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CQ Amateur Radio

COMMUNICATIONS & TECHNOLOGY

APRIL 2016

The 2015 CQWW DX Contest

- ...from Cuba, p. 10
- ...SSB Results, p. 16
- ...QRP with a Stealth Antenna, p. 26

On the Cover: The T42US team celebrated improved US/Cuban relations with a joint operation during the 2015 CQWW SSB Contest. Details on page 4; story on page 10.

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announcements

APRIL

BRANSON, MISSOURI — The 4 State QRP Group will hold the **OxarkCon QRP Conference** Friday, April 1 and Saturday, April 2 at the Stone Castle Hotel and Conference Center. Contact: Tom Brown, WØMFQ, P.O. Box 627, St. Charles, MO 63302. Website: <http://www.ozarkcon.com>.

FORT SMITH, ARKANSAS — The Fort Smith Area Amateur Radio Club will hold the **Hanging Judge Hamfest** and **2016 ARRL Delta Division Convention** Saturday, April 2 at Columbus Acres. Contact: Mike Cole, W5TMC, 124 Grant Street, Roland, OK 74954. Phone: (918) 427-1431. Website: <http://www.hangingjudgehamfest.com>. VE exams.

JACKSONVILLE, FLORIDA — The Northern Florida Amateur Radio Society will hold the **14th Jacksonville Radio Free Flea** Saturday, April 2 at the Terry Parker Baptist Church Parking Lot. Website: <http://nofars.net>.

RALEIGH, NORTH CAROLINA — The Raleigh Amateur Radio Society will hold the **44th Annual RARSfest** and **2016 ARRL North Carolina State Convention** Saturday, April 2 at the Jim Graham Building State Fairgrounds. Contact: Jeff Wittich, AC4ZO, (919) 362-4787. Email: <jwittich@nc.rr.com>. Website: <http://www.rars.org/rarsfest>. Talk-in 146.64. VE exams and card checking.

WELLBORN, FLORIDA — The Suwannee Amateur Radio Club will hold its **4th Annual Tailgate** Saturday, April 2 at 1504 4th Avenue in Downtown Wellborn. Contact: SARC (386) 249-3260. Email: <rustypreen@aol.com>. Website: <http://www.suwanneearc.org>. Talk-in 145.270 (PL 123). VE exams.

CLAREMORE, OKLAHOMA — Green Country Hamfest Inc. will hold the **Green Country Hamfest** and **2016 ARRL Oklahoma State Convention** Friday, April 8 and Saturday, April 9 at the Claremore Expo Center. Contact: John Harwell, KD5NAQ, (918) 379-0950. Email: <info@greencountryhamfest.org>. Website: <http://www.greencountryhamfest.org>. Talk-in 147.09+ (PL 88.5). VE exams.

COLUMBUS, INDIANA — The Columbus Amateur Radio Club will hold the **33rd Annual Columbus Hamfest** Saturday, April 9 at the Bartholomew County Fairgrounds. Contact: Matthew Bruner, KC9BWO, 325 Robbins Street, Hope, IN 47246. Phone: (812) 375-4860. Email: <kc9bwo@att.net>. Website: <http://www.carcnet.net>. Talk-in 146.79- (PL 103.5). VE exams.

CULPEPER, VIRGINIA — The Culpeper Amateur Radio Association will hold the **Culpeper Amateur Radio Swapfest** Saturday, April 9 at the Culpeper Agricultural Enterprise. Contact: Bob Stohlman, K4RCG. Email: <bobstohlman@gmail.com>. Website: <http://w4cul.org>. Talk-in 147.120+ (PL 146.2).

CUYAHOGA FALLS, OHIO — The Cuyahoga Falls Amateur Radio Club will hold its **62nd Annual Hamfest** Saturday, April 9 at the Emidio and Sons Party Center. Contact: Ted Sarah, W8TTS, (234) 206-0270. Email: <hamfest2016@cgarc.org>. Website: <http://www.cfarc.org>.

HAMPTON, NEW HAMPSHIRE — The Port City Amateur Radio Club will hold the **Seacoast Amateur Radio Flea Market** Saturday, April 9 at the St. James Masonic Lodge. Contact: Mark Pride, K1RX, (603) 775-0220 or Dick Cooper, W1MSN, (603) 474-2373. Email: <fleamarket@w1wqm.org>. Website: <http://www.w1wqm.org>. VE exams.

MEMPHIS, TENNESSEE — The Mid-South Amateur Radio Association will hold the **Memphis FreeFest** Saturday, April 9 at the Bartlett Station Municipal Center. Contact: Tony Brignole, WA4KHN, (901) 216-3263. Email: <abrigno@comcast.net>. Website: <http://sites.google.com/a/maraonline.org>. Talk-in 147.03+ (PL 107.2). VE exams.

MOBILE, ALABAMA — The Mobile Amateur Radio Club will hold the **Mobile Hamfest** Saturday, April 9 at the Abba Shrine Center. Contact: L J. Early, W4LJE, (251) 635-2327. Email: <mobilehamfest@hotmail.com>. Website: <http://w4iax.net>. Talk-in 146.94 or 146.82. VE exams.

PHOENIX, ARIZONA — The Arizona Amateur Radio Club and the **Amateur Radio Council of Arizona** will hold the **April Hamfest** at DeVry Saturday, April 9 at DeVry University. Contact: Gary Hamman (602) 996-8148. Email: <k7gh@arrl.net>. Talk-in 147.060+. VE exams and card checking.

SEATTLE, WASHINGTON — The Communications Academy will be held Saturday, April 9 and Sunday, April 10 at the South Seattle Community College-Jerry Brockey Center and Olympic Hall. Website: <http://www.commacademy.org>.

SELAH, WASHINGTON — The Yakima Amateur Radio Club will hold the **Yakima Hamfest** Saturday, April 9 at the Selah Civic Center. Contact: Bob Dameron, KE7HLK, (509) 452-3877. Email: <bigiron9@msn.com>. Website: <http://www.w7aq.com>. Talk-in 146.660 (PL 123). VE exams.

SPRING GROVE, PENNSYLVANIA — The York Hamfest Foundation will hold the **2016 York Hamfest** Saturday, April 9 at Elicker's Grove Park. Email: <duane.sterner@yahoo.com>. Website: <http://www.yorkhamfest.com>. Talk-in 147.330+ (PL 123) or 146.52. VE exams and DXCC/WAS/VUC/WAC card checking.

TAMPA, FLORIDA — The Tampa Amateur Radio Club will hold **TARCfest Hamfest XXXVI** Saturday, April 9 at their clubhouse, 7801 North 22nd Street. Contact: Bill Bode, N4WEB. Email: <n4web@hamclub.org>. Website: <http://hamclub.org>. VE exams.

CHESAPEAKE, VIRGINIA — The Chesapeake Amateur Radio Service will hold its **SpringFest 2016** Sunday, April 10 at the Moose Lodge #898. Contact: CARS, 120 Afton Avenue, Norfolk, VA 23505. Website: <http://w4car.org>. Talk-in 146.820 (PL 162.2) or 444.000 VE exams.

FRAMINGHAM, MASSACHUSETTS — The Framingham Amateur Radio Association will hold the **Framingham Flea** Sunday, April 10 at Keefe Technical School. Contact: Eric Taylor, KB1PJN, (508) 310-5913 (before 10 p.m.). Email: <tables@fara.org>. Website: <http://fara.org>. Talk-in 147.15. VE exams.

STERLING, VIRGINIA — The VHF Super Conference will be held Friday, April 15 through, Sunday, April 17 at the Holiday Inn Washington Dulles Intl. Airport. Website: <http://vhfsuperconference.com>.

VISALIA, CALIFORNIA — The Southern California DX Club and the **Northern California DX Club** will hold the **International DX Convention** Friday, April 15 through Sunday, April 17 at the Visalia Convention Center. Contact: Cathy Gardenias, K6VC, or Doug Miller, K6JEY. Email: <info@dxconvention.org>. Website: <http://www.dxconvention.org>. DXCC/WAZ/WAS/VUCC card checking.

BRAINERD, MINNESOTA — The Brainerd Area Amateur Radio Club will hold the **Brainerd Area Hamfest** Saturday, April 16 at the Brainerd National Guard Armory. Contact: BAARC, 33247 East Shamineau Drive, Motley, MN 56466. Website: <http://www.brainerd-ham.org>. Talk-in 147.225+. VE exams and card checking.

DES MOINES, IOWA — The Des Moines Radio Amateur Association will hold the

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Amateur Radio Parity Act Moves Ahead

A bill in Congress that would hold private land use agreements regarding amateur radio antennas to the same standards that already apply to municipalities, is now another step closer to a vote in the House of Representatives. The House Energy and Commerce Committee's subcommittee on communications and technology, which held hearings on H.R. 1301 in January, sent the bill to the full committee on February 11 with a favorable recommendation. The bill, also known as the Amateur Radio Parity Act, would require that homeownwers' associations and restrictive covenants (CC&Rs) "reasonably accommodate" amateur radio operation, the same rule that has applied to state and local governments since 1985. According to the *ARRL Letter*, the bill currently has over 100 co-sponsors and a companion bill in the U.S. Senate, S. 1685, was approved last year by the Senate Committee on Commerce, Science, and Transportation.

In a related story, the Missouri state legislature is considering an identical measure to H.R.1301, which would implement its requirements on a state level. The effort is being spearheaded by Larry Scantlan, KEØKZ, who says the Missouri bill can serve as a template for similar actions in other states. Several states have already incorporated the "reasonable accommodation" rule into their laws as they apply to state, county, and local governments.

China Continues Building Facilities on Spratlys

There may or may not be any DXpeditions in the near future from the Spratlys. But there is a chance that the island chain in the South China Sea may become a source of HF interference. The *Washington Post* reports that China is building what may be a powerful HF radar installation on one of the islands, possibly to monitor ships and aircraft in the South China Sea and the Strait of Malacca, one of the world's most important shipping lanes. Construction of this facility — whatever it may be — is part of a major effort by China to build up the islands and develop facilities there, which it claims are primarily for civilian purposes but the U.S. and others believe are mostly military.

The Spratlys are claimed, in whole or in part, by six different countries, and hams have mounted several DXpeditions there in the past 50 years, despite considerable danger. In 1983, two German hams were killed when the Vietnamese Navy attacked and sank their boat. Last year, evacuation of a sick ham on a DXpedition there was delayed several days after Chinese forces fired on a Philippine Navy plane sent to fly him out for medical care.

ARRL, Red Cross, Sign New Agreement

The ARRL and the American Red Cross have signed a new Memorandum of Understanding to govern their relationship over the next five years. It lays out the framework for cooperation between the Red Cross and the ARRL's Amateur Radio Emergency Service (ARES) on national, state, and local levels. A summary of the agreement in the *ARRL Letter* says it also clarifies that ARES members working with the Red Cross but not registered as volunteers with the aid organization do not need to undergo the background checks required of Red Cross volunteers.

Petitions Could Impact 80 Meters, License Terms

The FCC is reviewing initial public comments as well as a pair of petitions that could shift the boundary between the 80-meter CW/RTTY band and the 75-meter phone band, and do away with amateur radio license renewals.

The 80-meter petition, submitted by the ARRL (RM-11759), seeks to shrink the 75-meter phone band by 50 kHz in order to provide more spectrum for RTTY (radioteletype) and other data modes. According to the League, the FCC took away too much spectrum from the RTTY/data portion of the band when it expanded the 75-meter phone band by 150 kHz a decade ago. The ARRL seeks to move the bottom of the phone band up to 3650 kHz and shift the segment for automatically controlled digital stations from its current 3585-3600 kHz to 3600-3615 kHz.

The license term petition (RM-11760), was submitted by Mark Krotz, N7MK, of Mesa, Arizona. It seeks to have amateur licenses issued on a lifetime basis, rather than needing to be renewed every 10 years. Krotz claims it would reduce the FCC's workload and costs. The FCC has already granted lifetime credit for certain amateur examination elements (but not for others).

The Commission opened both petitions for 30-day public comment periods in late February. Those comments will be used to help determine whether to issue a Notice of Proposed Rule Making (NPRM). There will be additional opportunities for comment when and if an NPRM is issued.

Space Station "Ham TV" System Used for First Time

The digital amateur television (DATV) station aboard the International Space Station — dubbed "Ham TV" — was used for the first time in mid-February during a scheduled contact with the Royal Masonic School in Rickmansworth, England. The downlink-only system allowed British astronaut Tim Peake, KG5BVI, to transmit live video on 2.4 GHz along with two-way audio on 2 meters during the Amateur Radio on the International Space Station (ARISS) contact, according to the *ARRL Letter*. The TV signal was received by a ham in Italy and relayed to the school in England.

Schools or other educational organizations wishing to schedule future ARISS contacts have until April 15 to apply for slots in the first half of 2017. According to the *ARRL Letter*, schools/groups with the best shot at being selected will be those that can attract large numbers of participants and integrate the 10-minute voice contact into a well-developed educational plan.

Popular Science Archive Online

Popular Science magazine has placed its entire 140-year archive online with free access browsing, according to *Southgate Amateur Radio News*. The magazine worked with Google to make the entire collection searchable. A search on "ham radio" returned 380 results (a search on "amateur radio" returned 190, with considerable duplication). The earliest is from 1916 and the most recent is from 2008.

(Continued on page 61)

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CQ APRIL 2016

CONTENTS

On the Cover: The joint U.S./Cuban T42US team operated the CQ World Wide DX Contest SSB weekend from outside Havana. From left to right (see names on page 15): CO2PTE, WBØTKL, WX3K, USA Team Leader WB2REM, CM2OY, WC3W, Federacion de Radioaficionados Cuba President CO2RP, CL2TV, Cuban Team Leader CM2KL, K9DIG, CO2JD, KC4BAB, CO2AME, CO2XK, KK4SHF, and CO2II. T42US story on page 10; CQWW SSB results on page 16. (Cover photo by Karile Michel Garcia-Pola Grandito)

FEATURES

COLUMNS

DEPARTMENTS

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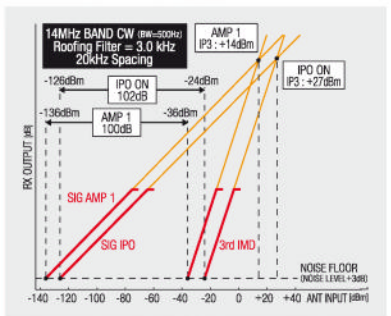

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zero bias – a CQ editorial

BY RICH MOSESON,* W2VU

Meeting New Hams Where They Are

Exactly what is it that qualifies one as a "real" ham? I got a letter in response to my February editorial ("How Old Are You Now?") which raised some very interesting points about how we view hams and ham radio, and how we perceive those members of our community whose interests may not be in line with those of the "traditional" ham. The letter read, in part:

"I received my Technician license in February 2009. The room was filled with people waiting to take the exam. I thought to myself, "Wow, this is great." I had no idea so many people were interested in amateur radio. Prior to administering the exam, one of the VEs asked for a show of hands for people upgrading to General — two hands went up. Then he asked if anyone was upgrading to Extra — one hand went up. Then he asked how many people were taking the Technician exam to fulfill a requirement to gain credit for a radio-controlled balloon class. The remaining hands were raised except for mine and two other people's. After the exam, I had the opportunity to talk to several of individuals taking the exam for the balloon class. None expressed a desire to get into amateur radio."

Of course, they *were* getting into amateur radio by virtue of taking their license exams. What the writer meant, I believe, was getting into ham radio as a hobby in and of itself, rather than as part of a different hobby.

But let's take a quick look at what's involved in a typical balloon flight using amateur radio (there's enough of this activity in the hobby that it has an "official" acronym — ARHAB, or amateur radio high altitude ballooning): The balloon's payload will likely be transmitting telemetry on altitude, speed, temperature, and GPS location data; an APRS signal for tracking; and possibly live video via amateur television or digital stills via one data mode or another. The members of the ground crew will need to be equipped and trained to receive these transmissions and make use of the information. In addition, once the balloon bursts and the payload parachutes back to earth, the chase team will likely use ARDF (amateur radio direction finding) techniques to locate it, and if more than one vehicle is involved, will probably coordinate via 2-meter or 70-centimeter FM. That's pretty active hamming in my book, even if it is all in connection with a different primary activity.

The writer goes on to say that when he went back to take his General exam a month later, the VEs asked the candidates the same questions, and that the answers were pretty much the same, except that several members of this group identified themselves as "preppers," who saw ham radio as "their lifeline to survival when and if the apocalypse came." Well, here's the deal on that: If you're really going to be prepared, and ready to make use of your ham license in the aftermath of "the big one" (whichever "big one" that may be), that won't be the time to start setting up your station, learning how to use the gear and learning the ins and outs of effective ham radio communications. No, the time to do all that is *now*, by getting on the air and learning about different operating modes, antennas, propagation, QRP, etc., and keeping your skills sharp with regular practice, so that you're not starting from zero once you've wiped the you-know-what off the fan that it's hit. A serious prepper won't keep his or her ham gear locked up in a closet, but will use it regularly.

I consider myself to be a fairly active ham, and I love ham radio as a hobby in and of itself. But if you look at my HF logbook for the first two months of 2016, you would find it to be empty. That's right. Zero contacts. I got a bunch of little radio kits at Christmastime and I've been spending my "radio time" over the past couple of months building. I've still got a ways to go. It wouldn't be completely incorrect to describe me right now as a "maker" who is using ham radio projects in pursuit of a building hobby.

My local astronomy club here in New Jersey — whose advisor is a ham — is doing a program this month on EME (Earth-Moon-Earth, or Moonbounce). Perhaps some amateur astronomers will find that amateur radio can add a new dimension to their astronomy hobby. With talk of sending a ham radio satellite to Mars, we'll need astronomy skills to track it and tune it in if the project succeeds. Let's not forget that it was an amateur astronomer and amateur radio operator, Grote Reber, who is considered the father of radio astronomy.

All this brings us back to the age-old question of what constitutes a "real ham." Do you have to enjoy only traditional ham radio activities, such as DXing, contesting, or ragchewing? Do you have to operate HF? Do you need to know and use Morse code? Or are you a "real ham" if you hold an FCC amateur radio license and make use of the privileges that it confers, whether as ends unto themselves or as part of another activity, such as ballooning, building, hiking, biking, or being prepared for an uncertain future? Our vote is for the latter.

Here's a radical idea: Instead of lamenting new hams' lack of interest in traditional ham radio activities, how about if we "meet them where they are?" Let's invite the folks from the ballooning course to make a presentation at a club meeting about how they make use of ham radio. Let's invite local "makers" who are combining ham radio with other "making" activities to show them off at a club meeting. Who knows? You might just find yourself tagging along on the next balloon launch, joining the makers' group or setting up a telescope alongside your antenna. And if these non-traditional hams are made to feel welcome at your club meetings (and not pressured to conform to someone else's view of what constitutes "real" ham radio), maybe they'll discover additional aspects of the hobby and broaden their interests as well. But even if they don't, so what? How we make use of our privileges on the airwaves is a personal choice, and there is no "right" or "wrong" way to "do" ham radio.

Issue Notes

A couple of quick notes relating to this month's issue: First of all, we have a different sort of Professor Heisseluft feature for you this April. It has been 40 years since the sage of Grossmaul-an Der Danau penned his first article for *CQ,* and to commemorate that anniversary, we have persuaded him to sit down for an interview with Ted Cohen, N4XX. Longtime readers will recall that Ted conducted a great number of "*CQ* Interviews…" with leading figures in amateur radio and the FCC back in the 1970s and '80s, so he is certainly well-qualified to chat with the good professor. You'll find Ted's interview beginning on page 28.

Much of this issue is dedicated to the results of the 2015 CQ World Wide DX Contest SSB weekend. We've brought back complete score listings after exiling them to the Internet for a few years. We also have two contest-related features, our cover story on the joint U.S./Cuban contest expedition from T42US and the story of how WB3D didn't let low power and a stealth antenna keep him from having a good time in the contest … and winning his category! But there's plenty more as well, even if contesting isn't your thing. Maybe ballooning? Enjoy the issue … and don't let the SWRs bite! (p. 54)

– 73, Rich, W2VU

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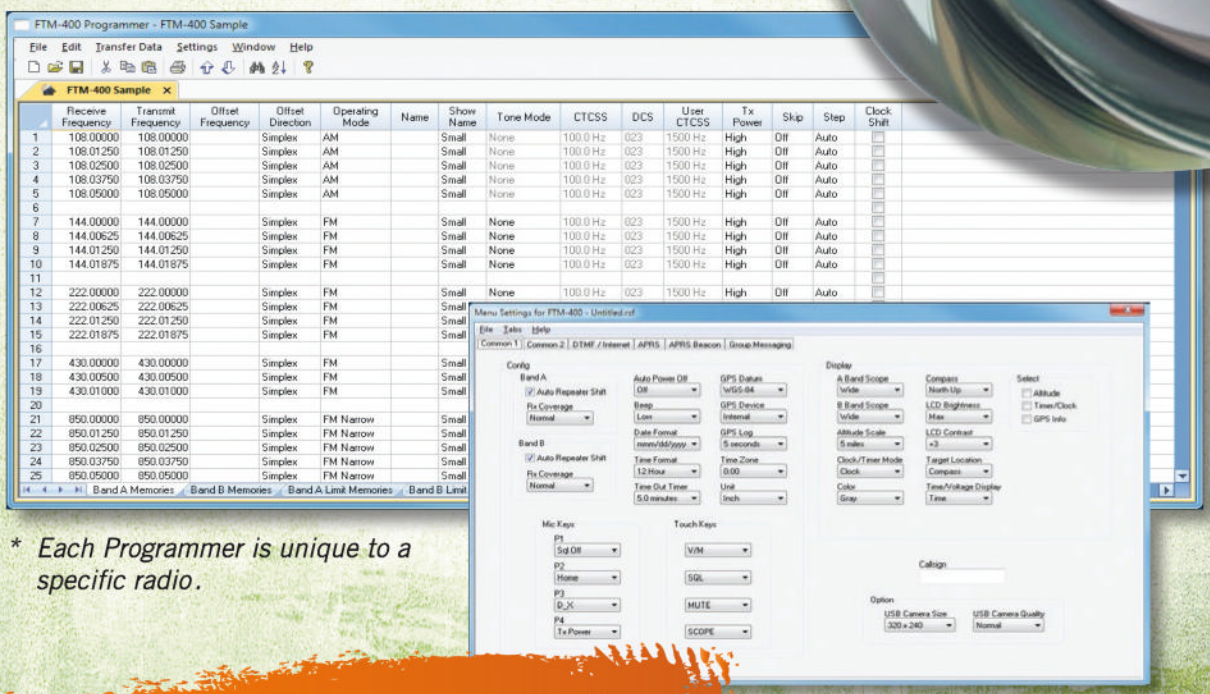

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To mark the thaw in relations between the U.S. and Cuban governments, a group of U.S. hams headed to Cuba last October to join several Cuban counterparts in a bi-national DXpedition wrapped around the SSB weekend of the 2015 CQ World Wide DX Contest (see results in this issue). Here's the story of T42US.

T42US Joint Cuban/U.S. DXpedition

Operation Centered on CQWW SSB DX Contest

BY RUTH SWEIGART,* KC4BAB

The T42US Joint Cuban/US DXpedition was a multi-purpose event held in Cuba from October 21-28, 2015. It included a radio exhibition, presentations of ham radio information, demonstrations of ham radio to Cuban kids and teens, administration of U.S. FCC amateur radio exams to Cuban operators, participation as a team (*Photo A*) in the CQ Worldwide DX SSB Contest, and a banquet for the operators and their families. The following is a journal from that trip.

Wednesday 10/21/15: Travel and Set-Up

We left Miami bright and early on Wednesday morning. The airline required us to be at the airport four hours ahead of our departure — mainly due to the large number of people flying (nine of us) and the large amount of luggage being transported. We carried a lot of equipment with us, despite each passenger being limited to 66 pounds of checked luggage. The luggage weight limitations caused us to separate our radio equipment up between our entire team in order to avoid paying an extra $2 a pound for amounts over 44 pounds on top of the $20 luggage fee.

We tried to bring as much as we could because it is hard to get wires, cables, or any kind of radio equipment in Cuba. We brought along two identical ICOM radios — one to be donated — along with supporting accessories like cabling, tuners, and antenna analyzers. Bringing this equipment into the country required approval from the Cuban government — it is normally not allowed. We had left a list with the Cuban radio group team leader to give to customs ahead of time. When we arrived at customs, they initially rejected some of the equipment as

* c/o CQ magazine

Photo A. Members of the T42US joint U.S./Cuban expedition team on the beach (Photos courtesy of T42US team)

contraband. After showing them the license issued by the Cuban FRC (Federacion de Radioaficionados Cuba — Cuba's national amateur radio association) along with another letter, we were then allowed to be checked in. All of the equipment had to be specifically identified and checked off from the list. We spent about two hours getting through immigration and customs.

Stepping Into the 1950s

The Havana airport is a throwback to the 1950s. The airplane was met by a bus that took us to the terminal. The terminal itself was no-frills. The roof leaked in places. There were a lot of people waiting outside, as there is no waiting area inside the terminal. The first thing you notice on exiting the terminal is all of the old classic American cars (*Photo B*) and the smell of exhaust.

Our Cuban team leader, Roberto, CM2KL, and Mr. Pedro Rodriguez, CO2RP, president of the FRC, met us outside the airport terminal. Roberto had arranged a bus to take all nine of us to the Iberostar Parque Central Hotel in the center of Old Havana. The hotel was very elegant — Titanic done Caribbean style — with majestic stairways, ceilings, skylight-lit interior, lush plants, great bar, and lots of hotel staff very willing to help you with anything — a beautiful place. Every night in the hotel, people would gather and drink, smoke cigars, and listen to a varying array of musical groups.

Photo B. Classic U.S. cars on the streets of Havana are featured on the T42US QSL card.

We arrived very early at the hotel and needed to wait for our rooms. We left our luggage in the lobby and took a walk up the boulevard to D'Linos restaurant. We had traditional Cuban fare — lechon, roast chicken and, of course, we all wanted to try a traditional mojito. What a wonderful start to our expedition. After lunch, we got our rooms and immediately set out for "the shack."

The shack was a rented house on Guanabo Beach, about 15 miles east of Havana. The house was about 100 yards from the beach and had a large open lot around it (*Photo C*). In between setting up and contesting, it was nice to take a walk on one of the most beautiful beaches in Cuba.

We arranged for a taxi driver to cart us back and forth between the beach and our hotel in his old green '56 Chevy BelAir. Karile, our driver, spoke absolutely no English. Luckily, some of us spoke some Spanish or had a dictionary to figure out words. It cost us 15 pesos (about $15 U.S.) per trip. Roads were generally in good shape. One day, we got stuck in the tunnel under the Havana harbor because of a bus-car accident. We thought we were going to die from the fumes. Those beautiful old cars run mostly on diesel and aren't exactly EPA rated. The accident was cleared very quickly, a testament to the Cubans' efficiency.

Antenna installation was in its beginning stages when we arrived. The antennas were lying on the ground in pieces. The two element 40-meter beam was not assembled. The 3-element and 5-element tribanders were assembled but were lying on the ground. Then a van from Radio Cuba showed up with five Cuban operators

Photo C. The station was set up in a rented house with a large open area in front for antennas. A shortage of tower sections limited antenna height; beams were turned by hand, using ropes.

Photo D. The group's 4-element, 6-meter beam held up for tuning prior to installation by, from left, Mark, WC3W; Juan, CM2OY; Roberto, CM2KL; Amed, CO2AME; Alexi, CO2XK; and Michel, CL2TV.

Photo E. The two U.S. stations, all set up and waiting for power.

inside. Jorge, CO2II, was the technical brain of the Cuban team — funny and smart. Roberto, CM2KL, helped pull things together.

Our antenna specialist, Stephanie Koles, WX3K, started whipping things into shape. We had to reset the elements and made numerous attempts to retune the antennas — the 3-element tribander suffered some SWR issues because of corrosion and poor maintenance. It was like tuning a piece of wet pasta in the air. Luckily, John, KK4SHF, brought an antenna analyzer.

Our antennas consisted of the two tribanders and 40-meter monobander mentioned above; a vertical; a 4-element, 6-meter beam (*Photo D*); and a longwire. Due to problems acquiring tower sections, the maximum height of any of the rotatable antennas was no more than 5 meters (16.4 feet) and they were turned by ropes attached to them. A third station was set up for the WARC bands, digital modes and 60 meters. This was the first time the Cuban government had given permission for hams to operate on the 60-meter band, thus offering many 60-meter enthusiasts a new country.

Thursday, 10/22: More Setup

We returned early Thursday morning to continue setting up the stations. One room was dedicated to a U.S. radio setup. The Cubans had another room for their gear. The stations included two ICOM 706MK2Gs and two Yaesu kilowatt amplifiers. We had brought bandpass filters so we didn't interfere with each other. We had arranged for a generator to be on hand in case of power outages and were hoping for Internet, but that was not a viable option. Internet access in Cuba is limited, with most availability from cyber cafes and within hotels. DSL access was talked about in the shack area, but was not a real option.

We decided to put the two U.S. stations in the front bedroom. We moved the furniture to another room and set up two tables near the windows (*Photo E*). We were a little concerned about only having one 115-amp circuit in the room. The lack of electrical outlets was a small hurdle. We changed power configurations at least two or three times because we didn't have enough power coming out of the one outlet available in the room for two radios and two amplifiers. We needed to rewire an outlet with exposed, frayed wiring. No one thought to bring a power strip. That would have been wonderful. We played musical chairs with power cords as needed. The power went out just as the generator was delivered so we had to run a cable out of the window and plug into the generator. The electricity eventually came back on and we operated without further power interruption.

Luckily, our radio room had a small air conditioner as conditions were brutal

with a fierce sun, 80° to 90° temperatures, and high humidity. Drinking water was a top priority. However, we needed to drink only bottled water to avoid "the Caribbean cha chas." Also, food was limited to hotels and good restaurants and "no ice" was no fun but necessary.

Friday, 10/23: On the Air

On Friday, one of the amplifiers kept cutting out, and the antenna switch wasn't working correctly. Everything eventually got fixed. We hooked up the WinKeyer, interfaced it to N1MM software and hooked up paddles so we'd have a CW-capable station available for after the SSB contest weekend.

John, KK4SHF, worked on the internal network to get N1MM on two laptops to talk to each other. The time was off on the laptops, which caused a problem trying to synch, and we discovered that the two laptops had different versions of the software. Luckily we had copies of the program with us and were able to install the same version on both laptops. After some Ethernet port configuration changes, both laptops synched. One was set up as the master and the databases shared information. And we still had no Internet.

Photo F. Noise problems initially plagued the U.S. group's station, but the Cuban group members installed a makeshift 4-rod grounding system over which they poured salt water … which solved the problem.

As we began testing and making contacts, Stephanie noticed a lot of noise. To help improve this issue, the Cubans created a large 4-rod ground with a large copper strap (*Photo F*). This reduced the noise significantly. Then they poured saltwater on the ground rods to make them more conductive. That cleared up the noise.

The contest started at 8 p.m. Friday with Jim and Nancy from our team working the radios to start.

Saturday, 10/24: Contesting and Presentations

On Saturday, we worked in shifts of approximately two to four hours each (*Photos G & H*). Bob Heil, K9EID, of Heil Sound, had loaned us two headsets and we found them extremely helpful in screening out ambient noise. Excellent audio quality was reported.

There was a noise source early in the morning that caused a total lack of communication for about two hours. When the noise mysteriously cleared, 15 meters was wide open to the world. No noise but lots of QRM — wall to wall stations trying to make contact — contest bedlam. Overall, the competition was a huge success from a technical and logistical standpoint, as well as accomplishing our goal of working as a united Cuban/U.S. team.

We had many visitors, including officials from the FRC and extended family of the Cuban hams in our group, as well as other local Cuban hams. In between contesting, presentations were made as part of our exhibition. One of the slide presentations was on RFI by Stephanie. Jim, WB2REM, did a slide presentation on remote linking. Nancy, K9DIG, demonstrated amateur radio to Cuban children. They got to wear headsets and try the radios. Nancy also provided a taste of Alaska by showing a presentation of her Iditarod competition and explained how she worked with the dogs. The images of snow went over well in the sweltering heat. Cuban coffee and pizza were served. Cuban coffee is made with sugar and espresso and served in little cups — that's all you need! Zing!

Sunday, 10/25 and Monday, 10/26: Testing and More Talking

Sunday and Monday, we had our volunteer examiners give FCC license exams to seven of the Cuban operators. It was the first time that U.S. amateur radio exams had been given on Cuban soil. The Cuban operators spoke little English but had great technical skills. With a lot of studying, they overcame the language barrier and all passed the Technician exams on Monday. Bob, CM2KL, took all three exams and was able to pass his Extra.

On Monday, we returned to the shack for some personal time on the radios. We all had a chance to make contacts on SSB and CW. The Cuban radio was also set up for PSK and RTTY. The Cuban operators used that when not in the contest.

To end our expedition, there was a

Photo G. Stephanie Koles, WX3K, and Mark Wohlschlegel, WC3W, operate the CQWW SSB DX Contest on Saturday, October 24. When this photo was taken, they were averaging six contacts per minute!

Photo H. Author Ruth Sweigart, KC4BAB, on the air from T42US.

The T42US Team

US Operators:
Jim Millner, WB2REM, Co-Leader; John Sweigart, KK4SHF; Nancy Yoshida, K9DIG; Stephanie Koles, WX3K; Ruth Sweigart, KC4BAB; Gordon Blumenfeld, WBØTKL; and Mark Wohlschlegel, WC3W.

Cuban Operators:
Roberto Ibarra, CM2KL, Co-Leader; Jorge Novoa, CO2II; Osmani Mambuca Juan, CM2OY; Amed Santana Gonzalez, CO2AME; Juan Carlos Molina, CO2JD; Michel Gomez, CL2TV; Alexei Joaquin Morejon Cohen, CO2XK; Jorge Luis Gonzalez, CM2PTE; Pedro Rodriguez, CO2RP, FRC President; and Jorge Rodriguez, CO2RK.

banquet held at a nearby restaurant for operators and guests. FRC President Pedro Rodriguez was our host. Mr. Rodriguez was instrumental in getting us approval to operate in Cuba and threw a great party for us. Large amounts of food, including whole cooked snapper, baked chicken, and pulled beef were served. There was some drinking, dancing, and lots of camaraderie and laughter. Toasts from both sides of the team were heartfelt and a great closing to our expedition.

After the banquet, most of the operators returned to the shack to tear down and grab personal gear before heading back to the hotel in Havana. Monday night was spent relaxing and exploring some local hot spots. Hotel Engleterre had music at its rooftop restaurant. Once again the moon was full and the steamy breeze was blowing. Stephanie was able to play the band's fretless bass, a unique opportunity for her as she normally plays regular bass in a local band at home.

Tuesday, 10/27 – Tourist Time

This was our one free day to explore Havana. Some of us did some shopping on Obispo Street, in Habana Vieja. We took rides on the little Cocos — which are motorcycle powered with a little round shell for passengers (Coco means coconut, and they look like one). Some of us took taxis and explored Havana. We saw the American Embassy — which is now open. The Malecon — which is the Havana seafront — was also great to walk. There are many well-known pictures of the waves crashing on the seafront. We visited for sunset — a beautiful sight over the city.

Wednesday, 10/28 – Heading Home

Time to return to the U.S. Once again, bright and early to the airport. We were checked at the airport to make sure we were returning with all of the equipment we had checked in with — minus the radio we donated to the Cuban operators. It was a short flight back from Havana to Miami.

It was a great experience for all involved and as amateur radio operators, we hope we have helped in our own way to improve relations between our two countries and possibly open the door to future joint Cuban/U.S. radio operations.

Many thanks to our team leaders, Jim Millner, WB2REM, and Roberto Ibarra, CM2KL, who struggled over an 8-month period to get permission, visas, and licenses to allow us to have this great opportunity.

Roberto hopes to host other U.S. amateur radio operators in Cuba. If you and your family are interested in coming to Cuba and visiting the FRC, meeting other Cuban hams and seeing the sights, contact Bob at <cm2kl@frcuba.co.cu>.

Results of the 2015 CQWW DX SSB Contest

It's this kind of unexpected opening ... that makes the game of radiosport so fascinating.

BY RANDY THOMPSON,* K5ZD

The 68th running of the CQ World Wide DX SSB Contest dished out its share of QRM, heartache, and triumph for those who packed the bands over 48 hours during the last weekend of October 2015. The story of the contest can be summed up in three words: Expectations, Coronal Mass Ejection (CME), and noise!

There is nothing more hopeful than preparing for a contest. We watch the bands 27 days in advance to see if the sun will be offering tricks or treats. We carefully plan our strategy — not only for which band to be on at what time, but also to make sure the family knows to give us time in the chair. For those who travel, it's a frantic rush to find and pack all of the gear. And we work on antennas. A contest like the CQ WW provides all the motivation needed to make last minute adjustments in the hope of a better score.

Conditions over the summer and in the months leading up to the contest had lowered all expectations for 10 meters. Lots of energy was going into low-band antennas. Two weeks before the contest, the solar flux went up and 10 meters started to open. The week leading up to the contest sounded great and expectations started to rise. Could we sneak one more year out of our favorite band with room for everyone?

The solar flux was up to 124 two days before the contest and we were not only seeing encouraging 10 meter conditions, but the low bands were looking promising as well. Hope and expectations were on the rise.

What a difference a few days can make. The flux was dropping as the contest began — down to 106 both days. Even worse, a CME arrived earlier than expected and spewed unwelcome particles into the ionosphere during the middle portion of the contest. The low bands were highly absorbed and not good at all. The high bands opened well, but not with the length of openings we have come to enjoy over the past few years. More than one multi-op team had visions of a record score after the first 24 hours, only to see it slip away due to slow QSO rates on Sunday. To tease us with what might have been, conditions improved dramatically during the last few hours of the contest. Perhaps it is the sun's way of offering some encouragement to try again next year.

The CMEs weren't all bad news. In a twist from the usual, the CMEs did not cause an aurora and radio blackout for the northern latitudes. Instead, stations in northern Europe enjoyed a rare late night polar opening on 20 meters into North America. It's this kind of unexpected surprise — where stations in the far north gained an unexpected advantage over those in the south — that make the game of radiosport so fascinating.

The team behind the multi-single entry of YS1YS in El Salvador. From left to right: Mario, YS1MAE; Roberto, YS1RS; and Mario, YS1GMV. (Courtesy of YS1GMV)

As if weak signal levels on the low bands weren't enough, static seemed to be everywhere. The remnants of Hurricane Patricia were moving through Texas, bringing rain and lightning. Big thunderstorms in the Caribbean made it difficult to hear anything on the low bands. Even stations in the Mediterranean complained of high static levels. Those who had invested their antenna building efforts on receiving antennas were rewarded.

A recurring theme in the post-contest comments was another kind of noise — QRM. Without 10 meters, all 40,000 stations active in CQ WW were crammed into less than 300 kHz on each band. It was almost impossible to find a clear frequency, which meant stations in different parts of the world were sharing three deep, causing lots of confusion and some not-in-log penalties. If you stopped talking even for a moment, it seemed someone would try to muscle in on the frequency. This was not helped by those selfish operators with over-processed audio and splatter well beyond the limits of a normal SSB signal.

* *k5zd@cqww.com*

2015 WW DX SSB TROPHY WINNERS AND DONORS

SINGLE OPERATOR

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

World – Low Power
TO2A (Op.: Rich Smith, N6KT)
Donor: Slovenian Contest Club

World – QRP
Ron Schwartz, VE3VN
Donor: Jeff Steinman, N5TJ

World Assisted
TM6M (Op.: Sebastien Le Gall, F8DBF)
Donor: Glenn Johnson, WØGJ

World – Assisted Low Power
P40W (Op.: John Crovelli, W2GD)
Donor: Gail Sheehan, K2RED

U.S.A.
Krassimir Petkov, K1LZ
Donor: Potomac Valley Radio Club – KC8C Memorial

U.S.A. – Low Power
K3CR (Op.: Alex Avramov, LZ4AX)
Donor: North Coast Contesters

U.S.A. – QRP
Anthony Luscre, K8ZT
Donor: Pat Collins, N8VW

U.S.A. – Assisted
Charles D Fulp Jr, K3WW
Donor: John Rodgers, WE3C

U.S.A. – Assisted Low Power
Dennis Egan, W1UE
Donor: LA9Z/LN9Z Leia Contest Club

U.S.A. Zone 3
Mitch Mason, K7RL
Donor: World Wide Radio Operators Foundation (WWROF)

U.S.A. Zone 4
Kevin Stockton, N5DX
Donor: Dave Pruett, K8CC & Greg Surma, K8GL

Europe
Tonno Vahk, ES5TV
Donor: Potomac Valley R.C. – W4BVV Memorial

Europe – Low Power
ED5N (Op.: Raul Blasco, EA5KA)
Donor: Tim Duffy, K3LR

Europe – QRP
Pit Schmidt, DK3WE
Donor: Steve "Sid" Caesar, NH7C

Europe – Assisted
OH0X (Op.: Kim Ostman, OH6KZP)*
Donor: Martin Huml, OL5Y

Europe – Assisted Low Power
Imanol Antonanzas, EC2DX
Donor: Alex Goncharov, R3ZZ

Africa
EF8U (Op.: Jeff Kinzli, N6GQ)
Donor: Chris Terkla, N1XS

Asia
UP0L (Op.: Vladimir Vinichenko, UN9LW)
Donor: Nodir Tursun-Zade, EY8MM

Caribbean/Central America – High Power
YN5Z (Op.: Scott Tuthill, K7ZO)
Donor: Alex M. Kasevich, 8R1A

Caribbean/Central America – Low Power
Felipe Hernandez, KP3Z
Donor: Albert Crespo, NH7A

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

South America
YW4D (Op.: Paolo Stradiotto, YV1DIG)
Donor: Yankee Clipper Contest Club

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

Russia
Anatoly Polevik, RC9O
Donor: Roman Thomas, R5AA

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

Japan – Low Power
Yuichi Yamazaki, JJ1VRO
Donor: Western Washington DX Club

Southern Cone (CE CX LU) – Low Power
CW5W (Op.: Jorge Diez Furest, CX6VM)
Donor: LU Contest Group

ASEAN (XZ HS XW XU 3W 9M 9V V8 YB DU)
XW1IC (Op.: Champ Muangamphun, E21EIC)
Donor: YB Land DX Club

ASEAN (XZ HS XW XU 3W 9M 9V V8 YB DU) – Low Power
Nikhorn Deesai, HS5NMF
Donor: Bob Kupps, N6BK

SINGLE OPERATOR, SINGLE BAND

World – 28 MHz
D4Z (Op.: Massimo Cortesi, IZ4DPV)
Donor: Joel Chalmers, KG6DX

World – 21 MHz
ED8X (Op.: Alexey Mikhailov, RA1AIP)
Donor: Robert Naumann, W5OV

World – 14 MHz
CR5C (Op.: Pavel Prihoda, OK4PA)
Donor: North Jersey DX Assn. – K2HLB Memorial

World – 7 MHz
D4C (Op.: Andrea Bianchi, HB9DUR)
Donor: Fred Laun, K3ZO – K7ZZ Memorial

World – 3.7 MHz
CR2X (Op.: Martti Laine, OH2BH)
Donor: Fred Capossela, K6SSS

World – 1.8 MHz
IH9A (Op.: Gianfranco Di Maio, IT9SPB)
Donor: Martin Monsalvo, LU5DX & Carlos Monsalvo, LU6EBY - LU8DQ Memorial

U.S.A. – 28 MHz
Jay Camac, N4OX
Donor: World Wide Radio Operators Foundation (WWROF)

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

U.S.A. – 14 MHz
Conrad Romberg, N5CR/7
Donor: Yankee Clipper Contest Club – KC1F Memorial

U.S.A. – 7 MHz
Dan Handa, W7WA
Donor: Stanley Cohen, W8QDQ

U.S.A. – 3.7 MHz
Joe Gagliardi, AA1BU
Donor: John Rodgers, WE3C

U.S.A. – 1.8 MHz
Ronald McClain, W2VO
Donor: South Texas DX & Contest Club (STXDXCC)

Caribbean/Central America (14 MHz)
Gil Joachim, FM5FJ
Donor: Nate Moreschi, N4YDU

Oceania (14 MHz)
E51EAQ (Op.: Jacek Marczewski, SP5EAQ)
Donor: Bruce D. Lee, KD6WW

Asia (21 MHz)
Shinya Hatakenaka, JA5FDJ
Donor: Dallas/Fort. Worth Contest Group W5PG Memorial

Europe – 28 MHz
EE3A (Op.: Jordi Bueno, EA3ATM)
Donor: John Rodgers, WE3C

Europe – 21 MHz
OH8X (Op.: Pasi Luoma-Aho, OH6UM)
Donor: Tine Brajnik, S5ØA

Europe – 14 MHz
OZ7X (Op.: Kristian Soeholm, OZ5KF)*
Donor: Charles Wooten, NF4A

Europe – 7 MHz
TM0T (Op.: Gildas Balannec, TU5KG)
Donor: Central Texas DX and Contest Club – NT5C Memorial

Europe – 3.7 MHz
OK5D (Op.: David Lunak, OK1DTP)*
Donor: Ted Demopoulos, KT1V

Europe – 1.8 MHz
Max Elleby, OZ4MD
Donor: Robert Kasca, S53R

MULTI-OPERATOR, SINGLE TRANSMITTER

World
EF8R (Ops.: R2AA, UA5C, RA5A, RT9T, EA8RM, LY4A, OH1RY, RN3QO, RW3QNZ)
Donor: So. Calif. DX Club – W6AM Memorial

World – Low Power
FY5KE (Ops.: FY5FY, F1HAR, F5HRY, F5UII, F6FVY)
Donor: Rex Turvin, NR6M

U.S.A.
K6ND/1 (Ops.: W1VE, KE1J, K6ND, K3JO)
Donor: Carolina DX Association – Ted Goldthorpe, W4VHF & Ken Boyd, K4DXA Memorial

Canada
VE3JM (Ops.: VE3EK, VE3EY, VE3JM)
Donor: John Sluymer, VE3EJ – Paul Hudson, VE3TA Memorial

Caribbean/Central America
V47T (Ops: K1DG, N2NT, KM3T)
Donor: Bob Raymond, WA1Z

Africa
CR3A (Ops.: CT1BOH, CT1FFU, CT3BD, CT3DL, CT3DZ, CT3EE, OM3GI, OM3RM)
Donor: World Wide Radio Operators Foundation (WWROF)

Asia
P33W (Ops.: UR5MID, LZ2HM, LZ3FN, LY4AA, 5B4AIE, R4FO, UA4FER, RW4WR, RA3AUU)
Donor: Edward L. Campbell, NX7TT – AA6BB and KA6V Memorial

Japan
JR5YCE (Ops: JM1UWB, JR2GRX, JJ5GMJ, JH5FIS, JH5RXS)
Donor: Arizona Outlaws Contest Club

Europe
EI7M (Ops.: EI8IR, EI3JE, EI3JZ, EI3KD, EI7IG, G0CKV, EI7KD, G4CLA)
Donor: Gail Sheehan, K2RED

Europe – Low Power
EF7X Ops.: (EA7AKK, EA7FUN, EA7KW, EA7PP, EA7RM)
Donor: EA Contest Club

Oceania
VK4NM (Ops: VK4NM, VK4LAT)
Donor: Junichi Tanaka, JH4RHF

South America
PJ4X (Ops: K2NG, NA2AA, PJ4LS, JH5GHM)
Donor: Victor Burns, KI6IM – The Cuba Libra Contest Club

MULTI-OPERATOR, TWO TRANSMITTERS

CN2AA (Ops: R3DCX, RA3CO, RC6U, RK3AD, R3FA, RK7A, RL3FT, RM2U, RM9I, RN2FA, RU9I, RV3MA, RW7K, RX3APM, UA2FM, UA3AB, UA3ASZ, UA4Z, UB7K)
Donor: Dave Leeson, W6NL & Barb Leeson, K6BL

U.S.A.
K3LR (Ops: K3LR, N2NC, N5UM, W3CDG, W2RQ, WM2H, W5OV, K3LA, K1AR, N6MJ, N3SD, K3UA, DL6LAU, N3GJ, LU7DW)
Donor: Jim Lawson, W2PV Memorial

Europe
DF0HQ (Ops: DG1ATN, DJ1TH, DJ9AO, DK5KMA, DK7YY, DL1AUZ, DL4UNY, DL5ANT, DL5GA, DL5MLO, DL6SAK, DL7CH, DL7FER, DL7VOA, DL8BH, DM8HH)
Donor: Finnish Amateur Radio League

Oceania
KH6J (Ops: AH6S, AH6NF, KH6NX, KH6U, KH7U, KH6WG, KH6XL, N2NL, WH6R, W0CN)
Donor: Tack Kumagai, JE1CKA – JR2GMC and JA9SSY Memorial

CONTEST EXPEDITIONS

World Single Operator
ZD7W (Op: Oliver Sweningsen III, W6NV)
Donor: National Capitol DX Association - Stuart Meyer, W2GHK Memorial

World Multi-Op
TO4K (Ops: G4XUM, GM4AFF, M5RIC, N0VD)
Donor: Gail Sheehan, K2RED

OVERLAY CATEGORIES

World – Classic
P49Y (Op.: Andrew Faber, AE6Y)
Donor: Pete Smith, N4ZR

U.S.A. – Classic
Jon Zaimes, AA1K/3
Donor: Tom Horton, K5IID

World – Rookie
Valery Zhitkovich, EW6W
Donor: Tim Duffy, K3LR - N8SM Memorial

U.S.A. – Rookie
Tucker McGuire, W4FS
Donor: Tim Duffy, K3LR - K3TUP Memorial

**Second place*

	Single Operator				Assisted			
	High	Low	QRP	Total	High	Low	QRP	Total
All Bands	844	1979	110	2933	1126	912	30	2068
10m	85	357	28	470	131	175	18	324
15m	98	224	35	357	108	99	13	220
20m	71	191	24	286	85	72	9	166
40m	59	86	15	160	56	44	14	114
75m	31	29	8	68	35	28	4	67
160m	28	20	4	52	21	13	3	37
Multi-One					260	121		381
Multi-Two					104			104
Multi-Multi					54			54
Totals				4326				3535

Table 1. *Number of Entries by Category*

The men behind the voices at Signal Point, PJ2T. Back row (from left to right): Jack, N4RV; Rick, NØYY; Andrea, IK7YTT; and Dave, VA7AM. Front: Heiko, DK3DM; Geoff, WØCG/PJ2DX; Uli, DL8OBQ; John, N4QQ; and Adam, W1ASB. (Courtesy of WØCG)

Installing radials directly in the saltwater at A73A were (red shirt) Alex, OZ7AM and (white shirt) Romeo, S59. (Courtesy of S59M)

There is QRM, and then there is QRM on 40 meters. It seemed like every high-powered multi-op was fighting for space between 7125 and 7200. Franki, OQ5M, summed it up this way, "if SSB is 'like pulling teeth' — on 40 it's without anesthesia." Karel, OK1CF, noted, "it is a great pity that many of us have forgotten how to work split. Between the terrible splatters here in [the] middle part of Europe, it is simply not possible to listen to weak signals."

The pressure to find a frequency was so great that some stations sought refuge by operating slightly outside of the amateur radio bands. We used our SDR recordings to identify stations that were running on 14350 and 21450. Sorry guys, but that puts a lot of your signal outside the limit. We removed these QSOs when we found them. Stations in ITU region 1 also need to remember that they may not work above 7200 kHz.

Radiosport is a game played regardless of the conditions. When the starting bell for CQ WW sounds, the bands explode with activity and the race is on. Conditions were good enough that over 5 million QSOs were reported in the received logs, including contacts with 223 different country multipliers. Even some QRP stations accomplished DXCC in a weekend. Nineteen stations were able to work all 40 CQ Zones on 15 meters, three did it on 20 meters, and one did it on 10 meters.

What words would describe your experiences in CQ WW SSB 2015?

Single Operator All Bands

The top overall Single Operator All Bands (SOAB) score was a repeat victory by Tom, W2SC, operating from his usual spot in Barbados as 8P5A. Tom logged exactly 400 contacts in the first 60 minutes of the contest on his way to a total of 10,220 after log checking! His only moment of concern was losing a homebrew solid-state amplifier 26 hours into the contest. After the contest, Tom reported, "the high bands were great but the low bands had very high noise levels. The first night it was even hard to work other Caribbean stations on 160."

Tonno, ES5TV, was thrilled with his second place overall finish calling it "… probably the most memorable contest experience I have ever had." Tonno was watching the online scoreboard at cqcontest.net and saw that Kim, OHØX, was ahead on multipliers. Tonno used that as motivation, saying, "I literally pushed like never before. Without a single break for 48 hours other than a quick jump or two into the bathroom." What Tonno didn't realize was that Kim was in the Assisted category. "Had I known that I was competing only against myself and without any ambition for top Europe, I would have certainly taken a short nap or relaxed." Taking advantage of the incredible late night opening on 20 meters to North America, Tonno finished far ahead of all other European scores.

There were four continents represented among the top five SOAB scores. Jeff, N6GQ, overcame a killer travel schedule to place fourth from EF8U in his first time operating from Africa. Vladimir, UN9LW, represented Asia with a big score from UPØL in Kazakhstan.

The USA Top Ten for SOAB featured stations from across the country. Krassy, K1LZ, in Massachusetts nailed down the top spot with Kevin, N5DX,

Spring

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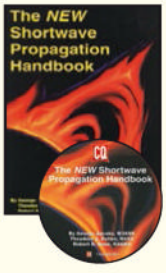

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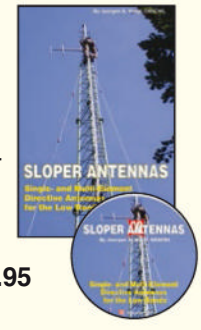

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2015 CQ WW DX SSB TOP SCORES

WORLD

SINGLE OPERATOR
HIGH POWER
All Band

8P5A (W2SC) 16,911,600
ES5TV.....13,177,813
VY2ZM (K1ZM).....11,665,566
EF8U (N6GQ).....9,956,860
UPØL (UN9LW) 9,666,524
CF3A (VE3AT).....9,618,125
9A1P (9A1UN) 9,316,256
RC9O 8,963,178
P3F (5B4AGN) 8,666,580
UW2M (URØMC) 8,424,752

28 MHz

D4Z (IZ4DPV) 3,252,670
CX2DK 2,325,162
ZY2B.....1,502,904

21 MHz

ED8X (RA1A) 2,069,516
OH8X (OH6UM) 1,797,696
CR6T (CT1ESV) 1,512,368

14 MHz

CR5C (OK4PA).....1,403,061
OZ7X (OZ5KF).....1,367,688
G9W (MØDXR) 1,352,575

7 MHz

D4C (HB9DUR) 1,436,064
TMØT.....798,532
RK4FD 750,547

3.7 MHz

CR2X (OH2BH) 453,248
OK5D (OK1DTP) 201,178
EW8Y.....163,464

1.8 MHz

IH9A (IT9SPB) 267,736
OZ4MD 42,280
G4L (G4LDL) 37,417

LOW POWER
All Band

TO2A (N6KT) 7,035,756
3V8SS (KF5EYY).....6,408,158
KP3Z.....6,138,341
VE3DZ.....5,727,392
NP2X 5,452,457
ED5N (EA5KA) 3,808,761
OK7Z (OK2ZI) 3,728,718
K3CR (LZ4AX) 3,568,956
EF2A (EA2OT) 3,542,272
LY5R (LY9A).....3,531,635

28 MHz

EA8TX.....1,122,680
ZP6DYA 514,856
VR2ZQZ 458,590

21 MHz

SØS (EA2CNU) 876,555
JF3BFS.....374,267
LZ2JA 241,280

14 MHz

9Y4D.....1,275,340
CO6LC 388,326
RZ90Q 239,085

7 MHz

RC7KY 163,114
YV8ER 157,080
SQ7NSN.....108,150

3.7 MHz

F5BEG.....55,242
SP4SHD.....33,672
VE3BR 30,108

1.8 MHz

SQ9IAU.....23,265
OK1JOK 13,886
YO8RZJ 12,528

QRP
All Band

VE3VN 677,340
DK3WE 642,208
JR4DAH 500,678
JH1OGC 485,010
UX2MF.....425,548
K8ZT 340,075
G4CWH.....290,418
IZ1ANK 287,328
W6QU (W8QZA) 236,610
NDØC.....235,554

28 MHz

PU1MHZ 122,910
I5KAP.....54,431
WA6FGV 43,758

21 MHz

YT7Z (YU7SK) 103,740
SP5DDJ 83,520
GJ3YHU 52,917

14 MHz

SQ5NBE.....58,290
IN3HUU 11,780
R2ABT 11,286

7 MHz

CT1BXT.....37,570
UT5UUV.....12,264
IZ2JPN.....11,456

3.7 MHz

OL4W (OK1IF) 13,872
SQ8MFB.....6,020
RA4FWA 3,936

1.8 MHz

HA1TI.....2,883

ASSISTED
HIGH POWER
All Band

TM6M (F8DBF) 14,263,470
OHØX (OH6KZP)...11,790,240
PX5E (PP5JR).....11,073,697
TO2M (VE3LA).....9,460,955
6Y9X (K1XM).....8,245,664
P4ØA (KK9A) 8,176,630
SO2O (SQ2GXO).....8,168,004
VA2WA 7,674,189
LP1H (LU5HM) 7,172,072
EU1A.....7,185,879

28 MHz

CQ3L (DF7ZS).....2,157,246
LR1E (LW6DG) 1,906,736
OK7K (OK1BN) 1,216,885

21 MHz

DL2ARD.....1,685,103
YV4NN.....1,542,240
9Y4W.....1,495,224

14 MHz

4L8A.....1,606,648
OL9A (OK2ZAW).....1,516,482
OH8L (OH8LQ) 1,503,712

7 MHz

SN3A (SP3GEM).....772,740
TM7G.....575,127
9A2L (9A3AG).....519,224

3.7 MHz

HA8A (HA8DZ).....279,672
M5B (G3WVG).....257,370
OQ5M (ON5ZO) 181,450

1.8 MHz

IO4C (IZ4ZAW) 76,440
EF8S (OH2BYS) 70,824
OK1W 69,388

ASSISTED
LOW POWER
All Band

P4ØW (W2GD) 8,641,514
EC2DX 5,377,401
HI3TEJ.....4,665,692
LY7Z.....4,394,565
W1UE.....4,143,150
9A5Y (9A7DX) 4,088,268
KE3X.....3,701,388
K5WA.....2,583,819
VE2IDX (VE3ZF).....2,569,899
VA3DF.....2,438,257

28 MHz

ED8O (EC5AN).....1,035,709
SV9GPV.....805,304
IR9W (IWØHBY) 739,576

21 MHz

YV1KK 1,229,658
EA8MT 1,012,860
UK9AA 867,232

14 MHz

GI6K (GIØKOW).....638,880
UR2Y (USØYW).....619,362
YO9HP 439,200

7 MHz

CQ7X (EA7JX).....235,480
PD1D 62,084
HI8KW 59,600

3.7 MHz

E74O.....63,492
OK1AY 59,625
YUØU.....56,628

1.8 MHz

ES5RY 32,154
Z35T 28,644
LY2OU 21,122

ASSISTED
QRP
All Band

RT4W.....678,300
IZ8JFL/1.....444,087
RA4AAT 417,125
IZ3NVR 358,474
DD5FM.....334,196
OK2FD 221,112
YU1LM.....195,337
SP9RQH.....141,949
UR5XMM 89,180
LZ7H.....74,036

28 MHz

SP5EWX 162,960
JR3RWB 117,645
R7NA 96,480

21 MHz

OH2BV 178,416
II3W (I3VFJ) 165,240
BD9XE 73,440

14 MHz

MWØJRX.....201,720
YT4T 71,536
IZØFUW 43,344

7 MHz

IQ3KU (IZ3IBL).....23,400
SV3GKU.....13,662
IZ1DGG.....10,761

3.7 MHz

EW1IP.....24,640
ES7RIX 4,536
9A4AA.....3,465

1.8 MHz

YP8A.....3,116
SP6OJK 1,710

MULTI-OP
SINGLE TRANSMITTER
High Power

EF8R 30,859,830
CR3A 26,524,220
P33W.....25,506,000
V47T 23,721,177
UP2L.....19,342,103
PJ4X.....18,425,844
EI7M 16,988,367
9K2HN 16,026,408
IR4X.....14,857,570
E7DX.....14,454,180

Low Power

FY5KE 14,118,480
VP9I.....6,784,064
EF7X 5,370,786
KP4BD 4,309,425
HI3K.....3,988,962
ED1B.....3,910,548
PR1T.....3,841,830
SZ1A.....2,942,055
OE2S.....2,863,344
9A3B.....2,493,120

MULTI-OP
TWO TRANSMITTER

CN2R 36,582,798
CN3A 34,973,452
PJ4Q.....23,660,020
C4A.....20,307,184
TO4K.....19,705,908
A73A.....19,171,206
V26B.....18,635,988
KC1XX 18,105,815
PX2A.....16,904,300
ED9K.....16,893,920

MULTI-OP
MULTI-TRANSMITTER

CN2AA 69,993,040
K3LR.....31,602,915
HK1NA 30,132,705
PJ2T 27,166,178
W3LPL.....23,637,570
DFØHQ.....23,497,428
9A1A.....23,148,840
ZW5B.....21,068,295
WE3C.....19,324,062
LZ9W 18,088,200

ROOKIE
High Power

EW6W.....3,240,975
W4FS 2,813,586
A92AA.....853,160
KG5CIK 364,212
ND7J/4.....355,320
LB7ZG.....258,995
VE3TCV.....224,576
W7CYL.....211,640
YU2DBZ.....184,496
YU1USA.....150,290

ROOKIE
Low Power

YY1YLY 692,886
BG2CTX 639,840
8P9EH.....419,152
OH5CZ 391,575
KF5VDX 363,090
YT5IVN 327,137
ED3T (EA3HSO) 319,770
M4P (MØPMV) 315,248
RØAEE 297,297
PA9IGB 294,752

CLASSIC
High Power

P49Y (AE6Y).....6,930,818
4LØA (4L4WW) 5,500,828
OHØV (OH6LI) 3,050,431
HG3R 2,883,540
A65BP.....2,882,180
AA1K/3.....2,653,530
SP9LJD.....2,527,448
G5W (5B4WN) 2,456,904
GM2V (GM3WOJ) ...2,450,760
OA4SS 2,355,792

CLASSIC
Low Power

VE3DZ.....3,526,202
OE6Z (OE6MBG) 2,402,244
V3A (V31MA).....1,918,290
K1BX.....1,538,685
TY4AB.....925,344
LY6A.....814,618
USØHZ.....786,210
K1HT.....738,360
SQ6H (SQ6PLH) 686,700
OK1TA 649,020

UNITED STATES

SINGLE OPERATOR
HIGH POWER
All Band

K1LZ 8,223,696
N5DX 7,336,080
N1UR 7,172,642
W9RE.....5,584,410
N9RV/7 5,573,344

28 MHz

N4OX 504,900
K8MFO.....441,188
W4SLT.....120,078
KC9WAV 115,230
NIØG.....92,514

21 MHz

KU2M.....1,118,340
W3EP/1.....363,485
K2YY/6.....284,532

14 MHz

N5CR/7 260,865
AB1WR 113,436
K1RX 96,652

7 MHz

W7WA 532,024
W1XX.....212,864
N7AU 48,500

3.7 MHz

AA1BU 101,222
W4QNW.....28,392
W2XL.....27,000

1.8 MHz

W2VO 4,440
N7GP (N5IA).....4,200
WB4WXE 2,400

LOW POWER
All Band

K3CR (LZ4AX) 3,568,956
AD4Z.....2,495,871
N5AW 2,226,978
NA8V 1,949,815
N4TZ/9.....1,887,472

28 MHz

K2PS/4.....137,826
K3MSB.....96,250
WE6EZ/5.....91,258

21 MHz

KØBBB.....151,065
W3SM/1.....122,752
K5FUV.....113,704

14 MHz

KJ4QHL 66,926
KF5CYZ.....32,851
KX2S/3.....26,325

7 MHz

KB3LIX.....29,484
KD5LNO.....16,660
W9QL.....4,329

3.7 MHz

W8JGU 7,498
K4CC.....6,223

QRP
All Band

K8ZT 340,075
W6QU (W8QZA) 236,610
NDØC.....235,554
W1JCW/5.....223,965
KA8SMA 151,891

28 MHz

WA6FGV 43,758
KM4VR 9,464
KIØG/5 3,120
N8XX 1,200

21 MHz

N3UR 16,464

14 MHz

WB3D/4 6,624

ASSISTED
HIGH POWER
All Band

K3WW 6,889,155
K5TR.....5,839,540
NN1SS 5,456,136
N3RS 5,158,964
AA3B.....4,647,250

28 MHz

W5PR 615,038
K2SSS 480,048
W7ZR.....222,162

21 MHz

K3EST/6.....931,245
N7DD 884,256
AB4B.....773,245

14 MHz

WA3C/8 329,556
N2NS/6 63,245
KJ7NL.....27,730

7 MHz

W9RN 71,027
W2TA/4.....68,794
W6RW/7 49,312

3.7 MHz

W3NO 59,247
N6RO.....18,590
W1ZZ.....11,221

ASSISTED
LOW POWER
All Band

W1UE.....4,143,150
KE3X.....3,701,388
K5WA.....2,583,819
W9PA.....2,272,050
KS1J 1,806,060

28 MHz

N1DG 220,500
N4IJ/5 199,955
KE5SNJ.....135,250

21 MHz

AIØL.....339,438
W2AW (N2GM).....256,122
N9TGR 240,099

14 MHz

N4DL 73,401
NW4V 10,176
N2GA 1,456

7 MHz

WK9U 34,452
KCØMCK/4.....4,180

3.7 MHz

K3TW/4.....8,195
WB4OMM 2,607

ASSISTED
QRP
28 MHz

KB2HSH.....11,232

21 MHz

NØUR.....20,808
W9SUN.....17,871
N8HP 16,614

14 MHz

N9NBC 19,512

7 MHz

N9NBC 19,512

MULTI-OP
SINGLE TRANSMITTER
High Power

K6ND/1 8,571,060
K8AZ.....8,447,173
NV9L.....7,142,818
W2FU.....6,447,080
WW4LL.....6,141,788

Low Power

NM1C.....1,667,925
KT4ZB.....1,423,148
WA1F/4.....503,440
K4RC 401,790
W3HAC 260,848

MULTI-OP
TWO TRANSMITTER

KC1XX 18,105,815
K9CT.....11,482,330
NQ4I 10,526,440
NØNI.....6,898,755
K4TCG 5,673,734

MULTI-OP
MULTI-TRANSMITTER

K3LR.....31,602,915
W3LPL.....23,637,570
WE3C.....19,324,062
WK1Q 12,144,725
W4RM 10,249,351

ROOKIE
High Power

W4FS 2,813,586
KG5CIK 364,212
ND7J/4.....355,320
W7CYL.....211,640
KG5CIJ.....98,306

Low Power

KF5VDX 363,090
KC1BOH.....205,425
KEØCRP.....187,543
AEØEE.....165,000
AC8XI.....161,138

CLASSIC
High Power

AA1K/3.....2,653,530
NN1N 1,729,920
N8II.....1,609,685
W1WEF.....1,424,280
K9JF/7 1,060,618

Low Power

K1BX.....1,538,685
K1HT.....738,360
NA1DX/3.....367,319
KK4RV 347,706
K1IX.....315,268

Gary, KF5VDX, set up this vertical array on the beach and worked 94 countries — five for all time new ones! (Courtesy of KF5VDX)

Rich, N6KT, operating as TO2A. (Courtesy of N6KT)

doing a great job to finish second from Arkansas. Mike, W9RE, did his usual strong effort from Indiana in fourth. Pat, N9RV/7, in Montana outdueled Mitch, K7RL, in Washington for the top score out west.

SOAB Low Power was the most popular category in the contest with 1,979 entries (see *Table 1*). The top score was a real Field Day style operation by Rich, N6KT, operating as TO2A in French Guiana. Rich worked from a tent with generator power and no antennas more than 10 meters high. This was Rich's 11th world high score in CQ WW Phone. Ashraf, KF5EYY, operated 3V8SS to second place just ahead of three North American entries KP3Z, VE3DZ, and NP2X. The top European score was ED5N operated by Raul, EA5KA. Long time high-power competitor Alex, LZ4AX, drove the K3CR station in low power for the top USA score, followed by Julio, AD4Z, and Marv, N5AW.

Single Operator All Bands Assisted

The Assisted categories continue to grow in popularity. The SOAB Assisted High Power category had 1,126 entries. The winner was TM6M in Western France operated by Sebastien, F8DBF. Sebastien had the second highest single-operator score in the contest behind only 8P5A. Kim, OH6KZP, operated OHØX to the highest multiplier of any single operator to finish second. Sergio, PP5JR, piloted PX5E to third with one of the few big scores from the Southern Hemisphere in a year where all the action was up north.

The winner of the SOAB Assisted Low Power category was John, W2GD, operating from P4ØW in Aruba. John's score would have placed him fifth in the High-Power category. The contest had a special meaning for John, "Nine months ago the doctors told me I had cancer and my prognosis was limited. But, after six months of treatment with a new immuno-therapy drug (and the loving prayers of thousands), last month I achieved the miracle of complete remission ... the cancer is currently gone. Unfortunately there is no permanent cure for this, but I'm enjoying every extra day I have."

what's new

SOTAbeams Redesigns Popular Portable Log Pad

SOTAbeams has redesigned its popular portable log pad. The changes were suggested by users and include a new page format together with revised columns for easier use. The pad uses A6 paper, which is 105 x 148 mm (approx. 4 x 6 inches) and is made up of 80 g/sqm white paper that is not waterproof. It is glued to the 750-micron grayboard backing along the long edge, which makes it easy to tear off individual sheets. There are 50 sheets per pad with 13 QSO lines per sheet.

The Log Pad is available now and has a retail price of $2.12 with a special price on 10 or more pads. For more information, contact: SOTAbeams, 2nd Floor, Paradise Mill, Park Lane, Macclesfield, SK11 6TL U.K. Phone: +44 (0) 7976 688359. Website: <http://www.sotabeams.co.uk>.

Note: *"What's New" is not a product review and does not constitute a product endorsement by* CQ. *Information is primarily provided by manufacturers/vendors and has not necessarily been independently verified.*

2015 CQ WW 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	67/7/23	533/18/77	1621/28/101	1996/33/108	2744/31/113	3259/30/111
ES5TV	235/12/54	562/19/73	982/31/107	2243/36/127	3017/38/132	781/35/117
VY2ZM	251/18/68	361/21/74	937/27/94	2006/34/117	1298/35/116	1088/29/105
EF8U	20/3/16	230/15/44	420/19/80	942/30/100	1778/35/110	2492/28/100
UPL	68/7/19	326/11/50	1300/28/95	1666/34/99	1183/31/99	1442/27/96

USA TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
K1LZ	79/10/38	329/21/70	714/20/81	897/31/100	1658/33/104	1114/23/93
N5DX	17/8/11	176/20/63	793/31/99	691/35/120	1622/37/126	780/32/108
N1UR	42/9/26	349/17/69	555/24/89	842/31/107	1141/33/115	1088/27/100
W9RE	33/9/15	171/18/63	450/30/95	643/34/111	979/35/113	897/26/96
N9RV/7	12/5/5	101/21/39	747/32/73	735/32/107	1667/37/113	533/27/65

WORLD SINGLE OPERATOR ASSISTED ALL BAND

TM6M	148/11/49	606/19/86	1287/31/115	1601/34/131	1872/37/135	1543/36/151
OHØX	180/9/52	515/17/85	965/35/126	1572/38/149	2457/39/151	605/36/143
PX5E	8/5/7	150/16/60	246/29/89	1028/34/124	1240/37/129	2888/35/136
TO2M	24/4/16	268/19/60	888/28/96	1434/35/120	1005/29/102	2819/32/124
*P4ØW	21/4/18	155/16/57	439/26/90	1060/34/121	995/33/113	1919/31/115

USA SINGLE OPERATOR ASSISTED ALL BAND

K3WW	40/8/25	199/20/74	243/26/96	1312/35/134	756/33/129	898/29/112
K5TR	23/10/17	90/20/60	563/30/109	367/36/122	1342/37/140	827/32/129
NN1SS	13/7/8	165/19/75	238/26/96	1071/37/130	713/33/118	603/29/113
N3RS	5/4/3	160/16/67	283/23/85	674/36/130	789/34/122	817/29/119
AA3B	16/6/15	170/14/64	332/25/91	659/32/116	598/31/114	798/26/107

WORLD MULTI-OPERATOR SINGLE TRANSMITTER

EF8R	85/11/54	632/21/92	1615/37/125	2365/38/156	2083/39/154	4814/38/162
CR3A	96/13/56	648/23/95	850/32/113	2364/38/147	2155/37/149	4168/38/154
P33W	179/9/56	451/20/84	1249/34/123	2628/38/155	2296/39/151	3299/37/154
V47T	87/11/47	417/19/84	1824/33/118	2206/37/140	3421/38/145	3700/34/137
UP2L	151/8/51	564/18/78	1798/37/129	2417/38/152	2363/37/150	965/32/129

USA MULTI-OPERATOR SINGLE TRANSMITTER

K6ND/1	42/11/32	374/19/82	535/27/102	823/37/135	1210/33/135	1210/30/122
K8AZ	21/9/18	76/20/73	523/29/105	1107/38/137	1313/37/138	958/33/126
NV9L	30/11/29	73/21/68	536/31/114	753/38/141	1129/38/140	902/31/116
W2FU	26/9/24	246/21/81	247/28/101	907/38/140	838/36/130	831/32/120
WW4LL	14/8/13	128/21/74	516/31/113	656/36/134	1040/38/140	726/32/126

WORLD MULTI-OPERATOR TWO TRANSMITTER

CN2R	246/10/49	1497/27/107	2031/33/121	2086/37/150	4086/38/153	3960/38/154
CN3A	62/8/45	887/21/92	2115/34/121	3043/38/149	3627/38/152	4068/37/158
PJ4Q	63/11/30	498/19/76	1539/28/108	2305/34/130	3272/32/118	3423/31/123
C4A	93/8/42	481/14/71	1396/32/114	2051/37/146	2202/38/135	2555/37/155
TO4K	84/6/20	650/17/72	1902/28/95	2557/33/125	3900/31/113	3392/29/118

USA MULTI-OPERATOR TWO TRANSMITTER

KC1XX	36/11/29	595/23/91	1297/32/119	1601/39/147	2408/40/151	1876/31/132
K9CT	32/8/18	232/23/75	699/33/115	1156/38/140	1888/37/140	1537/32/128
NQ4I	36/10/21	231/17/72	865/31/115	1071/37/138	1425/37/140	1521/30/128
NNØI	28/10/19	184/21/68	563/30/106	1165/37/131	1168/36/138	660/33/114
K4TCG	23/8/14	173/19/63	425/27/89	503/32/110	1146/35/109	1070/28/104

WORLD MULTI-OPERATOR MULTI-TRANSMITTER

CN2AA	872/20/84	2284/31/117	3537/37/140	5710/38/162	5518/39/168	5423/40/164
K3LR	466/19/61	841/27/99	2350/36/137	3353/39/174	3188/40/168	2260/34/147
HK1NA	268/16/52	596/21/78	2017/31/116	3349/37/140	3199/36/132	3888/32/120
PJ2T	175/13/28	644/20/79	1823/30/108	2816/36/136	3631/33/124	3794/30/124
W3LPL	275/14/42	750/26/99	1844/34/130	1931/39/158	3051/40/157	2001/34/140

USA MULTI-OPERATOR MULTI-TRANSMITTER

K3LR	466/19/61	841/27/99	2350/36/137	3353/39/174	3188/40/168	2260/34/147
W3LPL	275/14/42	750/26/99	1844/34/130	1931/39/158	3051/40/157	2001/34/140
WE3C	180/15/48	639/24/91	1222/33/123	2285/39/159	2491/40/153	1385/33/140
WK1Q	229/12/40	605/24/91	1021/27/110	916/38/145	1721/36/134	1230/30/124
W4RM	26/8/15	387/20/76	959/28/110	1405/36/132	1730/37/131	669/26/112

EC2DX put up a very nice score to finish first in Europe. Dennis, W1UE, was the top USA finisher and fifth overall.

