMC	28	36	3	3	3
YC8AO	21	7,050	70	17	30
YC3GOQ	"	6,916	87	16	36
YE3AA	"	3,060	40	15	21
YB3HJM	14	19,272	118	17	49
YB4MIO	"	13,216	110	16	43
YB3VI	7	282,906	1001	31	86
YB3RO	"	15,249	130	22	47
YC4SMD	"	1,386	44	7	11
YB3VY	"	80	4	4	4
YF3CXB	"	45	9	2	3
YC3WIS	3.7	182	8	6	7
YBØNDN	1.8	0	3	1	1
***YC1CWK**	A	416,988	704	70	173
*YB9WIC	"	170,328	416	67	121
*YB1HDR	"	161,920	375	53	131
*YB2CPO	"	88,231	247	48	95
*YB6UAK	"	70,096	264	30	74
*YB1TJ	"	59,532	210	43	80
*YB6LBH	"	56,172	219	42	82
*YB7WR	"	49,565	192	47	68
*YC7JYD	"	46,620	217	40	71
**YB8IBD*	"	38,130	180	38	55
*YCØYOU	"	34,986	136	35	67
*YC9XYP	"	29,779	185	38	59
*YB8ADX	"	28,449	153	41	68
*YE3CIF	"	12,432	70	32	52
*YF9CDL	"	11,781	113	24	39
*YF3DGO	"	11,328	82	25	39
*YC1HLT	"	7,975	78	20	35
*YB2UFM	"	5,529	54	23	34
*YB9YBB	"	5,022	73	23	31
*YB1IM	"	4,455	76	20	25
*YF3DQD	"	4,018	50	17	24
**YCØOXA*	"	3,776	75	20	39
*YC4TOT	"	2,088	39	12	17
*YC8BJK	"	754	45	11	15
*YD7VGB	"	480	27	14	18
*YC3BND	"	462	14	6	8
*YB3FUA	"	396	33	9	13
*YG2UFA	"	378	17	8	10
*YBØCBN	"	342	32	8	11
*YB3HQM	"	340	30	9	11
**YC1PRF*	"	304	23	8	11
***YB1BGI**	28	3,375	49	10	15
*YBØVB	"	2,816	33	11	21
*YB6DE	"	2,058	49	5	9
***YC9FAR**	21	58,140	324	22	46
*YC2VYY	"	29,548	157	25	58
*YB1PEF	"	9,639	81	18	45
*YBØKTT	"	9,625	84	18	37
*YB7MRK	"	8,280	100	14	22
*YC1DTE	"	7,760	83	13	27
*YC3YUD	"	4,958	50	13	24
*YC8HBN	"	4,752	60	14	30
*YC1ELP	"	3,552	66	12	25
**YC1MOD*	"	2,706	34	9	24
*YB1NCR	"	2,268	38	14	28
*YC4IWS	"	1,656	28	10	14
*YC2OBI	"	1,550	42	10	15
*YB9WAN	"	795	30	7	8
*YC9SWQ	"	88	7	4	4
*YC2DWL	"	48	8	6	6
***YB8EL**	14	30,720	151	19	61
*YB7KE	"	1,768	26	9	17
*YB8SX	"	1,584	41	8	14
*YB5OUB	"	660	17	8	12
***YC2GV**	7	34,668	199	23	58
*YG7SPN	"	23,322	213	21	48
*YG5YUD	"	10,971	110	17	36
*YC7OCS	"	3,672	58	12	22
*YD1DMK	"	3,636	77	13	23
**YD1IMK*	"	3,354	92	17	22
*YB8TDK	"	2,754	60	13	21
*YC8VRA	"	2,697	49	12	17
*YG3CHA	"	2,660	70	12	16
*YC4FIK	"	2,625	102	13	22
*YGØTUR	"	2,366	35	10	16
*YD4GBN	"	1,794	43	11	15
*YD3BGM	"	1,408	25	9	13
*YD2DPK	"	1,404	27	11	15
*YD1KOX	"	1,188	19	12	15
*YD8UYJ	"	1,140	30	8	11
*YC7JRC	"	1,026	29	10	17
*YC1EJL	"	1,014	64	11	15
*YC3FTY	"	874	53	9	14
*YDØRLX	"	735	46	5	10
*YF3CGG	"	728	31	12	14
*YD9ATS	"	713	25	9	14
*YD3XDR	"	693	20	9	12
*YD2FTC	"	602	17	6	8
**YD3IMS*	"	576	47	8	10
*YD2CAA	"	494	21	8	11
*YDØUVZ	"	465	18	6	9
*YG3DBH	"	435	11	7	8
*YB3BAR	"	390	21	6	9
*YD1CCZ	"	384	27	5	7
*YD7MIB	"	374	10	8	9
*YG3DKZ	"	351	18	6	7
*YG3EDN	"	342	12	8	11
*YG3DGP	"	336	10	6	6
*YD1GJL	"	266	21	8	11
*YG3DEA	"	204	10	6	6
*YD2CAB	"	171	7	4	5
**YD7MHZ*	"	171	8	4	5
*YD6BVV	"	160	32	7	13
*YC3LSB	"	152	9	3	5
*YG3DKB	"	147	12	9	12
*YG3EQR	"	144	6	4	5
*YDØRXA/5	"	112	12	3	4
*YD1FZK	"	108	6	3	3
*YD2LLC	"	91	33	6	7
*YC1HWN	"	80	27	3	5
*YC3RWT	"	77	11	4	7
*YD3CRW	"	63	12	3	4
*YD1FZM	"	60	12	1	3
*YG3EDM	"	54	3	3	3
*YF3DAE	"	49	12	3	4
*YD3SCV	"	45	6	2	3
*YC8VSR	"	36	6	3	3
*YD2JIS	"	28	17	2	5
*YD2DFD	"	24	2	2	2
*YG3EJV	"	22	10	4	7
*YG3EBO	"	9	5	1	2
***YD8CPZ**	3.7	682	33	10	12
*YG3DFB	"	560	14	9	11
*YG3DML	"	48	4	3	3
YB9GWR	AA	75,565	254	44	75
YB7GRN	"	41,410	170	32	69
YB3MM	28A	693	16	7	14
YBØDJ	"	234	7	6	7
YC3ISB	"	72	4	4	4
YBØNDT	21A	161,952	651	26	70
YC3ARY	"	20,520	121	21	51
YC5DL	"	16,124	118	22	36
YCØPJG	"	12,331	94	19	40
YBØMWM	14A	88,464	382	26	71
YC6BDD	7A	104,190	387	29	86
YC2TAN	"	49,155	241	25	62
YB8QT	"	3,816	58	15	21
YB8ACM	"	2,112	76	12	20
YB8ASY	"	551	46	8	11
YC5HEE	"	225	17	3	6
YC2DGT	"	110	21	4	6
YBØBDC	1.8A	0	2	1	1
YBØDJX	"	0	3	1	1
YBØZZE	"	0	5	1	1
***YC6JRT/Ø**	AA	248,010	490	65	145
*YC2YIZ	"	103,600	313	44	104
*YBØNSI	"	88,641	270	55	92
*YBØEIN	"	49,476	161	40	84
*YB8NT	"	25,284	115	25	61
*YBØYAD	"	16,988	126	22	40
*YB8RW/P	"	12,736	119	28	36
*YEØPO	"	3,520	42	14	26
*YC8OBM	"	2,726	65	14	15
*YB4MDL	"	2,460	56	16	25
*YC9VMJ	"	1,890	65	19	23
***YB2ECG**	28A	18	7	3	3
***YC1GI**	21A	19,278	137	19	44
*YC8UM	"	5,304	76	14	25
*YB3FTD	"	192	8	6	6
***YB8TK**	14A	56,330	254	24	62
*YBØANJ	"	30,094	139	20	62
(OP:4F3JX)					
*YB7SKM	"	25,912	156	23	56
*YB8UTI	"	20,515	159	15	40
*YE4IJ	"	11,343	80	17	40
*YB3TET	"	11,286	95	16	41
*YBØISE	"	312	24	9	15
***YC9SCN**	7A	23,140	223	19	33
*YD8UXV	"	11,960	101	20	32
*YD9YSS	"	11,036	127	22	40
*YG3BWY	"	7,943	77	17	30
*YD2BEK	"	2,356	67	17	21
*YD2PRX	"	1,802	45	15	19
*YF4ICC	"	1,610	37	11	12
*YG3DGQ	"	1,449	34	9	14
*YD2EEE	"	1,134	46	9	12
*YBØMZI	"	1,104	22	11	12
*YF4IDW	"	880	32	9	13
*YD2YDC	"	759	29	10	13
*YC3CQY	"	722	29	7	12
*YG3EKK	"	496	12	8	8
*YG3EOY	"	399	18	11	10
*YDØMAT	"	330	13	4	6
*YG3CMQ	"	289	31	6	11
*YD3KJS	"	210	19	4	6
*YG3EZN	"	150	5	5	5
*YD8MGN	"	90	7	4	6
***YD3RJL**	3.7A	168	12	5	7

New Caledonia

FK8IK	A	261,706	553	74	120
FK4QX	21	6	1	1	1

New Zealand

ZL2UO	A	19,418	102	25	48
ZL1AM	14	28,274	174	22	45
***ZL1YE**	A	34,243	133	48	73
ZL2AJ	AA	450,927	601	102	191
ZL2RX	"	33,475	138	41	62
ZL1XX	"	26,535	128	38	49
(OP:ZL3CW)					
ZL4FZ	"	2,765	29	13	22
ZL3GA	14A	2,822	31	12	22
ZL3TE	"	24	2	2	2
ZL1JG	3.7A	660	15	8	12
(OP:ZL1BIV)					
***ZL2MM**	AA	8,512	69	27	29
***ZL1TM**	7A	6,000	53	19	29

Palau

T8ED	A	1,819,972	2161	102	209
(OP:JA7XBG)					
T88CJ	"	143,424	523	43	65

Papua New Guinea

**P29RR*	A	170,941	511	73	126

Philippines

DU1IVT	A	330,855	931	54	83
DV1YAI	"	49,677	362	35	52
DW3TRZ	28	12,124	160	12	16
DU1RB	21	119,706	643	25	46
DU1JI	14	11,200	138	11	24
DU1R	7	92,966	412	24	62
***DV7DYH**	A	8,745	81	24	31
*DV1KIR	"	7,252	77	16	21
*DU3/W6QT	"	2,408	36	11	17
*DV7DTX	"	1,722	80	17	24
***DU7OK**	21	28,350	239	19	26
*DU1AVC	"	19,893	137	17	40
*DU4PMA	"	5,850	106	11	15
***4E1A**	14	111,280	402	31	76
(OP:4E1ADW)					
*DU4JT	"	4,284	74	10	18
***DV7FCC**	7	2,457	62	10	17
*DV7DYJ	"	1,870	53	8	14
***4F3FSK**	3.7	416	24	4	4
DU3/KB7DV	AA	259	25	18	19
DU1EG	21A	44,544	342	19	29
DU1EV	14A	5,084	68	11	20
DU1AV	7A	83,346	576	21	37
***DV1ZFE**	AA	10,336	75	28	40
***DU4DXT**	14A	4,674	68	16	25
***DW1XNG**	7A	90	22	6	12

Samoa

5W1SA	28A	16,695	171	15	20

Timor-Leste

**4W/OZ1AA*	A	15,776	116	27	41

Tonga

A31MM	21	723,492	2222	32	84
(OP:JA6WFM)					

SOUTH AMERICA

Antarctica

RI1ANC	A	65,945	194	40	81

Argentina

LV1F	A	639,564	1119	73	166
(OP:LU4FTA)					
LU8VLE	"	170,565	508	44	93
LU9MDH	"	60,900	248	36	69
LU1VM	"	51,579	208	41	58
LU5AB	"	47,795	234	32	47
LU8DY	"	30,174	126	32	75
LU2UG	"	7,488	102	14	25
LU7AQG	"	1,140	22	13	17
LU4JLR	"	16	6	3	5
LW7DX	28	650,670	1958	23	100
LW6EUR	"	36,080	198	19	63
LU6UO	21	41,934	303	18	40
LU9MBY	14	144,584	563	29	77
LU2DVI	3.7	2,484	42	15	21
(OP:LU2DVI/H)					
LU2DKT	1.8	6,401	71	14	23
***LW4EF**	A	450,824	971	61	127
*LW1EUD	"	300,792	787	55	96
*LU3DK	"	245,376	642	44	98
*LU2EGI	"	68,544	257	50	76
*AY1D	"	59,670	324	36	42
(OP:LU6EVD)					
*LU9HW	"	58,374	190	55	83
*LU2FDA	"	47,538	354	25	32
*LU1BJW	"	37,910	179	37	48
*LU1JHF	"	27,270	94	40	61
*LW7DJ	"	9,804	94	27	30
*LU8EHR	"	8,862	112	19	23
*LU7DDX	"	3,034	39	13	24
**LW8DXR*	"	2,162	51	24	23
*LU1DW	"	1,271	22	12	19
*LW4EI	"	528	14	11	11
*LU1XP	"	360	65	17	23
**LU6FN*	"	180	12	7	8
**LU3HS*	28	125,828	596	19	64
***LW5DPG**	"	86,190	501	17	48
*LU6DU	"	85,956	440	20	58
*LU2VCR	"	63,690	435	18	48
*LU3HIP	"	56,373	322	19	50
*LU9EHU	"	44,096	275	18	46
*LU6FHO	"	43,776	350	18	39
*LU1MPK	"	43,005	391	16	31
*LU4JHF	"	28,044	199	20	37
*LU4DPL	"	12,558	167	15	24
*LU9WNZ	"	2,072	70	10	18
*LU5EVK	"	1,680	49	11	9
*LU6EBF	"	1,564	54	11	12
**LU8DCF*	"	150	10	7	8
***LU5MT**	21	5,546	65	16	31
*LU5MEC	"	3,784	53	17	27
LU7MT	AA	1,545,632	1790	95	257
LU5FF	"	1,019,109	1440	71	202
L33M	"	228,390	635	53	85
(OP:LU3MAM)					
LU5DX	"	209,808	490	66	122
LU6ETB	"	111,202	454	40	54
LU4FPZ	"	48,420	297	30	30
LU1DZ	"	37,961	156	41	78
LU2DX	"	28,424	128	39	49
LU3CW	"	21,443	201	21	20
LW8DQ	"	6,191	69	13	28
LU7HN	28A	461,010	1594	24	86
L77D	21A	319,790	1052	27	86
(OP:LU6DC)					
LU9CBL	14A	2,233	43	13	16
***LU7DH**	AA	621,522	1250	65	133
*LU4DLL	"	519,792	971	73	165
(OP:LU1DX)					
***LU9DDJ**	28A	220,214	841	23	80
*LU7DV	"	91,448	495	18	53
*LT7F	"	85,618	466	21	53
(OP:LU6FOV)					
**LW6DW*	"	12,274	153	14	20
***LU2DKN**	21A	102,453	365	27	84
*LU7ADN	"	48,544	278	20	54

Aruba

P4ØT	A	10,358,145	6492	132	433
(OP:VE3DZ)					
P49Y	"	5,370,008	4825	101	291
(OP:AE6Y)					
P43L	3.7	32,490	289	12	33
***P4ØW**	AA	5,077,050	3574	115	395
(OP:W2GD)					

Brazil

PV1C	A	947,559	1366	68	189
(OP:PY1VOY)					
PY5WW	"	873,756	1464	63	171
PY9GC	"	460,551	865	71	170
PV8DX	"	429,272	877	58	126
PP5CY	"	394,940	1056	49	106
PY2SBY	"	371,826	688	72	155
PY1TV	"	11,118	109	39	63
PY4ME	"	3,237	57	17	22
PY2KP	"	90	10	9	9
PY2ZEA	28	300,612	906	24	99
PY2RKG	21	11,718	111	16	46
PP5BJF	"	10,175	133	20	35
PY2NFT	14	27,608	189	15	41
PS8DX	"	19,024	129	20	62
PP5BLU	"	13,895	198	14	21
(OP:PP5BSD)					
PY2GTA	"	6,272	64	16	33
PY7SV	7	558	13	8	10
***PY2EX**	A	569,835	1037	63	138
*PY5DD	"	143,737	445	65	114
*PY2LPM	"	107,136	290	61	125
*PY3ZK	"	92,000	335	43	82
*PY2XJ	"	87,720	312	48	88
*PY2EVR	"	29,172	184	26	40
*PY2AB	"	22,442	140	34	64
*PY2ACA	"	18,060	100	29	57
*PY2KG	"	16,368	96	40	53
*PP5IP	"	16,302	202	33	45
*PY1LU	"	13,272	106	27	52
*PY2DJ	"	12,948	98	35	48
**PY2VOX*	"	10,710	95	30	40
*PY2VOA	"	6,519	98	18	35
*PY1NS	"	6,076	50	21	41
*PY2MIA	"	4,756	109	18	23
*PY2OSD	"	4,272	62	21	27
**PU8MDJ*	"	3,510	128	11	15
*PY5MW	"	3,328	44	21	31
*PY2YZB	"	2,958	56	20	31
*PS8RV	"	1,972	57	28	40
*PY2ZU	"	1,470	52	13	17
*PY2TI	"	1,200	29	12	13
*PY2EBD	"	1,189	40	12	17
*PY2OQ	"	759	29	11	12
*PP5AM	"	702	18	12	14
*PY3ASQ	"	696	30	14	15
**PV8IG*	"	564	48	21	26
**PU8RJI*	"	484	55	9	13
*PY2NM	"	414	15	8	10
*PU5RTM	"	378	32	10	11
*PR7KSA	"	330	55	13	17
*PY5PLL	"	192	14	8	9
*PU2OXB	"	126	16	7	7
***PU2WDX**	28	67,206	360	16	53
*PU2KNM	"	40,779	272	20	49
*PY5ZHP	"	37,683	271	17	36
*PY2RSA	"	37,512	210	19	53
*PU5SKW	"	36,010	240	17	48
*PY4XX	"	24,585	207	17	38
*PP2BK	"	10,504	145	15	37
*PU3KNG	"	6,536	87	15	23
*PY1MK	"	5,576	90	14	27
*PU2YBW	"	5,550	101	14	23
*PU2OYQ	"	4,557	83	16	33
**PU3KNP*	"	4,100	55	14	27
*PU5KGB	"	3,332	79	12	16
*PU2URP	"	2,652	86	14	25
**PU2YHK*	"	2,272	49	12	20
*PU4ABA	"	2,072	44	14	23
*PU2ULN	"	2,000	71	13	27
*PY2WDD	"	1,836	52	13	21
*PU3JFF	"	1,378	20	9	17
**PY2CYD*	"	1,050	18	7	14
**PT9IR*	"	406	15	6	8
*PU8UMR	"	350	104	12	23
*PU2NUS	"	315	12	8	7
*PU1JME	"	266	23	6	8
*PY2RSS	"	252	27	5	4
*PU1VKG	"	238	24	7	7
*PU9OJZ	"	154	37	3	4
*PU9PED	"	144	15	4	5
***ZV2C**	21	507,288	1388	31	107
(OP:PY2CX)					
*PY5AS	"	14,880	136	20	42
**PY2RAR*	"	13,568	105	21	43
*PP7LP	"	10,516	151	16	28
*PY1TJ	"	8,892	102	13	26
*PY1EZ	"	5,875	73	15	32
*PY2DPM	"	2,263	47	12	19
*PV8AJ	"	1,240	57	12	19
*PY2RTB	"	893	20	8	11
***PY3FBI**	14	4,608	83	18	30
*PY3BEG	"	459	11	8	9
***PY5DC**	7	1,683	45	13	20
*PY2ESG	"	1,440	52	12	20
*PY1ZP	"	342	34	7	11
ZX5J	AA	10,324,320	5565	159	526
(OP:PP5JR)					
ZZ2T	"	4,377,347	3136	110	383
(OP:PY2MNL)					
PY4RGS	"	469,914	606	80	209
PY5JR	"	161,447	478	47	96
PY2TOP	"	115,335	273	50	115
PV2M	"	95,040	319	49	83
(OP:PT2ADM)					
PY2FSG	"	86,260	201	64	126
PY7RP	"	84,303	356	28	59
PR2W	"	53,192	235	40	69
(OP:PT2AW)					
PS2M	"	50,697	191	45	86
(OP:PY2OX)					
PP1CZ	"	45,150	257	23	47
PP5AO	"	34,340	156	36	65
PY2JNV	"	9,394	84	19	42
PY2AE	"	1,890	29	19	23
PY5AL	"	630	30	13	17
PP2FRS	28A	51,211	259	20	63
PY2TED	"	4,185	116	11	20
PY2KJ	21A	873,300	2007	30	120
PY5DK	"	88,395	409	25	58
PY3APY	14A	558	17	8	10
PY6TS	7A	8,142	74	21	38
PY4VG	"	5,120	95	17	23
***PY1GQ**	AA	963,648	1262	76	212
**PY3FOX*	"	773,357	1186	76	171
*PT7ZT	"	671,875	1182	56	159
*PP1WW	"	488,852	860	63	175
*PY2TKB	"	396,134	830	59	132
*PY1SX	"	393,040	559	67	205
*PY2COY	"	245,705	705	58	99
*PP5DZ	"	227,970	640	54	99
*PY3KN	"	217,930	489	64	121
*PY2ZR	"	206,349	583	45	98
**PW2A*	"	202,400	476	58	118
(OP:PY2DV)					
*PY1AX	"	199,784	490	67	159
*PY2WND	"	116,698	331	53	113
*PY4LH	"	106,176	344	49	109
*PR7RBA	"	96,720	273	56	130
*PY3PA	"	95,220	419	44	46
*PY1ON	"	90,324	231	50	106
*PY1AN	"	68,794	294	34	72
*PY9MT	"	63,420	281	46	94
*PY4WWW	"	57,200	196	42	88
*PY2FSR	"	44,100	216	40	60
*PV8DC	"	32,996	207	21	52
*PY2GZ	"	30,240	177	41	71
*PY2SPW	"	21,988	114	34	58
*PY2CAT	"	14,162	72	42	55
*PY2FRQ	"	10,904	94	23	35
*PR7LO	"	10,368	128	30	42
*PP7KVA	"	8,112	82	34	44
*PV8AZ	"	6,890	44	25	40
*PY1NX	"	6,731	57	25	28
*PY5II	"	5,859	51	24	39
*PP5BZ	"	4,625	77	11	14
*PY1UA	"	3,149	67	20	27
**PR7MB*	"	3,105	76	20	25
*PS2D	"	2,840	30	15	25
(OP:PY2GTO)					
*PY3RLC	"	2,548	74	22	27
*PY1BAB	"	2,520	99	23	37
*PY2TTE	"	2,491	51	21	26
*PS2F	"	2,160	29	14	22
(OP:PY2MSR)					
*PY5HT	"	1,950	75	14	16
*PY2KQ	"	1,147	32	16	21
*PT9JFM	"	609	28	10	11
**PY6UN*	"	500	11	10	10
*PY7KG	"	475	32	11	14
*PY1TR	"	360	38	14	16
*PP5AMP	"	192	8	6	6
*PY7AC	"	143	7	6	5
*PU9PWR	"	42	51	10	11
*PY1IA	"	40	7	5	5
*PT9GD	"	28	17	6	8
***PU2SDX**	28A	160,378	605	23	83
*PU5DUD	"	101,790	526	22	65
*PU2PSP	"	65,017	385	20	59
*PU5BOY	"	48,312	315	18	48
*PU2UAF	"	37,672	291	19	49
*PU2LEW	"	23,482	230	18	41
*PU4ENY	"	21,120	181	17	47
*PU8YAB	"	18,424	276	15	41
*PP5KC	"	17,444	142	14	35
*PY5PWR	"	11,760	138	13	35
*PY2TRB	"	6,435	77	16	29
*PY1FOX	"	5,510	94	13	25
*PU8PSF	"	3,570	174	11	24
*PU1KDX	"	3,268	115	16	27
*PU9ATH	"	3,234	83	14	19
*PU9DCB	"	3,190	106	9	20
*PU5YSV	"	3,182	71	13	30
*PU2TNT	"	3,127	40	13	40
*PU2NAX	"	2,618	71	14	20
*PU3LTA	"	2,030	30	11	18
*PU4GOD	"	1,820	37	10	16
*PU5WID	"	1,750	76	9	16
**PU2XCW*	"	992	42	11	20
*PU4HUD	"	861	29	9	12
*PP5FMM	"	616	23	8	6
*PU1SSH	"	585	57	14	25
*PU9GOB	"	133	26	3	4
*PU7EDR	"	117	81	5	8
*PU1JMK	"	105	19	7	8
**PU2LHA*	"	91	15	6	7
**PU8TAL*	"	48	4	4	4
***PY2UD**	21A	512,080	1239	30	118
*PP2CC	"	96,052	486	19	55
*PY2MP	"	51,961	226	22	69
*PY7ZB	"	25,978	270	17	45
*PS8ET	"	6,283	45	16	45
***PP7DX**	14A	5,664	52	17	31
*PY5AP	"	897	30	10	13
**PQ2HX*	"	90	12	4	6
**PY2AGO*	"	90	14	7	11
***PR7GA**	7A	1,972	26	9	20

Chile

CE8EIO	A	748,926	1280	79	164
CE2WNW	"	716,994	1573	65	118
3G3PR	"	109,989	384	56	65
(OP:CE3LQH)					
CE3JRI	"	20,794	117	30	44
CE3TKV	"	13,064	94	27	44
CE2AWW	28	420,954	1530	20	82
CE5JZO	21	215,481	896	27	66
CE3DNP	14	339,840	1098	30	88
CE3NR	"	85,653	384	28	65
XQ6OA	7	177,555	835	31	64
***CB3R**	A	496,086	1206	57	121
(OP:CE3KHZ)					
**CE7VPQ*	"	106,998	452	37	65
*3G3AA	"	60,562	302	47	60
(OP:CE3PBT)					
***CB3LR**	28	142,926	698	20	63
(OP:CE3GDR)					
*CA2CEV	"	77,928	487	20	48
*CE3EPN	"	57,960	436	19	41
*CA4CBK	"	36,714	349	18	40
*XQ5CIE	"	35,560	247	19	51
*CA5GRF	"	2,449	52	12	19
*CA6WKD	"	2,010	70	14	16
***CA1LEW**	7	2,652	69	13	21
*CE7BIY	"	1,155	27	10	11
CE1TT	AA	1,053,612	1679	74	185
CE3MDA	"	780	17	13	13
CE6SAX	28A	39,387	316	17	40
3G3M	14A	658,170	1685	34	108
(OP:CE2MVF)					
CE3CT	7A	386,756	1171	33	91
***CE6PGO**	AA	193,581	574	51	86
*CE7KF	"	74,245	228	57	98
*XQ3UP	"	33,675	200	33	42
(OP:XQ7UP)					
*CA3LMO	"	24,687	270	16	23
(OP:CE3LMO)					
*CE3WYZ	"	22,274	137	36	50
*CE4KCA	"	6,344	71	28	33
*XR3L	"	3,600	99	20	20
*CE3MMT	"	315	21	9	12
***CE3LI**	28A	27,408	263	16	32
***CE3CBM**	21A	57,975	310	22	53

Colombia

HK4CMB	A	1,707,264	2040	97	207
HK3C	"	1,138,960	2203	47	137
HK6J	"	465,773	1071	46	115
HK4DLO	14	28,733	222	17	42
***HK6P**	A	224,598	394	71	178
**HK6K*	"	35,640	175	29	52
**HK5LAM*	"	21,321	131	33	70
*HK3E	"	8,618	83	24	38
***HK3RDL**	7	2,701	35	13	24
HK4W	AA	124,605	429	28	89
***HK3J**	AA	212,710	491	67	111
*HK3Q	"	132,015	264	60	135

Curacao

**PJ2DD*	AA	654,560	1459	39	121
(OP:PF4T)					

Ecuador

HC2G	28	149,526	831	20	58
***HC3BL**	A	6,832	62	30	31
***HC5VF**	21	44,160	278	20	40

Paraguay

**ZP6KA*	14	880	28	11	11
***ZP5DNB**	7	133	19	3	4
ZP5BVK	AA	270,940	624	57	133
***ZP5DVD**	AA	95,364	424	34	74
*ZP5RPO	"	1,386	21	14	19
***ZP6ARO**	28A	70	6	4	6
ZP5BVK	AA	182,750	368	78	137
ZP5CGL	14A	31,354	224	17	44
***ZP9MCE**	AA	90,316	297	45	89

Peru

OA4SS	A	1,603,071	2387	72	171
***OA6Q**	A	278,378	608	57	124

South Shetland Islands

RI1ANO	A	9,480	66	22	38

Trinidad & Tobago

*9Z4A	A	6,858	82	23	31
*9Y4D	21	1,195,122	3144	27	112
9Z4Y	AA	125,829	435	43	80

Uruguay

CW5W	28	1,178,376	2864	27	121
		(OP:CX6VM)			
CV7S	21	1,134,296	3151	33	109
		(OP:CX7SS)			
CX1AV	14	229,383	962	24	75
*CX2LT	A	115,434	499	50	71
*CX1CAN	"	3,515	73	20	17
*CX1EK	28	61,295	388	18	47
*CX5ABM	"	38,400	276	17	43
*CX7BBR	14	13,632	146	24	40
CX2BR	AA	108,570	308	57	97
CX4SS	"	*41,220*	*261*	*24*	*36*
CX2DK	21A	1,896,412	3761	36	142
CX4BW	"	400,336	1148	31	100
*CX4AD	28A	76,296	452	19	49
*CX2CC	7A	102,960	394	31	86
*CX7ACH	"	187	16	5	6

Venezuela

YV5AM	A	156,585	450	46	97
YV4ABR	"	1,292	25	17	21
YV6CR	28	389,200	1386	25	87
YV2CAR	21	964,250	2563	28	105
YV5JBI	1.8	5,440	82	10	24
*YV4RDC	A	229,437	801	26	85
*YV4MT	"	57,200	181	49	94
**YY8CMO*	"	*34,008*	*147*	*31*	*73*
*YV5KG	"	15,840	126	34	56
*YV5JGO	"	8,772	80	29	39
**YV4AR*	"	*4,324*	*49*	*18*	*28*
*YV5OIE	"	2,714	30	20	26
*YV1SW	28	29,616	302	16	32
*YV4YC	21	1,101,992	2822	27	112
*YY1MTX	"	186,120	733	22	77
*YV5MYC	7	4,653	67	12	21
YV6BXN	14A	55,120	293	22	58
YW4V	1.8A	2,079	33	8	19
		(OP:YV4DYJ)			
*YV5EMG	AA	237,240	594	52	128
*YY1JLV	"	42,875	210	38	87
*YV5TNT	"	37,224	241	24	42
*YY1AFL	"	13,770	95	28	57
*YV5COR	"	1,768	31	14	20
*YY6KSN	28A	6	1	1	1
*YV7MAY	14A	129,696	531	20	76
*4M8E	7A	146,685	620	25	80
*YV4NR	"	23,946	149	18	60
*YY2JAB	"	10,740	93	16	44
*YV4VMT	"	6,615	60	11	38
*YY7RCV	"	154	10	5	9

QRP

KR2Q	A	644,160	729	73	247
HG6C	"	427,785	806	77	284
		(OP:HA6IAM)			
JR4DAH	"	266,104	489	76	156
G4CWH	"	250,756	573	61	217
JH1OGC	"	224,301	411	85	146
UT5EOX	"	195,027	512	55	196
UA3QQ	"	161,100	584	44	181
SP4LVK	"	112,714	432	44	150
UX2MF	"	105,090	297	55	171
PW5T	"	86,412	390	38	76
		(OP:PP5XA)			
K2YGM	"	78,110	210	36	110
G4Q	"	73,710	372	34	128
		(OP:G3PRI)			
W6QU	"	70,007	195	57	80
		(OP:W8QZA)			
PY2XIZ	"	68,901	277	45	74
UR5FEO	"	*68,136*	*320*	*37*	*130*
PY2BN	"	61,400	283	36	64
YT5DEY	"	52,920	306	32	115
JT1BZ	"	52,164	269	37	71
9A4OP	"	*50,213*	*295*	*33*	*116*
NDØC	"	44,880	143	41	79
DK8TA	"	34,194	242	31	108
JH7BMF	"	33,376	142	42	70
UX8IX	"	32,528	253	18	89
SQ3OGP	"	32,409	210	30	87
DL2DWP	"	31,654	199	28	91
LZ7H	"	30,875	217	29	96
DJ5TD	"	23,165	224	29	84
MIØULK	"	19,624	161	23	65
PAØAWH	"	18,914	175	21	77
DF7LS	"	17,640	140	26	72
IK3XTY	"	17,028	142	30	69
NP2Q	"	15,756	148	20	32
BD4HZX	"	15,360	122	34	46
9A5HZ	"	15,309	158	18	63
OH3KQ	"	13,400	145	25	75
VE6EX	"	11,956	131	22	27
HB9ZAG	"	11,397	125	24	63
DL1DXA	"	10,878	63	30	44
EA5EX	"	10,384	91	27	61
DDØVS	"	9,344	110	18	55
RZ3ARO/6	"	8,515	112	15	50
2EØLJZ	"	8,500	96	24	61
IU2IGX	"	7,973	103	13	54
UB2FBY	"	7,906	109	16	51
PDØPMS	"	7,611	125	9	50
M6SSV	"	7,500	90	19	56
NH6AB	"	7,248	61	24	24
DL5GSM	"	6,300	127	10	53
UB3DDA	"	5,544	83	17	49
W6VH	"	5,043	75	21	20
VE4RBH	"	4,136	49	19	25
CT1DJE	"	3,770	51	17	41
EA4CU	"	3,478	47	18	29
I2BPP	"	3,339	38	21	32
K8CN	"	3,225	31	16	27
DL5EC	"	2,923	40	13	24
RZ5A	"	2,600	57	15	37
DF1TB	"	2,500	61	13	37
WS9V	"	2,432	29	13	25
E21FYK	"	2,301	31	17	22
UA3PP	"	2,280	68	8	30
GØBWG	"	2,279	56	9	34
IW2NRI	"	2,135	31	14	21
SN9MT	"	2,014	55	9	29
SQ3OGZ	"	1,862	56	8	30
UAØSBQ/P	"	1,848	25	11	17
SY1AQG	"	1,786	34	13	25
EA3GYE	"	1,776	32	14	23
W4TTZ	"	1,530	22	13	21
VE5DLD	"	1,440	44	10	8