Single Operator Single Band

With the D4C contest station not fully ready for a multi-operator effort due to the reconstruction activities after Hurricane Fred (2015), two single-band entries were planned. Max, IZ4DPV, selected 10 meters and the callsign D4Z. Andrea, HB9DUR, joined Max on the trip with the intention of operating 20 meters. After two days of work trying to prevent interference from 20 meters to 10 meters, it was decided that Andrea would do 40 meters. The D4C mountaintop location is fantastic and resulted in two dominating first place scores.

No surprise that 10 meters was the most popular single-band entry category. It was nice to have plenty of room to spread out with signals from 28300 to above 28700. Marcelo, CX2DK, made a valiant effort in finishing in second place. The 10-meter scores dropped dramatically as you headed north. Jay, N4OX, had the top USA score on 10, with Don, K8MFO, close on his heels.

The top score on 15 meters was by Alexey, RA1A, testing out a new location in the Canary Islands as ED8X. It was tough going with the band packed from 21100 to the top. Pasi, OH6UM, made a last minute decision to switch from his usual 20-meter, single-band effort to 15 meters. Not only did he finish second in the world, he broke the Finland record (OH5BM, 1988) that had stood for 27 years! He ended up only 30K points from capturing the European record. Peter, KU2M, cruised to a dominant victory among USA scores.

The championship of 20 meters was between three Europeans: north, central, and south. The winner by a narrow margin was Pavel, OK4PA, operating as CR5C from the QTH owned by OK1RF. Kristian, OZ5KF, operated OZ7X to second place over Mark, MØDXR, at G9W. All three managed to put in about 40 hours of operation. It was 10 extra country multipliers by CR5C that made the difference. Siggi, TF3CW, deserves an honorable mention for his fourth place score and for handing out the zone 40 multiplier.

Will, AA4NC, enjoying the pileups from Fernando de Noronha as PYØF/AA4NC. (Courtesy of AA4NC)

EUROPE TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
ES5TV	235/12/54	562/19/73	982/31/107	2243/36/127	3017/38/132	781/35/117
9A1P	146/9/55	320/14/66	832/26/92	1025/33/102	1354/35/103	2253/35/124
UW2M	97/8/44	411/15/65	1156/29/101	1140/35/107	2049/35/123	1544/33/108
403A	270/12/53	400/17/68	1246/28/100	1185/36/112	1508/35/126	1264/32/110
OE3K	177/8/46	567/14/62	1159/28/97	1003/28/91	1103/33/101	994/30/96

EUROPE SINGLE OPERATOR ASSISTED ALL BAND

TM6M	148/11/49	606/19/86	1287/31/115	1601/34/131	1872/37/135	1543/36/151
OHØX	180/9/52	515/17/85	965/35/126	1572/38/149	2457/39/151	605/36/143
SO2O	116/9/53	174/19/82	1054/34/114	1144/37/124	1390/37/127	399/35/135
EU1A	39/6/30	129/13/58	1000/33/112	1069/37/125	1180/36/127	1034/36/140
DJ8OG	115/9/52	419/17/83	354/34/111	1068/37/130	1068/37/130	711/37/143

EUROPE MULTI-OPERATOR SINGLE TRANSMITTER

EI7M	102/11/52	597/17/88	1776/36/119	1804/38/146	2407/38/145	2037/36/151
IR4X	118/12/61	498/20/93	1486/37/127	1512/38/147	1809/38/148	1576/37/152
E7DX	84/10/56	631/24/99	1356/35/124	1429/38/151	2151/40/154	1918/36/156
RU1A	51/9/51	145/16/72	1243/35/127	2948/40/156	2552/40/150	602/35/144
OM7M	150/12/64	240/19/86	1607/37/133	1659/38/145	1600/39/151	1595/38/160

EUROPE MULTI-OPERATOR TWO TRANSMITTER

ED1R	254/13/62	1108/22/98	1773/29/113	1769/38/150	2672/40/147	1984/37/142
HG1S	187/7/46	1113/20/90	1312/31/113	1619/38/145	2713/39/149	1672/36/150
PI4DX	261/10/53	1023/18/87	1288/35/116	1772/38/132	1525/38/135	2124/36/135
IB9T	302/11/60	833/19/84	1152/28/104	1997/38/149	1942/36/134	2150/38/156
HG7T	231/11/55	1125/26/97	1388/35/125	1299/37/144	1840/40/147	1551/39/152

EUROPE MULTI-OPERATOR MULTI-TRANSMITTER

DFHQ	688/10/61	1815/26/100	3186/38/141	3329/40/163	2002/40/161	1538/38/160
9A1A	983/16/72	1970/20/98	2477/34/128	3163/38/145	2958/40/149	1856/37/146
LZ9W	620/12/62	1683/31/110	2275/39/132	2979/38/146	2057/38/143	1767/36/149
OT5A	778/12/61	1490/17/75	2126/28/117	1802/39/133	2204/39/140	1582/34/141
C37N	442/9/54	1438/19/83	2355/27/104	2823/31/115	2119/27/107	1457/25/98

Martti, OH2BH, operated on 75 meters as CR2X from his place in Madeira to a big lead over David, OK1DTP, as OK5D. Each made more than 1,600 QSOs on the band. The top USA score was by 75-meter regular Joe, AA1BU.

How can you operate from Italy and enjoy the extra QSO point advantage of being in Africa? Pantelleria Island is just across the continental boundary so it counts as a separate CQWW multiplier called African Italy. Gianfranco, IT9SPB, operated there as IH9A and finished far ahead of everyone on Top Band. Max, OZ4MD, was the top European. Scores were much lower in the USA where an east vs. west battle saw Ronald, W2VO, in western New York sneak ahead of Milt, N5IA, operating as N7GP in Arizona, by just 240 points!

QRP

It takes a special kind of determination to enter the QRM of CQ WW SSB with only 5 watts. Scores were only about half of what they were in the previous two years reflecting the shorter openings on 10 meters. Ron, VE3VN, took the top score for the world followed closely by Pit, DK3WE. Both are regulars in the QRP category. Mike, RT4W, made over 1,100 contacts on his way to the top Assisted score.

Overlay Categories

The Classic Overlay is open to single operator entries that use only one radio, no DX cluster, and counts only the first 24 hours of operation for the score. We had 856 Classic entries this year. The high-power winner was by Andy, AE6Y, vacationing in Aruba as P49Y. Andy explained his choice to focus on the Classic Overlay. "This year I was by myself, but the idea of celebrating one's 70th birthday (Sunday) alone is bad enough without the concomitant hallucinations and fatigue that go with a full-blown effort in this contest." Giving part-time efforts a chance to compete is one of the main reasons for the Classic Overlay. Yuri, VE3DZ, did a full-time effort, but his first 24 hours were enough to win the low-power class.

The Rookie Overlay is for operators who have been licensed less than 3 years at the time of the contest. The 315 Rookie entries were the highest number ever and indicate a bright future for CQWW. There were two big scores in the high-power class with both licensed in September 2014. Valery, EW6W, finished ahead of 17-year-old Tucker, W4FS. It was a very close race on low power between Grecia, YY1YLY, in Venezuela and Wuyi, BG2CTX, in China. Grecia is a 19-year-old YL who has now won the Rookie category in both CQ WPX and CQ WW SSB! Wuyi has only had a ham radio license for 2 months. Keep an eye out for all of these great operators in the future!

Multi-Ops

The most exciting multi-operator category was Two Transmitter. Six of the top 10 entries were contest expeditions. The top spot was a shootout between CN2R and CN3A in Morocco. CN2R won on the basis of a few more multipliers and lower error rate. PJ4Q was a combination of local and visiting operators who enjoyed the luxury of having a swimming pool included in the QTH. The guys at TO4K also enjoyed some relaxing time in their pool overlooking the Caribbean on their way to the top North American score.

While KC1XX won the USA title for multi-two, it was the spirited competition between K9CT and NQ4I that demonstrated how much fun it can be to use the cqcontest.ru live

Pasternack Announces a New and Improved Version of The Cable Creator™

Pasternack has released an improved version of its popular online tool called The Cable Creator™. This new iteration allows users to not only design and customize special cable configurations online, but also purchase their designs without the need to wait for a quote from the company's sales team.

With a modernized look and feel, Pasternack's Cable Creator enables engineers and buyers to quickly and easily create customized RF cable assemblies that meet their specifications from any combination of compatible connectors and cables offered by the company. Designers can choose from over 1,300 connector types and 115 different coaxial cables to construct a cable solution for their specific applications. The Creator can also be used to locate any of the company's existing 40,000+ cable assemblies.

This new version of the Pasternack Cable Creator builds a unique product page on the fly, which provides customers a part number, pricing, a build-of-materials (BOM) datasheet, and the ability to enter the desired length of the assembly. The users can then add their special designs to the online shopping cart and purchase their assemblies like any other products. The engineer or buyer can then use the newly created part number to reorder the same assembly again in the future. You can use Pasternack's new Cable Creator™ at <http://www.pasternack.com/t-cable-creator.aspx>.

Note: *"What's New" is not a product review and does not constitute a product endorsement by* CQ. *Information is primarily provided by manufacturers/vendors and has not necessarily been independently verified.*

Ivo, 9A3A, operating from the well-equipped station of 4O3A in Montenegro. (Courtesy of 4O3A)

score reporting site. According to Craig, K9CT, "our team was totally focused on the horse race ... It was a marathon and neither team was ever in the lead or behind very long. I can tell you that it kept our team in the chair and chasing every multi and QSO possible."

The biggest score of the contest was by multi-multi entry CN2AA. This team of Russian contesters has perfected the logistics to assemble a large station at a beachfront hotel just for the contest. The antennas are grouped in three sites, all within a 400-meter circle; The Beach (sandy beach by the Atlantic Ocean), The Cliff (30-meter-high cliff above the ocean) and The Rock (50-meter-high hill near the ocean). There were 51,052 total QSOs logged by CN2R, CN3A, and CN2AA. No one should have missed the CN multiplier!

Second place in multi-multi went to K3LR, just ahead of HK1NA. The K3LR station had upgraded to new Icom IC-7851 radios at all RUN positions on the way to an 11th consecutive USA victory. DFØHQ was the top European score, only 1% ahead of 9A1A. This was the first time in many years that WØAIH was not entered in the multi-multi category.

The multi-single category has become the category of choice for intense competition among Russian teams using very sophisticated in-band run and multiplier station combinations. This year, the winning team was EF8R on the strength of fantastic QSO numbers on 40 and 10 meters. CR3A in second place showed that a traditional single run and multiplier station could still be competitive. EI7M overcame losing their 80-meter dipole three hours into the contest on their way to the top European score. As always, it was a close race for the top USA plaque with K6ND/1 finishing just a few points above K8AZ. FY5KE tried the multi-single low-power category and more than doubled the world record.

Final Thoughts

Once again, the CQ WW Contest Committee pored over the logs and recordings to validate the results. In addition to the usual checking for transmissions out of band and unclaimed use of DX spotting assistance, we looked more closely into self-spotting. Spotting yourself or asking someone to spot you is prohibited by the rules. We detected a number of stations that were spotting themselves using other calls (sometimes fake calls) to hide their identity. We have developed new techniques to detect this and it resulted in 28 disqualifications. We ask everyone to please read the rules carefully and follow them.

After many years of contributions by individuals, the cost of producing and mailing certificates is no longer viable. As a result, *CQ* magazine has decided it will no longer provide paper certificates. All entries that were received by the log deadline may download their own certificates in electronic form from the cqww.com website. It is easy to use this file to print your own certificate.

The CQ WW contest lost a close friend and supporter shortly after the contest when Rich, KL7RA, unexpectedly passed away. Rich had built multi-multi capable stations at three different locations in Alaska over the past 30 years. His call was the zone 1 multiplier in many logs. We will miss his sharp wit and passion for ham radio contesting.

Thanks to the many people who work behind the scenes to administer the CQ WW DX Contest. Log checking was improved this year through the donation of a new server by the World Wide Radio Operators Foundation (WWROF). There is a small group of people who spend many hours of their time checking the logs and investigating suspected violations all with the goal of protecting the integrity of the competition.

We have added a new feature to the cqww.com website. You can now see the highest QSO rates by category and continent at <http://www.cqww.com/rates/>. Everyone loves high rates and it is fun to see how your best stacks up to others in your area.

We look forward to seeing everyone again later this year for the CQ WW DX SSB Contest on October 29-30, 2016. Full rules, all-time records, electronic certificates, and other information are available on the Web at <www.cqww.com>.

(Continued on page 93 for scores)

CQ WW SSB on the Web

Quadcopter Overview of Signal Point PJ2T: <https://youtu.be/vpGCzBwRcHY>
The Story Behind VP5DX: <http://www.nfdxa.com/CQWW%20@%20VP5DX.pdf>
VK2GGC in CQWW 2015: <https://youtu.be/1Mf8VIPyii8>
ED9K Expedition (Spanish): <https://www.facebook.com/ed9kTeam/videos/1134691346559622/>
Highest QSO Rates in CQ WW: <http://www.cqww.com/rates/>
9K2HN CQWW SSB 2015 effort By 9K2ID: <https://youtu.be/eQ-EtaX2eaU>
Oscar Mery Seven Mery (OM7M): <https://youtu.be/NJIkAODZoso>
CQ WW DX Contest, SSB 2015 From Loma del Toro (HI3K): <https://youtu.be/BLkvrQB8LbA>
JH5GHM Running Stations at PJ4X: <https://youtu.be/6nJWI1tUbWI>
E2A CQ WW SSB CONTEST 2015: <https://youtu.be/1GVREbMzVBI>
IO9A CQ WW SSB 2015: <https://youtu.be/hUVWHK5Ezwk>
CQWW SSB 2015 at SN7D: <https://youtu.be/NQROOIGJTJc>
RT4D team in CQWW 2015 Contest: <https://youtu.be/UPriybuTNoU>

Earning a certificate in the CQ World Wide DX Contest is difficult, regardless of your station setup. But with 5 watts and a stealth longwire antenna? WB3D tells us how he did it.

A QRP "Newbie" Takes on the CQWW SSB DX Contest

BY MEL MANNING,* WB3D

Photo A. The author at his operating position with his Youkits TJ2B handheld HF rig, tuner, and switching power supply. Would the little rig's 5 watts power him through the CQ WW DX Contest?

When considering participation in the CQ World Wide SSB DX Contest in October 2015, I decided to try using a Youkits TJ2B 5-watt handheld transceiver that I had just bought (*Photo A*). The radio acquisition was to provide HF capability on some of my planned travels aboard cruise ships and in other circumstances in which weight and size restrictions prohibited the use of my larger portable rigs. The contest was an opportunity to fulfill two goals: One, to test the small handheld HF rig and, two, to have fun in the contest. I was essentially new to QRP and I had my doubts as to whether I would make any contacts at all from my Florida QTH which is the fourth floor of a condo next to the Intracoastal Waterway on the Gulf of Mexico west of Tampa (*Photo B*).

Single-Band QRP Classic

The category I entered was Single Band (20 meters), QRP (5 watts is the output of the TJ2B), Classic Overlay (use only one

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Photo B. The view from the shack with the Intracoastal Waterway and the Gulf of Mexico in the distance. The stealth wire antenna is terminated in the palm tree to the right of the U.S. Flag and is unseen.

radio, no QSO-finding assistance, and may operate up to 24 of the 48 hours).

The operational setup included the N1MM Logger, a very small switching power supply, a stealth 33-foot end-fed (22 gauge) wire antenna that was just the right length to have the terminal end reach the top of a palm tree out the condo window, a 16-foot counterpoise lying on the floor and an antenna tuner with a built-in artificial ground tuning circuit (*Photo C*).

Re-Learning Patience

I was on the air at the beginning of the contest on October 24 and made my first contact at 00:16 with TO2M on Martinique Island. It very quickly became clear that relearning the science of patience was an essential element of QRP operating. My last contact was with VE3VEE at 23:37 on the 25th. In between, I operated less than 17 hours with the longest stretch being six hours. I had an absolute ball, not to mention a fantastic learning experience. The little radio performed beyond expectations and gave me a comfort level for it as a future traveling companion.

The end result was a claimed score of 8,379, based on 61 QSOs, 171 points, 14 zones and 35 countries. I'd worked Europe (including Russia), North America, South America, and numerous islands. After submitting my log to CQ, the raw score placed WB3D/4 in QRP 20 meters: World: #5, Continent: #1 and Country (K): #1.

I am delighted with the equipment and the contest results. I hope the final score does not vary much from the raw score. (*WB3D's final score turned out to be 6,624, placing him in 6th World, first in North America and in the U.S. for 20-meter QRP. – ed.*) By the way, I have been infected by the QRP bug.

Photo C. Close-up of the TJ2B and MFJ-934 antenna tuner with artificial ground circuit.

A CQ Exclusive:

In Honor of his 40th Anniversary with CQ Magazine,

CQ Interviews: Professor Emil Heisseluft*

Lauton Institute, Grossmaul-an Der Donau, Austria
*Interview Conducted By Theodore J. (Ted) Cohen, N4XX***

For 40 years, and always in an April issue, CQ magazine has carried intriguing amateur-related articles written by someone using the pen name "Professor Emil Heisseluft." Generally instructive, at times infuriating — one screed he penned so enflamed the amateur radio community that our readers tied up the phone lines complaining to CQ, the ARRL, and the FCC for three days — but always engaging, Professor Heisseluft has provided millions of our readers over the last 40 years with more than a few laughs in a month known for its absurd tricks. My predecessor, Alan Dorhoffer, K2EEK (SK), once remarked: "A Heisseluft piece isn't worth a tinker's dam unless at least five people cancel their subscriptions." Alas, on that basis, the good professor struck gold more often than not.

Given the interest Professor Heisseluft's articles always generate, we repeatedly asked him to "sit" an interview with CQ's Ted Cohen, N4XX, a man who through the years has interviewed many of the movers and shakers in the communications/electronics industries as well as in our federal government. Though reluctant to take the time, Heisseluft finally acceded to our wishes. So, it is with great pleasure that we present this exclusive CQ interview with the Lauton Institute's Professor Emil Heisseluft, an interview conducted early in 2016 when Ted caught up with Emil in Cruz Bay, St. John, the U.S. Virgin Islands. – W2VU.

CQ: Professor, thank you for taking the time to meet with me today. We at *CQ* have wanted to do this interview with you for many, many years, but we *do* understand your reluctance to engage 'the real world,' even in this type of venue.

Heisseluft: You're welcome, Ted. Please remember, however, that I am doing this as a favor to your publisher and editor and on the proviso that neither you nor anyone else reveals my true identity.

CQ: Agreed. To kick things off, please tell us a little about how you came to write April Fools articles for *CQ*.

Heisseluft: As your readers probably know, "Professor Emil Heisseluft" is not the only author of *CQ*'s famous April Fools articles. Before me there was "Jerzy Ostermond-Tor," whose articles date back to the mid-1960s. Your own former Propagation Editor, George Jacobs, W3ASK, wrote the Ostermond-Tor series, as he admitted in your 50th Anniversary issue some years ago[1]. These articles were brilliant in many respects, even foretelling the creation of what we now know as the Internet in 1967[2]. Then, in 1965, an April Fools article appeared under the pen name "Professor Emil Heisseluft." The article, "Developing a DX Voice[3]," created quite a stir among what you radio operators call DXers. Some years later, in 1975, I had an idea for an April Fools article of my own. I wondered if it were possible to use Heisseluft's name. Al Dorhoffer, who was the editor of *CQ* at the time, suggested I contact George to see if the author — whoever he or she was — might have objections to my doing so. Imagine my surprise when George told me that *he* had written that Heisseluft article, which he said was inspired by a good friend of his, a distinguished Austrian engineer-diplomat. It was in this phone conversation that he encouraged me to begin a series of Heisseluft articles that continues to this day. By the way, so many DXers were taken in by Heisseluft's piece on developing a DX voice that George often heard DXers in the 20-meter phone band going through the voice exercises prescribed by that article. I guess there always have been some readers who just don't "get it!"

CQ: When did your first Heisseluft article appear?

Heisseluft: The first April Fools article I authored appeared in the April 1976 issue of *CQ*[4]. The article basically postulated that we were in for a long sunspot drought, something that was on the mind of many people, scientists, and radio amateurs alike, at that time. It never came to pass, however, but a lot of people had trouble knowing whether or not the piece in *CQ* was real or a joke.

CQ: What was it *intended* to be?

Heisseluft: Actually, both. The science, in large part, was credible, with numerous references to the archival literature. But, as I am want to do in all Heisseluft articles, the science was carried to a ridiculous extreme. In this case, the sources I cited contained roughly 225 years of sunspot data to make projections that called for a prolonged sunspot minimum between 1976 and 2005. This would have been similar to the Maunder Minimum that apparently occurred in the 1300s[5]. Now, the Sun is 11 billion years old, so it's a bit arrogant for scientists to think that a mere 225 years of data can be used to predict future sunspot activity. As it turned out, the predictions of another Maunder Minimum were totally wrong. But the

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* *Professor Heisseluft left for Austria immediately following this interview. Correspondence to the professor may conveniently be directed c/o CQ, 17 West John Street, Hicksville, NY 11801*

** *Media-Tech, 122 Shady Brook Drive, Langhorne, PA 19047*

Photo A. The stealth aircraft on its last test flight to Tel Aviv, Israel[6].

April Fools article became quite a focal point for conversation in those days, both on and off the air.

CQ: So let me get this right. For the most part, you take a valid scientific principle or fact, and by extension, twist it to produce a totally ridiculous outcome?

Heisseluft: Yes. And unless readers understand this basic premise, they will be fooled.

CQ: I'm not sure I understand exactly what you mean.

Heisseluft: If readers think the underlying science is valid, some are apt to "buy" into the conclusion, in which case they are fooled. If readers dismiss the science because they find the conclusions invalid, then they, too, are fooled. Only those who recognize the validity of the science *and* the foolishness of the article's conclusions truly understand what I am trying to accomplish.

CQ: Didn't that often result in a few readers, upon finding out that they had been taken in, becoming so angry that they cancelled their subscriptions to *CQ*?

Heisseluft: No question about it! Readers often get very angry when they find out how gullible they have been. But as Al Dorhoffer often told me, he didn't consider one of my articles to be really good unless at least five readers cancelled their subscriptions because of it.

CQ: Can you cite other examples from the pages of *CQ* where you took scientific principles to ridiculous ends?

Heisseluft: Of course. In fact, I prepared for this interview by creating a table for you (*next 2 pages—ed.*). As you can see, I have authored 31 articles over the last 40 years, each of which begins with a discussion of some scientific, pseudo-scientific, or engineering principle. I've also treated matters pertaining to such things as amateur tests and licensing. My presentation then launches into an illogical extension of what facts are being discussed. For example, in the April 1994 issue of *CQ*, the article began with a discussion regarding the existence of an ionosphere on Mars that was capable of propagating high-frequency (HF) signals. Everything I said there was based on valid data acquired by NASA, the U.S. military, and various university researchers; this can be confirmed by a review of the scientific literature, which, by the way, was cited at the end of the article. However, the idea that the United

Year	Title	Scientific or Engineering Principal	Ridiculous Applications (and some not so ridiculous)
1976	The Prolonged Sunspot Minimum and its Implications With Respect to Future Sunspot Activity	Sunspot cycles; solar activity; sunspot cycle prediction	Prolonged period of sunspot activity between 1976 and 2005
1977	Broadcasters Threaten Takeover of Amateur ULF Band at WARC '79	Radiowave propagation at ULF	Amateur extrasensory perception (ESP) experimentation
1978	Selection of Contest Operators Using Biorhythm Charts	Human physiology	Selection of contest operators based on biorhythms
1979	Wideband Modulation (WBM) Techniques	Spread-spectrum modulation (direct sequence and frequency hopping)	Spread-spectrum applications in the amateur radio service
1980	Floating Mirrors And Their Use in Radio Communications	Space travel using metallic-film sails and solar radiation pressure; floating satellite mirrors using microwaves	Use of floating mirrors at E-layer altitudes for amateur radio communications
1981	Applications Of Stealth Technology To The Design of Invisible Antennas	Reflections from plane-parallel films; coated optical surfaces	Invisible antennas; stealth aircraft
1982	The Threat to Molecular Electronics From Microbes Produced By Genetic Engineering	Genetic engineering; molecular biology	Killer germs that destroy bioelectronic switches and eat molecular computer components
1983	All-Night Ionospheric Illumination Through The Use of Large Reflecting Satellites	Star Wars technology; large mirrors in space	Proposal by DXers and contesters to create an artificial ionosphere at critical geographical locations favorable for them; staggering physiological and biological implications; early tests in 1938, which went awry, were covered up by a broadcast of War of the Worlds
1984	Fluid-Logic Circuits and Their Early Applications to Amateur Radio	Fluid logic for device control	Catastrophic floods resulting from inability to control the world's first fluidic computer
1985	Amateur Radio's New Frontier: The Bands Below 30 kHz	Tethered satellites; Space Shuttle applications	Amateurs confined to bands below 30 kHz; all amateurs must be recertified for code proficiency, which is the only mode available
1994*	Ionospheric Propagation Possible On Mars	Mars' ionosphere	Amateur communications on Mars using proxy stations and licenses issued by lottery
1995	Secrets of Famous DXer Revealed … Amateurs Worldwide Stunned by Simplicity of New Scheduling Aide	Human physiology	Developing the ability to wake up within 10 minutes of any predetermined time during the night by drinking a precisely measured amount of water
1996	How To Stay At The Top Of The DXCC Honor Roll Until You Reach At Least Age 100	Genetic engineering; telomere shedding	Development of drugs for telomere retention and the subsequent prolonging of human life
1997	Little LEO's Dirty Secret	Low Earth Orbit (LEO) satellites	Potential for catastrophic collisions among LEOs, creating a chain reaction that would result in the complete destruction of all satellites in low-Earth orbit.
1998	Interference on Trans-Atlantic ESP Paths	Strongly electric fish; wave fish	Wave fish are burying ESP signals generated by hams in Europe and east-central Asia, making it difficult for 160-meter operators to complete ESP contacts
1999	No article		
2000	Electronic Sniffers For Amateur Radio Equipment	Electronic "sniffers" (noses)	Use of sensors in amateur radio equipment to determine if a piece of equipment had been used by a smoker
2001	New HF-Angle, Single-Site Emission-Locator (HASSEL) Stations Ready to Cleanse Ham Bands	High-frequency direction finding (HFDF); two-angle single-site emission locators (TASSELs)	FCC now using a new HFDF system now capable of locating an amateur radio station within 0.05-second of the mike being keyed
2002	The Impact of Solar Storms on World Economies and the Birth of a New Commodities Trading Technique	Interactions of high-energy solar particles with the North American power grid	Introduction of a fool-proof technique for trading electrical power futures on the commodities exchanges
2003	The Use of Pringles Containers to Enhance Network Security	3 GHz cavity resonators	Use of unique cavity resonator to sniff out holes in wireless network security
2004	Self-Propelled Swimmers for the Sensing and Transmission of Oceanic Data	Global environmental micro-electro-mechanics (MEMS) sensors (GEMS)	Development of tiny, buoyant, self-propelled probes that employ extremely small motors for maneuverability and miniaturized electronics for gathering, storing, and transmitting ocean data to satellite-borne receivers

Year	Title	Scientific or Engineering Principal	Ridiculous Applications (and some not so ridiculous)
2005	Psychological Testing of Amateur Radio Applicants … The Cure for Spectrum Rage	Human physiology; Psychological Stress Tests	New FCC rules would require applicants for new amateur licenses, as well as current licensees seeking to renew their licenses, to undergo psychological exams. The test results will be used for the purpose of determining a person's psychological profile and fitness for accessing the airwaves
2006	The Next Generation "Heathkit®": Biologically Based Self-Assembly Kits For The Radio Amateur	Genetic engineering; use of viruses to create crystalline semiconductor sheaths and to locate and bridge electrodes	Use of viruses to create field-effect transistors to be used in a self-constructing radio transmitter soon to be sold as a kit
2007	Communications in the Infrared Band Using a Digital Music Playback Device, a Griffon IR Converter, and Today's Top Ham Radio Songs	Unique communication techniques; digital music playback devices, together with Griffon technology, are used to communicate in the infrared (IR) band.	Radio amateurs can use this technology for line-of-sight communications, providing their playback system is loaded with a collection of canned songs for ham radio QSOs. The titles for the Top 25 such C&W/Western songs was provided in the article
2008	A Cray-Based Internet Protocol HF CW DX Contest Simulator	Computer simulations of CW contacts	By the year 2014, it should be possible for all HF CW contesting to be conducted over the Internet, leaving the HF CW bands open full time to those who wish to use them for ragchewing, traffic handling, and just plain experimentation
2009	The Use of Invisibility Shields to Hide Entire Contest Station Antenna Farms (see, also, 1981)	Microscopically thin films of metamaterial or plasmonic material are used to create invisibility zones or "cloaks"	New advances in cloaking technology employing concentric rings created in a thin, transparent acrylic plastic layer on a gold film have been demonstrated to completely hide an entire antenna farm of a major East Coast amateur contest station
2010	Reading the Mind: Taking Contesting to the Next Level (see, also, 1977)	Mind-reading applied to the operation of contest stations	Professor Heisseluft, under a grant from UW-M's Badger Amateur Radio Society (BARS) now is moving ahead aggressively to produce a mind-reading contest interface that should be ready for its debut in the CQ Worldwide CW Contest scheduled for October 2016
2011	Amateurs Licensed in the Contiguous Forty-Eight States Face Draconian On-Air Operating Restrictions	With U.S. government facing deficits unparalled in nation's history, Congress has no choice but to make cuts — drastic cuts — in the FY2012 Federal Budget	Professor Heisseluft uncovers secret congressional proposal to cut U.S. budget deficits, gut FCC Enforcement Division staff, and impose even-odd day restrictions on amateur radio on-air activities
2012	Vanity4Hams, LLC Guarantees You Any Vanity Call Sign Currently Held By An Individual, Bar None, In Just Over 2 Years	For a payment of U.S. $10,000 cash in unmarked $20 bills, Vanity4Hams will submit a vanity call application to the FCC on behalf of the applicant for the specific vanity call sign requested. "Bada-bing bada-boom, no questions asked. Success is guaranteed."	The FCC Rules and Regulations pertaining to vanity callsigns are addressed in US Title 47 CFR §1.948(g). Professor Heisseluft has uncovered a new corporation based in New Jersey that now takes the administrative burden usually associated with obtaining such a call off a radio amateur's shoulders
2013	Signals Detected from Outer Space by the Lauton Institute's Center for Research on Alien Populations	The Lauton Instituted has detected the first coherent signal from outer space comprising four notes transmitted in a seven-tone sequence — G-C-F-E-G-F-E — with the sequence repeated every 30 minutes. The signals appear to be coming from the area of Ankaa in the constellation Phoenix	Today, you will find SETI programs conducted by the Radio Astronomy Laboratory at UC Berkeley, the Harvard-Smithsonian group, which is working with Princeton University, and MIT Haystack Observatory. Scientists at Princeton University are even investigating whether extraterrestrials might be manipulating the light coming from stars
2014	Lauton Institute's Center for Research of Abnormal Personalities Offers Explanations for On-Air Misbehavior by Radio Amateurs	Six reasons for the deterioration in behavior among hams were identified as the root causes for many of the on-air problems heard today. These are: 1. Intolerance of divergent views 2. A general lack of operating experience 3. Feelings of station inferiority 4. Group diffused inappropriate behavior 5. Operating under the influence 6. Acts by truly emotionally sick individuals	Professor Heisseluft asked the former director of the Lauton Institute's Center for Research on Abnormal Personalities, Professor Hannah Blücher, to identify the problems she could identify in recordings made during both CQ and ARRL DX contests. Frau Blücher quickly diagnosed many of the operators she heard from off-the-air recordings as suffering from one of more of the following: Tourette Syndrome, attention deficit disorder, obsessive-compulsive disorder, auditory hallucinations, and delusions. She wasn't at all surprised to learn that after these contests, some operators have been found in catatonic states
2015	Operation Quiet Fear: FCC's New Initiative to Increase the Complexity of All Amateur Radio Written Exams	The United States is falling behind many countries of the world in the educational capabilities of its citizens. Recent results using standardized, international exams, for example, show that while U.S. teenagers scored average in reading and science, their scores in math were below average when compared to those for students in 64 other countries	Operation Quiet Fear is a secret initiative within the Federal Communications Commission (FCC) that is intended to address this brutal truth by upgrading the complexity of all amateur radio written exams. This will ensure all licensees are better qualified to participate in the Amateur and Amateur Satellite services as operators and experimenters

** No articles writtten in the period 1986-1993*

States government would conduct a lottery for the issuance of amateur radio licenses to be used for proxy contacts between two Mars Landers equipped for HF communications, and further, that it would sponsor awards for achieving a two-way contract was, frankly, outrageous. Or is it?

Thirty-one articles by Professor Emil Heisseluft have appeared in the pages of CQ since 1976; strangely, each can be found in an April issue.

CQ: Why do I get the feeling that you're pulling my leg?! In any event, of all the April Fools articles you've written, which one caused even you to laugh out loud as you wrote it?

Heisseluft: That's an easy question to answer, Ted. The April 1981 issue of *CQ* carried an article on stealth antennas. The article began with a discussion on the use of optical coatings to cancel light reflected off of objects in certain portions of the visible spectrum. A practical example of this is the coating used on eyeglasses to cancel glare. [These coatings result in treated glasses having a bluish tint. – *Ed.*] To demonstrate how the military was putting this technology to use, the article presented a photograph (*Photo A*)[6] of an Israeli jet that, it was alleged, had its surfaces treated to cancel light. The picture, of course, contained nothing but clouds, which caused quite a stir in the *CQ* Art Department because when your artists were preparing the April issue, they thought they had lost the picture containing the aircraft. To further tease your readers, the article stated the aircraft had been lost on the ground in Tel Aviv when mechanics failed to keep track of it after it landed there.

CQ: That must have elicited a few responses from our readers.

Heisseluft: Indeed! One even wrote to me, via *CQ*, and asked that the plane be outlined so that he could see it.

CQ: And the application of the technology to stealth antennas … how did you demonstrate *that* use?

Heisseluft: Well, I included a picture of an apartment building that ostensibly had a large tower topped by a Yagi-Uda array on its roof. The only object in the picture, of course, was the building; the tower and antenna didn't exist. I wrote an updated version of this article, cloud picture and all, based on a more advanced technology known as "cloaking;" it was published in the April 2009 issue of *CQ*.

CQ: I've heard mumblings to the effect that the smash hit *Gravity*[7] was based on your 1997 article, "Little LEO's Dirty Secret[8]." Is there any truth to that?

Heisseluft: Well, I can't speak to that, but the potential for a cataclysmic event in the Low Earth Orbit (LEO), where the Hubble Space Telescope and the International Space Station reside, is always with us.

CQ: By the way, Professor, I've noticed you always seem to be on the move. What's that all about?

Heisseluft: [Laughs] Staying on the move, as you say, is really a way to prevent readers from contacting me directly. I'm sure you've noticed, however, that every article carries a note to the effect that readers can conveniently address their correspondence to me via *CQ* magazine.

CQ: And have readers responded?

Heisseluft: Oh, my, yes! You wouldn't believe some of the letters Al Dorhoffer, Gail Sheehan [K2RED; former *CQ*

Photo B. The Lauton Institute's Center for Research of Abnormal Personalities, which, among other things, studies DXers, is located in this forested setting just outside Grossmaul-an der Donau, Austria[11]. The facility currently is treating five radio amateurs who recently formed a DX contesting club. The members anticipate erecting a rotating tower with Yagis for 160 through 6 meters at the peak of the mountain. Doctors and nurses will be in attendance during all contests.

Managing Editor. – *Ed.*], and Rich Moseson have forwarded to me. For example, in 1977, a man wrote that he was very disturbed by the broadcasters' threat to take over the ULF band. However, he also noted that he was taken aback when his wife pointed out that Professor Heisseluft translates to "Professor Hot Air" and that Grossmaul-an Der Donau translates to "Big Mouth on the Danube." I wrote back, via *CQ,* of course, that his wife was correct and that he owed her dinner. On another occasion, this time regarding my 1983 article in which the broadcast *War of the Worlds* was cited as having been used by the government to cover up the destruction caused by an errant space mirror, a man wrote that he was astounded by this revelation and awaited my immediate reply as to the details of the tragedy. Still another reader was incensed by the possibility that amateurs were going to have to have their CW skills recertified before they would be allowed to use the new bands below 30 kHz; he even went so far as to comb the FCC's files for any rulemaking activity on the subject.

CQ: How about other examples?

Heisseluft: Well, there was a letter from a professor at a prestigious university in southern California who berated me and *CQ* — he was outraged, actually — for the lack of "scientific control" used in the biorhythm studies I described in my 1978 article. This letter, and a number of others I have received from PhDs and MDs in response to my various articles, only point out that the more educated your readers are, the harder they fall! My 2002 article on a fool-proof technique for trading electrical power futures brought several letters from commodity traders who were interested in using the method to increase their profits. And finally, the letters received following the publication of my article on spectrum rage in 2005 created an unbelievable response from readers[9]. Some who "got it" applauded the move on the part of the FCC to require psychological tests of all radio amateurs; others, who apparently didn't see the humor in the article, called the FCC, and upon learning that it was a hoax, cancelled their subscriptions to *CQ*. Al Dorhoffer would have been proud!

CQ: Actually, I'm told the switchboard at *CQ* was tied up for three days by irate subscribers. During that period, Dick Ross, the publisher, and Rich Moseson, the editor, spent most of their time attempting to calm them down. I also understand the situation was much worse over at the ARRL and the FCC, two places where people still may not have forgiven the staff at *CQ* … and you!

Heisseluft: [laughs] *Gott in Himmel!* Can't anyone take a joke anymore? I hope *CQ*'s readers weren't too upset when we revisited the same topic in 2014[10].

CQ: No, you were a little more obvious that time. On another note, the material in your articles seems, at times, to foretell coming events in the world of technology. In some cases, it's almost uncanny how you have predicted the future. Would you comment on this?

Heisseluft: Well, it sometimes doesn't take too much imagination to see how applications involving certain technologies will evolve. For example, in the early 1980s, the engineering community in your country was abuzz with talk of a major space-based defense system. I knew that lasers would play a major role here, and further, that directing laser energy towards a target would require the use of orbiting mirrors. This led me

DMRAA Hamfest Saturday, April 16 at the Elwell Family Center in the Iowa State Fairgrounds. Website: <http://dmraa.com>. VE exams.

GEORGETOWN, DELAWARE — The Sussex Amateur Radio Association will hold the **Delmarva Amateur Radio & Electronics EXPO** and **2016 ARRL Delaware State Convention** Saturday, April 16 at Sussex Tech High School. Contact: Vic, KC3BUI, (302) 628-3060. Website: <http://www.radioelectronicsexpo.com>. Talk-in 147.090 (PL 156.7). VE exams and card checking.

KANSAS CITY, MISSOURI — The Ararat Shrine Radio Club will hold its **Hambash** Saturday, April 16 at the Ararat Shrine Temple. Contact: David Hinkley, KAØSOG, 1221 SE 11th Street, Lee's Summit, MO 64081. Phone: (816) 525-4826. Email: <pudding.boy@sbcglobal.net>.

MORGANTON, NORTH CAROLINA — The Lenoir Amateur Radio Club, **McDowell Amateur Radio Club**, and the **Western Piedmont Amateur Radio Club** will hold the **19th Annual Catawaba Valley Hamfest** Saturday, April 16 at the Burke County Fairgrounds. Contact: Michael Fox, KF4MWX, (828) 437-2787. Email: <kf4mwx@gmail.com>. Website: <http://cvhamfest.com>. Talk-in 147.150+. VE exams.

PERU, INDIANA — The Kokomo Amateur Radio Club, **Cass County Amateur Radio Club**, **Miami County Amateur Radio Club**, and **Grant County Amateur Radio Club** will hold the **11th Annual North Central Indiana Hamfest** Saturday, April 16 at the Miami County 4H Fairgrounds. Contact: Steve Shepler, Box 824, Marion, IN 46952. Email: <shepler1@gmail.com>. Website: <http://www.nci-hamfest.net>. Talk-in 147.345+. VE exams.

SHERIDAN, WYOMING — The Cloud Peak Radio and Electronics Group will hold the **Sheridan Swapfest 2016** Saturday, April 16 at the Masonic Lodge Building. Contact: Chris, (307) 251-9992. Email: <nx0e@arrl.net>. Website: <http://www.cloudpeakradio.org>. Talk-in 146.52 or 449.85- (PL 100). VE exams.

SOUTH PORTLAND, MAINE — The Portland Amateur Wireless Association will hold the **PAWA Hamfest** Saturday, April 16 at the Stewart Morrill American Legion Post #35. Contact: Bryce Romery, K1GAX, (207) 415-0498. Email: <k1gax@juno.com>. Talk-in 146.73- (PL 100). VE exams.

SUCCASUNNA, NEW JERSEY — The Splitrock Amateur Radio Association will hold its **Annual Hamfest** on Saturday, April 16 at the Roxbury Township Senior Center. Contact: Mike Greenfeld, K8BQ, Splitrock ARA, P.O. Box 610, Rockaway, NJ 07866. Phone: (866) 457-6687. Email: <k8bq@arrl.net>. Website: <http://www.splitrockara.org>. Talk-in: 146.985- (PL 131.8).

CHATHAM, MASSACHUSETTS — The WCC Amateur Radio Association will air special event station, **WA1WCC**, from 1400 UTC, Sunday, April 17 through 2359 UTC Monday, April 18. QSL to WCC ARA. Website: <http://www.qrz.com/db/wa1wcc>.

GALVA, ILLINOIS — The Area Amateur Radio Operators will hold its annual **Hamfest** Sunday, April 17 at the Galva American Legion. Contact: Bill Anderson, WA9BA, 30 Wallace Street, Galva, IL 61434. Phone (303) 525-0061. Email: <wa9ba@arr.net>. Talk-in 145.490- (PL 225.7).

BOISE, IDAHO — The Voice of Idaho Amateur Radio Club will host the **2016 ARRL Idaho State Convention** Friday, April 22 through Sunday, April 24 at the Boise Hotel and Conference Center. Contact: VIARC, P.O. Box 812, Boise, ID 83701. Email: <info@idahostateconvention.com>. Website: <http://idahostateconvention.com>. VE exams.

LINCOLN, NEBRASKA — The Lincoln Amateur Radio Club will hold the **End of Winter Hamfest** and **2016 ARRL Nebraska State Convention** Saturday, April 23 at the Lancaster Event Center. Contact: Reynolds Davis, KØGND, (402) 488-3706. Website: <http://lincolnhamfest.org>. Talk-in 146.16+. VE exams.

OAKLAND PARK, FLORIDA — The Broward Amateur Radio Club will hold the **Cy Harris W4MAQ Memorial Free Flea** Saturday, April 23 at the Collins Center. Contact: Tony Becker, KK4GUU, (954) 612-9303. Email: <tony@mcrsys.com>. Talk-in 146.910- (PL 110.9) or 146.790- (PL 88.5). VE exams and card checking.

PALMYRA, NEW YORK — The Drumlins Amateur Radio Club will hold the **30th Annual Drumlins Hamfest** Saturday, April 23 at the Palmrya VFW Post 6778. Contact: Joe King, KS2JEK, (585) 785-0036. Email: <hamfest@drumlinsarc.org>. Website: <http://www.drumlinsarc.us>. Talk-in 146.745 (PL 71.9). VE exams.

WAYNESBORO, GEORGIA — The Waynesboro GA SwapFest will be held Saturday, April 23 at the American Legion Post 120. Contact: John McDonald, K4BR, (706) 466-5646. Website: <http://waynesboroswapfest.com>. VE exams.

WHITE BEAR LAKE, MINNESOTA— The Northern Lights Radio Society will hold **Aurora '16** Saturday, April 23 at the First Lutheran Church. Website: <http://www.nlrs.org>. Card checking.

BOSTON, PENNSYLVANIA — The Two Rivers Amateur Radio Club will hold its **44th Annual Hamfest** Sunday, April 24 at The Spectrum. Contact: N3LQC, (724) 242-5347. Email: <n3lqc@comcast.net>. Talk-in 146.73. VE exams.

MIDDLETOWN, NEW YORK — The Orange County Amateur Radio Club will hold its **Spring Hamfest** Sunday, April 24 at the Town of Wallkill Community Center. Phone: (845) 391-3620. Website: <http:/www.ocarc-ny.org>. VE exams.

LAS VEGAS, NEVADA — The Sierra Nevada Amateur Radio Society and the **Las Vegas Radio Amateur Club** will hold **2016 ARRL Nevada State Convention** Friday, April 29 through Sunday, May 1 at the Eastside Cannery Casino-Hotel. Contact: LVARC Inc., P.O. Box 27342, Las Vegas, NV 89126-1342. Email: <info@nvcon.org>. Website: <http://nvcon.org>. VE exams.

(Continued on page 84)

to write the 1983 article on all-night ionospheric illumination. The fact that President Reagan announced his Star Wars program two weeks *after* the April 1983 issue of *CQ* reached your subscribers [which actually was in mid-March. – *Ed.*] unnerved a few people, but frankly, the signposts were there for all to see. Looking back on the articles I have written, I still think we'll live to see the increasing use of electronic sensors to detect odors from a variety of sources, including cigarettes and cigars. And you may still see HF communications used on Mars for low-data-rate communications on over-the-horizon paths between and among Mars landers.

CQ: Professor, I am constantly amazed at the breadth and depth of your scientific and technical knowledge. In reading your articles I see that you apparently have studied or have performed work in molecular biology, genetic engineering, ichthyology, optics, radiowave propagation, digital signal processing, electronic sensors, advanced modulation schema, fluid dynamics, space physics, orbital mechanics, space vehicle propulsion systems, human physiology, commodities trading, and other equally daunting fields. What was there in your educational background that not only stimulated your interest in such a broad range of scientific endeavors, but also, that exposed you to these many fields?

Heisseluft: Well, dear friend, you know from reading my articles that as a student at the Lauton Institute (*Photo B*)[11], I studied under one of the greatest minds of our times, Dr. Jerzy Ostermond-Tor, ex-YM4XR. It was he who encouraged me to broaden my worldly experience, and who, even to this day, remains a close personal friend and mentor.

CQ: So, as we draw this interview to a close, where are you off to now?

Heisseluft: No place exotic, that's for sure. I must return to the Lauton Institute within the next few days to deliver the seminal lecture derived from my work on the use of viruses to create crystalline semiconductor sheaths and to locate and bridge electrodes. My research in this area demonstrates unequivocally that we have the ability to create entire solid-state devices that self-assemble. But I hope to return to the pages of *CQ* at some future point with yet another tale of science run amok!

CQ: Thank you, professor!

Heisseluft: *Auf Wiedersehen*, Ted.

Notes:

1. Jacobs, G, 50th Anniversary issue, *CQ*, January, 1995
2. J. Ostermond-Tor, Ex-YM4XR, Special Subscriber Service: The Telephone Company's Answer to Amateur Radio, *CQ*, April, 1967
3. Heisseluft, E., "Developing a DX Voice," *CQ*, April, 1965
4. Heisseluft, E., "The Prolonged Sunspot Minimum and its Implications With Respect to Future Sunspot Activity," *CQ*, April, 1976
5. Maunder, E.W., Monthly Notices Royal Astronomy Society, Vol. 50, 1890
6. http://en.wikipedia.org/wiki/Image:Above_the_Clouds.jpg
7. http://gravitymovie.warnerbros.com/
8. Heisseluft, E., "Little LEO's Dirty Secret," *CQ,* April 1997
9. Heisseluft, E., "Psychological Testing of Amateur Radio Applicants … The Cure for Spectrum Rage," *CQ,* April 2005
10. Heisseluft, E., "Lauton Institute's Center for Research of Abnormal Personalities Offers Explanations for On-Air Misbehavior by Radio Amateurs," *CQ,* April, 2014
11. Castle Hochosterwitz, By Johann Jaritz - Own work, CC BY-SA 3.0 at https://commons.wikimedia.org/w/index.php?curid=1266270

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Get Ready for Hidden Transmitter Fun on CQWW Foxhunting Weekend

2016 CQ WW Foxhunting Weekend – May 14-15

BY JOE MOELL,* KØOV

When accidental or deliberate interference strikes your favorite repeater, will you be ready to quickly track down the source? If you have experience with your own radio direction finding (RDF) equipment, you can be confident and prepared. A great way to get that practice and have lots of fun at the same time is by participating in competitive hidden transmitter hunts, usually referred to as "foxhunts."

No foxhunting in your hometown? Why not plan one during the annual CQ World Wide Foxhunting Weekend? It's a great activity for any ham club. Radio foxhunting can be a technical challenge, a fitness builder, a source of intrigue and adventure, plus great ham camaraderie all rolled into one activity.

There are no formal requirements for Foxhunting Weekend, which is May 14-15, 2016. If there is a conflict on that weekend, any time in the spring will do. You are free to hold any kind of RDF contest. Be as creative as you wish with the hunt rules. Need some ideas? Read the February 2016 issue of *CQ* for stories of Foxhunting Weekend 2015.

A special Foxhunting Weekend cake baked by April Moell, WA6OPS, awaited finishers at an on-foot transmitter hunt in Fullerton, California last year. A workshop for building measuring-tape antennas and offset attenuators preceded this hunt. (Photos by Joe Moell, KØOV)

Mobile T-Hunting

Many clubs prefer mobile "T-hunting," a form of ham contesting that goes back to the days of Packards and loctal tubes. The 75- and 10-meter bands were preferred back then, but 2 meters is the prime T-hunting band nowadays. Equipment ranges from simple Yagis and quads to Dopplers and automatic bearing plotting on computer screens.

Your mobile foxhunts don't have to be fancy — at least not at first. Appoint someone to go out and transmit from an undisclosed location. A little-used simplex frequency is best for long hunts, but the input of the local repeater is OK for short fox transmissions as the club gets started. Hunters can listen to the repeater output to tell when the fox is on air and then flip to the input to get bearings. If hunters have problems getting their gear working, the hider can offer some clues. Give everyone a chance to find the fox, then debrief and make future plans at the end point or a nearby restaurant.

A good time for these practice foxhunts is just after your club's net on the repeater, when listenership is high. Why not start having mini-hunts like this right away, so the group will be ready for something more ambitious during Foxhunting Weekend? Encourage ride-alongs, so more people can participate.

Foxhunting for Medals on Foot

If your club's membership includes lots of students and Scouts, an on-foot foxhunt in a local park would be an ideal way to combine radio technology and good exercise. Remember that a ham license isn't required for anyone who is just receiving and tracking.

What better way to get young people interested in ham radio fun? Scatter a few low-power transmitters in a woodsy park. Encourage everyone to track them down with measuring-tape beams[1] or just with their handi-talkies and scanners. Have everyone bring some food and turn it into a mini-hamfest.

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Joe Moell, KØOV is ARRL's ARDF Coordinator and Moderator of the annual CQ Worldwide Foxhunting Weekend. He also writes the "Homing In" columns on radio direction finding topics in CQ. His website <www.homingin.com> is full of information and ideas about RDF equipment and techniques.

It's not difficult to mount a rotatable two-meter beam onto a vehicle to get bearings in motion. Both Yagis and cubical quads are popular for mobile T-hunting in southern California.

Champion and Beginner Foxhunters Head for Texas This Month

The Texas ARDF Group will host the 16th annual USA Championships of Amateur Radio Direction Finding from April 6 through 10, 2016, in Killeen, Texas, about halfway between Dallas-Fort Worth and San Antonio. Radio-orienteers from all over the country plus visitors from abroad are expected to attend. The competitive courses are open to anyone of any age, with or without an amateur radio license. Medals will be awarded in six age categories for males and five for females, in accordance with rules of the International Amateur Radio Union.

The fun gets under way on Wednesday, April 6 with optional practice courses. Thursday will be devoted to *foxoring*, a sport that combines RDF and classic orienteering. The sprint event takes place on Friday. Saturday is the day of the classic two-meter ARDF competition with an awards banquet to follow in the evening. Then the classic 80-meter ARDF competition gets off to an early start on Sunday morning, followed by lunch and the closing awards ceremony, concluding in time for those who must catch evening flights home.

The USA Championships will be just in time for final selection of ARDF Team USA 2016 members, who will travel to Albena, a resort in Bulgaria, for the 18th ARDF World Championships from September 3 through 9 of this year. USA's team positions will be filled based on the best individual performances in these and last year's national championships.

To find out what it's like to participate in the USA ARDF Championships and get an overview of the IARU rules, read "RDF in the Rockies: The 2015 USA ARDF Championships" in the November 2015 issue of *CQ* Magazine. Then register by going to <www.homingin.com> and following a link to the official championships' website. You may also subscribe to a group email list for updates and discussions of plans for the USA and World ARDF Championships.

After a couple of romps like this, try on-foot hunting with international rules. In championship foxhunts, competitors carry a card or an "e-stick[2]" to register at each of the five fox transmitters required by the rules. Their goal is to find them all and get to the finish line within a set time period, usually about two hours.

This form of all-on-foot foxhunting has become an international sport, with national and world championships[3]. It goes by several names, including foxtailing, radio-orienteering, and ARDF (Amateur Radio Direction Finding). Maybe there's a future medal winner in your local club, just waiting to be discovered.

With practice and perseverance, you could win ARDF medals and other honors, no matter what your age. National championships take place annually in about two dozen countries around the world. America's will be in Texas this month (see sidebar). Don't be afraid to try these championship courses just because you haven't done much ARDF. Our national championships are open to anyone who can run or walk through the forest for five to 10 kilometers (3-6 miles) while carrying RDF gear. It's normal for a high percentage of attendees each year to be newcomers. They are always welcomed and encouraged.

Once you have experienced USA's ARDF Championships, you may want to take on the world. Last September, three stateside radio-orienteers traveled to Gunma, Japan for the IARU Region 3 ARDF Championships. They competed against 100 of the best from five other nations and brought home a total of 10 medals.

Then in December, four ARDF enthusiasts from the U.S. went to the city of Guangzhou in southern China for the 2015 China International ARDF Championships. In their suitcases for the return trip were 10 more medals.

Begin Planning Now

It's time to start talking up foxhunting around your club and in repeater ragchews, and to plan a local Foxhunting Weekend event. It should be appropriate for the skill level of the members, be they experts or complete beginners. Make sure it's well promoted, fun, and fair for all. Above all, make it as safe for everyone as possible. All transmitting and receiving antennas should be eye-safe. Always be mindful of your own physical limitations and never take chances behind the wheel or in the forest.

Share Your Stories

For many clubs, Foxhunting Weekend kicks off a season of regular transmitter hunts. For others, it's a special once-a-year event, like Field Day. Make your 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. This Scout is getting a direction-finding lesson from Tom Gaccione, WB2LRH, at the Cabrillo Youth Center in San Pedro, California.

Afterwards, write up the results and send them to me so that I can share them with *CQ* readers. Tell me the date of the hunt, what kind of hunt (mobile or on foot), number and frequency of transmitters, how the hunt was scored to determine the winners, plus the callsigns of the hiders and the winners. Don't forget to include the name of your club and the city or area it serves. Readers also want to know what was unique about your hunt and what lessons (positive and negative) you learned from it.

The list of items to report is posted at my website <www.homingin.com>, so you can copy it into your word processor and insert the information. Or if the report in your club's newsletter includes all the information, just send me a copy by electronic or postal mail. Photo files are welcome and should be as high resolution as possible.

If your group has more than one Foxhunting Weekend event, please send a separate report for each one. Add other facts if they are important, such as the distance of each fox from the start, whether the transmitters were continuous or intermittent, attended or unattended, and other technical features. I also welcome first-person reports from both the hiders' and the hunters' perspectives.

Let's make this the biggest Foxhunting Weekend ever. Spread the word and encourage other clubs in your area to try it. I'll be waiting for your report. Happy hunting!

Notes:

1. http://www.homingin.com/equipment
2. http://www.homingin.com/epunch
3. http://www.homingin.com/intlfox

BY IRWIN MATH,* WA2NDM

Unusual Optical Communications

As those of you who read this column regularly know, we are involved with fiber-optic communications systems professionally but are also very interested in optical communications as it relates to amateur radio and have written several columns in that regard in the past. As a result, when we have time, we like to experiment with various schemes to achieve free space communications. When we do, *Figure 1* is a basic schematic of the type of optical receiver that we use. For a transmitter, we usually use amplitude modulation or a pulse frequency modulation scheme for a laser diode.

As you can see from the receiver schematic, a photodiode is used to collect light from the transmitter and convert it into a tiny current. This current is then amplified many thousands of times by an amplifier to a level that can then be processed further. The amplifiers used are typical op-amps for signals in the amateur HF region (up to 30 MHz or so) as shown in the schematic, and special purpose wideband monolithic type amplifiers for use at higher frequencies.

Using this type of detector and a companion transmitter, we have been able to achieve fairly decent point-to-point communications of several miles under optimum conditions and spotty communications over much greater distances. These basic systems all used simple lens arrangements to gather and focus light at the transmitting optics and onto the photodiode at the receiver.

Last year, we were fortunate to obtain the use of a high-quality, 8-inch reflecting telescope as well as some 10-GHz photodiodes and matching extremely low-noise high-gain amplifiers. The telescope would result in a very high-gain optical collector due to the large size of its mirror. Needless to say, in line with common amateur radio courtesy, we decided to first search to see if there were any signals that we could pick up, possibly from others doing similar experiments, before transmitting.

Since optical communications is normally line of sight, we needed a way to search a wide area, well beyond a line-of-sight path from our location. In the past, we have had heard of some experimenters in this area actually receiving some very erratic and spotty success bouncing signals off the moon, particularly with borrowed high powered laser diodes, beam collimators, and ultra high gain receivers with narrow band optical filters that were AC coupled to eliminate the normal continuous light from the moon and only pass the wavelength of the lasers used. In addition, narrow-band electrical filters were employed to pass only the specific modulation frequencies we were experimenting with. Although we do plan to experiment with that technique in the future, this time we were not transmitting but only listening, and without the optical filters.

Since the moon was only visible at dusk and dawn last April when we started to search, we hooked up everything as shown in *Figure 2* and set the astronomical tracking mount on the scope to locate and follow the moon, which it did quite accurately after a few seconds. We immediately received several signals that sounded like noise while pointed at the moon, but as these were not really recognizable or decodable and very sporadic using what we had on hand, we were ready to give up and call it a night after just a couple of hours.

When starting to pack up the equipment, however, we turned off the telescope-tracking mount, which moved the scope off the moon and we suddenly received a strong digitally encoded signal, or so it seemed. Wow, I wondered! Who could produce such a signal, or was it just some sort of military satellite using lasers for communications? We had read of such optical communications experiments but were surprised that we could actually tap into one. We started to record the data but as quickly as we found the signal, that is how quickly it disappeared. With the tracking unit turned off, we

*c/o CQ magazine

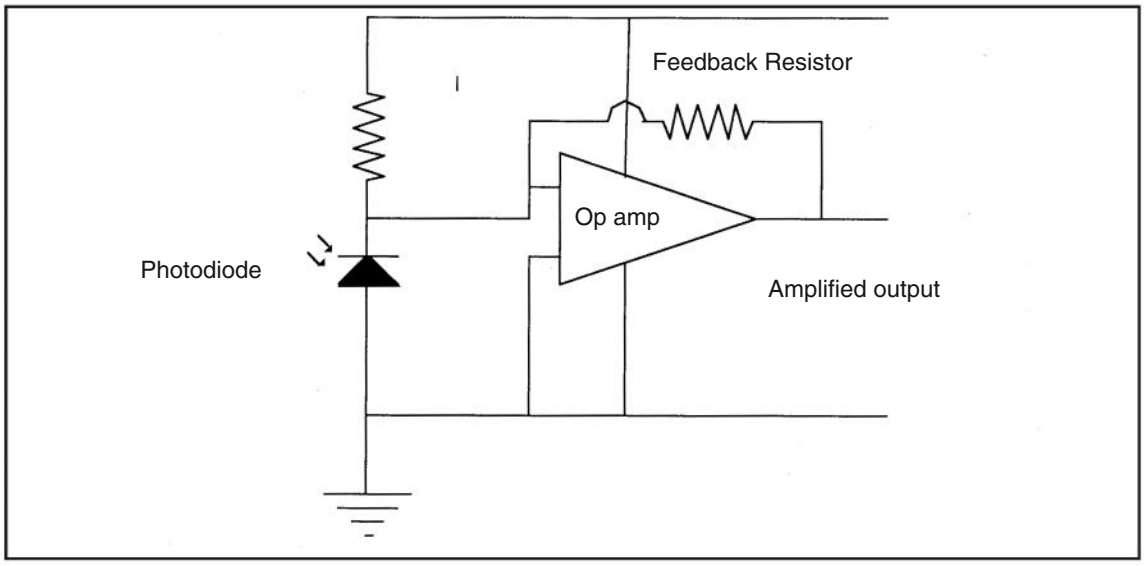


Figure 1. Basic optical receiver circuit.

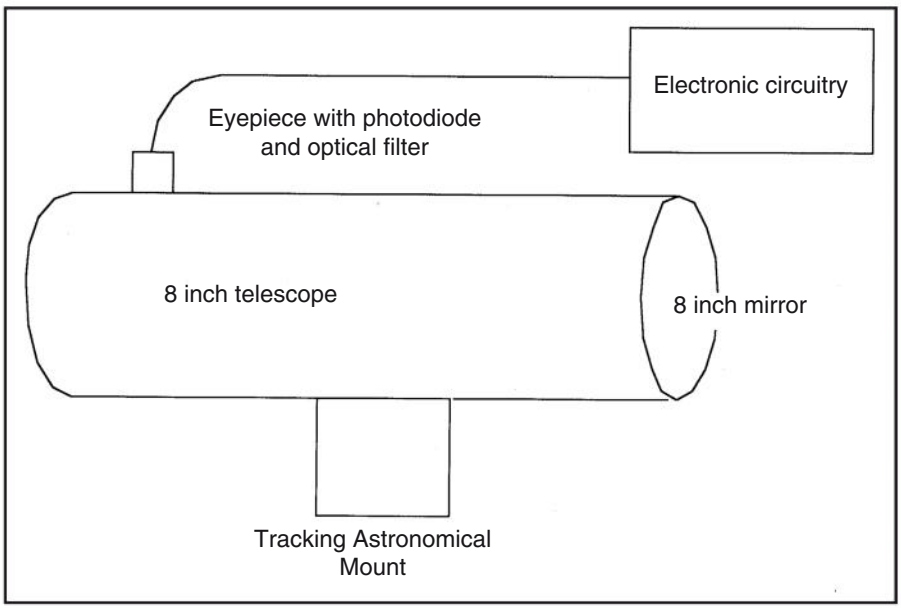


Figure 2. "Antenna " for receiving optical signals off the moon.

immediately manually scanned the entire area but could find nothing more. We had recorded only a second or two of data, however, so we attempted to try to decipher what little we had. After packing up all of the equipment and returning home, we began to examine the little data we had. The frequency of the carrier was found to be very close to 1420.5 MHz and the signal itself was pulsed just like a CW signal might look. CW at 1420 MHz, however, was certainly not standard amateur work.

Further research turned up the fact that the resonant frequency of hydrogen gas, the most common element in the universe, was at 1420.40575 MHz, very close to what we measured. Our equipment had nowhere near the accuracy required to be certain that the exact frequency of what we measured either was or was not the actual hydrogen frequency. The few seconds of data seemed to also be in some sort of code, but you could easily tell that it was not random (nor Morse, for that matter). The CW pulses were also strange in that it seemed that they were more than just simple on-off signals. They seemed to have an additional layer of data as there seemed to be sort of jitter in the rise and fall times of the pulses, but it was beyond our ability to try to decode anything. I had read of experimental pulse modulation techniques to squeeze more information onto a single pulse, but if this was in use, there was no way I could determine what it was.

In conclusion I am really not sure exactly what we picked up last April but you can bet that this April we will be out again with the exact same setup, and this time we will monitor the whole night. We also have a 10-inch telescope this time around, so who knows what kind of DX will turn up. We will be sure to let you know next April.

– 73, Irwin, WA2NDM

BY GERRY DEXTER,*

ISIS Off the Air

Let's get going and check out a few shortwave-lets:

~ Voice of the Caliphate Radio, mentioned last month, was blown off the air (read "destroyed") by U.S. warplanes back in early February.

~ Seldom reported is the country of Armenia, which transmits what it labels as an "international service" from Gavar, mostly in odd languages at inopportune hours. The latest alignment offers no hope, either: The schedule runs from 1500 to 1845 UTC on 4810 in a series of tongues, of which Greek, Turkish, Arabic, and Kurdish are the most Rosetta Stone-friendly. You'd feel about as helpless trying to hear this one as a cherry-flavored snow cone would, struggling to tie up to the Macapa docks!

~ It appears that "Radio Sana'a" is the correct name for that new Yemeni-based opposition broadcast on 11860 as intense monitoring by Ralph Perry and others has turned up nothing to the contrary. The current schedule seems to be 0400-0900 UTC and 1800-2300 UTC (other sources say the Sana'a broadcast runs 24 hours). It seems the Arabic broadcasts are in support of deposed Yemeni president Hadi who now hangs out in friendlier Saudi Arabia.

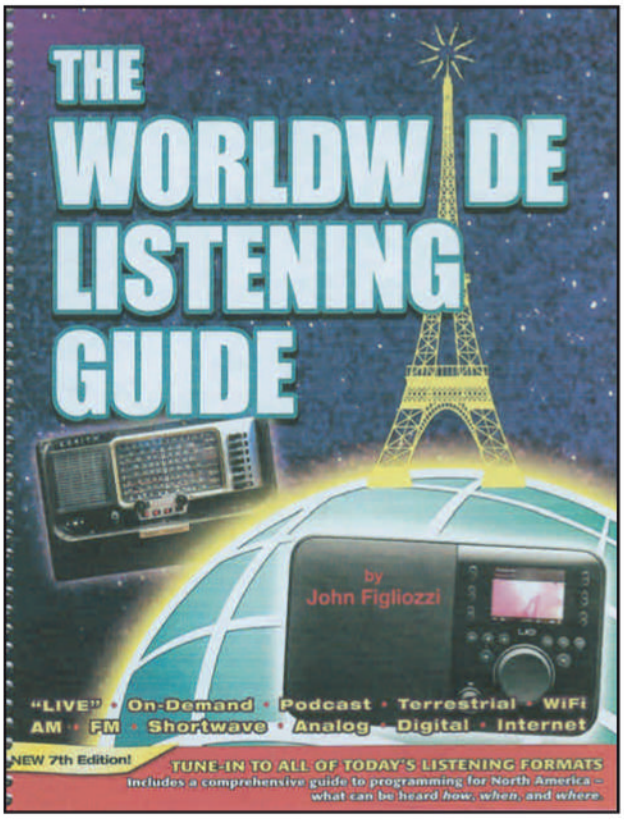
~ Poor Deutsche Welle. The former Voice of Germany now seems to be aired only from Talata (Madagascar), Dhabbaya (UAE), and Issoudun (France). Nicht Deutschland rundfunks! (At least for DW)

~ Indonesia is again showing signs of some domestic shortwave life. The reported actives include: Palangkaraya (Kalimantan), on 3325; Ternate (Malaku), on 3345; Merauke (Papua), on 3905; and Makassar (Sulawesi), on 4750. All of them are domestic Radio Republik Indonesia outlets.

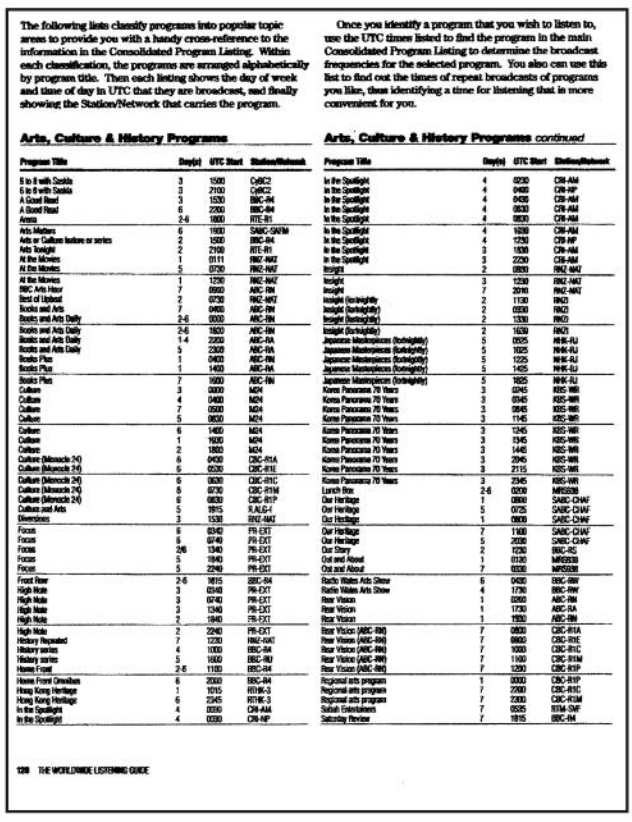
~ Radio Gaucha in Puerto Alegre, Brazil, has returned to the air on 6020. What's with all these PY stations? They seem to come on and go off like a flock of fluttering fluorescents.

~ The seldom reported Italian station Radio Marconi International is running occasional low-

*c/o CQ magazine



John Figliozzi's Worldwide Listening Guide is available now from the usual book ordering sources.



The following lists classify programs into popular topic areas to provide you with a handy cross-reference to the information in the Consolidated Program Listing. Within each classification, the programs are arranged alphabetically by program title. Then each listing shows the day of week and time of day in UTC that they are broadcast, and finally showing the Station/Network that carries the program.

Once you identify a program that you wish to listen to, use the UTC times listed to find the program in the main Consolidated Program Listing to determine the broadcast frequencies for the selected program. You also can use this list to find out the times of repeat broadcasts of programs you like, thus identifying a time for listening that is more convenient for you.

Arts, Culture & History Programs

Program Title	Day(s)	UTC Start	Station/Network
5 to 8 with Saskia	3	1500	CyBC2
5 to 8 with Saskia	3	2100	CyBC2
A Good Read	3	1530	BBC-R4
A Good Read	6	2200	BBC-R4
Arena	2-6	1800	RTE-R1
Arts Matters	6	1900	SABC-SAFM
Arts or Culture feature or series	2	1500	BBC-R4
Arts Tonight	2	2100	RTE-R1
At the Movies	1	0111	RNZ-NAT
At the Movies	5	0730	RNZ-NAT
At the Movies	1	1250	RNZ-NAT
BBC Arts Hour	7	0900	ABC-RN
Best of Upbeat	2	0758	RNZ-NAT
Books and Arts	7	0400	ABC-RN
Books and Arts Daily	2-6	0000	ABC-RN
Books and Arts Daily	2-6	1600	ABC-RN
Books and Arts Daily	1-4	2200	ABC-RA
Books and Arts Daily	5	2300	ABC-RA
Books Plus	1	0400	ABC-RN
Books Plus	1	1400	ABC-RA
Books Plus	7	1600	ABC-RN
Culture	3	0300	MDH
Culture	4	0400	MDH
Culture	7	0500	MDH
Culture	5	0630	MDH
Culture	6	1400	MDH
Culture	1	1600	MDH
Culture	2	1800	MDH
Culture (Monocle 24)	6	0400	CBC-R1A
Culture (Monocle 24)	6	0530	CBC-R1E
Culture (Monocle 24)	6	0630	CBC-R1C
Culture (Monocle 24)	6	0730	CBC-R1M
Culture (Monocle 24)	6	0830	CBC-R1P
Culture and Arts	5	1915	R.ALG-I
Diversions	3	1530	RNZ-NAT
Focus	6	0340	FR-EXT
Focus	6	0740	FR-EXT
Focus	2-6	1340	FR-EXT
Focus	5	1840	FR-EXT
Focus	5	2240	FR-EXT
Front Row	2-6	1615	BBC-R4
High Note	3	0340	FR-EXT
High Note	3	0740	FR-EXT
High Note	3	1340	FR-EXT
High Note	2	1840	FR-EXT
High Note	2	2240	FR-EXT
History Repeated	7	1230	RNZ-NAT
History series	4	1000	BBC-R4
History series	5	1600	BBC-RU
Home Front	2-6	1100	BBC-R4
Home Front Omnibus	6	2000	BBC-R4
Hong Kong Heritage	1	1015	RTHK-3
Hong Kong Heritage	6	2345	RTHK-3
In the Spotlight	4	0030	CHI-AM
In the Spotlight	4	0330	CHI-NP

Arts, Culture & History Programs *continued*

Program Title	Day(s)	UTC Start	Station/Network
In the Spotlight	4	0230	CHI-AM
In the Spotlight	4	0430	CHI-NP
In the Spotlight	4	0430	CHI-AM
In the Spotlight	4	0630	CHI-AM
In the Spotlight	4	0830	CHI-AM
In the Spotlight	4	1230	CHI-AM
In the Spotlight	4	1230	CHI-NP
In the Spotlight	3	1530	CHI-AM
In the Spotlight	3	2230	CHI-AM
Insight	2	0830	RNZ-NAT
Insight	3	1230	RNZ-NAT
Insight	7	2010	RNZ-NAT
Insight (fortnightly)	2	1130	RNZI
Insight (fortnightly)	2	0330	RNZI
Insight (fortnightly)	2	1330	RNZI
Insight (fortnightly)	2	1630	RNZI
Japanese Masterpieces (fortnightly)	5	0025	NHK-RJ
Japanese Masterpieces (fortnightly)	5	1025	NHK-RJ
Japanese Masterpieces (fortnightly)	5	1225	NHK-RJ
Japanese Masterpieces (fortnightly)	5	1425	NHK-RJ
Japanese Masterpieces (fortnightly)	5	1625	NHK-RJ
Korea Panorama 70 Years	3	0245	KBS-WR
Korea Panorama 70 Years	3	0745	KBS-WR
Korea Panorama 70 Years	3	0945	KBS-WR
Korea Panorama 70 Years	3	1145	KBS-WR
Korea Panorama 70 Years	3	1245	KBS-WR
Korea Panorama 70 Years	3	1345	KBS-WR
Korea Panorama 70 Years	3	1445	KBS-WR
Korea Panorama 70 Years	3	2045	KBS-WR
Korea Panorama 70 Years	3	2115	KBS-WR
Korea Panorama 70 Years	3	2345	KBS-WR
Lunch Box	2-6	0200	MRS53B
Our Heritage	1	0800	SABC-CHAF
Our Heritage	5	0725	SABC-CHAF
Our Heritage	1	0859	SABC-CHAF
Our Heritage	7	1100	SABC-CHAF
Our Heritage	5	2030	SABC-CHAF
Our Story	2	1230	BBC-R5
Out and About	1	0130	MRS53B
Out and About	7	0330	MRS53B
Radio Wales Arts Show	6	0430	BBC-RW
Radio Wales Arts Show	4	1730	BBC-RW
Rear Vision	1	0250	ABC-RN
Rear Vision	1	1730	ABC-RA
Rear Vision	1	1950	ABC-RN
Rear Vision (ABC-RN)	7	0830	CBC-R1A
Rear Vision (ABC-RN)	7	0900	CBC-R1E
Rear Vision (ABC-RN)	7	1000	CBC-R1C
Rear Vision (ABC-RN)	7	1100	CBC-R1M
Rear Vision (ABC-RN)	7	1200	CBC-R1P
Regional arts program	1	0000	CBC-R1P
Regional arts program	7	2300	CBC-R1E
Regional arts program	7	2300	CBC-R1M
Salish Entertainers	7	0535	R1M-SHF
Saturday Review	7	1815	BBC-R4

A sample page from The Listening Guide.

power tests on 11390 and they are anxious to receive reception reports (!) So far they've heard from at least 13 countries, all in Europe. Reports from the U.S. are as unseen as that "Swiffer" delivery person who's never seen on the TV commercials. I guess that's understandable, given that they list their power as "about" 30 watts and the time frame used is from 0900-1300 UTC. I'd be too blurry to stumble my way to the receiver at those hours!