CS7AFI	"	1,092	22	11	15
DF7XR	"	*1,044*	*23*	*14*	*15*
JR1UJX	"	912	19	9	15
IZØZFK	"	810	19	12	15
EA1IWM	"	805	23	7	16
W7BAK	"	700	15	8	12
PAØZAV	"	621	25	8	19
JN3DMJ	"	570	14	8	11
IU3DHU	"	560	29	8	20
JJØSFV	"	480	12	10	10
RN3AKK	"	*476*	*12*	*7*	*10*
YF3CYT	"	468	14	4	9
G3ZJF	"	*437*	*14*	*9*	*14*
UT3UEZ	"	399	11	8	11
VA3WR	"	300	9	4	8
AA6OC	"	200	12	5	5
W6GMT	"	195	9	8	7
TA1IFV	"	187	11	3	8
EA3FHP	"	168	10	4	8
VU3SIO	"	144	7	6	6
F4GSP/P	"	*96*	*11*	*4*	*8*
JS6TQS	"	72	4	3	3
M6TTZ	"	49	7	3	4
VA3MYC	"	32	5	4	4
SO6XL	"	15	3	2	3
LU7VCH	28	32,096	253	17	42
I5KAP	"	17,263	125	17	44
R7NA	"	12,772	102	21	41
SP7VTQ	"	6,912	57	17	31
EC4AA	"	5,160	65	11	29
LU4VZ	"	2,624	54	11	21
OK1LV	"	1,914	32	10	19
EB3EPR	"	1,488	30	5	19
N4IHS	"	468	13	4	8
JA4DQX	"	*144*	*9*	*3*	*6*
PU8RFL	"	63	30	3	4
YC3BLJ	"	63	5	3	4
PU2TRX	"	-84	60	10	11
HG3C	21	43,952	269	20	62
		(OP:HA3HX)			
K8ZT	"	24,820	117	19	66
SP5DDJ	"	20,826	136	23	55
JR2EKD	"	20,808	119	22	46
JQ1NGT	"	*14,193*	*118*	*20*	*37*
UA6BFE	"	12,528	167	25	62
JR1NKN	"	10,575	96	17	30
UR1YDD	"	*7,203*	*102*	*14*	*35*
9A1DD	"	3,744	30	20	28
YF3WIL	"	3,492	54	14	22
VA3PCJ	"	3,393	44	8	21
K2QO	"	*2,142*	*30*	*12*	*22*
JA7QQK	"	2,040	29	12	18
SP5FKW	"	*1,938*	*61*	*15*	*23*
DL2TM	"	570	36	6	9
HB3YRU	"	372	11	5	7
YU4MOM	"	336	20	3	13
VK6FLAB	"	240	18	6	6
YU4JAN	"	108	11	3	6
WB9AYW	"	98	7	1	6
JH1HDE	"	84	4	4	3
JA1KPF	"	60	4	2	3
DO5TMM/P	"	45	5	2	3
YC3TKM	"	45	3	2	3
TG9ADQ	14	131,824	741	22	66
IZ1ANK	"	42,585	474	19	66
CT1BXT	"	30,952	273	14	59
R7KO	"	25,650	268	14	61
RW3AI	"	18,023	215	12	55
I4PZP	"	14,976	182	17	55
SY1AEA	"	13,860	189	7	53
R6LHD	"	13,328	191	14	54
YL3IZ/MM	"	12,627	99	17	44
MW8T	"	7,215	125	9	30
		(OP:MMØCWJ)			
RN3DDZ	"	*6,116*	*116*	*9*	*35*
K2GMY	"	5,265	54	16	23
KZ3I	"	4,914	47	11	31
UT4UMZ	"	4,914	88	7	32
SP9L	"	3,780	93	8	34
DK1MIR	"	3,774	73	8	29
		(OP:E73WM)			
MØJBA	"	3,608	105	8	33
ES1TAR	"	3,318	78	9	33
UA1AFT	"	2,940	51	11	19
LY3UV	"	380	36	4	16
OL3R	"	374	18	5	12
		(OP:OK1VWK)			
2EØGBD	"	169	11	4	9
YU3EMA	"	168	18	5	9
BG8NKX	"	156	19	6	7
MØIKO	"	144	12	3	6
VR2UNG/P	"	117	5	4	5
KK7VL	"	90	8	5	5
PA1B	"	*25*	*5*	*1*	*4*
TA1CH	"	*18*	*2*	*1*	*2*
NQØRP	"	8	3	2	2
K2BCM	"	6	1	1	1
KP3LR	7	64,676	506	19	55
LY5G	"	36,260	426	13	61
OK2VWB	"	27,056	301	13	63
LY2NK	"	26,136	315	13	59
IZ3IBL	"	24,409	262	13	64
LZ1DM	"	21,584	225	15	61
IZ4VQS	"	20,808	255	12	56
IQ1BD	"	19,404	268	11	55
		(OP:IZ1DGG)			
4L7AA	"	13,048	122	10	46
IN3HUU	"	12,483	204	7	50
EO3Q	"	9,075	106	12	43
		(OP:UR3QCW)			
R2FI	"	5,969	143	9	38
OK6OK	"	4,836	124	7	32
YO2NWW	"	4,343	75	9	34
S5ØBH	"	4,180	71	11	33
YB8ROP	"	4,114	59	12	22
YT5CQ	"	2,562	56	9	33
9W2VBC	"	1,056	41	9	13
TA7AGL	"	663	19	5	12
IK1ZNU	"	589	34	3	16
JA2MWV	"	270	10	8	7
PE4SVG	"	*238*	*18*	*2*	*12*
WBØIWG	"	216	9	5	7
S54MI	"	209	24	3	16
LU7DUE	"	171	19	4	5
MØZJQ	"	143	16	2	11
VU3YPP	"	98	6	3	4
OE1ABV	"	*90*	*12*	*2*	*8*
DJ4MX/P	"	32	8	2	6
9W6FAD	"	18	3	1	1
YG3EOQ	"	0	0	0	0
SQ8MFB	3.7	10,296	220	9	43
CR5M	"	6,578	117	8	38
		(OP:CT1HSN)			

DO4HZ	"	5,136	106	9	39
OL4W	"	3,990	107	5	33
		(OP:OK1IF)			
IZ5OVP	"	2,562	66	7	35
Z3ØW	"	2,508	53	8	30
OM6AMR	"	*567*	*29*	*4*	*17*
YG3CYS	"	345	11	7	8
JH1APZ	"	312	13	6	7
SP3DBM	"	*90*	*13*	*2*	*8*
JA5NSR	"	30	5	3	3
HA5NB	1.8	3,680	104	4	36
SQ2BXI	"	3,535	114	4	31
VA3XO	"	2,431	130	6	5
RA2FDX/3	"	*684*	*42*	*4*	*15*
EA6SX	"	462	22	4	18
S59GS	"	448	29	4	12
OK2FD	AA	391,710	770	72	258
RT4W	"	247,086	536	69	249
YU1LM	"	108,000	441	46	154
IZØFUW	"	102,816	345	54	150
IK1ZOF	"	69,520	272	40	118
PE2K	"	38,478	313	25	81
IZ8JFL	"	32,660	149	36	106
DO8YX	"	28,215	159	27	72
JK1TCV	"	27,768	110	42	62
HA5BA	"	27,000	224	26	82
RD9D	"	26,462	105	44	87
OK1DMP	"	24,525	105	31	78
LA1DSA	"	13,344	101	28	68
RA3DJA	"	11,970	109	23	67
JH3DMQ	"	11,470	88	24	38
TA3IW	"	11,098	94	17	45
IK2CFD	"	9,310	79	25	45
HK3W	"	7,584	48	33	46
KB9NKM	"	*6,780*	*50*	*22*	*38*
G8C	"	6,014	94	12	50
		(OP:MØWLY)			
MW6KGY	"	*4,712*	*78*	*18*	*44*
MØVWK	"	*3,362*	*60*	*11*	*30*
YCØOSX	"	3,276	92	12	16
IW2MYH	"	2,920	44	17	23
DL7CB	"	1,350	40	9	21
EA4SG	"	1,189	22	10	19
K4SSE	"	690	20	9	14
IK8TNG	"	*550*	*15*	*11*	*14*
PY4WJ	"	216	8	6	6
YC3TEN	"	30	6	2	3
PY2ZA	28A	17,934	151	18	43
PU2RTO	"	6,042	80	15	38
SP5EWX	"	2,709	35	16	27
PY2VQ	"	2,450	78	10	15
3G3O	"	1,159	40	9	10
		(OP:CE3OP)			
PY1MT	"	1,144	32	9	17
YO8WW	"	585	15	6	7
SP7M	"	456	12	8	11
OH1ØTA	"	4	2	1	1
		(OP:OH1MN)			
PU2MDD	"	-40	50	8	12
9A4AA	21A	3,973	62	9	20
EI1E	"	3,731	54	12	29
		(OP:EI5KF)			
YC2VOC	"	3,204	45	14	22
BG7BDB	"	2,320	38	11	18
E72MD	"	2,187	55	7	20
PY2RBN	"	1,014	34	12	14
ES1XQ	"	682	20	7	15
		(OP:ES2YW)			
YO8TRU	"	589	20	7	12
YU3VIP	"	90	15	5	10
UZ7M	14A	91,800	538	27	93
		(OP:UT9MZ)			
YP8W	"	56,232	404	20	79
		(OP:YO8SEP)			
TA3AER	"	40,755	243	12	53
ES7AM	"	22,848	278	12	56
JM1NKT	"	20,475	145	22	41
LZ8U	"	19,370	230	11	54
		(OP:LZ2TU)			
UT3EK	"	16,560	184	13	59
JRØBUL	"	2,201	35	14	17
SMØR	"	1,680	50	5	25
YO8TND	"	1,508	53	6	23
G3WW	"	864	35	5	19
K7HBN	"	828	26	6	6
YBØOHG	"	775	30	9	16
RAØAY	"	646	14	6	11
USØFF	"	493	34	4	13
JM2LHB	"	90	9	5	5
KNØBBY	"	6	1	1	1
IT9GAK	7A	34,040	291	17	75
LX/G1TPA/P	"	28,842	508	9	48
ES4O	"	2,652	100	6	33
		(OP:ES4RAO)			
YCØMZE	"	352	13	6	10
YC3PPD	"	336	10	6	8
OF1MN	"	252	18	6	15
		(OP:OH1MN)			
YG3EQC	"	6	1	1	1
OZ6OM	3.7A	15,892	292	8	50
UT5WAA	"	2,013	70	6	27
HA8V	"	1,943	71	5	24
		(OP:HA8MV)			
YD3VRY	"	368	11	7	9
CT2JBG	"	324	16	2	10
YO9FLD	1.8A	5,841	96	9	50
HA7I	"	5,547	128	4	39
		(OP:HA7JTR)			
EU1AA	"	5,375	164	6	37
ES7XX	"	1,107	40	5	22
		(OP:ES7GN)			
YP8A	"	1,092	45	4	22
		(OP:YO8WW)			
OU2V	"	513	30	3	16
		(OP:OZ1FJB)			
K3TW	"	276	13	5	7
HA7JQK	"	154	12	4	10
ES3O	"	45	6	3	6
		(OP:ES2UK)			

MULTI-OPERATOR SINGLE TRANSMITTER

NORTH AMERICA

United States

District 1

W1NA	6,411,252	3962	132	496
K1XM	5,329,986	3326	130	517
N1MM	3,211,747	2105	124	459
WX1S	1,835,541	1456	97	362
W1QK	1,592,625	1272	99	366
W1HIS	828,115	824	82	297

District 2

W2ZQ	764,242	749	92	330
AB2DE	414,144	541	63	225
K2JMY	185,344	468	59	197

District 3

W3MF	1,823,481	1368	102	387
W3ZGD	307,320	438	68	192
K3OQ	218,553	318	66	197
KA3PCX	67,680	196	39	102
K3PH	3,564	33	15	29

District 4

N4WW	4,052,724	2672	136	490
N8PR	1,270,410	1010	113	357
W4MLB	460,362	932	75	216
K3TD	275,600	400	64	196
K4UN	145,624	295	63	155
W4UAL	103,894	240	54	127
*WK1DS	306,772	418	69	214
*WA1F	141,588	318	36	126

District 5

K5TR	4,429,061	3217	148	489
K5UA	745,161	846	73	250
KS5Z	346,696	612	79	208
*W6NJB	27,136	119	39	67
**K5SRT*	*10,120*	*100*	*36*	*56*
*N5XXD	3,456	36	18	30

District 6

NØKQ	298,352	473	69	163
NX6T	*119,340*	*333*	*53*	*103*
W6DR	52,578	161	46	81
W6KA	41,895	177	52	81
W6RFU	35,625	143	26	69
*W6BHZ	35,640	154	41	58
*ND6U	4,560	52	19	21

District 7

KY7M	1,732,750	1903	123	355
WØRIC	1,474,438	1495	116	321
K7E	432,377	689	73	180
W7MRF	322,857	509	75	186
W7VJ	316,880	492	65	168
W7TVC	310,452	503	75	171
AB7HP	42	11	4	10
*K7JAN	36,166	143	43	64

District 8

K8AZ	4,383,540	2590	140	499
W8PR	1,586,709	1210	117	396
W8AT	891,921	908	90	291
KB8ZGL	209,466	363	64	179
W8DC	186,840	408	57	159
WC8VOA	69,732	209	48	108
*N8YXR	116,382	264	46	117
*W8AJT	52,700	163	47	108
**W8EDU*	*14,615*	*89*	*25*	*54*

District 9

NV9L	4,004,079	2476	132	465
AA9A	3,086,366	2114	125	438
**K9IU*	*15,222*	*89*	*29*	*57*

District Ø

KØUH	11,620	67	29	41
N5KB	8,927	73	27	52
KDØEZS	*3,360*	*44*	*19*	*29*
KØLTC	*304*	*22*	*8*	*8*

Alaska

*KL7RST	1,872	50	9	9

Canada

District 1

VO1CRC	352,755	938	52	143
*VE9ML	741,418	822	76	282
*VE9MWA	25,632	115	27	62

District 2

VE2BWL	2,632,175	2475	98	357
VA2ZM	*1,846,420*	*2048*	*88*	*292*
VA2MP	209,348	403	51	148
*VE2CWQ	288,880	494	53	177

District 3

VE3EJ	9,823,765	5449	154	553
*VE3WPZ	144,401	341	55	142
*VE3SOO	39,100	205	37	78
*VE3AYR	18,225	105	19	62

District 4

VE4JBB	461,812	1400	45	121

District 6

VE6SV	3,364,632	3439	116	328
CG6AO	*121,180*	*866*	*33*	*40*

District 7

VE7SAR	36,292	174	24	62

District 8

VYØERC	165,984	458	38	95
VY1AAA	138,300	679	39	61

Costa Rica

TI5M	1,752,876	2355	97	251

Cuba

T42A	1,465,590	2511	77	217

Jamaica

6Y1LZ	11,235,357	7744	148	509

Mexico

*XE2NL	2,349	33	11	18

Montserrat

VP2MDG	4,419,818	4344	108	329

Puerto Rico

**WP3E*	*16,947*	*181*	*25*	*38*

U.S. Virgin Islands

NP2N	*1,907,400*	*2772*	*85*	*245*

AFRICA

Canary Islands

EF8R	31,451,984	11696	186	755
*EA8URG	73,845	235	36	99
*EA8BMG	5,781	62	13	28

Ceuta & Melilla

*ED9E	4,485,280	3079	107	437

Ethiopia

*ET3AA	660,924	1249	44	154

Madeira Islands

CR3A	20,170,863	8342	174	663
*CR3Z	55,800	188	37	87

Morocco

CN2AA	27,771,275	10706	186	739

Tunisia

*3V8SS	3,172,500	2290	107	393

ASIA

Asiatic Russia

District 9

R9PA	5,664,395	3989	120	449
RT9L	3,388,032	2545	115	404
RK9CYA	332,628	474	79	239
RN9T	312,280	741	44	141
RC9J	101,178	297	34	112

District Ø

RTØC	4,374,048	3884	149	403
RKØW	238,753	407	66	191
UIØL	54,480	290	48	72
RØAK	2,627	31	15	22
*RCØCB	12,792	203	29	49

Asiatic Turkey

YM7KA	*3,185,823*	*2874*	*95*	*344*
TCØF	2,271,388	2640	63	259
*YM3VBR	298,800	646	40	160
*YM2KY	202,370	743	22	76
*TC1ØM	175,608	787	17	64
*TC29EKM	55,620	258	25	83

China

B4T	1,229,580	1442	111	294
B1Z	1,200,314	1773	100	273
B7Q	654,588	1156	92	227
BI4WXD	539,032	1033	90	194
BI4IV	114,798	478	53	106
BH6IC	29,110	209	24	47
*BA8CY	542,569	1022	76	187
**BY1AS*	*407,570*	*1029*	*77*	*188*
*BY7KTO	172,368	598	58	110
*BG5BRT	73,970	402	51	79
*BY4AA	48,312	245	43	79
*BG7RCX	30,392	182	43	73
*BD3QA	13,400	128	39	61
*BY2HIT	176	16	9	7

Cyprus

C4A	9,823,212	5009	148	566

Hong Kong

VR2CC	953,984	2304	85	172
VR2ØFUN	*6,501*	*196*	*13*	*20*

Japan

District 2

JI2ZJS	1,754,688	1568	127	329
JI2ZEY	1,025,206	1514	99	202
JJ2YRE	127,544	358	48	101
*JK2VOC	134,676	357	65	109

District 7

JA7ZFN	3,746,966	2729	143	398

District 8

JR8YLW	3,404,672	2566	140	396
JH8YOH	1,899,417	1836	119	312

Kazakhstan

UP2L	13,011,399	6976	150	567
UN9FWW	*7,424*	*62*	*20*	*38*

Kuwait

9K2HN	12,730,971	6210	154	599

Macao

*XX9O	295,405	833	67	138

Taiwan

BMØDX	1,463,536	2649	90	238

Thailand

E2X	2,066,460	2169	106	359
*E28AI	705,456	1193	75	201
**E28AD*	*73,549*	*283*	*42*	*91*

United Arab Emirates

*A61FK	1,584,740	1798	76	264

West Malaysia

9M2M	569,066	1239	81	197
*9M2R	191,000	731	56	135
*9M4CME	18,880	141	25	39
**9M2SDX*	*12,240*	*116*	*29*	*56*
*9W2PQS	5,543	109	7	16

EUROPE

Aland Islands

OHØZ	1,009,125	1558	87	264

Andorra

C37RC	1,338,876	2463	76	320

Austria

OE5XRL	284,242	908	51	206
*OE1XA	54,378	278	37	134

Azores

CQ8M	*1,027,000*	*1660*	*78*	*317*

Belarus

EW6W	6,357,000	4966	157	593
EU1WU	4,981,928	4247	150	566
*EW8ZO	256,225	732	59	218
**EW4WE*	*180,711*	*852*	*42*	*165*
**EU1XA*	*3,350*	*67*	*11*	*39*

Belgium

OT6M	3,121,560	2912	130	468
OP4K	2,659,230	2735	120	447
ON1TO	1,379,866	2213	80	318
OT5X	673,712	1723	69	247

Bosnia-Herzegovina
E74E 1,049,320 2013 86 284
E73ESP 853,220 2134 82 288
E7C 123,690 605 40 146
*E71EEE 384,354 876 70 256
*E75RKP 16,435 171 19 76

Bulgaria
LZ1D 895,618 1480 101 330

Croatia
9A3W 1,778,856 2318 112 386
9A2U 949,289 1393 99 310
*9A6V 383,943 699 84 245
*9A5G 9,088 76 24 47

Czech Republic
OK5W 7,578,498 4826 158 620
OK7O 1,377,091 2126 89 332
OK2KOJ 838,000 1345 91 328
OL7C 120,615 314 51 164
*OL1Z 420,911 683 84 263
*OK2OCT 105,127 508 44 165
*OK1KKI 13,268 185 11 51
*OK5SWL 1,260 33 11 24
*OK6O 270 56 9 18

Denmark
5P2C 1,284,633 2329 88 353
OZ5BAL 455,017 863 79 274
5Q1A 232,320 662 48 172
*OV5TC 241,374 503 75 219
*OZ7D 188,240 516 68 192

England
M4A 3,222,555 3034 134 519
G4R 1,615,031 1864 98 353
G3B 1,434,053 1508 115 388
G3M 732,672 1130 97 335
MØREG/P 230,434 627 63 211
G1T 53,256 347 38 130
GØAZH 4,779 59 20 39
*G4ATH 227,592 659 51 210
*G3YNN 225,792 502 67 189
*2EØMGP/P 32,400 235 29 106

Estonia
*ES3V 117,234 400 50 184

European Russia
District 1
RM1Q 783,475 1681 86 299

District 3
RC3W 2,179,488 2597 130 454
R2VA 1,105,416 1704 99 369
RA3W 881,559 1471 103 338
RK3PWR 810,468 1362 102 321
RU3C 64,845 277 42 123
*RZ3DZI 4,047 71 15 42
*RK3DWH 1,932 53 9 33
*RK3FWE 418 45 8 30

District 4
UA4M 6,413,949 5633 160 611
UA4S 4,024,566 3829 142 560
RT4D 1,007,514 1285 115 387
RK4W 38,912 201 34 94

District 6
RT6A 8,545,275 6426 163 652
UA7K 8,495,880 6335 163 667
R7AB 8,269,560 5857 172 634
RU7M 52,197 158 39 98

Finland
OF5Z 4,823,280 4144 158 625
OH6K 982,554 1308 106 392
OF2FNR 542,568 984 80 296
*OH3AC 18,414 107 27 66

France
TM6M 13,676,145 7587 164 645
TM3R 6,491,940 4374 154 600
TM1T 4,821,336 4127 133 479
F8KCF 1,261,182 1787 97 340
F1AEY 854,400 1483 91 293
F6BLZ 367,875 732 75 252
F5KSE 140,286 343 54 152
F8KGH 12,600 136 16 56
*F8KLY 648,818 994 93 308
*F6KJG 22,720 113 42 100

Germany
DR5N 4,467,852 3140 148 590
DLØCS 3,909,375 3293 133 562
DFØSAX 2,706,146 2612 145 553
DR7A 2,110,426 2641 103 354
DJØA 1,453,659 1511 120 417
DLØHMK 312,480 827 63 225
DR2P 246,207 599 62 259
DLØSLG 124,950 556 48 162
DN1QP 11,832 102 27 60
*DL/4X1DX 1,072,720 1225 105 401
*DLØWM 143,640 371 54 156
*DLØGSH 78,234 328 43 134
*DKØND 12,222 119 26 71
*DN1NE 2,200 30 17 23

Greece
J42T 6,443,508 5416 154 554
SZ1A 3,016,841 3262 147 520
SZ3P 410,541 1226 64 217
*SZ4KRD 87,096 413 41 150

Hungary
HG3DX 7,577,920 4864 161 635
HG6N 4,507,965 3915 145 548
HG5A 3,625,868 3665 130 447
HG5ØØA 319,062 1178 56 190
*HA1NR 5,782 92 9 40
*HA5KHC 5,644 75 21 47

Iceland
TF3W 17,255 108 25 60

Isle of Man
MDØGLK 21,620 146 25 69

Italy
IR4M 12,836,928 7012 167 665
IR4X 12,798,432 6805 171 693
IO5O 8,798,770 5576 162 593
IR6T 7,331,896 4603 156 592
IR1Y 4,972,672 3846 153 580
IR2L 3,963,960 3238 143 550
IR3Z 3,777,126 3304 142 545
IQ2MI 1,736,019 1926 123 446
IQ8CS 610,875 1621 83 292
IQØRU 608,561 1422 70 223
IQ5ZP 510,340 1317 74 266
IN3FOX 317,611 666 67 222
IQ3WW 277,554 605 64 213
IV3CNZ 207,705 655 48 179
*IQ3RK 2,630,880 2819 134 514
*IZ8XXE 1,155,807 1448 105 396
*IQ8BB/8 745,172 1125 103 379
*IZ7ZKV 467,780 1061 83 297
*IQ8XE 229,140 497 68 217
*IQ3BM 118,342 420 51 163

Kaliningrad
*UC2K 55,936 289 36 92

Latvia
YL1ZS 20,240 99 31 61

Liechtenstein
HBØA 1,303,705 1935 79 324
HBØ/DD5ZZ 704,421 1560 72 297

Lithuania
*LY4O 358,719 995 65 262
*LY3ZM 53,430 397 25 112

Luxembourg
LX7I 13,415,550 7778 168 682

Macedonia
*Z37CPR 5,335 95 11 44

Netherlands
PC2L 1,146,320 2097 97 348
PA6DX 423,708 1248 65 203
PI4KAR 273,808 661 82 232
PI4YLC 249,486 727 56 202
PI4MM 67,368 377 38 130
*PI4DLZ 53,053 375 26 117

Norway
LN8W 4,501,770 4013 138 541
LA3T 258,792 671 61 185

Poland
SO4B 3,258,410 2658 150 563
SN7H 1,304,708 2301 90 349
SN1D 1,069,710 1376 114 429
SP2KPD 911,430 1555 90 320
SP9KAO 864,441 1485 88 329
SN5P 606,144 1062 83 269
SP9KDA 564,696 1261 78 294
3Z1K 389,655 886 66 249
SP9ZHR 94,000 322 50 150
SN9K 1,575 26 11 14
*SP2TMT 273,540 699 61 221
*HF6K 193,112 624 57 182
*SP2KDS 163,332 561 58 176
*SP9PBH 107,694 422 44 149
*HF5L 27,195 169 32 79
*HFØHW 19,448 235 20 68
*SP5PDB 16,544 115 30 64
*SN5G 14,006 191 25 69
*3Z2ØØT 4,662 48 23 40
*SP5ZSK 24 4 3 3

Portugal
CR6K 9,744,225 6263 156 595
*CR5SSB 141,693 415 51 168

Romania
YR7J 13,572 178 16 62
*YP7P 1,898,397 1903 137 484
*YO4KAK 98,394 362 48 138

Sardinia
IQØID 168,226 617 46 187

Scotland
GMØV 1,860,448 2809 88 288
*GM7A 132,600 487 39 156
*MMØTGH 115,320 455 39 147

Serbia
YU5R 4,767,350 3839 153 589
YT6T 1,293,850 1847 101 357
YT5L 2,108 60 6 25
*YU1AFV 54,372 752 18 74
*YTØB 11,135 156 19 66

Sicily
IO9R 964,512 1837 86 308
IO9Z 655,975 1153 98 377
*IB9T 3,082,500 2778 137 548

Slovak Republic
OM7M 11,575,499 6610 176 681
OM4Q 967,980 1242 99 343
OM3KFF 206,448 596 59 213

Slovenia
S54K 1,643,024 2422 101 363
*S56K 764,048 1351 93 331
*S54I 480,537 1118 61 260

Spain
EF7T 5,123,108 4253 147 547
EC5AN 3,541,968 3303 133 515
EE5T 3,330,677 3696 138 535
ED1T 2,149,845 3018 89 344
EF5I 1,501,286 2323 90 331
EE1G 802,672 1194 95 359
EA2RCP 413,172 1072 51 156
ED1WW 391,210 974 59 231
EA5/LN2G 136,971 523 40 131
ED2R 107,136 542 26 102
EA1RCR 84,564 405 45 129
ED2W 41,600 387 28 100
*EA3CI 1,399,658 1617 112 421
*ED3D 291,962 1000 56 197
*EB2DJ 112,350 385 48 162
*EA1URE 23,046 151 43 124
*ED4W 2,881 88 6 37
*EA4RCT 1,692 31 10 26

Sweden
SK3W 4,037,488 2974 140 518
SK7K 1,512,232 2760 89 332
SKØQO 565,640 1006 81 314
SE3T 96,928 241 54 154
SC6AS 286 10 6 7
*SK5DB 166,980 446 60 182
*SM6XUZ 930 22 11 20

Switzerland
HB9H 4,725,677 3930 144 539
HB9PUE 2,167,248 2455 116 438
HB9OK 611,418 1446 74 288
HB9AUS 385,350 532 90 260
HB9BS 228,752 477 72 200
HB2C 120,736 603 33 143
HB9DD 51,705 319 34 101

Ukraine
UZ2I 1,340,540 2093 109 376
UR4RWW 231,256 668 59 215
UR4UWY 117,075 589 40 135
UT7E 114,300 463 37 143
UZ4E 81,391 403 45 154
*UW7W 1,129,736 1323 108 391
*UT4MWM 250,738 724 65 218
*UR6GWZ 21,708 152 31 77
*UT7AXA 13,160 144 17 77
*UT4UWC 9,282 98 20 58
*UTØLWD 7,216 135 18 64
*UT4UXB 2,679 59 15 42
*UT2HZT 756 20 10 17
*UZ1HWW 700 21 10 18

Vienna International Center
4U1A 504,114 1180 78 221

OCEANIA
Australia
VK4KW 4,569,600 3336 140 370
VK4NM 2,786,334 2924 107 247

Guam
AH2R 4,713,839 3575 128 351

Hawaii
NH6V 1,436,960 1794 95 185

Indonesia
YE2A 2,917,350 2466 123 327
YE1K 1,173,432 1411 80 232
YB5C 185,574 469 46 111
YB3ZCR 1,548 61 19 24
*YE1R 30,674 157 31 67
*YC1ZAD 23,643 158 20 51
*YE1ZAL 8,296 51 26 35
*YBØZZD 7,626 129 31 51
*YC1ZAZ 6,893 124 25 36
*YC1ZAH 442 39 7 10

New Zealand
ZL1RQ 647,244 1067 92 142

Philippines
DU1HR 658,896 1184 67 145
DX1MK 623,025 1195 75 150
DX1CW 39,342 234 31 48
*DX3H 143,622 371 58 100
*DX7CA 87,200 409 42 67
*DX1EVM 25,064 210 37 67
*DU1NA 20,336 123 28 54
*DZ1PUP 5,150 47 22 28

SOUTH AMERICA
Argentina
LQØD 3,421,080 3330 117 291
LU8YE 3,177,240 2986 113 302
LO7H 2,948,211 2781 106 293
LU3DX 2,541,964 2714 102 260
LU2WA 814,338 1318 82 199
LU4KC 5,088 86 22 26
*LU1DBQ 60,507 368 34 49

Bonaire
PJ4K 9,447,988 5882 134 444

Brazil
PY2NA 6,310,746 4166 128 415
PQ5B 5,506,200 4140 119 385
PR7AA 3,048,416 2363 119 377
PP5JN 1,040,385 1909 58 157
ZW3A 811,520 1338 82 174
PR2D 677,040 989 77 196
*ZW8T 2,158,650 2069 99 306
*PR1T 1,493,172 1681 95 247
*PV2B 23,100 218 23 37
*ZV4ØMS 14,028 150 34 50
*PY3AA 1,665 32 18 19

Chile
*3G1D 618,957 984 94 197
*CE6TRA 240,294 713 60 114

French Guiana
FY5KE 18,259,920 7801 177 663

Paraguay
ZP6A 2,934,048 2954 102 314

Trinidad & Tobago
9Y4W 10,676,238 6573 135 443

Uruguay
CX5BE 1,480,960 1864 93 227
*CW1DC 630,762 1251 70 139

MULTI-OPERATOR TWO TRANSMITTER
UNITED STATES
KC1XX 13,350,755 6967 158 579
K2LE 5,316,135 3343 127 478
WW4LL 5,096,979 3484 132 475
K9CT 4,207,896 2898 140 476
N7AT 2,606,752 2679 124 340
K2AX 2,274,171 1740 110 419
WA3EKL 2,063,000 1721 109 391
W2CG 1,749,956 1403 102 359
K7ZS 1,389,214 1466 107 279
WB2P 1,373,625 1081 104 391
NØIJ/9 1,107,336 1046 110 334
K3CCR 1,051,650 1015 84 326
W1FM 956,955 916 85 308
NØMA 946,330 1077 94 291
K7JR 604,623 783 99 228
W7VO 600,642 803 90 204
WA8MCD 553,784 691 82 237
N2CW 478,368 738 64 224
W1AF 286,550 400 63 212
W8DGN 175,798 354 56 147
W3UC 125,800 277 44 141
W4CAR 64,970 186 46 100
K5LRW 57,200 195 55 88
WØUJ 54,460 210 45 95

NORTH AMERICA
VE3JM 9,762,500 6475 126 499
6Y4T 7,511,859 7034 126 387
HI3K 7,077,618 6835 114 372
VP5W 2,119,397 2983 84 259
VE6FI 1,191,360 2186 81 191
VE7SCC 1,007,680 2173 70 165
VE9FI 644,602 931 62 225

AFRICA
CN2R 26,206,313 11739 167 620
ZS2PE 97,439 438 42 97

ASIA
JT5DX 10,481,552 7023 142 510
RWØA 9,980,586 6125 145 548
B9K 5,514,585 4420 134 429
A5A 2,871,050 2641 103 352
A61HA 2,281,960 2459 76 280
A61EK 1,898,690 2133 73 289
HSØAC 782,952 1458 90 233
EP2C 437,330 917 43 159
XU7AJA 263,389 961 61 136
JA1YPA 142,163 348 48 113
JA1ZGP 64,200 278 51 69
JA2YGP 8,512 77 25 31

EUROPE
ES9C 14,124,964 9780 168 700
9A7A 13,087,800 8173 170 655
EC2DX 12,330,400 8670 165 635
HG7T 11,266,072 7734 170 668
YT5A 8,537,892 6807 166 615
SN8B 7,504,722 5812 156 582
PI4COM 7,448,592 5887 145 551
IK2YCW 7,226,394 5829 153 561
SJØX 6,523,572 6242 134 543
S51A 6,237,900 5186 147 570
DP7D 5,960,034 5028 135 531
LZ5R 5,886,566 5607 146 540
EI9E 5,838,855 5894 121 484
II2S 5,181,923 4881 142 525
DAØWRTC 4,741,121 3698 155 582
CR6P 4,726,080 5297 116 431
GM2T 4,618,310 5017 118 447
GJ2A 4,359,744 4609 119 457
DM4X 4,104,576 3576 140 532
G5O 3,642,096 3632 108 444
EF3T 3,402,980 3780 119 426
IK7YTT 3,386,768 3158 134 482
IO9A 3,371,025 3671 109 416
9H6A 3,254,040 4694 105 447
CR5T 3,182,504 3428 115 453
DP6A 2,966,565 2930 141 524
GM6NX 2,821,500 3174 115 435
EE2K 2,275,896 2908 106 377
ED7B 2,014,880 2374 102 388
PI4M 1,907,616 2834 104 392
PA6AA 1,764,447 2917 106 387
OE5T 1,669,910 2448 112 358
LA4C 1,629,363 2632 94 373
IO1C 1,193,280 2627 86 266
PAØAA 1,113,304 1797 94 345
DM4M 1,071,657 1419 114 399
ISØXDA 814,590 1407 90 341
OE3A 758,849 1350 96 307
4U1ITU 742,224 1786 67 269
GW9J 650,848 1497 67 285
IQ5PO 643,626 1105 90 321
IIØM 584,610 1174 75 315
E7PD 413,440 1237 51 205
ED1L 199,234 618 54 212
OM6H 154,440 566 48 172
EB3AN 105,570 516 50 157
EA4RCH 49,920 360 34 122
ED2C 31,977 249 34 119
GB2GP 14,405 195 17 50

OCEANIA
AHØBT 7,166,356 5107 138 370
AHØK 7,099,948 5026 144 382
KH7CW 6,287,272 4972 139 327
VK9CZ 5,193,552 3867 117 375
ZM4T 2,629,781 2872 100 243
V84CSB 67,221 302 38 61

SOUTH AMERICA
PZ5K 23,541,502 10956 165 613
PJ4G 17,801,244 9182 159 549
PX2A 13,941,148 7605 150 526
PJ4Q 13,356,636 7576 140 496
LT1F 12,425,000 7309 147 478
ZV5O 8,321,352 5950 125 412
CB1H 2,821,546 2647 111 308

MULTI-OPERATOR MULTI-TRANSMITTER
UNITED STATES
K3LR 19,187,946 9500 174 648
W3LPL 14,193,245 7468 156 599
K1TTT 8,799,840 5412 146 533
K1KI 4,399,488 2713 127 481
K1KP 3,314,400 2693 106 374
WØAIH 3,193,344 2655 133 434
N5AA 2,340,700 1892 133 393
NE3F 2,099,512 1591 116 420
W1CSM 1,156,965 1043 90 321
KØBBC 286,612 349 73 243
W9YB 35,934 168 34 79

NORTH AMERICA
V26B 14,638,603 9052 153 560
KL7RA 3,668,592 4385 105 263
VE5PV 1,377,090 1999 89 232
VE7RAC 565,364 1749 58 115
VC3C2C 488,943 983 70 203

AFRICA
CN3A 34,131,377 13872 176 713

ASIA
A73A 19,654,817 9440 164 633
A44A 16,487,691 8394 158 623
JE1ZWT 2,737,644 2245 136 347
JA7YRR 1,948,885 1986 120 289
BY7SH 164,190 585 68 127
E27AZ 48,262 274 39 79
9M4CHS 13,737 116 21 36
JA2YCK 3,672 71 29 39
E2ØAE 1,188 36 18 26

EUROPE
M6T 13,456,575 10027 162 663
DFØHQ 13,414,101 9226 171 716
LZ9W 12,984,558 9939 171 680
CU4DX 11,937,484 9379 142 534
OT5A 8,436,939 7651 154 563
PI4CC 7,782,994 6823 147 586
RY6Y 4,893,508 4680 154 579
DP6T 4,303,000 4558 133 529
LZ7A 3,258,203 4168 136 505
YU1EW 941,235 1510 90 303
LA4O 723,477 1816 66 283
DR3W 459,459 893 84 267
F4KJQ 407,160 844 79 281
PI4D 350,460 1024 62 208
SE8W 256,000 740 61 195
IU2GLK 181,896 751 63 249
MØSQC 177,954 661 44 179
MØHFC 165,208 628 44 170
M3P 106,288 409 37 145
SP1KIZ 86,457 381 47 132
OZ4EDR 80,136 306 48 141
IQ3QU 35,862 240 34 95