~ In Papua New Guinea, NBC at Bougainville has returned to the air on 3325.Your best shot at this one is in the spring around 1100-1200 UTC.

~ Reach Beyond Australia (formerly called HCJB) is about to install a third 100-kilowatt transmitter at Kununurra. They are hoping to have the new unit in service in time for the B-16 season, which goes into effect at the end of October.

~ Florida's WRMI has replaced 7455 and now uses 7730.

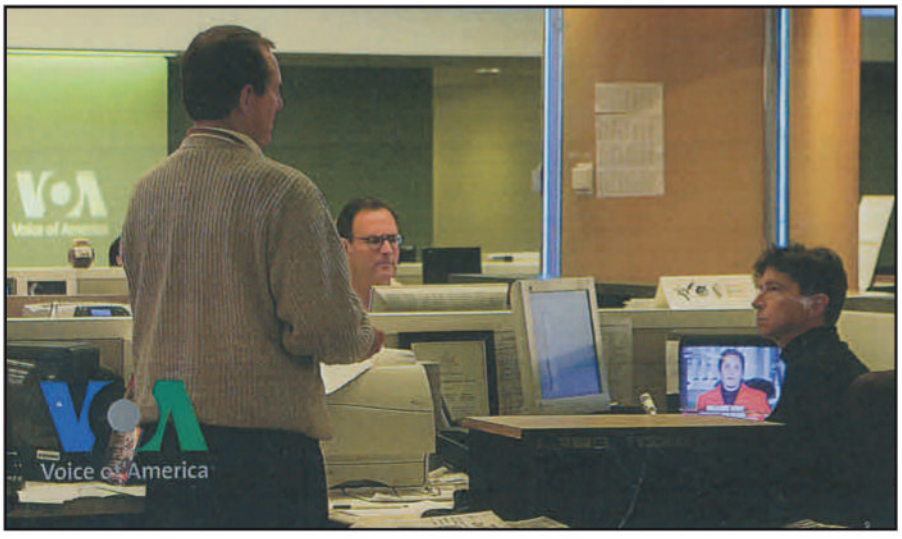
~ *The Latin American DX Survey* has been released by Australian DXer Rob Wagner. The survey is available as a free download from: <http://bit.ly/1RmiEOS>.

~ And the *Worldwide Listening Guide*, by John Figliozzi (mentioned a couple of months back) is out. It's a great source for programming lists over any medium and is available from Amazon, Universal Radio, and a bunch of other online book sellers. It's more than worth the price.

Remember, your shortwave broadcast station logs are always welcome. But *please* be sure to double or triple

Rich Parker sent this QSL from the Rhein Main Radio Club saluting 2015's EDXC Conference in St. Petersburg.

Radio New Zealand's transmitter building at Rangitaiki.



An assignment editor shown in the VOA newsroom on this QSL for the Tinian (Northern Marianas Relay QSL). (Thanks D'Angelo)

Pirate Radio Casablanca named after one of our favorite movies. (Thanks D'Angelo)

space between then, list each log according to the station's *home* country, and include your last name and state abbreviation after each. Also needed are spare QSLs or good copies of station schedules, brochures, pennants, station photos, and anything else you think would be of interest. If you are an amateur radio operator who is also an SWL you are also most welcome! Join KB2DMD and N9OVQ and let's hear from you!

Leading Logs

Here are this month's logs. Additional logs are posted online <http://cqplus listeningpost.blogspot.com>. All times are in UTC. Double capital letters are language abbreviations (SS = Spanish, RR = Russian, AA = Arabic, etc.). If no language is mentioned English (EE) is assumed.

CANADA—CFVP, Calgary, 6030 at 2228 with comedienne Gilda Radner, "Funny 10-60" ID, then Larry the Cable Guy. (Sellers, BC)

CONGO (Rep.)—Radio Congo, (t) 6115-Brazzaville from 0605 tune in. Seemed to be a "morning reflections" type pgm; almost religious-sounding with M and FF anmts, African choral mx. At 0620 xylophone-type repeated like an IS, then more FF anmts. (Perry, IL) (A **testosterone** log – *GLD*)

ETHIOPIA—Radio Fana, 6110 at 0311 in Amharic with M and HOA music. (Taylor, WI) 0415 with M, W hosting percussion-driven music. This was a superb African opening. (N9OVQ, IL)

GUYANA—Voice of Guyana, Georgetown, 3290 at 0220-0410 with a lot of music; news at 0400. (D' Angelo, PA) 0440 carrying BBC news then original pgmg at 0530 with multiple W doing news. 100% readable; the strongest I've heard them since reactivation. (N9OVQ, IL)

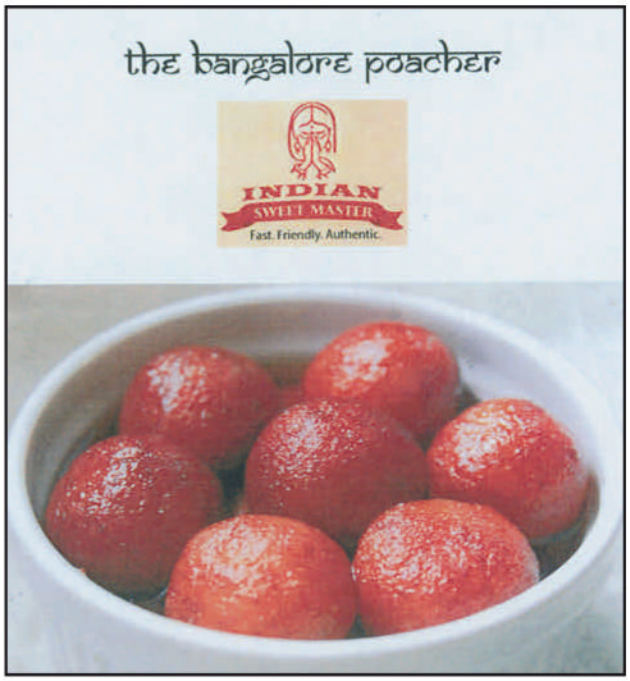
HAWAII—WWVH National Bureau of Standards, 15000 at 2212, W gave time just prior to the stronger WWV anmt. (Sellers, BC)

MALAYSIA—RTM, Sarawak FM, 9835-Kajang at 1105 with M/W in Malay. (Brossell, WI)

MYANMAR—Myanmar Radio, 7200-Yangon at 1353 mixing with CNR-1 from 1400 until CNR closed at 1400 leaving Myanmar in the clear until they went off suddenly at 1402. (Perry, IL)

NIGERIA—Radio Kaduna, 6090 good at 2202, with Caribbean Beacon attempting to get on the air, creating a strong het. (Wood, MA)

NORTH KOREA—Korean Central



Rich D'Angelo also got this QSL from pirate Bangalore Poacher.

Broadcasting Station, 15180-Kujang with martial/victory music at 1108. (Brossell, WI)

OPPOSITION—Denge Kurdistane, 9400 (via Grigoriopol to Turkey), in Kurdish at 1355. (Perry, IL)

Radio Sana'a (p), (p Saudi Arabia to Yemen), 11860 at 1351-1412 with M and long talk in AA. No top-of-hour break, so no ID noted. (D'Angelo, PA)

Que Me Radio, (via Palau to Vietnam), 9530 with talks in VV at 1207. (Brossell, WI)

PAPUA NEW GUINEA—NBC, 6075 via Brandon (Australia) at 1106 with talks in Tok Pisin. (Brossell, WI)

Wantok Radio Light, 7325-Port Moresby at 0415 with religion. (Padazopulos, Greece)

SINGAPORE—BBC Far East Relay Station, 15510 at 1135 with news headlines. (Brossell, WI)

SUDAN—Sudan Radio, 7305 at 0224 with AA talks. (Brossell, WI)

ZAMBIA—NBC Radio One, 5915 strong at 0405 with great local music and M in Swahili. Went from no signal at 0350 to a strong level at 0405. (N9OVQ, IL)

ZANZIBAR—Radio Television Zanzibar, 6015-Dole at 0320 with HOA music and W hosting. Nice to hear this one after many months of trying. (N9OVQ, IL) 11735 at 1959-2017 with time pips on the hour, W with ID f/by brief news in Swahili. (D'Angelo, PA) 2002 with M in Swahili and domestic music. (Taylor, WI)

~ More loggings are posted online at <http://cqplus listeningpost.blogspot.com>.

QSL Quests

If you send reception reports to All India Radio. AIR would prefer you give the reception times in stated in Indian Standard Time, which is 5 and a half hours ahead of GMT/UTC. Further, you can forget about using the SINPO or SIO codes; they'll be happy with a simple description of the reception quality (strong, fair, weak). Reports may be sent to: Spectrum Management and Synergy, Directorate General, Room Number 204, All India Radio, Parliament Street, New Delhi 110001, India. Email to: <spectrummanager@air.org.in>. (Use email if you can't fit that long postal address on the envelope!) And BTW, they say you do not need to include return postage, (which will make it a bit cheaper to handle all the follow-ups you'll probably need to send, (especially if you're reporting to the often unresponsive regional outlets). Source: *The New Zealand DX Times*. (Parenthetical comments are mine)

Rich D'Angelo reports replies from the VOA for its Tinian relay, and the pirates Radio Casablanca and Bangalore Poacher.

Who Goes There?

~ 5910 strong in EE at 0320-0359 when they abruptly pulled the plug. Most of the news was about Ugandan politics. (N9OVQ, IL)

~ 6930 pirate at 0030 with patriotic music and a movie soundtrack. (Hassig, IL)

~ 6940 at 2235. Weak, with a long talk. (Hassig, IL)

Just Sayin'

"On air" people (and, for that matter, people everywhere) murder the pronunciation of "W." It comes out douba-ya, or something close to that. Examine the letter: It's actually two you's; a "double you" oddly that's not how it comes out of the mouths of all too many!

Back in the Day

Radio Mar, YNTP, Puerto Cabesas, Nicaragua, on 9581 airing its domestic service in Spanish at 1405 on December 16, 1972.

CORY GB SICKLES, WA3UVV

"Potpourri"

How well did you weather the weather this past winter? As April showers bring May flowers, we may not want to look back at the long cold winter, but it deserves some reflections.

Going back and forth between South Jersey (just below the Mason-Dixon Line) and Southwestern PA (just above the Mason-Dixon Line) I can certainly say I had my fill of winter within a week of the start of the new year. December was unusually warm in the area — a wonderful feeling that elicited short sleeve polo shirts on many days — but quickly seemed cruel as there was a sudden drop into "deep freeze" temperatures.

Many cars suddenly didn't start, as batteries that were a bit "long in the tooth" could not produce the needed cranking amps. January brought about more frigid temperatures — made only to seem worse, if measured in Celsius — that caused some issues with black ice and a general feeling of depression, as many longed for the warm and sunny days of December.

Late January brought some snow, with a major storm hitting on the 22nd though the 24th of the month. I had planned to go to Yaesu Day at DX Engineering in Tallmadge, Ohio on Saturday. Alas, the nearly 30 inches of snow (plus drifts and even higher ridge left by a certain plow driver's questionable technique) meant I couldn't get my SUV out of the driveway until too late in the day. Still, I have little reason to complain, as there were an estimated 500+ drivers, associated families, and one university basketball team of note — all stranded on a section of the Pennsylvania Turnpike.

I'm sure that as you read this, there are still after-action studies going on and continued posturing about what went wrong and what they'll do better next time and still more finger pointing — but the bottom line is that people were held captive in their cars. I trust you keep some sort of Go Bag (not just radios) in your vehicle. But if you were stuck in heavy snow and rather cold temperatures for over 24 hours, just how prepared are you for that?

Hopefully, you have a sufficient supply of bottled water for an average number of passengers and a like-minded quantity of energy bars (that aren't left over from the last Bush administration) plus blankets, dry socks and the like, some inflatable pillows, and playing cards or games to help pass the time. Hopefully, you keep your fuel tank as full as possible and could keep cycling your engine for heat and to charge your battery. I hope you also know to get out of the car periodically to keep the exhaust pipe clear and avoid inhaling carbon monoxide.

Sound like a lot to keep in the car? Maybe so, maybe not — I think it's all a matter of perspective. Sit in it for a day and a half and then let me know. If you have a station wagon or SUV, then it should be an easy matter to get to this Go Bag. If you're driving a sedan and it's in the trunk, give some thought as to how quickly you'd want to decide to go out and bring it inside the passenger compartment — or if the trunk is accessible through a fold-down seat back.

There's another set of concerns that may have come to your mind — the lack of a restroom in your vehicle. I'm not sure how detailed the esteemed editor or publisher of this fine periodical would like me to be, but let's just say you are going to need some sort of improvised or disposable resource to handle those needs, as well. Search the Infobahn for terms like "disposable toilet," "lady j adapter," "absorbent bedpan liner," "kitty litter" and so on for some ideas. That last item might also be usable for helping you get out of some trench your tires have dug into, as well as some sort of high-traction boards.

Of course, toilet paper, paper towels, hand sanitizer and the like will be important, as well. If you've never considered all of this, but drive distances in winter weather, then expand your mind for a few moments and give some thought to those preparations, as well.

Shelter in Place With a Radio

About two weeks before this storm, there was another one that seriously affected traffic in West Virginia (yes, just below the Mason-Dixon Line). This one brought in much less snow, but with wind and some ice, it brought traffic to a standstill throughout the area. School buses — on the road since mid-afternoon — didn't get many children home until well after midnight. While most commercial buses have some sort of restroom facilities, school buses don't. Suffice it to say those unfortunate children were fairly miserable and traumatized by the time they got to their families.

Smarter-thinking (or perhaps just "thinking") principals and staff kept their students at school. Here, they had electricity, heat, bathrooms, gym mats, food, etc. and wisely chose to shelter in place. These kids had an "adventure," while others did not. Their parents experienced fewer worries, as well. If you are driving into a storm with steadily deteriorating conditions, perhaps taking advantage of the restaurant or motel at the next exit ramp wouldn't be such a bad idea, after all.

As we should touch on radios for a bit, having a 2-meter rig sitting on 146.52 MHz is a good idea. Having a weather alert feature is valuable. So is having a CB radio. As I've learned while driving through western Maryland at night, there is very spotty cell service for me between Cumberland and the West Virginia line, which means text messaging capabilities are non-existent.

I won't raise many fellow hams at midnight or 2 a.m., but there are enough truck drivers still on the road to give me someone to talk to on CB — casu-

*e-mail: <wa3uvv@gmail.com>

ally or when there's some "non-good" event in play. Having it on, while monitoring channel 9 and/or 19 — with the squelch set at a quiet threshold — really is a good idea.

If the highway you're on is turning into a parking lot, a CB might be the best way to know what's ahead, what the cause is, and how to avoid it. It might also aid you in helping someone near you in need, such as providing a candy bar to a diabetic or making use of your CPR and other first-aid training — in the field.

Along with this, having a radio that can operate on MURS (no license required) or GMRS (license required) can also be helpful. Likewise, an FRS radio sitting on channel 1 may come in handy to communicate with others in your immediate area. Making friends with the folks in the RV next to you could come in handy, as well. (See previous paragraphs)

Using CERT to Recruit

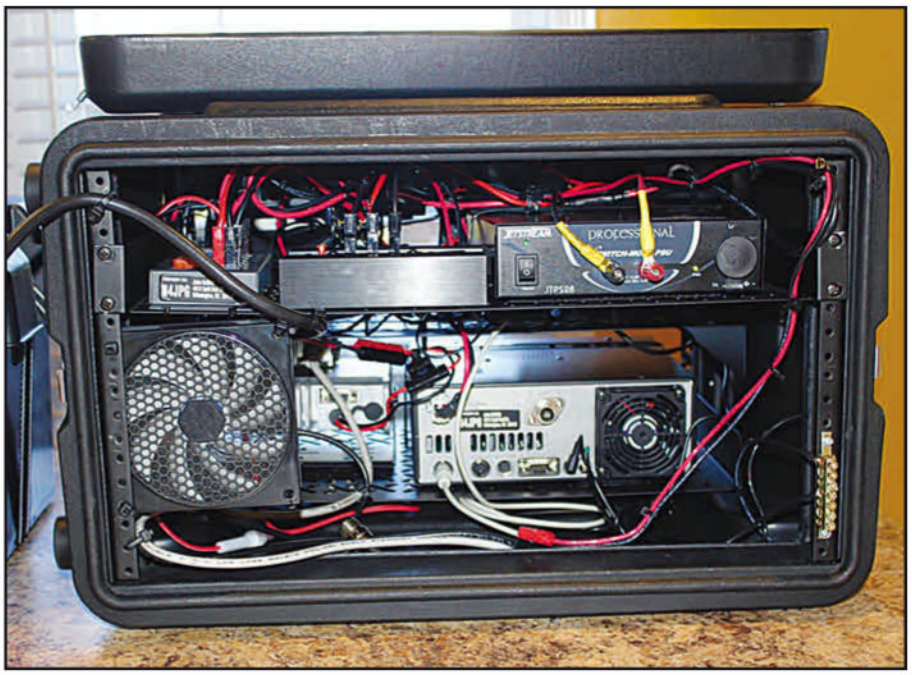
CERT team members — who are out in force in many areas during snowstorms and in place afterwards — use all of these "non-ham" radio services to stay in touch. CERT - an acronym for Community Emergency Response Team - is a great way to recruit more (especially EmComm minded) people into amateur radio. Acting as an instructor or guest speaker during a class is an excellent way to introduce yourself as an Emcomm participant or leader, plus show off your Go Box or Go Bag and talk about the value of ham radio and its use during and following a crisis.

In fact, your Go Box can also be a very significant tool for PR purposes at different gatherings or to assist you in creating one of your own. Something outfitted with HF and VHF/UHF capabilities can give your audience a basic idea of what we are capable of doing.

Be sure to cover some of the non-verbal modes we use to communicate, as well. Fldigi, Winlink, and APRS are good ways to introduce the concept of moving data around — especially ICS and HICS forms. In my introductory CERT class of a few years ago, there were just under 20 students who were deaf or hard of hearing. Voice modes have little use to them, but keyboard-to-keyboard digital is of significant interest. Amateur radio is a pursuit open to many, without age or most physical requirements. Including the deaf and HOH community members is something that benefits everyone.

Sidewalk Amateur Radio

Another PR opportunity for you and your Go Box can be borrowed from the world



Rear and front views of N4JPG's work reveals a Go Box with HF, digital voice, and conventional analog coverage, plus support for keyboard digital modes. Of particular interest are the shelves (see text and next photo for details).

of astronomy. Some years back, a program to bring the appreciation of astronomy to the people in an everyday setting was co-founded by John Dobson. Amateur astronomers may recognize his name as associated with the popular Dobsonian telescope mount.

The concept of "Sidewalk Astronomy" has spread to many locales. Essentially, someone sets up a telescope and invites people to look at the moon, planets, and stars. Visit <www.sidewalkatronomers.us> for more details. Even though light pollution attenuates what one can normally see in an open field out in the country, it's certainly more than the naked eye and — if nothing else — gives someone an opportunity to think about celestial bodies and astronomy. Some walk by and don't want to try it out, some participate and move on and a smaller percentage have their imaginations inspired and become interested in learning more — to eventually become astronomers themselves.

In a parallel endeavor, Sidewalk Amateur Radio (or whatever you might prefer to call it) is an opportunity to set up an impromptu station (Go Box) with some take-away propaganda about

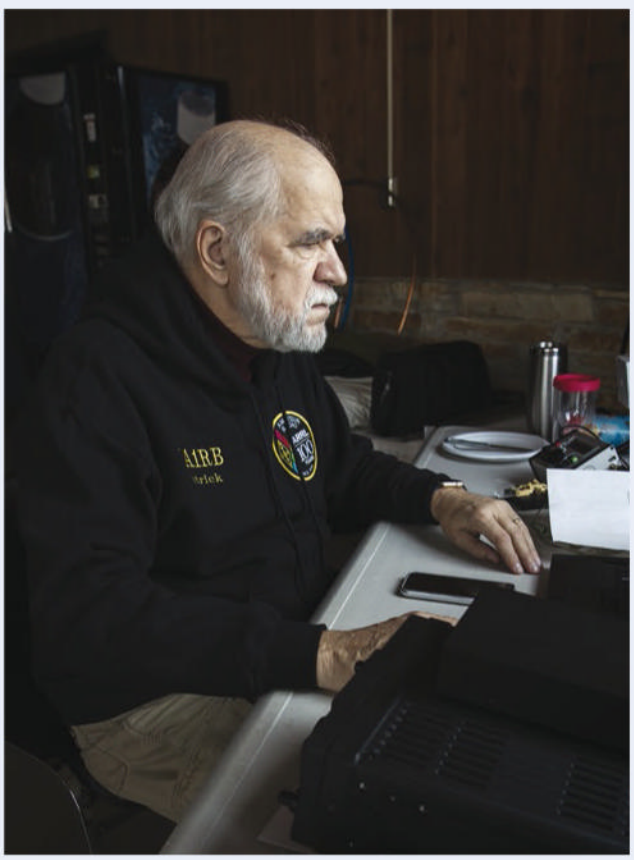
ham radio and your contact information. Any antenna you set up will be less than perfect, but it should be able to generate some interest. Maybe a pair of participants — one operating the radio and another inviting people over and holding some supporting conversations — is best.

You'll get those who walk by disinterested, those who experience the fun and learn more (but move on), and those who are your "real" audience — learning more, participating, and subsequently becoming hams themselves.

Don't let Emcomm be your only focus. Especially with young people, touch on all of the things that amateur radio can do to support education (without actually mentioning the dreaded word) and open one's mind — as kids are usually accompanied by their parents. Just as McDonald's made a conscious decision to market to kids, who get their parents to bring them there (with their parents' money)— you need

Winter Field Day

As illustrated in this month's column, emergencies requiring communications assistance don't always wait for warm weather, and neither should our preparedness exercises. That's the idea behind "Winter Field Day," sponsored (appropriately enough) by the Winter Field Day Association. The 24-hour event is held annually on the fourth full weekend of January, with bonus points for operating outside, away from home and/or without commercial power. For complete details, see <http://www.winterfieldday.com/index.html>.



Patrick Moretti, KA1RB, operating the PSK31 station at the 2016 Winter Field Day operation of the Black Diamond Group, WI9BD, at Menominee Falls, Wisconsin. (Photo by Leroy Skalstad, WD9HOT)

to excite the parents to support the more involved interests of their kids and know why ham radio is such a worthwhile activity. For the kids, it can just be — fun!

Above all else, offer everyone an opportunity to talk on the air. Even if cell phones and instant text messaging have jaded you, there's still nothing like the thrill of holding a microphone and talking on the radio. Especially when it's the first time.

If you are a regular reader of this column, then you might remember that I've covered PR opportunities and alternate forms of two-way radio before. As there are many ways to use these in furthering the growth of your Emcomm group and efforts, plus provide service to your community, I'll be continuing to do that and hope that you let me know of different ways that you have exploited such opportunities.

Quoting from former Canadian Prime Minister Pierre Trudeau: "Be ready when opportunity comes … Luck is the time when preparation and opportunity meet."

PA Turnpike Revisited

Revisting the January debacle on the Pennsylvania Turnpike, I want to recognize the rescue and public service efforts of many of the people of Bedford County, Pennsylvania. As some who lived near the affected area learned of what was happening (and not happening) on the turnpike, they left the comfort of their homes and brought supplies and comfort to those in need.

Using access ways, overpasses, and ultimately by foot, they delivered water, food, and other items. By and large, there was no centrally-controlled, practiced, or otherwise coordinated response — but there were pocketed responses — coming in advance of and in addition to anything "official."

Special recognition goes out to these hardy souls as well as anyone who rendered aid weeks earlier in West Virginia. Not only did they demonstrate the charity, good citizenship, and empathy of many in this country — they did so simply because they recognized a need and stepped out of their comfort zones (literally, as well as figuratively) to do "something" to help others. They did this without waiting for their tax dollars to go into action. They just did it because it needed to be done and they knew they could provide some of that help. Good for them.

One more quote — this time from American President Theodore Roosevelt: "Do what you can, with what you have, where you are."

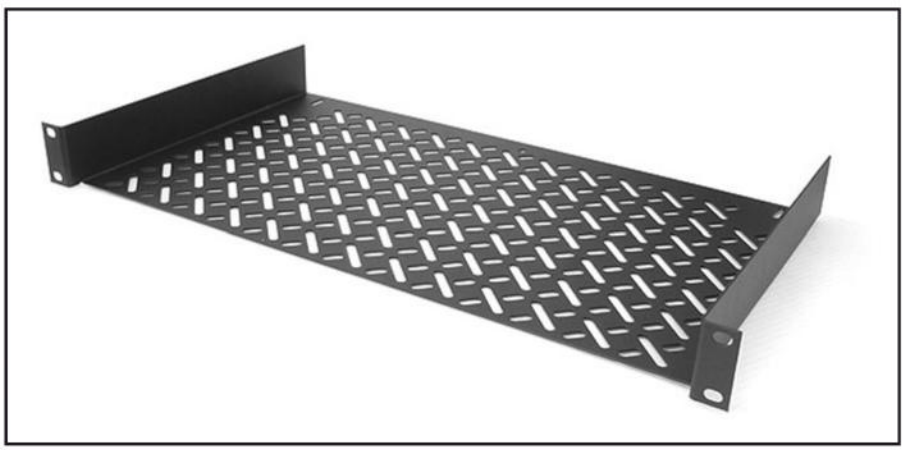
Go Kit of the Month

Now let's change things up a bit and take a look at a Go Kit from John Patrick, N4JPG, as shared on the Ham Radio Go Kits Facebook page — a good place to share ideas. Using a Gator box, John has stuffed this 4RU enclosure with HF, VHF/UHF analog, and DMR transceivers, as well as external speakers, digital mode interface, ventilation, and some nicely laid-out cabling.

One of the things I like in this design is John's choice of rack shelf. The Middle Atlantic Products UTR1 has a "universal" hole pattern throughout the bottom. This makes it easier to mount a variety of transceivers and accessories — through the use of mounting screws and holes laid out in the equipment for feet. Lining up the existing holes for use in securing your gear can eliminate the need for mounting brackets and requires less vertical space.

Many already use this technique, but end up pulling off case bottoms and lining up holes to drill. That works, but the UTR1's "X" pattern speeds up the process and involves substantially less effort to rearrange items later on. They're available through online sources like <www.sweetwater.com> or <www.markertek.com> plus local musicians retail stores.

While I do get to see a nice mix of more elaborate Go Kit and Go Box designs, I don't see much posted in the way of simpler setups or soft case — Go *Bag* — layouts, if you will. Perhaps your Emcomm needs are very simple and just a basic portable and accessories are enough for the kinds of responses you prepare for. Well, I think readers would like to see those, too. So — please email some pictures to me with a short description of what you have and the idea behind it.

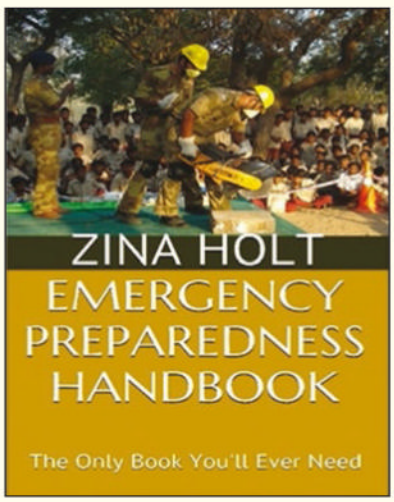


This closeup of the Middle Atlantic Products UTR1 shelf gives you a better idea of the cutout pattern. It should be able to accommodate a variety of gear, without the need for additional holes or brackets for your equipment.

Book of the Month

Last, but not least, our Book of the Month is *Emergency Preparedness Handbook: The Only Book You'll Ever Need*, by Zina Holt. I'm not sure about it being the "only" book, but it is a good read and it's available online for an attractive price. If you're still not sure of all the things you want to have lined up at home and for your family, this is a good place to get started.

Until next time — Stay safe and look for the opportunities that are out there.



Our Book of the Month entry is available as an ebook, for a reasonable price. It's a good starting point or remedial reference for experienced hams.

What You've Told Us…

Our November survey asked about how you respond to people who ask you about ham radio. An overwhelming majority of the respondents (95%) said they'd been asked at least once what hams do. Your responses (thankfully) are overwhelmingly positive (77%), while 11% say your answer depends on the person and circumstances involved, 9% give a matter-of-fact response, 3% said "I don't talk about the hobby" and nobody admitted responding negatively.

Asked what ham radio activities you talk about with non-hams, the majority of you (56%) said you discuss a variety of activities, and 9% said it depends on who's asking. Specific activities included DXing (11%), emergency communications (7%), the people you meet on the air (4%), building/experimenting (3%), contesting (3%), repeaters (3%) and "off the grid" operating (1%).

Most of you enjoy explaining ham radio to others, with 50% responding "happy to explain what we do" and another 43% who are "excited to share something about the hobby." Four percent said they are nervous that they might say the wrong thing and 1% answered "like I want to crawl under the nearest table."

Finally, we asked if the way you answer people's questions about ham radio is influenced by the articles and projects described in *CQ*. A gratifying 41% of you answered yes, while 31% said no and the remaining 28% weren't sure.

This month's free subscription winner is **Michael Di Persio**, KC2Q, of Davenport, Florida.

Reader Survey April 2016

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/CQApr16> [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 2016 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. This month, we'd like to hear about some of your ham radio plans and goals for the new year.

It's the start of another hamfest season, so this month, we'd like to hear about hamfests and you.

1. Approximately how many hamfests do you attend each year?

None 1
1 2
2-5 3
6-10 4
More than 10 5

2. When you attend a hamfest, are you generally there primarily as a ...

… buyer 6
… seller 7
… volunteer 8
… other (what?) 9

3. What is the *main* thing that draws you to a hamfest? (Choose one)

Flea-market 10
Forums 11
New equipment sales 12
Socializing with fellow hams 13
Other (what?) 14

4. In general, what is the greatest distance you are willing to travel to attend a hamfest?

Up to 10 miles 15
Up to 50 miles 16
Up to 100 miles 17
More than 100 miles 18
Do not attend hamfests 19

5. Please indicate whether each of the following will make you more likely to attend a particular hamfest, less likely or have no influence.

	More Likely	Less Likely	No Influence
Flea market	20	21	22
Forums	23	24	25
New equipment dealers	26	27	28
ARRL approval	29	30	31
ARRL convention	32	33	34

6. Have you attended or do you plan to attend any of the following this year? (Select all that apply)

Local hamfest 35
Regional hamfest/ARRL Division Convention 36
Major hamfest (e.g., Orlando or Dayton) 37
Specialty Conference 38
None 39

Thank you for your responses. We'll be back with more questions in upcoming issues.

Survey Response for Issue: April 2016

Name _____ **Call Sign** _____

Address _____

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

Country _____

E-mail .....

kit-building

BY JOE EISENBERG,* KØNEB

"Curiously Strong"

The Altoids® mint tin has become the de facto standard case for a whole host of QRP and kit projects. Its universal availability, low cost, light weight, and convenient size make it ideal for an enclosure. Circuit boards for a lot of kits and other projects are intentionally sized to fit inside. You can thank the British for their marketing genius that created both the mints and the tins, and thank them again for this kit as well!

Kanga FOXX-3

Drilling larger holes in an Altoids tin for jacks and connectors and switches can be a problem due to the very thin metal used in the tin. The Kanga FOXX-3 CW transceiver kit (*Photo A*) makes this process a lot easier, by requiring only four 1/8-inch holes to be drilled in the base. The Kanga FOXX-3 is a kit that has been around for about 15 years, yet still remains popular. The popularity of this kit is due to the ease in which it mounts in the Altoids tin, as well as the step-by-step method of assembly. This method prevents a lot of problems that can be hard to track down once a kit is assembled.

A step-by-step kit usually begins at the power supply and audio amp stages and moves on from there. Each stage is built in order and tested before moving on to the next, allowing for complete troubleshooting before it becomes a lot more difficult. The Kanga FOXX-3 has the parts for each stage enclosed in its own bag (*Photo B*). Each of these bags holds smaller ones separately containing the resistors, capacitors, and assorted other parts. It is so well done, that I did not need to use my normal "cat-proof" tray for my parts. Just open it a bag at a time as you follow the steps. Once you complete a stage, you perform the recommended tests and then move on to the next stage. The directions for the Kanga FOXX-3 were very clear and easy to follow, along with a schematic of each stage you are building and a parts pictorial for that stage.

There are three options for connecting a telegraph key: a 1/8-inch jack, a two-pin plug and cable, or using a button (supplied!) to act as your key. I chose to install the jack, so I could either connect a straight key or the output of a keyer. Because this kit comes with all of the optional parts, you may end up with a few spare parts. Since there are many kits for which a two-pin plug with matching jack and

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

Photo A. The Kanga FOXX-3 transceiver kit mounted in an Altoids® tin.

Photo B. A bag containing the crystal oscillator stage parts for the 40-meter FOXX-3. Each stage has its own bag.

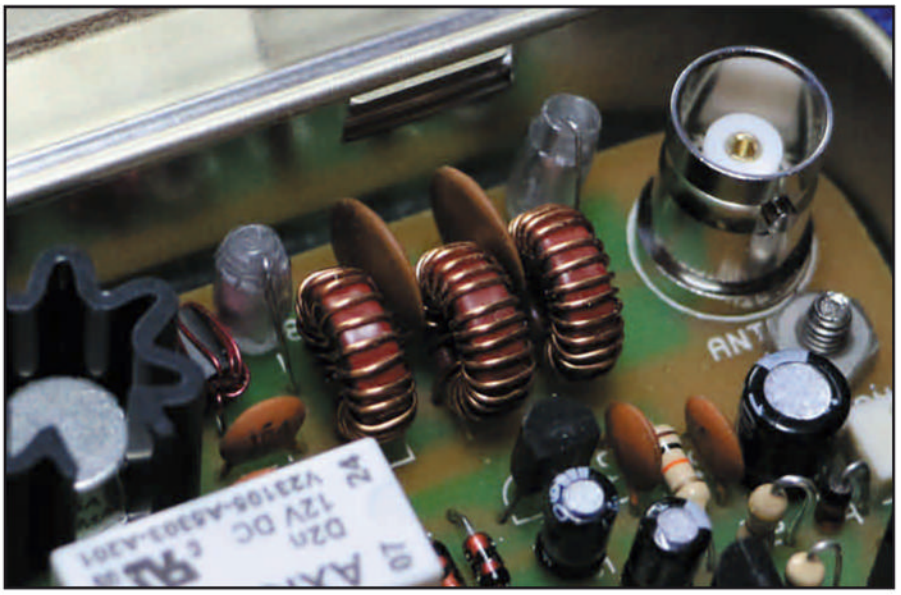

Photo C. A close up of the FOXX-3 output stage filtering. If you encounter broadcast interference, putting an antenna tuner in line might help. So might W8TEE's "Cheap and Easy BCI Filter" project elsewhere in this issue.

wire would be useful, I'll keep these in my parts bin for future use. The only issue I had was that the holes in the PC board were just a bit tight to fit the two pins needed for the resistor that determines the RF power output. Using a tiny drill bit by hand quickly cleared up the problem.

Connecting the FOXX-3 directly to an antenna revealed a small bit of shortwave and local AM broadcast interference. But when I connected my antenna tuner to the FOXX-3, it pretty much eliminated the outside interference. An antenna tuner is really a kind of bandpass filter, and can be quite helpful. The output filtering in the kit (*Photo C*) only provides harmonic filtering above the frequency band of operation. The receiver sensitivity was not quite as good as the RockMite][I wrote about last month, but still hears plenty of signals.

You can buy the FOXX-3 kit from Kanga US ($45, if in stock) at <http://www.kangaus.com> or from Kanga UK at <http://www.kanga-products.co.uk> for £29.95 ($43.70 U.S. at this writing), plus shipping. The FOXX-3 is available in versions for 20, 30, 40, 60, and 80 meters.

1960s-Era Chinese Radio Kits

When looking at kits for teaching radio principles, I have found a number of educational kits that assemble things like an AM or FM broadcast radio on a board that has a schematic diagram printed on the board itself. I also came across a unique kit that is a replica of a kit popular in China in the 1960s. During that time, China was a very closed society, so those of us on the outside had little idea what was going on there in the realm of radio. With things being quite expensive for the Chinese consumer in that era, DIY kits were quite popular. China at the time produced a lot of components, but fewer assembled products than it does today.

The most popular Chinese radio kits

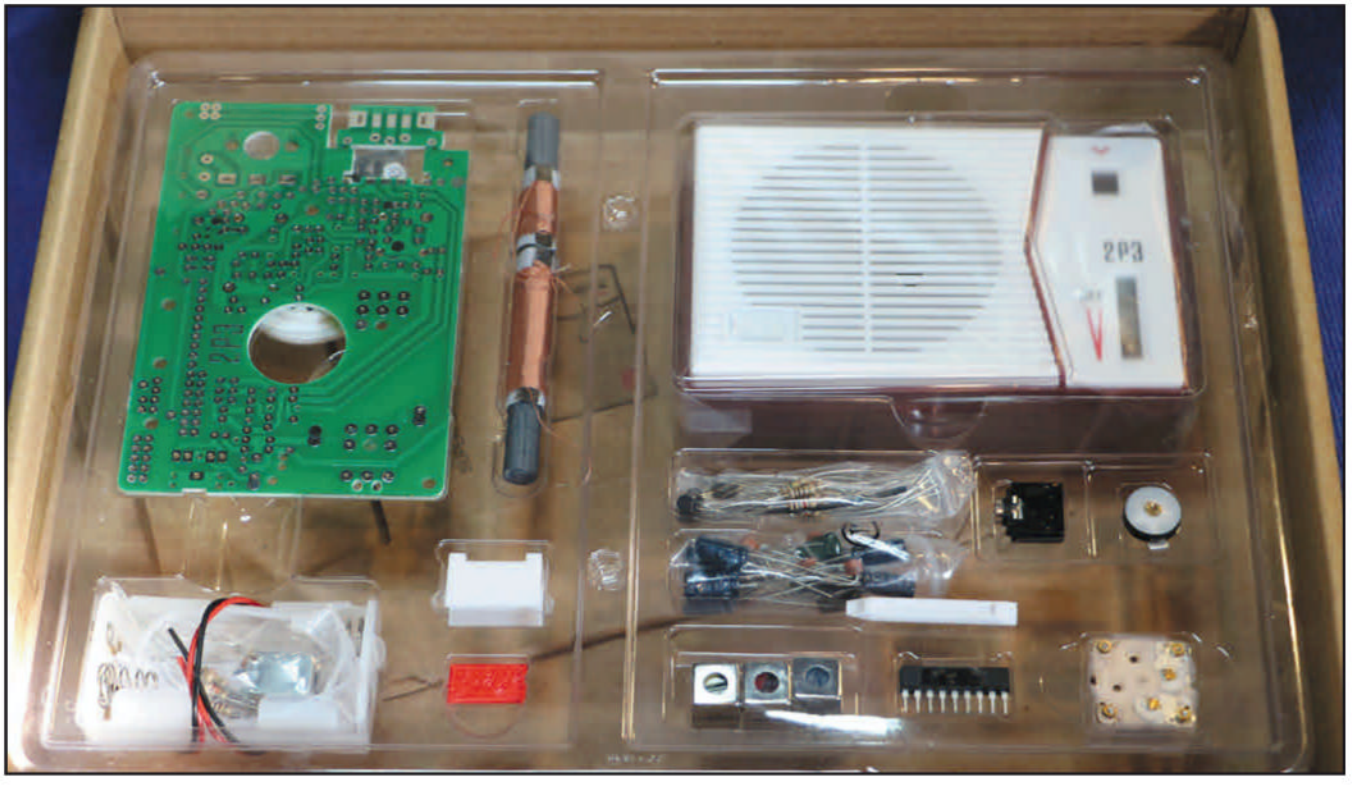

Photo D. The Tecsun 2P3 replica kit box showing all of the parts neatly packed inside.

were based on a plastic case called the 2P3. These cases were sold to builders, along with a variety of parts and boards (*Photo D*), depending on how complex a kit the builder wanted to assemble. The beauty of it was that there were a number of kits made to construct an AM broadcast radio that all fit into the 2P3 case, thus the legend of the 2P3 radio kits. Tecsun has come up with a well-designed radio kit (*Photo D*) that comes with a reproduction of the 2P3 case (*Photo E*). The box the kit comes in (*Photo F*) even has a sketch of a Chinese schoolboy wearing the typical uniform of the period and even a portrait of Mao on the wall! The instructions have plentiful diagrams, but are still written in a Chinese-English manner.

The diagram is very clearly illustrated with color photos of the parts and a large schematic and block diagram to make this truly educational. The similarities with the original 1960s design only extend to the three transistors in the RF and IF section, then go more modern with an IC-based audio output amplifier. As with many Chinese kits, there are a few details left out of the manual. It mentions you can build this kit stage by stage, but doesn't give instructions how to do that, leaving it up to the builder to read and understand the schematic. A lot of things are unclear, so, for example, you might find yourself unsoldering the wires from the speaker to get it mounted in the case after you test and align the radio.

The alignment procedure is pretty easy and is well written. It actually first requires you to check the current draw of the three transistor stages before activating them by shorting a gap with solder. If the current draw is outside the parameters for each on the diagram, there is a bag of resistors supplied to use to bring the values of current draw more in line with acceptable limits. My kit needed no changes in the resistors to produce the desired current draw for each of those three stages. Once the alignment is complete, the board is mounted in the case and the speaker wires reattached (*Photo G*). A diagram of what case screws and parts go where is part of the large printed manual sheet, as are detailed drawings of special assemblies, like the volume control.

Most typical AM radio kits suffer greatly in the areas of sensitivity and selectivity, but this kit is an exception. It picks up all of my local signals as well as a large number of much weaker signals with reasonably good quality audio, and plenty of volume. The kind of Art Deco appearance of the case is typical of pocket AM radios of that era and makes for a nice looking final product. I found my 2P3 kit for $25.95 on Amazon.com at this link: <http://amzn.to/1Qned3z>.

73 to Ramsey Kits

Finally, a name long known for a large variety of kits has left the marketplace. Ramsey Electronics, known for kits aimed at beginners, hams, and fans of very low power broadcasting, will no longer be producing anything in kit form. The company has decided to continue only its test equipment offerings, leaving the huge variety of kits it produced for 40 years by the wayside. Ramsey kits (*Photo H*) were known for their extremely detailed printed manuals that always included a lengthy description of the theory of the circuit involved, stage by stage, making every kit a learning experience. Each stage was built one at a time to enable troubleshooting as you went along. The PC boards in their QRP kits were single-sided and had the parts spaced quite a distance apart, making them ideal for first time builders. Ramsey also produced a large number of mini-kits of extremely simple design for beginning builders as well as more sophisticated kits.

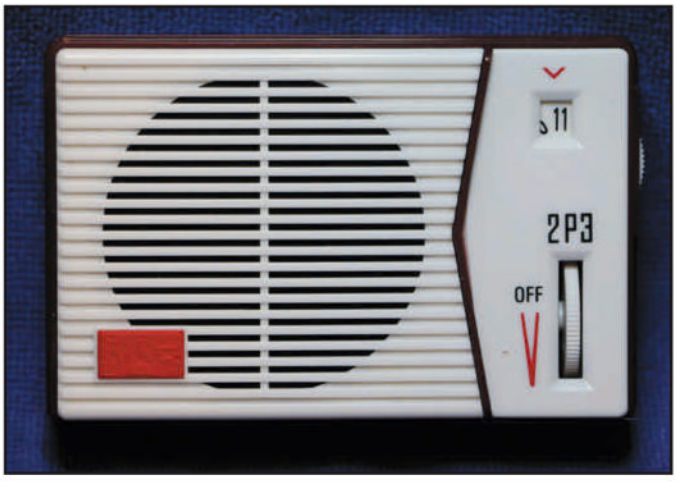

Photo E. The classic 2P3 case (see text for details).

what's new

N3FJP Beginning API Development

N3FJP Software has begun Application Program Interface (API) development to interface other digital or logging programs with N3FJP's logging software.

As of presstime, the work completed will not be evident until other programmers add connectivity to N3FJP's software to their programs. N3FJP called on users who have a program that they wish to see interfaced with N3FJP's software, to contact the developer(s) and refer them to this site: <http://www.n3fjp.com/help/api.html>.

For more information, contact: Scott, N3FJP. Website: <http://www.n3fjp.com>.

Note: *"What's New" is not a product review and does not constitute a product endorsement by* CQ. *Information is primarily provided by manufacturers/vendors and has not necessarily been independently verified.*

Photo F. The box for the 2P3 AM radio kit, featuring a period sketch of a Chinese student building it with a portrait of Mao overlooking the scene.

A hallmark of most Ramsey kits was the use of the same sized PC board and case for a wide variety of kits. This made them all styled alike and stackable. Having an easy-to-assemble case made the final steps a breeze.

At one time, Ramsey had three different booth locations at the Dayton Hamvention®, two inside the exhibit halls and one outside in the flea market, so nobody could miss their products. I, for one, never left for home without at least one of their kits when I saw them at Dayton. Along with Heathkits, my Ramsey kits helped me gain the skills I have building kits today. The good news is that their remaining stock is now available on amazon.com by searching for Ramsey, and Ramsey will honor the warranty on kits sold until the end of 2016 (*That is, kits sold through the end of 2015 will be covered by Ramsey's warranty until the end of 2016. Kits purchased through Amazon during 2016 will not. – ed.*). Although Ramsey is now gone, new kits appear all of the time, and I'll keep bringing them to you here.

– Until next time, 73 de KØNEB

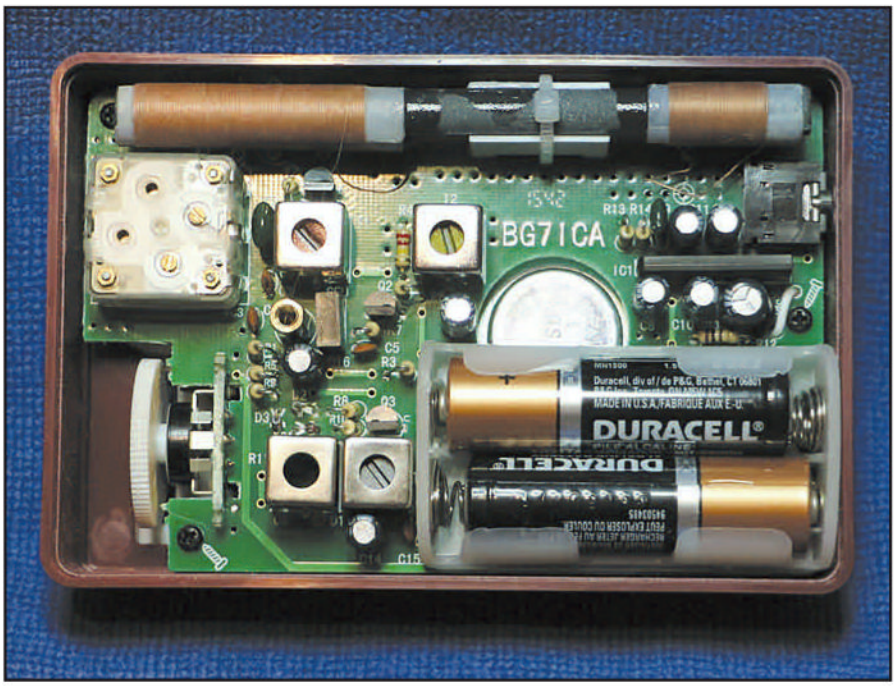

Photo G. The finished 2P3 AM radio, all aligned and ready to play!

Photo H. My trusty Ramsey active antenna kit, still working after more than 20 years!

BY KENT BRITAIN*, WA5VJB

FLASH! EPA Declares the SWR an Endangered Species!

Those adorable little 8-legged arachnids that inhabit our antennas and feedlines (*Figure 1*) are now an endangered species.

According to a spokesman for the U.S. Environmental Protection Agency, "It is a classic case of habitat destruction." With all the modern antennas and antenna tuners taking our SWR counts down to 1, not to mention growing restrictions on antennas altogether, the poor little critters simply have no opportunity to breed. But there is hope. Continuing work by Mr. Smith and Dr. Chart on an antenna with an infinite SWR, if successful, will be able to provide a home for all the SWRs in the universe. Meanwhile, it is essential that we all take good care of the SWRs inhabiting our stations. Government officials warn of significant fines and other sanctions (including pins in coax) for amateurs caught eliminating SWRs beyond permissible reduction levels.

Proper care and feeding of SWRs has been discussed previously in this column, most recently in May 2014 (*because the Antennas column didn't run in the April issue that year – ed.)*. SWRs, we explained, "do not necessarily put all eight legs on the ground (or your feedline) at the same time. What you need to do is get those radio waves going up and down the antenna very fast, and it burns their little feet like walking on hot asphalt. Therefore, they lift up one, then two, then more feet. Finally, they are standing on one foot with the other seven legs up in the air as shown in *Figure 1*. Now your SWR reading is 1 and you get out best because the other seven legs radiate the radio waves."

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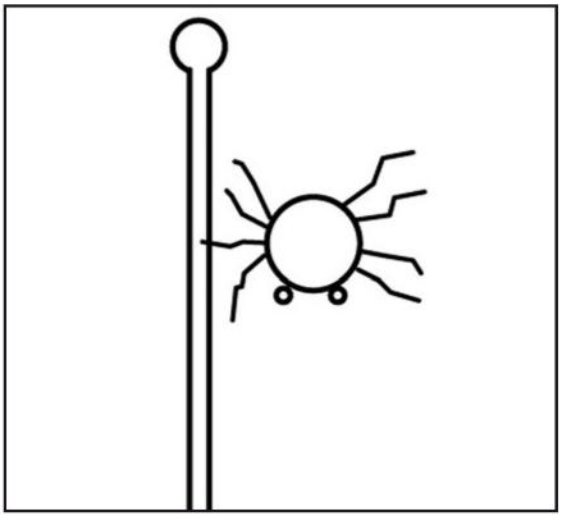


Figure 1. Artist's conception of an SWR on an antenna (the real ones are not visible to the naked eye). RF currents burn their feet, and your signal gets out best when only one foot is in contact with your antenna, as the other seven radiate RF energy.

You Can Help!

Just as the National Audubon Society conducts its Great Backyard Bird Count each year, *CQ* is now conducting an annual Wild SWR Tally. Each April 1, amateurs are encouraged to take portable SWR-detection devices (similar to the one shown in *Photo A*), and count the number of SWRs registered in the vicinity of their antennas. Remember that SWRs may be dormant or active depending on the frequencies in use and the resonance of associated antennas. We will tally your results and report on them the following April.

– *73, Kent, WA5VJB*

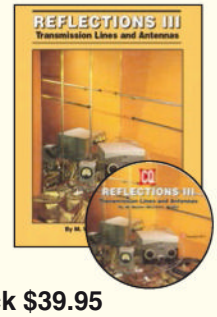
Photo A. A typical handheld SWR field detector such as this one may be used to participate in CQ's new Wild SWR Tally, conducted each April 1. The meter in this photo reads zero, indicative of the declining SWR population that has prompted the Environmental Protection Agency to declare SWRs as an endangered species.

Spring

Plan Your Springtime Projects Now!

Reflections III

by Walt Maxwell, W2DU



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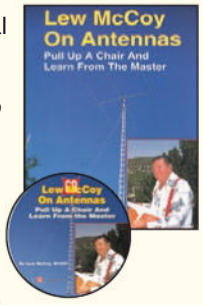
Lew McCoy on Antennas

by Lew McCoy, W1ICP



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by Dave Ingram, K4TWJ

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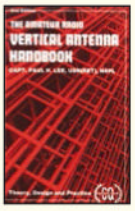

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learning curve

BY RON OCHU,* KOØZ

Common Amateur Radio Antenna Connectors

BNC, F, RCA, N, PL-259, SO-239, SMA … To an amateur radio newcomer, these connector designations can easily look like "alphabet soup" and sound equally confusing. Hams throw around these common connector names as readily as they do callsigns. At first, these names may seem daunting, but with a little explanation they will become just as easy to digest as, well, alphabet soup.

Ubiquitous PL-259/SO-239

The connectors that hams will encounter the most have to be the PL-259 and SO-239 antenna plug and jack (*Photo A*). In *Photo A*, the left connector is a male PL-259 ("PL" for "plug") and the one on the right is its female counterpart, the SO-239 ("SO" for "socket"). These connectors are commonly referred to as UHF connectors, but generally should be avoided above 6 meters. They were designed during World War II when UHF frequencies were considered to be anything above 30 MHz. These connectors are listed as providing a reliable 50-Ω impedance over a frequency range of 0.60 KHz to 300 MHz. However, there is a lot of data to suggest that the PL-259 offers increasing insertion loss at frequencies over 100 MHz. Most likely, a PL-259/SO-239 combination would be fine for 2 meters, but you would be better served by using "N" connectors on the 144 MHz bands and higher. One explanation for this is that, unfortunately, not all PL-259/SO-239 connectors are made equally.

*e-mail: <ko0z@cq-amateur-radio.com>

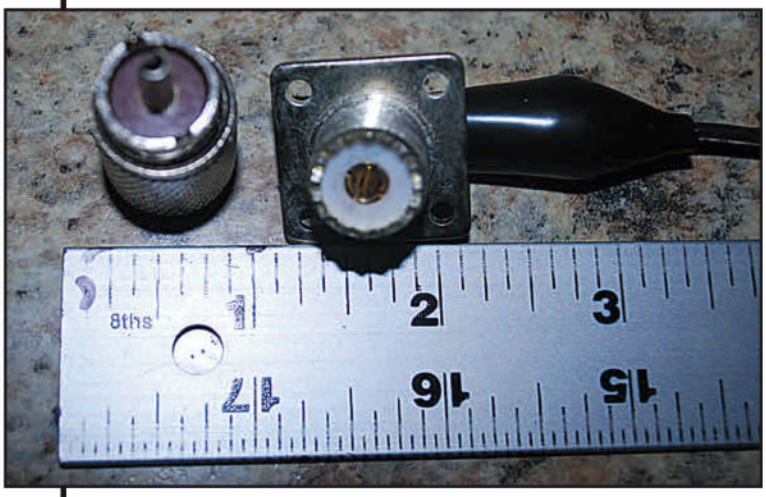

Photo A. UHF connectors, the PL-259 (male) is on the left and the SO-239 (female) is on the right. These connectors are found in most HF applications. Typically found on RG-8U coax. (All photos by KOØZ)

Photo B. A true Amphenol Teflon® PL-259 is on the left and an imitation Teflon connector is in the middle. The PL-259 on the right uses Bakelite as an insulator; these are great connectors, but increasingly difficult to find at hamfests.

The quality varies tremendously. Amphenol makes good connectors, but they cost around $5 each. Less expensive versions vary in quality. Some of the so-called Teflon® PL-259 connectors are not really made out of Teflon; rather, they are made from far less expensive polypropylene. This can be a problem because the polypropylene surrounding the PL-259's center pin does not handle heat well and it will melt very easily during soldering. Melted polypropylene will render the connector useless.

In *Photo B*, there are three PL-259s of varying quality. The left connector is a genuine Amphenol Teflon PL-259. The one next to it is one of the "Teflon look alike" connectors commonly found at hamfests and these need to be treated with care. The third connector has a Bakelite dielectric surrounding the center pin. They're good but are becoming harder to find at hamfests in favor of the less expensive, Teflon look-alike connectors.

PL-259s are popular with hams because they are robust, can handle a wide range of coaxial cable types, are inexpensive, and are relatively easy to install (*and because most commercial HF and VHF radios are built using SO-239 sockets - ed.*). Typically, PL-259 connectors are attached to RG-8U coax. For newcomers, installing a PL-259 may appear to be a bit confusing, but there are a number of good resources available to assist you. KØBG has a very good website that offers great explanations of what to look for in a good quality connector <http://www.k0bg.com/coax.html>. He also offers some very nice tips on how to solder connectors and is well worth your time to look it over. Another resource is from well-known DXer and contester Tim Duffy, K3LR, at <http://www.k3lr.com/engineering/pl259/>.

Reducers

RG-8U is the most commonly found coaxial cable in most ham installations. Smaller-diameter versions, such as RG-8X or RG-58, are also used

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Photo C. PL-259 reducers are used to connect smaller diameter coax to a PL-259. The UG-175 (left) is used for RG-58U and a UG-176 (on the right) is used for the slightly larger diameter RG-8X coax. One can never have too many of these on hand.

quite a bit. In order to use a PL-259 connector with these smaller diameter coaxial cables, a reducer is needed (*Photo C*).

A reducer mates the smaller diameter coax with a PL-259 connector by sliding over the smaller diameter coax and screwing into the PL-259 body. UG-175 reducers are used for RG-58 coax and the UG-176 is used for the slightly larger RG-8X coaxial cable. In *Photo C,* the reducer on the left is a UG-175 and next to it is a UG-176. Notice that the UG-176 has a bigger hole to accommodate the larger diameter RG-8X coax. One can never have too many reducers in the workbench parts box, so it's a good idea to keep them in stock along with PL-259s.

BNC Connectors

Before amateur radio manufacturers switched handhelds to SMA connectors (more on these later), the BNC (Bayonet Neill-Concelman) connector was the predominant connector (*Photo D*). The BNC is popular because it offers low loss and constant impedance up to 3 GHz, and it will tolerate voltages up to 500 VDC. *Photo D* shows the male BNC on the left and the female on the right.

This connector offers a bayonet twist-on connection for a secure, yet easy to get on and off connection. Originally designed by Paul Neill of Bell Labs and Carl Concelman of Amphenol Corporation, the BNC makes switching coax/antennas very easy and quick to accomplish, which is very handy while operating out in the field. Hence the BNC's popularity. This connector works well with 50- and 75-Ω impedance coaxial cable.

The N Connector

When I was still a young ham operator, mere mention of the N connector meant "serious" business. N connectors were mostly found only on serious, directional VHF (Very-High Frequency, 50-222 MHz), UHF (Ultra-High Frequency, 420-902 MHz) and SHF (Super-High Frequency 1200 MHz and higher) antennas. *Photo E* shows an outside, mast-mounted UHF pre-amp with two female N connectors. The center connector in *Photo E* is an SO-239 connector.

An N connector costs more than a PL-259 and installing one seems a lot more involved. Actually, in many ways, putting an N connector on coax is easier than working with a PL-259. Paul Neill of Bell Labs invented the N connector in the 1940s to work with 50- and 75-Ω feedlines. *Photo F* pictures a male N connector on the left and its female counterpart on the right. The major advantage of the N connector is that it provides constant impedance up to 11 GHz and has low insertion loss. Another major advantage of this connector is that it offers a waterproof connection.

A Brief Word on Waterproofing

Properly installed N connectors claim to be waterproof and be that as it may, I am a firm believer in Murphy's Law (Whatever can go wrong, will go wrong, in direct proportion to how badly you don't want it to go wrong), so I always use plenty of electrical tape and coax seal around all my outside coaxial connections. A little bit of extra "insurance" goes a long way. After all, Dr. Benjamin Franklin quipped, "An ounce of prevention is worth more than a pound of cure."

F Connectors

Perhaps the easiest connector to install, the F connector is used mostly with video applications. Occasionally, it can be found with some older ham rigs or accessories. The F male connector is pictured on the left and the female on the right in *Photo G*. This connector was invented by Eric Winston during the 1950s during the development of cable television. Typically, this connector is used with 75-Ω coax, such as RG-59.

RCA Connectors

As the connector's name implies (*Photo H*), Radio Corporation of America invented this connector in the 1940s for radio-phonograph applications. Commonly known as AV (Audio-Video) connectors or Phono connectors, the RCA connector passes AF (Audio Frequency) through HF (High Frequency) frequencies. Literature states that the RCA will handle up to 100 watts at HF frequencies. Some older Heathkit gear and some current QRP (low power) radios use these connectors.

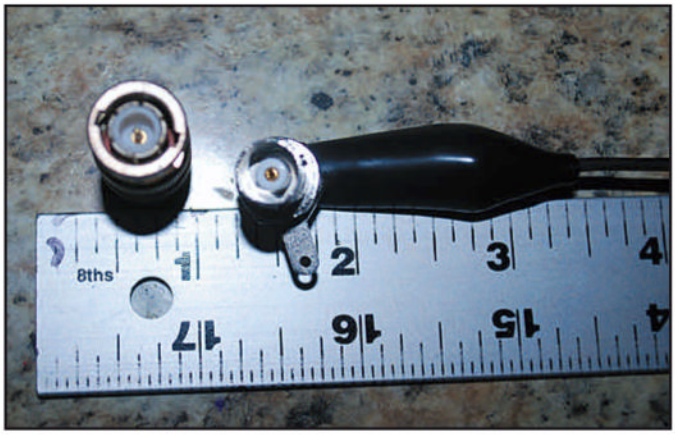

Photo D. BNC connectors: On the left is a male BNC and a chassis mount, female BNC is on the right.

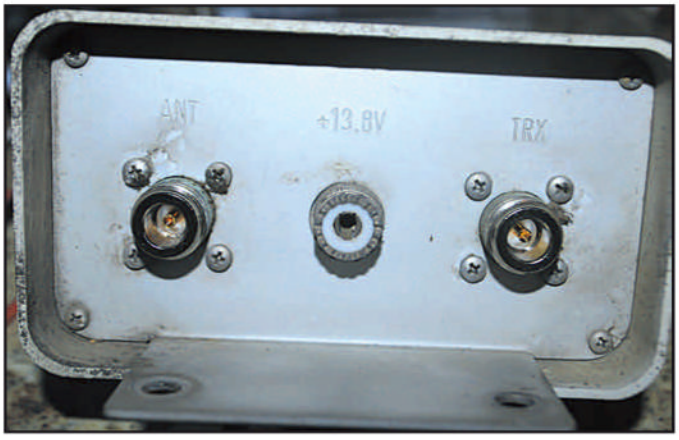

Photo E. A 432-MHz, mast-mounted single sideband pre-amp. Notice the antenna and the TRX (coax back to the transmitter) connectors are female N.

Photo F. For serious weak-signal UHF and above work, N connectors are used. On the left is a male N connector and on the right is a female, barrel N connector.

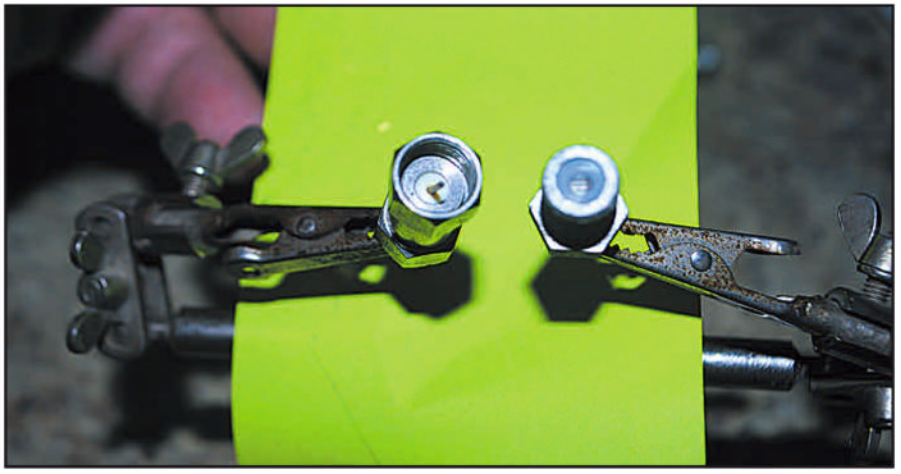

Photo G. F connectors are mostly used in video work, but they are occasionally found in ham radio applications. On the left is a male F connector with a slightly bent center pin and on the right is a female F.

Photo H. RCA connectors can be found on older ham radio equipment and some current QRP kits. Today they are mostly used for audio-visual applications. On the left is a male RCA connector and on the right is a female.

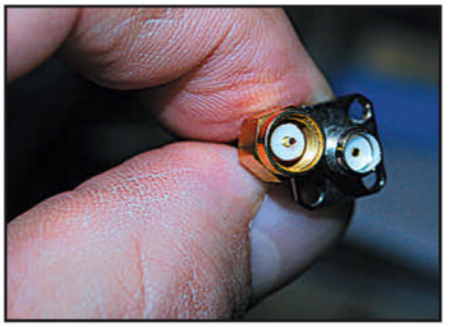

Photo I. SMA connectors are frequently found on ham radio HTs and on microwave equipment. The gold SMA on the left is a male connector and to its right is a female SMA.

RCA connectors are mostly used to connect audio cables from audio amps to speakers. They are also used to make composite video connections. A composite RCA connection consists of a wire bundle with three RCA connectors. The yellow RCA is used for video, the white RCA carries left channel audio and the red RCA is for right channel audio. *Photo H* shows a male RCA plug on the left and a female RCA jack on the right.

SMA Connectors

SMA stands for Sub Miniature type A (*Photo I*). This connector, for the most part, has replaced the BNC connector on amateur radio HTs. SMAs are rated from DC to 18 GHz and can handle a few hundred watts at microwave frequencies which is very impressive, when you think about the small surface area of the SMA.

Most amateur radio microwave components above 5 GHz employ SMA connectors. Southwest Microwave has a very useful chart indicating various RF connectors and their RF power capabilities at various microwave frequencies. *Photo I* contains a male SMA on the left and a female SMA on the right.

Adapters

The topic of adapters could, in itself, become an entire column. If you get into any serious antenna work, you'll soon discover that having a wide assortment of RF adapters in your parts box will go a long way to aid with antenna testing or connecting coax cables together during an event. A ham can never have too many or too varied RF adapters. However, let's save a lengthier description of adapters for next month's column. Thank you for reading *CQ* magazine and I hope to "see you" on the air!

– 73 and GL de Ron, KOØZ

magic in the sky

BY JEFF REINHARDT, AA6JR

It's Showtime!

California's Spanish mission town of San Juan Capistrano celebrates the return of the swallows every spring. Somehow these little birds have an accurate calendar or natural mechanism that tells them it's time to head for that historic Orange County enclave to the delight of tourists and innkeepers alike. If you're so inclined to visit, you don't have to wait 'til next March — that particular location is blessed with a delightful climate that's suitable for visiting just about anytime.

For us hams, spring is "showtime." From Orlando to Yuma, there are gatherings of geeks (and I use the term respectfully) that have us perusing catalogs, inspecting swap meet offerings, and searching for that next purchase that will bring each of us one step closer to ham radio nirvana.

And why not? As a species, we humans are unequalled at accumulating "stuff" because, in some form or another, it brings us a degree of happiness. There's decorative stuff, like art, glassware, figurines, or baubles; there's "collectible" stuff like stamps, coins, baseball cards, or certain antiques. And there's functional stuff like cars, bicycles, shop tools, and yes, radio gear. This latter group tends to take up a bit more space but I'll opine that most newer radio gear is pretty compact. And if you have an antenna collection that includes a few box quads and a Sterba Curtain or two, you're in another league, because if you gather those things, you've also collected a good chunk of real estate.

In any event, every spring I kind of take inventory of the radio stuff I have and think of some of the things I might like to acquire. Note that I didn't say "need," because I really don't "need" more gear. So I go through the "go kit" to see if everything still works, note which items are obsolete, worn out, or unreliable and create a shopping list of sorts. There's the "I can justify buying that" shopping list and then there's the intangible, "only in my head," shopping list of items that fall into the "hey, that's really cool, I think I'll buy it" group of impulse purchase items that varies with the amount of available disposable income.

Some of these purchases have been good, like my Timewave DSP-599zx purchased at Dayton many years ago. While I never updated the updateable firmware, it still provides great service. In the so-so list I have a mobile DSP box that I rated a four on a scale of 10; an overpriced custom HT holder for mobile use that's completely worthless since I no longer have the HT and a "stick" HF antenna mount that clamps onto a railing. While traveling, I used it twice with mediocre results, but it may not be the mount's fault so much as it was the operator's or perhaps the whimsy of the propagation gods.

But even with the occasional "klunk," buying stuff at shows and swap meets is an adventure and you don't always know what you're going to get. With used gear, that may be where your negotiating skills kick in but there's no substitute for seeing the item work … unless you have an unquenchable faith in mankind and older technology or perhaps excellent technical skills where it comes to repairs.

Accessorizing

When I think about ham radio conventions, conferences, or expos, I tend to think of the booths and displays put forth by the big manufacturers. At locations like Dayton and elsewhere, their presence includes factory reps who can answer questions and allow you to explore the features of the new hardware they have on display. So during last year's spring purchasing season, I bought a new HF+VHF+UHF transceiver for the field and I have to say I'm pretty impressed with the unit; it's done all I've asked it to do.

After the initial purchase, I added an LDG external auto tuner as an accessory and it has also performed well. Then, some programming software was purchased. I have to admit, I'm a sucker for accessories. Show me something that can reportedly take a good thing and make it better, and I'm interested. I blame this trait on having somehow acquired a J.C. Whitney car accessory catalog when I was about eight years old. I would flip through the pages and imagine a fully tricked-out J.C. Whitney car, most likely a slammed and chopped '49 Mercury with the fake tear drop spotlights drilled into its fenders to the stuffed cat with blinking eyes sitting on the rear parcel shelf and the blue dot tail lights impressing those eating your dust. Let's not forget the fender-mounted chrome horns that play a tune, hub cap spinners and wire curb feelers jutting from the right side fenders. Fortunately, I acquired some sense of taste before I reached purchasing age, but to this day, I still wonder two things. One: Who really bought that stuff? And two: Somewhere is there still a warehouse full of those items, just waiting to be shipped?

Fortunately, ham radio accessorizing tends to be a bit more practical and in many cases, dare I say functional? My Heil microphone was a step in the right direction of better transmitted audio, Bose noise-reducing headphones are a plus at a busy multi-station Field Day site (and on airplanes with crying babies), the MFJ electronic keyer attached to a Bencher paddle accelerated my interest in CW operations and the early Rigblaster unit I purchased is still delivering dutiful service when I choose to operate HF digital modes. The various battery rejuvenators I have purchased have delivered mixed results but I think that's more a function of the individual battery pack than the charging device. Having acquired many different HTs over the years, it's tough to keep batteries interested in performing when called upon. I guess they get bored.

At last year's ARRL Southwestern Division gathering in Torrance, California, there was an exhibitor displaying antennas that were also sculptures. I tried taking photos to share with you but they didn't

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come out so well. Nevertheless, they were interesting designs but I have no idea how they perform as antennas. But after 20-some years of attending swap meets and conventions, I have to say it is refreshing to see a new interpretation.

And let's not forget that there may be some "snake oil" out there. One of the better "products" I've seen was (hopefully a joke) offered to newbie operators — "SWR Reducing Spray" — an aerosol intended to be applied to your antenna that claimed to reduce standing waves and enhance the radiation of your signal. No, I didn't buy one.

But Wait, There's More …

From self-setting "atomic" clocks for the shack to devices that let you remotely control your shack from the convenience of your smart phone, "screwdriver" antennas for mobile rigs, antenna analyzers of all types that seem to be getting more sophisticated, weather stations, amplifiers that will help your signal bounce around the world or beyond, antenna rotators, aftermarket HT speaker-mic combos, replacement HT battery packs and components for assembling your own creation. Each booth or stall at a ham gathering has something to offer that's at least entertaining and at best, a useful addition to your collection of "stuff." The fun part of accessory shopping is that you can spend a little or a lot and still come away with something that adds to your enjoyment.

What's Your Club Up To?

I'm lucky to be affiliated with a very active club. There are monthly meetings that attract more than 50 attendees, special operating events like T-hunts, Winter Field Day, the regular June Field Day, social events like a holiday party, August picnic, licensing classes, VE sessions, and more.

Sadly, I've recently learned of a few longer-established clubs fading out of existence. One disbanded because no one wanted to run for any of the officer positions. Another long-established club stopped collecting dues because they had more money in the treasury than they knew what to do with; which is very sad when you think of the activities that could be funded, like radios that might be purchased for young hams or scholarships that could be awarded for students pursuing higher education in electronics or computer science.

Before any more clubs fade away, I hope the members have a serious discussion with one another about all the good things a club can do — from the items mentioned above to offering entertaining and engaging speakers, teaming up with scouting organizations, working with a school district to arrange a contact with the International Space Station … the opportunities seem endless. All it takes is a spark and a few people joining forces. Next thing you know, good things start to happen. Friendships can be made with disaster relief organizations; groups like Skywarn can always use additional communicators and partnerships with public safety agencies can result in new purpose and renewed energy.

Social media outlets offer new means to reach into the community. If your club has not become active in this area, it should be considered. Not only is it the key to updating your community on club activities, it's a way to communicate with a younger audience that's already computer-savvy. That's a ready-made readership your club can "mine" for new, active, tech-hungry recruits into our hobby.

With all that we have to offer, I have faith in the notion there are many thousands of young people waiting for the thrill of placing some Magic In The Sky.

ham radio news

(from page 3)

Milestones: Tropical Hamboree Co-Founder Evelyn Gauzens, W4WYR, SK

ARRL Honorary Vice President Evelyn Gauzens, W4WYR, became a Silent Key on January 31, just days before her 87th birthday. Best-known as co-founder of the Miami Tropical Hamboree hamfest and its chair for 45 years, Gauzens was also a longtime ARRL Southeastern Division Vice Director, and was active in a variety of other organizations, including the amateur radio group at the National Hurricane Center. Gauzens was inducted into the CQ Amateur Radio Hall of Fame in 2012.

ARRL, RFinder, Join Forces

The ARRL has formed a partnership with online repeater database RFinder in which RFinder will become the League's primary source of data for its annual *Repeater Directory* and subscriptions to RFinder will replace the ARRL's current "TravelPlus for Repeaters" software and online apps. According to the *ARRL Letter*, the ARRL will receive a portion of each $9.99 annual subscription to RFinder, The printed *Repeater Directory* will continue to be published.

Ham Radio in the Mainstream Media

Amateur radio was featured in a recent podcast by radio technology reporter Kim Komando. According to ARRL Media and Public Relations Director Sean Kutzko, KX9X, the 15-minute segment focused on the value of ham radio during emergencies. And the technology blog, *Hackaday*, recently featured a profile of Rufus Turner, W3LF (SK), said to be the first African-American radio amateur in the United States. The *ARRL Letter* says Turner helped develop the venerable 1N34A diode and wrote a 1949 article in *Radio-Electronics* magazine in which he explained how to build your own transistor before they were commercially available.

New Extra Class Question Pool Released

The Question Pool Committee of the National Conference of Volunteer Examiner Coordinators has released the updated question pool that will be used for Amateur Extra Class license exams between July 1, 2016 and June 30, 2020. Committee chair Rol Anders, K3RA, told the *ARRL Letter* that the new pool "place(s) more emphasis on digital communications, digital test equipment, software defined radios, and propagation/space weather." The new questions also cover some additional topics, including antenna types commonly used by amateurs. The new question pool may be downloaded from <http://www.ncvec.org/page.php?id=365>.

AMSAT's Fox-1E Likely to Get a Lift from NASA

NASA has accepted the Fox-1E cubesat — a joint effort between AMSAT and Vanderbilt University — to be part of its CubeSat Launch Initiative (CSLI) program. The satellite, also known as RadFxSat-2, will carry a radiation effects experiment developed by Vanderbilt as well as a 30-kHz-wide amateur radio linear transponder with an uplink on 2 meters and a downlink on 70 centimeters. This will be in place of the FM repeater carried by most amateur cubesats. The project received a #1 priority out of 20 accepted proposals and has been offered a launch date by NASA. This is the second collaboration between AMSAT and Vanderbilt. The first — RadFxSat/Fox-1B — is also part of NASA's CSLI program and is scheduled for launch next January.

BY DENNIS LAZAR,* W4DNN

Even QRP Fanatics Sometimes Cheat

I was on 20 meters and the band was hot. My FlexRadio 1500 panadapter screen revealed a huge pile-up at 14.025. It was an IOTA island that I really, really wanted to work. I grabbed for the key and jumped into the fray. "DE W4DNN QRP, QRP, QRP." That last string often can entice a DX station. Sort of like picking the right fishing lure to catch the big fish. If all goes right, the op will come back, "The QRP station, the QRP station only," and I snag the contact. But this time, it didn't work. Noise levels were high, the pile-up was huge, and after 10 tries, I still couldn't break through. It was time to cheat.

I rotated the antenna switch, putting my trusty Yaesu FT-100 online (*Photo A*). I tuned in the station and gave it a few more tries at 100 watts. Still no luck. The big guns were taking me out. All is fair in love, war and DX chasing. The 100-watt rig was feeding RF through a venerable Heathkit SB-200 linear amp (*Photo B*). Flipping another switch allowed me to try it again, this time at 600 watts. I nailed the contact! It's not the same thrill as QRP, but the end result was a QSL card from a rare one.

QRP success often depends more on band conditions and the operator at the other end of the circuit than on the actual power output of the transmitter. At times, during a QRP rag chew, I have asked a station to give me an S meter reading at 5, 100, and 600 watts. The results often are amazing. Given a quiet band, the difference in intelligibility of the contact is usually negligible. In actual radio communication it's not really the S meter reading that counts.

Success Often is on the Receiving End

I like to point out, with gratitude, that a QRP contact is more likely to be successful due not so much to the transmitting station's signal but to the receiving station's equipment and operator. Sometimes this can be due to an operator's persistence, good hearing, mental processing, or motivation to make the contact. Other times it depends on the receiving station's noise level, antenna, and receiver.

Not long ago, I was trying to work stations in the South Carolina QSO Party. I needed a SC station confirmed on LOTW to complete my LOTW WAS. Running 5 watts out to a ground mounted vertical, I was gratified to get immediate comebacks from higher power stations who were nearly buried in my noise floor. How is this possible?

My noise level on 40 meters (especially during frequent summer lightning storms in the southern states) is often above S8. It would take close to an S9 signal to get through. But if the receiving station, at higher elevation with a low noise antenna and environment, had an ambient QRN of 2, my QRP signal would be very easy copy. Sometimes band conditions also are exceptional in one direction. I gave a station running high power a report of S7 and was amazed to get a report of S7 in return … with only two watts.

S Meter Secrets

S meters (*Photo C*) are not all that accurate, the best being those of SDR radios because they determine S meter readings by direct measurement of RF signal amplitude. Most S meters, however, are part of the AGC (automatic gain control) circuit and there is little correlation between S units and actual dBs.

Photo A. Stepping up from the 5-watt Flex to the 100-watt Yaesu can often bag the DX.

* <w4dnn@cq-amateur-radio.com>

But even with the best receiver, the S meter is measuring the strength of the signal at the 50-ohm input of the receiver, not at the antenna. Losses between antenna and receiver go unseen. Still, it gives the operator a good idea of relative signal strengths. The IARU standards specify that one S unit corresponds to a difference of 6 decibels (dB) or a four times increase in power.

In a very informative online post by Don, KB9UMT, in the Copper Electronics forum, he provides the formulas for calculating dB. He also compares many combinations of S meter signal strength for various SSB transmitting systems at low takeoff angles on 14 MHz. His data show that if you double your transmitted power, you will get a 3-dB increase in signal strength at the receiver. A 4X-power increase will result in a 6-dB increase and 20X equals an increase of 13 dB. Increasing transmitter output power from 5 watts to 100 watts gives you only a 14-dB increase in received signal strength or just over two S units.

The Antenna Makes the Difference

Don shows that, over a typical communication signal path, 100 watts radiated by a triband beam, which yields effective radiated power (ERP) of 400 watts, will result in an S7 at the receiving end. Five watts with a high dipole will yield 5 watts ERP and arrive as an S2 at the receiver. Five watts with a backpack whip will result in an ERP of only one watt and an S1 signal at the receiver. A loaded backpack whip is considered to be a 6-dB loss as compared to a high dipole. "If given the choice between higher power and a better (higher gain) antenna, I'd go with the better antenna every time," says Don. "Added antenna gain increases not only the transmit side of the equation but also the receive."

Power and antenna gain are important considerations, but probably more so are band conditions, location, operator skills, and, of course, the receiving operator's motivation to pull that weak QRP signal out of the noise.

How QRP Gear and "The Code" Helped Bring Victory in WWII

As readers of my past columns know, XYL Ruthie, K4KLQ, and I often travel the back roads of America as avid RVers. Wherever the journey leads, our eyes are always open for ham radio events, stations, fests, and bargains. So a highlight of our recent trip across the

Photo B. When necessary, major QRO with Heathkit SB-200 can make the difference.

Photo C. S-meters are usually part of the AGC circuit and not all that accurate.

Southwest was the discovery, in Gallup, New Mexico, of a giant mural and a small museum depicting the QRP rigs and their heroic operators who helped to win World War II in the Pacific[1].

It was not long after the December 7, 1941 attack on Pearl Harbor by the forces of the Empire of Japan, "a day that will live in infamy," that our communication codes were broken. As war spread across the Pacific, Japanese intelligence experts were able to decipher every code the U.S. used to communicate combat messages. The Japanese knew the time, place, and direction that the American attack forces would be deployed.

Early in the war, in England, at a place called Bletchley Park, cryptographers were hard at work, desperately trying to decipher the coded messages sent by the Nazis using their ingenious "Enigma" machines. The U.S. had little experience in cryptography as it was drawn into war both in the Atlantic and Pacific theaters. Our soldiers and sailors suffered for it. But one man, Philip Johnson, had an idea.

The son of a missionary to the Navajo Indian Nation, Johnson was one of the few non-Navajos who spoke their language fluently. A World War I veteran, he knew of the military's search for a code that would withstand all attempts to decipher it. He also knew that Native American languages, notably Choctaw, had been used in that war to encode messages.

Johnston believed the Navajo language answered the military requirement for an undecipherable code because it is an unwritten language of extreme complexity. Its syntax and tonal qualities, not to mention dialects, make it unintelligible to anyone without extensive exposure and training. It has

Photo D. In addition to a rifle, ammo, water, and rations, Code Talkers packed the TBY-2, vibrator power supply, batteries, generator, and accessories. (Code Talker photos courtesy of <www.navy-radio.com> and <vrhistory.com>; used by permission.)

no alphabet or symbols, and is spoken only on the Navajo lands of the American Southwest. One estimate indicates that fewer than 30 non-Navajos, none of them Japanese, could understand the language at the outbreak of World War II.

Early in 1942, Johnston met with Major General Clayton B. Vogel, the commanding general of Amphibious Corps, Pacific Fleet, and his staff to convince them of the Navajo language's value as code. Johnston staged tests under simulated combat conditions, demonstrating that Navajos could encode, transmit, and decode a three-line English message in 20 seconds. Machines of the time required 30 minutes to perform the same job. Convinced, Vogel recommended to the Commandant of the Marine Corps that the Marines recruit 200 Navajos.

The Navajo Code Talkers (Wind Talkers) are Deployed

In May 1942, the first 29 Navajo recruits attended boot camp. Then, at Camp Pendleton, Oceanside, California, this first group created the Navajo code. They developed a dictionary and numerous words for military terms. The dictionary and all code words had to be memorized during training.

Once a Navajo code talker completed his training, he was sent to a Marine unit deployed in the Pacific theater. A code talker's primary job was to transmit information on tactics and troop movements, orders, and other vital battlefield communications over telephones and radios. They also acted as messengers and performed general Marine duties.

Praise for their skill, speed, and accuracy accrued throughout the war. At Iwo Jima, Major Howard Connor, 5th Marine Division signal officer, declared, "were it not for the Navajos, the Marines would never have taken Iwo Jima." Connor had six Navajo code talkers working around the clock during the first two days of the battle. Those six sent and received over 800 messages, all without error.

The Japanese, who were skilled code breakers, remained baffled by the Navajo language. The Japanese chief of intelligence, Lieutenant General Seizo Arisue, said that while they were able to decipher the codes used by the U.S. Army and Army Air Corps, they never cracked the code used by the

The Japanese, who were skilled code breakers, remained baffled by the Navajo language.

Photo E. The TBY-2 and later TBY-8 had a tuning chart and key mounted to the top, although most code talking was phone.

Photo F. Code Talkers operated their equipment despite the humidity of the jungles of the South Pacific.

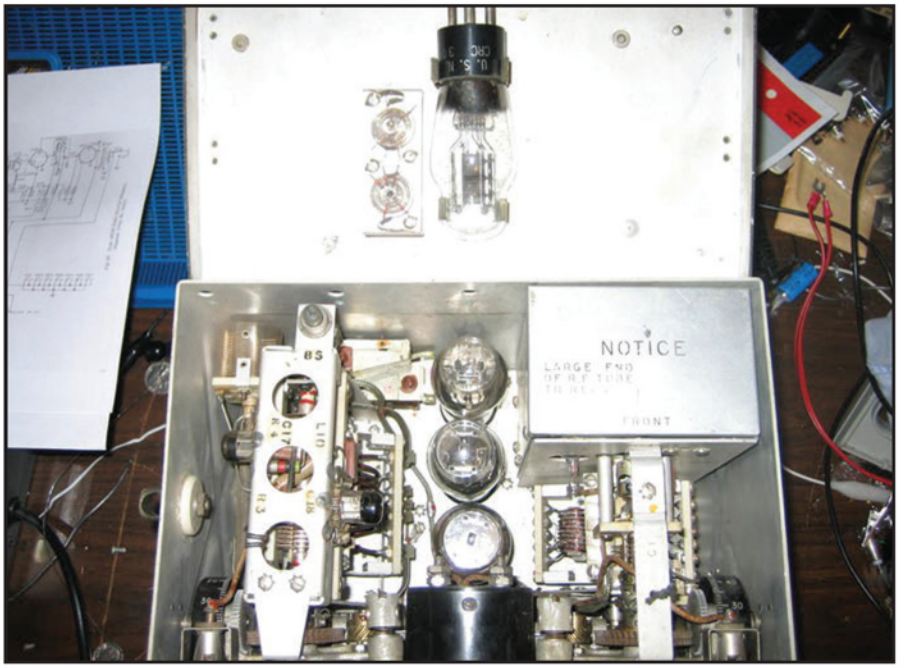

Photo G. Although water resistant, this rig did not fare well in the jungle environment.

Marines. The Navajo code talkers even stymied a Navajo soldier taken prisoner at Bataan (About 20 Navajos served in the U.S. Army in the Philippines). That soldier, forced to listen to the jumbled words of talker transmissions, said to a code talker after the war, "I never figured out what you guys who got me into all that trouble were saying."

Long unrecognized because of the continued value of their language as a security classified code, the Navajo code talkers of World War II were not honored for their contributions to defense until Sept. 17, 1992, at the Pentagon in Washington, D.C.

The Navajo Code Talker's Dictionary

When a Navajo code talker received a message, what he heard was a string of seemingly unrelated Navajo words. The code talker first had to translate each Navajo word into its English equivalent. Then he used only the first letter of the English equivalent in spelling an English word.

Thus, the Navajo words "wol-la-chee" (ant), "be-la-sana" (apple) and "tse-nill" (axe) all stood for the letter "a." One way to say the word "Navy" in Navajo code would be "tsah (needle) wol-la-chee (ant) ah-keh-di- glini (victor) tsah-ah-dzoh (yucca)."

Most letters had more than one Navajo word representing them. Not all words had to be spelled out letter by letter. The developers of the original code assigned Navajo words to represent about 450 frequently used military terms that did not exist in the Navajo language. Several examples: "besh- lo" (iron fish) meant "submarine," "dah-he-tih-hi" (hummingbird) meant "fighter plane" and "debeh-li-zine" (black street) meant "squad."

The 1/2-Watt Radios that Made it Possible

While nothing can surpass the skills and courage of the Navajo themselves, the radio they used, the TBY-2 (first manufactured in 1941), and later the TBY-8, provided the code talkers the ability to operate right on the front lines.

Described in the Westinghouse Electric manual as "Ultra High Frequency Transmitting-Receiving Equipment, it was described by its later manufacturer, Colonial Radio Corporation, as "Ultra Portable." With three men needed to handle the radio, batteries or man-powered generator, antenna, and accessories (*Photo D*), that designation is a stretch.

The radio covered 28 to 80 MHz in four bands with an output of one-half watt on CW and AM. The transmitter is a modulated oscillator matched up with a regenerative receiver. In the top cover was a frequency calibration book and a telegraph key (for MCW) and the transmit switch (*Photo E*). While the transmitter's stability was not great, the receiver was wide enough not to mind.

The TBY ran on +1.5, +3, -7.5, and

The Code Talkers were among 44,000 Native Americans who wore the uniform in World War II.

+150 Volts DC and was powered by batteries with a vibrator power supply or a hand-operated generator power supply. The front panel meter was switched to measure filament voltage, which could be adjusted to compensate for dying batteries.

Many of us old timers out there will recognize the tube lineup which consisted of a type 30 triode transmit oscillator and receive audio preamp, a type 1E7G dual pentode transmit modulator and receiver audio output, two type 158A acorn triodes as a push-pull modulated Hartley oscillator in the transmitter. A 959 acorn pentode was the receive RF preamp and another 958A acorn triode was the super-regenerative detector. Last was another type 30 triode, which was the 5-MHz crystal oscillator for receiver calibration.

To facilitate carrying this "compact" rig through jungle mud and undergrowth (*Photo F*), the radio was packed into a canvas backpack which, although "splash proof," was not up to protecting the rig from Pacific island humidity and swamp exposure (*Photo G*). It was up to the operators to protect and maintain their gear as best they could[2].

Not a Walk in the Park

The story of the young Navajos who served throughout the Pacific Theater would not be complete without emphasizing their sacrifices. Some were very young, like Albert Smith, who joined the Marines at age 15. At least one Code Talker was over-age. On active duty, their value was so great that and their mission so sensitive, that they were closely guarded. By war's end, some 400 Navajos had served as Code Talkers. Thirteen were killed in action.

Late in his life, Albert Smith explained, "The word for America was, 'Our Mother.' Our Mother stood for freedom, our religion, our way of life, and that's why we went to war." The Code Talkers were among 44,000 Native Americans who wore the uniform in World War II.

And Now For My Final

I close this month's column with a little humor and a reminder. If you have an interesting or unique QRP story to tell, please email it to me. I'll be happy to get it into a future issue.

Three hams met in line before a ham-fest ticket booth.

The first ham asked, "Hey, How's it going?"

The second ham whispered, "Sorry, I can't speak loudly, I've got laryngitis."

"What?" asked the first ham.

"I've got laryngitis," the second ham whispered.

"I can't hear you, speak up man!!!"

The third ham stepped in, "You've got to listen harder, OM, the guy's running QRP!"

Remember ... The QRP kilowatt is located between the receiving ham's ears.

Real hams wear headphones.

Notes:

1. Portions of this column are from a history prepared by the Navy & Marine Corps WWII Commemorative Committee, published by the Naval History and Heritage Command.
2. Some information from Dave Ross, N7EPI, <www.hypertools.com/#tby>. Also from N6CC, Navy 6 Combat Coms, <www.N6CC.com>.

My First QRP Rig

BY BARRY FLUXE, W4LSV

My first QRP story occurred back in 1980 when I was WB8LSV. The sunspot cycle was up. Sears was selling off its CB radios at reduced prices. I bought a Sears Road Talker 40 sideband transceiver (see photo) and converted it to 10 meters. By adding a Variac diode (I think) to the RIT circuit and a DPDT switch, I was able to tune most of the 10-meter band.

I bought a cheap magnetic mount CB antenna and chopped off a few inches and put it on the roof of my Ford pickup. Not a quality high-tech installation by any means. Every day during my 30-minute drive to work at a power plant in Shippingport, Pennsylvania, I would listen on 10 meters. I would make a few CQs and maybe work a couple of stations.

One day in September 1980, I heard W6RO, the ham station on the Queen Mary in Long Beach, California, calling CQ. I thought my chances of getting a reply were slim to none as I was driving along the Ohio River with hills on both sides of me. I answered them anyway and was shocked when I got an S5 report for my 5-watt mobile signal. The operator on the other end was more excited than I was when I told him what equipment I was running. I could hear him telling all the others in the radio room about my setup. The "foot long" W6RO QSL card I received is still one of my prized possessions. Isn't QRP great?

The Sears Road Talker 4, along with RadioShack and Midland CBs, were often converted to 10 meters. (Courtesy www.cbmuseum.net)

"Look! Up in the Sky!"

BY TOM SMERK,* AA6TS

This month we look at a variety of ham radio activities and accomplishments, ranging from contacts from North Korea for the first time in 13 years to a successful maker fair in Germany. But first, we take to the air up in the air (or above it) with an exciting story about a "first" for Nepal — their first ever amateur radio contact between students and the International Space Station.

Nepal Students Enjoy First ARISS Contact

ARISS — the Amateur Radio on the International Space Station program — is making it possible for students all around the world to speak over amateur radio to crewmembers aboard the International Space Station. On January 20, Nepal enjoyed that country's first ARISS contact, when students attending Brihaspati Vidhyasadan School (BVS) in Kathmandu spoke via ham radio with ISS crew member and U.K. Astronaut Tim Peake, KG5BVI. Astronaut Peake answered 17 questions from the students.

Through a program known as the Principia Mission, Peake is devoting part of his scheduled time in space to educational activities for youngsters on Earth.

In preparation for the ARISS contact, the school organized a week-long program and exhibition related to space travel and technology, including support from the Nepal Amateur Radio Operators' Society. Hams from Nepal and India had used a building at the school to provide emergency communications assistance during the recent Nepal earthquake.

Three-hundred people including the British Ambassador to Nepal, the Cultural Affairs Officer from the U.S. Embassy, a member of the National Human Rights Commission, and a former Minister for Science and Technology, were on-hand to witness the event. You can see the contact video on <https://youtu.be/Asaa1xb6fGo>.

[ARISS, Principia Mission and the Amateur Radio Newsline]

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A crowd of about 300 people were on hand for Nepal's first-ever ham radio contact with the International Space Station. (Courtesy of Pravin Raj Joshi)

The participants in the ARISS contact pose for a photo. (Courtesy of Pravin Raj Joshi)

While we are looking skyward, if you like to track balloons carrying amateur radio payloads, here's the latest …

Australia Amateur Radio Balloon Experiments

A tiny (pico) balloon named "PS-58" was launched on December 29 from Melbourne, Australia and at last report had passed between Cuba and Haiti. The balloon carried a tiny 30-meter-band amateur radio transmitter emitting a signal on WSPR JT9, allowing hams such as Ken, ZS6KN, in Pretoria, South Africa; Jim, W8AC, in Ohio; and John, AT4AT, of Virginia, to track its progress.

A second balloon launch by The Southern Hemisphere Space Studies Program in conjunction with the Amateur Radio Experimenters Group (AREG) was scheduled for January 26, 2016, which was the date for "Australia Day" in that country. The ham transmitter broadcast on 434.450 MHz using 100-bps RTTY (7N2) under the AX5ARG-1 callsign. This callsign is significant because the AX prefix is something that Australian amateurs may only use for Australia Day. The AREG is offering a special QSL card to confirm reception of the balloon telemetry.

[picospace.net and AREG]

Here was an unusual opportunity to log a contact with North Korea, a country that has been silent on the ham bands for 13 years. I hope you were one of the lucky ones who heard Dom calling CQ! He'll be back later this year — read on …

A Surprise from North Korea

After 13 years of ham radio silence, Polish amateur radio operator Dom Gryzb, 3Z9DX, made the first of what was to become a few hundred QSOs from North Korea on December 20 and 21, 2015.

Dom had been meeting with North Korean officials, working out details to operate from the country in January and February of 2016. Dom informs that the project has been postponed to the end of the summer in 2016.

Constantly surrounded by government officials, Dom worked about 780 stations as a demonstration of what they can expect from the planned late-summer DXpedition. His operation was totally unexpected by hams.

Operating as P5/3Z9DX, Dom worked 20 meters and 15 meters SSB in spite of a noise level of 59+10 on 15 meters and 59+30 on 20 meters, mostly due to geomagnetic storms.

Photos from Dom's trip can be found at his website at <http://k38dom0.wix.com/3z9dx>.

[DX-World.net and various news sources]

You may have read about NIAR in this column before. It appears they are still very busy promoting amateur radio in India.

NIAR Promotes Ham Radio in India

The National Institute of Amateur Radio in India (NIAR) has been busy promoting amateur radio to communities there.

Last December at the Applied Electromagnetics Conference in Assam, India, NIAR's Executive Vice Chairman and Director, S. Ram Mohan, VU2MYH, led a panel discussion on establishing communications during major disasters that knock out conventional communications. VU2MYH later joined Jose Jacob, VU2JOS, at the Indian Institute of Technology to demonstrate ham radio to students and staff of the school, as well as delegates from throughout India.

These demonstrations were followed by an amateur radio awareness program for law enforcement officials at the Assam Police Radio Organization Training School in Guwahai, Assam, where NIAR hams demonstrated HF as well as Pactor communications. Operators and technicians who work for the police department are to receive amateur radio training, including Morse Code.

[Amateur Radio Newsline]

Here is a continuation of a story we started last month about a team of hams visiting India's disaster-stricken state of Bengal. This month, the team makes recommendations to increase ham radio capability.

Disaster Team Recommends Establishing Amateur Radio Communications

After an earthquake measuring 4.5 on the Richter scale hit the heavily populated city of Kolkata in India's Bengal state, disaster experts became concerned that the city doesn't have an integrated ham radio network that can be used for communication when landlines and cellular networks fail.

Ambarish Nag Biswas, secretary of the West Bengal Radio Club said: "It is difficult to conduct rescue operations without a proper ham radio infrastructure. Each block should have such a network to locate people in distress."

A National Disaster Management Authority team visited the city in November to take stock of the city's disaster preparedness and recommended setting up such a network.

This area was also ravaged by cyclone Aila in May 2009.

[The Times of India]

Records on the microwave bands continue to be set and broken …

134 GHz record broken in U.K.

A CW contact of 35.6 kilometers (a little over 22 miles) on the 134-GHz band between Chute Causeway near Andover and Cheesefoot Head near Winchester bests the previous U.K. record of 19.2 kilometers set by G8KQW and G8ACE on September 20, 2015.

Ian Lamb, G8KQW, and John Hazell, G8ACE, are claiming this new record for CW on 134 GHz utilizing a line-of-sight path.

[Amateur Radio Newsline and Southgate Amateur Radio News]

A club in the U.K. is holding an interesting event that runs all year …

U.K. Club Hosts a Year of "British Scientists" Special Events

During 2016, the Phoenix (U.K.) Amateur Radio Club will be on air at various times to commemorate the work of over 40 British scientists throughout history. These many events, which will occur roughly at two-week intervals, will be of short duration, usually on a date connected with each person.

The special events began on January 8, marking the birthday of Stephen Hawking, and will end December 25 with a celebration of Sir Isaac Newton.

Three classes of awards are available: Bronze (5 contacts), Silver (10 contacts), and Gold (15 contacts).

As each commemoration approaches, PARC will publish information on its website at <https://sites.google.com/site/phoenixaradiouk/home> and on the MØPHX and YHARG Twitter pages.

[PARC]

The 3rd edition of a popular maker fair in Germany was held in January.

Munich Maker Fair

On January 16-17, more than 7,500 people attended a two-day hobbyist fair known as "Make Munich." The event attracted people who like to tinker with things and use their hands to build and create new technology. The Deutscher Amateur Radio Club (DARC) was present, representing amateur radio. In the early days of ham radio, hams created their own equipment out of necessity. This concept is enjoying a resurgence worldwide and the Munich maker fair was proof that it is fun to "DIY!"

Make Munich, which began in 2013, is southern Germany's biggest Maker and DIY Festival.

[Amateur Radio Newsline and Make-Munich]

In Closing ...

I am excited as I write this because my favorite local hamfest will be happening in just two weeks. I always enjoy going to the ARRL Southwest Division Convention in Yuma, Arizona every February.

I'd like to hear more about hamfests and other events in your country, as well as any other amateur radio news. I would also like to hear your thoughts and comments about the column and your suggestions on how we can contact more countries to share their ham radio news and happenings. Please email me at <aa6ts@cq-amateur-radio.com> and keep us up to date so we can share your excitement with the rest of the world! – *73 de AA6TS*

BY TONY EMANUELE,* WA8RJF

What's In Your Toolbox?

Internet Chat Pages For Weak-Signal Ops

VHF Plus Calendar

Microwave Activity Day (MAD)	Saturday April 2nd 7 a.m. to 2 p.m. local.
144 MHz Spring Sprint	Monday April 11th 7 - 11 p.m. local.
222 MHz Spring Sprint	Tuesday April 19th 7 - 11 p.m. local.
2016 VHF Super Conference Sterling, VA	April 15th to 17th <http://vhfsuperconference.com>
DUBUS EME Contest 3.4 GHz	April 16th & 17th.
Lyrids Meteor Shower	April 22nd & 23rd.
432 MHz Spring Sprint	Wednesday April 27th 7 - 11 p.m. local.
Microwave Sprint (902 MHz and up)	Saturday May 7th 8 a.m. - 2 p.m. local.
50 MHz Sprint	Saturday May 14th 2300Z until 0300Z Sunday May 15th.
Dayton Hamvention™ VHF+ Forum	Saturday May 21st.

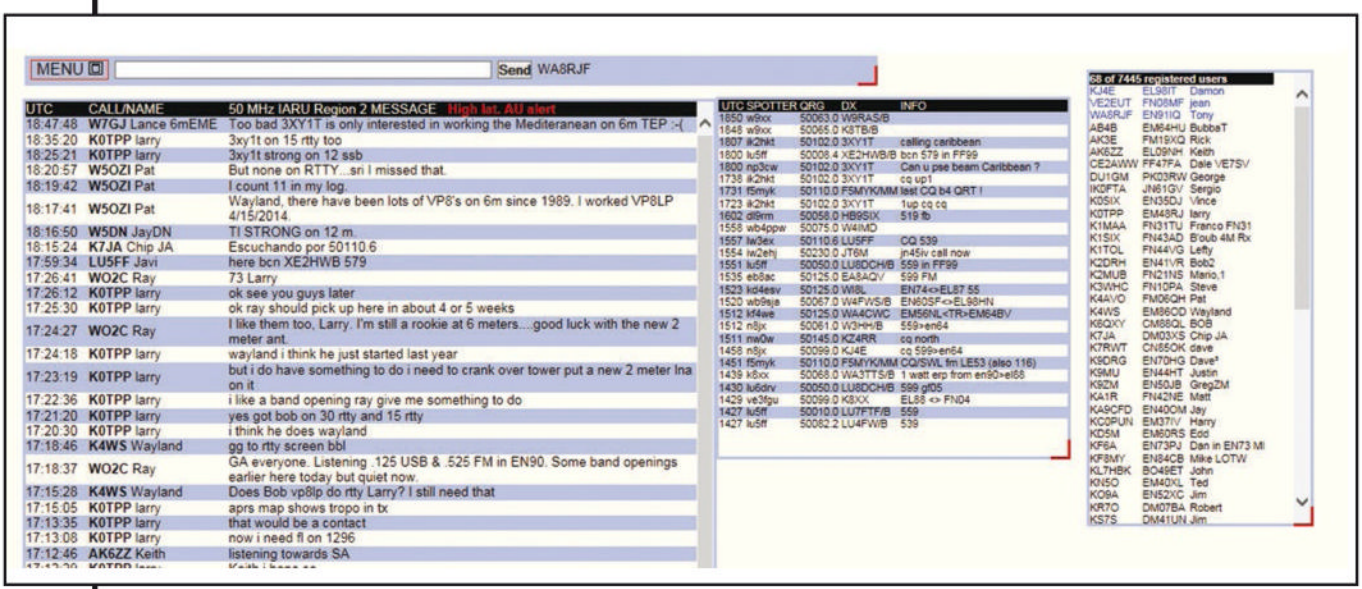
The Internet has made available a vast number of tools for just about every aspect of amateur radio, including those of interest to the weak signal VHF/UHF/microwave operator. This month's column will explore one of the more popular tools/websites, the ON4SKT chat pages.

How to Coordinate Activity

Unlike HF operation where one can simply find a clear frequency and call CQ or tune the band looking for someone else calling CQ, the nature of VHF/UHF/microwave operation is such that unless the band is open, the odds of working a DX station can be rather low. Of course that has never deterred the VHF operator. Using a schedule is a time-tested method to overcome that obstacle. Two stations simply agree on a time and frequency and give it a go. Prior to the Internet, schedules for such things as meteor showers or EME (Earth-Moon-Earth) were made by telephone, VHF newsletters, VHF nets, and even via the mail. Of course that has all changed as the Internet makes real-time scheduling possible.

Another challenge that presents itself to those interested in working the higher bands is how to let the other station know to QSY to a new band, usually up in frequency. In general, the higher the frequency, the more difficult the contact becomes. Typically, stations move from 2 meters to 222 MHz or 432 MHz without too much difficulty, but at 432 MHz and above, the coordination can be a bit dicey. The communications path may be tenuous at best, and trying to convey the next higher operating frequency to your QSO partner on the liaison frequency in marginal conditions can be problematic. "Was that QSY to 432.110 or was that 432.120

c/o CQ magazine
e-mail: <wa8rjf@cq-amateur-radio.com>



This screenshot provides an example of what you can expect to see on the ON4KST chat pages.

MHz?" The Internet can eliminate that uncertainty.

To facilitate schedules and promote activity, a number of Internet chat pages have been developed. For general VHF+ QSO scheduling and coordination the ON4KST chat pages are probably the most popular. Alain Stievenart, ON4KST, notes that he started a 50 MHz chat page in June 2001 as a service to the amateur radio community. Today he boasts over 15,000 registered users. The service is free and is without advertisements, cookies, or nefarious software sometimes found on other chat pages or websites. Based on its success and requests from many amateurs worldwide, the chat pages were expanded to include Low Band, 50/70 MHz, 144/432 MHz, microwave, and EME chat pages. See <http://www.on4kst.com/chat/start.php>.

Using the ON4KST chat pages could not be easier. Users must first register, but the process is simple, requiring an email address, callsign, grid locator plus a few other details, and choosing a password.

Once registered, select the band of interest for your particular IARU region. IARU region 2 is North and South America. In North America, the two most used pages are the 50- and the 144- & 432-MHz chat pages. Even though there is a separate microwave chat page, the 144- & 432-MHz chat page is where microwave coordination takes place in the U.S. & Canada.

The chat page in its simplest form includes the chat section, a link to Gabriel Sampol, EA6VQ's, very popular DX Maps website <http://www.dxmaps.com/spots/map.php> so that the recent Internet QSO posts are displayed and a section that lists all the current users. The users section is helpful as it includes the callsigns, names, and six character grid square for each station listed. Clicking on a station listed in that section will result in the beam headings and the distance between you and the selected station being displayed as a posting to the text area.

A nice feature of all the ON4KST chat pages is the ability to format the page to your particular needs or interests. The menu tab can be used to change settings, set up alarms, include ionospheric data, and the solar indices, to name just a few. *Figure 1* is a screen shot of the 50 MHz ON4KST chat page with a minimum of options selected.

To broadcast/send a message to all users currently logged onto the page, simply enter the text and click send. During contest or band opening, there can be considerable traffic on the page. If you happen to be focusing on a QSO or band opening and turned away from the computer, a message intended for you may scroll off the screen before catching your eye. The ON4KST pages includes a feature that permits the sender of a message to attract the attention of the intended recipient. If the message entered is preceded by the callsign of the target station in parenthesis, an audio tone called a "meep" will be sent to attract the attention of the specified station. Additionally the line of text will be highlighted in a different color to also attract the other station's attention. Example: *(WA8SRA) Dale meet me on 902.100 CW. You call me.*

Chat Page Etiquette

All public forums are better served if the users abide by a level of etiquette appropriate for the forum. No need to discuss the obvious and my experience has been that the users of the chat pages frequented by the VHF+ community conduct themselves in an appropriate fashion. However, when discussing coordination of QSOs on any chat pages, it is necessary to review the rules of what information can be exchanged during a QSO attempt.

A valid QSO on VHF and on higher bands requires that both stations mutually identify each other with callsigns, exchange a report and receive confirmation that the report has been received by the QSO partner[1]. The report is typically the grid square but can be a signal report or any other mutually agreed upon piece of information. Nothing new here.

A QSO's validity can be questioned if any part of the information exchanged is divulged on the chat page prior to completion of the QSO. Examples of chat page posts or exchanges that invalidate a QSO include: "I am hearing you. Please send your grid." or "Got your grid but did not receive your rogers." An example of a permissible exchange during the QSO attempt is: "Let's start 1 minute sequencing — you even minute." When in doubt, don't post a message or, if you feel you must post a message that may question the integrity of the QSO, then reset and start the QSO attempt from the beginning.

– CU on the Bands, 73 Tony

Notes

1. The definition of a HF QSO at times seems to be a bit less rigorous in my opinion.

BY TED MELINOSKY,* K1BV

Alaska's Judicial Districts and Awards of the CQCW.RU Club

Alaska — Why does the USA-CA program use Judicial Districts instead of counties? This subject is raised from time to time, the latest coming from Ernie, VK3FM.

The USA-CA was developed in the early 1960s, not too long after the Territory of Alaska was granted statehood. The Alaska Statehood Act was signed by President Dwight D. Eisenhower on July 7, 1958, allowing Alaska to become the 49th U.S. state on January 3, 1959.

As a territory, Alaska never had counties. The closest administrative governmental unit was the Judicial District, the land area which defined the territory over which federal judges had jurisdiction. There were four of them. As time went by, boroughs (not counties) were established in 16 of the more populated areas of the state. Very large parts of the state were left as "unorganized boroughs" which were collectively governed by the state capital.

The originator of the USA-CA program, Clif Evans, K6BX, probably made the decision to use the Judicial Districts in lieu of counties. I suspect he did this because the award would have been rendered almost impossible to complete if boroughs and unorganized boroughs were required. Why? Even today, some of the unorganized boroughs have a population density of just under 0.5 persons per square mile.

I have several times asked that an Alaskan club issue an award for contacting Alaskan boroughs. No luck so far. This website provides an excellent quality but large (4MB PDF download) Alaskan map showing Judicial Districts <http://www.courts.alaska.gov/rules/venuemap.pdf>.

The Award Program of the CQCW.RU Club

This club is not a traditional type with monthly meetings and a wide spread of interests. There are no meetings and everyone who joins has a love of CW. The president, R6CN, lives in Russia; the "Graphics Guy" lives in Canada; the "Idea Guy" lives in Ukraine, the "Translator" lives in Norway and the "Tech Companion" hails from the Netherlands. The job titles are unique, and correct.

There are 410 members on their rolls, five from the U.S. The website is written in Russian and English, so you should have no problem with navigation. Actually, you will have a small problem, but that is caused by the presence of 114 awards, in a number of interesting categories, all in full color, all available for **free** as digital downloads, with some very interesting categories. The only time money is requested is if you have a commercial interest, and want to use their blog to advertise a product.

I am showing five of the awards, which is just scratching the surface. And while writing this article, I note on their home page, that they've just added two more awards.

Russia CQCW Club

General Requirements: Rules of the awards are the same for stations located all over the world. For

Part of the Great Inventors Series of Awards offered by the CQCW.RU Club is this award featuring Nikola Tesla. To earn it, spell T E S L A using callsign suffixes and rack up points.

USA-CA Honor Roll

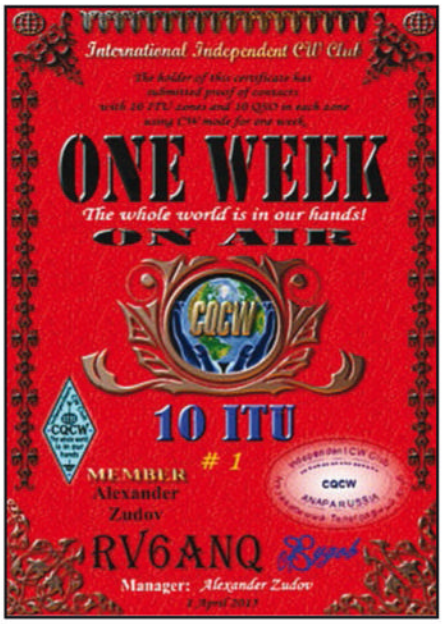
500
JA1WWO 3693

1500
W7OLY.....1569

1000
W7OLY.....1876

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.

*12 Wells Woods Rd., Columbia, CT 06237
e-mail: <k1bv@charter.net>



Spend one week on the air contacting 10 stations in 10 ITU Zones and this certificate is yours.

SWL, the rules are the same as for licensed amateur stations. Each award is available for one or any band, and each award has its own specific conditions. Repeated QSOs on different bands will count for different QSOs to meet the award requirements. (for MIX and WARC). Contest QSOs OK.

All contacts must be made in the CW mode. Review the rules to determine the starting date and for the correct award manager, as there have been changes since their 2013 inception. You can apply with a log extract of the QSOs needed.

Apply to email address of the club: <cq73@ya.ru> or <ux2ij@mail.ru>

Internet: <http://www.cqcw.ru>

Great Inventors Series – Nikola Tesla

During a one-day (GMT/UTC) period, collect a total of 10 points using the suffixes of stations you contact to spell the five letters T E S L A. The points are tied to how many of the needed letters are in each QSO. Only callsigns composed of all the needed letters can be used.

- A contact which has one letter in the suffix which is a T E S L or A counts for 1 point. (YU3T)
- A contact which has two letters in the suffix which is T E S L or A, counts for 2 points. (F2SA)
- A contact which has three letters in the suffix which is T E S L or A, counts for 3 points (W1ATL)

One Week ITU

Within a one-week period (0000z Monday to Sunday 2359z), contact 10 stations in each of 10 different ITU zones. A total of 100 contacts is needed. There are three awards in this little series, with the second one requiring 10 contacts in each of 20 zones, and the third requiring 10 contacts in each of 30 zones. The award can be customized if earned (1) on not less than 3 HF bands, all on WARC bands, and all on only one HF band.

Arctic and Antarctic

Earn a total of 50 points by contacting islands of the Arctic, located within the Arctic Circle, and with Antarctic Territories, which are located south of 60 degrees south latitude. Each contact counts for 10 points. In Greenland, only QSO with radio stations located north of 66.6° North latitude. You must have at least one QSO each with Arctic and Antarctic stations.

Missing points may be obtained for QSOs with stations located in the continental Arctic regions of Alaska, Canada, Norway, Sweden, Finland, and Russia. Each of these missing contacts count as one point. All QSOs must be made with different stations. Apply to <ux2ij@mail.ru>.

Blue Lakes

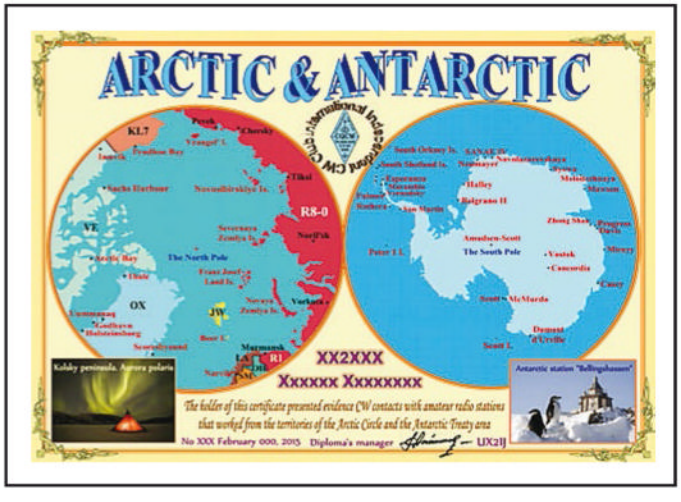
There are three levels to this award, which requires contacts with countries and areas that contain the largest lakes in the world. A link is provided on their website which calls up an Excel spreadsheet listing (1) the name of the lake, (2) the specific callsign prefix identifying valid stations near that lake, and (3) the area of the lake which produces your score to earn the award.

There are three classes of the award, each with a different point requirement. You must work stations giving you the points for the level you wish. All QSOs must be with different stations near different lakes so use the spreadsheet, it will be very helpful. Apply to <ux2ij@mail.ru>.

Bronze "Pontos Euxinus" (Black Sea)

There are four levels to the award, this is the first. You must make six contacts with each of the six Black Sea countries and another six operating from different main harbors of the Black Sea.

The countries bordering on the Black Sea are: Bulgaria, Georgia, Romania, Russia, Turkey, and Ukraine.



Collect QSOs from Arctic countries and Antarctica to earn the 50 points necessary to win this award.

The principal harbors of the Black Sea are:

Adler	Alushta	Anapa
Balaklava	Batumi	Bilhorod-Dnistrovkyi
Burgas	Varna	Gagra
Gelendzhik	Gudauta	Yevpatoria
Illichivsk	Port Kavkaz	Kerch
Constanta	Port Krym	Kulevi
Novorossiysk	Midia-Navodari	Odessa
Ochakov	Poti	Zonguldak
Sevastopol	Samsun	Sinop
Sulina	Sochi	Sukhumi
Taman	Trabzon	Tuapse
Feodosiya	Chernomorsk	Yuzhne
Yalta	Mangalia	

Let us know of any new certificates or awards programs that might be used in future columns. A URL (Internet address) is all we need to start the process.

The Blue Lakes award features a pleasant photo of a lake and mountains. To hang this award on your wall, make contact with hams who live near the largest lakes of the world. There is an Excel spreadsheet that will aid in your quest.

The Bronze Award has two levels. First you need to make contacts with all of the countries that border the Black Sea. The next level requires you to QSO six port cities along the coast.

what's new

DX Engineering Now Exclusive Low Band Systems Distributor

As contesting and Field Day popularity grow, multi-operator ham radio stations are becoming common. Running multiple radios, which requires multiple antennas quickly introduces significant installation and RF interference issues.

With that in mind, Low Band Systems and its line of multiplexers and band-pass filters are now exclusively being offered by DX Engineering. Operators can use Low Band Systems' multiplexers to connect multiple radios to a single multi-band antenna, allowing different radios to operate on different bands simultaneously. Not only does that reduce equipment installation hassles, it can save money since there's no need for extra antennas and coax cable.

Insertion loss for Low Band Systems' multiplexers is less than 0.2 dB — and each radio will receive 35 dB of rejection from out-of-band signals. The multiplexers provide a VSWR less than 1.2:1 and work with 50-Ω feedlines.

It's important to note that these multiplexers split the RF signal, so an appropriate band-pass filter is also required. Low Band Systems multi-stage band-pass filters limit the RF to a single band, effectively eliminating the RF interference issues multi-radio operators experience when using dedicated monoband stations. The filters deliver the critical isolation demanded by each multiplexer's band input. Installed in optimal conditions, users can experience up to 80 dB of isolation between all connected transceivers, regardless of the operating band.

Low Band Systems multiplexers and band pass filters are available now with retail prices ranging from $159.95 to $289.95 for the multiplexers and from $119.95 to $174.95 for the band-pass filters. For more information, contact: DX Engineering, 1200 Southeast Avenue, Tallmadge, OH 44278. Phone: (800) 777-0703. Website: <www.DXEngineering.com>.

our readers say...

Old Contester

Editor, *CQ:*

Your editorial covering the reported age of contesters (February *CQ*) was very enlightening.

I have been trying to fill in the gaps of the Triple Play Award by participating in contests. Once I have completed the award, I won't participate in contests again. Licensed over 56 years ago, I "grew up" with CW but I was inactive for quite a while. After retirement, I became active again but my code speed has dropped to about 10 WPM.

CW contesters send at 25 WPM or more and seem to enjoy calling "CQ TEST" more than actually working stations because they do it so much. Calling at high speeds deters and discourages people like myself and younger hams who are trying their hand at CW. When the youngsters are faced with high speed CW, I'm sure they hurry back to their digital and phone modes.

As the high-speed CW ops die off, so will CW contesting. If you want to encourage young people to get into CW contesting, encourage them by sending at 10 WPM or even slower.

Having certain CW contests limited to 10 WPM or, at least, devoting certain time periods to them or extra points for slower speeds should encourage younger people to get into them. Might also encourage them to get into phone contesting and contesting in general.

John Majka, K9AAN

"97.1" Editorial

Editor, *CQ:*

I particularly enjoyed your editorial in the Jan. 2016 issue of *CQ* magazine. When I have talked about ham radio to new people or when I teach tech classes, I usually start with the five fundamental purposes, partly because so many hams seem to limit their interests to just one aspect.

In recent years, for political reasons and because it is more understandable to a lay public, emphasis has been disproportionately on the emergency aspects. I fear that overplaying that hand will one day backfire. I think technical experimentation (homegrown science) is an equally important justification for the RF spectrum that we occupy. DXing may look to the public like hams having fun (which they should be), but you make a great case for international goodwill which is in such short supply.

Also, like you, I have used the word "magic" when asked for the elevator summary.

In the future, I plan to make copies of your editorial to give to people who ask me about ham radio. Thank you.

73 de KK7FM, George Noble
Portland, OR

Listening

W4DNN got quite a few favorable comments for his "Parting Thought" in his December column, in which he quoted a Bible verse and noted that "God's instructions to you are often sent in QRP. Be still and listen carefully …"

Dennis,

It took me awhile to read the December issue of *CQ*. But when I read your article I must say that first, I was impressed with your writing and, second, your parting thought was worth the many years of ham radio and all its joys.

Thank you for sharing God's QRP blessings and your good writing. He does speak; we must listen.

Neil Obright, K6UIP

BY BOB SCHENCK, N2OO

YF1AR/8 IOTA Tour

BY BUDI SANTOSO, YF1AR
EDITED BY W2FB & N2OO

(N2OO turns over the keyboard this month to Budi, YF1AR, to share the story of his multi-island IOTA expedition in Indonesia. – W2VU)

This crazy idea was meant to be a tribute to my beloved motherland Indonesia. The chosen destination was the Mollucas (Maluku) Islands chain, which is a haven for IOTAs (Islands on the Air[1]). Specifically, I chose southwestern Mollucas (*Photo A*) because this area is relatively isolated and comprises many most-wanted IOTA islands. The original idea was to activate all 10 IOTAS in the Mollucas in four months. I activated four of them during the first stage of my tour in two months (*Photo B*). Seven islands saw its first activation[2] and I visited five of the small outermost islands of Indonesia, bordering Timor Leste (4W). The tour was interrupted partly because of a family obligation, my second son's wedding, and due to a religious obligation, Umrah pilgrimage to Saudi Arabia. In addition, my budget for the expedition unexpectedly tripled due to high costs of just about everything in these remote places.

KISAR OC-272 15-20 October 2015

My first destination was Kisar Islan (OC272), to which I traveled from Jakarta via Ambon, Surabaya. I was met there by YD8VNZ and stayed

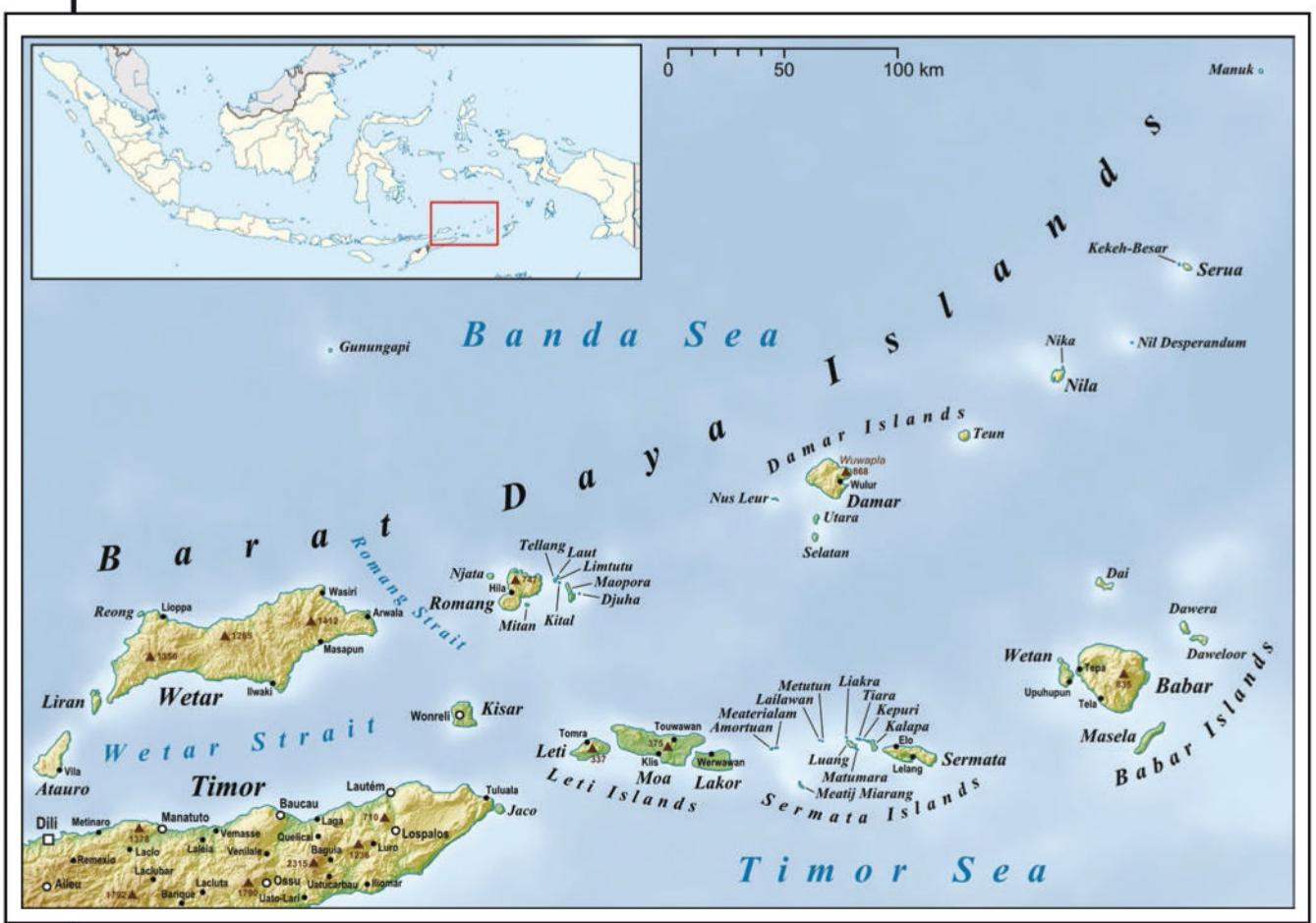


Photo A. This is a map of the area visited by Budi.

Photo B. Budi, YF1AR, typically set up his radio in whatever space was available, usually on the floor. Here he is on Masela Island (OC-271). (Photos courtesy of YF1AR)

near the seaport. That evening we had a gathering with local amateurs and had a nice eyeball QSO with the president of the local ORARI[3] chapter, YC8VLZ. After an overnight stay in Ambon, I boarded a light aircraft to Kisar Island to begin my IOTA tour.

While in Ambon, I made an acquaintance with an anthropologist from Patimura University in Ambon who was on the same flight to Kisar. After a 1-hour flight, we arrived in Kisar and I was allowed to use his vehicle during my stay. I immediately drove to the main port, Nama, which is located on the western part of the island and was the QTH for YF1AR/8 in 2013 when I activated Kisar for the first time as OC-272. However, the area was being renovated and there was a lot of construction. I ended up operating from the ferry seaport (*Photo C*), which is next to the main port. After obtaining a permit to operate from the harbormaster, I installed my vertical antenna on top of the water tower and my radio was set up in the waiting area for ferry passengers. I was only able to operate for 19 hours a day because between noon and 5 p.m. local time, there is no electricity. I used this time to rest. Cell signals were available near the port only for voice and SMS (text messages) but no data. After consulting with local residents, I decided to go next to Arwala on Wetar Island using a wooden boat. I was informed ahead of time that electricity would be available for 24 hours using batteries and solar cells.

Wetar Island OC-272 21-28 October 2015

The trip to Wetar[2] took place in the middle of the night around 2200 local time. I was wrongly informed that the trip would only take 2-3 hours. It turned out that the dangerous journey took 6 hours, crossing the Strait of Kisar with high waves, and clearly the boat was substandard and unsafe. At one point, the boat almost capsized from the high waves and we all screamed. Arriving in

The WPX Program

CW

3708 . . . . . JH1OGT
3709 . . . . . NØKV
3710 . . . . . N4XFA

SSB

3825 ..... K6KNS
3826 ..... JP1EWY
3827 ..... K4JO
3828 ..... W4GZX
3829 ..... JH1OGT
3830 ..... WD9T
3831 ..... KX7L
3832 ..... NØKV
3833 ..... YBØVB
3834 ..... N7AU
3835 ..... KF5ZWS
3836 ..... PT7CB
3837 ..... IT9YOZ
3838 ..... K1HG

Mixed

3160 ..... K6KNS
3161 ..... DL7XT
3162 ..... JH0OXS
3163 ..... IK2HTY
3164 ..... W4GZX
3165 ..... JH1OGT
3166 ..... K7JAN
3167 ..... W4LVH
3168 ..... MMØIEL
3169 ..... N1HO
3170 ..... K5RCR
3171 ..... NØKV
3172 ..... W4NE
3173 ..... K1SET
3174 ..... YB6HAI
3175 ..... W6WF
3176 ..... KD8ZWG
3177 ..... N4XFA
3178 ..... N7AU
3179 ..... KI3F
3180 ..... K6VHF
3181 ..... EA2DVR

Digital

498 . . . . . YB1BML
499 . . . . . IK2HTY
500 . . . . . JH1OGT
501 . . . . . KT4EP

CW: 500 KA1SAW, 600 NH6T/W4, 650 JR3UIC, 700 HK3W, 750 NZ3O, 900 NØKV, 1450 JH1OGT, 7650 K9QVB

SSB: 350 WA3QWA, K1HG. 400 W4GZX, WA3QWA. 500 K6KNS. 550 NW3U. 600 N7AU. 750 KX7L. 800 AE4WG, OM7CA. 850 EC4KW, NZ3O, PT7CB. 1150 JH1OGT. 1200 HK3W. 1300 NØKV. 2700 W6AFA. 5850 HA5DA

Mixed: 450 KM4CQG, W4GZX, K7JAN, YB4HAI, N4XFA. 500 W4NE, W4ALF. 550 K6KNS, NW3U. 600 N7AU, KI3F. 750 KA1SAW. 1150 K8YAH. 1200 EC4KW, NZ3O. 1250 AC7JM, JR3UIC. 1400 KX7L. 1550 NØKV. 1850 OM7CA. 1900 JH1OGT. 2000 HK3W

Digital: 400 AE4WG, NØVVV. 450 KC9UNL. 500 KX7L. 600 JH1OGT, K8YAH, KI3F. 900 AC7JM, JR3UIC. 1100 W2/JR1AQN. 1450 HK3W

160 Meters: OM7CA, K5RCR, NØKV, W4NE, N7AU, HK3W
80 Meters: OM7CA, K6FG, NØKV
40 Meters: OM7CA, NØKV, NZ3O, YB6HAI, JR3UIC, HK3W
30 Meters: OM7CA, NØKV, JR3UIC
20 Meters: OM7CA, NØKV
17 Meters: OM7CA. NØKV, AC7JM
15 Meters: OM7CA, K6FG, NØKV, AC7JM, KA1SAW, HK3W
12 Meters: K6FG, NØKV, JR3UIC
10 Meters: OM7CA, NØKV, KA1SAW, HK3W
6 Meters: NØKV

Africa: OM7CA, K6FG, NØKV, NZ3O, HK3W
Asia: OM7CA, K6FG, NØKV, AC7JM, YB6HAI, HK3W
Europe: OM7CA, NØKV, YB6HAI, N4XFA, W4ALF, KI3F, PT7CB
Oceania: OM7CA, NØKV, NZ3O, HK3W
North America: OM7CA, W4GZX, NØKV, W4NE, N4XFA, N7AU, KI3F, PT7CB, K1HG, K6VHF
South America: OM7CA, K6FG, NH6T/W4, K8YAH, NØKV, NZ3O, HK3W

Award of Excellence with 160 Bar: NØKV, OM7CA
160M Bar: HK3W, OM7CA
30M Bar: NØKV, OM7CA, RA3DNC
17M Bar: NØKV, OM7CA, RA3DNC
12M Bar: NØKV, RA3DNC
6M Bar: NØKV

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.

The WAZ Program

ALL BAND WAZ

Mixed

9288 ..... SQ5EBM
9289 ..... IT9DVZ
9290 ..... W4ALF
9291 ..... TA2AD
9292 ..... W5UHQ

CW

806 ..... N6VNO

SINGLE BAND WAZ

15 CW

361 ..... WC6DX

160 Meter

471 ..... JA7QVI, 39 zones

160 Meter Updates

F4GTB, 37 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, P.O. Box 792, Brandon, MS 39043-0792. 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>.

Arwala — which has no port — we had to take a dinghy (with only enough space for two) to land. I waited for my ride and witnessed a beautiful sunrise on a pristine beach with white sands. What an unforgettable sight.

After I arrived at my host family, I found out that the battery and solar cell could only be used for two hours a day. I was utterly disappointed but what could I do? I was not about to swim back to Kisar and, with no cell reception, I was cut off from the rest of the world. I managed to find a location for my activity right by the beach. My host was very gracious and provided me with lodging, food, and generator power. I made new friends with the local residents, all of whom were very hospitable.

Photo C. Budi used ferries like this one on Wetar Island (OC-272) to travel between some of the islands.

Liran Island OC-272
Oct 30- Nov 6, 2015

I continued on to Liran[2]. Aboard the ship during the 10-hour journey, I met the harbormaster at Liran, and I stayed at the harbormaster's rental residence. I visited the lighthouse at Manoha to get a cell signal from Timor Leste. There was no signal from the Indonesian cell provider. I was able to operate from Liran without much difficulty.

Leti Island OC-246
Nov 8-Nov 12, 2015

The next destination was to Leti Island[2] via Kisar and Damar islands. The 12-hour trip was uneventful and I immediately visited the harbormaster office in Tomra and got permission to operate. I installed the antenna on top of the lighthouse at approximately 20 meters above ground (*Photo D*). My operating position was right on the beach with 12 hours of electricity between 1800 and 0600 local time. I had good cell signal with SMS (but no Internet) from Leti. I also paid a visit to the village head in Tomra.

Photo D. On Leti Island (OC-246), the local lighthouse became an excellent antenna support!

5 Band WAZ

As of February 1, 2016
1929 stations have attained at least the 150 zone level, and 947 stations have attained the 200 Zone level.

As of January 1, 2016
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	9A5I	198	1, 16
HA5AGS	199	1	AK8A	198	17, 22
I5REA	199	31	EA5BCX	198	27, 39
IK1AOD	199	1	F5NBU	198	19, 31
IK8BQE	199	31	G3KDG	198	1, 12
IZ1ANU	199	1	G3KMQ	198	1, 27
IZ3ZNR	199	1	IK0FVC	198	1, 31
JA1CMD	199	2	JA1DM	198	2, 40
JA5IU	199	2	JA3GN	198	2 on 80 & 40
JH7CFX	199	2	JA7XBG	198	2 on 80 & 10
JK1BSM	199	2	K2EP	198	23, 24
K1LI	199	24	K2TK	198	23, 24
K3JGJ	199	24	K3JGJ	198	24, 26
K7UR	199	34	K4HB	198	24, 26
K8PT	199	26	K4JLD	198	18, 24
KZ4V	199	26	K6FG	198	17, 18
N3UN	199	18	KB0EO	198	22, 23
N4NX	199	26	KZ2I	198	24, 26
N4WW	199	26	N2QT	198	23, 24
N4XR	199	27	N4GG	198	18, 24
N8AA	199	23	N8LJ	198	17, 24
RA6AX	199	6 on 10M	NS6C	198	17, 22
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	VE2TZT	198	23, 24
S58Q	199	31	W4UM	198	18, 23
SM7BIP	199	31	W5CWQ	198	17, 18
VO1FB	199	19	W6OUL	198	37, 40
W1FJ	199	24	W9RN	198	26, 19 on 40
W1FZ	199	26	W9XY	198	22, 26
W2LK	199	23	WA2BCK	198	23, 24
W3NO	199	26	WC5N	198	22, 26
W4DC	199	24	WL7E	198	34, 37
W4LI	199	26	ZL2AL	198	36, 37
W6DN	199	17			

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

946 DJ9BX 947 RU3FM

New updates to the 5BWAZ list of stations:

1927 IK0VFC, 198 zones 1180 RU3FM, 200 zones
1571 K8YC, 195 zones

The following have qualified for the basic 5 Band WAZ Award:

1928 NY4G, 154 zones 1929 DJ9BX, 200 zones

***Please note: Cost of the 5 Band WAZ Plaque is $100 shipped within the U.S.; $120 all foreign (sent airmail).**

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, John Bergman, KC5LK, P.O. Box 792, Brandon, MS 39043-0792. 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>.

Sermata Island OC-246
Nov 14-Nov18, 2015

I left for another 12-hour trip, this time to Sermata Island, with transit on Moa and Lakor Islands. My host in Sermata was the former village head and my operating position again was right on the beach (*Photo E*). I met a legislator from southwest Mollucas, who is a native of Sermata Island and he gave his full support to my activity, even donating fuel for the generator. Electricity was available using the generator from 1700-0100 local time. Due to the limited supply of fuel and the high price locally, my operation was somewhat sporadic. During my off-air time, I built a two-wheeled wooden car. No cell signal for voice or SMS, let alone Internet.

Luang Island OC-246
Nov 19-Nov 24, 2015

I missed the scheduled ferry to Luang[2] due to misinformation. The ferry had left at dawn and there I was waiting for the ferry at noon. I ended up taking a charter boat that took three hours. The first night, I stayed at the multipurpose building near the beach. The following night I moved to the house of the village head, farther inland. Due to limited electricity from 1700-0500 local time, my radio activity was sparse. No cell reception here, either. My host was very kind and had prepared my room for my radio activity.

Babar OC-271
Nov 25-Nov 28, 2015

The journey to Babar Island took 12 hours. I was offered a place to stay in the middle of the town. I visited the village head and reported my activity to the local police. The village head and the local police chief stopped by and observed my radio activity. My plan to go to Wetang Island was cancelled due to lack of information regarding the ferry schedule. Electricity was available between 1700-0600 local time. Cell signals were adequate for voice and SMS and there was limited Internet availability.

Masela Island OC-271 Dec 1-Dec 3, 2015

I arrived in Masela[2] after a 12-hour voyage. On the ship I met the local village head at Dawelor and school principal, Mr. Agus. Upon arrival, Mr. Agus took me to the village head in Uiwily who hosted my stay. My radio was set up in the living room. I spent some time at the beach and watched local children enjoy the waves (*Photo F*). Electricity was available with a generator between 1700-0100 and again from 0700-0900.

Banda Besar Island OC-157
Dec 8-Dec 10, 2015

From Babar, I continued my journey to Yamdena Island aboard a cargo ship, which took 14 hours. I spent two days and three nights on the ship while waiting for the next ship going to Banda Neira. The long trip was uneventful and I arrived in Banda Neira safely. Since this island had been activated before, I decided to go to Banda Besar, a new island for Nusantara Award. The trip took 30 minutes and I met the village

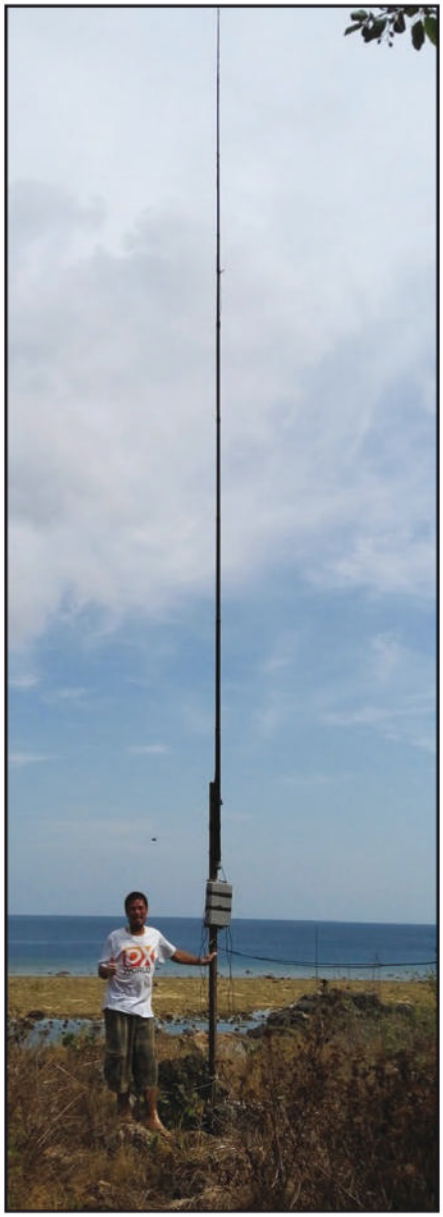


Photo E. On Sermata Island (OC-246), the antenna support was lower but right on the beach.

head. My operating position was again … you guessed it … right at the beach. Electricity was available between 1700-0800, with good cell reception for voice, SMS, and Internet. A strong earthquake hit the area while I was there. I went sightseeing to Fort Belgica, a 17th century Dutch fort in the southwestern part of Banda Neira.

Banda Api Island OC-157 Dec 10 2015

Another new island for Nusantara Award, Banda Api[2] is only 15 minutes away from Banda Neira using a small boat (*Photo G*). I spent only one night here and operated for only 10 hours because the next day at dawn I had to leave to return to Ambon. I arrived in Ambon in the wee hours and rode a bus to the airport. I took the first flight to Jakarta at 0700 local time and arrived in the afternoon safely. My lovely wife and grandchildren waited for me anxiously at Soekarno-Hatta Airport. At last, home sweet home.

Acknowledgements

I want to thank GDXF, Clipperton DX, and personal donors. Thank you also to Steve Busono, W2FB, my editor, and Bob Schenck, N2OO, my QSL manager. This trip was one of the longest IOTA expeditions on record and certainly is the longest so far in Indonesia. Thank you for support and for calling me.

Postscript

This IOTA tour has changed me in many ways but most of all it has transformed me to become more appreciative of my life in Java. I gained much wisdom during this long and costly trip. These life lessons are priceless. I traveled many

CQ DX Awards Program

SSB Award

YBØUB 2640

The basic award fee for subscribers to *CQ* is $6. For non-subscribers, it is $12. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, 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. We recognize 341 active countries. Please make all checks payable to the award manager. Photocopies of documentation issued by recognized national Amateur Radio associations that sponsor international awards may be acceptable for CQ DX award credit in lieu of having QSL cards checked. Documentation must list (itemize) countries that have been credited to an applicant. Screen printouts from eQSL.cc that list countries confirmed through their system are also acceptable. Screen printouts listing countries credited to an applicant through an electronic logging system offered by a national Amateur Radio organization also may be acceptable. Contact the CQ DX Award Manager for specific details.

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 341 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 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

OH2BN 341
DL3DXX 340
EA2IA 340
F3TH 340
K2FL..... 340
K2TQC.....340
K3JGJ 340
K3UA.....340
K4CN.....340
K4IQJ 340
K4MQG 340
K5RT 340
K9BWQ 340
K9MM 340
N4AH.....340
N4JF.....340
N4MM 340
N5FG 340
N5ZM 340
N7FU 340
N7RO 340
NØFW 340
OK1MP.....340
W3GH 340
W4OEL.....340
W5BOS 340
W7CNL.....340
W7OM.....340
W8XD.....340
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WK3N.....340
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W1DF 338
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W6OUL 336
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WD9DZV 331
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K4IE 295
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K4IQJ 341
K4JLD 341
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K4MZU.....341
K5OVC.....341
K5RT 341
K5TVC 341
K6YRA.....341
K7VV 341
K8SIX.....341
K9MM 341
KE5K 341
KZ2P 341
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N4MM 341
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KD5ZD.....331
WA4WTG 331
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VE7SMP 330
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WK3N. 339
N5ZM. 338
N5FG 337
OK1MP 337
K4CN 334
W3GH 333
K3UA 332
W9RPM 330
K8SIX. 325
AB4IQ 295
K8ME 278
IN3YGW. . . . 275

Photo F. Budi hangs out at the beach with some of the children on Masela Island. (OC-271)

Photo G. Budi arriving by boat at Banda Api Island. (OC-157)

kilometers; I was away from my family; propagation was not that great; I had to make do with limited electricity in unfamiliar surroundings. I ate turtle meat, fish, and instant noodles. I witnessed an earthquake while in Banda, as well as a small-scale tsunami … quite scary.

I was also interrogated while on Luang Island. Being an outsider and of a different faith from most of the residents, officials thought I belonged to ISIS and was communicating to them via CW. There were moments of solitude, but the radio was always there. The calming ocean waves greeted me every morning and treated me to countless beautiful sunrises. I love YB land, my homeland, the largest archipelago in the world.

Notes:

1. Islands on the Air (IOTA) is a program of the Radio Society of Great Britain (RSGB). See <http://www.rsgbiota.org/>
2. New islands for Nusantara Award (Work All Indonesian Islands)
3. ORARI is Indonesia's national ham radio society

contesting

BY DAVID SIDDALL,* K3ZJ

Youth in Ham Radio, CQ WW Director Resigns, Convention News, and WRTC2018 Happenings

This month we look at some interesting activities in Europe, including a mock WRTC conducted in virtual reality and establishment of a new Youth Contesting Program that is bringing young contesters from Europe and Africa to some of Europe's "Top-Gun" superstations. We also lament the resignation of the CQ World Wide DX Contest Director, K5ZD; recognize two conventions being held this month where contesters will gather; and review the latest WRTC preparations in Germany to welcome the competitors in 2018.

Youth in Contesting Moves to Virtual Reality and Superstations

European competitors are ramping up efforts to interest and retain youngsters interested in ham radio. We can all look to work some of these youngsters when they take over some of Europe's best-known "Top-Gun" stations.

k3zj@cq-amateur-radio.com

Activities Increase in Europe to Welcome Youth

Regular readers will remember that back in February's Contesting column I discussed the findings of Part 1 of the CQ WW Contest Committee's September, 2015 survey. In the course of the discussion one of my conclusions was that, based on the survey's results, "[n]ot only are we old, we are bordering on extinction," said that this conclusion will form the basis of further discussion, and asked what you think can be done. This month we look at youth radiosport activities in Europe.

The demographics of radiosport competitors continue to tilt against us, whether or not it represents our generally aging population. Despite the multiple good efforts to interest youth in ham radio

Calendar of Events

All year	**CQ DX Marathon**	**http://bit.ly/1QCtHmu**
Mar. 26-27	**CQ WW WPX SSB Contest**	**http://www.cqwpx.com/**
Apr. 2	LZ Open 40m Sprint Contest	http://www.lzopen.com/lzocc40/indexF.htm
Apr. 2-3	EA RTTY Contest	http://concursos.ure.es/en/eartty/bases/
Apr. 2-3	Mississippi QSO Party	http://www.arrlmiss.org/
Apr. 2-3	Missouri QSO Party	http://bit.ly/1L6aw3o
Apr.2-3	SP DX Contest	http://bit.ly/U7iXkx
April 2-3	QRP Spring QSO Party	http://www.qrparci.org/contests
Apr. 6	UKEICC 80m Contests SSB	http://bit.ly/1LOtyeE
Apr. 7	SARL 80m QSO Party	http://bit.ly/H0IqQf
Apr. 9-10	JIDX CW Contest	http://jidx.org/jidxrule-e.html
Apr. 9-10	Georgia QSO Party	http://georgiaqsoparty.org
Apr. 10	Hungarian Straight Key Contest	http://hskc.ha8kux.com/
Apr. 15-16	Holyland DX Contest	http://bit.ly/20QxRrK
Apr. 16	ES Open HF Championship	http://bit.ly/24mp1GV
Apr. 16	TARA Skirmish Digital Prefix Contest	http://bit.ly/1TvwpdK
Apr. 16-17	Michigan QSO Party	http://www.miqp.org/Rules.htm
Apr. 16-17	Ontario QSO Party	http://www.va3cco.com/oqp/rules.htm
Apr. 16-17	YU DX Contest	http://www.yudx.yu1srs.org.rs/2015/rules.html
Apr. 16-17	CQ Manchester Mineira DX Contest	http://www.cqmmdx.com/rules/
Apr. 16-17	Nebraska QSO Party	http://www.qcwa.org/chapter025.htm
Apr. 17	ARRL Rookie Roundup, SSB	http://www.arrl.org/rookie-roundup
Apr. 23-24	10-10 Spring Digital Contest	http://bit.ly/22dn4vg
Apr. 23-24	SP DX RTTY Contest	http://bit.ly/1oxHDCM
Apr. 23-24	Helvetia Contest	http://bit.ly/1yYxmng
Apr. 23-24	Florida QSO Party	http://www.floridaqsoparty.org/rules.html
Apr. 27	UKEICC 80m Contests CW	http://bit.ly/1LOtyeE
Apr. 30-May 1	Russian WW MultiMode Contest	http://bit.ly/1RQ9Gdq
May 1	AGCW QRP/QRP Party	http://bit.ly/1gnVDX0
May 7	FISTS Slow Speed Sprint	http://www.fistsna.org/operating.html
May 7-8	7th Area QSO Party	http://bit.ly/1WDXaMy
May 7-8	10-10 Spring CW Contest	http://bit.ly/22dn4vg
May 7-8	ARI DX Contest	http://bit.ly/1OCllGG
May 7-8	Delaware QSO Party	http://www.fsarc.org/index.htm
May 7-8	Indiana QSO Party	http://www.hdxcc.org/inqp/rules.html
May 7-8	New England QSO Party	http://www.neqp.org/rules.html
May 28-29	**CQ WW WPX CW CONTEST**	**http://www.cqwpx.com/**

This information also appears monthly on the CQ website.

referred to by Rich, W2VU, in his February editorial *Zero Bias*, and those of many others including in classrooms around the country and at the Youth Forum at the Dayton Hamvention®, there is a noticeable lack of teenagers and 20-somethings in ham radio generally and radiosport specifically. Continuing and intensifying efforts to interest the younger generation is justified by the numbers. And anyway, it would be fun for us older contesters to meet some bright youngsters and share their enthusiasm, wouldn't it? This is what 4O3A, ES5TV, the teams at 9A1A and SK3W, and others are starting to do under an organized youth program in Europe.

Semantics aside, I think that W2VU and I agree on the need for efforts to teach our youth about ham radio. From my viewpoint, a radiosport-specific focus not only would help contesting, but also more likely would attract and retain the interest of youth more generally in the wonders of ham radio. After all, contests have a lot in common with video games that are so popular with youngsters today. It seems to me that efforts to expand youth interest in gaming to include radiosporting are means that we should pursue. But how does one successfully do this? Some of our fellow contesters in Europe already are doing so and may give us some ideas here in North America.

Radio Arcala, OH8X, and Youth in Amateur Radio

In Europe, a number of initiatives have been taken to attract youth to radiosport, including (but not limited to) virtual reality and operating opportunities at some of Europe's biggest stations. We'll discuss these below.

I think it's fair to suggest that one of the contributors to this European focus on youth in amateur radio was the paper initiated by our fellow contesters at Radio Arcala, OH8X. The paper, published in 2010 by Radio Arcala & Oulu University Center for Wireless Communications, is titled "Extending Amateur Radio to Augmented Reality."

The authors laid out the case and it is worth the time to read the short summary below.