OCEANIA
KH6J 10,063,521 7113 157 346
DX9M 395,764 1106 63 100
9M6SDX 31,084 189 29 47
VK2BV 11,534 93 33 40
YB3ZBD 2,064 41 20 23

SOUTH AMERICA
PJ2T 18,646,320 10591 149 511
HCØE 6,853,375 5253 119 384
ZY2A 2,082,918 2364 90 269

ROOKIE
NORTH AMERICA
United States
District 1
WM4CH 35,168 126 29 83
K1DVL 2,668 39 9 20
*KC1ELF 22,698 86 29 68
*K1ECU 11,322 63 23 51
*AB1YK 10,880 70 19 45
*W1AKI 6,210 53 18 36
*W1FOY 1,820 22 9 19
*W1FEB 322 11 5 9
*KC1FYB 234 12 4 5

District 2
KD2IWW 126,100 255 48 146
K2RYD 92,184 220 47 120
KD2NXM 8,307 73 23 48
*W2XK 114,774 295 27 114
*K2MV 35,310 123 31 76
*AC2VE 8,694 61 24 45
*K2KU 2,320 41 19 21
*KD2JQG 30 3 2 3
**W7BAK 700 15 8 12

District 3
W3XOX 132,111 291 53 136
K3ABE 9,996 82 14 37
*K3JAG 14,094 86 29 52
*KC3IVS 4,560 36 16 32
*KC3EWJ 3,854 33 14 33
*AC3BQ 1,904 24 13 21
*KC3JUZ 350 9 7 7
*K4VDX 140 5 5 5

District 4
K4AKK 289,712 419 77 227
N4VLK 31,124 139 43 81
K4AFE 17,661 79 28 59
KX4BE 960 17 9 15
W3JRD 805 15 11 12
*KM4SII 222,642 396 51 166
*NN2T 102,510 242 64 137
*W4BBT 49,790 173 38 92
*W4LID 23,892 142 17 49
*KM4RKT 23,072 96 37 66
*KB8ABJ 16,290 72 29 61
*KN4EWI 15,870 86 19 50
*KM4ODS 15,738 72 27 59
*AE4TI 13,728 86 27 51
*KK4BZ 11,560 147 9 25
*KM4ZMW 7,546 48 30 47
*N4JBN 7,128 48 20 34
*KZ4M 2,508 35 17 27
*W1MKW 1,665 23 14 23
*KM4WII 1,581 27 12 19
*W4JOR 1,007 19 7 12
*KM4SYN 391 9 8 9
*K4KGM 289 10 7 10
**N4IHS 468 13 4 8
**KNØBBY 6 1 1 1

District 5
K5ABB 3,283 45 29 38
KG5SER 1,980 32 18 26
*AA5DX 31,242 134 43 80
*NQ5M 27,192 135 30 58
*KG5KRZ 14,720 73 29 51
*K5LGX 11,398 73 35 47
*KD2KW 8,601 67 27 34
*W5ANE 8,556 66 22 40
*K5SVV 8,109 61 22 31

*AG5DB	7,930	57	27	38
*KG5IQU	7,740	50	20	40
*W5YYA	2,080	29	11	21
District 6				
W6MOB	**40,576**	**142**	**48**	**80**
W6NYA	6,216	74	15	27
***W6SFI**	**5,546**	**45**	**24**	**23**
*W6ZAR	4,326	37	14	28
*N6REK	2,006	28	15	19
*AE6PL	840	19	11	13
*N6DBI	527	17	8	9
*N6SAC	338	17	6	7
*KK6VZE	160	8	5	5
District 7				
WA6NFJ	**27,224**	**118**	**34**	**49**
***K7HKR**	**50,310**	**160**	**49**	**80**
*AA7EA	1,870	45	17	17
*W7FZY	361	17	11	8
*K7VNC	156	6	6	6
*WA7JBM	96	10	8	8
*K7EEX	48	9	6	6
*KI7MAT	40	4	3	2
District 8				
AE8U	306	12	8	9
***K8PJK**	**3,157**	**38**	**17**	**24**
*XE8DNV	2,080	31	15	25
*W8AHT	988	19	11	15
*XE8BNE	697	14	5	12
*N5MKY	512	18	14	18
*NA8B	330	13	10	12
*KE8EAS	168	8	5	7
District 9				
K9GWS	**20,739**	**105**	**36**	**57**
***KC9PKF**	**8**	**2**	**2**	**2**
District Ø				
KEØCRP	**23,051**	**105**	**29**	**60**
KJØI	5,824	45	24	32
***KEØITC**	**14,080**	**85**	**31**	**57**
*KEØJFZ	4,998	51	18	33
*WØWTF	198	7	5	6
*WØDDP	161	15	4	3
Alaska				
***KL7TH**	**8,610**	**103**	**20**	**22**
Canada				
District 1				
***VA1QLE**	**2,475**	**39**	**10**	**23**
District 2				
***VE2KTA**	**42,718**	**186**	**28**	**78**
District 3				
***VE3MZD**	**99,000**	**193**	**51**	**149**
*VA3TTB	71,995	237	34	87
*VE3XKZ	26,290	128	34	76
*VE3SCN	16,926	88	25	53
*VE3MJD	12,012	68	28	50
*VA3ASE	7,680	75	22	42
*VE3RXH	312	14	6	6
*VA3TTZ	104	10	7	6
*VE3ISG	42	3	3	3
District 6				
VE6IKR	**572**	**16**	**6**	**7**
***VE6FRD**	**1,323**	**29**	**14**	**13**
District 7				
*VE7XNC	175	29	16	19
Cuba				
***CM8NMN**	**136**	**7**	**4**	**4**

AFRICA

Canary Islands

EA8DET	**186,202**	**495**	**42**	**115**
Mozambique				
C93PA	**235,620**	**447**	**49**	**149**
South Africa				
ZS2MAC	**1,320**	**20**	**9**	**13**

ASIA

Asiatic Russia

District 9				
RM8L	35,280	145	18	66
Asiatic Turkey				
***TA3ODG**	**3,680**	**49**	**11**	**29**
China				
***BG9NJY**	**21,251**	**155**	**21**	**58**
*BI4WOP	1,525	41	11	14
India				
VU2ZMK	**62,514**	**217**	**42**	**96**
***VU3ESV**	**61,490**	**235**	**42**	**101**
*AT2FI (OP:VU2YQ)	45,990	183	40	86
*VU3WBB	14,904	171	20	34
*VU3OXH	260	22	11	15
*VU3XIO	2	1	1	1
**VU3YPP	98	6	3	4
Japan				
District 1				
JA1PLL	1,518	23	7	15
***JI1NZA**	**4,392**	**55**	**16**	**20**
*JI1XOH	576	16	7	11
District 2				
*JS2DLR	3,645	35	20	25
District 6				
****JS6TQS**	**72**	**4**	**3**	**3**
District 7				
JP7PYI	**14,972**	**91**	**34**	**42**
District 8				
*JH8IYN	800	16	9	11
Singapore				
***9V1OW**	**7,191**	**89**	**21**	**26**
Taiwan				
BW/JP3PZG	**225**	**32**	**5**	**4**
West Malaysia				
***9W2SAF**	**16,120**	**208**	**15**	**25**
*9W2LRN	4,625	78	13	24
*9W2JMW	1,935	60	5	10
*9W2VPZ	441	20	3	6

EUROPE

Austria

***OE1GAQ**	**33,284**	**307**	**25**	**81**
*OE9SEV	14,632	250	11	48
**OE1ABV	130	17	2	8
Balearic Islands				
***EA6AMM**	**97,016**	**306**	**45**	**136**
Belarus				
***EW7BA**	**267,850**	**728**	**63**	**212**
*EU1ADH	21,080	186	21	64
Belgium				
***ON3WM**	**78,196**	**348**	**42**	**131**
*ON3PGL	31,008	204	28	86
*ON5IA	9,169	164	8	45
*ON3PH	1,794	31	16	23
Bulgaria				
LZ4AA	24,753	147	27	84
Corsica				
TK4RB	**631,736**	**1280**	**86**	**303**
Croatia				
***9A3EJZ**	**5,671**	**53**	**19**	**34**
Denmark				
***OZ1KIH**	**2,552**	**61**	**20**	**38**
England				
MØVCB	**304,794**	**677**	**65**	**222**
***MØTWB**	**121,326**	**467**	**44**	**175**
*2EØEFS	48,246	388	21	108
*MØYRX	14,807	108	18	49
*M6YTU	12,212	99	21	50
*2EØIQW	10,270	115	20	59
*2EØLYF	4,635	79	13	32
*2EØHCL	910	27	10	16
**M6SSV	7,500	90	19	56
**M6TTZ	49	7	3	4
Estonia				
****ES1TAR**	**3,318**	**78**	**9**	**33**
European Russia				
District 1				
***R1ZM**	**24,852**	**211**	**24**	**90**
District 3				
R2DS	**69,696**	**371**	**38**	**138**
***R2SAZ**	**73,060**	**203**	**71**	**189**
District 4				
*RW4HD	95,693	251	67	154
***UB4RDB**	**19,425**	**147**	**27**	**78**
*R4PCI	2,068	53	11	33
Finland				
***OH1XFE**	**176,484**	**503**	**52**	**179**
*OH5Y	143,060	557 (OP:OH5EUY)	50	180
*OH6UX	20,868	121	32	79
*OH5BK	10,640	124	19	61
France				
F4HRM	**359,060**	**706**	**61**	**199**
*F4HNP	18,810	163	22	73
***F4HSE**	**7,897**	**108**	**14**	**39**
*F4HWL	3,034	100	6	35
*F4HXC	640	12	10	10
*F4HQO	400	14	5	5
Germany				
DK6MP	**642,200**	**1042**	**87**	**293**
DK5RL	209,884	490	67	207
DM1MF	28,634	122	44	95
DL7NV	23,072	184	29	83
DL9CP	17,336	96	30	58
DJ9YL	14,344	104	29	59
DL8BFV	3,087	33	21	28
***DO7EE**	**23,766**	**174**	**26**	**76**
*DO5HCS	13,160	132	21	49
*DO9CW	5,986	107	13	28
*DF4JM	4,025	91	6	29
*DM4DS	3,526	52	13	28
*DO1MPR	3,116	76	23	59
*DO7DOC	1,800	80	8	37
*DO3GE	1,720	35	12	28
*DL7LL	1,632	40	11	23
*DF2GL	1,107	38	10	17
*DM1MA	1,088	34	10	22
*DF1MB	2	1	1	1
Ireland				
***EI5HZB**	**5,934**	**69**	**19**	**27**
Italy				
IU8HEP	**113,126**	**326**	**56**	**173**
IU2DUP	19,520	161	17	63
IU4FIT	17,956	180	16	51
IU2DXF	11,872	97	21	35
***IU4HMY**	**133,749**	**452**	**54**	**177**
*IU8FUN	103,383	390	45	144
*IU1GNA	74,496	332	41	153
*IU2GGD	43,292	220	34	103
*IU1FIB	34,408	183	38	98
*IU1JCZ	30,368	269	18	86
*IN3GYN	29,430	199	31	78
*IU4HRJ	29,252	259	36	106
*IU1FSL	17,150	155	27	71
*IU6FUB	15,794	110	27	79
*IU5ICR	8,932	172	10	48
*IU5HES	7,128	97	23	49
*IU4FNQ	3,185	55	15	34
*IU2GDC	3,015	33	18	27
*IU2HEE	1,380	24	10	20
*IU8IZA	528	15	10	14
*IU3GJD	280	10	5	5
*IU4DTV	120	11	5	10
**IU2IGX	7,973	103	13	54
Kaliningrad				
*UA2K	5,811	61	18	21
*R2FAT	510	31	13	21
****UB2FBY**	**7,906**	**109**	**16**	**51**
Netherlands				
***PA9S**	**242,795**	**517**	**66**	**179**
*PD9MK	16,200	178	16	65
*PD5ML	14,532	135	19	65
*PD5ISW	5,733	117	14	49
*PD5WSQ	4,950	90	12	38
*PC1Y	1,443	20	17	20
*PI4DHG	1,360	21	16	18
		(OP:PD7BDN)		
*PD4BER	460	16	8	15
*PDØARY	180	22	6	14
Norway				
LB1AH	**773,816**	**1217**	**85**	**309**
LA6SK	1,295	23	13	22
***LA7IJ**	**8,142**	**116**	**14**	**45**
Poland				
***SP5WIT**	**137,313**	**523**	**48**	**161**
*SQ9PUW	31,510	227	31	106
*SQ3MIS	19,594	180	26	75
*SQ4FDK	16,008	159	21	66
*SQ3ESP	14,847	132	29	72
*SQ6PTR	13,202	124	23	59
*SP9SMD	10,922	182	19	67
*SQ5T	7,008	102	16	57
*SQ9GOL	6,480	74	16	32
*SQ8VPS	6,438	133	13	24
*SP2AWJ	6,370	73	20	45
*SP6SNJ	5,518	96	8	54
*SP5MMJ	3,572	102	8	30
*HF95OSP	162	16	7	11
*SQ5MW	105	15	7	14
**SN9MT	2,014	55	9	29
**SP3DBM	120	16	2	8
**SO6XL	15	3	2	3
Romania				
***YO7MSJ**	**3,894**	**77**	**17**	**49**
*YO3IWZ	2,961	67	15	32
Scotland				
***MMØRYR**	**1,833**	**56**	**9**	**30**
Serbia				
YU3EYL	**7,360**	**106**	**19**	**61**
***YU3EEA**	**58,026**	**592**	**20**	**94**
*YU4NSL	825	31	10	23
*YU4LED	350	20	3	11
*YU4MLL	100	21	9	16
*YU4DWW	22	10	3	8
**YT5DEY	52,920	306	32	115
**YU4MOM	336	20	3	13
**YU4JAN	108	11	3	6
**YU3VIP	90	15	5	10
Sicily				
***IT9GDN**	**30,528**	**133**	**36**	**108**
Slovak Republic				
***OM1DR**	**16,066**	**273**	**10**	**48**
*OM8ADM	15,336	187	14	57
**OM6AMR	630	30	4	17
Spain				
***EA4GSL**	**111,735**	**417**	**42**	**149**
*EA4GUU	52,311	229	44	115
*EA4GUW	49,170	244	32	117
*EA4GYR	22,110	195	37	97
*EA1ITX	7,056	71	20	52
Sweden				
SM5VFE	4,992	47	18	34
Switzerland				
HB9FWO	**6,789**	**52**	**28**	**45**
HB9GNB	1,505	27	19	24
HB9GPC	176	6	5	6
***HB9FXU**	**9,660**	**117**	**19**	**51**
*HB9FZB	775	29	7	18
*HB9/DK6PB	352	92	9	35
Ukraine				
***UR3QTN**	**28,672**	**216**	**27**	**85**
*UR6LF	156	14	4	8
**UT5WAA	2,244	75	6	27
Wales				
**MW6KGY	4,712	78	18	44

OCEANIA

Australia

***VK3TNL**	**459**	**11**	**9**	**8**
Christmas Island				
***VK9VKL**	**15,488**	**69**	**33**	**55**
Hawaii				
***KH6DH**	**4,140**	**48**	**21**	**24**
*WH6FAM	1,080	22	12	12
Indonesia				
YC4SMD	**1,386**	**44**	**7**	**11**
***YG7SPN**	**23,322**	**213**	**21**	**48**
*YD8UXV	11,960	101	20	32
*YF3DGO	11,328	82	25	39
*YD9YSS	11,036	127	22	40
*YD1IMK	3,354	92	17	22
*YG0TUR	2,366	35	10	16
*YD4GBN	1,794	43	11	15
*YG3DGQ	1,449	34	9	14
*YD2DPK	1,404	27	11	15
*YD8UYJ	1,140	30	8	11
*YDØRLX	735	46	5	10
*YD9ATS	713	25	9	14
*YG3EKK	496	12	8	8
*YD2CAA	494	21	8	11
*YG3EOY	399	18	11	10
*YD7MIB	374	10	8	9
*YG3DKZ	351	18	6	7
*YBØCBN	342	32	8	11
*YG3EDN	342	12	8	11
*YG3DGP	336	10	6	6
*YDØMAT	330	13	4	6
*YD2CAB	171	7	4	5
*YD7MHZ	171	8	4	5
*YG3EZN	150	5	5	5
*YG3EQR	144	6	4	5
*YDØRXA/5	112	12	3	4
*YD1FZM	60	12	1	3
*YG3EDM	54	3	3	3
*YD2DFD	24	2	2	2
*YG3EJV	22	10	4	7
*YG3EBO	9	5	1	2
**YF3WIL	3,492	54	14	22
**YG3EQC	6	1	1	1
**YG3EOQ	0	0	0	0
New Caledonia				
FK4QX	6	1	1	1
Philippines				
DV1YAI	**49,677**	**362**	**35**	**52**
***DV7DYH**	**8,745**	**81**	**24**	**31**
*DV7FCC	2,457	62	10	17
*DV7DYJ	1,870	53	8	14
*DV7DTX	1,722	80	17	24
*DW1XNG	720	38	6	12

SOUTH AMERICA

Argentina

***LU9WNZ**	**2,072**	**70**	**10**	**18**
*LU1XP	360	65	17	23
*LU8DCF	150	10	7	8
Brazil				
***PV8DC**	**32,996**	**207**	**21**	**52**
*PU4ENY	21,120	181	17	47
*PY2FRQ	10,904	94	23	35
*PU5YSV	3,182	71	13	30
*PU2YHK	2,272	49	12	20
*PV8AJ	1,240	58	12	19
*PU5RTM	378	32	10	11
*PU8UMR	350	104	12	23
*PU1JMK	105	19	7	8
**PU8RFL	63	30	3	4