"Amateur Radio (AR) as a beneficial passion with a valuable role in society has reached an alarming crossroads. According to a recent study and based on the demographics of a membership survey, it was concluded that the global AR population will diminish in the course of the next 20 years to the point where its existence is in jeopardy in terms of reaching a critical mass needed to conduct meaningful activities on the level assumed by this global pursuit… The current influx of new members is not expected to secure the continuation of this valuable activity. The initial drivers — radio waves, radio communication over long distances at no cost and related theories and electronics as such — do not sufficiently attract today's youth. A new strategy is needed for renewal.

"This paper lays down some elements and seeks new attractions that can potentially bring a new lease on life to amateur radio together with young people, while honoring the past and providing the current aging population with ways to lead and be part of a proposed transition. At the same time, it is designed to help the elder generation gain further knowledge of new technologies and continue their enjoyment by coexisting in harmony with the youth of today.

"Amateur Radio's future is on the agenda wherever several ham radio operators meet. There exists a high degree of consensus that a new strategy and some readjustment will be necessary. Actually, work on that new strategy is already overdue with a high sense of urgency. It is now up to the amateur radio community to determine how much of these traditions should be modified to gear this valuable hobby to the interest level of today's youth.

"Looking to the future has always been more challenging than reviewing the

LINVILLE, NORTH CAROLINA — Special event station "**Mile High Radio**" will be aired from 1900 UTC, Friday, April 29 through 1900 UTC, Sunday, May 1 to honor the Mile High Bridge. Frequencies include 3.865, 7.265, 14.265, 21.365 for SSB and 3.065, 7.110, 7.120, 14.065, and 21.065 for CW. QSL to Butch, WS4H.

CEDARBURG, WISCONSIN — The Ozaukee Radio Club will hold its **38th Annual Spring Swapfest** Saturday, April 30 at Columbia St. Mary's Center. Contact: Loren Jentz, N9ENR, 1213 Woodridge Dr., Apt. 1, Grafton, WI 53024. Phone (262) 377-7941. Website: <http://www.ozaukeeradioclub.org>. Talk-in 146.91- (PL 127.3).

SONOMA, CALIFORNIA — The Valley of the Moon Amateur Radio Club will hold its **Hamfest** Saturday, April 30 at the Sonoma Veterans Memorial Building. Website: <http://vomarc.org>. Talk-in 145.350 (88.5). VE exams.

MAY

SANDWICH, ILLINOIS — The Kishwaukee Amateur Radio Club will hold the **Dekalb Hamfest** Sunday, May 1 at the Sandwich Fairgrounds. Contact: Bob Yurs, W9ICU, (815) 895-7584. Email: <w9icu@arrl.net>. Website: <http://www.karc-club.org>. Talk-in 146.730- (PL 100).

CADILLAC, MICHIGAN — The Wexaukee Amateur Radio Club will hold the **54th Annual Cadillac Amateur Radio and Computer Swap** Saturday, May 7 at the Cadillac Junior High School. Contact: Alton McConnell, (231) 862-3774. Email: <nu81@yahoo.com>. Talk-in 146.98. VE exams and card checking.

HAGERSTOWN, MARYLAND — The Antietam Radio Association will hold **The Great Hagerstown Hamfest** Saturday, May 7 at the Washington County Agricultural Center. Contact: Herman Niedzielski, K2AVA, (301) 791-5841. Email: <k2ava@myactv.net>. Website: <http://w3wcw.org>. Talk-in 147.090+ (PL 100) or 146.940-. VE exams and card checking.

SUPERIOR, WISCONSIN — The Arrowhead Radio Amateur Club will hold its **HAM FEST!** Saturday, May 7 at the Head of the Lakes Fairgrounds-Multipurpose Building. Contact: Robert Schulz, KCØNFB, 115 Eden Lane, Duluth, MN 55805-1533. Phone: (218) 481-7458. Email: <arac_hamfest@charter.net>. Website: <http://www.thearac.org>. Talk-in 146.940- (PL 103.5), 147.000- (PL 103.5), or 146.940- (PL 114.8). VE exams and card checking.

KEYSTONE, COLORADO — Rocky Mountain Ham Radio will hold **Hamcon 2016** and the **2016 ARRL Rocky Mountain Division Convention**, Friday, May 13 through Sunday, May 15 at the Keystone Conference Center. Contact: Hamcon 2016, 9975 Wadworth Parkway K2-275, Westminster, CO 80021. Website: <http://hamconcolorado.org>.

ZANESVILLE, OHIO — The Muskingum Valley Council Radio Club will air a special event station from 2000 UTC Friday, May 13 through 0000 UTC, Saturday, May 14 to salute Scoutfest 2016. Frequencies include 7.280 and 14.290. QSL to MVCRC, 734 Moorehead Avenue, Zanesville, OH 43701. Contact: Matthew Murphy, KC8BEW. Email: <matt.kc8bew@gmail.com>. Phone: (740) 704-8836. Website: <http://mvcbsa.org>.

EAST GREENBUSH, NEW YORK — The East Greenbush Amateur Radio Association will hold its **13th Annual Hamfest** Saturday, May 14 at the East Greenbush Fire Company. Contact: Tom, KC2FCP, <kc2fcp@nycap.rr.com>. Website: <http://w2egb.org>. Talk-in 147.270+ (PL 94.8).

GOSHEN, CONNECTICUT — The Southern Berkshire Amateur Radio Club will hold its **25th Annual Hamfest** Saturday, May 21 at the Goshen Connecticut Fairgrounds. Contact: Stan, W2VID, (518) 398-7003 or Lee, K1LEE, (860) 435-0051. Email: <info@w1baa.org>. Website: <http://www.w1baa.org>. Talk-in 147.285+ (PL 77). VE exams.

TINTON FALLS, NEW JERSEY — The Garden State Amateur Radio Association will hold its **Hamfest** Sunday, May 15 at the MOESC parking lot. Contact: Rem Hunnewell, K2REM, (732) 889-6692. Email: <hamfest@gardenstateara.org>. Website: <http://www.gardenstateara.org>. Talk-in 147.045+ (PL 67). VE exams.

DAYTON, OHIO — The Dayton Amateur Radio Association will hold the **2016 Dayton Hamvention®** Friday, May 20 through Sunday, May 22 at the Hara Arena and Convention Center. Website: <http://hamvention.org>. VE exams and card checking.

WALL TOWNSHIP, NEW JERSEY — The Ocean-Monmouth Amateur Radio Club will hold the **OMARC Tailgate Hamfest** Saturday, May 21 at Diana Site, 2300 Marconi Road. Contact: Jeff Harshman, N2LXM, (732) 996-0637. Email: <jharshman@n2mo.org>. Website: <http://www.n2mo.org>. Talk-in 145.110- (PL 127.3). VE exams and card checking.

DURHAM, NORTH CAROLINA — The Durham FM Association will hold the **42nd DurHamFest** Saturday, May 28 at the Durham Public Schools Staff Development Center M-1. Contact: Durhamfest chair, (919) 732-7616. Email: <durhamfest@dfma.org>. Website: <http://dfma.org>. VE exams.

PINELLAS PARK, FLORIDA — The Glorious Society of the Wormhole will hold its **2016 Hamfest** Saturday, May 28 at Freedom Lake State Park. Contact: Mike Scott, (727) 492-6454. Email: <jemke1@jemke.com>. Talk-in 146.850- (PL 146.2).

TOWN OF WASHINGTON, NEW JERSEY — The Bergen Amateur Radio Association will hold the **BARA Spring Hamfest** Saturday, May 28 at Westwood Regional High School. Contact: Jim Joyce, K2ZO, (201) 664-6725. Email: <k2zo@arrl.net>. Website: <http://www.bara.org>. Talk-in 146.19+ (PL 141.3). VE exams and card checking.

WEST FRIENDSHIP, MARYLAND — The Maryland FM Association Inc. will hold its **Annual Memorial Day Hamfest** Sunday, May 29 at the Howard County Fair Grounds. Contact: Maryland FM Association Inc., P.O. Box 351, Hanover, MD 21076. Phone (301) 641-5313 (btw. 6 and 10 p.m.). Email: <marylandfm@verizon.net>. Website: <http://www.marylandfm.org>. Talk-in 146.16+ (PL 107.2), 223.16+ (PL 107.2), or 449.000- (PL 107.2). VE exams.

past. That is exactly what the team at Radio Arcala is trying to do through this project. While sitting around the fireworks under the blazing skies of Lapland's Aurora Borealis, the light suddenly came to them. The message came loud and clear — this valuable passion needs to be enhanced and taken to the youth on their terms."

The entire paper is at <http://bit.ly/1oxD23z>.

There are multiple serious efforts in Europe to take ham radio and radiosporting "to the youth on their terms." A leader of these efforts that most contesters know, or know of, is Martti Laine, OH2BH/CU2KG (op. CR2X, etc.). Martti helps lead at Radio Arcala and was a member of the Project Task Force for the above-quoted paper. Whether or not due specifically to anything in the Radio Arcala paper, since it was published there has been a new emphasis on recruiting youth into ham radio and contesting.

Virtual Reality Mock WRTC for Youth Held in Finland

At WRTC2014, I discussed with Martti youth efforts in ham radio, and in radiosport in particular. We discussed the efforts to attract youth that originated in Finland with Radio Arcala (OH8X), as well as those undertaken in Europe generally under the auspices of the Youth Working Group of the International Amateur Radio Union (IARU) Region 1[1]. The Youngsters on the Air (YOTA) program[2] operates in each country under the auspices of its national association's youth coordinator and IARU Region 1.

YOTA summer camps were initiated in 2011 by Florin, YO9CNU, who serves as the IARU Region 1 Youth Coordinator for Romania. Summer camps are a tradition throughout Europe and quite popular. The first summer camp in Romania was a success and summer camps have been held every year since. They have been filled to capacity with teams composed of five youngsters from as many as 15 different countries residing within IARU Region 1. Teams consist of four youths ages 15-25 and one leader aged 18-30. Team members are recommended by their national amateur radio association. The second YOTA summer camp was held in Belgium and the Netherlands in 2012; the third in Estonia in 2013; the fourth in Finland in 2014; the fifth in Italy in 2015; and the sixth will be held in Austria (south of Salzburg) this July.

During that conversation at WRTC2014, Martti told me about the YOTA summer camp in Finland the following week, where a youth "mock WRTC" event would be conducted. Virtual reality would be employed to replicate realistic contest conditions, QRM, and propagation anomalies included. "Virtual reality" in this case was enabled by HamSphere, a web-based amateur radio simulation site for licensed radio amateurs and non-hams alike wishing to experience amateur radio without going on the air. HamSphere provides ham-radio like communications capability worldwide over the Web, complete with a virtual ionosphere based on actual sunspot numbers and solar flux values. Virtual Yagi, quad, vertical, and wire antennas all are available for selection for the various bands, and the interface simulates a ham transceiver. There is a regular schedule of contests, including SSB, CW, and VHF/UHF3.

For the 2014 YOTA event, Martti and gang arranged for the "European Radio Team Championship" (ERTC) to be held on HamSphere for a 6-hour period. Campers competed under realistic conditions in multi-single teams. A video of the actual operation taken by a Spanish participant can be viewed at <http://bit.ly/1QxbOH0>.

The mock WRTC was successful despite a power failure immediately before the event. Gold was earned by OK2SVA, OK1NOR, and OK1JD, from the Czech Republic. Silver went to IT9RGY, IZ6TSA and IT9DBF, representing Italy. Bronze was earned by ES6AXS, ES5HTA, and ES1XQ from Estonia. Presiding as Chief Judge was Hans, PB2T/NB2T, an active contester and then President of IARU Region 1. And yes, judging was completed within 24 hours[4].

Youth Contesting Program at "Top-Gun" Stations

Another great idea is an organized Youth Contesting Program (YCP) that arranges for a team of youth competitors to take over a large contest station and operate an actual contest. Senior experienced contesters provide supervision and mentoring before and during the contest.

The first event was held at 4O3A for the CQ WW RTTY DX Contest in September. Nine operators from five countries operated multi-two from Ranko's Montenegro superstation: S57BM, IT9RGY, IZ6TSA, YU3VIP, E7ØRA, E75DCE, E79AA, 4O9IT, and 4O9TT. Some of these young hams had participated in the mock WRTC in Finland. The trial run at 4O3A was judged to be a great success, and Ranko already has agreed to host again for the 2016 CQ WW RTTY. A video commemorating this first YCP operation can be viewed at <http://bit.ly/1Q5S7At>.

A second YCP event was held in October in conjunction with the SAC Phone contest. This time, 9A1A was the host station, which also operates regularly with local youth contesters under the callsign 9A1RBZ. 9A1RBZ was used for the international youth group during the SAC phone contest in accord with its regular practice. On the team were young contesters OE3FTA, HA8RT, 9A7MIM, 9A5CPP, 9A7CDZ, 9A5AEV, 9A5CMM, and Hungarian beginner Gabor. The team placed second out of 16 entries in the multi-one category for Europe.

Three additional "Top-Gun" station events have been scheduled under the program. A youth team will be driving ES5TV in the CQ-M International DX Contest next month (May 14-15). This time, four youth operators will join a local youth contingent, including the first from Africa (which also is in Region 1 of the IARU). Tsegaye, KB3WWJ, and YL Dagi, KB3WWY, help oversee club station ET3AA at Addis Ababa University, Institute of Technology[5]. They are sure to take back a wealth of knowledge that can be put to use at ET3AA. The other two participants traveling to ES5TV for the contest are Peter, SA2BLV; and Hendrik, DD5HT.

Similar YCP operations on the calendar are SK3W/SK9HQ during the IARU HF Championship July 9-10, 2016, and 4O3A in the CQ WW RTTY DX Contest September 24-25, 2016. We look forward to working these operations and hearing about many more in the future.

Conventions

The all-day Contesting Academy that has been run for the past several years at the International DX Convention in Visalia, California by the Northern California Contest Club (NCCC) has been canceled this year. The Convention otherwise will continue as usual on April 15-17, including DX University. Notwithstanding the absence of the Contesting Academy program, Visalia, equidistant between Los Angeles and San Francisco, is a great place to get to know many contesters who also double as DXers. Many of our West Coast brethren do not regularly make the May trek to Dayton. It is to be noted that Contest University at Dayton is not affiliated with NCCC's Contesting Academy at Visalia and the Dayton event will be held on schedule on May 19. See last month's column for information on it and other Dayton radiosport activities.

On the same April 15-17 weekend as Visalia, but on the East Coast, VHF/UHF contesters and aficionados will gather in Sterling, Virginia (near Dulles International Airport in suburban Washington, DC) for the first-ever VHF Super Conference. This gathering is hosted by the Grid Pirates Contest Group (K8GP) and Directive Systems and Engineering, and also is sponsored by the Southeastern VHF Society, North East Weak Signal Group, and the Mt. Airy VHF Radio Club. Information is at <http://vhfsuperconference.com>.

Randy Thompson, K5ZD, Stepping Down as CQ WW Contest Director

Randy, K5ZD, announced his intention to step down as Director of the CQ WW Contest as soon as a replacement is found. The CQ WW DX Contest Director is responsible for appointing the members of the CQ WW Contest Committee

and organizing their work to develop the rules, log checking, and production of the contest results. In a blog posting on the CQ WW website Randy explains that his decision is due to increasing responsibilities in his professional career.

Randy has done an outstanding job as contest director, first for the WPX contests and then for the CQ WW contests. Under his oversight, log submission deadlines were shortened and a web tool implemented for submitting scores. Final published contest results moved up not by the one month gained by the shorter submission deadline, but by four months — from August back to April for Phone results and September back to May for CW results. Even more impressive, under Randy's stewardship it has become routine to publish on the website a complete list of raw scores and claimed high scores just seven or eight days after the contest ends.

Under his leadership, the CQ WW Committee improved the log checking process. Contest integrity was enhanced through enforcement actions against rule violations, as discussed in this column last October. In addition, under Randy's oversight and John, N2NC's leadership, a searchable historical database with all scores since 1948 was constructed and resides on the CQ WW website for all to use at <http://www.cqww.com/score_db.htm>. In addition to N2NC, the database team included AA4NU, AD1C, JK3GAD, K1EA, KB9OWD, N3RD, N5DX, NO5W, OH6NIO, ON7SS, PD2R, and W2JU.

Randy served as CQ WPX Director from 2008 until his appointment as CQ WW Director in 2012. Randy said that he has "enjoyed working on the CQ contests and hopes to stay involved with the websites and log checking. The demands of a new job are preventing me from dedicating the time that the role deserves. With WPX, WW, and WRTC2014 activities over the past eight years, I am ready for a break. I am very proud of the work the Committee has done in enforcing the rules and feel that contesting results are now more accurate than ever. I look forward to working with the new Director."

WRTC2018 Happenings

Preparations for WRTC2018 are steadily progressing. As of April 1, there were only 832 days remaining before opening ceremonies on July 12, 2018.

WRTC2018 Antenna Chosen

WRTC2018 announced that Spiderbeam has been chosen to provide the WRTC2018 competition antennas. The selection was made after a thorough technical evaluation of proposed antennas and a competitive bidding process among multiple antenna suppliers. The list of preferred attributes for the competition antenna included light weight, good performance, competitive price, and sufficient experience within the helper team. Several antennas met the requirements, and Spiderbeam came out on top.

WRTC2018 said that Spiderbeam proposed an antenna that addressed the electrical and mechanical performance sought and also provided the option of adding a rotatable dipole for 40 meters. "Antennas are a critical component to the success of WRTC," said Andreas Paulick, DL5CW, leader of the WRTC2018 station committee. "With about 65 stations to build in less than two days, we wanted antennas that could be easy to store and transport and deliver the performance expected by the competitors. Spiderbeam was the best fit for our requirements." The Spiderbeam setup also includes the mast and rotor support.

WRTC2018 Test Stations to Participate in 2016 IARU Contest in July

As in New England for WRTC2014, the WRTC2018 Committee will conduct training sessions and station tests during the 2016 IARU HF Championship on July 9-10. There should be some interesting stations to work and reverse-beacon signals to compare. More details are expected to be released closer to the event.

WRTC2018 Sponsorships and Donations Accelerate

Recently DX Engineering and Vibroplex signed on as corporate bronze sponsors, joining OM Power (amplifiers), Mastrant (synthetic guy ropes), SaxPrint (QSL cards), and Funktechnik-Dathe (German ham radio equipment retailer). Above them, Funk Amateur (German amateur radio magazine and parts supplier) is a silver sponsor and Spiderbeam (WRTC2018 antenna supplier) reigns as a gold sponsor and looking at amateur organizational support, the World Wide Radio Operators Foundation (WWROF) is THE major donor with platinum level position. Following at the gold level, from this side of the Atlantic are the Yankee Clipper Contest Club (YCCC), Frankford Radio Club (FRC), YASME, and Contest Club Ontario (CCO).

They join Germany's Bavarian Contest Club (BCCC), Rhein Ruhr DX Association (RRDXA), and German DX Foundation (GDXF).

As mentioned in the February column, a club donation competition is in progress. Individual donations by amateurs also can be credited to their club. As of mid-February, the three top clubs are the BCC, RRDXA, and the Potomac Valley Radio Club (PVRC). Joining PVRC from North America are the Northern California DX Foundation (NCDXF) at 7th place and the American Radio Relay League (ARRL) at 16th.[6]

Notes:

1. See <http://bit/ly/1oXTlr4>. IARU Region 1 encompasses the national amateur radio associations of Europe, Africa, Middle East, and Northern Asia.
2. The YOTA website is at <http://www.ham-yota.com>.
3. See <http://hamsphere.com>. Thousands of hams are members of HamSphere under their regular callsign, although, of course, a license is not required.
4. An account of the 2014 YOTA camp by Ward Silver, NØAX, was published in the December 2014 *QST*: "Youngsters On The Air – YOTA 2014."
5. Individual licenses and callsigns are not yet issued in Ethiopia despite many efforts. Students have taken the RSGB International Examination to qualify as operators, and more recently 57 students passed the FCC examination when a VEC team was at ET3AA. More on ET3AA and the licensing situation is in an article by Ken, K4ZW, in "Contesting from Addis Ababa, Ethiopia – ET3AA," *National Contest Journal*, January/February 2014: <http://bit.ly/1Qxhq3X>; and in "the ET3AA Story," December 2015, *CQ* DX column by Bob Schenck, N2OO (p. 88).
6. Standings as of February 15, 2016. For the latest, see <http://bit.ly/24moV1T>

The Season of Lights

BY TOMAS HOOD,* NW7US

A Quick Look at Current Cycle 24 Conditions

(Data rounded to nearest whole number)

Sunspots:
Observed Monthly, January 2016: 34
Twelve-month smoothed, July 2015: 41

10.7 cm Flux (current):
Observed Monthly, January 2016: 104
Twelve-month smoothed, July 2015: 1160

A_p Index:
Observed Monthly, January 2016: 10
Twelve-month smoothed, July 2015: 13

One Year Ago: A Quick Look at Solar Cycle Conditions

(Data rounded to nearest whole number)

Sunspots:
Observed Monthly, January 2015: 67
Twelve-month smoothed, July 2014: 79

10.7 cm Flux:
Observed Monthly, January 2015: 142
Twelve-month smoothed, July 2014: 145

A_p Index:
Observed Monthly, January 2015: 10
Twelve-month smoothed, July 2014: 9

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for April 2016

Propagation Index	Expected Signal Quality (4)	(3)	(2)	(1)
Above Normal:				
1-2,4-5,8-9,16-24,26,28-29	A	A	B	C
High Normal:				
3,6-7,10,13-15,25,27,30	A	B	C	C-D
Low Normal:				
11	B	C-B	C-D	D-E
Below Normal:				
12	C	C-D	D-E	E
Disturbed:				
n/a	C-D	D	E	E

Where expected signal quality is:
A--Excellent opening, exceptionally strong, steady signals greater than S9
B--Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.
C--Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.
D--Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.
E--No opening expected.

HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing in *The New Shortwave Propagation Handbook* by George Jacobs, W3ASK; Theodore J. Cohen, N4XX; and Robert B. Rose, K6GKU.

2. With the propagation index, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a propagation index of 2 will be good on April 1 and 2, fair on April 3, 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.

One man's garbage is another's treasure. Space weather and the state of Earth's geomagnetic field might be thought of in the same way. That which degrades the propagation of radio waves in the HF (high frequency) spectrum might create conditions for useful VHF (very high frequency) radio propagation. During times of minor to severe geomagnetic activity, the ionosphere loses its ability to refract HF radio signals. At the same time, however, high geomagnetic activity may occur with auroral substorms that create areas of ionization capable of reflecting VHF signals.

Auroral observations over the last 100 or so years reveal that peak periods of radio aurora occur close to the equinoxes — that is, during the months of March and April, and again during September and October. Of these two yearly peaks, the greater peak — in terms of the number of amateur radio VHF contacts reported — occurs during October. However, don't discount April's activity, some of which can be very strong (when the geomagnetic field activity is said to be at moderate to strong storm levels). The minimum activity annually occurs during the months of June and July, with a lesser minimum during December.

Just What Are Those Lights?

Aurora is a direct result of solar plasma interacting with gases in the upper atmosphere. Geomagnetic storms develop when strong gusts of solar wind carrying clouds of solar plasma buffet the magnetosphere around the Earth, or during the passage of a coronal mass ejection (CME) which collides with the Earth's magnetosphere.

The magnetosphere is filled with electrons and protons that are normally trapped by lines of magnetic force that prevent them from escaping to space or descending to the planet below. The impact of a CME breaks loose some of those trapped particles, causing them to rain down on the atmosphere.

Gases in the atmosphere start to glow under the impact of these particles. Different gases give out various colors. Think of a neon sign and how the plasma inside the glass tube, when excited, glows with a bright color.

These precipitating particles mostly follow the magnetic field lines that run from Earth's magnetic poles, and are concentrated in circular regions around the magnetic poles called "auroral ovals." These bands expand away from the poles during magnetic storms. The stronger the storm, the farther these ovals will expand. Sometimes they grow so large that people at middle latitudes, like California, can see these "Northern Lights."

When active aurora is seen in the auroral zone, a strong magnetic disturbance is usually also observed there. These disturbed magnetic fields

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Figure 1. The first Norwegian 200 kroner note portrays Kristian Birkeland (1867-1917), magnetism researcher, inventor, and co-founder of Norsk Hydro against a stylized pattern of the aurora borealis and a very large snowflake. The back of the 200 kroner note shows a map of the north polar regions including Scandinavia to the right and northern Canada to the left. A ring encircling the magnetic dip pole (located near Resolute, Canada) symbolizes the location of auroral phenomena including the satellite-determined statistical location of Birkeland currents. Birkeland's original depiction of field-aligned currents published in 1908 is shown in the lower right corner. (Courtesy of Wikipedia)

Figure 2. Portrait of Kristian Olaf Bernhard Birkeland. (Courtesy of Wikipedia)

often are much stronger than those of a geomagnetic storm but are strictly local, fading away quickly as one moves toward the equator. This suggests that the currents that disturb the magnetic fields flows somewhere nearby — probably near the auroral arcs.

Curious Science

Norwegian physicist Kristian Birkeland (whose portrait appears on Norwegian currency), carefully observed auroral disturbances and concluded that the currents flow parallel to the ground, along the auroral formation. Because electrical currents must flow in a closed circuit, and because these magnetic disturbances seemed to be caused by processes taking place in distant space, Birkeland proposed that the currents came down from space at one end of an arc and returned to space at another end.

In 1910, Birkeland performed a series of experiments to reproduce many of the characteristics of the aurora that he observed during his expeditions. He placed an electromagnetic sphere, coated with fluorescent paint, inside a vacuum chamber and projected a beam of electrons at the sphere. This enabled him to view the trajectories of streaming electrons. Birkeland was able to accurately reproduce how solar wind would make its way into the Earth's magnetic poles, and was able to simulate the auroral ovals near the Earth's magnetic poles.

It wasn't until 1954 that auroral electrons were actually observed by sensors aboard a rocket launched into an aurora by Meredith, Gottlieb, and Van Allen, of Van Allen's team at the University of Iowa. The Van Allen team discovered Earth's radiation belts, now called the Van Allen Belts.

Continual research has revealed that aurora is caused by the large-scale interaction between the earth's magnetic field and the solar wind. The magnetic field around the Earth, the magnetosphere, is distorted by a flow of charged particles, mainly protons and electrons, which flow away from the sun. This flow is called the solar wind, which also contains magnetic field lines.

The Big Force Field Around Earth

On the windward side of Earth, the side mostly facing the sun, a bow shock is formed in the magnetosphere, while on the leeward, opposite side, the magnetosphere is dragged out into a long tail. As this happens, the magnetosphere acts as a giant shield around the earth, blocking solar wind particles.

However, there are distinct regions in the magnetosphere where solar wind particles may enter the earth's upper atmosphere. Solar wind particles can enter directly via the dayside cusps or, having been trapped in the plasma sheet around the Earth, they can enter via the enclosed magnetic field lines at the polar auroral oval on the night side.

In 1961, Dr. Jim Dungey of the Imperial College, United Kingdom, predicted that cracks might form in the magnetosphere when the solar wind contained a magnetic field that was oriented in the opposite direction to a portion of the Earth's field. He postulated that the two magnetic fields would interconnect through a process known as "magnetic reconnection" and form a crack in the shield through which the electrically charged particles of the solar wind could flow.

In 1979, Dr. Goetz Paschmann, of the Max Planck Institute for Extraterrestrial Physics, Germany, detected these cracks using the International Sun Earth Explorer (ISEE) spacecraft. Recently, the Imager for Magnetopause to Aurora Global Exploration (IMAGE) satellite, along with the 4-satellite Cluster constellation that flies far above IMAGE, revealed the

direct correlation between a proton aurora (non-visible) and the flow of ions through these cracks.

All of this takes place within the area known as the auroral oval. These are rings with a radius of roughly 1,500 miles, centered on the Earth's geomagnetic poles (not on the geographical pole, nor even magnetic poles). The geographic North Pole is located at 90 degrees north latitude and is the point where the lines of longitude converge. The magnetic North Pole is located roughly at 73.5 degrees north latitude

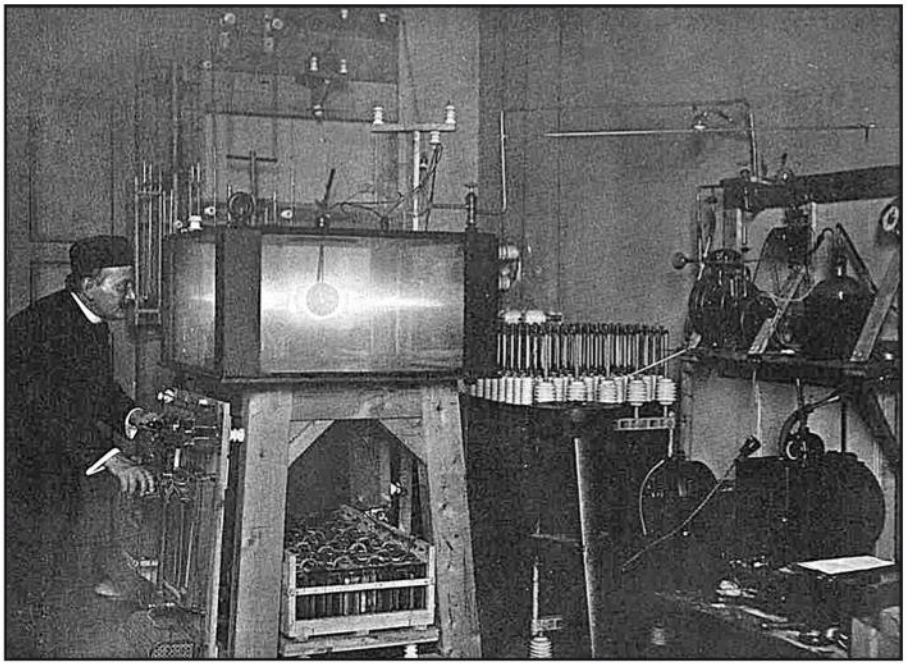


Figure 3. Kristian Birkeland and his terrella experiment, which shows the "zodiacal-light ring." It requires little magnetizing of the globe but a great discharge-current. (Courtesy of <http://www.catastrophism.com/texts/birkeland/>)

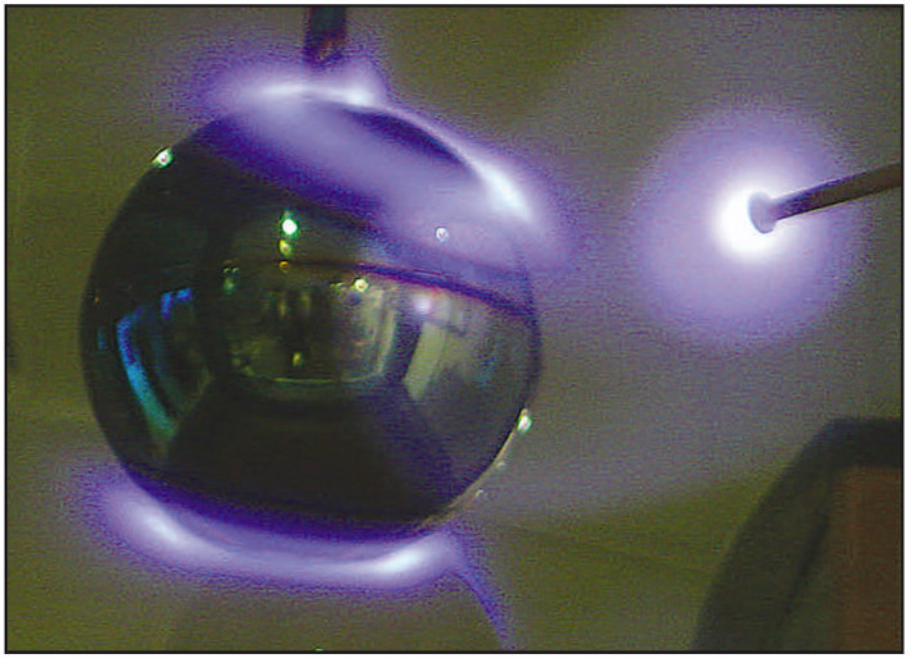


Figure 4. A terrella (Latin of "little earth") is a small magnetized model ball representing the Earth. Terrellas had been used up until the late 20th century to attempt to simulate the Earth's magnetosphere, but have now been replaced by computer simulations. (Courtesy of Wikipedia/Universite Paris-Sud (Orsay) – Journes de la Science, 2005)

and 100 degrees west longitude, near Resolute Bay, Canada. This is the point where magnetic medians converge. The geomagnetic pole, however, which is the center of the auroral oval, is located at the northwest tip of Greenland at 78.5 degrees north latitude and 69 degrees west longitude. It is the northern axis of the mathematical field of closest fit to the actual magnetic field of the Earth. Using this geomagnetic pole, we define a set of latitude and longitude coordinates, known as the geomagnetic coordinates. During average solar activity, the auroral oval lies in a ring between about 70 and 75 degrees north geomagnetic latitude. It can grow during geomagnetic storms and shrink during very quiet geomagnetic activity periods, and extends farther south on the nightside of Earth than on the dayside. That means that as the Earth rotates beneath the aurora, a given location will be nearer the oval at night than during the day.

In the early 1970s, scientists recognized a connection between the component of the interplanetary magnetic field (IMF) that lies along Earth's magnetic axis (known as "B sub z (B_z)") and Earth's changing seasons: The average size of B_z is greatest each year in early spring and autumn. So why do these storms increase in strength and number during spring and autumn?

As the Sun rotates (one full rotation occurs about every 27 days), the plasma spewing out from the Sun forms into a spiral shape known as the "Parker Spiral" (named after the scientist who first described it). This solar wind carries with it an interplanetary magnetic field, which ever expands away from the sun in this spiral. Think of one of those rotating lawn sprinklers with jets of water shooting away from the center. You can see a bending or curving of the water lines. As the Earth moves around the Sun, these spiraling solar winds sweep into Earth's magnetosphere. How the magnetic field lines (IMF) in the solar wind interact with the magnetic field lines of the magnetosphere is the key to geomagnetic storms and aurora.

At the magnetopause, the part of our planet's magnetosphere that fends off the solar wind, Earth's magnetic field points north. If the IMF tilts south (i.e., B_z becomes large and negative), it can partially cancel Earth's magnetic field at the point of contact. This causes the two magnetic fields (Earth's and the IMF) to link (think of how two magnets link with one magnet's south pole connecting with the other's north pole), creating a magnetic field line from Earth directly into the solar wind. A south-pointing B_z opens a window, through which plasma from the solar wind and CME can reach Earth's inner magnetosphere, bombarding the gases of the upper atmosphere.

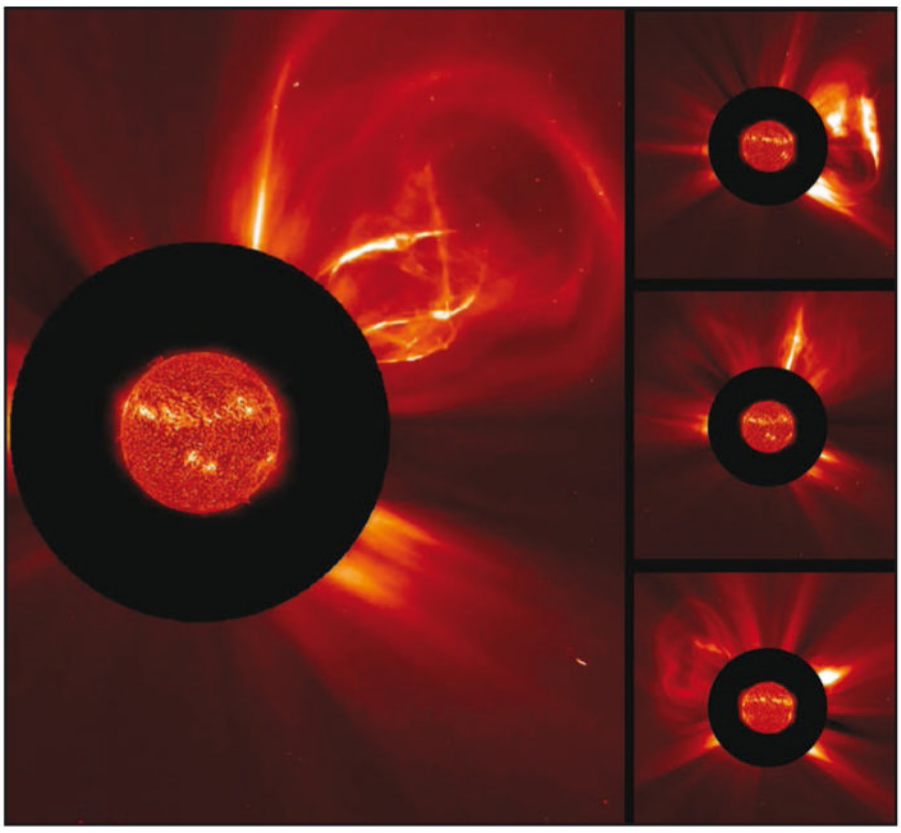


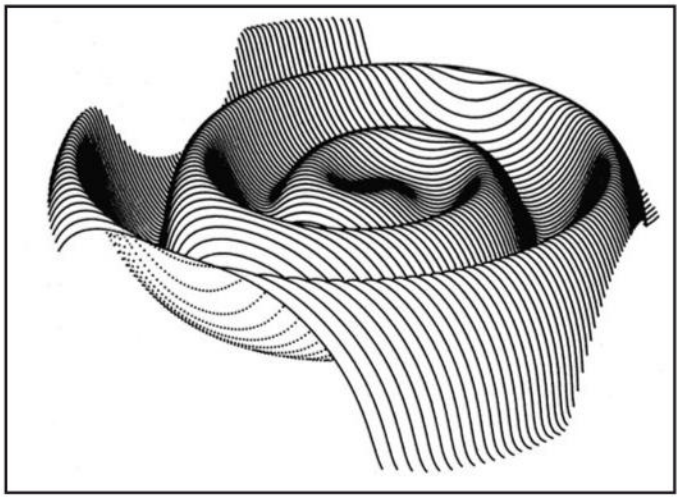
Figure 5. The Sun produced about a dozen coronal mass ejections (CMEs) in eight days between November 22 and 28, 2011. The SOHO C2 coronagraph shows the storms (both large and small) blasting out in different directions. The Sun itself taken by the Solar Dynamics Observatory in extreme UV light was scaled appropriately and superimposed on the coronagraph. This image shows a composite of some of the larger CMEs. The times of the three stacked LASCO C2 images featured in the still are (top to bottom): 11/26/2011 at 07:48:06 UTC; 11/23/2011 at 10:48:06 UTC; and 11/29/2011 at 08:00:05 UTC. (Courtesy of NASA/SOHO/SDO)

Earth's magnetic dipole axis is most closely aligned with the Parker spiral in April and October. As a result, southward (and northward) excursions of B_z are greatest then. This is why aurora is most likely and strongest during the equinoctial months. When we are in the peak of a solar cycle and in the year or so after a peak, solar activity is very high. The amount of solar wind and plasma is large at this point in the cycle, causing very dramatic and spectacular auroral light shows.

When the molecules and atoms are struck by solar wind particles, the stripping of one or more of their electrons ionizes them to such an extent that the ionized area is capable of reflecting radio signals at very high frequencies. This ionization occurs at an altitude of about 70 miles, very near the *E*-layer of the ionosphere. The level of ionization depends on the energy and number of solar wind particles able to enter the atmosphere.

While a correlation exist between visible and radio aurora, radio aurora can exist without visual aurora. Statistically, a diurnal variation of the frequency of radio aurora contacts has been identified that suggests two strong peaks, one near 6 p.m. and the second around midnight, local time.

VHF auroral echoes, or reflections, are most effective when the angle of incidence of the signal from the transmitter, with the geomagnetic field line, equals the angle of reflection from the field line to the receiver. Radio aurora is observed almost exclusively in a sector centered on magnetic north. The strength of signals reflected from the aurora is dependent on the wavelength when equivalent power levels are employed. Six-meter reflections can be



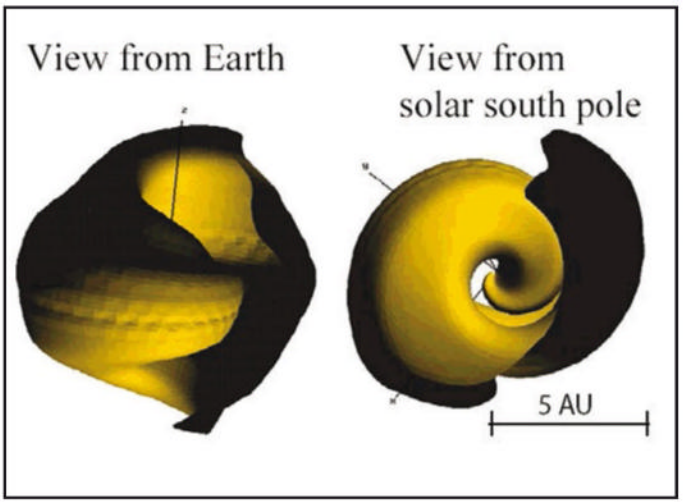


Figure 6 (Left). The heliospheric current sheet is shaped like a ballerina's skirt and extends to the outer reaches of the Solar System, resulting from the influence of the Sun's rotating magnetic field on the plasma in the interplanetary medium. (Courtesy of J. R. Jokipii, University of Arizona)

Figure 6 (Right). The shape of the heliospheric current sheet in March 2000 as calculated by the Blue Horizon supercomputer using data from several spacecraft. (Courtesy of NASA)

expected to be much stronger than 2-meter reflections for the same transmitter output power. The polarization of the reflected signals is nearly the same as that of the transmitted signal.

The K index is a good indicator of the expansion of the auroral oval, and the possible intensity of the aurora. When the K index is higher than 5, most readers in the northern states and in Canada can expect favorable aurora conditions. If the K index reached 8 or 9, it is highly possible for radio aurora to be observed by stations as far south as California and Florida.

Look for aurora-mode propagation when the planetary-K (K_p) rises above 4, and look for visual aurora after dark when the K_p rises above 5. The higher the K_p, the more likely you may see the visual lights. But you don't have to see them to hear their influence on propagation. Listen for stations from over the poles that sound raspy or fluttery on frequencies above 28 MHz, possibly up as high as 440 MHz. Sometimes aurora will enhance a path at certain frequencies, other times it will degrade the signals. Sometimes signals will fade quickly, and then come back with great strength. The reason for this is that the radio signal is being refracted off of the more highly ionized areas that are lit up. These ionized areas ebb and flow, so the ability to refract changes, sometimes quickly. I've observed the effect of aurora and associated geomagnetic storminess even on lower HF frequencies.

Expect an increase in geomagnetic storms, and auroral activity, as we move through March and into April. I have an aurora watch page at <http://aurora.sunspotwatch.com/> that provides up-to-the-minute aurora information and data.

April Propagation

As we move into spring in the Northern Hemisphere, we experience great DX openings from around the world on HF. This is because the sun is most directly over the equator, creating equal day and night periods in both hemispheres. The Vernal Equinox, which will occur on Sunday, March 20, 2016 at 04:30 UTC, marks the day when the hours of daylight and darkness are about equal around the equator.

This creates an ionosphere of similar characteristics throughout more of the world than is possible during other times when it is summer in one hemisphere and winter in the other, and there are extreme differences in the ionosphere. This equalization of the ionosphere, which takes place during the equinoctial periods (autumn and spring) is responsible for optimum DX conditions, starts late in February and lasts through late April.

The improvement in propagation is most noticeable on long circuits between the Northern and Southern Hemispheres. During this season, conditions are also optimal 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. However, with the sunspot cycle in the neighborhood of a smoothed sunspot number of 30 or so, the frequencies from 15 to 10 meters will have sparse openings, with 15 meters being the most active of these upper-frequency bands. If openings occur on these higher bands, expect good DX openings from most areas of the world during the hours of daylight. 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 17 and 20 meters 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 meters is expected to be open longer than 20 meters, with DX through most of the month. 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 40 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 60 and 75/80 meters during the hours of darkness. Propagation patterns on 75/80 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.

Check both long- and short-path openings during the sunrise and sunset periods on all bands, for all paths between the northern and southern hemispheres.

For short-skip openings of approximately 250 miles, check 75/80 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 meters from midnight to sunrise.

For openings between distances of 750 and 1,300 miles, try 20 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, if solar activity is higher.

A seasonal increase in sporadic-*E* ionization usually begins during April and continues through the spring and summer months. Expect an increase in short-skip openings on frequencies from 15 to 10 meters during April, as well as a possible occasional opening on 6 meters. While sporadic-*E* openings may occur at any time, they tend to peak between 8 a.m. and noon and again between 5 and 9 p.m. local time.

VHF Ionospheric Openings

Lyrids, a major meteor shower, will 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 (30 to 60 good-sized meteors entering the atmosphere every hour), this should make possible meteor-scatter type openings on the VHF bands.

Widespread auroral displays can occur during April, as explained above, 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) and planetary-A (A_p) figures.

Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for January 2016 was 34.0. The 12-month running smoothed sunspot number centered on July 2015 is 40.9. A smoothed sunspot count of 42, give or take about 10 points, is expected for April 2016.

The Dominion Radio Astrophysical Observatory at Penticton, BC, reports the observed radio flux for January 2016 was 103.5. The 12-month smoothed 10.7-cm flux centered on July 2015 is 116.0. The predicted smoothed 10.7-cm solar flux for April 2016 is 102, give or take about 14 points.

The observed monthly mean planetary A-Index (A_p) for January 2016 was 10. The 12-month smoothed A_p index centered on July 2015 is 13.1. Expect the overall geomagnetic activity to be varying greatly between quiet and active during most days in April, with storm-level activity improbable.

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. Please check out the space weather and radio propagation self-study course that this columnist is offering at <http://NW7US.us/swc>.

You may email me, write me a letter, or catch me on the HF amateur bands. If you are on Facebook, check out <http://www.facebook.com/spacewx.hfradio> and <http://www.facebook.com/NW7US>. Speaking of Facebook — check out the *CQ Amateur Radio* Magazine fan page at <http://www.facebook.com/CQMag>. Finally, check out my space weather videos on my YouTube channel: <https://YouTube.com/NW7US>.

I'll be keeping my ears to the radio, hoping to hear you on the air. Happy DX!

– 73, Tomas, NW7US

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 are listed in italics. (All country terminology reflects the DXCC list at the time of the contest.)

2015 CQ WW DX SSB RESULTS
SINGLE OPERATOR
NORTH AMERICA
United States-District 1

K1LZ	**A**	**8,223,696**	**4791**	**138**	**486**
N1UR	"	7,172,642	4017	141	506
NN1N	"	1,729,920	1331	122	358
W1WEF	"	1,424,280	1272	100	315
K1LU	"	951,576	928	79	293
N1DD	"	853,902	847	84	294
K1RM	"	822,681	1044	62	221
K1CN	"	549,310	625	78	248
K1BV	"	224,264	413	45	149
AA1O	"	191,142	334	54	168
W1GXZ	"	134,064	283	43	125
KQ2M/1	"	108,120	378	37	69
KB1WXM	"	107,156	268	44	128
W1FQ	"	74,074	193	33	110
W1NSK	"	40,252	133	34	82
WA2HIP/1	"	31,392	135	27	82
W1IKE	"	27,832	110	27	71
KB1ODO	"	26,460	97	35	70
W1KMA	"	2,982	32	16	26
N1FZO	"	693	16	9	12
W3EP/1	**21**	**363,485**	**933**	**29**	**110**
AB1WR	**14**	**113,436**	**293**	**30**	**107**
K1RX	"	96,652	464	15	58
KB1GKN	"	7,700	56	13	37
W1XX	**7**	**212,864**	**621**	**28**	**100**
AA1BU	**3.7**	**101,222**	**413**	**14**	**72**
K1HAP	**1.8**	**1,625**	**30**	**10**	**15**
***K1BX**	**A**	**1,538,685**	**1189**	**103**	**362**
*K1HT	"	738,360	717	93	267
*N1ALO	"	465,930	633	66	213
*K1IX	"	315,268	432	70	199
*W1CCE	"	244,296	371	70	191
*N1DC	"	231,280	378	64	172
*KR1A	"	214,526	355	54	169
					(OP:KL7JT)
*W1JQ	"	213,248	351	54	170
*W1MAW	"	212,962	320	59	174
*WC4E/1	"	200,999	327	64	175
*KQ1F	"	183,184	303	51	163
*K1VSJ	"	168,670	302	45	157
*KA1EKR	"	161,931	272	70	161
*WA1N	"	146,600	266	51	149
*KG1V	"	143,090	276	55	150
*N1JW	"	106,108	229	42	122
*KA1VMG	"	90,880	220	46	114
*W1CRK	"	82,560	204	41	119
*WA1OTZ	"	59,052	165	40	93
*N1GSA	"	57,963	170	40	99
*W1BJ	"	52,440	148	35	103
*KB1YO	"	48,960	124	41	103
*K1LOG	"	44,296	139	29	84
*KC1ANM	"	42,720	142	34	86
*W1ZFG	"	29,085	105	31	74
*W1LUC	"	27,120	101	40	73
*NQ1C	"	24,099	113	23	64
*K1LHO	"	23,540	127	30	80
*KE5ISO/1	"	17,385	82	30	65
*K1WCC	"	9,348	58	18	39
*K1VOI	"	9,052	58	26	47
*KD1O	"	8,265	52	16	41
*KC1PR	"	7,685	54	12	41
*AB1DQ	"	6,720	55	24	40
*KA2DTH/1	"	4,698	40	22	32
*KC1AJT	"	3,828	36	17	27
*K1MTD	"	3,150	30	18	27
*NØIZE/1	"	2,673	31	11	22
**N1IMW*	*"*	*2,405*	*31*	*14*	*23*
*K1DRV	"	2,376	30	12	21
*WA1TE	"	1,645	21	16	19
*AA1HK	"	1,274	27	10	16
*KB1ZAC	"	1,140	29	10	20
*W4FEB/1	"	12	2	2	2
***N1WRK**	**28**	**60,698**	**237**	**18**	**71**
*NM1G	"	37,288	170	19	60
*NJ1Q	"	9,114	74	13	36
*KB1DMR	"	1,431	22	8	19
***W3SM/1**	**21**	**122,752**	**389**	**24**	**88**
***KC1DKY**	**14**	**2,176**	**30**	**9**	**23**
*W1PEF	"	576	14	6	12
**AB1QZ*	*"*	*90*	*10*	*8*	*10*
NN1SS	**AA**	**5,456,136**	**2803**	**151**	**540**
W1GD	"	3,562,000	1920	131	519
W1CTN	"	3,117,215	1782	129	506
K1LD	"	1,890,278	1155	130	468
W1QK	"	1,857,579	1330	104	399
W1TO	"	1,760,598	1161	115	419
K1JB	"	1,650,701	1107	117	416
W1EBI	"	1,648,920	1138	108	412
WX1S	"	1,504,992	1107	118	370
KG1E	"	1,415,232	1039	104	382
AB1NE	"	1,305,185	1055	94	351
K1KI	"	1,293,600	1085	111	351
NT1K	"	1,202,421	998	96	343
NB1U	"	1,167,305	822	117	410
NE1B	"	1,119,423	834	103	376
K1SD	"	1,027,824	801	109	374
K2LE/1	"	926,146	843	83	315
AB1JV	"	924,000	721	102	378
W2JU/1	"	822,360	666	96	349
K1RV	"	818,944	644	96	361
N9NC/1	"	771,120	653	96	324
W1FJ	"	738,500	657	104	318
KB1W	"	700,606	701	78	280
W1UK	"	685,200	613	92	308
WK1J	"	672,792	650	87	301
N1BCL	"	650,520	649	98	292
K1VK	"	580,300	603	93	257
K1BG	"	561,388	433	107	372
K1ESE	"	553,776	596	72	260
K1KA	"	533,628	560	87	279
KV1J	"	523,020	508	97	282
W1HIS	"	497,743	469	92	299
N1MD	"	411,936	448	77	259
WA1ZYX	"	369,778	491	63	200
AA1V	"	320,524	332	82	271
N1KM	"	312,018	376	80	242
AE1T	"	294,577	388	66	205
KX1X	"	285,690	391	74	193
W1KQ	"	273,760	410	49	187
K1TH	"	259,000	367	63	196
KK6VKF/1	"	258,396	384	63	181
AA1QD	"	240,750	286	87	234
K1HI	*"*	*211,302*	*307*	*61*	*212*
W1NG	"	190,762	239	80	219
K1SM	"	181,441	321	60	161
W1EQ	"	168,867	241	59	202
KA1IOR	"	167,254	249	62	179
KA1O	"	147,968	213	71	201
N1GLT	"	124,956	200	70	164
K1MO	"	124,740	248	43	137
KG1D	"	111,826	233	50	137
K1ZZ	"	100,572	204	44	130
W1RM	"	89,880	160	71	143
W1ZQ	"	71,205	201	40	101
WM1G	"	51,600	152	34	95
WA1DRQ	"	39,804	134	30	77
K1IG	"	39,060	120	31	93
K1RI	"	34,945	123	37	108
K1GQ	"	15,980	69	32	62
AB1QB	"	13,528	58	33	56
W1PL	"	13,104	68	24	48
NF1A	"	10,374	52	32	46
KG5HEW/1	"	7,872	50	22	42
WV1M	*"*	*6,862*	*49*	*13*	*34*
WE2W/1	"	45	3	2	3
W3IZ/1	**28A**	**61,600**	**223**	**19**	**81**
W1NK	**21A**	**35,672**	**137**	**21**	**70**
W1ZZ	**3.7A**	**11,221**	**79**	**10**	**39**
***W1UE**	**AA**	**4,143,150**	**2171**	**141**	**534**
*KS1J	"	1,806,060	1378	102	363
*W1NT	"	1,488,302	1203	99	347
*KA2KON/1	"	1,044,869	882	95	332
*KG4V/1	"	743,219	722	85	294
					(OP:N1EN)
*WT1A	"	663,950	680	76	274
*N1API	"	648,240	641	75	290
*W1UJ	"	615,075	550	95	322
*NF1O	"	376,988	437	67	249
*K1TR	"	349,479	413	78	231
**KE1V*	*"*	*295,608*	*477*	*57*	*169*
*WO1N	"	256,360	320	75	215
*KC1BOH	"	205,425	278	61	214
*W1DYJ	"	201,438	272	72	207
*K1GJY	"	184,416	317	59	167
*K1TW	"	127,224	262	44	127
*NE1F	"	114,392	227	40	141
*K3IU/1	"	112,230	235	41	133
*KC1AXJ	"	84,508	220	39	109
*K1RO	"	75,310	162	41	129
*KC1ACN	"	64,719	190	42	111
*W1RPG	"	61,200	153	37	107
*KC1CRS	"	33,401	107	44	83
*K1KU	"	14,664	64	30	64
*N1EEK	"	10,595	59	19	46
*W1MSW	"	7,448	48	20	36
*W1KM	"	5,355	44	17	34
**WD1S*	*"*	*2,596*	*29*	*21*	*23*
*AB1XB	"	1,421	23	12	17
*KG6CIH/1	"	589	11	9	10
***N1DG**	**28A**	**220,500**	**531**	**30**	**120**

District 2

N2NT	**A**	**3,345,341**	**2383**	**126**	**395**
					(OP:WW2Y)
WA2NHA	*"*	*1,215,564*	*1095*	*85*	*321*
W2LU	"	874,449	852	104	313
W1WV/2	"	460,970	526	78	232
KB2SXT	"	420,233	583	52	201
WB2PJH	"	409,979	543	63	218
WS9M/2	"	358,556	520	72	209
WB2HJV	"	352,240	446	79	217
K2QY	"	285,950	431	63	203
WB2KLD	"	250,472	377	65	174
K2CX	"	246,422	372	66	187
KW2J	"	179,154	312	60	162
WB2NFL	"	142,683	271	50	149
N2ZL	"	135,222	269	47	139
K2JMY	"	128,372	371	72	196
N2IIE	"	108,640	256	41	119
WB2WGH	"	82,050	203	38	112
N2JJ	"	59,670	161	38	97
KC2LST	"	48,250	142	38	87
W2UDT	"	42,904	160	38	86
KA2AEY	"	37,730	141	22	76
W2REA	"	25,792	100	41	63
W2LC	*"*	*7,056*	*51*	*12*	*36*
KD2DWD	"	5,565	40	19	34
KC2KZJ	"	4,278	37	16	30
W2RR	**28**	**14,981**	**75**	**16**	**55**
					(OP:WA2AOG)
W3EH/2	"	12,650	90	12	43
KU2M	**21**	**1,118,340**	**2355**	**38**	**133**
N2ZN	**14**	**6,072**	**50**	**10**	**34**
N2AMW	"	4,840	47	7	33
KA2BXH	"	1,525	22	8	17
W2XL	**3.7**	**27,000**	**142**	**17**	**55**
W2VO	**1.8**	**4,440**	**53**	**8**	**29**
***WA2JQK**	**A**	**447,100**	**519**	**76**	**264**
*N2BEG	"	440,122	492	87	250
*WA1FXK/2	"	414,256	555	65	207
*AB2TC	"	281,732	475	49	160
*KC2TA	"	202,240	297	59	197
*KC2QJB	"	178,200	296	46	174
*W2ID	"	172,134	289	60	159
*WW2V	"	168,116	300	58	154
*KD2NE	"	162,848	286	62	162
*K9CHP/2	"	151,488	294	50	142
*K2WJL	"	124,600	256	41	137
*KD2JOE	"	109,032	248	43	125
*WA2QAU	"	100,920	215	46	128
*NT2I	"	93,729	229	43	114
*KD2DXI	"	83,096	173	59	129
*WA2TYK	"	67,734	163	50	109
*W2DFC	"	64,326	198	42	100
*W2RES	"	61,061	155	40	103
*N2IVN	"	52,244	135	43	105
*N2VM	"	30,573	111	36	93
*KD2BXD	"	30,392	98	29	87
*K2CC	"	27,324	106	26	66
(OP:KC2QVD)					
*N2LBZ	"	25,908	99	31	71
*KC2PDO	"	22,472	86	30	76
*KC2OSR	"	19,789	104	22	55
*W2VU	"	18,146	84	22	64
*AC2MT	"	15,580	80	24	52
*K2MIK	"	14,550	74	28	47
*KX1W/2	"	14,418	91	30	51
*KV2X	"	12,474	66	29	52
*KB2SDF	"	12,080	70	30	50
*KC2ASA	"	11,524	61	22	45
*N2UJN	"	10,098	58	26	40
*NW2K	"	8,374	55	17	36
*AC2OC	"	7,392	50	24	42
*W2VDZ	"	6,325	44	19	36
*W2HCB	"	6,272	48	20	36
*KC2MBV	"	6,254	46	21	38
*KD2DXJ	"	4,320	44	17	28
*W2YK	"	3,456	32	10	26
*KC2RZZ	"	2,840	29	15	25
*KD2FJQ	"	2,109	23	14	23
*KB2GD	"	1,645	24	13	22
*W2MRD	"	1,479	19	11	18
**KC2JRQ*	*"*	*768*	*14*	*10*	*14*
*KC2SYF	"	380	12	10	10
***WN2IHJ**	**28**	**11,536**	**85**	**18**	**38**
*N2VIG	"	10,200	73	14	46
*KG2DWS	"	2,574	33	9	24
***NA2X**	**21**	**704**	**17**	**7**	**15**
*K2JF	"	140	6	5	5
***AD2EE**	**14**	**17,451**	**110**	**14**	**49**
*NG2S	"	12,749	82	17	44
*N2CEC	"	8,624	75	12	37
*KD2JAA	"	8,064	51	19	45
*KD2CJR	"	1,274	33	7	19
*AG2AA	"	294	11	4	10
*WA3YRI/2	"	170	6	4	6
N2MM	**AA**	**4,107,504**	**2270**	**138**	**526**
W2IRT	"	3,242,157	1858	131	482
W2RD	"	2,179,008	1334	136	440
W2GDJ	"	1,761,452	1174	120	419
KE2TR	"	1,735,314	1216	115	408
KF2O	"	1,713,165	998	138	493
N1IBM/2	"	1,621,640	1016	121	450
K2CYE	"	1,478,469	1092	98	373
N1EU/2	"	1,457,704	1025	117	397
KM2O	"	1,369,235	992	120	377
W2YR	"	1,315,650	903	123	414
N2SR	"	1,294,380	1075	86	337
K2EP	"	1,201,332	885	105	374
W2GR	"	1,121,440	992	89	341
W2LE	"	1,040,546	924	88	315
WA2OAX	"	1,032,264	700	118	413
K2CJ	"	1,012,275	871	85	324
WA2MCR	"	923,106	820	95	316
W2CCC	"	881,460	770	103	312
					(OP:K2CS)
KE1IH/2	"	871,812	804	92	305
N2ED	"	625,976	684	79	259
WS2E	"	537,543	505	102	285
N2VW	"	493,955	488	92	293
W2LK	"	445,830	478	83	247
KA2D	"	426,384	459	79	257
K2QPN	"	355,080	465	64	205
AB2E	"	351,024	424	78	231
K2KQ	"	338,744	383	86	236
K2RET	"	324,386	488	52	189
K2MK	"	279,930	461	41	174
NA3E/2	"	250,875	396	52	173
W2OSR	"	219,240	366	63	169
KF2E	"	186,651	309	51	172
WB2NVR	"	152,520	328	37	127
K2XF	"	134,325	241	48	151
K2RB	"	130,416	278	39	137
NB2S	"	111,389	241	40	127
W2DZ	"	105,840	206	63	133
N2YBB	"	101,752	217	52	132
N2JNE	"	93,264	212	51	123
N2NI	"	49,140	144	36	90
WX2S	"	45,880	119	48	100
AK2S	"	42,000	133	35	85
N2RJ	"	30,470	104	34	76
K2NP	"	24,503	84	36	71
K1PTF/2	"	14,800	72	26	54
K2HAT	"	2,242	24	15	23
WB2TPS	"	1,792	22	10	18
KC2YEA	"	748	12	11	11
KC2SP	*"*	*589*	*11*	*8*	*11*
K2SSS	**28A**	**480,048**	**1208**	**30**	**116**
N2CU	"	12,314	98	16	31
N2MUN	**21A**	**170,884**	**510**	**24**	**95**
N2ROQ	**7A**	**11,466**	**67**	**13**	**50**
KN2T	*1.8A*	*2,619*	*88*	*9*	*18*
***N2SQW**	**AA**	**1,576,436**	**1221**	**97**	**361**
*KC2LRC	"	847,077	772	95	304
*WB2WPM	"	554,090	606	73	262
*K2ZR	"	543,502	625	80	251
*W3MR/2	"	453,612	446	94	273
*N2FF	"	378,459	420	76	245
*NM2O	"	296,424	405	65	211
*N2TXG	"	226,010	357	50	183
*KE2D	"	164,256	261	72	160
*K2MFY	"	151,716	297	48	140
**WW2P*	*"*	*142,380*	*223*	*61*	*165*
*W2ZS	"	138,681	305	48	123
*W2FDJ	"	136,320	259	51	141
*W2NTV	"	107,282	206	54	140
*K2QMF	"	105,570	246	31	122
*K2LML	"	101,601	233	38	121
*K2TER	"	96,992	176	54	170
*AB2IO	"	27,645	117	26	69
*KD2HFN	"	22,256	78	34	73
*K2SI	"	20,128	102	25	49
*AG2T	"	13,179	74	19	50
**K2MFR*	*"*	*5,166*	*53*	*10*	*32*
*AA2LF	"	1,920	26	9	21
*W3DNQ/2	"	646	12	8	11
***K2QB**	**28A**	**20,306**	**108**	**15**	**56**
*WA2LUL	"	153	6	3	6
***W2AW**	**21A**	**256,122**	**598**	**32**	**121**
					(OP:N2GM)
*KS2G	"	96,336	316	22	86
***N2GA**	**14A**	**1,456**	**22**	**9**	**17**

District 3

K3ZO	**A**	**4,608,564**	**2946**	**126**	**425**
AA1K/3	"	4,159,254	2712	124	437
K3UL	*"*	*2,556,026*	*1822*	*133*	*388*
K3TC	"	1,857,278	1330	111	388
N3RJ	"	776,480	762	92	276
W3KL	"	673,678	702	92	242
K3CCR	"	652,979	695	79	270
					(OP:N3UM)
K3ZA	"	632,712	713	77	251
4U1WB/3	"	507,746	1052	73	181
					(OP:AJ3M)
KB3Z	"	478,800	553	75	240
NW3H	"	236,586	408	65	193
N3CB	"	172,356	313	54	158
N3XF	"	162,604	285	66	146
K2PM/3	"	112,833	227	51	138
N3PPH	"	61,623	175	28	95
KA3YNV	"	59,640	176	36	104
KC3II	"	56,672	181	25	87
W3SCA	"	25,536	95	33	81
W2CDO/3	"	16,268	79	27	56
K3ISH	**21**	**7,849**	**63**	**16**	**31**
AI3Q	**14**	**42,583**	**152**	**23**	**74**
***K3CR**	**A**	**3,568,956**	**2190**	**133**	**446**
					(OP:LZ4AX)
*N8NA/3	"	884,520	825	82	308
*W3BGN	"	672,764	770	77	239
*K3SU	"	662,993	727	75	256
*NA1DX/3	"	367,319	493	80	209
*N3OJL	"	307,664	423	67	201
*K3CWF	"	299,466	419	59	195
*WA3SRU	"	180,095	329	49	150
*W3IUU	"	143,871	253	66	155
*K3URT	"	135,050	285	42	143
*K3JZD	"	129,850	295	44	131
*WB3ESR	"	124,916	271	35	132
*K3NDM	"	90,768	203	51	135
*W3BC	"	88,920	199	49	131
*N3MWQ	"	66,766	200	33	100
*W3ZX	"	62,370	171	34	101
*WA3AAN	"	58,725	167	36	99
*K3JD	"	47,838	136	39	95
*KK6L/3	"	39,904	138	36	80
*KA2VLP/3	"	35,768	119	46	90
*K3LAB	"	32,856	109	34	77
**W3GY*	*"*	*31,941*	*121*	*40*	*77*
*KØBAK/3	"	24,095	113	18	61
*K3JPT	"	23,664	103	25	62
*K3MZ	"	20,520	83	26	64
*K3KU	"	20,176	85	38	66
**KB3AC*	*"*	*17,751*	*76*	*37*	*60*
*KC3CIP	"	15,824	75	31	55
*KB3RKM	"	14,744	77	23	53
*N3NTF	"	12,104	78	26	42
*WW3N	"	8,619	62	11	40
*WS3S	"	8,418	59	19	42
*N3TWM	"	6,480	48	19	35
*ND3R	"	5,104	42	14	30
*KB3QWC	"	5,088	35	20	33
*AB3WM	"	1,984	22	11	21
*KB3GJT	"	1,870	23	13	21
*KC3CNT	"	1,700	23	13	21
*W3SFG	"	805	15	10	13
*N3VKK	"	660	15	9	11
*KC3DEI	"	506	11	11	11
**N3GBJ*	*"*	*416*	*9*	*7*	*9*
*W3DKT	"	72	5	4	4
***K3MSB**	**28**	**96,250**	**320**	**24**	**86**
*W3DF	"	58,869	232	23	70
*K3SWZ	"	42,944	180	21	67
***KX2S/3**	**14**	**26,325**	**124**	**19**	**62**
*WA2VQV/3	"	1,122	20	7	15
*KC3ASH	"	364	10	5	8
***KB3LIX**	**7**	**29,484**	**135**	**17**	**61**
***K3LA**	**3.7**	**966**	**19**	**7**	**16**
K3WW	**AA**	**6,889,155**	**3448**	**151**	**570**
N3RS	"	5,158,964	2728	142	526
AA3B	"	4,647,250	2573	134	507
W3LL	"	4,050,625	2318	133	492
K3ZU	"	3,726,401	1999	149	524
N3AD	"	3,554,646	2009	145	514
N3RR	"	2,906,568	1669	144	488
NW3Y	"	2,596,808	1650	127	439
AA1ON/3	"	2,420,558	1516	132	442
K3SW	"	2,214,468	1447	119	429
					(OP:K4IKM)
K1RH/3	"	1,835,460	1282	109	406
W3GM	"	1,833,300	1245	116	409
					(OP:K3ND)
K2PLF/3	"	1,689,510	1097	127	439
K3OO	"	1,557,387	1110	109	384
K3IPK	"	1,449,396	1045	109	385
W3PHL	"	1,412,430	958	119	415
					(OP:N3ZA)
NK3Y	"	1,200,193	1066	91	310
W3JX	"	1,158,885	907	106	349
WA3F	"	1,093,120	924	101	326
KD3TB	"	1,087,478	879	103	346
W3GK	"	1,081,422	909	102	336
KC3WX	"	1,055,313	859	102	339
WB2ZAB/3	"	996,003	1058	91	242
K3TUF	"	978,144	813	99	344
WC3N	"	966,552	907	91	300
K3WJV	"	847,798	747	96	326
N3MX	"	843,372	749	100	311
K3ATO	"	755,827	724	90	299
N3FJP	"	682,528	722	88	264
W3OU	"	665,754	652	87	279
KD3RF	"	605,346	545	90	316
NB3I	"	572,520	594	89	278
W3GVX	"	513,300	617	75	225
WØBR/3	"	388,072	425	99	259
K3WI	*"*	*382,191*	*697*	*36*	*155*
KW3Z	"	360,672	489	69	203
WV2M/3	"	322,392	403	68	235
K3BZ	"	285,957	411	76	191
WA3AER	"	180,188	328	52	162
NS3L	"	112,554	198	67	167
K3SOM	"	108,300	265	32	118
NG3J	*"*	*103,873*	*175*	*46*	*163*
NB3R	"	92,159	210	43	114
NA3M	"	72,468	155	54	129
W3OD	"	70,638	135	72	121
NZ3O	"	37,122	100	39	99
WB3IWC	"	35,260	147	12	70
K8GU/3	"	3,731	32	14	27
N3QE	**28A**	**6**	**1**	**1**	**1**
W3NO	**3.7A**	**59,247**	**248**	**16**	**71**
***KE3X**	**AA**	**3,701,388**	**1970**	**143**	**525**
*W3KB	"	1,315,703	1045	99	358
*K3NM	"	926,274	715	102	385
**AA3S*	*"*	*553,982*	*599*	*80*	*258*
*W3VYK	"	439,582	508	68	251
*N3ALN	"	361,620	466	75	219
*N3YUG	"	290,232	405	63	198
*N3FM	"	115,420	238	57	142
*KB3KNX	"	108,455	203	55	144
**N3UPN*	*"*	*105,927*	*199*	*57*	*144*
*N3WMC	"	72,288	194	40	104
*KB3WD	"	57,159	236	20	67
*ND3N	"	43,428	130	44	97
**AC3SS*	*"*	*36,621*	*132*	*33*	*84*
*KW3F	"	31,110	97	41	81
*N3KF	"	24,640	100	24	64
*K4JDF/3	"	24,347	100	32	65
*KA3YJM	"	21,294	94	24	67
*K3VYY	"	18,915	84	31	66
*K3WGR	"	12,012	58	36	48
*KN3A	"	10,500	55	26	49
*K3DCW	"	9,153	50	40	41
*N3VN	"	7,038	50	27	42
**NE3K*	*"*	*4,510*	*40*	*13*	*28*
*KC3EER	"	594	12	10	12

District 4

NR3X/4	**A**	**4,811,200**	**2876**	**139**	**481**
					(OP:N4YDU)
K4AB	"	4,393,657	2603	144	473
K4JPD	"	3,039,872	2108	134	410
					(OP:N4OO)
KZ2I/4	"	1,557,100	1231	109	351
K4PV	*"*	*1,475,236*	*1478*	*104*	*309*
W4GE	"	887,406	797	91	312
K3ZM/4	"	870,716	1011	76	232
KA8Q/4	"	821,160	801	78	282
W4KW	"	806,008	789	96	293
N4NO	"	789,089	911	73	250
KU4V	"	677,540	666	103	277
NJ2F/4	"	599,724	660	78	246
W4WWQ	"	480,200	523	99	244
N4UFP	"	435,500	515	85	240
NT4TS	"	421,298	499	84	229
W4QK	"	418,728	518	73	219
N4AA	"	377,274	489	63	214
WA4JUK	"	371,250	501	86	211
W4PR	"	228,516	332	75	199
N4GU	"	199,184	340	55	156
K4CEB	"	186,866	309	65	168
KA2NFG/4	"	180,960	311	70	162
WB5WAJ/4	"	178,760	327	57	148
KN4KL	"	178,068	332	63	150
W3SA/4	"	175,189	323	52	151
AB4GG	"	158,080	303	52	138
W1GKT/4	"	156,780	293	54	141
AI4CJ	"	149,744	299	48	143
WB6NYR/4	"	146,664	287	53	141
W4LWZ	"	143,430	277	54	156
WX4US	"	138,381	279	53	140
AE4VJ	"	107,350	207	47	143
W4RHB	"	106,920	209	54	144
N4LZ	"	104,940	238	43	116
N7EO/4	"	93,612	197	48	126
K4KAY	"	90,520	237	39	116
N4KZ	"	86,227	196	46	117
N4CU	"	69,300	174	44	110
K4UN	"	62,986	166	53	101
WA9TTC/4	"	58,116	142	51	116
AI4WW	"	53,997	158	37	86
AA4GT	"	53,820	183	39	99
NA4C	"	50,562	146	60	99
N4APR	"	50,256	141	48	96
KM4CPA	"	35,306	140	41	86
N8AID/4	"	32,918	116	30	79
KK4PC	"	29,785	98	43	72
KW4J	"	29,640	112	42	88
KY4D	"	28,710	106	33	77
K4PP	"	14,972	73	24	52
W9DHD/4	"	11,286	58	25	41
KM4IK	"	10,206	52	35	46
W4ATL	"	8,448	57	27	37
K4BAI	"	8,272	71	21	26
N4CNZ	"	7,590	50	25	41
KN4DS	"	5,985	49	25	38
N4VAN	"	2,440	22	19	21
KC4TNC	"	1,584	22	15	21
N4OX	**28**	**504,900**	**1114**	**33**	**132**
W4SLT	"	120,078	347	28	98
NTØY/4	"	46,400	207	20	60
WB7OND/4	"	4,653	49	7	26
W4RRE	**14**	**60,928**	**213**	**23**	**89**
KF4RPJ	"	22,776	115	19	59
K4KZZ	*7*	*63,300*	*236*	*24*	*76*
ND4Y	**"**	**3,160**	**36**	**14**	**26**
NX4N	"	627	15	7	12
W4QNW	**3.7**	**28,392**	**162**	**18**	**60**
K8EAB/4	"	90	5	2	4
WB4WXE	**1.8**	**2,400**	**34**	**12**	**20**
W4ZYT	"	171	8	4	5
***AD4Z**	**A**	**2,495,871**	**1791**	**120**	**399**
*KK4RV	"	347,706	486	64	210
*KC4TEO	"	293,625	429	60	201
*K7SV/4	"	226,775	345	65	170
**K4SXT*	*"*	*163,770*	*234*	*67*	*198*
*W4UEF	"	152,220	288	59	156
*KV4KY	"	137,104	251	54	155
*AI4GR	"	135,200	249	62	146
*N4EK	"	131,824	306	35	119
*WA4RNN	"	123,210	279	49	136
*K4FTO	"	120,793	256	53	146
*K4DMH	"	119,972	274	55	123
*K4ORD	"	117,658	244	55	123
*KR4M	"	102,935	220	48	125
*K4FJW	"	102,243	225	64	133
*N8FF/4	"	95,940	201	50	114
*N4GBK	"	94,570	187	57	136
*W4PFM	"	82,665	199	49	116
*NT4Z	"	66,650	175	48	107
*W9NWY/4	"	61,740	183	34	106
*K4ML	"	52,452	158	32	92
*KN1FE/4	"	51,238	141	47	90
*KM4HRG	"	50,740	159	26	92
*W4DHT	"	50,416	141	42	95
*N4CVN	"	49,780	149	34	97
*W4DFR	"	45,424	140	45	91
*KK4PUX	"	41,888	140	30	89
*KD9LA/4	"	41,309	151	28	73
*K4JAF	"	40,138	125	39	83
*KE4VH	"	37,752	134	40	92
*K4WQ	"	33,428	108	42	80
*WØJTC/4	"	31,654	113	23	75
*W4AFB	"	30,480	101	40	80
*KK4HEG	"	29,715	109	34	71
*WX4TV	"	29,304	118	35	76
*N4HWH	"	28,314	119	40	77
*AE4FH	"	26,418	102	36	75
*K4GOP	"	26,384	101	30	67
*W4FRA	"	26,208	103	30	66
*NQ4K	"	25,988	131	19	54
*AI4KM	"	25,272	135	36	81
*AB4UG	"	24,119	108	30	59
*NY4D	"	23,108	86	40	69
*KK4QOE	"	22,050	96	37	61
*KG4USN	"	21,836	80	37	66
*NC4MI	"	18,952	90	38	65
*WU2T/4	"	18,720	97	22	58
*N8SK/4	"	16,320	82	26	59
**K9HVW/4*	*"*	*14,400*	*89*	*23*	*49*
*WX4ET	"	14,348	80	24	44
*K4XG	"	14,105	76	35	56
*N3TG/4	"	13,806	68	24	54
*KJ4WD	"	13,432	73	24	49
*KI4CBN	"	13,425	71	21	54
*N4DLT	"	13,202	61	28	54
*NØKOE/4	"	13,040	89	20	60
*ND4G	"	11,592	62	27	45
*KI4NVK	"	11,169	56	23	50
*KM4MHJ	"	10,988	79	21	46
*WØQQG/4	"	10,500	64	25	45

*KK4MPR	"	10,275	53	24	51
*W7ZP/4	"	8,568	51	21	42
*KS3K/4	"	7,748	59	16	36
*WX4RM	"	7,714	48	21	37
*KR4YO	"	7,203	54	15	34
*W4GFY	"	5,890	42	25	37
*NP2MR/W4	"	5,229	40	24	39
*KO4OL	"	4,455	42	19	26
*AK4RO	"	3,738	38	13	29
*W9ARO/4	"	3,036	46	21	25
*K4BLL	"	2,832	33	21	27
*KE4QCM	"	2,772	24	20	24
*K4ISR	"	2,405	28	16	21
*KM4HQL	"	2,349	40	11	16
*N4DCT	"	1,947	33	10	23
*NG4L	"	1,600	21	13	19
*WB4HXE	"	1,540	23	9	19
*W4HRL	"	1,305	27	12	17
*KM4MBG	"	1,269	21	12	15
*N4ARO	"	1,242	19	11	16
*WA4GQG	"	1,204	23	9	19
*K1TN/4	"	1,107	16	12	15
*W1NII/4	"	924	21	15	18
*KJ4PJU	"	880	14	9	13
*KJ4CEG	"	840	18	10	14
*KK4IQD	"	600	12	8	12
*AE4M	"	532	19	11	17
*AK4CJ	"	273	8	5	8
*KK4AIZ	"	260	7	6	7
*AB4LX	"	228	7	6	6
*KF4JFU	"	90	5	5	5
*AI4UN	"	24	2	2	2
***K2PS/4**	**28**	**137,826**	**422**	**28**	**89**
*AA4NP	"	17,066	119	17	36
*KM4HOH	"	12,672	86	16	48
*KM4HVE	"	10,672	88	19	39
*K4RDU	"	8,798	60	16	37
*KD4YDD	"	6,215	45	10	45
*N3JT/4	"	2,046	24	11	22
*N8IK/4	"	1,885	27	10	19
*K4VBM	"	1,080	20	8	12
*KD4QMY	"	903	16	7	14
*KK4UON	"	418	16	9	13
***K3MDX/4**	**21**	**50,078**	**200**	**23**	**75**
*WA4JA	"	4,095	43	13	26
***KJ4QHL**	**14**	**66,926**	**239**	**25**	**84**
*KV4LV	"	13,552	95	12	44
*KA1DBE/4	"	8,642	59	14	44
*KK4WPR	"	3,731	35	13	28
*KK4CCH	"	3,108	35	13	29
*KI4EBD	"	340	11	6	11
*KV4UV	"	36	3	2	2
***K4CC**	**3.7**	**6,223**	**52**	**14**	**35**
N4WW	**AA**	**3,671,525**	**1893**	**156**	**559**
N4UU	"	3,287,460	2070	122	464
K5KG/4	"	3,046,218	1841	139	470
W4FS	"	2,813,586	1800	124	442
K4OV	"	2,704,526	1782	116	422
N6AR/4	"	2,697,200	1618	140	473
N4HB	"	2,309,195	1393	137	458
K5EK/4	"	2,012,413	1320	125	422
W3OA/4	"	1,997,640	1283	126	432
W3GQ/4	"	1,895,936	1279	128	401
WJ2D/4	"	1,770,876	1217	116	397
N4PQX	"	1,720,469	1025	134	455
W4DXX	"	1,600,938	964	140	481
N4KG	"	1,559,528	948	138	466
NF4A	"	1,529,550	1071	119	396
K4FS	"	1,521,398	1119	112	381
WX4G	"	1,448,172	1088	127	379
NA4K	"	1,335,180	1013	111	365
K1KNQ/4	"	1,246,859	986	117	346
N1TO/4	"	1,168,308	1077	82	309
K3IE/4	"	1,119,255	923	95	340
K4LM	"	1,062,928	770	118	378
N4QS	"	1,009,718	902	92	309
WS4WW	"	987,470	934	88	294
K1PT/4	"	979,824	792	110	337
W4VIC	"	879,606	870	85	293
AD8J/4	"	795,910	811	84	271
W4JVN	"	756,360	759	87	273
W3CF/4	"	744,398	594	108	359
W2YE/4	"	735,801	740	86	277
K5VIP/4	"	695,725	608	95	330
K4WMS	"	667,058	580	116	318
N4PD	"	650,036	589	97	307
N3KN/4	"	604,702	670	74	255
W7DO/4	"	587,708	523	105	302
K4GAA	"	566,100	604	80	260
N9DFD/4	"	558,446	586	80	273
K1GG/4	"	552,299	508	115	292
W4LT	"	535,797	625	87	246
KG4W	"	509,371	518	92	269
W4TTY	"	489,142	447	92	306
NJ4V	"	455,088	552	68	236
N4TL	"	437,370	521	73	232
N4BCD	"	434,730	484	92	245
NN4X	"	420,480	428	95	265
KE4UW	"	364,080	331	101	309
ND7J/4	"	355,320	401	80	249
K3SV/4	"	320,379	421	59	210
KE4S	"	314,552	416	72	202
N8ZFM/4	"	301,185	345	88	257
NO9E/4	"	300,263	409	75	208
ND2O/4	"	288,144	402	64	212
N4DU	"	288,073	397	87	184
ND4V	"	277,986	313	79	242
K4RO	"	276,427	421	72	169
AJ4VE	"	259,752	345	72	202
AJ4A	"	258,700	316	108	217
KD2JA/4	"	240,755	344	80	189
AJ1F/4	"	239,316	371	69	162
NS4X	"	212,589	338	66	171
N2TU/4	"	205,296	275	64	209
K8YC/4	"	204,892	266	79	204
KJ4IPF	"	152,435	273	63	152
NV4A	"	149,296	240	61	187
K3SEN/4	"	148,920	288	60	144
K5AUP/4	"	139,725	225	66	159
W4UT	"	111,033	245	41	128
W8KRZ/4	"	105,786	226	38	124
K4KRK	"	86,940	183	59	130
AA4DD	"	82,877	190	57	122
KK4KW	"	67,415	175	31	108
W8LIG/4	"	62,495	158	34	111
W1IE/4	"	53,108	152	50	92
K4WW	"	50,064	134	47	102
K4SBZ	"	48,042	131	50	107
KK4VA	"	43,569	116	47	94
K4YYL	"	41,789	116	44	87
KT4Q	"	40,002	123	30	88
W4KTR	"	28,388	107	24	70
WK4Y	"	27,930	94	28	86
AD4YQ	"	26,208	88	39	73
NB4F	"	23,300	89	37	63
KE4KMG	"	22,422	80	41	70
N4DXI	"	21,228	100	31	56
W4EAB	"	18,744	86	25	63
NK4K	"	16,254	75	29	57
N4JOW	"	12,284	62	25	49
WA4HXC	"	11,152	68	15	53
ND1Y/4	"	9,648	50	23	49
WB4EHG	"	8,125	59	19	46
K2SD/4	"	6,786	47	23	35
KD5M/4	"	5,684	45	15	34
W4BCG	"	4,823	40	20	33
N4FY	"	4,120	40	13	27
WA4MSU	"	3,248	41	13	16
N4XYZ	"	2,028	24	16	23
WA6POZ/4	"	1,612	20	11	20
W4/UT5UDX	"	300	9	7	8
KB4FB	"	54	3	3	3
AD4EB	**28A**	**191,970**	**526**	**28**	**107**
W4ML	"	166,830	443	26	108
					(OP:W4MYA)
W9IL/4	"	74,655	244	22	83
K4EDI	"	68,880	208	23	97
N4BP	"	53,165	127	32	123
WØPV/4	"	37,151	139	23	74
AB4B	**21A**	**773,245**	**1528**	**39**	**148**
KØLUZ/4	"	355,971	798	37	124
W4ANT	"	2,788	26	16	25
N4KH	"	1,150	24	9	14
K4BGV	**14A**	**1,058**	**24**	**8**	**15**
W2TA/4	**7A**	**68,794**	**228**	**26**	**92**
KD4RH	"	28,900	133	22	63
***N3ZV/4**	**AA**	**919,646**	**787**	**107**	**327**
*N2ESP/4	"	412,064	469	78	238
*W8EEY/4	"	375,468	507	61	207
*NN4RB	"	293,220	401	70	200
*WF7T/4	"	208,980	314	75	183
*K4DMR	"	159,236	233	59	183
*W4ZAO	"	157,832	261	59	159
*N4CV	"	142,524	270	59	155
*N4HXI	"	141,564	275	46	142
*KO9V/4	"	115,070	230	44	141
*KJ4YPY	"	113,274	244	47	127
*W3ZL/4	"	103,641	200	65	128
*K4AOR	"	85,332	213	50	106
*AA4LR	"	81,104	219	52	96
*KD4UZ	"	76,895	172	44	125
*KC5CMX/4	"	74,555	162	53	132
*KK4BKD	"	69,120	198	38	97
*N4LAG	"	52,875	136	43	98
*K4WI	"	51,770	119	64	103
*W4TTM	"	50,140	155	31	84
*W4WNT	"	32,890	115	34	81
*KD4ACG	"	27,030	92	28	78
*NC9W/4	"	20,758	86	31	66
*KK4R	"	14,025	74	32	53
*WS1C/4	"	13,886	63	46	60
*N4YHC	"	13,515	66	29	56
*KD4LEM	"	12,328	78	19	48
*W4CNA	"	10,224	56	25	47
*KLØET/W4	"	9,717	64	24	55
*N1RM/4	"	9,504	58	26	40
*KT4FQ	"	9,072	59	23	40
*KK4TUX	"	4,944	38	15	33
*KJ3Q/4	"	4,120	37	14	26
*AB4VT	"	3,182	32	17	26
*N4UEZ	"	665	15	7	12
*KK4CBL	"	304	10	6	10
*K4TOJ	"	180	6	4	6
*WB2RIS/W4	"	150	5	5	5
***N3CZ/4**	**28A**	**25,039**	**125**	**20**	**53**
*KD4SEV	"	3,256	37	17	27
***N3UA/4**	**21A**	**15,054**	**73**	**22**	**56**
***N4DL**	**14A**	**73,401**	**209**	**31**	**98**
*NW4V	"	10,176	57	17	47
***KCØMCK/4**	**7A**	**4,180**	**35**	**12**	**32**
***W4JDS**	**3.7A**	**48**	**4**	**3**	**3**

District 5

N5DX	**A**	**7,336,080**	**4079**	**163**	**527**
NR5M	"	3,959,630	3068	146	384
N2IC/5	"	2,388,486	1877	133	341
KM5VI	"	1,679,770	1410	128	354
WD5K	"	1,397,737	1157	123	326
AD5XD	"	1,345,960	1167	111	326
K5RX	"	1,172,626	967	120	322
K5YAA	"	1,126,554	1060	114	315
N5RZ	"	958,176	849	117	315
K5ER	"	743,424	752	97	266
WG5H	"	327,700	551	67	159
AD5UQ	"	161,056	261	64	160
AB5C	"	111,072	253	47	109
K5YM	"	95,744	206	52	124
W5CO	"	80,028	187	53	109
WD5R	"	58,504	214	29	74
N5GI	"	36,888	128	41	75
WV5Y	"	30,690	125	40	70
N5OB	"	28,938	102	29	77
N5DTX	"	12,284	90	32	51
AC5RO	"	11,360	67	25	46
KC5SB	"	5,612	46	16	30
KG5EIU	"	2,924	34	20	23
KF5NRS	"	81	6	5	4
K5RZA	**21**	**11,130**	**83**	**14**	**39**
N5KF	**14**	**26,124**	**112**	**23**	**61**
N1FOY/5	"	3,525	39	14	33
W5GDX	**7**	**1,876**	**26**	**8**	**20**
K8OZ/5	**1.8**	**121**	**18**	**6**	**5**
***N5AW**	**A**	**2,226,978**	**1477**	**139**	**419**
*KF5VDX	"	363,090	489	82	203
*K5KJ	"	216,153	357	60	159
*KE5LQ	"	131,018	226	73	145
*NW5Q	"	122,672	258	55	121
*N5LUL	"	108,192	232	53	115
*K5XU	"	60,188	147	55	109
*KC5QIH	"	55,772	155	49	97
*NN5T	"	50,540	137	47	86
*WB5K	"	49,407	179	42	87
*K1JHS/5	"	39,894	133	43	79
*KF5SLK	"	39,176	134	38	80
*K5OLV	"	35,880	118	46	84
*W5KAL	"	34,629	125	41	78
*K5LAD	"	25,056	109	38	58
*AE5TD	"	22,372	99	33	61
*NM5WB	"	18,984	89	33	51
*AE5ZC	"	15,747	74	34	53
*KF5WFL	"	13,725	73	30	45
*N5CWA	"	12,403	68	26	53
*K5KLA	"	11,682	65	18	48
*AA5WZ	"	10,919	73	23	38
*AF5JG	"	10,620	77	24	36
*KF5SNL	"	9,729	73	28	41
*WA5DSS	"	7,437	54	28	39
*N5STT	"	7,104	41	24	40
*KF5HAJ	"	3,105	30	16	29
*K5BKW	"	2,982	41	20	22
*K5MLY	"	2,178	24	14	19
*KB6OJE/5	"	1,820	27	16	19
*K5IX	"	1,677	24	17	22
*K5UNX	"	1,125	23	13	12
***WE6EZ/5**	**28**	**91,258**	**362**	**24**	**79**
*KG5FII	"	11,648	78	19	37
*W5BM	"	9,971	76	17	42
*KØRVB/5	"	1,540	26	10	18
***K5FUV**	**21**	**113,704**	**341**	**27**	**95**
*K5TMH	"	13,504	86	19	45
*NT5TM	"	12,648	81	19	43
*AF5CC	"	2,387	33	12	19
***KF5CYZ**	**14**	**32,851**	**133**	**25**	**66**
*WD5BHS	"	4,368	41	12	30
*KF5RUW	"	1,148	20	12	16
*AF5OI	"	42	4	3	4
***KD5LNO**	**7**	**16,660**	**97**	**20**	**50**
*KF5TXU	"	1,102	26	8	11
***AC5O**	**1.8**	**48**	**9**	**4**	**4**
K5TR	**AA**	**5,839,540**	**3212**	**165**	**577**
N5DO	"	2,224,000	1438	137	419
K5LLA	"	2,192,940	1463	127	413
W5GN	"	1,747,680	1288	127	401
N5XJ	"	1,488,256	1244	111	337
KE5MMT	"	1,430,703	1129	113	346
K5ZO	"	1,213,940	986	104	351
N5NU	"	1,054,790	898	123	350
N5ZC	"	1,026,104	1025	109	267
NT5V	"	969,516	932	93	289
K9MK/5	"	501,990	440	116	319
KG5CIK	"	364,212	461	91	211
K5CD	"	348,634	501	84	215
K7IA/5	"	276,639	361	84	219
KK7JS/5	"	216,975	289	78	197
W2GS/5	"	201,312	308	57	176
KØNM/5	"	149,098	230	84	170
K5MV	"	139,048	280	55	136
W3TZ/5	"	129,272	221	66	160
K8LS/5	"	112,714	275	56	110
KG5CIJ	"	98,306	212	65	134
K5BG	"	96,996	249	31	106
AC4CA/5	"	84,700	205	50	104
K5CM	"	80,784	207	49	95
WD5GBS	"	72,570	153	53	124
W5THT	"	54,530	156	39	94
W5GFI	"	47,880	139	40	86
K5CI	"	39,446	127	41	80
WA5OYU	"	33,748	142	51	67
KM5PS	"	33,561	110	34	79
W5GA	"	14,706	65	33	53
WA5NOM	"	5,088	34	21	32
W5PR	**28A**	**615,038**	**1297**	**35**	**146**
N5MT	"	86,592	256	31	92
AA5AU	"	33,728	101	27	97
W5RZ	"	3,710	36	11	24
N5KW	"	2,820	39	9	21
W5WMU	14A	56,644	261	26	72
***K5WA**	**AA**	**2,583,819**	**1463**	**155**	**496**
*N1CC/5	"	596,414	562	99	307
*WB5EIN	"	180,715	344	76	159
*N5KPK	"	62,626	134	60	121
*KF5YUB	"	45,240	143	40	80
*K5YVY	"	40,828	135	34	84
*NM5M	"	15,190	65	39	59
*KF5GTX	"	14,586	69	32	46
*KF5WVJ	"	14,356	59	42	55
*WF5E	"	11,284	74	34	57
*NØLD/5	"	3,225	45	21	22
*K5QW	"	1,296	20	10	17
*K5WW	"	170	6	5	5
***N4IJ/5**	**28A**	**199,955**	**529**	**32**	**113**
*KE5SNJ	"	135,250	401	31	94
*WA5WFE	"	84,456	285	25	83

District 6

K6XX	**A**	**3,156,186**	**2395**	**138**	**355**
K6NA	"	1,904,640	1470	140	340
N6TV	"	818,832	895	103	233
NN6DX	"	522,460	645	90	212
					(OP:W1PR)
K6SCA	"	480,194	656	91	195
KØAU/6	"	416,442	558	91	190
WØYK/6	"	407,296	723	96	160
KW6S	"	266,976	446	66	150
W6JK	"	226,000	331	87	163
WW6O	"	189,818	340	70	144
K6YK	"	175,890	332	65	130
WU2SWS/6	"	161,226	267	72	162
WU6X	"	156,060	300	79	125
NA6MG	"	117,121	260	63	110
N6NF	"	109,369	235	58	121
WA6URY	"	93,480	235	65	87
KJ6LJB	"	51,600	188	48	72
WA6MRK	"	51,205	153	54	79
WB6HVW	"	45,260	144	44	80
AD6LV	"	39,055	147	46	61
W4EF/6	"	36,771	111	48	71
W6RFU	"	34,611	146	30	53
					(OP:W6AAF)
K6BEW	"	34,226	127	36	73
AF6SA	"	33,550	113	35	75
AK6TR	"	23,432	88	37	64
AI6II	"	19,046	91	37	52
AD6NR	"	17,019	80	36	57
NBØO/6	"	8,357	53	25	36
K6KNS	"	6,670	55	27	31
W6NS	"	3,640	36	17	18
WA6ERA	"	2,898	29	16	26
AA6MK	"	1,845	55	22	19
WA6FWN	"	1,740	21	14	15
K2YY/6	**21**	**284,532**	**832**	**31**	**100**
WQ6X	"	96,660	349	30	78
K6LRN	"	78,287	237	32	89
NØKQ/6	"	8,586	68	16	38
W6RKC	**7**	**3,924**	**44**	**14**	**22**
***K6GHA**	**A**	**366,612**	**507**	**88**	**186**
*KQ6P	"	197,142	355	65	141
*NZ6Q	"	146,494	317	63	115
*K6MMU	"	136,480	313	48	112
*K6PGH	"	111,720	245	55	113
*K6EGF	"	102,410	199	66	124
*N6PZK	"	101,270	227	75	130
*N6OI	"	66,638	173	46	97
*KA6MIB	"	51,832	164	47	77
*AA6EE	"	48,339	138	47	84
*KG6SVF	"	46,128	148	50	74
*K6MUG	"	44,850	151	48	67
*KE6WC	"	43,121	148	46	61
*K6MCS	"	40,100	149	35	65
*WB8YQJ/6	"	36,838	121	41	72
*N6DZR	"	28,381	102	37	64
*K6CSL	"	25,542	110	45	54
*K6BIR	"	23,940	115	37	47
*K6KHB	"	23,023	110	36	55
*ND6U	"	22,831	116	34	45
					(OP:AB6DX)
*AE6XC	"	20,944	94	34	54
*K6PVA	"	20,181	95	35	58
*N6AJS	"	19,520	97	32	48
*KB6A	"	16,776	102	30	42
*N6ENO	"	16,728	91	35	47
*NJ6W	"	16,072	92	32	50
*KA9A/6	"	15,050	87	30	40
*KJ6PTX	"	13,328	78	27	41
*AG6GL	"	12,692	72	32	44
*KJ6TTR	"	8,909	63	28	31
*AF6GQ	"	7,074	51	20	34
*KB6VME	"	6,972	60	21	21
*K6VDU	"	6,540	45	28	32
*KK6PTS	"	5,376	49	26	30
*W6AOZ	"	5,015	37	27	32
*AI6CN	"	4,644	38	25	29
*AF6VT	"	4,108	39	26	26
*KK6PVS	"	3,920	37	16	24
*KK6DPE	"	2,430	37	18	27
*KK6RDY	"	1,886	43	19	22
*K6PDL	"	1,848	25	14	19
*N6BCT	"	1,804	42	21	20
*KK6UBP	"	1,334	43	27	31
*KK6IEE	"	1,150	20	12	13
*KDØLGH/6	"	858	20	14	12
*N6OIL	"	510	16	9	8
*KJ6UVQ	"	360	11	9	9
*KK6SUV	"	299	18	7	6
***N6BHX**	**28**	**4,896**	**51**	**17**	**19**
*KK6PVH	"	104	7	4	4
*N6RBW	"	6	1	1	1
*KM6Z	21	27,181	138	23	54
*WA7BNM/6	"	20,670	110	20	45
***AE6YB**	**"**	**3,052**	**42**	**10**	**18**
*KU6T	"	476	16	7	7
***K6KMH**	**14**	**1,150**	**19**	**12**	**13**
***NJ6G**	**3.7**	**80**	**6**	**4**	**4**
W6TK	**AA**	**1,926,848**	**1455**	**123**	**353**
W6YI	"	1,498,088	1022	128	414
KX7M/6	"	890,330	1038	101	221
N6QQ	"	537,075	519	95	290
WA6KHK	"	478,315	532	100	253
K5OA/6	"	463,540	601	94	207
WC6H	"	426,852	493	98	236
W6PZ	"	361,762	483	91	186
					(OP:K6SRZ)
W1SRD/6	"	258,048	278	92	244
N6JV	"	252,184	404	64	168
N6ETO	"	210,840	361	60	150
W6SR	"	203,179	389	51	148
K6RC	"	171,156	316	56	148
N6PE	"	147,657	224	61	188
W6DR	"	145,808	265	76	132
NS6E	"	119,238	261	57	110
WU6C	"	119,110	254	69	146
K6JEB	"	112,218	237	65	112
KR6N	"	91,520	261	67	93
K6RR	"	83,732	227	63	110
NK6A	"	71,690	196	42	92
W6GJB	"	60,060	145	66	90
W6FB	"	56,760	162	51	81
WB6BFG	"	55,480	133	44	108
N6AN	"	45,965	129	59	86
K6RIM	"	43,800	114	53	93
KF6I	"	40,600	160	40	60
K9YC/6	"	40,014	127	37	77
K6ELE	"	36,295	147	36	83
NE6I	"	33,600	116	49	63
W9TVX/6	"	31,588	106	31	75
W6SX	"	15,022	84	27	47
AI6EG	"	13,135	77	30	41
K6DN	"	11,070	50	33	49
NA6O	"	9,052	51	29	44
N6GP	"	8,360	54	20	35
AI6Z	"	6,890	40	28	37
K6TA	"	6,466	48	20	33
W6RGS	"	3,600	31	21	27
KM6HB	"	3,526	38	19	22
KM6I	"	3,036	33	16	17
KK6IVX	"	2,478	76	24	35
NE6AA	"	675	20	13	12
K3EST/6	**21A**	**931,245**	**1953**	**37**	**144**
W6AFA	"	433,948	1037	35	122
N2NS/6	**14A**	**63,245**	**165**	**31**	**108**
N6RO	**3.7A**	**18,590**	**130**	**23**	**42**
***N6WS**	**AA**	**1,240,250**	**1007**	**125**	**326**
*NT6X	"	148,288	254	76	148
*N6ORB	"	140,456	271	72	122
*NC6B	"	121,952	235	67	139
*KK6NON	"	79,624	236	54	94
*KB6WKT	"	47,740	120	64	90
*W6KY	"	37,856	136	46	58
*K6DSW	"	29,432	117	44	60
*K6WDE	"	19,359	93	38	43
*W6JBR	"	13,050	67	27	48
*W6JWP	"	7,224	50	25	31
*WB6CZG	"	6,649	42	28	33
*K6LE	"	6,600	44	24	31
*KZ5OM/6	"	6,270	47	29	28
					(OP:K6III)
*KE6TIM	"	6,188	46	24	28
*KJ6LJI	"	5,439	47	24	25
*AA6VX	"	4,608	36	23	25
*AI6CU	"	44	9	6	5
*W6AWW	3.7A	84	7	4	3

District 7

N9RV/7	**A**	**5,573,344**	**3795**	**154**	**402**
K7RL	"	5,350,257	3646	154	407
K5RR/7	"	1,453,200	1249	121	299
W7AT	"	1,096,520	1032	114	281
K9JF/7	"	1,060,618	1092	110	251
KE2VB/7	"	955,080	938	107	272
NX1P/7	"	886,800	1182	106	194
W6AEA/7	"	886,252	1080	78	220
K7XC	"	476,340	534	109	231
N6TR/7	"	364,472	581	75	157
K7ABV	"	354,200	467	85	195
N7RVD	"	330,966	584	79	148
KS7T	"	325,221	450	80	189
K7GQ	"	316,762	453	68	183
NK7L	"	314,826	452	85	189
KM6JD/7	"	291,468	475	69	158
W7YAQ	"	254,174	297	101	233
WX7B	"	211,130	366	72	143
AK7AT	"	208,926	352	72	147
N7XCZ	"	182,646	318	75	144
K6MW/7	"	179,536	303	78	151
W7CAR	"	172,430	328	70	145
W7PV	"	117,564	235	60	142
AD7XG	"	108,800	236	58	112
W6ZQ/7	"	105,450	226	70	115
K7HP	"	99,300	256	62	88
K9JDV/7	"	90,720	224	60	108
KB7AZ	"	62,622	162	47	95
NE7D	"	49,385	155	38	81
W7OXB	"	42,130	157	46	64
W7MCM	"	41,375	126	47	78
K9QJS/7	"	41,093	147	43	66
KF7TY	"	40,600	129	35	81
KØJJL/7	"	40,500	148	50	85
WB7BBQ	"	32,131	114	48	79
WA6NFJ/7	"	28,224	125	37	59
KE7HTL	"	18,240	88	24	52
N7QS	"	15,714	79	32	49
KI7N	"	3,783	35	19	20
KF7BA	"	1,692	20	16	20
AD7AF	"	726	14	10	12
N7LR	"	620	13	11	9
N5CR/7	**14**	**260,865**	**705**	**37**	**116**
KF7WRS	"	41,642	162	24	70
W7PU	"	37,947	169	21	70
W7ON	"	33,282	147	23	63
KI7DG	"	26,010	123	25	65
W7WA	**7**	**532,024**	**1324**	**35**	**111**
N7AU	"	48,500	221	29	71
W7ZZ	"	3,663	44	11	22
N7TA	**3.7**	**7,250**	**63**	**18**	**32**
N7RK	"	2,700	38	11	19
N7GP	**1.8**	**4,200**	**253**	**11**	**24**
					(OP:N5IA)
K7CW	"	473	31	6	5
***W7RM**	**A**	**1,513,600**	**1264**	**130**	**310**
					(OP:K2PO)
*N7IR	"	859,572	833	115	263
*K7ACZ	"	599,460	578	112	276
*N7VZU	"	257,094	397	69	174
*W6US/7	"	224,180	406	82	138
*W8BFX/7	"	177,804	324	73	125
*N7MZW	"	153,408	312	68	120
*NØKVN/7	"	141,264	308	72	144
*K7ANT	"	126,160	287	52	114
*W7TSQ	"	125,120	290	53	117
*K7HBN	"	108,984	258	46	106
*WAØWWW/7	"	99,680	234	47	113
*WB7QXU	"	96,250	212	57	118
*KR2E/7	"	86,344	189	65	107
*AE7AP	"	85,050	210	61	101
*K3WYC/7	"	80,768	244	42	86
*N7AME	"	60,300	188	55	79
*N7TEW	"	59,595	163	54	91
*W7PT	"	52,380	152	44	91
*W7MCP	"	48,068	149	41	81
*K7RBT	"	46,215	154	43	74
*KE7II	"	44,990	155	41	69
*AA7DK	"	39,325	137	48	73
*N7XY	"	37,147	122	50	71
*W7ZI	"	34,000	110	50	75
*AC7SG	"	33,156	120	37	71
*KE7ZAC	"	31,622	126	42	55
*K7RR	"	31,200	118	41	55
*W7SE	"	29,568	129	32	56
*N7JI	"	28,764	118	49	53
*W1DGL/7	"	27,825	131	43	62
*N7INV	"	23,051	101	35	54
*K7KFB	"	22,152	109	36	42
*KV7J	"	21,538	100	31	58
*NS7I	"	20,293	91	35	56
*AC7MX	"	17,940	126	29	36
*KI6LTC/7	"	17,850	85	34	51
*KB6UNC/7	"	17,640	102	38	52
*WS7V	"	16,252	87	23	45
*N7VS	"	14,350	85	37	45
*KI6LSB/7	"	14,276	72	27	56
*KE7DZ	"	13,158	72	37	49
*K7DBN	"	12,998	71	30	37
*KG7VQ	"	12,410	66	25	48
*AF7EL	"	11,760	98	28	42
*KNØJI/7	"	10,296	90	35	37
*AK7MG	"	10,164	95	31	35
*NG7O	"	10,153	53	30	41
*KB7HDX	"	9,900	63	24	42
*KI6AHH/7	"	6,710	61	25	36
*N7AHE	"	6,431	48	28	31
*KM7N	"	6,099	51	22	35
*NT7S	"	5,900	39	24	35
*N7CPM	"	5,626	50	25	33
*K7GZP	"	4,914	49	19	23
*WA6LOC/7	"	4,002	39	21	25
*K3BYU/7	"	3,811	50	15	22
*K1AUS/7	"	2,800	33	14	21
*W7JKC	"	2,520	28	13	23
*NE4RD/7	"	2,142	26	14	20
*KA6JLT/7	"	1,333	32	15	16
*W6RHY/7	"	837	26	16	15
*KG7HSN	"	820	19	10	10
*W7JSD	"	704	14	11	11
*WA7CC	"	368	10	9	7
*N7NIP	"	322	8	7	7
*KG7UET	"	304	10	8	8
*K7TR	"	165	11	6	5
*WM5F/7	"	80	5	4	4
***WY7KY**	**28**	**10,320**	**90**	**21**	**27**
*K7BG	"	1,600	25	10	15
*K7SKE	"	138	8	3	3
*KG7UAV	"	36	18	6	6
*KF7WWP	"	24	2	2	2
***W7UPF**	**21**	**63,700**	**240**	**26**	**74**
*N7MSI	"	1,218	22	9	12
***N6LB/7**	**14**	**19,906**	**117**	**24**	**50**
*W7FYW	"	18,816	87	26	58
*K7KU	"	7,400	59	16	34
					(OP:KØKR)
*W7KME	"	3,916	32	16	28
*KE7NUQ	"	88	4	4	4
*AF7QI	"	81	8	5	4
*W7OSU	"	6	1	1	1
(OP:KG7OQW)					
***WB7FJG**	**7**	**2,926**	**29**	**16**	**22**
*KG7SNE	"	117	5	5	4
KA6BIM/7	**AA**	**1,958,151**	**1557**	**136**	**345**
K7UA	"	1,747,410	1334	120	351
K7WP	"	1,263,210	991	124	350
K7CF	"	854,056	826	117	287
N7RO	"	853,727	978	107	236
W7CT	"	838,832	734	109	303
KY7M	"	771,925	733	91	310
N7NM	"	706,262	701	93	269
KD7PCE	"	694,876	755	93	239
N9NA/7	"	694,485	778	108	237

WØRIC/7	"	679,770	594	120	295
WA2BFW/7	"	655,905	703	113	252
K7AR	"	597,411	611	111	258
KN7K	"	549,759	683	88	241
W6SA/7	"	479,978	544	102	221
KI7M	"	419,364	639	95	202
K7JQ	"	391,956	546	84	183
N7VF	"	361,031	549	82	171
N3XRU/7	"	313,788	372	102	229
WB7S	"	310,726	467	67	180
W7RN	"	287,647	342	89	224
					(OP:K5RC)
W7QR	"	284,325	434	73	182
K6UM/7	"	277,982	392	82	180
W7TX	"	227,906	366	76	147
KX7YT	"	224,896	360	66	158
W7CYL	"	211,640	311	81	179
W7DRM	"	209,610	295	75	199
W7VJ	"	176,469	370	62	115
K7EG	"	165,243	295	70	153
AC7GL	"	135,548	265	62	126
W7RIS	"	123,210	229	75	147
KG7P	"	114,515	242	68	117
N7BT	"	112,591	241	65	114
K7BVT	"	105,133	239	51	110
KF7CQ	"	96,915	194	59	136
W7RTX	"	91,184	215	51	113
WS7L	"	82,082	171	51	131
KE7IHG	"	77,920	178	56	104
KR7LD	"	68,808	194	48	93
W7WHY	"	66,156	178	54	94
KT7G	"	62,689	187	50	89
KO7SS	"	59,392	178	28	88
N6YMM/7	"	51,500	158	47	78
KM6CQ/7	"	48,927	148	54	87
K6KR/7	"	44,608	123	53	83
NK7Z	"	39,606	134	60	78
N7DXT	"	37,720	122	49	66
WA7AJ	"	33,894	145	48	78
W7SLS	"	26,410	106	41	54
K7UT	"	23,618	104	34	64
W7GDK	"	21,525	78	39	66
K7DD	"	17,928	82	40	68
N7FO	"	15,872	90	16	48
WA7BAM	"	15,200	82	34	46
AJ7T	"	14,490	62	36	54
W7SO	"	14,058	69	21	50
WO7R	"	4,664	40	24	29
AD7VB	"	2,394	24	16	22
KB7DV	"	512	39	16	16
KK7L	"	187	6	5	6
WF4U/7	"	12	3	3	3
W7ZR	**28A**	**222,162**	**685**	**30**	**92**
K7MY	"	46,632	204	25	62
N7DD	**21A**	**884,256**	**1752**	**37**	**146**
K6LL/7	"	457,498	1106	34	123
W7WW	"	103,600	283	28	112
KR7RR	"	24	2	2	2
KJ7NL	**14A**	**27,730**	**123**	**23**	**71**
KD7DCR	"	18,200	93	21	49
WB7AAV	"	5,460	49	16	26
W6RW/7	**7A**	**49,312**	**279**	**29**	**63**
K9DR/7	**3.7A**	**1,034**	**24**	**10**	**12**
***K7SS**	**AA**	**336,876**	**468**	**85**	**183**
*K6WSC/7	"	230,112	293	79	209
*NA7OM	"	115,128	287	56	100
*AC7JM	"	93,670	219	57	113
*AA7UN	"	68,376	178	50	104
*N7UJJ	"	44,750	135	45	80
*AE7DW	"	43,188	143	45	77
*W7FD	"	41,664	161	43	81
*K7JNA	"	39,744	136	39	69
*KD7RCJ	"	34,440	114	49	71
*K7HV	"	30,375	93	44	91
*K7AZW	"	24,168	103	47	59
*WA7YXY	"	15,675	81	39	56
*W7PSK	"	14,529	63	33	54
*N3KCJ/7	"	12,395	79	25	42
*WN7RRX	"	7,480	49	23	32
*K7VAP	"	6,096	70	24	24
*KG7GEP	"	5,356	46	22	30
*KE7WNB	"	4,320	37	21	24
*WY7AA	"	3,652	31	18	26
*KG7DMI	"	1,705	20	13	18
**KG7HAX*	*"*	*1,222*	*21*	*12*	*14*
*W7MLG	"	897	18	12	11
*KB7JJG	"	247	7	6	7
***K7ULS**	**28A**	**62,604**	**316**	**26**	**68**
*WAØKDS/7	"	43,848	156	27	81
*WØPAN/7	"	18,265	107	21	44
***KK7AC**	**21A**	**102,340**	**328**	**28**	**91**
*N7FLT	"	58,485	201	26	79
***WAØQVC/7**	**14A**	**819**	**16**	**8**	**13**
*KE1DS/7	"	384	15	7	9
*K7TYF	"	24	2	2	2
***KK7PW**	**7A**	**700**	**27**	**7**	**7**

District 8

K3ZJ/8	**A**	**2,077,889**	**1572**	**112**	**361**
N8II	"	1,609,685	1391	95	312
K8AO	"	1,357,620	1309	95	279
K8GL	"	885,950	981	72	253
KE8FT	"	748,238	762	94	279
WA8RCN	"	587,650	715	83	239
K8NWD	"	558,424	616	89	243
WD8EOL	"	528,031	667	80	233
N8IVE	"	485,298	578	69	228
N8MWK	"	333,330	454	69	202
W8JRK	"	323,036	433	72	206
N8BJQ	"	304,090	468	64	171
W8MSP	"	184,124	328	69	172
K8MJZ	"	177,760	318	58	144
W8KTQ	"	173,043	304	58	163
KC8QDQ	"	169,274	311	60	154
KT8Y	"	96,744	205	52	122
KC8YVP	"	70,056	182	43	96
K8TLC	*"*	*63,840*	*188*	*47*	*105*
K8JTD	"	31,578	101	39	75
KD8IIN	*"*	*25,300*	*100*	*37*	*73*
WA8OLD	"	19,975	88	22	63
W8TJM	"	18,160	91	22	58
W8DPK	"	10,816	62	21	43
K8DIL	"	4,235	44	10	25
KE8BII	"	2,108	28	13	21
NS8O	"	2,010	23	9	21
AB8NO	*"*	*90*	*5*	*5*	*5*
K8MFO	**28**	**441,188**	**1071**	**30**	**118**
N8VW	**21**	**74,883**	**246**	**23**	**86**
W8GOC	**14**	**35,625**	**144**	**24**	**71**
N8OL	**3.7**	**6,075**	**65**	**16**	**29**
***NA8V**	**A**	**1,949,815**	**1434**	**114**	**379**
*K8PGJ	"	812,292	788	92	289
*AA8OY	"	256,800	413	60	180
*WT8E	"	194,250	298	71	179
*N8SBE	"	170,362	314	59	147
*WB2UBW/8	"	164,970	300	48	147
*W8TM	"	164,430	289	45	158
*AC8XI	"	161,138	260	62	164
*NE8O	"	150,144	297	47	137
*W8KNO	"	140,184	280	56	142
*W8TAH	"	132,496	247	62	146
*N8NYI	"	122,026	247	50	144
*N8PPF	"	119,002	243	61	138
*N8IL	"	104,040	230	47	123
*K8ZZU	"	101,380	218	54	131
*N8JE	"	70,873	159	63	124
*KA8NJW	"	69,434	202	45	104
*AB8OU	"	61,299	169	42	97
*WA8LE	"	56,040	169	32	88
*K7DR/8	"	53,907	176	36	83
*K8GQ	"	49,178	141	42	92
*WA8YVF	"	46,008	151	29	79
*N8BV	"	45,632	142	42	82
*W8IDM	"	42,312	135	34	95
*N8DRG	"	31,824	109	39	78
*W8WDW	"	30,562	109	42	76
*KE8ANS	"	26,793	106	40	77
*KD8CAO	"	25,288	84	35	74
*W8AYL	"	23,638	84	33	73
*WB8SBI	"	23,220	103	32	54
*W8PEN	"	22,413	96	28	65
**NF8M*	*"*	*17,313*	*77*	*35*	*52*
*W8JPF	"	15,364	70	34	58
*N8MPF	"	13,940	77	33	49
*WA8AXF	"	13,040	68	31	49
*N8FYL	"	7,540	53	26	32
*KØACP/8	"	7,198	68	28	33
**K1DBM/8*	*"*	*5,232*	*38*	*17*	*31*
*NR8U	"	3,648	36	15	33
*KC8WGA	"	3,053	30	17	26
*W8DWC	"	2,898	31	17	29
*W4YPW/8	"	2,870	35	14	27
*NK8X	"	2,072	26	7	21
*N3MBH/8	"	1,925	25	14	21
*W8UMH	"	1,740	25	9	20
*KD8KZG	"	1,512	21	9	19
*WE8UPJ	"	1,274	19	11	15
*KD8YNG	"	1,036	21	16	21
*KF8MZ	"	693	13	10	11
*KJ8O	"	476	12	7	10
*N8GBU	"	462	15	9	12
*KC8EVS	"	342	13	10	9
*KE8BWA	"	234	10	8	10
***KB8UUZ**	**28**	**65,330**	**251**	**22**	**72**
*WB8JUI	"	24,601	127	14	59
*WO8USA	"	16,120	100	15	50
**K8WAY*	*"*	*9,500*	*77*	*12*	*38*
*KD8RJT	"	532	11	9	10
***KD8WKR**	**14**	**7,392**	**51**	**17**	**39**
*KC8NLP	"	425	13	10	7
***W8JGU**	**3.7**	**7,498**	**63**	**13**	**33**
K1LT/8	**AA**	**2,071,524**	**1197**	**140**	**497**
AA4R/8	"	1,774,890	1201	129	404
K8CX	"	930,608	865	91	301
WA8Y	"	472,976	551	91	237
NE8P	"	401,373	514	65	212
W8KX	"	311,520	423	65	199
KB8KMH	"	291,606	340	84	234
N8VY	"	267,714	325	85	236
K8MEG	"	212,296	340	56	167
KG8CW	"	162,093	283	60	153
AJ8B	"	151,698	299	60	133
N8MZ	"	124,440	263	45	138
N8HMG	"	109,200	214	58	137
KM8Q	"	109,048	258	47	125
KD8QYE	"	89,082	175	59	143
W3HKK/8	"	71,554	198	45	88
AC8TO	"	55,094	128	58	111
KD8VSQ	"	54,832	133	39	110
AB8AA	"	21,182	94	26	63
WA8A	"	20,648	81	33	56
W8QZ	*"*	*16,821*	*73*	*33*	*56*
K8EEE	"	12,312	61	23	49
W8HMK	"	2,052	21	16	20
N8AGU	*"*	*198*	*7*	*5*	*6*
AC8G	**28A**	**97,662**	**284**	**27**	**96**
N8DE	**21A**	**333,279**	**698**	**37**	**134**
W8CZN	"	316,400	669	39	136
W8RID	"	2,975	29	7	28
WA3C/8	**14A**	**329,556**	**709**	**38**	**136**
WD8E	**3.7A**	**3,293**	**43**	**11**	**26**
W8CO	**1.8A**	**208**	**13**	**6**	**7**
**AB8M*	*AA*	*1,080,601*	*930*	*95*	*324*
***N4RA/8**	**"**	**942,900**	**768**	**106**	**343**
*K8LY	"	778,955	685	89	326
*WD8S	"	249,700	407	44	176
*N8VV	"	151,060	295	38	144
*KD8JAM	"	40,902	154	32	70
*W8MSC	"	30,520	111	33	76
*W8ENO	"	22,172	91	34	58
*KD8CXQ	"	18,144	75	26	70
*N8VZ	"	12,960	72	29	52
*N8EA	"	4,653	37	17	30
*KC8GE	"	1,333	17	14	17
*N8DKA	"	408	10	7	10
*N8FE	"	196	8	7	7
***AB3DC/8**	**28A**	**26,625**	**150**	**18**	**53**
*W6EUH/8	"	320	10	7	9
					(OP:XQ6BQ)
***KG9Z/8**	**3.7A**	**5,405**	**65**	**15**	**32**

District 9

W9RE	**A**	**5,584,410**	**3173**	**152**	**493**
W9GT	"	1,003,392	968	94	290
AC9S	"	853,765	852	90	271
W9OP	"	545,688	617	78	240
AC9KW	"	510,984	662	67	215
KA9OKH	"	439,992	424	92	286
W9NY	"	393,118	708	54	160
AIØM/9	"	325,440	417	84	204
K9RU	"	249,645	374	70	197
K9MA	"	189,140	343	48	145
W9KXQ	"	164,274	336	58	151
KJ9C	"	163,400	319	56	144
WA5LOU/9	"	94,208	214	53	131
K9BGL	"	90,652	207	59	114
N9SJA	"	84,378	207	37	110
KC9EOQ	"	79,233	203	36	111
N9KR	"	62,900	154	48	100
N9NTC	"	57,750	154	44	106
NJ9T	"	44,982	176	35	91
N9SB	"	34,100	123	29	71
WA9ZVF	"	25,443	106	30	69
W9TC	"	12,524	74	25	37
KJ9P	"	9,240	53	29	48
N9EP	"	8,911	51	27	40
KD9DCW	"	8,625	50	26	43
W9/NP2I	"	1,254	24	14	19
KC9WAV	**28**	**115,230**	**357**	**26**	**89**
W9GL	**21**	**190,238**	**460**	**34**	**112**
WI9H	**14**	**41,900**	**163**	**23**	**77**
K9IDQ	**7**	**24,309**	**131**	**19**	**54**
KEØL/9	**3.7**	**2,175**	**32**	**9**	**20**
***N4TZ/9**	**A**	**1,887,472**	**1317**	**124**	**405**
*KD9MS	"	569,296	565	101	263
*KD9GY	"	297,022	454	66	187
*W9RF	"	291,600	451	66	174
*WD9CIR	"	260,150	406	63	179
*K9QVB	"	208,544	323	71	195
*KD4ULW/9	"	168,354	312	57	142
*K9FRO	"	126,524	253	48	140
*WØVLL/9	"	123,891	255	48	135
*WB9HFK	"	122,362	247	56	137
*NG9M	"	102,304	211	54	130
*NJ9R	"	101,035	231	50	117
*NK4P/9	"	96,940	243	38	110
*K8VGL/9	"	93,396	226	56	125
*N9MW	"	92,988	213	47	115
*WB9LRK	"	50,697	153	40	89
*KK9EJ	"	44,145	147	47	88
*NJ9U	"	41,448	139	47	85
*KC9LOX	"	40,777	127	36	85
*K9AMP	"	40,005	125	38	89
*KD9BNP	"	36,792	124	40	86
*KG9HG	"	34,452	112	38	78
*NT9M	"	28,455	109	37	68
*KC9TTR	"	26,059	96	32	71
*WBØPTO/9	"	23,763	100	29	60
**N9EAX*	*"*	*22,944*	*98*	*34*	*62*
*K9PMV	"	22,780	106	27	58
*KV9W	"	18,540	88	34	56
*WM9E	"	14,141	69	23	56
*K9ELF	"	11,775	64	28	47
*W9WGN	"	11,664	59	27	54
*K9IBM	"	10,640	59	30	50
*WY9S	"	9,780	64	17	43
*KC9EE	"	9,246	55	26	41
*N9AAC	"	6,848	57	25	39
**KE5RHE/9*	*"*	*5,900*	*43*	*22*	*37*
**K9VER*	*"*	*5,670*	*46*	*18*	*36*
*AB9YG	"	4,560	51	18	30
**K9DRS*	*"*	*4,048*	*36*	*16*	*28*
*KC9WJF	"	4,000	38	19	21
*KE9EX	"	3,969	34	21	28
*KA9BBQ	"	3,818	36	19	27
*KC9DOA	"	3,168	36	19	25
*KD9BPQ	"	2,898	34	18	24
*N9LOH	"	2,613	36	17	22
*KB9O	"	2,484	26	16	20
*KU9V	"	2,028	25	17	22
*K9EGS	"	1,617	21	13	20
*AC9LM	"	1,590	23	12	18
*W3ZAP/9	"	1,560	21	11	19
*K9BOO	"	1,080	16	13	14
*WB8RFB/9	"	598	12	11	12
*WB9NOO	"	448	10	6	10
*NV9X	"	80	4	4	4
***N9WKW**	**28**	**16,936**	**104**	**14**	**44**
*K9GY	"	3,906	47	13	18
***AB9MS**	**21**	**4**	**1**	**1**	**1**
***KC9VYX**	**14**	**18,876**	**103**	**19**	**59**
*N9CO	"	14,364	90	16	41
*KD9DEY	"	360	12	9	9
*K9SGB	"	240	10	7	9
***W9QL**	**7**	**4,329**	**41**	**9**	**28**
K9NW	**AA**	**3,264,646**	**1831**	**151**	**487**
K9IMM	"	2,675,970	1645	134	449
WE9V	"	2,124,836	1311	136	450
N2BJ/9	"	2,105,160	1445	124	406
NØIJ/9	"	1,934,954	1277	135	439
K9ZO	*"*	*1,797,320*	*1255*	*117*	*407*
N9ZM	"	1,642,260	1161	131	374
WO9Z	"	1,524,593	1100	118	385
W9IIX	*"*	*831,622*	*818*	*86*	*281*
KC9QQ	"	730,048	717	102	272
W9XX	"	631,620	666	87	261
W9AV	"	531,552	621	83	256
K9OM	"	321,550	414	81	214
KW9E	"	310,527	434	73	206
K9NO	"	305,100	492	51	174
W9GIG	"	296,810	331	82	253
KS9A	"	286,454	403	67	192
W9YK	*"*	*218,406*	*318*	*70*	*197*
WB9VGO	*"*	*166,852*	*297*	*53*	*149*
WI9WI	"	162,271	226	60	203
ND9Z	"	151,840	292	63	145
NØFCD/9	"	137,472	257	56	136
W9DCA	"	128,180	227	72	149
W9VA	"	128,100	254	49	134
AB9PN	"	123,954	228	67	152
AB9CD	"	111,100	234	66	154
K9YX	"	110,220	254	45	120
N9NS	"	88,410	160	74	136
KØTQ/9	"	65,364	172	46	110
K9EN	"	59,736	185	43	109
NA9RB	"	46,956	134	42	87
N9IO	"	45,056	128	34	94
W9OA/9	"	39,650	117	34	88
W9OO	"	26,832	95	42	62
WS9W	"	17,688	82	35	53
WØELT/9	"	1,248	20	12	12
KA9FOX	"	144	7	3	5
K9ZM	**28A**	**7,748**	**53**	**14**	**38**
K2UR/9	**21A**	**274,350**	**624**	**34**	**121**
W9RN	**7A**	**71,027**	**233**	**28**	**93**
***W9PA**	**AA**	**2,272,050**	**1427**	**136**	**458**
*NE9U	"	1,456,367	1124	117	356
*K9SF	"	945,832	925	92	290
*K9PG	"	785,434	681	111	331
*NM9P	"	571,860	623	93	260
*K9MU	"	530,292	482	98	315
*K9PY	"	419,824	501	78	226
*W9XT	"	267,090	315	80	227
*KA9O	"	264,972	361	71	213
*W9VQ	"	215,541	324	63	180
*K9OR	"	206,976	258	83	225
*KD9CLH	"	165,912	314	44	142
*N9VPV	"	101,135	219	61	118
*KC9ZJI	"	78,870	184	47	118
*KW9U	"	69,360	159	51	119
*N9FZV	"	65,113	173	41	108
*WB8BZK/9	"	55,131	144	45	96
**WT2P/9*	*"*	*49,104*	*146*	*36*	*88*
*KC9UJS	"	48,800	123	57	103
*WA9LEY	"	38,850	135	34	77
*AB9M	"	36,990	103	41	96
*N5FIW/9	"	31,510	116	38	77
*W9UIH	"	26,015	82	45	76
(OP:KD9DEV)					
*NA9VY	"	24,057	99	33	66
*KC9UHH	"	22,019	93	37	60
*K5YZ/9	"	13,500	63	36	54
*KØCD/9	"	12,160	58	22	58
*K9WKD	"	11,960	63	38	54
*N9BT	"	10,332	61	23	40
*W9TTY	"	1,860	24	10	21
*N9JTB	"	1,377	22	8	19
***KC9WRB**	**28A**	**17,024**	**101**	**16**	**48**
*NG9R	"	2,046	27	10	21
***N9TGR**	**21A**	**240,099**	**542**	**37**	**126**
***KB9ORA**	**14A**	**36**	**3**	**2**	**2**
***WK9U**	**7A**	**34,452**	**183**	**20**	**67**
*WU9D	"	72	5	3	5

District Ø

KØTT	**A**	**2,086,100**	**1671**	**119**	**341**
N7WY/Ø	"	980,826	938	96	290
NCØB	"	832,156	871	90	248
NEØU	"	750,666	777	97	269
WØOVM	"	549,290	695	72	223
KØDEQ	"	457,248	624	65	199
KØFX	"	437,598	551	90	232
KØAP	"	408,606	496	72	230
KØJJR	"	340,956	506	62	184
KØHCV	"	300,240	409	76	194
WS7X/Ø	"	296,192	565	59	149
ACØB	"	292,485	422	74	181
WØHBH	"	258,468	403	57	181
ADØH	"	249,473	414	66	161
WBØQLU	"	207,126	349	53	169
KØRJW	"	206,856	360	63	158
WØOR	"	138,516	266	61	143
WØKIT	"	136,837	260	59	134
NUØC	*"*	*123,892*	*250*	*67*	*121*
NØMHL	"	107,793	227	52	125
WØQKL	"	96,555	234	54	103
NFØN	*"*	*94,122*	*196*	*54*	*112*
NØVRM	"	88,478	206	48	118
NUØW	"	60,348	143	58	130
AGØDX	*"*	*50,592*	*169*	*49*	*75*
NØAXE	"	32,332	126	36	82
NYØT	"	31,980	108	48	75
KØYB	"	29,952	105	37	67
K9DU/Ø	"	23,622	101	28	65
ADØAB	"	21,012	101	36	67
WBØLJK	"	20,915	94	29	60
KDØJLE	"	10,200	77	32	43
WØRU	"	10,032	61	29	37
KV6O/Ø	"	5,635	40	15	34
NIØG	**28**	**92,514**	**362**	**26**	**76**
NØWRK	*21*	*9,540*	*74*	*15*	*38*
***WØYJT**	**A**	**302,784**	**482**	**66**	**183**
*KØFD	"	217,239	356	68	159
*NØECK	"	203,682	319	81	168
*KEØCRP	"	187,543	319	60	163
*AEØEE	"	165,000	303	63	137
*NGØT	"	164,802	266	64	163
*WAØLJM	"	123,750	273	48	117
*WØZF	"	107,730	236	55	116
*KDØOYC	"	81,776	211	52	100
*KBØARZ	"	72,072	181	48	106
*NEØDA	"	70,905	171	56	107
*KBØPPA	"	66,462	167	58	101
*ADØJA	"	66,150	197	47	100
*KØTC	"	59,714	171	56	90
*WØRK	"	51,858	140	47	87
*ADØFB	"	51,480	147	38	92
*NØUJJ	"	46,354	173	33	65
*NØAB	"	45,960	165	36	84
*KA8HDE/Ø	"	41,720	116	52	88
*NØAXZ	"	41,301	130	41	76
*KBØJIT	"	34,542	124	41	73
*NØTEK	"	19,800	83	35	64
*WØLSB	"	16,434	83	32	51
*KCØVFP	"	15,680	70	39	59
**KBØQEF*	*"*	*15,150*	*87*	*38*	*63*
*W7KAM/Ø	"	14,850	74	26	49
*KCØFOT	"	14,555	76	24	47
*KCØIUY	"	13,350	67	25	50
*NO2D/Ø	"	11,736	66	27	45
*NØGOS	"	10,370	70	20	41
*KØAPR	"	10,268	76	25	43
**KØPPY*	*"*	*9,794*	*72*	*15*	*44*
*KØPFZ	"	9,782	61	26	41
*NØMDC	"	9,620	50	24	50
*WØOJW	"	9,516	55	36	42
*NØBAK	"	8,128	54	26	38
*KDØXT	"	5,936	50	21	35
**WBØHHM*	*"*	*4,560*	*43*	*17*	*23*
*KDØOIX	"	4,482	44	19	35
*WNØR	"	4,005	41	20	25
*NØECT	"	3,116	34	19	19
*NØPLC	"	2,952	26	15	26
*KCØDMF	"	2,750	36	22	28
*KDØWUQ	"	2,664	32	15	21
*NØSFH	"	2,640	33	10	20
*WØNFS	"	2,112	26	11	21
*WB9QAF/Ø	"	1,260	27	15	20
*WØFRE	"	1,034	19	9	13
*WCØWB	"	728	17	13	13
*NØFN	"	567	14	9	12
*KDØRSX	"	192	8	5	7
*K2HT/Ø	"	117	8	7	6
*KCØFUE	"	108	6	6	6
*N8TUT/Ø	"	90	22	8	7
***NØUK**	**28**	**5,891**	**51**	**13**	**30**
*KDØPNH	"	861	16	7	14
**KDØGJD*	*"*	*49*	*4*	*3*	*4*
***KØBBB**	**21**	**151,065**	**431**	**32**	**103**
*WØSHL	"	47,045	192	22	75
*KØCS	"	13,370	97	21	49
*KJØP	"	2,212	33	12	16
**KØSV*	*14*	*20,942*	*105*	*17*	*57*
**KDØHIY*	*"*	*1,798*	*33*	*11*	*18*
**W6NF/Ø*	*"*	*1,564*	*26*	*8*	*15*
***KØKEV**	**"**	**49**	**4**	**4**	**3**
*KDØWUF	"	49	4	3	4
***AAØA**	**7**	**1,300**	**19**	**8**	**17**
KØKX	**AA**	**3,936,866**	**2117**	**152**	**507**
KØCN	"	1,881,972	1230	133	416
WØGJ	"	1,780,636	1370	128	356
KQØC	"	1,483,264	1049	135	377
K3PA/Ø	"	1,359,842	932	133	414
KØARY	"	1,327,072	1042	99	353
WAØMHJ	"	1,288,255	918	121	384
WØERP	"	1,213,650	1016	107	328
NØAT	"	1,108,968	834	118	365
KØBJ	"	1,072,938	826	118	353
NØKE	*"*	*989,228*	*874*	*128*	*318*
KØOU	"	897,636	908	100	281
KØYR	"	870,882	905	86	260
AAØAI	"	753,186	589	115	359
WØGG	"	743,148	716	97	281
NØODK	"	711,179	708	83	276
WØJM	*"*	*705,788*	*665*	*100*	*304*
NØBUI	"	494,214	603	65	229
WBØN	"	467,610	530	93	234
WB9KPT/Ø	"	442,152	576	81	195
AAØAW	"	336,250	451	77	192
NWØM	"	294,978	450	57	176
KØAD	"	260,478	374	81	180
KØIR	"	250,976	357	77	176
NRØT	"	233,480	337	78	182
NØOJ	"	184,140	330	52	146
K5VYT/Ø	"	135,432	296	37	125
NØUU	"	128,940	243	65	145
KØOB	"	128,475	217	66	159
WØZQ	"	95,804	211	54	118
KSØAA	"	53,578	161	64	114
WB2UFO/Ø	"	42,150	118	50	100
NØXOC	"	36,720	100	42	94
WØJEC	"	29,766	91	37	86
WØAD	"	27,795	106	46	63
WØVB	"	27,234	112	31	71
KØQMU	*"*	*24,089*	*87*	*33*	*76*
KØHB	"	20,737	91	31	58
KØSIX	"	9,408	57	24	40
N9KY/Ø	"	864	14	10	14
WØDET	"	168	9	7	7
KBØEO	**28A**	**88,560**	**255**	**32**	**103**
KØJPL	"	19,824	130	22	37
KBØHP	"	4,524	56	13	16
KVØQ	**21A**	**607,848**	**1315**	**37**	**135**
***NØHR**	**AA**	**1,654,224**	**1228**	**110**	**372**
*AD1C/Ø	"	597,534	645	87	260
*KØMPH	"	312,200	409	76	204
*KIØJ	"	277,797	431	60	161
*WGØM	"	253,689	322	84	225
*WXØZ	"	205,359	331	69	162
*NØKK	"	132,466	234	59	155
*WØSEI	"	106,088	228	61	117
*WØXE	"	34,136	113	46	90
*WØRAA	"	25,305	98	39	66
**ADØCI*	*"*	*23,976*	*93*	*34*	*74*
*KØVBU	"	17,716	71	33	53
*KAØNEB	"	17,574	80	36	65
**KØRC*	*"*	*16,653*	*78*	*38*	*53*
*NØLLH	"	4,345	45	24	31
*AKØMR	"	2,835	25	21	24
*KEØCCI	"	1,408	19	13	19
*ACØYG	"	135	5	4	5
***AIØL**	**21A**	**339,438**	**966**	**32**	**107**
*NXØI	"	5,289	48	8	33
*KFØIQ	"	5,096	39	13	36

Alaska

AL1G	**A**	**183,816**	**791**	**38**	**70**
***AL7LO**	**A**	**79,250**	**278**	**49**	**76**
*AL4Y	"	67,716	257	52	56
*KL7NC	"	50,740	284	42	44
*KL2ZZ	"	37,910	176	32	53
*KL7DG	"	27,255	162	35	34
*KL3A	"	11,394	84	24	30
***KL1JP**	**28**	**1,036**	**31**	**7**	**7**
***WL7F**	**21**	**170,476**	**1147**	**25**	**43**
AL9A	**AA**	**943,400**	**1501**	**85**	**180**
NL7V	"	550,374	807	83	186
KL7AIR	"	498,780	1018	70	134
					(OP:KL7YK)
WL7E	**14A**	**30,432**	**117**	**26**	**70**

Barbados

8P5A	**A**	**16,911,600**	**10220**	**147**	**533**
					(OP:W2SC)
***8P6NW**	**A**	**135,980**	**481**	**51**	**79**
***8P6ET**	**28**	**154,077**	**736**	**21**	**66**
***8P2K**	**21**	**178,530**	**684**	**24**	**86**
					(OP:8P6SH)
***8P9AL**	**AA**	**470,763**	**1307**	**60**	**111**
					(OP:KG9N)
***8P9EH**	**21A**	**419,152**	**1294**	**33**	**103**

Belize

***V3A**	**A**	**2,380,290**	**3257**	**89**	**241**
					(OP:V31MA)

Bermuda

***VP9NNO**	**28**	**2,280**	**27**	**10**	**20**
VP9AD	**AA**	**34,348**	**105**	**43**	**81**

Canada
District 1

VY2ZM	**A**	**11,665,566**	**5941**	**164**	**574**
					(OP:K1ZM)
VE1JBC	"	363,895	517	63	196
VE9FX	"	187,040	338	56	168
VO1AX	**7**	**35,224**	**247**	**17**	**51**
***VE9AA**	**A**	**1,285,568**	**1281**	**83**	**296**
*VA1MC	"	173,600	347	51	149
*VE1RSM	"	104,696	233	53	131
*VA1CM	"	884	17	9	17
***VE1SQ**	**14**	**94,164**	**314**	**23**	**91**
VO1MP	**AA**	**3,400,620**	**2141**	**118**	**452**
VY2TT	"	1,477,310	1087	103	382
VO2NS	"	1,455,137	1951	81	232
VE1OP	"	154,580	221	56	206
VE9CB	**7A**	**382,302**	**1150**	**27**	**107**
***VE9WH**	**AA**	**128,710**	**225**	**64**	**147**
*VO2AC	"	63,832	159	52	106
***VE9ML**	**14A**	**58,860**	**238**	**19**	**71**
***VO1BBN**	**3.7A**	**2,924**	**35**	**9**	**25**

District 2

VE2EBK	**A**	**553,080**	**612**	**80**	**250**
VE2TSM	"	337,176	537	53	199
VE2HAY	"	893	22	7	12
VE2JM	**21**	**20,394**	**124**	**19**	**47**
***VA2EW**	**A**	**1,695,240**	**1530**	**101**	**307**
**VA2MP*	*"*	*238,238*	*392*	*53*	*168*
*VE2ZT	"	220,950	413	61	164
*VA2ES	"	213,807	390	51	158
					(OP:VE2AXO)
*VE2PDT	"	156,240	334	43	137
*VE2JCW	"	87,204	320	40	89
*VE2CJR	"	75,440	307	40	75
*VA2SCH	"	18,690	121	19	51
*VE2DJC	"	15,124	71	23	53
***VA2CO**	**21**	**40,236**	**185**	**18**	**66**

*VA2EI 14 16,678 104 14 48
*VE2YMV " 4 1 1 1
*VE2GT 7 3,922 45 11 26

VA2WA AA 7,674,189 4351 145 536
VA2EN " 1,584,052 1168 110 414
VA2AM " 1,224,336 868 121 431
VE2PIB " 790,088 799 97 331
VA2KF " 253,503 399 47 182
VA2AGW " 102,850 210 45 142
VE2RO " 65,175 156 42 123
*VE2IDX AA 2,569,899 2327 114 373
(OP:VE3ZF)
*VE2EB " 53,360 173 24 91
*VA2MO " 41,706 129 39 87
*VE2FU 28A 71,797 241 24 83

District 3

CF3A A 9,618,125 6085 148 477
(OP:VE3AT)
VC3X " 3,240,700 2713 114 346
(OP:VE7VR)
VE3TW " 1,204,746 1121 90 308
VE3AD " 1,164,988 1297 76 243
VE3XB " 691,240 576 107 333
VA3TIC " 392,882 590 67 199
VA3XH " 295,545 389 80 205
VE3GYL " 184,552 392 52 132
VE3HED " 6,030 34 34 33
VA3VF 28 32,060 170 13 57
VA3FP 21 57,024 204 24 75
VE3EJ " 19,670 100 15 55
VE3CR 14 111,585 303 30 99
VE3UZ 7 5,265 53 11 28
VE3PN 1.8 19,950 303 9 26
*VE3DZ A 5,727,392 3469 135 479
*VA3SWG " 1,286,928 1566 83 248
*VA3UG " 373,176 488 74 210
*VE3RX " 230,912 343 75 181
*VE3KKQ " 227,360 385 57 175
*VA3TPS " 221,792 375 63 169
*VA3GD " 106,554 240 49 128
*VA3GUY " 106,403 216 47 140
*VA3EC " 45,738 136 34 87
*VA3TPV " 32,207 109 31 76
*VE3XQ " 22,873 116 25 64
*VE3DVY " 12,928 74 20 44
*VA3NW " 8,662 62 31 40
*VA3EON " 8,449 68 24 47
*VE3SB " 8,178 56 22 36
*VE3RUV " 7,936 58 20 44
*VE3EP " 6,313 47 22 37
*VA3FN " 168 9 6 6
*VE3LVW 28 41,132 165 21 70
*VE3SST " 3,740 44 10 24
*VE3FH 21 122,864 402 22 90
*VE3TG " 51,887 207 15 74
*VA3MPF 14 2,325 34 9 22
*VE3BR 3.7 30,108 287 12 40
*VE3MGY 1.8 5,951 300 6 5
*VE3EDY " 4,522 149 6 11

VE3RA AA 6,533,800 3270 158 570
VE3CX " 4,016,168 2889 134 450
VE3ZZ " 521,145 580 76 257
VE3RZ " 327,320 355 81 253
VE3TCV " 224,576 353 65 177
VE3IDT " 96,668 216 44 125
VE3RRH " 91,332 197 53 124
VE3BW " 85,079 231 50 99
VE3MT " 42,927 156 41 82
VE3JDF " 40,095 113 41 94
VE3VGI " 30,688 101 35 77
VA3QR " 21,358 77 46 72
VE3UTT 28A 646,720 1624 31 129
VE3VEE 14A 1,006,803 2091 38 151
*VA3DF AA 2,438,257 1493 132 469
*VE3CV " 1,114,176 896 104 344
*VE3JAQ " 372,072 522 73 223
*VA3JLF " 181,973 299 59 174
*VA3WU " 129,168 216 62 172
*VE3AJ " 60,047 167 42 107
*VA3PDG " 38,781 187 31 62
*VA3NGE " 31,824 111 40 77
*VE3XAT " 27,495 91 35 82
*VA3MQS " 15,147 74 21 60
*VE3WPV " 9,768 61 23 43
*VE3RNF " 5,568 42 25 39
*VE3BLU " 2,178 26 10 23
*VE3IAE 28A 69,350 266 20 75
*VE3SKX 21A 36,480 141 20 75
*VA3IPG " 30,855 159 20 65

District 4

VE4AKF 28 5,256 69 13 23
*VE4YU A 218,400 408 61 147
*VE4DRK " 75,118 255 46 96
*VE4DPR " 3,649 37 13 28

VE4VT AA 3,642,700 3244 123 376
(OP:VE4EAR)
*VA4HZ AA 76,194 194 57 109
(OP:VE4HAZ)

District 5

*VE5TLW A 193,030 397 59 140
*VE5SDH " 54,412 201 40 82
*VE5CON " 18,560 98 36 44
*VE5AAD " 7,192 50 25 37
*VE5KS 14 103,068 304 29 97

VE5ZX AA 1,264,520 1282 101 303
*VE5UO AA 163,100 540 47 93
*VE5SF " 65,145 184 35 94
*VA5LF 28A 5,633 51 14 29

District 6

VE6AMI A 306,000 519 58 167
VE6IVN " 124,488 277 59 123
VE6FT " 122,760 305 49 106
VA6MA 21 107,463 398 29 84
*VE6EX A 713,348 1110 85 193
*VE6ZC " 58,292 244 54 64
*VE6QO " 19,904 131 28 36
*VE6HV " 209 8 6 5
*VE6SAR " 30 3 3 3

VA6CV AA 614,669 733 81 242
VA6UK " 352,296 568 78 174
VE6LB " 112,056 292 60 114
VE6JY 14A 1,126,890 2516 38 152
(OP:VE5MX)
VE6WQ 7A 343,602 1315 32 94
(OP:@VE6JY)

*VA6AK AA 494,118 621 72 219
*VE6AX " 138,276 304 52 115
*VE6NS " 92,320 260 56 104
*VE6CSX " 4,590 48 23 22
*VE6UM 21A 140,233 554 26 87

District 7

VE7BC A 338,184 589 83 148
VE7AX " 86,173 239 54 83
*VE7JH A 1,362,312 1550 114 264
*VA7CRZ " 770,202 1061 98 208
*VE7FCO " 79,236 226 48 94
*VE7RSV " 77,865 208 54 91
*VE7CKZ " 61,570 199 56 75
*VE7VAW " 42,622 174 46 55
*VA7BWG " 17,822 109 33 34
(OP:VE7GM)
*VA7MPG " 15,960 96 32 38
*VE7BGP " 14,982 82 31 35
*VE7JDZ " 5,814 51 28 29
*VA7QD " 4,260 46 28 32
*VA7ZM " 1,664 25 11 15

VE7SV AA 3,423,888 2547 144 414
(OP:VE7CC)
VA7FC " 2,400,908 2866 117 272
VE7NY " 1,373,715 1999 101 214
VA7ST " 1,329,332 1693 96 250
VE7XT " 934,920 1291 106 212
VE7SZ 28A 177,633 960 25 56
VE7XF " 70,713 274 26 71
VA7RR 21A 1,223,950 2923 37 138
VA7JW " 60,060 212 28 77
*VA7BEC AA 810,238 1330 87 199
*VE7URN " 85,763 278 56 83
*VA7DXC " 11,340 76 29 31
*VA7HZ " 1,372 20 13 15
*VA7IR 21A 69,360 361 23 57

District 8

VY1MAB A 270,400 1315 50 54
*VE8NSD A 104,896 288 53 96
*VE8GER " 66,000 219 50 75

VE8EV AA 1,444,464 1789 100 236
VY1MB " 44,545 391 33 26
*VY1EI 28A 55,520 663 16 24

Cayman Islands

ZF2AH 28 877,184 3011 31 97

Costa Rica

TI1K 7 166,992 674 27 85
(OP:TI2CDA)
TI2SW 3.7 1,456 28 8 18
TI1T 1.8 646 30 8 9
(OP:TI2CC)
*TI8/AA8HH A 80,960 453 38 50

TI2KAC AA 311,501 864 62 119

Cuba

CO2GG A 881,640 1548 65 183
*CO8DM A 233,244 498 60 149
*CO7RR " 124,450 272 58 132
*CO2VE " 106,264 335 41 107
*CO2YT " 79,629 353 37 90
*T46X " 40,710 162 37 81
(OP:CO6HZ)
*CO6HK 28 181,700 862 28 72
*CO6EC " 74,160 405 24 56
*CO6LE 21 154,560 669 27 78
*CO8AW " 75,990 371 19 66
*CO6LC 14 388,326 1450 29 93

*CO6LP 28A 291,942 1115 31 95

Dominican Republic

*HI8PLE A 59,924 150 40 102

HI3TT AA 1,838,484 2640 92 256
*HI3TEJ AA 4,665,692 4750 111 328
*HI8JSG " 1,392,657 1923 84 245
*HI7SBR 14A 79,970 306 21 89
*HI8KW 7A 59,600 240 18 82

Guadeloupe

FG4KH A 2,465,957 2610 92 311
(OP:F1DUZ)

Guantanamo Bay

*KG4EM AA 354,114 464 80 229

Guatemala

TG9IIN 14 22,532 265 15 28

Jamaica

6Y9X AA 8,245,664 6643 117 407
(OP:K1XM)

Martinique

FM5AN A 447,282 614 78 219
FM5EB 21 256,308 806 28 96
FM5FJ 14 917,814 2430 37 129
*FM1HN 14 2,356 39 13 18

TO2M AA 9,460,955 6438 147 518
(OP:VE3LA)

Mexico

XE1B 28 845,154 2681 32 109
XE1H " 44,064 599 15 19
XE2X 3.7 72,000 694 14 36
*XE1GZU A 19,764 144 23 38
*XE1BY 28 194,900 860 25 75
*XE1ZTW " 5,976 66 13 23
*XE2WK 21 1,377 31 10 17
*XE1SVT 14 840 14 8 13

XE2B AA 2,719,104 3114 93 295
XE1MEX " 461,270 437 92 294
XE2CQ 21A 615,750 1733 33 117
4A5XX " 213,256 803 29 93
(OP:XE1EE)
XE2S 7A 241,653 987 29 80
XE1/N4DMH 1.8A 2,394 62 9 10
*XE2AU AA 141,183 322 60 129
*XE2JS " 107,442 509 31 63
*XE2ST 21A 120,000 548 25 71

Montserrat

VP2MDG A 4,564,264 3975 117 371
(OP:K2DM)

Nicaragua

YN5Z A 7,277,274 6451 124 374
(OP:K7ZO)

Panama

*HP1/K6CT AA 110,630 719 31 43

Puerto Rico

KP3BR 7 12,600 96 13 43
*KP3Z A 6,138,341 5109 122 395
*WP3GW " 334,110 472 66 193
*WP3EF " 184,208 298 74 158
*WP4PHY " 102,860 285 37 102
*KP4CPC " 69,276 395 37 55
*KP4CG " 36,064 176 33 59
*KH2RU/KP4 " 20,276 145 20 54
*NP3OT " 15,423 149 26 27
*WP4SD 28 339,840 1218 27 93
*NP3RE " 261,440 1342 25 70
*WP3E 21 17,290 104 15 50