CLASSIC

NORTH AMERICA

United States

District 1

KQ2M	**2,367,480**	**2498**	**82**	**280**
W1WEF	921,633	976	84	277
K1LU	207,835	383	48	163
W1FQ	23,463	101	28	71
W1GXZ	15,433	87	17	44
***K1HT**	**353,438**	**485**	**64**	**198**
*K1BX	274,950	422	50	185
*K1VSJ	208,832	363	48	160
*N1DC	126,040	266	54	130
*K1IX	118,161	273	46	125
*KC1SS	23,142	109	22	65
*K1JSM	19,425	96	19	56
*WA1OTZ	8,509	56	22	45
*W1OHM	2,666	35	8	23
*K1XS	2,542	25	16	25
*KG1RY	792	18	10	14
*W1VCM	480	11 (OP:N1WKO)	9	11

District 2

KD2RD	**1,513,673**	**1490**	**79**	**282**
W2LU	215,138	380	68	186
N2JJ	190,688	350	44	158
NN2NN	26,125	117	22	73
W2RR	19,166	208 (OP:WA2AOG)	12	25
N2CG	15,810	76	32	53
***N2GA**	**320,320**	**524**	**46**	**174**
*AC2RL	193,536	326	58	166
*K2ZR	89,958	227	50	124
*N2HMM	73,002	212	37	101
*W2MKW	24,064	100	32	62
*K2DLS	10,366	62	26	45
*N2IVN	7,812	47	21	42
*KJ6GHN	5,808	49	14	34
*KD2GXL	5,625	46	14	31
*K2SZ	4,840	52	11	33
*NV2K	2,684	33	16	28
*K2HVE	312	11	4	9
*KA6WBQ	42	3	3	3
**K2YGM	78,110	210	36	110
**K2BCM	6	1	1	1

District 3

W3LL	**1,767,768**	**1450**	**104**	**334**
AA1K	1,692,288	1485	95	321
K3TC	511,280	568	75	257
K1BZ	300,575	427	73	202
KY3W	240,240	391	58	173
W3BGN	88,032	450	18	78
N3TWM	67,734	188	46	96
***W3MMM**	**252,572**	**404**	**54**	**179**
*WA2VUM	97,461	266	34	119
*WS3C	76,788	203	45	113
*W6YTG	40,020	139	33	82
*AI1W	27,690	144	18	60
*AI3Z	22,080	100	29	67
*K3JD	15,440	76	26	54
*AB3JF	15,368	82	20	48
*N3OJL	12,284	67	26	48
*AJ3DI	1,786	28	16	22
*KG4USN	567	15	8	13
*N3MYB	289	10	7	10
**KZ3I	4,914	47	11	31

District 4

W4KW	**537,230**	**682**	**79**	**231**
AC4G	501,334	549	85	249
WA3DQS	87,552	251	33	111
W4ANT	52,593	144	45	96
N7KDT	43,554	169	37	82
K4BAI	27,808	121	30	58
N4LZ	23,430	119	18	53
WF4W	18,584	89	30	62
N4ZY	17,754	100	23	43
W2ARP	15,520	92	22	58
WI4MPY	6,901	60	19	48
K4JC	2,546	52	8	11
***K4SXT**	**161,352**	**241**	**68**	**181**
*KC4TEO	159,399	305	54	145
*AI4DB	73,950	197	50	100
*NC4MI	57,785	179	41	86
*WN4AFP	42,126	148	33	86
*WA4EMU	33,448	133	36	77
*AE4M	32,012	124	33	73
*K4FTO	27,499	125	32	75
*KK4WX	24,465	117	36	69
*W5VS	18,732	87	24	60
*WA4IPU	16,848	131	27	51
*WA4PKL	11,765	98	19	46
*KT4FQ	8,832	71	15	33
*W4GFY	7,564	54	23	39
*K4QR	6,400	51	16	34
*K3NP	5,928	56	22	30
*NJ8J	5,876	47	21	31
*NØDIM	5,063	45	22	39
*NV4B	4,896	69	8	16
*NN4RB	4,370	37	18	28
*K4CGA	4,305	59	15	26
*AJ5E	3,960	41	15	29
*N4YHC	3,696	32	19	25
*KE4KVC	2,370	48	8	22
*W4GOT	2,318	28	16	22
*K9DY	880	17	8	14
*KK4RT	483	22	7	14
*AI4UN	210	9	6	8
*K4EOR	48	14	7	9
*K4ME	18	4	3	3
**W4TTZ	1,530	22	13	21

District 5

N2IC	**1,955,766**	**1733**	**123**	**303**
N5AW	1,282,424	1170	106	312
KD5JVV	134,200	265	60	140
WM5Q	119,972	255	53	125
N5KDA	41,296	180	22	67
KM5VI	29,842	177	21	65
K9ING	18,900	105	40	65
N5RMS	2,886	32	12	25
W5CO	676	34	11	15
***NW5Q**	**60,382**	**178**	**45**	**88**
*NN5T	47,092	150	44	78
*KC7QY	32,318	116	41	72
*K5IB	20,169	100	29	52
*W5YBT	11,704	65	31	46
*K5BZI	8,614	57	28	45
*N5LXI	6,298	61	31	36

District 6

NN6DX	**250,920**	**442**	**61**	**144**
			(OP:W1PR)	
K6JAT	186,208	396	64	120
N6JS	136,850	455	57	118
AI6LY	96,855	227	57	108
NC6R	74,087	315	47	92
K6YK	68,040	209	48	78
WA6URY	39,405	136	44	67
N6AJ	25,784	141	33	55
KB6A	4,212	53	17	19
N6XI	630	12	10	11
KR6D	480	13	8	8
***W6ZL**	**47,400**	**220**	**21**	**54**
*KE8FT	44,760	144	51	69
*WB6CZG	26,076	112	44	62
*K6TER	16,686	98	33	48
*AE6YB	15,688	142	17	36
*KE6WC	8,268	55	25	28
*W6WG	5,217	45	21	26
*N6BHX	3,069	48	13	18
*NU6Y	1,029	21	10	11
*AI6IN	989	21	12	11
*NA6NA	160	10	5	5
*KD6GWH	54	3	3	3
*AG6VH	42	10	4	3

District 7

NX1P	**604,920**	**823**	**98**	**186**
KE2VB	96,696	234	59	99
KM6JD	83,948	285	46	78
KB7AZ	73,154	193	52	106
NK7L	40,986	157	46	92
N7XCZ	40,293	142	38	73
W7CAR	30,660	146	34	50
W7KNX	26,491	173	19	40
WG7X	20,250	97	32	58
NF7E	11,532	81	23	39
KH6VM	10,710	82	26	44
N7RK	7,854	72	17	25
N7DK	5,720	45	25	27
N2OML	5,074	57	25	34
***N7FLT**	**52,992**	**211**	**24**	**68**
*W8BFX	42,188	149	40	66
*N7ZUF	36,015	146	32	73
*W7GSV	24,206	103	38	60
*KG7OH	22,705	115	40	55
*K7EPH	18,450	90	37	53
*KNØW	17,864	97	35	53
*W7ZI	16,289	78	34	57
*AA7TV	14,535	72	37	48
*WA7BAM	14,014	88	30	47
*WØBF	13,425	70	35	40
*N7RVD	11,382	110	15	27
*KF7OJA	5,247	64	26	27
*N1RWY	5,104	58	26	32
*N7AME	4,784	47	25	27
*NØKVN	4,400	35	24	26
*K7QA	3,969	59	18	31
*W7OXB	3,825	40	19	26
*WV7S	2,464	33	11	21
*N7MWV	738	15	6	12
*K1AUS	414	23	12	11
*KI7PKL	272	9	8	8
*K7PCB	216	12	5	4

District 8

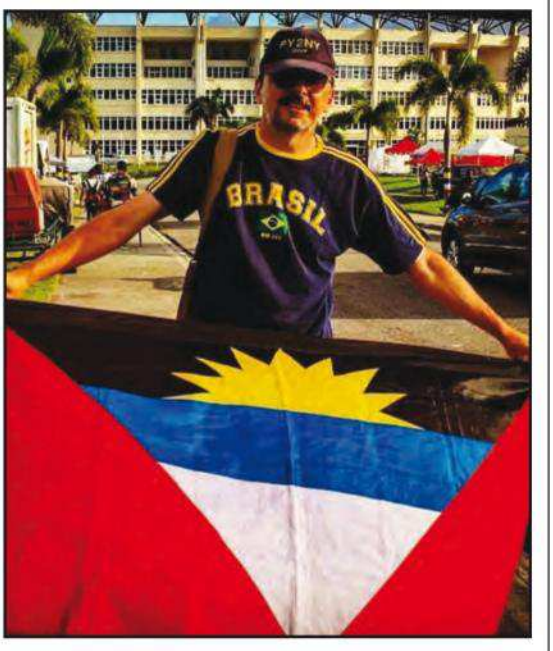
K3ZJ	**63,500**	**182**	**40**	**87**
AA8DC	45,985	196	19	66
***N8II**	**1,009,896**	**1040**	**82**	**266**
*N8MWK	135,056	268	50	134
*N8GLS	116,232	255	43	124
*W8TM	44,764	133	32	92
*N8PPF	36,822	129	41	73
*AF8C	20,400	127	20	55
*K7DR	18,468	88	26	55
*N8SBE	14,880	100	20	42
*K8RGI	13,122	97	31	50
*WA8MXJ	8,052	57	18	43
*K8AJS	5,304	49	8	31
*K8WAY	4,750	43	19	31
*WE8UPJ	4,000	44	22	28
*AC8NP	3,315	39	13	26
*NS8H	494	11	9	10
*AB8XU	425	10	8	9
*AE8TF	425	10	7	10

District 9

W9GT	**395,079**	**610**	**50**	**187**
W9VA	18,827	103	18	49
***W9RF**	**144,358**	**314**	**53**	**125**
*WD9CIR	33,408	131	29	67

*AC9GK	30,935	135	40	75
*KØDZ	30,193	130	40	69
*W9GYK	9,858	82	15	38
*KC9VYX	5,236	52	12	32
District Ø				
N7WY	**401,310**	**599**	**55**	**190**
NEØU	372,842	548	75	202
NØUU	*50,470*	*200*	*30*	*73*
NUØC	37,504	125	45	83
NØFY	30,780	125	24	71
KAØLDG	27,257	110	35	62
NØWRK	15,210	117	20	45
KØVG	924	17	10	12
KIØF	250	58	5	5
***WØETT**	**146,306**	**310**	**62**	**129**
*WAØLJM	32,844	142	32	60
*WA2JQZ	24,934	101	38	53
*KØNR	24,722	100	30	64
*AFØZ	14,430	92	31	47
*KJ5CI	11,346	70	23	39
*KØSCO	9,344	54	29	44
WRØU	*5,782*	*48*	*21*	*28*
*NØEMU	4,320	78	25	35
*NNØJS	962	19	11	15
**NDØC	44,880	143	41	79
**WBØIWG	216	9	5	7
Belize				
***V3A**	**914,628**	**1832**	**73**	**173**
				(OP:V31MA)
Canada				
District 1				
VA1XH	**213,405**	**391**	**47**	**158**
VO1KVT	164,960	424	47	113
VO1BQ	154,960	395	35	114
CG9ZZ	*21,000*	*101*	*19*	*56*
				(OP:VE9ZZ)
***VA1SEA**	**152,460**	**314**	**47**	**133**
*VE1SQ	97,644	253	42	116
District 2				
VA2WA	**3,021,744**	**2883**	**82**	**306**
VE2IDX	985,779	1493	71	218
				(OP:VE3ZF)
VA2LGQ	3,468	43	11	23
District 3				
VE3KZ	**1,422,288**	**1481**	**82**	**275**
VE3CR	406,080	520	63	219
VE3TW	391,811	615	58	193
VE3AD	48,671	149	31	88
VE3GYL	31,255	132	28	67
VE3FTM	*15,678*	*96*	*18*	*49*
***VE3RUA**	**66,096**	**197**	**48**	**96**
*VE3LMS	40,140	178	23	67
*VE3WG	39,625	144	42	83
*VE3RX	36,414	117	43	76
*VA3NW	32,118	132	35	66
*VA3EC	26,307	122	23	56
*VE3LBG	252	10	5	9
District 6				
VE6GD	**8,554**	**84**	**19**	**28**
***VA6AN**	**14,874**	**101**	**33**	**34**
District 7				
VE7BC	**71,554**	**213**	**46**	**87**
CF7XNL	33,228	204	36	42
VE7WGJ	6	4	3	3
***VA7CRZ**	**186,308**	**400**	**62**	**126**
Costa Rica				
TI2CDA	**2,054**	**30**	**9**	**17**
Dominican Republic				
***HI8PJP**	**5,220**	**112**	**7**	**11**
Mexico				
***XE2PDZ**	**1,440**	**61**	**6**	**6**
Puerto Rico				
WP4OFO	*159,840*	*663*	*36*	*75*
***NP4ET**	**140,146**	**416**	**44**	**114**
*KP4JFR	1,501	37	8	11
*WP4WW	1,188	20	8	14
				(OP:KP4JRS)
St. Lucia				
J68GD	**993,475**	**1846**	**66**	**179**
(OP:K9AW)				
U.S. Virgin Islands				
***NP2Q**	**15,756**	**148**	**20**	**32**
Maritime Mobile No. America				
***YL3IZ/MM**	**12,627**	**99**	**17**	**44**
AFRICA				
Algeria				
***7X2JV**	**107,625**	**357**	**21**	**84**
Canary Islands				
***EA8BOA**	**10,252**	**131**	**15**	**29**
*EA8CSB	363	14	3	8
Egypt				
***SU9JG**	**29,376**	**158**	**19**	**49**
				(OP:EA7TN)
Reunion Island				
FR4QK	*6,710*	*53*	*19*	*36*
Maritime Mobile Africa				
***UT5EKF/MM**	**9,798**	**59**	**25**	**44**
ASIA				
Asiatic Russia				
District 9				
RT9S	**2,325,724**	**1859**	**107**	**351**
R8WF	1,508,420	1454	88	291
RZ9YI	228,942	435	67	170
RD9SA	85,995	303	23	82
RO9S	62,055	271	24	81
RV9CQ	25,662	135	25	66
R9CZ	1,380	22	5	18
***RU9AC**	**483,531**	**604**	**77**	**246**
*R8UT	35,490	167	17	61
*R9AAL	16,377	104	30	73
*UA9OMT	15,680	110	16	40
*RX9DJ	1,215	20	8	19
District Ø				
UAØXAK	**43,912**	**281**	**38**	**50**
Asiatic Turkey				
***TA2EJ**	**168,168**	**390**	**36**	**132**
**TA7AGL	663	19	5	12
China				
***BG8INK**	**45,900**	**226**	**24**	**66**
*BG8IL	25,600	143	23	57
*BG5TOX	8,900	220	9	11
*BG5NKC	735	19	9	12
*BH4LFG	140	14	5	5
Cyprus				
H2T	**3,572,603**	**3221**	**81**	**316**
				(OP:5B4XF)
Georgia				
4LØA	**3,920,940**	**3424**	**86**	**325**
				(OP:4L4WW)
India				
VU2CVS	**7,938**	**56**	**19**	**44**
VU2UPX	1,440	46	15	30
***VU2DCC**	**32,219**	**126**	**32**	**69**
*VU2KWJ	7,812	74	23	40
*VU2JOS	6,392	79	29	39
*VU2BL	1,620	46	16	29
VU3NPI	*648*	*22*	*13*	*14*
*VU3LMS	464	21	13	16
VU2NEP	*119*	*10*	*3*	*4*
*VU3YJB	70	10	5	5
*VU2JFA	12	3	2	2
*VU2JFB	2	1	1	1
*VU3JFE	2	1	1	1
**VU3SIO	144	7	6	6
Japan				
District 1				
JE1RXJ	**202,522**	**436**	**76**	**142**
JA1DCO	195,000	318	93	167
JA1CRJ	47,601	152	52	77
JA1GVM	36,180	134	38	70
JA1NFD	24,912	146	22	50
JH1CTV	12,920	100	34	51
JI1NIK	4,272	51	21	27
JA1TEG	240	11	3	7
***JS1KKY**	**222,072**	**406**	**76**	**152**
*JM1UTT	85,800	222	61	104
*JJ1KZZ	12,483	79	21	36
*JH1GLJ	9,537	84	18	33
*JHØROS/1	4,860	49	17	28
JA3WNJ/1	*3,672*	*53*	*14*	*22*
*JH1EJB	2,640	49	21	27
*7L1DST	2,240	30	13	19
*JH1HHP	1,431	21	13	14
*JA1GZK	1,044	20	8	10
JK1EXF	*836*	*14*	*9*	*13*
*JE1SPY	714	28	8	9
JL1LGX	*589*	*13*	*9*	*10*
7L4IKF	*494*	*16*	*7*	*12*
*JH1RDU	288	11	9	9
*7L2DOP	209	7	5	6
District 2				
JA2JWH	**63,420**	**211**	**58**	**93**
***JA2KKA**	**10,004**	**74**	**23**	**38**
*JR2FJC	9,537	70	17	34
*JR2AAN/2	9,360	74	19	33
*JE2BOM	1,104	18	11	13
District 3				
JA3AER	**97,544**	**250**	**67**	**111**
JN3QNG	33,695	142	50	65
JA3QOS	18,468	102	31	50
***JL3RNZ**	**279,542**	**572**	**68**	**138**
*JP3KPJ	2,821	41	11	20
*JG3EHD	40	4	4	4
District 4				
***JA4TUJ**	**12**	**2**	**2**	**2**
District 5				
JA5FDJ	**377,578**	**1008**	**35**	**107**
District 7				
JA7QVI	**226,175**	**1025**	**29**	**54**
JA7VEI	75,972	186	57	99
JG7AMD	14,430	109	21	44
***JA7HYS**	**147,784**	**328**	**70**	**126**
*JA7KQC	20,412	75	46	62
*JE7LHT	6,431	45	19	40
*JM7WWH	16	2	2	2
District 8				
***JK8PBO**	**924**	**18**	**10**	**12**
District 9				
***JA9EJG**	**8,460**	**65**	**26**	**34**
District Ø				
***JRØDZH**	**12,006**	**77**	**31**	**38**
Kazakhstan				
***UNØLM**	**23,358**	**174**	**10**	**41**
Republic of Korea				
HL2ZDA	**478,020**	**990**	**82**	**175**
				(OP:JH4RHF)
Sri Lanka				
4S7BHG	*678,015*	*1000*	*75*	*210*
Taiwan				
BX8AAD	*4,264*	*44*	*23*	*29*
***BW/JL3RDC**	**2,200**	**85**	**13**	**12**
Thailand				
***E2ØNGF**	**23,616**	**187**	**21**	**51**
West Malaysia				
***9M2AIM**	**128**	**8**	**3**	**5**
EUROPE				
Aland Islands				
***OFØRJ**	**3,264**	**63**	**13**	**38**
				(OP:OHØRJ)
Austria				
OE5WHN	*75,852*	*281*	*46*	*126*
***OE4NKB**	**18,645**	**154**	**29**	**84**
**OE5HIL*	*520*	*16*	*9*	*11*
Balearic Islands				
***EA6SX**	**462**	**22**	**4**	**18**
Belarus				
EU3AA	**11,625**	**111**	**17**	**58**
***EW6M**	**20,930**	**282**	**15**	**55**
*EU1EU	11,020	131	16	60
EW7A	*6,942*	*74*	*13*	*26*
Belgium				
OR4T	**7,504**	**72**	**19**	**37**
***ON4CT**	**167,960**	**363**	**65**	**156**
*ON6AT	100,192	353	47	155
*ON3SAT	92,421	374	50	139
**OT4R*	*10,836*	*137*	*16*	*47*
Bulgaria				
LZ7J	*200,900*	*526*	*61*	*184*
				(OP:LZ1CDJ)
LZ5DB	**6,650**	**106**	**16**	**34**
*LZ8Z	10,160	99	20	60
				(OP:LZ2HT)
*LZ7MM	6,751	103	12	31
*LZ4SU	2,436	26	19	23
***LZ1DM**	**21,584**	**225**	**15**	**61**
Croatia				
9A3B	**122,136**	**1327**	**14**	**70**
				(OP:9A2VR)
9A1AR	73,710	910	11	67
***9A3BSE**	**36,112**	**197**	**32**	**90**
*9A1EA	12,798	86	28	51
*9A3DOS	12,166	96	27	50
*9A2VX	8,321	113	12	41
*9A6DZ	4,050	45	20	30
*9A3CJW	2,772	64	8	36
**9A6BMJ*	*868*	*25*	*10*	*18*
***9A4OP*	*50,213*	*295*	*33*	*116*
**9A1DD	3,744	30	20	28
Czech Republic				
OK4NN	**47,846**	**237**	**29**	**65**
***OK2TC**	**69,080**	**385**	**34**	**123**
*OK1PMA	59,892	397	28	110
*OK2VV	36,549	200	37	94
*OK2IH	36,156	203	34	104
*OK2BEN	21,060	136	36	81
*OK2HBR	18,113	316	9	50
*OK7PY	6,248	138	7	37
*OK1TVL	3,080	52	17	38
**OK6OK	4,836	124	7	32
**OK1LV	4,060	73	10	19
**OL3R	374	18	5	12
				(OP:OK1VWK)
Denmark				
OZ7EA	**35,090**	**174**	**36**	**85**
OZ3SM	13,464	123	24	78
***OZ8CT**	**119,853**	**498**	**41**	**152**
*OV1RR	19,602	104	34	87
				(OP:OZ1HHH)
*OZ1LFI	16,520	219	10	49
*OZ1D	12,213	78	25	44
*OZ5DX	1,581	36	6	11
England				
G6T	**285,768**	**724**	**56**	**160**
				(OP:G4MKP)
G3WZD	138,516	453	43	151
G6GLP	111,888	336	43	146
G4IUF	106,074	259	49	164
MØRBE	97,559	382	40	141
M4J	16,416	331	9	45
				(OP:GØDVJ)
M1DDD	12,675	160	11	54
MØHHG	6,014	110	15	47
***M1U**	**621,569**	**1075**	**79**	**270**
				(OP:MØUTD)
*M4M	157,718	534	46	168
				(OP:MØPNN)
*MØACM/P	94,245	354	41	142
*G4NBS	70,144	354	29	99
*G8ZRE	65,469	345	34	123
*GØRAH	38,325	351	17	58
*G8GHD	35,696	189	24	73
*MØAUG	33,024	213	23	63
*MØP	32,860	171	33	91
				(OP:MØRYB)
*GØBBO	25,122	211	22	84
*G3YRZ	22,104	234	16	56
*G1EIX	17,177	137	26	63
*MØKED	15,980	109	26	59
MØGVZ	*13,674*	*109*	*24*	*62*
*G3YZO	13,064	140	22	70
*MØOSA/M	11,772	102	17	37
*G4BEE	10,530	83	22	56
G5BBL	*10,428*	*101*	*23*	*56*
*GØOFD	8,991	115	17	64
*GØMCV	8,968	93	18	58
*M2E	8,046	126	11	43
*G1M	3,570	73	9	25
*MØLTE	2,343	60	6	27
G3XYF	*528*	*11*	*11*	*11*
*M5Z	496	27	5	11
				(OP:JK3GAD)
*GØNVN	168	14	3	11
**MØJBA	3,608	105	8	33
**GØBWG	2,279	56	9	34
Estonia				
ES6RW	**2,943,738**	**3077**	**130**	**419**
				(OP:ES5RW)
ESØIA	223,020	585	65	205
ES4RD	81,302	601	24	82
***ES4RLH**	**14,444**	**109**	**24**	**68**
*ES8SX	5,029	84	10	37
*ES8AS	54	9	2	4
European Russia				
District 1				
RW1CW	**582,912**	**971**	**88**	**308**
UA1ORK	*35,200*	*252*	*21*	*67*
***UA1CUR**	**215,229**	**569**	**56**	**221**
*RV1CB	72,000	226	49	143
*U1BA	44,063	242	31	108
District 3				
RM2U	**1,073,550**	**1438**	**105**	**320**
				(OP:RU3RU)
UA3VFS	689,070	1116	97	349
RU3Q	420,133	901	77	252
RT5A	59,100	318	23	77
RX3Q	17,640	142	34	86
***UA3BL**	**320,736**	**747**	**67**	**245**
*UA5F	231,492	494	77	226
*R3AQ	136,220	377	49	196
*UA3ABJ	47,808	440	21	75
*UA3Z	23,046	188	35	103
*RQ2Q	20,100	149	25	75
*R2AHS	16,660	143	24	74
*R3THA	14,151	108	32	57
*RU3XY	11,921	86	29	62
*RA3DGH	6,840	140	8	37
**R5DZ*	*3,190*	*79*	*15*	*43*
*RV3A	575	32	5	20
*R2EL	345	22	4	11
***RN3DDZ*	*6,116*	*116*	*9*	*35*
**UB3DDA	5,544	83	17	49
District 4				
***RN4HAB**	**155,111**	**488**	**48**	**191**
*RU4AA	49,248	206	48	123
**UA4WGM*	*30,916*	*201*	*28*	*90*
*R4LAK	16,116	215	15	53
*R4CO	7,544	78	24	58
*RA4L	3,792	76	10	38
*R4HBM	3,328	74	15	37
**RA4LV*	*2,280*	*25*	*17*	*23*
*RA4LPC	336	11	6	10
District 6				
***R6DBT**	**99,893**	**378**	**50**	**141**
*UA6HLN	70,818	301	40	134
*R6LBK	35,640	230	26	94
**UA6AAK*	*2,356*	*32*	*15*	*16*
**R7KO	25,650	268	14	61
**RZ3ARO/6	8,515	112	15	50
District 9				
***UA9FGJ**	**5,656**	**50**	**14**	**42**
*R9XS	5,324	99	12	32
European Turkey				
TA1CQ	**11,716**	**127**	**16**	**42**
***TA1LHJ**	**546**	**18**	**9**	**17**
Finland				
OG7O	**1,155,303**	**1541**	**108**	**351**
				(OP:OH1VR)
OH6QU	138,719	401	32	117
OH1MA	72,408	256	57	111
OG7M	61,152	198	42	114
				(OP:OH1FIX)
OH6JE	23,112	168	28	80
OF3BCX	16,510	161	14	51
				(OP:OH1ZAA)
OH6IO	*24*	*2*	*2*	*2*
***OH1QX**	**22,494**	**230**	**15**	**54**
				(OP:OH1ZAA)
*OH2HZ	19,136	180	20	72
*OH2LIR	4,284	47	23	40
*OF8JIX	2,772	88	6	30
				(OP:OH8JIX)
*OF2MZA	1,152	35	7	17
				(OP:OH1ZAA)
*OF7EML	18	3	3	3
France				
F1AGR	**271,460**	**525**	**69**	**176**
***F4ETG**	**161,745**	**445**	**51**	**154**
*F1RCH	118,944	417	52	172
*F5VMN	76,736	458	26	83
*F4FLO	17,766	84	34	60
*F5IPE	17,127	201	19	80
*F1MLN	16,430	126	19	34
*F1MQJ	11,322	186	9	42
*F1TZM	3,479	63	15	34
*F4FSB	580	35	3	17
**F5OHH*	*464*	*23*	*9*	*20*
Germany				
DJ5MW	**3,047,198**	**2870**	**118**	**399**
DL7BC	1,177,908	1380	95	317
DL1WA	1,057,680	1487	94	358
DHØGHU	415,584	748	79	254
DLØESA	352,784	876	68	204
				(OP:EA1HEO)
DL1DTL	325,042	582	73	258
DK4VW	308,858	641	70	208
DL4WA	270,050	622	70	205
DL1TRK	128,694	402	51	190
DDØVE	124,992	398	50	174
DL3SKF	87,978	257	55	131
DL4RCE	*68,882*	*195*	*52*	*150*
DKØUU	56,712	182	44	92
				(OP:DF2CD)
DKØSU	47,760	201	37	83
				(OP:DF7SA)
DG7HL	28,560	176	29	91
DL5DTG	25,925	117	31	54
DF6RI	20,336	197	20	62
DG7FB	14,430	127	23	55
DL2ZBO	9,240	98	22	48
DL6MFK	2,128	47	13	25
DG2SDK	*703*	*27*	*5*	*14*
***DJ3HW**	**265,122**	**540**	**71**	**215**
*DL5JS	118,494	423	40	134
*DH4PSG	92,796	322	50	159
*DL9HB	77,770	239	48	154
*DLØRD	67,402	257	44	90
				(OP:DL3ECQ)
*DL5LB	62,928	364	33	111
*DO9SR	27,930	188	21	77
*DK2TS	26,287	178	27	70
*DL1AWC	26,257	198	28	93
*DK5OCE	23,100	173	29	76
*DL4GBA	22,601	124	32	65
*DL8AX	19,594	113	31	70
*DL8OAZ	18,952	149	30	73
**DL6AL*	*14,352*	*142*	*26*	*78*
*DL9ZWG	11,520	100	26	64
*DO1TOM	9,765	158	14	49
*DL8DXL	6,800	63	22	46
*DL1FW	5,402	83	20	54
*DL6DJ	4,675	89	12	43
**DF9DH*	*4,656*	*45*	*18*	*30*
*DO5AL	3,960	48	17	28
*DL1RPR	3,604	52	13	21
**DM6HK*	*3,486*	*50*	*14*	*28*
*DL3KDP	2,992	38	12	22
*DL1BDU/P	2,964	76	9	43
*DL3EAZ	2,660	78	4	31
*DL2RZG	2,556	75	4	32
*DL7BTW	1,782	66	8	25
**DK6HM*	*602*	*18*	*7*	*7*
*DL1STV	50	8	4	6
**DK8TA	31,688	227	31	105
**DL5GSM	6,300	127	10	53
Greece				
SV2BXA	**81,270**	**235**	**59**	**130**
SV2KF	936	16	9	15
***SV7CUD**	**3,990**	**48**	**18**	**39**
Guernsey				
***MUØGSY**	**95,732**	**600**	**20**	**71**
Hungary				
HA5UA	**70,794**	**379**	**40**	**98**
***HA3NU**	**1,418,480**	**1416**	**111**	**365**
Iceland				
TF3SG	*2,970*	*44*	*19*	*36*
Ireland				
EI5KG	*150,380*	*416*	*55*	*151*
Italy				
IK7NXU	**386,950**	**537**	**92**	**263**
IZ5WTV	378,684	782	78	236
IØLYO	375,291	775	71	262
IZ5MXA	181,916	891	38	140
IZ4TOA	180,690	434	82	203
IZ6OUX	148,608	638	56	160
IWØGTA/5	147,516	496	44	184
IK3SSW	119,700	403	44	146
IZ4JMU	86,436	366	55	141
IU4AOS	59,800	218	40	90
IU5DBS	*56,541*	*182*	*44*	*97*
IU5BKR	40,119	203	30	99
IQ3ME	37,089	262	29	88
				(OP:IW3GST)
IZ4IRX	*25,920*	*142*	*30*	*66*
IV3WMS	17,608	148	16	46
IK7IMP	*17,600*	*132*	*26*	*62*
IK2MPR	14,162	180	14	59
IU5FFM	*2,212*	*39*	*10*	*18*
IK2OLJ	1,938	40	21	30
IU3FCM	*880*	*18*	*9*	*13*
IU3EES	*24*	*3*	*3*	*3*
***IK1JJM**	**259,076**	**592**	**59**	**212**
*IK1RGK	207,930	484	63	176
*IZ5NFD	194,310	501	59	195
*IV3ARJ	173,964	440	57	161
*IK3ZBM	160,758	372	52	177
*IZ2BKA	93,537	324	42	129
*IZ2SMQ	91,254	262	57	144
*IK4BEI	74,620	294	42	122
*IK7RVY	62,952	208	36	93
*IK8SVQ	56,848	195	54	122
*IZ2BZP	54,870	251	38	117
*IU4DAF	53,953	183	48	115
*IW8DQY	47,450	289	30	100
**IWØQO*	*46,665*	*197*	*39*	*114*
*IW7EFJ	39,140	236	26	77
*IZ7VII	38,622	188	33	90
*IN3EOV	37,089	199	29	88
*IQ2XI	36,801	170	37	104
				(OP:IK2VUD)
*IU1HCC	34,077	168	31	80
*I1RB	32,163	236	41	110
*IZ2QCP	32,004	198	32	95
*IN3UFW	29,601	250	23	94
*IZ5UGE	21,489	159	24	63
*IZ1HBC	20,670	124	24	54
*IK2AUK	20,496	140	30	82
**IK6UBY*	*20,188*	*140*	*23*	*80*
*IK6SBW	17,958	113	29	53
*IK2YSJ	17,052	155	26	72
*IZ2EEV	13,398	147	21	56
**IW4CNY*	*13,112*	*182*	*17*	*71*
*IZ4UFB	12,972	145	23	71
*IK1TNU	10,164	109	18	59
*IV3ZNK	9,425	70	24	41
**IØØFO*	*9,348*	*198*	*25*	*89*
*IK3MLF	9,102	65	27	47
*IU2BZE	8,352	111	24	63
*IK5MEP	7,345	80	20	45
*IQØWV	4,176	84	14	34
*I1DXD	3,864	34	23	33
*IZ1UGZ	3,744	70	17	35
*IZ3ZLE	3,196	30	22	25
**IX1CVF*	*3,172*	*68*	*12*	*40*
*IN3XSK	2,208	62	14	34
*IK2IKW	2,024	36	15	29
**IW3UP*	*1,932*	*32*	*16*	*30*
*IK4NZD	1,736	45	10	18
*IZ1RHY	1,488	20	15	16
*IU2BFT	1,406	45	10	28
*IZ1WIX	1,230	47	4	26
*IZ1FRM	825	15	11	14
*IZ3WFD	456	12	8	11
*IK5VQI	425	18	8	17
*IZ1YCG	380	20	5	15
**IK7LMX*	*378*	*14*	*8*	*10*
*IZ8DUD	266	15	3	4
*IW1RHX	252	10	3	9
*IK8WEI	240	19	6	14
**IZ1ZJO*	*112*	*20*	*10*	*18*
**IK1ZNU	589	34	3	16
Kaliningrad				
***UA2FHZ**	**26,600**	**211**	**35**	**98**
*RA2FO	24,990	189	27	78
Latvia				
YL2GD	**1,856,778**	**2540**	**114**	**348**
YL2CI	252,340	1105	35	120
***YL3GY**	**42,642**	**219**	**36**	**102**
Lithuania				
LY5W	**444,540**	**886**	**76**	**234**
LY4T	346,653	720	80	253
LY9Y	143,172	388	55	191
***LY2N**	**101,703**	**371**	**43**	**124**
*LY3IV	18,768	211	14	55
Macedonia				
Z35M	**111,834**	**539**	**36**	**135**
Z3B	79,240	293	31	109
				(OP:Z33PB)
***Z35W**	**61,950**	**383**	**28**	**77**

The team at EC2DX poses for a group shot.



V26B waves the flag.