NP4G AA 143 6 6 5
KP4JFR 28A 12,826 98 15 38
WP4WW 21A 25,994 307 15 26
(OP:KP4JRS)
*NP4RA AA 75,396 241 38 84

Sint Maarten

*PJ7PL A 297,704 1103 39 97
(OP:WA1ZAM)

St. Kitts & Nevis

V47JA AA 290,076 422 74 202
(OP:W5JON)

U.S. Virgin Islands

KP2XX 28 290,232 1655 22 65
*NP2X A 5,452,457 4989 110 369
*WP2SC " 9,384 62 27 42

*KP2DX 7A 29,898 205 18 48
(OP:KP2BH)

AFRICA

African Italy

IH9A 1.8 267,736 965 21 77
(OP:IT9SPB)
*IH9YMC 28 94,136 428 21 61

Algeria

*7R7R A 281,190 509 37 158
*7X2VB " 82,077 327 20 89
*7X5TV 7 17,604 124 11 43

Angola

*D3AM A 201,900 490 45 105

Benin

*TY4AB A 925,344 1293 64 188

Canary Islands

EF8U A 9,956,860 5882 130 450
(OP:N6GQ)
EA8TZ " 2,419 28 16 25
ED8X 21 2,069,516 4320 34 130
EF8B " 204,350 554 28 106
(OP:OH2BP)
EA8/RA1A 3.7 10,191 88 8 35
*EF8O A 530,622 745 61 185
(OP:DJ1OJ)
*EA8BQM " 282,964 484 60 158
*EA8AQV " 174,240 281 57 163
*EA8GP " 20,720 127 20 54
*EA8CVW " 11,840 69 18 46
*EA8TX 28 1,122,680 2813 30 106
*EA8CZK " 81,874 325 21 73
*EA8BGO 14 31,442 156 17 62
*EA8BPX 7 70,092 243 21 78

EA8CSD AA 1,574,442 1323 101 313
EA8PT 28A 131,450 418 26 84
EF8C 21A 777,240 1752 31 122
(OP:EA8DDM)
EA8CCQ 14A 295,125 841 30 95
EF8S 1.8A 70,824 350 15 63
(OP:OH2BYS)
*ED8W AA 1,965,062 1930 81 277
(OP:EA1BP)
*EA8/HA7TGC" 21,535 133 13 60
*ED8O 28A 1,035,709 2361 31 120
(OP:EC5AN)
*EA8CNR " 300,132 826 27 99
*EA8MT 21A 1,012,860 2046 35 135
*EC8AQQ 14A 174,244 493 28 99

Cape Verde

D44AC A 17,152 99 19 48
D4Z 28 3,252,670 6077 36 149
(OP:IZ4DPV)
D4C 7 1,436,064 2961 36 132
(OP:HB9DUR)

Cueta & Melilla

EA9KB 14A 1,249,020 2719 34 128

Egypt

SU9IG A 663,950 972 54 191

Gabon

TR8CA AA 227,976 504 45 116

Madagascar

*5R8SV A 479,755 743 54 175

Madeira Islands

CT3MD 28 157,890 586 21 74

CT3HF AA 2,554,680 1807 102 386
CQ3L 28A 2,157,246 4049 35 147
(OP:DF7ZS)
*CT3FW 21A 87,135 286 21 90

Morocco

*CN8MAA 21 152,390 546 21 77

*CN8VO AA 1,158,003 1350 64 233
*CN8KD 28A 156,364 581 23 74

Mozambique

C91C A 525,252 820 71 151
*C91TDD A 25,179 93 43 66

Reunion Island

FR4NT A 1,523,660 1478 103 267
*FR5DX A 1,003,574 1279 75 211

*TO9ØR AA 1,227,660 1891 61 176
(OP:FR4QT)

Senegal

6W1SR AA 77,212 154 80 114
(OP:F6EPY)

South Africa

ZS1TMJ A 959,107 1403 67 172
ZS6RJ " 871,357 1083 72 211
ZS1VV " 474,208 727 62 170
ZS2ABE " 40,950 123 46 80
ZS9Z 28 265,318 881 26 80
(OP:ZS1OIN)
*ZS2NF A 149,400 316 57 109
*ZS1BHJ " 38,376 116 37 86
*ZS6RKE " 1,456 24 11 17
*ZS2EC " 323 11 9 10
*ZS6SVJ 14 35 3 2 3

ZS6WN AA 339,360 397 86 217
ZS6A 28A 17,794 78 23 59
ZS5NK 21A 16,704 94 25 47
*ZS6C AA 46,760 125 50 90
*ZR6DX " 44,323 129 47 80

St. Helena

ZD7W A 5,214,324 3584 136 388
(OP:W6NV)

Tanzania

5H3EE 28A 88,566 350 24 63

Tunisia

*3V8SS A 6,408,158 4464 103 396
(OP:KF5EYY)

Western Sahara

*SØS 21 876,555 2379 28 101
(OP:EA2CNU)

Zambia

9J2JOCV A 390,336 713 50 142
(OP:9J2HN)

ASIA

Afghanistan

*T6TM 21 26,424 151 21 51

Armenia

EK3GM A 320,950 640 38 137
*EK6SI A 2,019,589 1978 79 298
*EK4JJ " 20,303 123 25 54

Asiatic Russia
District 9

RC9O A 8,963,178 5538 132 470
UA9JDP " 1,529,220 1782 68 240
UA9TF " 1,040,820 1173 86 246
R9AE " 981,460 1264 79 231
RZ9UC " 428,460 1033 55 138
RL9I " 318,176 496 75 169
R8MD " 318,078 506 59 187
RK9UN " 279,180 683 44 121
RV9WP " 169,920 295 65 175
UA8WAA " 71,585 243 25 78
RU9UC " 56,628 159 49 94
RV9MA " 49,010 141 44 86
R9CC " 7,056 52 29 34
RK9Q " 24 2 2 2
(OP:RW9QA)
UA8U 28 339,472 1278 22 90
RZ9JZ " 125,910 525 19 71
RA9UAD " 38,664 209 16 56
UA9SCX 21 74,428 325 21 71
R8WF 7 100,672 382 23 81
RC9AR " 49,049 210 23 68
RX9UKF " 12,402 101 13 40
RW9CD 3.7 84,159 396 14 67
RD9SA " 12,204 98 11 43
RZ9WU " 4,992 50 8 31
*RF9C A 1,971,603 1673 95 328
(OP:RV9CBW)
*R8CT " 1,920,016 1666 103 331
*RK9DC " 338,916 499 61 183
*RT9TM " 287,712 453 53 190
*UA9NP " 195,940 389 51 143
*R9QQ " 187,434 391 41 137
*RT9YA " 136,080 313 57 132
*RZ9AD " 101,136 255 54 118
*RW9LL " 68,880 183 44 120
*UA9YTN " 67,375 205 32 93
*RA9AEA " 62,756 209 29 87
*RF8R " 52,212 176 30 84
(OP:RW9RW)
*RK9AK " 45,279 162 25 92
*RW9SW " 42,294 141 29 85
*R9YC " 33,180 136 35 70
*RX9DJ " 22,944 95 27 69
*RD9D " 22,806 92 43 83
*UA9AV " 15,438 80 25 58
*UA9MW " 11,830 70 21 49
*R2Ø15RR A 10,880 68 20 48
(OP:RW9Y)
*RC9W " 638 13 10 12
*RZ9OW " 90 7 5 5
*UA9R 28 216,550 690 28 94
*UA9OMT " 107,282 526 15 64
*RZ8U " 91,020 603 13 47
*RV9YK " 56,287 285 19 58
*R9AAL " 24,253 135 19 60
*RD8O " 17,756 138 9 37
*RG9Y " 4,960 69 9 22
*R9CAC " 340 15 8 9
*RX9CCJ 21 147,500 474 23 95
*R9RA " 80,288 309 25 79
*RA9CCK " 43,650 196 22 68
*RU9WZ " 7,755 56 11 44
*RZ9OQ 14 239,085 681 32 103
*RA9APG " 66,500 252 27 73
*R9CZA " 25,704 138 17 55
*RA9JM " 8,955 72 9 36
*RC9M " 2,900 38 7 22
*UA9SMU 7 26,908 162 13 49

RK9AX AA 2,866,380 2292 109 364
UC8U " 1,591,312 1700 90 277
RO9A " 1,477,000 1162 109 391
RZ9U " 1,136,856 1093 98 306
RA9JBA " 971,800 1082 80 264
UA9YE " 717,992 810 87 311
RW9QA " 675,584 619 109 355
R9AB " 361,188 486 83 233
RN9N " 345,184 497 61 207
UA9LAO " 121,989 297 39 118
RU9AZ " 102,425 184 62 179
R9CM " 65,844 150 61 116
UA9OC " 41,040 116 50 85
RX9SN " 36,594 120 32 75
UA9CDC " 20,200 92 30 70
RK9UE " 12,616 60 24 52
RV9CX " 42 3 3 3
RT9J 28A 173,810 589 28 102
RW9WT " 26,880 150 19 51
RW9USA 21A 1,093,602 2617 38 143
RG9A " 901,356 1918 38 148
RV9UP 14A 532,100 1237 36 134
RK9QWM " 403,328 1123 30 107
RK9DM " 272,880 703 33 111
RK8I " 39,091 162 27 70
RW9QC " 17,739 90 19 54
R9LM 7A 9,353 88 14 33
R8TT 3.7A 160,797 643 18 75
*RW9UX AA 1,905,500 1450 119 381
*UA9UDX " 363,072 568 65 183
*RA9MX " 317,322 404 76 230
*RA9MAS " 186,964 455 42 130
*RT9YT " 114,903 323 44 109
*RK9DO " 98,195 219 48 157
*R9AM " 96,944 245 37 109
*R9RT " 69,810 162 54 125
*RW9C " 27,753 116 22 65
*RU9YF " 26,394 120 21 62
*RA9UN " 15,318 85 20 54
*RG8U " 15,134 79 38 56
*RW9DX 28A 128,583 528 21 70
*RZ9UO " 117,612 525 17 64
*UB9UAT " 110,618 512 18 64
*R9VA " 77,316 450 16 52
*UA9UX " 51,153 343 9 42
*UA9OR " 30,528 170 11 53
*RZ9UMA " 10,360 138 10 25
*RW8T 21A 128,904 433 28 95
*RT8O " 6,300 58 13 32
*UA9LBQ " 819 21 3 10
*RW9TP 14A 98,841 276 34 107

District Ø

RWØBG A 1,531,820 1654 103 298
RTØR " 767,648 999 89 233
RØVZ " 596,820 1075 85 205
UAØXAK " 179,550 487 73 98
UAØAXX " 176,670 435 47 104
RØAEW " 112,578 276 45 129
UAØACG " 40,552 141 53 84
RØAA 21 287,408 796 32 110
*RØAEE A 297,297 663 51 138
*UAØUK " 287,212 582 71 165
*RUØLL " 80,700 215 46 104
*RØCAF " 79,365 239 65 100
*RØCW " 71,890 266 46 84
*RAØWHE " 70,000 217 32 93
*RØWC " 44,110 160 24 86
*RØTR " 35,328 137 34 62
*RWØUM " 15,756 109 31 47
*RØABD " 4,888 49 19 33
*RØCM " 2,460 38 20 21
*RXØSA 28 44,681 204 19 72
*UAØOD " 30,981 231 15 54
*RAØUJ 21 22,557 174 22 51
*RCØLAD " 10,368 88 21 27

UAØSR AA 1,181,141 1427 92 285
UAØSE " 348,462 569 76 167
UAØBA " 74,789 198 34 109
RUØSN " 24,610 80 45 62
RAØACM " 14,965 79 33 40
UAØCW " 704 14 10 12
RAØFF 28A 245,768 788 34 90
RNØCT 21A 1,098,125 2600 36 139
UBØA " 753,594 1747 37 137
RMØF " 490,122 1575 33 113
RTØF 14A 859,312 1983 39 133
RKØUT " 289,956 880 35 111
UAØW " 2,178 24 11 22
*RAØANO AA 20,790 80 36 63
*UCØA 28A 84,042 426 14 55
*RWØAJ " 14,790 72 19 68
*RDØW 21A 277,704 851 30 103
*UAØWY " 178,296 648 26 88
*UAØUY " 61,740 281 25 73

Asiatic Turkey

TA2AGO A 316,799 715 44 123
TA5BS " 232,875 647 30 95
TC4A " 38,250 169 20 70
(OP:TA4CS)
TA2AKX " 14,399 92 22 55
TA2OQ 28 19,520 124 17 44
TA7AO " 902 28 10 12
TA3EJ 21 19,133 147 15 38
*TA7AOF A 308,308 796 42 112
*TA2EJ " 166,344 398 42 132
*TA3ABM " 104,346 223 50 137
*TA2LP " 36,977 177 23 80
*TA2NC " 36,540 121 41 85
*TA2ANB " 34,020 144 29 76
*TA2ANL " 22,790 101 25 61
*TA7AZC " 12,862 89 15 44
*TA2AET " 11,656 99 19 43
*TA2ALD " 10,944 72 23 49
*TA5ISJ " 10,670 69 13 42
*TA2MES " 9,024 62 20 44
*TA3IUY " 6,897 57 20 37
*TA7ASN " 2,555 29 12 23
*TA3EP " 1,540 21 10 18
*TA8A " 408 10 7 10
*TA4PR 28 16,006 128 14 39
*TA4BU " 104 5 3 5
*TA4APR " 70 4 3 4
*TA4ALQ " 42 3 3 3
*TA2BW 21 4,587 53 8 25
*TA4ED 14 34,716 184 14 52
*TA3OM " 34,650 209 13 50
*TA4MA " 25,080 153 13 53
*TA3AER " 5,338 67 6 28
*TA5IW " 210 7 3 7
*TA5EA " 45 3 2 3
*TA5IR " 45 3 2 3

TA3AMH AA 18,816 106 13 51
TA4OSK " 4,300 42 15 35
TA5FA 14A 496 11 6 10

***TA3EL**	AA	224,112	508	44	124
*TA4AKS	"	103,896	266	41	107
*TA7EB	"	3,440	30	17	26
***TA2AKG**	28A	24,288	173	20	49
***TA4ASO**	21A	12,349	97	12	41

Azerbaijan

***4K6FO**	A	1,306,437	1324	86	277
***4K9W**	28	4,563	53	12	27

Bahrain

A93JA	A	3,966,952	2968	109	379
(OP:KE5JA)					
A92GR	28	219,674	728	29	90
A92GE	21	615,726	1391	35	123
A92AA	AA	853,160	1037	69	239

China

BD3CB	A	590,209	1098	76	165
***BA3MM**	A	238,392	707	61	137
*BG4HRM/7	"	217,871	444	73	150
*BH8ASZ	"	82,446	290	48	103
*BG5VSD	"	82,149	360	54	85
*BH1KVZ	"	61,716	229	45	94
**BH4WPN*	"	*58,617*	*300*	*45*	*72*
*BD5XX	"	25,600	147	37	63
*BY2WL	"	17,688	118	36	52
(OP:BH2RJX)					
*BD3QT	"	11,520	95	32	40
*BD3QW	"	9,176	83	28	34
*BG6LQZ	"	8,509	74	24	43
**BG1WNU*	"	*3,726*	*75*	*24*	*30*
*BG5NKC	"	629	25	17	20
*BG8ILM	"	24	2	2	2
***BA1SN**	28	5,822	63	13	28
*BG6AFT	"	1,870	49	12	22
***BG8INK**	21	85,754	354	28	78
*BG8IL	"	80,772	317	28	78
*BG6AHD	"	43,050	211	23	59
*BG4UQX	"	22,480	148	23	57
*BH4OEW	"	22,400	119	28	52
*BA2BA	"	4,056	71	16	23
**BD7LDM*	"	*3,616*	*79*	*13*	*19*
***BD4UM**	14	903	29	9	12
BH7PFH	AA	198,852	456	70	149
BG6CCP	"	160,890	419	67	119
BDØAAI	"	155,155	370	67	150
BH4BKF	"	52,536	196	36	96
BG3OJZ	"	51,652	215	50	98
BD4KM	"	*22,704*	*120*	*32*	*54*
BGØAVK	"	3,078	41	21	33
BD4KA	"	1,190	24	17	17
BG5EFD	28A	98,040	454	23	63
BA7JA	21A	613,356	1810	36	122
BD7BM	"	302,434	1170	31	87
BG9QM	"	*196,992*	*933*	*29*	*79*
BY7MJ	14A	124,868	557	28	78
(OP:BD7LMD)					
BG4HYK	7A	4,890	122	12	18
BY5HB	"	1,425	57	10	15
(OP:BG5EFD)					
BG4WOM	3.7A	574	22	7	7
***BG2CTX**	AA	639,840	1014	88	222
*BH4AYG	"	200,477	419	74	149
*BH7JUO	"	149,310	502	52	106
*BG6FDZ	"	86,736	253	42	114
*BH4TQX	"	65,667	222	61	98
*BD2FW	"	58,247	238	63	94
*BG6CJI	"	54,162	205	41	77
*BD7IAL	"	48,929	296	38	75
*BG2AUE	"	46,759	198	41	66
*BI3NAW	"	41,616	166	46	90
*BH1SCW	"	36,240	189	47	73
*BG4TRN	"	33,540	114	44	85
*BH3PTL	"	29,464	132	43	73
*BH4SKP	"	27,707	105	34	69
*BD4MR	"	21,375	135	25	50
**BG4HUL*	"	*21,344*	*125*	*38*	*54*
*BG4HJE	"	16,425	95	24	51
*BA4SD	"	15,184	102	25	48
*BA1PK	"	11,703	58	29	54
**BG3UPX*	"	*6,532*	*87*	*32*	*39*
*BH4TNQ	"	4,440	69	27	33
**BH4CAC*	"	*3,500*	*35*	*22*	*28*
*BG6CIR	"	2,622	62	28	41
*BD9ALM	"	1,247	17	14	15
*BG7TJA	"	754	40	12	17
*BH4CNN	"	527	20	14	17
*BG3IAY	"	276	18	11	12
*BD9CJH	"	156	7	5	7
***BG9HKP**	28A	67,766	401	15	47
***BG4VRG**	21A	3,708	66	12	24
***BG8SRQ**	14A	8,174	75	18	43
*BA5HAM	"	4,480	42	14	26
*BD4RDU	"	192	12	6	6
*BH4XAE	"	24	3	3	3

Cyprus

P3F	A	8,666,580	4938	130	485
(OP:5B4AGN)					
C4Z	28	602,663	1636	33	104
(OP:5B4AIZ)					
C44C	28A	455,618	1220	28	103
(OP:5B4AHJ)					

Georgia

4LØA	A	6,929,234	4947	109	405
(OP:4L4WW)					
4L5O	"	12,696	105	11	35
4L8A	14A	1,606,648	3101	38	150

Hong Kong

VR2XAN	A	4,694,824	3727	138	398
VR2XMC	"	21,420	116	32	58
***VR2ZQZ**	28	458,590	1735	31	90
**VR2UBC*	*21*	*5,504*	*75*	*19*	*24*
***VR2WOA**	14	6	1	1	1
VR2XMT	21A	326,700	1499	31	90

India

VU2PAI	A	3,033,835	2523	106	321
VU2RCT	"	2,201,642	2582	72	241
VU2YVK	"	582,411	966	66	183
VU2CVS	"	81,838	225	53	113
VU2DCC	"	30,996	110	49	77
VU2TO	"	28,203	122	47	72
VU2BL	21	10,368	96	13	41
VU2JOS	14	24,905	134	25	60
***VU2DED**	A	220,616	384	54	164
*VU3TYG	"	104,319	257	56	117
*VU2SGW	"	55,544	187	37	94
*VU2GRM	"	53,907	175	46	105
*VU2KWJ	"	33,496	138	29	77
*VU2WE	"	22,600	107	32	68
*VU3NPI	"	12,516	79	30	54
*VU2UUU	"	6,634	55	25	37
*VU2NSL	"	5,460	46	21	31
*VU3BUN	"	3,572	38	20	27
*VU2DPN	"	2,484	36	18	28
*VU2IVV	"	1,914	30	15	18
*VU3CML	"	1,440	27	11	21
*VU2MIK	"	210	10	6	9
*VU3OBR	"	187	11	7	10
*VU2YE	"	84	14	6	8
***VU2NFG**	28	56,274	250	20	63
*VU3ONE	"	1,530	29	12	18
***VU2IBI**	21	2,800	44	14	26
***VU3MEY**	14	1,500	30	10	15
*VU3LMS	"	1,092	25	10	16
*VU3MOA	"	180	10	5	5
VU2CPL	AA	1,925,892	1980	90	276
VU2MUD	"	158,368	302	66	158
VU2ABS	"	124,300	236	63	157
VU2GRR	"	55,112	149	52	114
VU2LBW	28A	60,669	287	17	64
VU2WJ	7A	25,550	140	18	55
***VU2AE**	AA	126,945	242	55	162
*VU3KPL	"	60,390	202	32	78
*VU3NXI	"	30,709	128	32	75
*VU3UNO	"	16,830	107	39	63
*VU2ECB	"	16,434	94	24	59
(OP:VU2KWM)					
***VU2CDP**	28A	41,571	175	21	72
***VU3RTL**	21A	8,030	78	17	38

Israel

4Z5LY	A	1,136,016	1402	71	251
4Z5LU	"	27,071	109	27	80
4X2M	*7*	*366,163*	*1080*	*23*	*96*
***4Z5FW**	A	8,109	105	12	39
***4X6DK**	28	94,100	338	25	75
***4Z5MY**	14	3,234	38	8	25
***4Z5KO**	7	29,862	190	16	47
4X6TT	AA	1,989,000	1715	96	329
4Z5PJ	"	6,000	42	26	34
4XØA	28A	405,888	1165	30	98
(OP:4X1VF)					
***4X1KS**	AA	124,246	302	36	110
*4Z5OZ	"	9,401	59	36	43

Japan

District 1

JE1LFX	A	1,337,220	1619	105	201
JH1FNU	"	817,760	1043	90	214
JH1MDJ	"	721,864	918	85	201
JH1EVD	"	658,996	822	85	214
JE1FQV	"	616,926	988	76	153
JH1HIC	"	520,380	674	93	202
JR1IJV	"	464,847	655	86	181
JA1LNZ	"	464,550	551	95	231
JH1QDB	"	432,135	543	92	205
JA1DCK	"	357,588	490	103	198
JR1EMO	"	248,160	417	83	157
JA1DCO	"	192,576	403	53	139
JA1GVM	"	188,936	331	80	146
JF1LMB	"	134,232	294	72	116
JR1JCB	"	121,500	292	64	116
JJ1VFE	"	106,304	252	63	113
JQ1LPT	"	89,838	208	53	108
JH1CTV	"	80,592	251	56	90
JA1XRA	"	47,272	121	60	92
7L4VYK	"	43,230	159	34	76
JO1SIM	"	40,800	157	44	76
JM1NZJ	"	33,390	142	41	49
JA1UOA	"	18,312	100	33	51
JF1OPL	"	6,885	47	21	30
JA1DSW	"	6,552	50	24	28
JE1CWQ	"	4,738	55	19	27
JE1HRC	"	3,318	33	16	26
JA1TD	"	2,040	23	18	22
JA1LZK	"	1,710	25	14	16
JA1XZF	"	1,248	20	8	16
JA1EPJ	"	198	6	5	6
JA1DEU	"	84	4	3	4
JJ1LBJ	28	189,750	616	30	85
JH1OVY	"	44,631	209	24	57
JE1RXJ	"	28,420	172	23	35
JA1NVF	*21*	*198,247*	*642*	*31*	*96*
JA1NFD	"	62,560	270	27	65
JF1KML	"	54	3	3	3
JA1IZZ	"	6	1	1	1
***JJ1VRO**	A	778,928	837	104	252
*JR1EMT	"	296,946	489	74	160
*JG1OWV	"	244,068	364	101	157
*JA1GLE	"	212,107	458	70	123
*JJ1ENZ	"	196,443	355	72	147
*JA1SCE	"	185,458	403	67	115
*JH1OLB	"	167,804	368	63	119
*JA1FWS	"	161,986	340	63	136
*JR1QBA	"	150,660	345	71	109
*JF1MAD	"	115,101	263	67	122
*JE1GZB	"	114,003	301	63	96
*JF1WNT	"	108,750	243	71	103
*JJ1KZZ	"	108,720	236	64	116
*JA1BJI	"	106,505	253	72	107
*JA1CRJ	"	101,569	227	59	110
*JF1MQS	"	97,300	274	46	93
*JG1VHA	"	85,392	217	61	83
*JA1GFB	"	69,525	203	53	82
*JK1NSR	"	66,906	202	47	79
*JA1DDZ	"	66,454	170	53	96
*8J1JOCV	"	61,347	198	46	75
(OP:JL1IHE)					
*7K1CPT	"	56,718	177	54	83
*JA1BPN	"	45,220	163	50	69
*JH1BCS	"	37,632	186	31	53
*JH1MRG	"	31,622	142	43	54
*JF1DWJ	"	28,749	107	46	65
*7K1MAG	"	23,520	128	33	47
*JA1CCX	"	22,640	101	31	49
*JE1REU	"	20,008	108	30	52
*JF1KWG	"	17,388	102	25	44
*JG1LPL	"	15,687	108	27	36
*JG1SWV	"	13,651	69	32	41
*JA1OHP	"	13,359	73	32	41
*JA1UXV	"	12,802	63	27	47
*JA1STY	"	9,472	64	34	40
*JH1VOR	"	9,372	64	29	37
*JN1DNV	"	8,288	64	22	34
*JM1DSC	"	8,140	53	33	41
*JK1EXF	"	8,060	53	26	36
*JH1EYM	"	7,548	43	32	36
*JP1GVC	"	7,018	51	25	33
*7M2ALZ	"	6,556	67	20	24
*JG1XAJ	"	6,490	56	26	33
*7J1ABD	"	6,235	51	20	23
*7N4GIB	"	5,928	48	23	29
*JH1OIB	"	5,904	70	17	24
*JA1LBZ	"	4,120	39	18	22
*JH1EJB	"	3,078	41	17	21
*JG1AKM	"	2,550	29	16	18
*JG1FGL	"	2,275	33	15	20
*JG1RRH	"	1,682	24	12	17
*JF1OPO	"	1,380	24	10	13
**7M1MCY*	"	*1,216*	*22*	*9*	*10*
*JI1FLB	"	399	11	9	10
**JA1LPQ*	"	*352*	*8*	*8*	*8*
**JM1APC*	"	*176*	*11*	*7*	*9*
*7L1AFS	"	130	5	5	5
**JJ1HHJ*	"	*90*	*5*	*5*	*5*
***JA1WSX**	28	86,031	282	32	89
*JH1HLC	"	38,760	160	25	70
*JP1IXV	"	25,674	146	24	42
*JA1MYW	"	20,544	120	24	40
*JH1GLJ	"	16,820	119	21	37
*7J1YAD	"	13,038	98	19	34
(OP:JF1TEU)					
*JI1HFJ	"	11,684	100	17	29
*JG1TVK	"	7,830	49	21	37
*JA1QU	"	5,084	47	17	24
*JG1GCO	"	1,860	30	12	18
*JE1DUO	"	1,728	32	11	16
*JO1JKH	"	660	13	9	11
*JG1FML	"	54	3	3	3
***JA1NQU**	21	136,045	449	29	86
*7K4XNN	"	111,146	378	31	88
*JE1RRK	"	62,335	283	26	65
*JR1MEG/1	"	46,662	250	24	53
*JF1GZZ	"	43,197	226	26	51
*JJ1NDP	"	30,132	208	19	43
*JA1RYC	"	24,426	144	21	48
*JG1MIJ	"	24,244	147	24	52
*JK1NJH	"	10,547	81	18	35
*JK1BII	"	5,772	56	17	22
*JI1LAI	"	5,461	47	17	26
*JA1DBG	"	3,430	47	13	22
*JH1JNJ	"	3,420	37	14	22
*JM1MOM	"	2,368	28	17	20
*JE1HTV	"	442	12	8	9
*JH1HHP	"	361	15	9	10
***JO1NLP**	14	2,170	38	16	19
*JA8KEA/1	"	759	17	11	12
***JH1RDU**	7	7,425	69	20	25
*JH1SUU	"	5,460	68	17	22
*JE1AYU	"	2,175	37	13	16
***JE1SPY**	3.7	1,904	34	13	12
JH1EAQ	AA	3,354,024	2576	133	341
JF1SEK	"	*1,259,136*	*1235*	*110*	*274*
JE1FQV	"	986,986	978	111	263
JK1OPL	"	523,476	516	120	273
JH1ACA	"	511,680	628	95	217
JQ1ABC	"	358,449	512	98	175
JN1THL	"	*352,506*	*607*	*70*	*161*
JA1WWO	"	234,136	395	73	153
JM1XCW	"	221,676	528	50	97
JH1UBK	"	200,640	341	83	157
JA1HGY	"	175,552	304	71	140
JA1IXY	"	149,073	247	84	153
JJ1NYH	"	135,339	239	64	133
JL1RXW	"	124,062	294	66	108
JH1OAI	"	97,150	236	45	100
JI1ICF	"	*72,960*	*348*	*32*	*44*
7N4SJX	"	63,206	161	57	86
JA1BPA	"	24,794	88	26	72
JH1RFM	"	23,838	120	32	55
JQ1PCT	"	22,601	89	31	66
JI1LAT	"	18,624	94	37	59
JA1PYP	"	18,258	79	45	57
JH1APK	"	7,616	78	18	16
JK1ODA	"	558	11	8	10
JA1FFO	"	340	10	8	9
JJ1RDX	28A	187,317	611	32	85
JH1SJN	"	62,403	269	28	65
JI1ALP	"	25,280	120	26	53
JA1CTB	21A	202,160	589	32	101
JR1BTG	"	139,920	488	30	80
JS1KQQ	"	8,064	62	13	35
***8N1F**	AA	1,093,284	1191	118	264
*JS1KKY	"	357,892	514	86	176
*JA1GQC	"	97,295	276	55	90
*JA1ADU	"	88,796	211	52	106
*JA1UII	"	78,884	193	54	110
**JF1DIR*	"	*18,778*	*121*	*29*	*53*
*7K1SLY	"	14,168	68	31	46
*JP1LRT	"	3,220	37	21	25
***JL1EEI**	28A	66,105	228	31	82
*7N2UQC	"	64,064	269	26	65
*JQ1COB	"	15,050	89	24	46
***JM1NKT**	21A	322,959	816	36	111
*JQ1VDJ	"	123,656	414	29	87
*JA1JLP	"	20,540	140	23	42
*JI1KOA	"	3,906	37	18	24
*JA1LKY	"	108	7	6	6
***JE1LPZ**	14A	6,762	57	18	28
*JI1BDQ	"	1,961	21	17	20

District 2

JF2QNM	A	1,870,800	1732	127	273
JA2AXB	"	1,470,045	1616	109	236
JA2VHO	"	416,060	597	94	190
JE2DJC	"	195,794	343	72	151
JA2KPW	"	181,598	347	72	130
JA2JWH	"	167,660	343	74	128
JH2BTM	"	76,260	242	41	82
JR2BCF	"	29,079	133	27	54
JA2HOL	"	24,728	97	31	57
JR2BOF	"	5,217	53	19	28
JA2QNV	"	2,028	28	18	21
JA2ATE	28	23,870	138	22	55
JG2NLN	"	2,844	37	10	26
JJ2RON	"	168	6	6	6
JA2PAC	21	581,328	1518	32	112
JE2BOM	"	31,680	149	26	54
JF2BDK	14	55,765	205	25	70
JA2XLV	"	39,525	183	28	57
JF2OHQ	"	3,168	41	13	19
JA2HNP	7	39,425	159	30	65
***JG2RFJ**	A	127,840	272	70	118
*JR2UBS	"	76,570	190	56	99
*JA2GHP	"	54,398	193	46	72
*JR2FJC	"	46,208	165	51	77
*JR2MIO/2	"	43,008	152	46	66
*JQ2OUL	"	17,100	84	33	42
**JI2IXA*	"	*3,108*	*32*	*17*	*25*
*JR2TTS	"	2,592	34	13	23
*JR2EUE	"	1,485	21	12	15
*JA2IXS	"	720	15	7	9
*JR2LBF	"	110	8	6	5
***JH2MYN**	28	77,385	292	31	74
*JH2KKW	"	44,204	194	26	60
*JL2XMW	"	19,764	126	21	40
*JL2OGZ/2	"	264	11	3	5
***JH2JNU**	21	41,194	213	25	61
*JK2AQT	"	32,925	171	23	52
*JR2UVB/2	"	32,370	215	25	53
*JA2KQE	"	21,515	124	23	42
*JA2KKA	"	8,010	76	16	29
*JE2HCJ	"	4,975	71	12	13
*JO2XYK	"	1,863	31	11	12
*JR2AAN/2	"	1,647	27	12	15
***JG2KKG**	14	68,139	232	31	82
***JF2FIU**	7	144	6	5	4
JR2PMT	AA	645,504	759	101	227
JA2IVK	"	512,680	722	94	186
JF2IWL	"	245,758	443	73	133
JA2XYO	"	84,480	203	56	120
JA2FSM	"	62,500	199	45	80
JH2FXK	"	16,898	88	21	50
JF2VAX	"	798	16	10	9
JH2RMU	28A	26,560	128	26	57
JE2WLD	"	12,960	98	18	36
JA2HBK	"	2,808	28	19	20
JR2WLQ	14A	15,128	104	20	42
***JE2DOD**	AA	15,563	85	31	48
*JJ2QXI	"	192	6	6	6
***JF2KWM**	21A	5,750	52	19	27
***JM2LHB**	14A	504	16	10	11
***JA2PFO**	7A	4,940	55	15	23
***JH9DRL/2**	3.7A	8	2	2	2

District 3

JA3QOS	A	657,287	817	95	212
JH3CUL	"	520,514	619	90	227
JR3QHQ	"	341,039	512	76	181
JR3BOT	"	299,592	521	74	145
JR3RIU	"	204,876	410	61	128
JA3LEZ	"	197,600	372	61	129
JA3FRI	"	76,320	190	60	100
JA3NVF	"	24,153	121	37	60
JA3DVJ	"	22,908	147	33	59
JH3FUK	"	16,932	84	39	44
JG3BXS	"	11,771	79	35	44
JG3KMT	"	9,310	62	30	40
JA3ENN	"	4,914	35	25	29
JA3AVO	"	144	6	6	6
JA3EGE	28	102,592	353	31	81
JR3RIY	21	295,000	904	29	89
***JA3IBU**	A	175,344	363	61	147
**JE3EDJ*	"	*134,850*	*298*	*48*	*107*
*JA3EBT	"	90,428	257	50	98
*JG3EWE	"	62,720	204	49	79
*JA3DAY	"	57,750	185	42	68
*JJ3TBB/3	"	32,870	147	37	58
*JA3KDJ	"	25,584	132	33	49
*JO3QVT	"	23,400	120	39	65
*JA3JM	"	7,370	61	24	31
*JN3WPH	"	5,967	49	21	30
*JR3JRI	"	5,304	52	31	37
*JH3GMI	"	4,140	46	21	25
*JA3HKR	"	2,730	30	16	19
*JA3PFY	"	2,132	38	18	23
*JR3NDM	"	780	15	9	11
***JL3MCM**	28	114,960	371	32	88
*JG3SVP	"	1,946	55	7	7
*JA3RAZ	"	264	8	5	7
***JF3BFS**	21	374,267	1048	33	98
*JA3UWB	"	58,608	272	25	63
*JF3IYW	"	57,120	273	22	62
*JE2OTM/3	"	5,440	64	18	22
*JP3KPJ	"	3,780	54	15	20
*JA3PYH	"	1,128	25	9	15
*JA3BBG	"	990	21	8	14
*JO3XCK	"	651	19	9	12
***JG3EHD**	14	90	5	2	4
JA3AOP	AA	1,438,290	1421	108	270
JG3RPL	"	1,169,586	1192	98	260
JN3TMW	"	604,117	616	119	270
(OP:JF1RPZ)					
JN3SAC	"	408,260	564	83	191
JS3LSQ	"	101,430	256	65	96
JA3OOK	"	41,820	133	48	75
JF3PNQ	"	10,890	61	23	43
JK3NSD	"	10,584	51	31	41
JN3TRK	"	425	11	8	9
JF3LOP	28A	2,240	30	12	16
JR3NZC	21A	737,814	1766	32	122
JO3DDD	14A	249,016	768	36	100
JA3RAR	7A	24,075	139	26	49
JS3CTQ	3.7A	56,011	303	28	51
***JL3RDC**	AA	330,652	530	87	154
**JL3VUL/3*	"	*327,568*	*578*	*73*	*163*
*JF3EIG	"	98,736	218	62	114
*JA4XHF/3	"	49,476	141	41	83
*JH4PUL/3	"	16,472	86	30	41
*JA3IEZ	"	4,293	41	23	30
*JF3GFH	"	2,205	29	13	22
***JM3QIS**	21A	20,234	108	19	48
*JI3FSI	"	336	10	6	8
*JA3EJG	"	18	2	1	2
***JO3PSJ**	14A	5,148	43	16	28
***JI3CWI**	7A	6,724	79	16	25

District 4

JH4UYB	A	5,742,408	4134	146	368
JG4AKL	"	819,549	862	106	263
JA4CMW	"	233,046	496	58	140
JA4DPL	"	203,832	436	54	117
JA4NQD	28	12,100	98	19	36
JA4FJL	7	32	4	4	4
***JE4MHL**	A	512,820	640	97	211
*JR4CZM	"	13,020	61	38	46
*JH4CES	"	1,600	20	14	18
***JJ4CDW**	28	35,651	171	21	56
*JA4DWG	"	13,090	86	17	38
*JA4AQR	"	10,710	86	17	34
***JE4URN**	21	49,764	155	29	87
*JR4CTF	"	23,562	152	21	42
*JA4TUJ	"	140	6	6	4
***JR4GPA**	14	76,760	298	25	70
*JN4UUS	"	925	19	11	14
***JR4PDP**	7	1,045	25	8	11
JR4OZR	AA	3,350,130	2105	150	452
JH4ADK	"	747,360	781	105	255
JO4CFV	"	209,878	403	79	123
JA4CSJ	"	9,717	57	34	45
JR4DHK	"	2,550	31	13	21
JE4KQH	"	2,332	26	19	25
JM4WUZ	21A	238,868	696	33	100
JR4VEV	14A	72,928	263	30	76

District 5

JA5SUD	A	161,568	286	68	148
JJ5IYC	"	112,000	272	63	97
JE5JHZ	"	32,340	144	32	45
JA5FDJ	21	1,226,907	2872	34	119
JA5NSR	7	18,944	119	21	43
JJ5GSY	"	544	15	8	8
JA5BZL	3.7	1,056	16	11	13
***JJ5HUD**	A	235,340	446	69	136
***JA5XPD**	21	12,508	85	20	39
*JA5CBU	"	4,056	40	16	23
*JG5DHX/5	"	3,330	42	14	23
JI5RPT	AA	378	9	6	8
JH5MXB	21A	240,462	725	30	92

District 6

JA6LCJ	A	2,323,952	2013	123	308
JA6EML	"	418,704	631	69	175
JA6BWH	"	320,950	479	79	183
JG6ALR	"	21,306	95	40	66
JA6VQA	21	49,950	216	26	64
***JA6CVR**	A	155,736	365	74	115
*JA6CM	"	38,690	147	35	71
*JK6CSW	"	10,248	74	23	38
*JA6EMA	"	4,773	45	17	26
***JH6FTJ**	28	29,750	151	20	50
*JG6XYS	"	6,292	67	16	28
*JH6SCA	"	1,242	24	9	14
***JS6RTJ**	21	130,525	435	31	84
*JA6FCL	"	45,475	210	26	59
*JA6EFT	"	37,920	191	25	55
***JE6TUP**	14	75	5	2	3
JA6SRB	AA	344,510	576	69	166
JA6GMC	28A	63,772	244	31	76
JA6ZPR	14A	332,761	877	34	109
(OP:JR6CKX)					
JA6BZI	7A	88,440	306	32	88
***JA6GXP**	AA	63,623	171	51	98
***JH6WHN**	28A	8,456	59	21	35
***JF6RIM**	14A	21,624	123	22	46
*JL6USD	"	105	5	3	4
***JH6QIL**	7A	300	11	6	6

District 7

JA7NVF	A	3,588,516	3037	129	318
JA7BME	"	959,480	1056	110	222
JG7AMD	"	217,638	407	74	140
JA7VEI	"	199,728	350	75	144
JR7RZK	"	68,580	180	51	84
JA7CNS	"	41,160	152	47	58
JA7IC	"	25,088	128	36	62
JA7ETU	"	9,636	60	29	37
JA7GFN	"	2,655	27	20	25
JA7ADV	"	1,410	46	23	24
JG7EHM	28	21,105	119	19	44
JA7QVI	21	730,728	1729	36	117
JA7FTR	14	351,075	805	36	119
JA7LLL	"	6,419	49	19	30
***JA7HYS**	A	201,711	343	71	142
*JH7BMF	"	51,610	161	51	79
*JR7DUT	"	21,528	126	31	38
*JR7ASO	"	160	6	5	5
***JA7BEW**	28	161,760	533	30	90
*JH7RTQ	"	135,792	421	32	91
*JE7HYK	"	57,620	253	26	60
*JA7AMK	"	7,720	77	17	23
*JA7AXP	"	1,196	22	9	14
***JI7EMD**	14	14,260	98	18	44
***JH8CLC/7**	7	42	3	3	3
JA7GYP	AA	198,870	341	62	148
JO7KMB	"	181,671	329	64	147
JA7DNO	"	56,520	183	42	78
JH7XVB	"	1,320	22	14	16
JA7OWD	28A	677,069	1777	33	106
JP7GRU	21A	1,980	28	13	17
***JH7CUO**	AA	377,880	520	82	186
*JA7RPC	"	260,032	410	74	165
*JA7KBR	"	2,100	31	11	17
***JA7ZP**	28A	26,904	141	26	50
***JF7PHE**	14A	204	7	5	7

District 8

JA8DKJ	A	156,208	279	75	133
JA8FFM	28	68,985	250	27	78
JA8ECS	21	226,441	669	33	94
JA8TGD	"	30,600	144	22	53
***JA8IJI**	A	129,360	311	57	111
*JM8FEI	"	27,354	114	40	57
*JM8GJB	"	3,200	36	16	24
*JA8JTZ	"	1,860	24	11	19
***JH8DHV**	21	19,220	120	23	39
***JH8SIT**	7	4,212	49	16	20
JH8SLS	AA	11,914	55	27	47
JA8AZN	"	570	12	8	11
JH8SGR	28A	35,100	109	34	101
JH8CXW	"	29,160	141	25	56
JH8DBJ	21A	73,900	261	28	72
JA8RWU	14A	609,875	1239	39	136
JF8QNF	"	482,130	1084	38	127
***JL8BEL**	AA	29,393	97	44	75
***JH8XVH**	28A	73,125	246	30	87
***JJ3DJS/8**	21A	5,624	60	11	27

District 9

JH9KVF	21	322,404	921	32	102
JA9CCG	"	91,624	330	28	76
JE9QMZ	"	32,690	165	24	46
***JA9KBS**	A	169,026	318	63	134
*JA9TQY	"	143,119	337	59	108
*JA9LX	"	4,324	44	19	27
*JA9EJG	"	391	9	8	9
***JA9XAT**	28	50	4	2	3
***JA9GEW**	21	26,910	164	21	44
*JA9NEG	"	1,472	20	17	15
**JH9CEN*	"	*1,450*	*24*	*11*	*14*
*JH9VUU	"	703	15	9	10
*JH9JJD	"	126	7	4	2
JF9JTS	AA	1,053,740	1290	95	200
JR9GMS	"	31,570	101	41	69

Call	Cat	Score	QSOs	Zones	Countries	Note
District Ø						
JJØPJD	A	69,250	200	43	82	
JAØEVI	"	4,914	39	23	31	
JAØHYU	"	1,769	23	15	14	
JAØGCY	21	45,568	219	26	63	
JHØMXV	"	16,368	98	22	40	
*JAØNFP	A	111,384	258	64	104	
*JHØCCK	"	22,188	94	21	65	
*JJØSOQ	"	6,555	49	23	34	
*JAØRCK	"	4,700	34	20	30	
*JAØAVS	"	1,886	28	12	11	
*JAØBJY	"	1,664	22	13	13	
*JHØJDV	28	176,798	596	31	78	
*JJØNSL	21	100,008	354	30	78	
*JRØJOW	"	2,528	33	15	17	
*JIØWVQ	"	2,280	28	10	20	
*JHØEPI	14	140,415	439	32	83	
JJØJML	AA	2,165,505	1720	126	339	
JHØKHR	"	59,520	153	58	97	
JAØJWQ	28A	4,560	42	11	29	
JAØGCI	14A	38,178	155	30	71	
*JRØDZH	AA	14,976	86	28	36	
*JAØCTP	21A	924	20	11	11	
Kazakhstan						
UPØL	A	9,666,524	5985	138	458	(OP:UN9LW)
UN5J	"	24	2	2	2	
*UN6LN	A	323,832	505	64	198	
*UN7FW	"	252,747	499	55	152	
*UP2F	28	2,470	33	6	20	(OP:UN8FM)
UN9GD	28A	339,208	1128	22	87	
UN2E	14A	302,715	714	33	122	
UN2G	7A	2,040	28	12	22	
*UN7MMM	AA	1,205,904	1471	71	225	
*UN5GAV	"	65,600	166	52	112	
*UN6T	"	13,176	73	23	49	
*UN7JX	28A	112,350	456	24	81	
*UN7GOD	"	532	10	9	10	
*UN4PG	21A	78,764	275	28	88	
Kuwait						
9K2K	7A	376,329	999	33	108	(OP:9K2GS)
Kyrgyzstan						
EX8MAT	A	303,203	599	52	141	
*EX8AY	A	13,728	90	21	45	
Laos						
XW1IC	A	1,269,544	1829	80	216	(OP:E21EIC)
Lebanon						
*OD5NJ	28	235,599	888	21	70	
OD5ZZ	AA	514,692	748	61	200	
*OD5PY	AA	800,889	1187	52	187	
Macao						
*XX9LQ	A	10,251	105	27	40	
Mongolia						
*JT7AA	A	1,530	56	15	15	
*JT1PB	AA	358,530	1029	51	134	
Ogasawara						
*JD1BIA	28	720	14	10	10	
Pakistan						
*AP2IA	21	109,700	547	24	76	
Palestine						
*E41MS	AA	13,869	89	21	46	
Republic of Korea						
HL4RBR	A	328,640	607	80	180	
DS4AOW	"	73,220	241	54	86	
HL5ZEE	21	18,231	119	19	40	
*DS2CYI	A	138,510	400	57	105	
*HL2VXK	"	68,620	292	57	89	
*HL5JCB	"	9,280	75	22	42	
*HL5YI	"	3,034	31	18	23	
*D8ØY	3.7	868	50	7	7	
Saudi Arabia						
HZ1SM	14	200,778	701	27	82	
HZ1HZ	AA	2,372,356	2205	88	298	(OP:OE1LZA)
HZ1FI	"	58,696	231	17	71	(OP:DL2RMC)
*7Z1HL	AA	106,200	255	36	114	
*HZ1PS	"	53,169	165	38	73	
Singapore						
*9V5ØXX	A	17,760	199	22	38	
*9V1JA	"	10,812	91	30	38	
Taiwan						
BV1EK	A	430,671	768	90	177	
*BV1EL	A	62,640	447	41	49	
*BU2CN	28	5,500	61	15	29	
BVØMT	AA	1,119,264	1871	73	189	(OP:BM2JCC)
BX3AC	"	215,622	733	48	114	
BU2AU	"	8,265	85	24	33	
*BX6AD	AA	16,461	111	38	55	
*BU2CA	21A	90	8	4	5	
Tajikistan						
*EY7BL	A	20,803	131	16	55	
EY8MM	AA	417,417	569	70	203	
Thailand						
HS5NMF	A	1,755,900	2438	82	218	
HSØZCW	"	672,192	1023	91	197	
HS7BHK	"	197,925	493	60	135	
HSØZDG	"	10,880	73	21	47	(OP:K4YT)
HSØZDR	21	45,496	214	24	64	
*HSØZHC	A	1,528,000	2025	89	231	
*E21YDP	"	467,324	726	68	179	
*E29BUQ	"	246,537	575	64	143	
*HS1JZT	"	204,666	391	67	164	
*E2ØQVD	"	95,570	215	68	122	
*HS6ZBQ	"	23,793	115	39	64	
*HS8GLR	"	17,250	152	28	41	
*HS3LUY	"	5,590	58	25	40	
*HSØZIN	28	75,852	426	28	70	
*HS3ANP	"	41,184	303	20	52	
*HS5SRH	21	152,500	542	31	91	
HSØZDX	AA	3,807	35	20	27	
*HS8JWH	AA	12,717	91	33	48	
*HS5IHQ	"	8,883	68	25	38	
*HS8LVC	"	1,760	33	15	17	
*HS3LSE	28A	73,391	502	23	56	
*E22UUW	21A	18,410	115	21	49	
*HS8JYX	"	7,682	79	16	30	
*HS5FAI	14A	15,075	105	23	44	
*HS4DDQ	7A	31,500	238	22	53	
United Arab Emirates						
A65BP	A	2,882,180	2180	117	373	
A65EE	"	1,240,482	1542	80	223	
*A65CR	A	22,359	122	28	59	
*A61DA	AA	227,879	491	54	127	
*A61VV	"	40,425	154	25	80	
Uzbekistan						
UK7AL	A	129,986	282	54	152	
*UK9AA	21A	867,232	2135	36	128	
Vietnam						
*XV4Y	A	48,246	178	49	80	
*XV9NPS	21	16,632	112	17	49	
XV2CJB	28A	43,332	354	19	50	(OP:JJ2CJB)
West Malaysia						
9M2YAA	21	411,840	1543	29	103	
9M4DX	7	237,952	998	34	94	
*9M2TSM	A	16,426	113	36	50	
*9M4CPH	"	9,891	78	26	37	(OP:9W2JDY)
*9M2KRZ	"	9,443	66	30	41	
*9M2A	28	12,600	282	16	26	(OP:9M2CLN)
*9W2GEO	"	1,200	30	10	14	
*9M2HCN	"	105	8	3	4	
*9W2LWO	"	80	4	4	4	
*9M2RDX	21	5,340	110	14	16	
*9M4CKB	"	624	29	7	9	(OP:9W2KEY)
*9M2RUL	14	56	5	4	4	
*9M2ESM	7	1,581	41	6	11	
*9W2KEY	"	16	2	2	2	
*9M2FUL	AA	42,622	236	38	63	
*9W2MWZ	"	805	23	10	13	
*9M2/JE1SCJ	"	775	21	15	16	
*9W2VVH	28A	8,976	84	17	27	
EUROPE						
Aland Islands						
OHØV	A	3,847,937	3304	144	445	(OP:OH6LI)
OHØJFP	21	832,314	2497	35	112	(OP:SMØTQX)
*OHØBR	14	59,040	502	17	73	(OP:OH2BR)
OHØX	AA	11,790,240	6294	174	706	(OP:OH6KZP)
Albania						
ZA/OH2YY	A	223,850	904	49	136	(OP:OH2YY)
Austria						
OE3K	A	6,480,748	5003	141	493	(OP:OM3BH)
*OE6Z	A	2,402,244	2204	119	403	(OP:OE6MBG)
*OE1HHB	"	761,788	1098	91	321	
*OE3DMA	"	351,897	776	74	199	
*OE1CIW	"	116,379	374	52	149	
*OE5HEL	"	68,724	311	41	125	
*OE3RTB	"	58,450	230	47	120	
*OE4WWL	"	56,722	208	48	110	(OP:OE1WWL)
*OE1KFR	"	48,048	211	38	94	
*OE2LRO	"	23,744	162	27	79	
*OE6FTE	"	19,740	131	27	78	
*OE3MDB	"	13,299	111	27	66	
*OE1TKW	"	8,360	70	24	52	
*OE6RAD	"	2,730	32	15	20	
*OE3MCS	"	2,223	36	14	25	
*OE1VMC	21	1,680	48	11	17	
*OE1XRK	14	40	5	3	5	(OP:OE1RXW)
OE3DXA	AA	867,008	973	108	388	
OE9MON	"	814,302	980	87	255	
OE6MDF	"	691,200	872	92	308	
OE3I	"	115,540	381	60	158	(OP:OE3SEU)
OE2WNL	"	58,098	241	38	100	
OE5JSL	7A	15,554	138	18	59	
*OE5KFM	AA	39,516	193	39	109	
Azores						
CU2AF	28	251,686	1524	26	96	
CR2A	21	383,523	1456	33	114	(OP:OH2PM)
CR2X	3.7	453,248	1778	27	101	(OP:OH2BH)
*CQ8CQ	A	305,640	896	48	132	(OP:CU3AA)
*CU5AQ	14	3,045	53	9	26	
CU3AC	AA	700,740	1025	82	173	
CU3AN	28A	161,124	796	26	90	
Balearic Islands						
EA6SX	7	548,102	2237	34	124	
*EA6/DK5IR	A	134,400	504	44	156	
*EA6ZS	"	53,070	236	37	108	
*EA6AIF	"	6,237	60	19	44	
*EA6ALH	"	2,880	42	16	29	
*EA6ALQ	"	675	16	12	15	
EA6EE	AA	202,315	536	50	165	
EA6XQ	28A	289,506	1054	30	92	
*EA6AZ	28A	10,880	128	12	28	
Belarus						
EW6W	A	3,240,975	3133	125	422	
EW2W	"	1,518,300	2028	110	340	
EW3LN	"	21,534	119	40	71	
EW2A	28	552,780	1413	37	143	
EW8GL	21	3,404	44	12	25	
EW8OP	14	165,726	1257	22	77	
EW8Y	3.7	163,464	1463	18	80	
EW8W	1.8	7,040	154	7	37	
*EW8R	A	443,856	880	81	255	
*EW8DX	"	325,520	840	65	248	
*EU2EU	"	227,360	514	68	222	
*EW8AX	"	218,010	614	58	200	
*EU3A	"	111,033	311	62	157	
*EW1TO	"	74,106	342	42	137	
*EW8OG	"	48,169	241	36	115	
*EU1DX	"	41,138	139	47	87	
*EU2MM	"	34,385	165	33	82	
*EW4CDC	"	15,244	92	28	46	
*EW8RU/1	"	12,080	133	17	63	
*EU1AA	28	226,460	836	30	104	
*EW2BO	"	118,984	387	30	109	
*EW1KV	"	23,002	205	16	46	
*EW6AF	21	144,212	707	27	97	
*EU4AX	"	73,830	345	27	88	
*EW1EA	"	9,312	100	14	34	
*EU6DX	14	22,820	224	14	56	
*EW8RR	7	5,712	102	10	41	
EU1A	AA	7,185,879	4451	161	592	
EU6AF	"	1,503,586	2205	95	327	
EW4A	"	1,184,859	1545	116	391	
EW4M	"	523,768	992	77	299	
EW7M	"	123,241	203	80	171	
EW3MM	"	32,984	156	27	49	
EW8OM	"	14,420	97	35	68	
EV1R	7A	260,005	1429	33	116	
EW1M	"	96,309	563	28	95	
EU3AA	3.7A	10,106	121	10	52	
*EW7DK	AA	341,004	526	92	270	
*EW4R	"	191,152	511	52	156	
*EU4T	"	30,222	161	29	117	
*EW1BA	"	5,252	55	20	32	
*EW4FG	28A	49,920	224	28	76	
*EW4KA	3.7A	14,364	176	12	51	
*EW4GL	"	8,798	149	8	45	
Belgium						
ON5GQ	A	500,448	661	96	305	
ON4MHO	7	9,917	203	8	39	
*OR2F	A	2,005,215	2033	117	438	(OP:ON8LDS)
*ON5UJ	"	335,703	549	81	236	
*ON3ND	"	269,101	667	64	195	
*ON3VS	"	158,414	520	55	151	
*OT7E	"	149,599	441	52	159	
*ON5AFB	"	120,802	409	48	161	
*ON8UK	"	105,072	345	49	127	
*ON6AT	"	82,240	300	41	119	
*ON6FC	"	72,627	284	39	90	
*ON3EA	"	54,108	271	41	121	
*ON2AD	"	36,450	211	32	103	
*ON6LO	"	480	22	4	16	
*OQ4B	28	51,948	209	29	79	(OP:ON4BHQ)
*ON5GF	14	14,250	187	10	47	
*ON6VOX	"	10,962	164	10	48	
*ON6NA	1.8	2,952	76	5	31	
OO7P	AA	3,656,016	2769	139	512	(OP:ON4AMI)
OR3A	"	1,700,388	1809	105	342	
OT4A	"	1,054,445	1536	91	238	
ON7HLU	"	935,240	1127	103	351	
OR1Z	"	676,975	1411	77	248	
OO6T	"	543,774	967	88	275	
ON4VDV	"	284,354	499	86	180	
OR5T	"	117,747	413	53	136	(OP:ON4ALY)
ON7BT	"	56,571	206	47	126	
OO5G	28A	152,626	464	33	101	(OP:DJ6OI)
OQ4T	14A	285,088	1115	33	118	(OP:ON4TO)
OO5M	3.7A	181,450	1487	16	79	(OP:ON5ZO)
*OO7W	AA	440,044	982	67	225	
*ON3AR	"	292,326	548	65	184	
*OT1S	"	223,485	515	60	175	(OP:ON5RZ)
*ON4AXU	"	162,597	296	80	169	
*ON6LR	"	144,728	310	67	162	
*OP4K	"	135,648	335	54	103	
*OO7R	"	76,360	235	50	116	(OP:ON6OM)
*ON3PGL	"	50,862	248	35	112	
*ON7PX	"	32,488	148	38	93	
*ON1TO	"	15,260	244	8	62	
*ON5LNS	"	6,171	57	18	33	
*ON3DI	3.7A	25,857	508	6	45	
Bosnia-Herzegovina						
E73SDM	A	460	30	5	18	
E78T	7	88,464	789	19	78	
*E7ØEA	A	14,440	81	31	64	
*E73CV	14	47,322	315	22	77	
*E74KM	7	17,290	199	12	58	
E72M	AA	160,968	643	34	118	
*E71AGA	14A	38,016	308	20	68	
*E74O	3.7A	63,492	749	11	67	
*E74R	"	40,470	551	10	61	
*E75MM	"	1,764	60	5	23	
Bulgaria						
LZ2XF	A	313,513	618	77	240	
LZ1GE	"	94,080	324	48	148	
LZ1YG	"	986	36	8	21	
LZ1HW	"	128	8	8	8	
LZ2PG	28	73,988	318	26	80	
*LZ8E	A	2,097,106	2500	115	436	(OP:LZ2BE)
*LZ2YO	"	548,340	885	87	293	
*LZ1DM	"	355,347	711	71	250	
*LZ3SD	"	119,105	399	48	157	
*LZ1BY	"	95,228	318	47	132	
*LZ5IL	"	27,084	126	32	90	
*LZ5EO	"	19,902	130	31	76	
*LZ5PL	"	13,800	102	29	46	
*LZ2CWW	"	11,840	157	17	63	
*LZ1AQ	"	4,425	52	17	42	
*LZ2ZD	"	1,392	20	11	13	
*LZ2GS	28	43,872	256	25	71	
*LZ1DQ	"	25,826	198	20	54	
*LZ2JA	21	241,280	1086	29	99	
*LZ9V	"	155,648	848	26	102	
*LZ2JOW	"	2,808	42	13	26	
*LZ1FJ	14	3,182	72	7	30	
*LZ2PS	7	61,152	474	21	77	
*LZ3TL	"	819	29	6	15	
LZ1ST	AA	11,537	83	29	54	
LZ4T	28A	610,659	1636	38	151	
LZ1NG	"	383,328	1157	36	140	
LZ2NG	"	13,500	82	24	51	
LZ3ZZ	21A	279,750	1288	30	95	
LZ2HN	1.8A	1,352	51	5	21	
*LZ1ZM	AA	468,082	1183	71	212	
*LZ2WP	"	202,488	404	68	168	
*LZ1VCT	"	128,030	361	59	158	
*LZ7O	"	79,488	263	53	139	(OP:LZ1ONK)
*LZ5XQ	"	57,596	254	26	95	
*LZ1ND	"	41,400	231	38	77	
*LZ2ZY	"	40,584	162	42	72	
*LZ1OJ	"	6,402	62	19	47	
*LZ2DF	"	1,350	17	14	16	(OP:LZ2II)
*LZ2HA	28A	107,040	415	30	90	
*LZ2FL	"	92,202	388	30	97	
*LZ1VDR	"	74,970	336	26	72	
*LZ1MC	"	27,797	182	24	53	
*LZ6B	21A	434,155	1565	33	122	(OP:LZ2AB)
*LZ3DJ	"	15,552	158	14	50	
*LZ2WNW	14A	113,702	532	31	108	
*LZ3RN	7A	6,550	105	9	41	
Corsica						
*TK4RC	A	1,113	20	10	11	
TK/PB8DX	AA	6,173,544	5362	127	484	
Crete						
SV9COL	AA	272,986	738	76	162	
SV9DJO	21A	132,384	804	18	78	
SV9FBG	14A	468,616	2111	34	118	
*SV9RNG	AA	18,060	182	23	63	
*SV9/SV1OAN	"	4,176	79	9	39	
*SV9GPV	28A	805,304	2879	36	136	
Croatia						
9A1P	A	9,316,256	5930	152	542	(OP:9A1UN)
9A9R	7	371,676	1655	30	111	(OP:9A7ZZ)
*9A9J	A	620,114	935	89	308	
*9AØW	"	607,202	790	96	265	
*9A6RT	"	405,736	668	75	253	
*9A2BD	"	304,950	678	68	217	
*9A8FCC	"	172,800	448	63	162	
*9A4MF	"	135,676	395	51	163	
*9A6ZZ	"	40,000	146	43	57	
*9A3DOS	"	22,048	128	34	72	
*9A5BAA	"	20,570	124	35	75	
*9A6TAQ	"	20,430	111	28	62	
*9A3BSE	"	18,090	123	26	64	
*9A1EA	"	15,352	110	33	68	
*9A5IP	"	9,928	102	18	50	
*9A1SZ	"	8,833	99	18	55	
*9A3CJW	"	6,786	71	18	40	
*9A3DZK	"	2,640	70	10	34	
*9A4VM	28	21,725	147	21	34	
*9A3TU	"	1,274	25	10	16	
*9A2BW	"	1,170	29	7	11	
*9A6KZH	21	67,305	317	25	80	
*9A6RMI	14	30,415	253	18	59	
*9A5ADI	"	11,928	175	9	47	
*9A5ST	7	30,494	283	15	64	
*9A2XW	"	12,978	175	11	52	
*9A3NC	"	486	27	5	13	
*9A1MM	1.8	2,006	61	5	29	
9A4M	AA	17,490	123	20	35	
9A2KD	"	14,991	103	23	34	
9A3KS	"	2,706	31	19	22	
9A7JCY	28A	256,404	839	33	105	
9A5D	21A	734,079	2051	38	141	(OP:9A5DU)
9A2L	7A	519,224	1975	37	127	(OP:9A3AG)
9A1CC	"	19,872	200	12	60	
*9A5Y	AA	4,088,268	2595	162	612	(OP:9A7DX)
*9A6DJX	"	203,510	584	53	182	
*9A2GA	"	148,764	376	55	176	
*9A6OY	"	9,471	99	20	57	
*9A5YY	"	1,104	16	11	13	
*9A3TY	28A	158,480	515	29	111	
*9A3BDE	"	63,635	323	21	68	
*9A4OP	21A	18,328	150	22	57	
*9A3DZH	"	14,579	156	15	46	
*9A3MBM	14A	18,144	195	15	57	
*9A5KIR	"	7,750	92	15	47	
*9A1IW	1.8A	15,675	259	7	50	
Czech Republic						
OK2SFP	A	261,290	602	66	224	
OK2EA	"	226,490	501	77	213	
OK1BLU	"	184,512	509	55	193	
OK1FRO	"	100,992	352	48	144	
OK2ABU	28	37,800	210	23	61	
OK1TFH	"	21,328	146	18	44	
OK6MA	21	20,262	149	18	48	
OK7PV	14	14,495	153	16	49	
OK1EP	7	27,280	216	16	72	
OK5D	3.7	201,178	1669	16	81	(OP:OK1DTP)
*OK7Z	A	3,728,718	3222	133	473	(OP:OK2ZI)
*OK1TA	"	649,020	836	107	328	
*OK2MBP	"	600,880	1131	77	293	
*OK2BEN	"	316,128	637	72	224	
*OK2BRX	"	208,464	520	64	194	
*OK1MKU	"	208,386	394	79	227	
*OK1HEH	"	201,476	602	53	188	
*OK1BA	"	185,772	509	57	169	
*OK2SAR	"	152,721	413	62	177	
*OK1PMA	"	148,894	434	56	162	
*OK2SGY	"	127,748	452	50	168	
*OK2TS	"	110,722	403	39	127	
*OK1AJY	"	105,276	289	54	132	
*OK1KZ	"	58,588	216	48	103	
*OK1DXW	"	57,572	223	44	104	
*OK1XBF	"	35,280	223	38	109	
*OK1ULL	"	30,847	208	25	84	
*OK2KFK	"	30,284	201	36	98	(OP:OK2ABU)
*OK2BND	"	30,250	162	36	85	
*OK2TC	"	18,297	130	33	74	
*OK1VHV	"	15,904	144	26	86	
*OK1HCG	"	13,746	105	21	58	
*OK2IUH	"	11,020	59	28	48	
*OK2MRJ	"	9,792	115	15	57	
*OK2SWD	"	6,930	101	13	57	
*OK7N	"	5,194	54	16	37	
*OK1TVL	"	1,665	41	15	30	
*OK3JS	"	70	4	3	4	
*OK1XC	28	97,125	433	26	79	
*OK1FHI	"	15,050	101	21	49	
*OK2PBG	"	13,746	109	19	39	
*OK6D	"	544	18	6	10	
*OK2TDI	"	6	1	1	1	
*OK2BZE	21	97,920	402	27	93	
*OK1LL	"	78,744	406	21	81	
*OK2SSJ	14	16,980	249	12	48	
*OK1TRW	"	16,830	219	14	52	
*OK1MMN	"	9,342	87	15	39	
*OK5SWL	"	672	28	5	19	(OP:OK2SWD)
*OK2ILD	7	55,752	504	18	74	
*OK4GP	"	36,040	303	15	70	
*OK1JOK	1.8	13,886	265	6	47	
*OK1HFP	"	7,335	171	5	40	
*OK2BNF	"	2,304	78	5	27	
OL5Y	AA	738,760	748	100	340	
OK1TN	"	326,080	479	90	230	
OK1DTC	"	248,153	635	51	148	
OK2SG	"	74,800	182	59	141	
OL6P	"	34,989	187	35	74	(OP:OK2PP)
OK1MSP	"	33,125	145	39	86	
OK7K	28A	1,216,885	2720	37	162	(OP:OK1BN)
OL5M	"	69,618	262	30	93	(OP:OK1GI)
OK7M	21A	1,208,442	2728	39	147	(OP:OK1DIG)
OK6Y	"	303,264	912	36	120	(OP:OK2PTZ)
OL5T	"	149,435	476	33	110	
OK1C	"	114,046	438	28	99	
OK6DJ	"	35,478	228	22	59	
OL9A	14A	1,516,482	3638	40	158	(OP:OK2ZAW)
OL3R	"	753,112	2195	38	146	(OP:OK1VWK)
OK1KSO	7A	442,168	1472	33	119	(OP:OK1CF)
OK4K	"	365,700	1430	36	123	(OP:OK1BOA)
OK1DOY	"	183,825	922	26	103	
OK4A	3.7A	11,781	243	9	42	(OP:OK1DXR)
OK1W	1.8A	69,388	882	13	63	
OK1T	"	46,647	662	11	60	
*OK1K	AA	461,352	676	86	290	(OP:OK1XOE)
*OK4DZ	"	230,076	419	82	167	
*OK6AA	"	169,248	408	60	186	
*OK2GU	"	48,471	228	38	113	
*OL6A	"	37,985	285	21	86	(OP:OK1SKJ)
*OK2WED	"	26,166	133	33	65	
*OK2FI	"	12,155	118	23	62	
*OK7MT	"	8,424	57	25	47	
*OK1TD	28A	124,866	430	28	98	
*OK1NS	"	41,860	191	31	61	
*OK2RO	"	15,209	102	20	47	
*OK1AY	3.7A	59,625	764	12	63	
Denmark						
OZ1ZD	A	618,678	1071	81	261	
OZ1KEF	"	485,787	745	85	254	
OU2V	"	190,764	506	59	193	(OP:OZ1FJB)
OZ1LFI	"	103,045	418	45	140	
OZ7EA	"	83,616	290	48	153	
OZ7DK	"	27,864	130	39	69	
OZ3BJ	28	105,222	299	32	110	
OZ8RH	"	68,238	305	24	78	
OZ7RQ	"	54,780	216	27	83	
OZ7X	14	1,367,688	3685	38	130	(OP:OZ5KF)
OZ4MD	1.8	42,280	605	11	59	
*OZ4NA	A	375,100	854	72	238	
*OZ1ACB	"	246,240	565	59	211	
*OZ4FA	"	214,140	495	63	186	
*OZ1KKH	"	207,480	449	65	215	
*OZ5AGJ	"	89,250	338	46	129	
*OZ8UW	"	17,200	116	26	74	
*OZ3SM	"	8,190	71	26	64	
*OZ1ELY	"	5,915	77	18	47	
*OZ1DGQ	"	2,581	37	13	16	
*OZ5TL	"	2,478	43	16	26	
*OZ1NLD	"	589	17	9	10	
*OZ9V	21	26,100	209	18	57	
*OZ5GOL	14	19,344	260	11	51	
*OZ6MU	"	234	27	7	19	
*OZ4QX	"	99	5	4	5	
5Q2J	AA	1,871,688	2017	119	427	
OZ5D	"	567,706	1040	85	288	
OZ4O	"	203,232	526	50	182	
OZ6GH	"	170,346	406	66	201	
OZ1AA	"	53,340	234	40	100	
OZ1LCW	"	15,604	74	30	53	
OZ5HP	"	13,776	72	31	51	
OZ1DWK	"	12,168	82	33	71	
OZ9ØIARU	"	6,570	146	7	38	(OP:OZ2PBS)
OZ7IB	"	24	6	6	6	
5P1B	14A	51,136	203	31	105	
OZ3ØEU	3.7A	44,676	609	12	56	
OZ1IKY	1.8A	20,520	357	9	48	
*OZ1KVM	AA	226,728	602	63	205	
*OZ4MU	"	63,961	233	44	121	
*OZ1IVA	"	21,423	127	34	77	
*OZ5TO	"	14,104	177	17	69	
*OZ1DJJ	21A	45,399	187	28	83	
*OZ6OM	14A	13,148	80	23	53	
*OZ1NF	7A	26,950	289	16	61	
England						
G5W	A	2,456,904	2306	111	390	(OP:5B4WN)
MØMCV	"	911,840	1514	84	326	
G4DBL	"	402,534	680	78	243	

G3VGZ	"	247,604	605	54	205
G4LKD	"	115,440	408	47	161
G1SCT	"	83,284	287	48	140
G4HYG	"	76,540	350	38	134
MØRBE	"	32,205	147	35	78
G8JYV	"	11,625	141	17	58
G8NVX	"	1,406	36	14	24
G5E	21	188,935	586	34	111
		(OP:G3RAU)			
G4FKA	"	185,952	680	34	115
G3SVD	"	113,265	436	31	104
G4OCO	"	68,224	438	22	82
G9W	14	1,352,575	3630	37	138
		(OP:MØDXR)			
M3C	"	29,148	238	19	65
		(OP:GØVQR)			
M9A	7	115,185	903	20	85
		(OP:G3ZVW)			
G4DBW	"	36,632	463	13	63
G3ZGC	"	4,747	69	9	38
MØCCA	"	182	13	4	9
G6X	3.7	1,428	50	5	23
		(OP:MØKLO)			
G4L	1.8	37,417	530	12	59
		(OP:G4LDL)			
*G3R	A	669,735	1129	74	289
		(OP:GØDCK)			
*G4ADJ	"	236,462	600	59	215
*G4IUF	"	208,791	337	80	217
*G4DFI	"	169,420	544	52	163
*G1PCR	"	161,756	492	46	166
*G8T	"	151,107	468	48	161
		(OP:G4SHF)			
*G8AFN	"	149,526	396	48	165
*G4DDL	"	121,954	395	45	172
*GØCER	"	116,427	370	47	150
*MØP	"	100,893	341	40	129
		(OP:MØRYB)			
*GØMBA	"	97,008	427	44	144
*G8ZRE	"	91,492	418	36	142
*G4DDX	"	82,368	299	46	146
*MØAUG	"	80,755	348	40	115
*G3PRI	"	69,768	353	32	121
*MØGKC	"	57,582	303	31	95
*MØYKS	"	50,050	170	43	100
*MØRNW	"	46,717	232	34	103
*G1EIX	"	45,024	238	37	97
*G1PPA	"	40,672	304	24	100
*GØWAT	"	34,036	193	33	94
*MØMPM	"	34,008	156	35	69
*MØNST	"	33,798	177	38	91
*GØCPA	"	32,500	218	29	101
*G3YPE	"	27,960	138	34	86
*GØIZM	"	27,240	180	26	94
*2EØKDT	"	24,780	120	35	83
*G7NIB	"	24,255	168	26	79
*2EØLKC	"	19,723	171	27	94
*G7VNN	"	16,564	135	20	62
*GØWWD	"	13,662	120	28	71
*G8HXE	"	13,083	119	25	64
*M1LMO	"	11,610	97	28	58
*G4FFN	"	11,256	85	24	60
*2EØTTK	"	6,901	69	21	46
*MØPKZ	"	4,602	61	16	43
*MØLEY	"	3,969	47	17	32
*2EØSVZ	"	2,814	37	13	29
*MØPGX	"	2,115	40	14	33
*M6WID	"	1,518	42	8	25
*GØMRH	"	1,472	52	13	33
*MØTRJ	"	1,014	19	12	14
*MØPAX	"	690	18	8	15
*GØT	"	24	2	2	2
*G4OTU	28	25,040	179	20	60
*MØOSA/M	"	11,110	98	13	42
*MØTQR	"	10,500	96	13	37
*G8GHD	"	10,212	100	15	31
*G3VYI	"	9,292	96	16	30
*MØVCP	"	1,560	27	11	19
*GØFPU	"	1,430	23	10	16
*M5T	21	118,560	710	27	87
		(OP:G7SKR)			
*G7UGC	"	31,500	228	19	56
*G3Y	14	163,285	868	26	87
		(OP:G3YBY)			
*G3YRZ	"	31,980	275	17	61
*G4KIU	"	21,762	314	9	53
*M6HKD	"	368	23	3	13
*M6FCY	"	238	17	4	10
*MØWLY	7	19,497	279	12	55
*2EØVCC	"	3,600	86	7	33
*G6FOP	"	154	16	2	12
*GØRRM	1.8	3,440	86	6	37
*G3VIR	"	1,148	36	5	23
M9K	AA	2,236,341	2673	105	342
		(OP:MØSIY)			
G4IIY	"	1,179,900	1461	91	369
MØGHQ	"	822,348	1016	100	331
GØDWV	"	699,435	908	95	310
M3W	"	324,496	497	76	196
		(OP:G4FAL)			
M1GEO	"	274,092	723	62	189
G4LPD	"	175,934	411	60	182
G4RRM	"	118,552	310	56	147
GØIPE	"	14,960	111	25	63
G4BWP	"	10,512	60	24	48
MØUNI	"	8,640	74	22	50
G6OKU	"	1,924	30	13	24
G6VMR	"	280	8	7	7
G4A	28A	230,526	572	35	127
		(OP:G4TSH)			
G3TBK	"	136,655	430	30	121
M6O	"	8,643	49	20	47
		(OP:G3WGN)			
G6MC	21A	610,902	1697	36	126
M2L	"	447,825	1304	39	136
		(OP:MØBJL)			
GØBNR	"	399,714	1069	40	146
GØHVQ	"	94,350	429	23	88
G7Y	14A	533,936	1984	32	119
		(OP:MØZDZ)			
M1N	"	113,373	612	25	92
		(OP:M1DST)			
G3SVL	"	24,882	168	21	66
G3RXQ	7A	141,812	822	25	96
M5B	3.7A	257,370	1609	19	96
		(OP:G3WVG)			
*MØA	AA	468,160	578	98	342
		(OP:G8APB)			
*MØPNN	"	408,096	800	72	240
*M4P	"	315,248	699	56	216
		(OP:MØPMV)			
*G8KEK	"	241,736	572	57	211
		(OP:G8KEK/P)			