*Z35F	9,126	150	9	45
*Z32U	*8,379*	*105*	*13*	*44*
Netherlands				
PAØJNH	**201,450**	**517**	**61**	**194**
PAØMIR	9,512	102	14	27
***PG1R**	**97,722**	**420**	**41**	**142**
*PDØMHZ	48,590	306	26	87
*PA3DBS	40,656	273	30	91
*PA4HM	39,627	252	28	83
*PAØTCA	20,444	117	25	51
*PBØACU	13,904	98	30	49
*PDØWR	11,544	144	16	62
*PA/SP5PY	4,848	83	12	36
*PA2CHM	510	29	3	14
*PD1WES	144	15	2	10
**PAØZAV	621	25	8	19
Northern Ireland				
MIØAIH	**816**	**20**	**15**	**19**
****MIØULK**	**19,624**	**161**	**23**	**65**
Norway				
***LA2AB**	**81,852**	**674**	**26**	**88**
			(OP:LB4UH)	
*LA8OKA	33,536	219	31	100
*LA6M	28,512	256	20	79
			(OP:LA6GX)	
LB2WG	*11,400*	*147*	*13*	*47*
Poland				
SP1JQJ	**135,201**	**425**	**51**	**136**
SP5ICS	72,333	282	47	124
SP9EJH	6,372	84	18	36
SP9SDR	2,695	94	5	30
SP3CMX	855	31	6	9
***SP7B**	**183,209**	**520**	**52**	**169**
*SP2GCE	73,390	352	41	138
*SQ2SAT	69,797	262	49	120
*SP9YFF	61,744	315	34	102
*SP2JMR	51,744	181	53	101
*SP5DRE	45,108	243	32	94
*SQ9IWS	37,638	241	30	93
*SP8P	37,373	198	37	96
*SP1DMD	33,072	194	30	76
*SP7MU	24,850	324	11	59
*SQ5TDZ	20,610	119	35	55
*SP6TRH	15,440	129	19	61
*SQ6IYV	9,559	71	28	51
*SQ8FEU	9,477	155	13	26
*SP5XXX	5,633	128	7	36
*SQ9PPT	224	17	4	12
*SQ5NPX	108	10	4	5
*SQ7KVB	81	7	4	5
Portugal				
CT1DSV	**181,704**	**368**	**82**	**186**
CT1APN	20,500	104	40	85
***CT7AIX**	**12,768**	**121**	**9**	**33**
Romania				
YO3GNF	**351,975**	**810**	**62**	**223**
YO3JW	17,706	154	16	62
***YO3BY**	**159,537**	**572**	**51**	**162**
*YO8BDW	89,595	392	45	136
*YO7MPI	84,252	313	52	152
*YO7LYM	33,565	212	36	101
*YO2IS	30,660	203	19	54
*YO9IOE	23,980	191	26	83
*YO7LDT	20,352	144	27	79
*YO9FYP	10,906	91	23	59
*YO9CWY	10,246	177	8	39
*YO8RZJ	7,872	173	6	42
*YO9RAO	6,280	95	12	28
*YO9NCL	4,307	60	15	44
*YO9HG	3,920	79	12	28
Scotland				
MM3T	**78,672**	**395**	**30**	**119**
GM3ZDH	24,745	155	25	76
***MM1E**	**330,544**	**619**	**61**	**222**
		(OP:MMØGOR)		
*GM2Y	4,959	71	17	40
		(OP:MMØDXH)		
Serbia				
YT6W	**1,344,623**	**1722**	**96**	**331**
YU7PEP	36,360	363	24	96
***YT2VP**	**84,564**	**429**	**37**	**137**
*YT1XN	4,830	64	12	30
*YU4BBZ	375	33	5	20
**YT5CQ	2,562	56	9	33
Sicily				
IR9Z	**639,840**	**1416**	**72**	**272**
		(OP:IT9VCE)		
IT9JQY	7,275	62	28	47
***IT9FRX**	**301,200**	**1027**	**50**	**201**
*IT9EWR	76,230	351	28	93
*IT9PQJ	55,520	181	46	114
*IW9GRL	22,176	98	41	85
*IT9AZK	6,175	101	28	67
Slovak Republic				
OM7JG	**110,208**	**418**	**53**	**139**
OM2AGN	33,158	161	29	89
OM8KD	4,964	97	18	50
***OMØCS**	**139,518**	**548**	**37**	**170**
*OM8ST	4,895	78	14	41
*OM8ADU	4,466	86	14	44
Slovenia				
S56FE	**60**	**5**	**5**	**5**
***S56AX**	**30,710**	**317**	**14**	**69**
*S57NAW	30,294	362	12	69
*S54ZO	9,072	137	13	50
**S59GS	448	29	4	12
Spain				
EB1DJ	**806,352**	**1502**	**67**	**254**
EA2KV	*117,040*	*388*	*46*	*130*
***EA4DXP**	**160,650**	**421**	**49**	**176**
*EA3KT	119,412	400	50	164
*EE2A	85,646	298	43	144
			(OP:EA2SN)	
*EA5/UA9NP	50,086	235	38	120
*EA3ARP	24,592	163	24	82
EA3EYO	*21,632*	*137*	*27*	*77*
*EC5EA	16,380	105	25	35
*EB3TR	10,830	174	9	48
*EA7MT	7,285	90	9	22
*EA2RW	2,346	35	16	30
*EB4CMS	88	19	6	16
*EA3BE	13	7	6	7
**EA4CU	3,478	47	18	29
**EB3EPR	1,488	30	5	19
Sweden				
SMØO	**54,984**	**228**	**45**	**113**
		(OP:SAØDIJ)		
SM2CEW	24,817	139	25	58
SB6W	9,990	101	21	53
		(OP:SA6RTJ)		
SM5CZQ	3,150	48	16	29
***SM5KQS**	**86,104**	**356**	**43**	**145**
*SM5S	68,529	329	37	122
		(OP:SM5SIC)		
*SM5NUZ	31,369	201	29	98
*SF3A	17,835	151	24	63
		(OP:SM3CER)		
*SM6OPW	1,050	40	7	18
Switerland				
***HB9FLX**	**17,748**	**128**	**28**	**59**
*HB9TRR	11,092	102	20	39
Ukraine				
UT7NY	**352,846**	**696**	**85**	**246**
UW7RV	108,488	338	53	138
UR5NLA	87,291	326	49	134
UT5RB	67,600	338	36	133
UR4EI	29,500	199	32	86
***US0HZ**	**545,445**	**948**	**93**	**298**
*UT3UZ	265,060	599	60	230
*US3EW	106,914	378	47	126
*UR5WFJ	40,777	344	18	103
*UR3ABQ	31,672	218	33	115
*UT7IS	8,184	91	17	49
*UT5UT	7,052	64	15	28
*UT8IAR	2,562	44	9	33
*UR2LM	2,550	45	10	40
*UW1U	2,040	69	5	25
**UX2MF	105,090	297	55	171
***UR1YDD*	*7,203*	*102*	*14*	*35*
Wales				
GW1YQM	**115,938**	**394**	**63**	**163**
***GW4SHF**	**213,010**	**638**	**51**	**187**
GW7ERI	*28,280*	*174*	*28*	*73*
*MW6OWO	16,910	142	26	69

OCEANIA

Australia				
VK4QH	**173,290**	**495**	**52**	**78**
VK3TZ	82,485	262	43	74
VK2GR	42,660	160	47	61
***VK6RT**	**37,841**	**213**	**23**	**56**
		(OP:VK6SMK)		
*VK7DW	300	12	6	6
East Malaysia				
***9W6ZUL**	**4,147**	**51**	**11**	**18**
Hawaii				
WH7W	**55,977**	**420**	**19**	**28**
***KH6MOI**	**3,567**	**40**	**19**	**22**
Indonesia				
YB4MIO	**13,216**	**110**	**16**	**43**
YB4NY	12,797	105	28	39
YC8AQ	7,379	88	17	30
YC3GOQ	6,916	87	16	36
YB3BX	4,005	43	19	26
YC3WIS	182	8	6	7
YB3VY	80	4	4	4
YF3CXB	*45*	*9*	*2*	*3*
***YB9WIC**	**103,581**	**316**	**60**	**93**
*YB1TJ	59,532	210	43	80
*YC9XYP	29,779	185	38	59
*YB1PEF	9,639	81	18	45
*YBØKTT	9,625	84	18	37
*YB2UFM	5,529	54	23	34
*YB1IM	4,455	76	20	25
*YB8TDK	2,754	60	13	21
*YC8VRA	2,697	49	12	17
*YC4TOT	2,088	39	12	17
*YB8SX	1,584	41	8	14
*YC2OBI	1,550	42	10	15
*YC7JRC	1,026	29	10	17
*YC1EJL	1,014	64	11	15
*YD8CPZ	682	33	10	12
*YG3DFB	560	14	9	11
*YD1FZK	108	6	3	3
*YD3CRW	63	12	3	4
*YG3DML	48	4	3	3
**YF3CYT	468	14	4	9
**YG3CYS	345	11	7	8
**YC3BLJ	63	5	3	4
New Zealand				
ZL1AM	**28,676**	**176**	**22**	**45**
***ZL1YE**	**34,243**	**133**	**48**	**73**
Philippines				
DW3TRZ	**12,656**	**169**	**12**	**16**
***4E1A**	**111,280**	**402**	**31**	**76**
		(OP:4E1ADW)		
*DU1AVC	20,748	142	17	40
*4F3FSK	2,432	115	4	4

SOUTH AMERICA

Argentina				
LU7AQG	**1,140**	**22**	**13**	**17**
LU3HS	*125,828*	*596*	*19*	*64*
***LU2EGI**	**68,544**	**257**	**50**	**76**
*LU9EHU	46,656	304	18	46
*LU1BJW	37,910	179	37	48
*LU4JHF	28,044	199	20	37
Aruba				
P49Y	**5,370,008**	**4825**	**101**	**291**
			(OP:AE6Y)	
Brazil				
PP5CY	**394,940**	**1056**	**49**	**106**
PY2ZEA	313,650	949	24	99
*PY2DJ	12,948	98	35	48
*PP7LP	10,516	151	16	28
*PU2YBW	5,550	101	14	23
*PU5KGB	3,332	79	12	16
*PU1JME	266	23	6	8
*PY2RSS	252	27	5	4
****PY2BN**	**61,400**	**283**	**36**	**64**
Chile				
CE5JZO	215,481	896	27	66
*CA2CEV	77,928	487	20	48
*CE3EPN	57,960	436	19	41
*XQ5CIE	35,560	247	19	51
*CA5GRF	2,449	52	12	19
Colombia				
HK4DLO	**28,733**	**222**	**17**	**42**
HK5LAM	*21,321*	*131*	*33*	*70*
Trinidad & Tobago				
***9Z4A**	**6,858**	**82**	**23**	**31**
Venzuela				
YY8CMO	*34,008*	*147*	*31*	*73*
***YV1SW**	**29,616**	**302**	**16**	**32**

Check Logs

2EØHES, 2E1EPQ, 3B8CW, 4S7AYG, 4S7KLG, 4Z4AK, 5P9R, 7K1LUE, 7L4GPF, 8J2Y, 8P5ØB, 9A1CMC, 9A2WB, 9A5DO, 9A6DDA, 9A6TT, 9A6W, 9K2K, AA7G, AC2OC, AC9PR, AI6Z, AT3T, AT5M, BD1IIJ, BH4RNX, CT1DNU, CT1EPC, CT1IQI, CX9AU, DF1SD, DF2KK, DF3OL, DG8OBN, DJ3ZF, DJ8RS, DJ9BX, DKØIW, DK2CF, DK2WF, DK3GG, DK7MD, DK7OG, DK8QY, DK8T, DLØABT, DL1JNA, DL1NPG, DL4LAM, DL4MM, DL5FAB, DL6JV, DL6MDG, DL6UD, DL7DZ, DL7LF, DL7VEE, DL7ZZ, DL9MRF, DL9VF, DM4VPF, DM5DX, DM7CW, DM7MRE, DO4ZH, DU7HF, DU7RH, E71W, E72U, E74SL, E77C, EA1AF, EA1ARW, EA1AS, EA1CF, EA1WH, EA2KR, EA2OT, EA3GBU, EA3JL, EA3NP, EA4CRP, EA4GQS, EA5HRM, EA7BB, EA7LL, EA8/ES2RR, EA8AKN, EA8KC, EB1TR, EE1D, EM9Q, ES2RR, EU1FQ, EU1KY, F1TIO, F5MDB, F5PCV, F6IRA, GØGFQ, G3SBP, G3SWC, G3VDB, G3ZHL, G4DYA, G4ENZ, G7IXU, G7SSE, GJ3YHU, HA6ØKNA, HA8BE, HA9RT, HB9CIP, HB9CZD, HB9GKJ, HB9RYZ, HG1G, IØIJ, I1VDM, IN3XUG, IR4B, IT9IQQ, IT9RWB, IU1JEX, IU2CVS, IV3MPI, IW7DOL, IZ3GNG, IZ7DOK, IZ8AZZ, IZ8IFL, JAØQNJ, JA1MSS, JA2KVD, JA5TNF, JA5UAC, JA6WJL, JA8AZN, JA8FFM, JG1SXP, JG3GOM, JH1FSB, JI1RMZ, JJ2ICA, JJ2QXI, JL1MYP, JR5JAQ, JS3OSI, KØOI, K1SX, K5IZO, K6DJ, K6RG, K7DSE, K9JWP, KB9WQJ, KC7ES, KD5QHB, KD5QHV, KD7F, KD8WBZ, KEØNWG, KE2KB, KE7LBB, KE8CYC, KIØKN, KJ6MBW, KK7JS, KL7KK, KM4VEN, KQ6RS, KU5Y, KV4ZY, LA5LJA, LA6WDA, LU1IBL, LW3DG, LXØRL, LY1CT, LY2CO, LY2HS, LY2X, LZØM, LZ1JZ, LZ1MS, LZ1QN, LZ1UK, LZ1VQ, MØCLH, MØHFY, MØHOM, MØHZV, MØKNG, MØYGB, M5ADL, M6LXF, M6OPU, MMØUED, MW5R, MW6NFN, NØDQS, NØHSB, N1RB, N3CMI, N4EEV, N4JR, N5MOA, N5STT, N5XTR, N6FUB, N6MZ, N6RW, N8DC, N9ZYL, NGØG, NK4K, NS3T, NS3X, OE1RFU, OE2BZL, OE5FZO, OE8TTR, OG6A, OH2BKX, OH2GEK, OH2IS, OH2XX, OH3JQ, OH5BQ, OH6GDX, OK1AMF, OK1VKC, OK1YM, OK2BZ, OK2SG, OK6DJ, OM3RM, OM3TWT, OM6WW, OP2A, OQ4A, PAØVLY, PA2REH, PB4FUN, PC3H, PEØMVJ, PG2AA, PH9E, PP2RON, PP6ZZ, PR7AB, PU2NGB, PU5AGM, R2DR, R2LAC, R3DCB, R3GM, R6YY, R7HF, R7KMA, R9AB, R9HBF, RAØQD, RA1CE, RA3WDK, RA4AAT, RA4DB, RA4FP, RA6CA, RA9AMO, RA9DZ, RA9LT, RG7K, RJ1O, RK3MXT, RK3T, RK8A, RL3FA, RL9A, RM6J, RN2FA, RN6LG, RO3G, RQ4C, RU3YAA, RU6DX, RU9CY, RU9LA, RV6ASU, RV6LCT, RV9UCN, RW3DKK, RW3Z, RW7M, RW9MC, RW9WT, RX3XA, RZ1O, RZ3AUL, RZ3F, S51MA, S51R, S57RW, S59AA, SA3V, SF7WT, SMØSHG, SM2OWW, SM4DHF, SM5GMZ, SM6BZV, SM7IUN, SN2M, SN2W, SN9Z, SO6R, SO7BIT, SP1KQR, SP2EWQ, SP2GJV, SP2KAC, SP2MKT, SP2TQI, SP2ZCH, SP3HUF, SP3J, SP3QFZ, SP4W, SP5DL, SP5EAQ, SP5GDY, SP5XSD, SP6BPK, SP6CZ, SP6EF, SP6GTN, SP6HEQ, SP6JOE, SP6MLX, SP6NZ, SP6OJK, SP7JLH, SP8QEJ, SP9WZJ, SP9Z, SQ4HRN, SQ6ELV, SQ7BCN, SQ7BFS, SQ9DEO, SQ9FK, SQ9MZ, SQ9NFC, SQ9NFQ, SQ9NIS, SQ9UM, SV1BJW, SV1GRB, SV1PMH, SV1RHL, SV2JAO, SV3DCX, SV3QUP, SV8/DK3SJ, SV9CVY, SV9DJO, SX2X, TF1VS, TK4LS, TY2CD, UA1NDX, UA3IFF, UA3RW, UA4NCI, UA6ACA, UA6CT, UA6FF, UA6J, UA6JQ, UA6LQZ, UA7T, UA9CEP, UA9CNX, UB4IIQ, UC3C, UC5G, UI3A, UN7ECA, UR3CMA, UR5EDX, UR7EN, UR7EZ, UR8IDX, US0YA, US5EEK, US5ETV, UTØNN, UTØUY, UT5IA, UT5ULB, UW7CN, UX2IB, UX7IA, UX7VA, UZ3RR, VE3JSO, VE3VSM, VK3GA, VK4QO, VK4ZD, VK6WX, VP8NO, VU2XE, VU3BUN, W2MRD, W4DFG, W4MY, W5IDX, W6JJY, W6OPO, W6YA, W8MLS, W9OSI, WN3DX, XE1RF, YB2ERL, YL2TD, YL3CV, YL3GDM, YL5X, YO3DAC, YO3IPR, YO6FPW, YO6LA, YO8TK, YT1KC, YT1UM, YT5DLT, YU1XX, YU3MMM, YU9MBA, YV1DIG, YV5EN, YY4AJL, Z33B, ZL1BIV, ZL4AS, ZS5NK

Administrative Check Logs

5T2AI, ED8H, II9P, KA8SMA, MM3AWD, OZ4MD, SP5AUY, TI2CC, YTØZ

Disqualified: 4L5P, EA3IAA, EF9R, EI9HX, IK3ZAQ, IK4GRO, IK4LZH, IK4TVP, IW1FRU, IZ5CMI, IZ8NWA, LZ2WNW, N1DID, PY8WW, R7CA, R8TT, RC7KY, RT5Z, RZ3Z, S52NR, SQ2WHH, SQ7CL, T77CX, UTØMJ, YL2C

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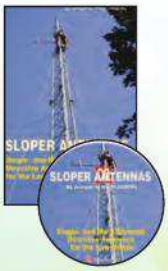

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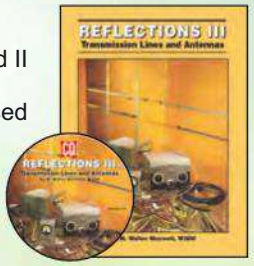

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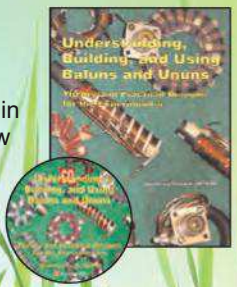

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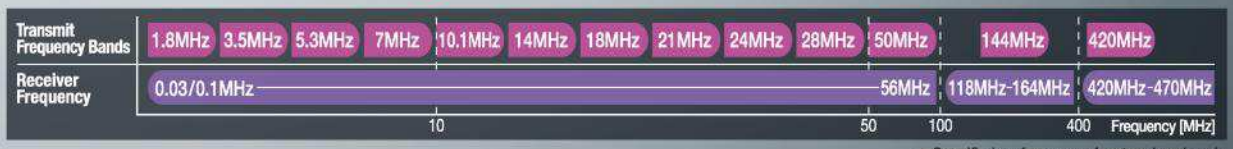

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