*2E1AYS	"	213,840	391	65	205
*G8AJM	"	154,336	532	46	162
*G3YPP	"	152,559	517	48	153
*G6BDV	"	150,396	402	62	187
*2EØIFC	"	127,488	338	52	140
*GØUWS	"	109,532	438	37	160
*G3VAO	"	95,130	227	60	150
*MØMNV	"	58,136	180	53	119
*G4AYU	"	41,080	158	40	90
*G4WGE	"	40,170	211	33	97
*M6BIR	"	34,945	176	35	110
*G3YBO	"	34,320	137	33	71
*M5Z	"	32,200	200	27	88
		(OP:JK3GAD)			
*MØPLX	"	27,391	236	22	69
*MØWYH	"	27,000	217	24	84
*G7VTU	"	21,100	122	30	70
*MØMXX	"	11,737	104	25	72
*M6FVN	"	2,736	45	19	38
*2EØTBT	"	1,824	51	12	26
*MØTGC	"	81	8	3	6
*G3VDB	28A	26,496	175	16	53
*2EØXAR	"	15,300	101	19	49
*G4KXQ	"	13,786	114	15	46
*G4JFS	"	8,134	66	16	33
*2EØUDX	21A	68,930	299	29	84
*G9F	"	66,490	335	24	85
		(OP:G4BVY)			
*2EØIMD	"	4,956	88	11	31
*G4LWB	14A	10,528	81	17	39
*2EØSDV	7A	25,200	334	15	60
*G8X	3.7A	24,768	342	11	58
		(OP:G4FJK)			

Estonia

ES5TV	A	13,177,813	7820	171	610
ES2IPA	"	120,267	357	56	151
ES5MG	3.7	30,336	323	15	64
*ES7GM	A	3,461,076	3162	135	522
*ES6PA	"	216,864	562	59	192
*ES6RMR	"	79,020	244	48	132
*ES1QX	"	18,025	145	29	74
*ES1CN	21	83,426	394	26	92
*ES5RIM	14	15,810	193	14	48
*ES8SX	7	15,848	225	10	46
*ES3VI	3.7	22,936	358	8	53
ES6RW	AA	6,608,238	4097	163	635
		(OP:ES5RW)			
ES1BH	"	471,608	1079	82	252
ES4RD	21A	191,064	790	33	139
ES2EZ	14A	296,974	1063	36	130
*ES2MC	AA	1,459,360	1523	115	445
*ES4NY	"	420,336	571	100	332
*ES2TT	"	71,016	191	40	92
*ES5TF	28A	132,164	383	33	115
*ES4RC	"	36,234	179	28	71
*ES5RY	1.8A	32,154	434	11	58

European Russia
District 1

RW1CW	A	941,160	1010	118	388
RU1AB	"	593,169	735	112	335
UA1CEI	"	551,420	1304	75	241
RA1AL	"	541,488	1012	85	263
RD1AH	"	365,485	764	77	258
U1BD	"	286,572	780	69	217
R1MA	"	45,570	183	38	109
RA1TV	"	13,800	94	24	51
RM1T	"	1,560	47	8	22
		(OP:R1TE)			
UA1ORK	21	277,965	1158	29	106
*UA1CUR	A	328,105	732	72	239
*U1BA	"	76,825	277	46	129
*UA1NFA	"	71,100	309	35	123
*RD1D	"	35,700	213	38	112
*UA1ZIK	"	24,860	102	40	73
*RA1OHX	28	38,280	527	16	50
*RA1L	"	13,041	121	17	46
*UA1F	"	1,120	50	12	28
*UA1CBM	21	3,268	66	7	31
*UA1AQA	14	80,535	540	24	67
UA1AFZ	AA	692,928	893	97	335
UD1A	"	266,004	540	82	242
RA1QD	"	80,432	254	55	121
RA1AO	"	79,672	258	48	136
RN1ON	"	64,106	317	41	92
RX1CQ	"	59,421	389	27	60
RV1CC	"	28,231	108	42	67
R1AK	14A	456,555	1580	36	129
		(OP:UA1ANA)			
R1DX	7A	69,500	270	31	108
UA1OMS	3.7A	51,850	465	16	69
*RU1ZC	AA	137,904	340	55	153
*UA1OOX	28A	36,018	271	22	65

District 3

UA3VFS	A	992,486	1438	94	364
R3KF	"	524,356	833	101	326
RA3NC	"	206,642	491	69	208
R3ZV	"	190,721	497	71	198
R3GZ	"	141,904	422	58	123
UA3RN	"	117,334	424	54	149
RN3FS	"	83,300	211	58	117
RL3QI	"	78,568	275	45	139
RZ3RZ	"	71,688	215	58	148
RO5I	"	69,475	205	53	122
RW3XZ	"	41,293	171	36	83
UA3PI	"	41,250	297	40	125
RW3SK	"	17,472	96	32	59
RT3N	"	14,820	123	23	72
RW3QHN	"	12,090	84	25	68
RA3THN	"	11,151	67	24	39
UA3UCD	"	5,429	37	25	36
R3IS	"	1,288	16	13	15
UA3X	"	1,240	19	15	16
RA3UT	"	150	5	5	5
RA3EA	28	78,565	380	29	66
RT5K	21	802,240	2263	38	146
R3KM	"	316,827	1227	30	111
RA3OA	7	5,100	68	12	39
RA3TT	"	819	23	6	15
RA3Q	3.7	9,450	111	11	52
RA5AO	1.8	5,985	144	6	39
*RA3DAD	A	1,074,272	1319	103	369
*RZ3F	"	868,790	1138	90	320
*UA3BL	"	634,920	1028	96	311
*RJ3DC	"	435,045	489	117	368
*RA3RLJ	"	287,040	702	61	199
*RK3DYB	"	250,038	685	63	198
		(OP:R2DAW)			
*R5DT	"	200,994	378	72	169
*RL3DI	"	187,920	394	64	168

*RW3AJX	"	174,629	503	62	185
*RA3XT	"	168,270	389	64	173
*R3DL	"	129,554	296	69	142
*RZ5D	"	123,354	291	61	170
*RW3DVW	"	121,212	368	61	173
*R2DGD	"	106,926	344	53	160
*R3LW	"	106,455	340	55	180
*UA3ABF	"	96,768	310	44	100
*RW3LL	"	89,838	220	61	125
*R2AHS	"	86,848	350	39	145
*R3AAA	"	83,790	325	50	140
*RA3DQP	"	80,480	361	38	122
*RD5A	"	78,705	277	45	120
		(OP:UAØKCX)			
*RN3Z	"	77,586	210	53	140
*RX3VF	"	77,525	334	40	135
*R2OFF	"	73,968	383	28	106
*RA3DJA	"	65,824	255	45	131
*UA3IHJ	"	61,190	213	47	98
*RZ3DOT	"	57,500	184	50	65
*R3WZ	"	54,528	192	48	94
*RA3R	"	35,560	202	30	97
*R3QX	"	31,242	108	48	75
*RA3ZH	"	30,702	99	42	77
*R2DFE	"	30,186	127	37	80
*RJ2A	"	23,100	130	33	77
		(OP:RN2O)			
*R3AQ	"	22,600	108	38	75
*RU3UW	"	19,110	113	32	73
*RU3YAA	"	17,270	119	32	78
*RA3LJ	"	16,500	147	30	80
*R3RT	"	13,728	68	36	60
*RX3AU	"	12,464	55	32	50
*RA3E	"	11,125	69	31	58
*R2SA	"	10,920	148	13	47
*UA3YCZ	"	10,692	105	29	70
*R2DEU	"	10,656	114	28	68
*RY2S	"	10,164	110	25	59
*RA3YDA	"	6,440	47	25	31
*RN3FY	"	6,272	77	18	46
*RA3RGQ	"	6,160	38	25	30
*R2RAU	"	4,602	65	17	42
*RW3ZA	"	2,720	30	17	23
*R2AD	"	1,624	20	9	19
*RU3U	"	360	14	7	13
*RA3OO	"	176	11	7	9
*RZ3LC	28	82,110	422	26	89
*RU3SD	"	65,076	268	24	92
*UA3IVF	"	51,895	274	27	70
*R3HD	"	49,920	256	24	80
*R3PC	"	45,778	263	24	70
*RA3RA	"	30,084	163	25	67
*RM2P	"	16,821	167	15	48
*RD3FV	"	15,486	178	15	43
*UA3UAT	"	14,824	110	17	51
*RA3DGH	"	13,091	186	10	43
*R3DZ	"	7,680	58	23	37
*RT3LA	"	7,645	66	19	36
*R3THA	"	7,200	94	12	36
*R3RAE	"	6,700	82	15	35
*R2GB	"	2,898	39	14	28
*RD3DS	"	2,553	33	11	26
*RX3AVD	"	2,301	40	12	27
*RZ3XA	21	161,018	679	31	112
*UA3ABJ	"	64,896	450	25	79
*RY3F	"	17,073	229	12	51
*RZ3Z	14	112,500	567	29	96
*UA3UAD	"	6,634	55	21	41
*R2MA	"	3,486	78	7	35
*R2GAP	"	1,624	30	8	21
*RD3AJB	7	13,266	171	14	52
*RN3P	"	361	16	6	13
*RK3E	1.8	4,429	113	7	36
RM3DA	AA	2,563,866	2633	126	475
RU3FM	"	2,001,441	1421	151	552
R3BA	"	835,639	1178	102	325
R5FU	"	611,184	801	106	322
RG5A	"	374,748	706	78	256
RZ2D	"	368,830	572	106	279
		(OP:UA3BZ)			
R3OM	"	293,832	594	74	244
UA3AGW	"	259,216	354	89	183
RN3B	"	138,816	277	62	130
R3BT	"	111,066	199	80	134
RV3ID	"	106,800	246	60	140
RT2O	"	104,139	283	55	148
UA3RE	"	89,359	248	59	134
RT5C	"	84,210	265	59	151
R3MS	"	76,209	170	66	125
R5AJ	"	59,718	310	35	76
RX3DPK	"	50,285	171	40	73
UG3G	"	37,398	187	40	98
R3MAL	"	33,066	158	47	120
RV5K	"	28,679	103	38	81
RL3BZ	"	24,660	158	31	59
R3LA	"	16,867	113	33	68
R3EG	"	15,960	76	21	55
RN3OG	"	8,120	46	27	43
RA3LCW	"	7,957	54	27	46
UA3DSN	"	1,222	21	10	16
RV3FT	"	130	5	5	5
R3AA	28A	214,332	728	35	124
RA3DNC	"	164,360	613	31	109
UA3RF	"	129,027	656	28	95
RT5Z	21A	835,380	2137	39	156
		(OP:RA3CW)			
RW3WR	"	84,318	344	31	107
RU5TT	14A	200,502	857	33	125
		(OP:R3TE)			
RL5A	7A	29,465	323	16	55
UI5F	3.7A	84,600	837	17	77
*RA3Y	AA	1,045,305	1634	98	337
*RK3RT	"	553,587	1053	81	258
*RC3U	"	429,538	940	72	221
*RA3RBL	"	153,999	512	59	154
*RK2M	"	146,280	461	46	184
*RQ3M	"	117,000	238	70	155
*RK2A	"	88,478	206	79	87
*R3RR	"	83,616	214	59	149
*R3WR	"	69,600	174	63	111
*RK3DU	"	58,604	288	35	126
*RM5C	"	46,736	261	28	99
*R2EA	"	46,320	300	30	90
*R5DF	"	43,542	138	44	74
*RA3FD	"	33,649	143	45	88
*UA3DVB	"	31,605	141	43	104
*R2AT	"	26,675	164	29	68
*R5WP	"	22,002	154	35	79
*RW3FR	"	21,320	83	40	64
*UA3YCX	"	13,312	109	33	71
*R2DGG	"	12,460	103	26	63
*UC5D	"	12,060	109	26	64
*UA3DUJ	"	9,180	72	19	35

*RX3AFE	"	8,946	64	23	40
*RO5K	"	7,930	79	15	50
*UA3XAC	"	7,776	82	16	56
*RC3C	"	4,234	35	26	32
*UA3YAA	"	3,120	37	16	23
*RN3K	"	1,927	33	14	27
*RG3AR	"	1,333	31	15	28
*RO5D	28A	150,006	522	31	107
*R3LC	"	126,132	421	30	108
*RK3DT	"	102,850	455	28	93
*R3RK	"	81,650	487	26	89
*UA5F	"	61,132	297	30	86
*RT3D	"	40,656	144	27	85
*RV3LO	"	35,828	128	26	80
*RN3N	"	5,311	51	13	34
*RA3SAE	21A	135,750	489	31	119
*R2Ø15GV	14A	27,436	260	17	59
		(OP:RG3B)			

District 4

RM4HZ	A	1,659,726	3081	95	327
UA4HRZ	"	301,784	428	87	230
UA4PAN	"	205,400	587	63	197
RN4NF	"	175,802	324	76	186
RW4HD	"	140,896	335	69	169
UA4NC	"	100,620	316	56	178
RW4PP	"	399	11	8	11
RX4W	28	311,850	1620	30	105
RK4FD	7	750,547	2528	38	141
*UA4ATR	A	486,288	774	90	306
*RU4AA	"	476,076	776	88	300
*RA4ACX	"	432,684	787	83	274
*R4WAB	"	210,984	586	60	176
*R4IB	"	190,816	516	72	196
*RK4FAO	"	164,388	539	49	179
*RW4HZ	"	120,185	314	57	158
*RM4C	"	101,888	386	40	159
*RX4CD	"	101,490	299	54	145
*R4CO	"	99,910	313	50	144
*RN4SC	"	98,972	339	52	166
*UA4CNJ	"	92,787	327	43	154
*RA4HBS	"	68,450	267	42	143
*RW4F	"	68,226	235	42	124
*R4YY	"	65,960	327	38	132
*RA4W	"	43,215	255	30	99
*UB4WAW	"	26,299	224	28	91
*RU4PAA	"	12,012	84	29	62
*UA4ARF	"	9,360	94	23	67
*RA4LK	"	5,600	51	23	47
*RN4W	"	616	13	10	12
*R4MM	28	30,000	173	25	75
*UA4UT	"	28,644	205	21	63
*RQ4C	"	25,976	314	17	51
*RN4ACX	"	20,904	184	16	51
*UA4ACP	"	10,314	145	13	41
*RW4S	"	3,276	60	10	26
*RA4FP	"	1,593	21	9	18
*R4SAJ	21	7,865	106	12	43
*UA4SJO	14	31,365	285	20	65
*UA4WGM	"	4,232	73	10	36
*RA4L	"	117	10	3	10
*RA4FUT	3.7	7,280	112	11	45
RJ4P	AA	6,102,295	4890	151	594
RL4F	"	2,154,852	1977	135	477
RW4W	"	1,475,104	1747	121	375
RM4W	"	929,880	1013	122	452
RD4F	"	845,427	862	127	434
RU4SO	"	577,095	608	111	284
RM4R	"	370,968	630	81	267
RN4HFJ	"	257,526	704	59	192
RW4WZ	"	108,824	256	61	183
RA4LO	28A	40,548	184	26	83
UA4LCH	7A	262,400	997	34	126
*RW4WA	AA	1,307,669	1566	118	465
*RL4A	"	1,022,376	1192	115	377
*RZ4AG	"	628,320	961	93	292
*UA4ATB	"	596,923	997	71	282
*R4FAN	"	571,128	701	101	323
*R4FA	"	428,264	766	93	283
*RT4H	"	233,544	512	67	229
*R4RA	"	224,147	397	80	207
*RA4PBE	"	150,894	424	57	192
*R4RM	"	81,391	247	57	142
*RA4LY	"	28,431	102	46	71
*RA4UAT	"	18,972	72	39	63
*RZ4Z	"	11,088	102	21	67
		(OP:RW4YD)			
*RW4NH	"	3,900	36	21	29
*RW4CBU	"	315	13	9	12
*RW4C	"	216	6	6	6
*RN4AM	28A	2,916	27	15	21
*RC4R	14A	39,794	257	20	81
*UA4NDX	7A	25,666	212	19	63

District 6

RN6AJ	A	180,063	453	57	190
RN7A	"	80,409	340	37	110
R7AY	"	68,378	158	65	114
RA7A	"	41,580	148	39	66
RX6LN	"	9,983	77	19	48
RX6CC	"	8,085	49	30	47
RK7T	"	7,479	102	12	15
RA7KU	"	2,064	24	19	24
R6AC	28	69,948	329	26	90
RG6G	21	873,236	2612	37	145
RA7R	14	840	40	6	22
R7AC	7	3,870	99	8	37
*RW6AEW	A	318,092	699	76	207
*UA6LN	"	287,938	578	77	237
*RL6K	"	284,466	606	67	206
*RZ6BR	"	275,145	558	61	194
*RK6K	"	202,692	647	52	202
*R7NP	"	192,708	333	86	217
*RV7M	"	181,185	543	57	200
*RA6LIS	"	160,011	528	45	162
*R6DBT	"	62,307	247	44	117
*R6CR	"	60,900	200	44	131
*R6FAA	"	38,656	118	56	95
*UA6ARR	"	35,504	210	32	80
*UA6JQ	"	24,084	89	44	64
*RU7KN	"	19,530	114	31	74
*UA6J	"	19,005	71	43	62
*R7HL	"	17,490	75	46	60
*RA6DT	"	11,088	76	18	45
*RN6DR	"	10,769	77	29	60
*RA7T	"	4,455	51	22	33
*RO6M	"	4,212	59	15	37
*R6AW	"	3,948	38	18	29
*R7FL	"	2,451	27	18	25
*R6FCI	"	1,634	21	17	21
*RA6XB	"	1,221	26	11	22
*R7AM	28	148,896	662	29	103
*UA6BGM	"	38,614	259	21	65

*RQ7R	"	7,680	57	20	40
*RA6AR	"	1,512	32	9	18
*UA4ASE/6	14	462	21	5	16
*RC7KY	7	163,114	910	30	92
RX7T	AA	1,049,895	1210	106	399
RU6K	"	696,960	707	115	369
UA6YN	"	333,476	895	70	216
RC7A	"	272,734	648	62	191
RN6L	"	197,760	861	48	158
R7KU	"	161,460	259	86	148
R7FF	"	51,262	144	42	100
R7NK	"	48,510	123	54	100
R6AF	"	39,905	123	36	79
RU6B	"	24,570	82	39	78
R7TU	"	13,230	79	28	62
RU6YJ	"	4,214	32	22	27
R7KM	"	1,953	31	10	21
R7KW	"	1,710	21	17	21
UA6LJB	"	621	15	12	15
UA6LCN	28A	224,981	824	32	125
RA6GW	"	154,432	570	31	121
R7LV	"	129,778	279	36	151
RY7G	"	95,914	777	23	68
R7AB	21A	1,143,072	2824	40	156
		(OP:UA6AA)			
UC7A	"	56,406	320	23	79
RQ7M	14A	508,718	1868	37	142
RU6YZ	"	27,744	214	23	73
*R7MM	AA	547,224	650	98	355
*R7GA	"	184,252	404	68	224
*RW7M	"	139,830	252	74	163
*R7KMA	"	137,256	278	69	159
*RG7K	"	135,445	338	65	198
*UA6HLN	"	68,080	268	47	138
*RQ7L	"	45,540	136	44	94
*RK6AQP	"	25,600	127	35	93
*RQ6M	"	22,852	120	28	88
*R6LEQ	"	19,488	128	30	86
*RZ7L	"	18,810	76	33	62
*R7KQ	"	12,150	72	33	48
*RK6LZZ	"	11,023	57	25	48
*RA7KW	"	6,032	75	18	40
*RL6M	"	644	14	10	13
*R7NW	28A	216,769	789	34	139
*RA7M	"	6,027	59	14	35
*RV6LCI	"	160	6	4	6
*RC7M	"	108	6	1	5
*UA6LUQ	14A	95,914	615	28	91
*R7CA	"	49,590	433	24	66

District 9

UA9FLK	A	891,982	1894	85	292
UA9FGJ	21	35,496	198	23	79
*UA9XMC	A	299,364	591	76	227
*RT9X	"	49,200	184	45	119
*RA9FEL	21	46,788	483	15	69
*R9XS	"	15,594	187	12	57
*RD9FM	"	5,656	59	17	39
*RK9FBO	14	12,288	195	14	50
UA9XL	AA	1,286,940	1664	107	375
R9XZ	"	16,585	132	28	79
R9XT	"	6,440	67	25	45
RU9F	"	2,418	23	16	23
R9GM	3.7A	22,770	249	14	55
*RC9X	AA	64,798	224	53	128
*UA9FKH	"	21,518	148	25	81
*UA9FAR	21A	130,815	476	31	122

European Turkey

TA1AGA	A	61,146	256	40	118
*TA1BX	A	238,577	899	51	176
*TA1AJJ	"	8,134	84	25	58
*TA1IER	"	2,067	43	10	29
*TA1AGK	"	1,560	37	13	27
TA1API	AA	59,343	281	40	111
*TA1ED	AA	360,429	816	72	245
*TA1L	"	60,588	197	46	152
*TA1AMO	"	44,220	243	34	98
*TA1MRT	"	9,576	81	26	58
*TA1DX	"	7,739	45	32	39

Faroe Islands

*OY9R	A	27,178	162	29	78

Finland

OG7O	A	1,214,640	1573	118	386
		(OP:OH1VR)			
OH3WW	"	461,160	812	81	297
		(OP:OH1HS)			
OH1KF	"	380,646	620	81	261
OH3EX	"	165,086	394	53	144
OH8FAL	"	127,420	384	61	169
OH1BV	"	88,023	303	50	133
OH1B	"	59,070	202	42	123
		(OP:OH1BOI)			
OH2N	"	43,099	151	46	85
OH1MA	"	38,850	141	27	84
OG7M	"	26,035	109	36	91
OH6JE	"	16,568	92	42	67
OH9A	28	331,650	1212	32	118
		(OP:OH1NOA)			
OH8X	21	1,797,696	4171	38	154
		(OP:OH6UM)			
OH3D	"	82,142	354	28	106
		(OP:OH2NC)			
OG3I	"	35,148	238	18	69
		(OP:OH9MM)			
OH2XF	"	24,892	133	23	75
OH3BCX	"	21,316	175	15	58
		(OP:OH1ZAA)			
OH8WW	14	974,980	2958	34	130
		(OP:OHØXX)			
OH2VZ	"	19,363	207	16	51
OH5ZA	7	7,540	113	11	41
		(OP:OH1ZAA)			
*OH6ECM	A	937,257	1271	97	356
*OH9GGY	"	477,829	820	81	278
*OH1RX	"	233,840	503	74	242
*OH5TS	"	102,934	269	64	150
*OH3KQ	"	99,012	301	63	160
*OG3P	"	92,169	327	60	149
		(OP:OH3P)			
*OH6EHZ	"	68,170	295	44	126
*OH2HZ	"	60,390	399	27	95
*OH2LU	"	54,812	230	38	104
*OH5BW	"	46,190	239	40	115
*OH5EP	"	44,520	140	47	93
		(OP:OH5GJZ)			
*OH2ECG	"	39,480	198	38	103
*OH1LAR	"	38,760	210	49	121
*OH3KX	"	32,766	170	37	92

*OH5HUZ	"	18,900	90	31	44
*OH6EPM	"	15,824	126	23	69
*OH3NAQ	"	13,244	102	24	62
*OH8JK	"	4,757	45	25	42
*OH2JLN	"	2,622	57	10	36
*OH5ELX	"	676	22	9	17
*OH9GIT	"	320	12	9	11
*OH7EML	"	136	10	7	10
*OH4TY	28	19,710	146	21	52
*OH3WR	21	40,293	206	22	77
*OH6EAC	"	8	2	2	2
*OH3HS	14	13,838	104	19	55
OG7A	AA	3,411,478	2503	142	544
(OP:OH6MW)					
OH5BM	"	3,355,534	2759	156	565
OG6N	"	3,241,168	2571	140	533
(OP:OH6NIO)					
OH1Z	"	1,686,246	1623	134	473
(OP:OH1LEG)					
OG1D	"	1,411,132	1332	123	401
(OP:OH1JD)					
OH2LZC	"	1,299,582	1537	108	419
OH3Z	"	649,440	858	102	250
(OP:OH1NX)					
OH6RE	"	551,276	610	107	377
OH2KW	"	504,395	828	94	265
OG55W	"	271,566	477	77	244
(OP:OH2OT)					
OH3JR	"	228,305	288	112	273
OH6DX	"	191,799	337	71	232
OH2XX	"	158,340	408	60	150
OH6OS	"	104,910	233	52	143
OH3RT	"	89,197	195	65	126
OH1TD	"	70,650	230	42	115
OH5C	"	66,951	200	52	77
(OP:OH5CW)					
OH3FM	"	39,198	154	43	98
OH6BA	"	20,904	101	43	91
OH6TN	"	20,592	92	32	56
OH5XB	"	17,978	72	39	50
OH2EV	"	12,160	112	21	59
OH7NW	"	10,507	60	31	48
OH2KI	"	7,303	48	30	37
OH1HB	21A	65,250	213	33	112
OH8L	14A	1,503,712	3469	39	157
(OP:OH8LQ)					
OH1F	"	1,358,194	3313	39	155
(OP:OH1TM)					
OH3OJ	"	665,280	2095	37	139
OH6GAZ	"	19,602	112	23	58
OH2CK	7A	106,552	417	34	118
OH2BO	1.8A	5,928	102	10	47
*OH6GDX	AA	730,296	870	97	344
*OH5CZ	"	391,575	722	82	263
*OH5CY	"	125,990	330	57	158
*OH2FTA	"	89,095	358	43	130
*OH8EJW	"	85,020	274	48	147
*OH6E	"	78,880	192	65	167
*OH8KVY	"	70,848	300	45	119
*OH5BK	"	45,844	251	36	110
*OH2LNH	"	26,260	150	35	95
*OH4MCV	"	24,400	138	33	89
*OH8KA	"	16,038	104	29	70
*OH7EBA	"	12,480	74	31	65
*OH2KM	"	3,149	50	13	34
*OH2FHN	"	2,244	33	17	27
*OH3KAV	"	306	11	8	10
*OH3BU	1.8A	1,144	44	4	22

France

F6GOX	A	2,706,256	2419	127	457
F5VHY	"	760,368	777	103	331
F8DHB	"	506,755	1118	56	159
F5SDD	"	436,791	745	75	216
F1MLN	"	120,228	325	56	116
F1UBA	"	25,704	192	36	100
F6API	"	22,680	136	29	79
F4HIN	"	9,435	97	19	66
F1ADG	"	8,960	74	20	36
F4HKV	"	2,665	25	20	21
F4FET	21	282,336	1029	34	102
F5JY	"	77,004	376	23	85
F8BDQ	"	32,319	234	19	62
F5VIF	"	8,385	75	13	30
F4DNW	"	7,123	157	8	9
F8DVD	14	527,360	1893	34	126
TMØT	7	798,532	3136	36	122
*F2AR	A	638,830	990	82	304
*F4FTV	"	488,741	888	63	220
*F4GVZ	"	428,621	779	76	247
*F6FTB	"	353,736	723	62	244
*F8ATS	"	316,641	560	83	216
*F4EIH	"	287,430	510	69	217
*F6BQG	"	275,420	509	67	226
*F4ETG	"	267,018	621	61	172
*F4AYI	"	250,160	596	66	229
*F4DXP	"	244,343	607	56	173
*F4CDR	"	191,520	541	54	198
*F6DRP	"	179,721	658	39	132
*F5JU	"	168,017	369	64	175
*F4ESV	"	157,398	308	70	152
*F1ICS	"	143,808	388	54	170
*F4DLL	"	130,000	410	53	147
*F1EOY	"	92,708	311	39	115
*F1IWH	"	78,729	305	37	126
*F6CYT	"	74,736	278	46	127
*F6FET	"	60,150	252	38	112
*F8FHI	"	48,355	221	33	62
*F1PYN	"	35,532	216	34	107
*F8OOI	"	31,388	145	39	79
*F4EFL	"	23,598	114	38	76
*F5MA	"	15,946	100	26	41
*F1TZM	"	15,876	126	22	62
*F8CPA	"	15,548	145	24	68
*F1PNJ	"	15,072	98	29	67
*F8DYD	"	15,010	90	27	52
*F5BTH	"	11,704	75	35	53
*F4FBP	"	9,198	79	24	49
*F6KOH	"	8,250	86	15	40
(OP:F1GKS)					
*F4HFQ	"	7,869	67	22	39
*F5CT	"	5,445	59	10	35
*F4GFT	"	3,672	52	15	39
*F6IHY	"	3,444	34	15	26
*F4BPJ	"	1,440	28	14	22
*F4FLO	"	1,216	20	14	18
*F8DHE	"	705	17	7	8
*F4HLL	"	520	18	10	16
*F5LIW	28	253,377	749	32	109
*F5RVO	"	27,000	152	19	56
*F5PAL	"	26,523	182	18	45
*F4BRV	"	1,512	26	12	16
*F8BXI	"	24	2	2	2
*F4FTA	14	154,726	596	33	110
*F4IVV	"	23,023	204	22	69
*F4GLQ	"	16,226	186	13	48
*F4FIA	"	1,276	42	6	23
*F5BEG	3.7	55,242	577	14	67
*TM2G	"	15,860	304	8	44
TM6M	AA	14,263,470	7057	168	667
(OP:F8DBF)					
TM2Y	"	6,012,657	3422	169	614
(OP:F6BEE)					
TM7F	"	4,568,850	3749	124	461
(OP:F6GLH)					
F4ERS	"	2,336,000	2120	126	458
F6DZU	"	1,521,408	2088	86	250
F1RHS	"	574,584	637	119	237
F4FEP	"	506,827	610	88	279
F1UIJ	"	389,790	654	70	235
TM4E	"	278,898	726	64	218
(OP:F4GPB)					
F4HJO	"	225,582	435	69	177
F5IDJ	"	157,725	272	72	153
F1MKC	"	156,630	457	52	175
F6BLZ	"	136,468	359	51	167
F6FLU	"	82,899	165	75	108
F8DFP	"	33,550	184	34	76
F4EUG	"	29,631	141	32	51
F4FLQ	28A	955,696	2236	36	148
F6CQU	"	202,580	672	35	105
F6ITD	"	111,375	438	31	94
F6AUS	"	55,727	172	28	105
F5NBX	"	55,008	161	29	115
F4ENK	21A	807,653	2017	39	148
F4FFH	"	616,058	1709	39	139
TM4L	14A	1,320,404	3765	38	140
(OP:F8ARK)					
F4HJG	"	281,748	990	35	124
TM7G	7A	575,127	2326	34	119
F4DPW	"	131,824	1063	20	92
F4CPF	"	2,709	37	11	32
TMØR	3.7A	114,240	1067	14	70
(OP:F1BLQ)					
*F4FFZ	AA	1,187,730	1117	114	384
*F4FSY	"	946,440	1333	92	348
*F8ATM	"	747,711	625	114	429
*F5DRD	"	576,830	886	86	284
*F1SKH	"	233,648	483	75	197
*F4FRF	"	21,624	107	39	63
*TM2M	"	6,380	57	20	38
(OP:F4GTD)					
*F4GVE	"	5,644	57	23	45
*F8CRS	"	1,794	30	18	28
*F5TGR	28A	57,155	190	27	88
*F1EBN	21A	213,760	659	38	122
*F5ASD	"	180,747	686	33	100
*F4GGQ	14A	418,644	1349	38	136
*F5CCX	"	134,120	540	34	106
*F1ULQ	7A	28,934	351	14	60
*F5HNQ	3.7A	4,512	66	11	37

Germany

DJ5MW	A	6,009,900	4437	141	509
DL1WA	"	1,899,506	1919	107	411
DJ3HW	"	919,560	1034	110	375
DL9GWD	"	905,728	1097	104	360
DL5DTG	"	589,992	844	92	311
DL4WA	"	541,660	801	90	275
DF3TE	"	364,416	591	78	234
DKØL	"	350,075	832	59	216
(OP:DH8ZA)					
DKØSU	"	281,573	643	68	225
(OP:DF7SA)					
DK4IO	"	242,369	503	70	199
DL1JGO	"	223,440	493	67	199
DF3IS	"	205,208	523	54	173
DK7VW	"	189,800	447	67	193
DL1TRK	"	189,462	467	61	212
DH1PAL	"	186,416	479	60	184
DK5EZ	"	183,680	324	73	207
DC9ZP	"	154,062	361	63	180
DF6PB	"	131,560	261	71	189
DF5BX	"	113,424	359	51	153
DL1VJL	"	98,421	235	54	105
DL1HBD	"	85,332	347	42	114
DL4ABR	"	80,106	313	43	126
DK8EY	"	52,668	214	35	98
DH8WM	"	38,080	141	44	75
DC1JAG	"	36,448	159	39	97
DJ9YL	"	36,162	136	42	81
DJ8QA	"	35,505	188	40	95
DC7DX	"	31,473	112	49	68
DL5QS	"	30,290	151	37	93
DL7LX	"	27,984	128	41	91
DB3FS	"	23,754	169	27	84
DJ5LY	"	23,430	103	43	67
DC2TL	"	7,006	97	13	49
DL1WM	"	6,966	56	21	33
DF3QG	"	5,922	46	18	29
DL2IE	"	1,088	18	16	16
DL1DTL	28	16,536	119	14	38
DLØESA	21	15,745	116	17	50
(OP:EA1HEO)					
DJ5IW	"	3,969	39	15	34
DJ6TF	14	187,693	686	31	120
DL9LM	"	48,510	412	19	71
DL8DAW	"	36,738	362	15	63
DL5RU	7	38,359	348	17	72
DJ2YE	"	25,872	262	14	63
DK1FW	"	17,568	198	15	57
DL2YCD	"	650	18	10	15
DK7TA	1.8	2,030	60	7	28
*DL2CC	A	1,951,719	1913	116	423
*DK1KC	"	519,470	892	79	283
*DL4ZA	"	493,272	852	81	291
*DL1MHJ	"	406,700	673	80	252
*DJ4JF	"	399,456	609	85	257
*DL1ATZ	"	365,712	640	73	231
*DL1MAJ	"	356,022	536	90	252
*DL2DQL	"	344,454	621	80	227
*DL8ULO	"	272,862	669	64	215
*DK3WN	"	257,771	621	59	198
*DL5LB	"	239,058	636	55	178
*DG8OBN	"	237,832	612	58	216
*DL8HK	"	236,544	626	51	205
*DG5MLA	"	233,264	490	69	175
*DL3ZAI	"	224,768	536	59	197
*DG2JA	"	204,424	513	60	193
*DL3SKY	"	199,804	537	54	185
*DF5BM	"	179,643	503	53	180
*DK7CH	"	163,150	585	57	194
*DB1RUL	"	139,568	383	50	158
*DK2WU	"	137,904	364	57	151
*DL3DRN	"	130,200	342	59	151
*DL3YEI	"	128,921	418	52	159
*DO1KRT	"	121,396	430	41	137
*DK4EF	"	119,568	300	56	132
*DM5SB	"	108,575	364	53	162
*DF5AN	"	103,836	284	55	149
*DF6RI	"	103,776	329	50	138
*DL6RG	"	98,496	339	50	142
*DL2AMT	"	93,812	358	40	148
*DL2QT	"	93,176	307	46	106
*DD5MA	"	86,516	241	51	121
*DL2RUG	"	86,044	309	40	156
*DL9LF	"	85,769	230	50	149
*DL7USW	"	78,078	337	46	136
*DK7MCX	"	76,880	306	42	113
*DK7TM	"	76,258	334	42	140
*DM3KZN	"	75,117	205	47	100
*DH9DX/P	"	70,000	250	44	131
*DK7GH	"	67,614	226	45	132
*DO1RTO	"	64,539	293	32	69
*DO9SR	"	64,500	288	35	90
*DF6QC	"	62,514	311	37	101
*DG1EKL	"	60,590	290	35	131
*DJ6HR	"	57,681	246	37	116
*DL5GSM	"	57,236	317	39	125
*DL4FAP	"	55,432	193	49	120
*DL4HWM	"	52,360	266	36	118
*DJ4WM	"	49,735	256	37	108
*DL9HB	"	47,719	171	35	84
*DO5LO	"	45,080	202	35	80
*DO3PKE	"	44,034	239	34	89
*DL3ARM	"	43,956	197	40	92
*DF2FM	"	37,672	161	43	93
*DK6SP	"	36,918	195	31	95
*DD1OP	"	34,716	136	40	92
*DL4DRW	"	34,528	156	37	67
*DL4JWU	"	31,590	206	31	104
*DL7VX	"	31,548	147	35	97
*DL9FB	"	31,416	183	35	101
*DO6NI	"	30,456	255	26	82
*DK2TS	"	30,080	171	29	99
*DL1DF	"	28,676	171	29	78
*DL1RPR	"	27,474	158	37	77
*DL1GBQ	"	27,354	156	26	71
*DL2DIE	"	26,796	199	28	88
*DL4SZB	"	25,800	137	31	98
*DL1IF	"	25,038	120	30	87
*DL2AWA	"	24,948	165	38	94
*DJ3CS	"	24,308	132	34	84
*DL7FUA	"	24,000	147	33	87
*DC1LEX	"	22,922	143	27	46
*DH7OM	"	20,648	106	31	58
*DL5MHR	"	20,370	125	30	75
*DM1LC	"	19,404	149	28	70
*DO7RU	"	19,256	138	22	36
*DL2LMS	"	18,881	97	30	49
*DL1MFZ	"	18,468	147	35	79
*DO1AYJ	"	18,318	140	21	65
*DL7VRG	"	18,036	113	33	75
*DL6EZ	"	17,954	124	25	69
*DL8ZU	"	17,854	103	41	72
*DLØABT	"	17,568	132	28	68
*DL1AS	"	16,490	117	27	70
*DL2AL	"	16,443	89	31	50
*DG1RPU	"	16,416	102	35	73
*DF9MP	"	15,444	106	22	44
*DK8HE	"	14,700	100	27	73
*DL4FNM	"	13,650	105	26	49
*DO2KD	"	10,944	118	19	53
*DO2HEY	"	10,795	104	24	61
*DK3YD	"	10,584	84	26	58
*DL2IC	"	10,360	68	24	50
*DL3TVI	"	9,840	88	17	23
*DG6DAF	"	9,702	65	24	42
*DO2FWW	"	9,685	84	24	41
*DO2MRC	"	9,000	112	20	52
*DF9DD	"	8,456	67	21	35
*DO6SI	"	8,320	111	14	50
*DK5KF	"	7,626	97	19	43
*DL9ZWG	"	6,808	75	21	53
*DO5MSN	"	6,771	72	20	41
*DKØPT	"	6,144	52	19	29
*DM2DLG	"	5,846	93	21	58
*DH2PL	"	5,452	44	24	34
*DG5YHK	"	5,220	54	23	35
*DC6RI	"	4,879	60	17	24
*DK3PM	"	4,736	60	17	47
*DL2ADI	"	4,256	44	22	34
*DO6FC	"	4,128	95	9	39
*DM6CZ	"	3,936	72	15	33
*DL3PW	"	3,510	64	17	37
*DD1AX	"	3,276	49	17	35
*DO1FPT	"	3,136	38	18	31
*DD9PS	"	3,024	32	20	22
*DL6BG	"	2,970	58	19	47
*DJ6DP	"	2,769	35	16	23
*DL1STV	"	2,480	46	8	32
*DK6TM	"	2,464	40	16	28
*DB1WT	"	2,280	50	9	29
*DF9IX	"	2,176	44	13	19
*DC1DB	"	2,128	40	12	26
*DO3EF	"	1,625	27	11	14
*DO3NO	"	1,484	31	11	17
*DK9MOS	"	1,258	37	10	27
*DM3AZ	"	1,224	19	12	12
*DN6TM	"	1,152	26	12	20
*DO2HRB	"	1,147	29	14	23
*DL1AWC	"	1,036	34	7	21
*DL1GO	"	980	27	11	17
*DK2IC	"	912	22	9	15
*DC4LW	"	891	23	10	17
*DK9OS	"	837	27	9	22
*DJ6DO	"	828	23	10	13
*DO7PSL	"	817	25	7	12
*DL7LZ	"	527	11	7	10
*DO2JX	"	416	10	8	8
*DL5BL	"	325	21	7	18
*DO2XX	28	56,185	267	22	63
*DF1JC	"	28,080	163	18	54
*DP4M	"	23,298	185	18	48
(OP:DJ4MH)					
*DL2RZG	"	17,745	120	19	46
*DO5DC	"	16,500	149	19	47
*DF5RF	"	12,789	98	16	33
*DL7BC	"	12,285	99	17	46
*DH5WB	"	12,096	103	17	37
*DF1AN	"	11,556	91	18	36
*DL3EBX	"	10,800	91	15	35
*DL4MFM	"	4,114	55	13	21
*DL2BRN	"	4,095	51	11	24
*DL7CU	"	3,042	45	9	17
*DO4GR	"	1,264	29	8	8
*DG1BQC	"	924	26	7	14
*DLØXX	"	558	14	8	10
(OP:DJ2YE)					
*DL9MFY	"	90	6	3	2
*DO1MEW	"	33	9	6	5
*DL5KUD	21	51,057	259	24	69
*DL5JS	"	36,080	229	22	60
*DO1PCD	"	25,818	205	17	61
*DL9ZP	14	97,092	577	26	90
*DLØGEO	"	29,970	336	14	60
(OP:DL2YAK)					
*DL7FB	"	24,388	280	12	55
*DL5ALW	"	9,891	83	19	44
*DL4GBA	"	8,930	88	14	33
*DK4REX	"	2,006	41	9	25
*DL6MJ	"	35	5	3	4
*DJ1YFK	"	24	4	2	4
*DJØMCZ	7	48,576	417	18	74
*DL8AAM	"	31,023	279	15	66
DJ8OG	AA	7,002,800	3735	171	649
DF9XV	"	3,501,064	2322	150	557
DJ7EO	"	3,420,502	2408	139	490
DK5QN	"	3,185,634	2469	146	508
DD2ML	"	3,172,098	2133	142	539
DJ5AN	"	2,751,042	1868	154	560
DL6NDW	"	2,523,060	1951	136	519
DL5GAC	"	2,069,284	2062	122	440
DL1NKS	"	2,005,938	2036	122	472
DF2LH	"	1,761,228	1501	130	479
DL4LAM	"	1,394,640	1123	130	455
DF8XC	"	1,244,484	1106	117	384
DF2RG	"	1,240,834	1197	118	408
DK1QH	"	1,091,995	1294	108	385
DJ7UC	"	1,059,850	879	118	399
DL7URH	"	1,022,018	1006	116	410
DK6CQ	"	872,160	873	111	349
DL7UXG	"	789,670	998	94	312
DK2AT	"	765,142	985	97	337
DL8UAT	"	739,952	803	109	340
DL1ASA	"	688,746	895	82	300
DC3RJ	"	675,995	1397	88	265
DF2TT	"	635,532	655	111	391
DL4JLM	"	613,339	721	90	271
DL5YM	"	594,664	1000	88	240
DL2DX	"	519,224	658	92	236
DL5RDO	"	513,382	630	96	298
DM1CM	"	492,012	830	80	266
DK8ZZ	"	465,215	761	77	218
DK2LO	"	458,640	595	93	271
DL7ON	"	394,020	481	100	296
DJ3WE	"	389,900	805	70	280
DK6AH	"	387,744	631	88	248
DJ6OZ	"	382,236	566	83	235
DL1II	"	352,515	512	90	241
(OP:DD1A)					
DM9EE	"	350,796	569	75	171
DL5WS	"	348,726	398	102	297
DD1JN	"	348,160	683	75	245
DK9HN	"	306,774	478	90	252
DL1NEO	"	297,735	423	86	259
DK1FT	"	283,080	643	62	218
DL5RDP	"	279,695	388	91	240
DL7CX	"	255,164	430	92	272
DK4VW	"	252,540	425	69	161
DK1AX	"	241,368	407	77	190
DG7JB	"	208,692	402	75	204
DL5XAT	"	206,682	360	80	214
DL8RDL	"	204,222	360	85	218
DL9GS	"	171,536	386	75	209
DH7TNO	"	162,426	320	76	177
DLØPE	"	161,840	416	56	182
(OP:DH8GHH)					
DL8NBJ	"	160,544	352	62	170
DL4YAO	"	135,000	320	47	153
DL8AKA	"	128,843	410	54	167
DF9VJ	"	106,050	259	52	150
DJ6TB	"	104,799	255	65	128
DL5NEN	"	101,716	254	64	172
DJ7MH	"	100,068	512	47	139
DF4WC	"	96,096	236	49	107
DK3GI	"	84,148	177	63	130
DLØNM	"	83,840	507	29	102
(OP:DB2RR)					
DL5ASK	"	76,638	194	52	107
DL3NCJ	"	73,746	269	41	112
DG3MR	"	67,135	217	47	98
DM5EE	"	62,124	136	69	98
DL1DBR	"	59,160	216	46	90
DM5TI	"	49,280	242	29	81
DG9SEH	"	47,472	207	37	92
DJ1AA	"	45,495	241	25	110
DH6DAO	"	44,232	124	53	99
DG2MKV	"	44,010	202	34	101
DK1LRS	"	43,212	180	46	110
DL1LOD	"	34,632	123	51	97
DL3AMI	"	31,878	98	48	78
DL5XL	"	27,911	109	40	73
DJ4MZ	"	26,625	156	24	47
DK3HV	"	26,078	99	44	74
DL2VM	"	24,012	93	39	77
DL5NEB	"	20,700	104	35	65
DL5NDX	"	20,085	117	27	38
DL7XT	"	15,111	119	22	47
DF4UM	"	11,648	91	18	46
DM2GM	"	10,400	70	30	50
DJ2IA	"	6,497	53	30	43
DL1SVA	"	5,842	49	18	28
DL7UPN	"	4,635	37	20	25
DL8RB	"	4,268	33	20	24
DK4US	"	3,420	46	13	17
DF2FR	"	2,774	25	18	20
DG3FDR	"	1,972	40	14	20
DL1KID	"	726	13	9	13
DL9NDV	"	704	14	10	12
DJ1XT	"	105	5	3	4
DK3T	28A	990,840	2442	37	147
(OP:DK3EE)					
DL5L	"	897,216	1986	37	155
(OP:DGØOKW)					
DH8BQA	"	596,177	1382	38	155
DL1YM	"	174,423	426	35	124
DL2OE	"	133,002	344	34	128
DL6DQW	"	27,200	125	26	59
DL1RG	"	18,157	102	23	44
DL2ARD	21A	1,685,103	3365	40	163
DMØY	"	856,515	2074	39	140
(OP:DL3BQA)					
DJ7WW	"	780,390	1875	38	136
DJ9ZB	"	130,707	442	28	113
DL3ARK	"	23,862	130	23	59
DL4DXF	14A	124,120	519	31	114
DH8WR	"	48,672	278	22	74
DL9DRA	"	7,742	59	20	29
DL5NAM	3.7A	70,594	624	17	77
DB2B	"	56,640	632	13	67
(OP:DL8OBF)					
DL8DBW	"	14,457	214	9	52
DD9WG	"	4,290	100	6	33
DM7C	1.8A	43,956	683	11	63
(OP:DL7CX)					
DK3AX	"	63	10	2	7
*DF2AJ	AA	638,078	920	88	295
*DL8MAS	"	584,064	857	75	263
*DK5D	"	543,345	612	93	314
(OP:DK5DC)					
*DL6RAI	"	494,349	758	88	279
*DF7EF	"	484,758	645	91	291
*DL6NAL	"	328,910	543	77	233
*DLØNG	"	295,612	608	60	203
(OP:DK8NC)					
*DL1DXA	"	294,455	412	103	226
*DL6ON	"	273,683	725	60	229
*DL1GME	"	261,568	634	64	204
*DJ1SL	"	245,300	509	54	166
*DH4PSG	"	235,741	456	76	243
*DJ9MH	"	206,712	397	68	196
*DL4EBA	"	191,733	633	53	184
*DK5WO	"	187,016	512	55	139
*DL6YAO	"	185,811	596	56	185
*DL2SWR	"	175,770	329	78	201
*DF2WF	"	163,548	532	47	184
*DO9ST	"	157,409	434	42	157
*DL2FAG	"	147,580	342	65	170
*DM5BB	"	141,183	333	52	137
*DF9GR	"	135,680	459	46	166
*DK5DQ	"	124,020	205	84	181
*DL1CG	"	100,636	384	45	136
*DL2MLU	"	94,864	304	50	126
*DJ2SEA	"	81,312	249	47	121
*DJ3JD	"	77,190	259	47	119
*DG1BHA	"	75,330	315	37	125
*DL8ZAJ	"	69,300	235	49	126
*DO3MKB	"	63,900	264	37	105
*DF1LX	"	60,720	159	62	122
*DM5CQ	"	60,605	261	42	113
*DL4EBW	"	47,628	244	37	125
*DF5EM	"	42,048	164	44	102
*DL5ZB	"	40,872	127	46	85
*DL4LT	"	37,401	216	31	106
*DL8AX	"	37,264	162	43	94
*DC8QT	"	33,232	189	35	89
*DL6RBH	"	32,128	160	35	93
*DL6AH	"	28,614	104	36	78
*DL5ANS	"	28,500	92	57	68
*DD8IL	"	26,536	159	31	93
*DL7UN	"	22,684	129	32	74
*DG2BHB	"	21,930	154	21	65
*DJ2SN	"	16,731	117	29	70
*DJ2FR	"	16,287	118	25	64
*DL9GCG	"	15,600	98	22	43
*DFØEG	"	13,986	95	23	40
(OP:DM6HK)					
*DM6CS	"	12,054	77	32	50
*DO1KUB	"	10,728	105	20	52
*DL1OJ	"	8,911	73	25	42
*DM9JM	"	8,520	104	16	55
*DL1NEK	"	8,190	74	21	44
*DF6YC	"	7,446	56	32	41
*DO2MWR	"	7,370	67	20	47
*DF5TR	"	7,200	64	26	46
*DF3IR	"	6,624	77	20	52
*DM6HK	"	6,105	56	21	34
*DC2VE	"	5,330	50	17	24
*DJ1KS	"	5,115	63	20	35
*DO2FM	"	3,900	62	14	36
*DL3LBA	"	3,876	39	21	30
*DL1YCF	"	3,864	37	22	34
*DO1UKR	"	3,570	76	13	38
*DL1DVE	"	3,186	45	16	38
*DN5MX	"	3,094	32	16	18
*DG8HJ	"	2,464	34	18	26
*DK2ZO	"	2,346	29	15	19
*DF8UO	"	2,142	29	15	19
*DO7WM	"	2,115	41	16	29
*DL7AOS	"	1,458	30	11	16
*DC2CT	"	1,410	19	12	18
*DL1KJ	"	1,305	19	10	19
*DL1FW	"	1,216	30	14	24
*DFØSL	"	240	8	5	5
(OP:DDØNM)					
*DL9SAD	"	170	7	4	6
*DG1UAE	"	27	5	4	5
*DL1QW	28A	143,055	384	35	130
*DK1IP	"	83,760	298	29	91
*DO4TP	"	22,620	152	19	41
*DM3PKK	"	2,800	30	11	24
*DG2MEL	"	2,142	31	15	19
*DB1VQ	21A	4,323	61	12	21
*DL6CT	14A	120,875	567	30	95
*DL4VAI	"	73,684	405	25	84
*DL4YR	"	7,392	90	17	39
*DL5OCR	"	6,500	112	9	41
*DL3CQ	"	36	3	2	2
*DF8AE	7A	39,044	424	15	71
*DJ4MH	"	23,104	253	13	63
*DD1MAT	"	1,218	24	9	20
*DK2BJ	3.7A	10,440	148	10	50

Greece

SV1PMR	21	118,473	803	24	77
*SV1PMH	A	376,194	678	76	242
*SV1NZX	"	201,080	572	58	162
*SV1KYC	"	95,485	345	39	130
*SV1GRD	"	60,876	263	45	126
*SV1CEI	"	31,702	117	42	89
*SV1AIN	"	28,178	157	41	105
*SV7CUD	"	21,691	114	37	78
*SV6NNZ	"	16,524	119	30	78
*SV1PIZ	"	16,380	107	34	71
*SV2OJJ	"	12,276	101	20	46
*SV1OCQ	"	11,040	114	22	74
*SV1ME	"	1,664	20	12	20
*SV8DTD	28	40,170	238	21	44
*SY1AEA	21	36,491	252	20	71
SV1JG	AA	1,742,160	1984	121	389
SX2V	"	230,040	486	90	234
(OP:SV2GJV)					
SV8IIR	"	48,363	161	51	96
*SV2BXA	AA	277,848	528	72	234
*SV1PMQ	"	133,280	401	60	178
*SV1ELI	"	107,334	273	59	142
*SV1ONV	"	61,614	226	45	144
*SY1BFI	"	47,034	224	33	101
*SV8PMM	"	17,578	147	25	69
*SV1DOO	"	9,694	76	27	47
*SV1CJF	"	4,284	46	22	41
*SW3JH	14A	76,109	411	27	94
(OP:DJ5JH)					
*SV2FLQ	1.8A	960	28	7	17

Guernsey

*MUØFAL	A	164,376	455	49	167
*2UØWGE	"	10,360	104	20	50
*MUØGSY	28	180,290	852	24	86

Hungary

HG3R	A	3,000,732	2825	119	395
HA5UA	"	50,025	221	39	76
HA7JQK	14	7,742	130	11	38
HG1G	7	146,672	1242	19	84
*HA5PL	A	94,068	420	47	154
*HA3FHH	"	85,085	224	44	143
*HA5LUI	"	29,601	138	39	78
*HG2UK	"	26,180	148	32	78
*HG7JEC	"	12,320	161	14	56
*HA8AT	28	9,246	85	16	30
*HA3LN	14	218,434	991	34	115
*HA5BI	7	13,860	203	9	51
*HA7AVU	3.7	12,320	206	9	47
HA8RT	AA	2,978,040	2471	140	550
HA3OU	"	535,870	700	97	313
HA8JV	28A	740,720	1692	37	151
HA1AG	14A	6,288	55	21	27
HA7I	7A	191,008	1149	26	101
(OP:HA7JTR)					
HA8A	3.7A	279,672	1603	27	102
(OP:HA8DZ)					
*HA6ITU	AA	470,253	1025	76	267
(OP:HA6NL)					
*HA5PP	"	256,221	464	64	185
*HA6PJ	"	75,112	325	41	123
*HA7MS	"	24,738	97	48	85
*HG6C	14A	245,058	1052	35	123
(OP:HA6IAM)					
*HA7NK	3.7A	33,031	457	10	57
*HA8BE	1.8A	2,380	67	5	30

Iceland

TF4X	A	2,826,175	3109	103	370
(OP:N5ZO)					
TF3CY	28	89,165	608	17	68
TF3CW	14	1,182,537	3435	34	119
TF3SG	7	57,429	516	17	64
*TF2MSN	A	262,786	587	61	201
*TF8KY	"	41,730	211	33	97
*TF8EK	"	476	23	9	19
*TF3JB	14	33,078	397	14	60
*TF8HP	"	378	18	5	13
*TF3DC	AA	96,928	264	42	166
*TF3MHN	"	2,583	40	12	29

Ireland

EI9CN	A	252,705	508	58	197
EI3GYB	1.8	1,880	39	8	39
*EI1A	A	2,105,408	2431	100	391
(OP:ON4EI)					
*EI4GNB	"	644,100	1161	67	272
*EI3CTB	"	163,968	503	49	175
*EI7CC	28	82,497	370	25	82
*EI4GZB	21	18,699	113	18	51
EI6JK	AA	4,880,352	3167	143	553
EI2CN	14A	381,966	1071	37	129
*EI7JZ	28A	49,104	229	23	70
*EI4II	14A	124,476	628	29	103

Isle of Man

MD2C	AA	186,430	373	52	154
(OP:MDØCCE)					

Italy

IIØX	A	1,226,115	1599	112	383
(OP:IZØPMV)					
IØLYO	"	817,052	1185	91	337
IK7HTB	"	656,243	994	84	305
IZ6ERS	"	633,992	1229	87	301
I4XNN	"	406,315	669	83	246
IK7NXU	"	302,700	492	75	225
IZ5EKV	"	284,961	940	40	89
IO1X	"	277,128	935	50	166
(OP:IW1FPK)					
IZ8LMA	"	262,305	486	65	196
IZ5MXA	"	243,126	718	61	173
IK3SSW	"	232,670	532	61	204
IK6GPZ	"	200,700	505	63	160
IK8NSR	"	174,981	387	67	152
IK2AQZ	"	173,761	495	58	183
IZ5ILJ	"	154,365	349	64	187
IW2CTQ	"	152,558	468	54	184
IU5BKR	"	136,484	356	55	174
IKØUXO	"	81,732	263	60	136
IU8FRE	"	73,875	212	50	147
IZ3ZLC	"	60,760	225	39	101
I1DXD	"	51,408	175	45	123
IK8GYS	"	50,864	193	52	124
IK8JDH	"	39,456	184	37	100
IZ1YCG	"	28,625	166	31	94
IKØUTM	"	27,876	131	31	70
IW3FVZ	"	27,417	151	35	76
IKØYUT	"	21,167	162	22	39
IX1CVF	"	20,640	163	27	93
IWØAEN	"	13,524	101	29	63
IZ3ZLG	"	10,075	108	14	51
IK2YYL	"	5,742	57	18	40
IKØVSY	"	3,102	53	12	10
IZ3WFD	"	2,501	30	17	24
IZ2ZQP	"	1,593	31	10	17
IV3OSC	"	1,517	27	16	25
IZØOTV	"	1,260	17	13	17
IR2L	28	137,588	607	29	77
(OP:IW2LLH)					
IZ5TJD/7	"	67,348	265	30	83
IK2SGB	"	22,140	148	16	38
II4Z	21	75,746	338	30	91
IK1BPL	"	69,472	356	23	81
IK1NEG	"	65,540	305	26	87
IZ8GUQ	14	93,654	511	28	101
IU8FRF	"	640	14	8	12
IZ5MOQ	7	40,960	494	16	64
IZ4RCQ	3.7	6,125	94	9	40
*IK2QLX	A	535,370	817	80	261
*IZ8FBU	"	318,618	696	64	215
*I5DOF	"	238,015	587	59	204
*IZ5IMD	"	222,656	492	66	218
*IR1X	"	220,374	713	58	173
(OP:IZ1GLX)					
*IK4BEI	"	167,466	444	56	170
*IZ2BZP	"	157,645	457	50	155
*IV3ONZ	"	126,477	429	46	161
*I1RB	"	113,240	358	51	139
*IK1SLD	"	110,644	439	43	156
*IZ8EEL	"	107,899	257	52	135
*IU3BXO	"	101,016	312	48	135
*IK4PKN	"	90,585	257	57	126
*IZ2SXZ	"	87,360	283	47	109
*IZ2YAF	"	84,534	306	47	146
*IK3XTT	"	83,782	276	50	113
*IV3ARJ	"	80,755	252	47	108
*IU4DTV	"	80,290	330	49	136
*IW1RGS	"	75,072	239	56	128
*IZ8GUH	"	74,824	258	53	135
*IW2EVH	"	73,630	261	51	134
*IK6SBW	"	73,162	244	47	110
*IZ2LQD	"	72,027	267	46	113
*IZ2OOS	"	63,357	281	40	107
*IX1CLD	"	59,488	243	44	132
*I1YGQ	"	55,936	254	37	115
*IZ5UGE	"	53,375	241	36	89
*IK8SDA	"	52,744	217	43	109
*IK2OFS	"	48,822	198	39	64
*IK8RJS	"	46,376	201	36	100
*IU4FIT	"	42,768	188	43	119
*IZ2JNN	"	39,420	207	30	78
*IK2VUC	"	38,808	159	47	107
*IK4FWF	"	37,995	174	43	106
*IØZUT	"	37,873	167	38	83
*IU4CHE	"	36,450	165	26	55
*IU1AUG	"	35,607	190	35	108
*IK2YSJ	"	33,565	191	35	102
*IU1FIB	"	32,385	185	28	99
*IN3ADW	"	32,032	221	30	82
*IN3JRZ	"	30,720	227	28	92
*IZ2BKA	"	30,654	133	37	80
*II3I	"	28,556	128	37	81
*IN3EOM	"	27,405	175	31	104
*IZØRJR	"	27,336	158	39	95
*IZ8BFV	"	26,784	126	43	81
*IZ1JOB	"	22,563	160	27	82
*IV3AEB	"	22,272	110	33	63
*IV3NVB	"	22,144	106	40	88
*IZ7EUB	"	21,988	83	39	53
*IW6NZY	"	21,150	148	28	66
*IV3IDP	"	19,975	128	23	62
*I6FDJ	"	17,954	143	24	70
*IZ8GBT	"	17,664	101	27	42
*IK7LVE	"	17,655	90	38	69
*IZ8YAA	"	17,622	162	21	68
*IZ1HBC	"	16,116	111	24	55
*I2BZN	"	15,264	123	25	71
*IK2REA	"	14,616	104	25	62
*IZ1RDQ	"	14,256	87	28	53
*IU2FGB	"	13,780	98	21	44
*IN3FWK	"	11,526	142	23	79
*IZ6ZFM	"	11,040	86	33	63
*IK8ARF	"	8,642	83	20	38
*IU7BOE	"	8,614	74	22	51
*IU3BRB	"	8,600	87	28	58
*IU1CYF	"	8,591	72	24	47
*IZ7CDE	"	8,240	98	17	63
*IZ8TVS	"	7,548	87	18	50
*IZ3GOG	"	7,448	66	16	33
*IW5EHL	"	6,840	71	21	51
*IU4AOP	"	6,720	48	27	33
*IN3MNS	"	5,952	57	20	44
*I5YKQ	"	5,220	59	20	40
*IK3MLF	"	5,145	43	20	29
*IZ2SRK	"	4,872	59	17	41
*IK5YJK	"	4,704	54	18	30
*IZ1MHY	"	4,508	45	20	29
*IN3RWF	"	4,060	60	17	53
*IK6IOQ	"	4,047	64	16	41
*IU4AOW	"	4,012	56	18	41
*IWØEZW	"	3,315	56	17	34
*IK4XQT	"	3,116	52	14	27
*IW5ELA	"	2,574	23	17	22
*IK1NPE	"	2,322	46	11	32
*IW2DJN	"	1,950	24	17	22
*IZ8GEX	"	1,786	29	15	23
*IZ1RHY	"	1,380	22	12	11
*IZ2CSX	"	1,258	26	14	23
*IK2PZC	"	1,152	18	11	13
*IW2OBX	"	936	24	10	14
*IW1BNZ	"	888	19	11	13
*IK2SYK	"	720	18	9	15
*I5FIP	"	575	25	7	18
*IZ1DLY	"	378	14	7	11
*IKØCHU	"	266	7	7	7
*IU1FID	"	255	13	6	11
*IW4ECF	"	128	12	5	11
*IZØEXX	"	104	5	4	4
*IZ8IBC	"	96	4	4	4
*IK5BOH/2	"	90	5	5	5
*IQ1KZ	"	60	9	7	8
*IZ1MIG	"	18	3	3	3
*IK4LZH	28	124,928	455	29	99
*IZ4JUK	"	90,640	403	25	85
*IB1W	"	63,852	319	26	76
*IZ7DOK	"	46,276	271	24	68
*IU2DUP	"	34,408	157	27	61
*IW5BT	"	32,660	135	26	66
*IZØFKE	"	29,094	170	22	56
*IK7XGH	"	22,848	152	20	48
*IZ2NZQ	"	15,252	102	18	44
*IZ4DYP	"	14,820	125	17	35
*IK2WXQ	"	6,946	69	17	29
*IZ4AIF	"	5,408	71	12	20
*IK7LMX	"	4,992	70	10	16
*IK4VFB	"	4,325	65	10	15
*IKØOKY	"	3,348	51	12	19
*IU2BFT	"	260	10	5	8
*IK8VVU	"	2	1	1	1
*IZ5ILF	21	156,984	605	27	97
*I3FGX	"	118,938	450	29	100
*IW5ECP	"	70,738	323	22	91
*IQ7AF	"	56,238	416	25	78
(OP:IK7JWX)					
*IZ7UIT	"	43,446	378	18	60
*IO7K	"	35,280	256	16	64
(OP:IZ7XNB)					
*IZ5CMI	"	26,100	148	21	54
*IWØECV	"	5,760	80	15	25
*IW1CHX	14	109,272	639	24	92
*IK5BSC	"	55,488	416	21	75
*IZØMQN	"	32,844	322	21	71
*IZ7ZKV	"	30,008	291	18	70
*IV3UHL	"	26,100	205	20	70
*IK3AVM	"	10,395	94	15	40
*IK2ODD	"	6,834	100	9	42
*IZ2EEV	"	4,760	79	9	31
*IZ8QNS	"	4,560	57	13	35
*IZ4MNZ	"	2,960	53	10	27
*IWØRTW	"	1,316	51	6	22
*IZ1LAY	7	8,968	137	11	48
*I3LGP	"	3,600	54	11	34
*IZ4MOC	"	500	25	3	17
*IW3GNS	"	228	20	4	15
*IU4FKR	"	102	10	8	9
*IK1ZNU	3.7	726	38	3	19
*IK3SSJ	1.8	888	34	5	19
IW2HAJ	AA	6,630,272	4024	158	590
IV3SKB	"	3,609,494	2831	150	544
IZ8FWN	"	2,504,172	2486	133	489
IZ2ODM	"	1,253,001	1277	119	382
IK3UNA/1	"	1,242,828	2028	102	335
IK2CIO	"	526,493	886	66	187
IK3SCB	"	508,751	1009	57	184
IK2SAI	"	487,425	811	81	254
IZ8EFE	"	449,852	556	101	321
IKØXBX	"	331,215	529	80	275
IZ2SMQ	"	320,433	573	67	242
IZ3XEF	"	297,738	405	90	188
IZ5YHD	"	275,723	512	89	242
I4JED	"	203,528	324	79	168
IZ3QHA	"	116,412	376	49	169
IK2ULV	"	86,373	271	50	139
IKØFUX	"	77,550	199	50	91
IZ3EAW	"	71,760	324	47	109
IKØOPS	"	54,044	163	44	74
IZ2DII	"	46,976	273	37	91
IZ1PLH	"	45,570	207	38	117
I2SVA	"	12,768	105	16	26
IZ8SXI	"	11,234	81	28	54
IZ2BVC	"	7,260	83	16	44
IZØKBA	"	2,604	26	17	25
IZ1KGY	"	1,596	19	12	16
IZ1KGK	"	64	4	4	4
IK4DCX	28A	695,268	1622	37	149
IR6T	"	487,025	1142	36	139
(OP:IK6JNH)					
IR4E	"	460,075	1079	36	139
(OP:IK4ZHH)					
IO3X	"	393,125	852	38	147
(OP:IV3JCC)					
IZ5CML	"	346,024	895	34	133
IR4B	"	304,278	761	34	132
(OP:IK4AUY)					
IK2WZM	"	148,596	522	29	93
IWØSAF	"	48,024	345	20	38
IZ2LTW	"	32,618	188	22	72
IZ8EDL	"	29,868	107	28	103
IZ8ESX	"	9,348	78	16	41
IO4W	21A	624,128	1561	40	144
(OP:IZ4AFW)					
IZ4ORO	"	392,445	1091	37	134
IKØPHY	"	392,040	1173	38	127
IWØBCF	"	151,682	495	34	115
IZ8HUJ	"	145,220	585	31	106
IK8INR	"	16,368	131	19	47
I7CSB	"	2,622	27	15	23
IB1B	14A	752,896	2268	37	136
(OP:IW1QN)					
IZ4VYY	"	399,012	1580	34	130
IZ5NFD	"	389,423	1399	36	137
IU4AZC	"	140,125	801	28	97
I5FCK	"	139,860	690	33	102
IW1RBI	"	68,250	387	25	80
IZ1NBX	"	52,528	345	22	76
IZ8IEV	7A	146,196	841	28	103
I1JTQ	"	121,024	800	22	100
IU6AKY	"	35,236	359	21	71
IO4C	1.8A	76,440	923	15	69
(OP:IZ4ZAW)					
IC8POF	"	6,916	136	8	44
*IQ2DN	AA	797,872	1311	86	290
(OP:IZ2JQP)					
*IZ3NYG	"	589,724	673	103	276
*IK8TEM	"	403,970	592	97	301
*IV3BCA	"	390,698	578	95	318
*IWØEAC	"	239,605	494	77	200
*IK3ORD	"	198,394	350	78	181
*IZ3EIN	"	164,318	328	62	180
*IZ1TRG	"	159,530	391	69	196
*IW2FUT	"	142,064	416	49	159
*IK6UBY	"	110,400	358	53	139
*IZ4YDF	"	94,284	245	59	135
*IU4AOS	"	61,202	185	54	88
*IZ2BHQ	"	58,480	159	54	118
*IW3HKW	"	50,864	155	52	124
*IW2NEF	"	37,730	155	37	73
*IZ1XEE	"	36,581	101	72	85
*IK4NZD	"	27,972	244	14	28
*IK2PFL	"	20,710	105	33	62
*IK2SAR	"	16,281	91	33	48
*IU2CKS	"	15,912	124	31	73
*IK2CLB	"	13,224	81	29	58
*IW3IAU	"	11,040	87	24	45
*IZ2OBS	"	5,445	59	17	38
*IU8DKG	"	3,692	61	14	38
*IU8ACV	"	3,450	31	21	25
*IUØDZR	"	3,195	37	15	30
*IU4BIP	"	1,443	25	16	23
*IK2IKW	"	1,316	17	14	14
*IZ2BZT	"	1,215	21	11	16
*IK2WPO	"	675	14	14	13
*IW2ODU	"	391	19	6	17
*IZ1QLT	"	189	7	4	5
*IZ3ZLP	"	24	2	2	2
*IØUZF	28A	508,344	1190	36	141
*IK7XNF	"	61,004	287	27	74
*IU4FJI	"	39,655	201	29	74
*IK4TVP	21A	392,938	999	39	143
*IK3TPP	"	368,354	1062	38	128
*II5D	"	207,816	636	37	131
*IR8W	"	16,185	177	14	51
(OP:IK8YFU)					
*IK5LWE	"	14,094	138	15	43
*IZ8VKW	"	8,262	90	13	41
*IZ8EFD	14A	244,795	978	37	136
*IZØDXD	"	90,600	513	28	92
*IZ4AKO	"	3,255	37	15	20
*IKØWRB	3.7A	2,640	58	9	31
*IZ5OQX	1.8A	567	29	4	17

Kaliningrad

RN2F	A	370,968	752	69	243
RN2FQ	"	123,760	388	54	167
UA2CZ	"	88,172	248	52	136
RA2FB	28	20,900	127	21	55
*UA2FHZ	A	36,450	167	42	93
UI2K	AA	3,960,712	2894	145	516
(OP:UA2FZ)					
*RA2FF	AA	237,888	296	88	248

Kosovo

Z6ØA	A	127,458	484	39	107
(OP:Z61DX)					

Latvia

YL2SM	A	5,744,170	4447	142	480
YL6W	"	1,194,579	1540	106	295
(OP:YL2GD)					
YL2PP	"	462,105	562	102	303
YL2UI	28	38,016	201	21	75
YL2BJ	14	569,712	2090	35	121
YL2CI	"	309,078	1310	35	119
*YL2GP	A	63,897	172	60	117
*YL2JR	"	16,848	110	29	75
*YL2II	"	5,304	79	18	50
*YL2LW	"	3,000	36	12	18
*YL5W	21	137,391	772	27	96
YL3CW	AA	2,237,760	2466	114	390
YLØY	"	30,171	117	40	73
YL2KO	28A	576,940	1419	36	146
YL2KF	"	38,024	187	25	73
YL9T	"	25,584	188	19	63
(OP:YL2TW)					
YL7A	21A	607,320	1637	39	141
(OP:YL2GM)					
YLØA	"	225,120	824	35	125
YL2IP	7A	24,600	221	16	66
*YL3IR	AA	17,490	74	42	64
*YL3GV	21A	22,780	222	16	52

Lithuania

LY4T	A	995,644	1366	100	367
LY2TS	"	566,415	934	88	281
LY4OO	"	416,625	835	78	225
LY2AE	"	412,344	772	77	255
LY5L	"	157,318	412	61	177
(OP:LY2HQ)					
*LY5R	A	3,531,635	3543	118	453
(OP:LY9A)					
*LY6A	"	814,618	1085	100	334
*LY2N	"	239,701	515	65	218
*LY2OM	"	230,362	641	60	223
*LY5Q	"	199,017	510	70	203
*LY2BAA	"	55,308	264	32	100
*LY3UV	"	33,580	166	34	81
*LY1K	"	26,660	210	22	102
*LY1NDN	"	16,284	119	27	65
*LY3Z	"	16,102	156	22	61
*LY4SA	"	10,270	97	24	55
*LY2AT	"	984	24	9	15
*LY2KA	21	79,552	334	28	85
*LY2ND	"	18,830	189	19	51
*LY2OF	"	8,800	102	15	40
*LY2EW	14	23,660	285	14	56
*LY3IV	"	15,392	169	18	56
*LY5I	7	77,634	494	22	92
LY2IJ	AA	2,137,520	1489	159	611
LY9Y	"	1,129,293	1259	123	438
LY2CX	"	1,006,228	1521	92	336
LY5O	"	500,955	855	92	275
LY3CY	"	243,005	688	55	210
LY3B	"	194,180	479	61	205
LY4BP	"	57,524	310	34	112
LY2AX	"	41,409	130	49	80
LY1R	28A	169,312	547	30	113
LY5Y	21A	653,250	1887	34	116
LY8O	1.8A	28,413	459	10	53
*LY7Z	AA	4,394,565	3456	142	593
*LY2NY	"	723,699	1093	82	339
*LY1SR	"	363,510	812	66	249
*LY4Q	"	218,124	636	59	190
*LY5AM	"	15,169	139	18	59
*LY2AJ	28A	41,760	199	30	66
*LY3X	7A	1,118	35	6	20
*LY2OU	1.8A	21,122	367	8	51

Luxembourg

LX7I	A	8,425,872	5953	136	507
(OP:LX2A)					
LX1NO	"	1,148,309	1666	83	270
*LX1IQ	A	59,985	206	51	104
*LX1ER	AA	535,527	788	94	285
*LX1DKE	"	21,320	139	31	73

Macedonia

*Z35W	A	978,512	1866	89	279
*Z33RW	"	50,806	267	35	98
*Z35F	21	104,640	639	28	81
Z39A	7A	214,795	1207	28	105
*Z32AJA	21A	285,056	1513	27	104
*Z35T	1.8A	28,644	397	10	56

Malta

*9H5DX	A	81,072	245	47	97
*9H1EJ	AA	111,780	264	59	184
*9H1XT	"	16,380	122	29	76

Moldova

ER3CR	1.8	5,330	144	7	34
*ER5DX	A	323,646	461	72	251
*ER3ZZ	"	53,196	225	45	111
*ER1OO	28	115,258	444	34	109
*ER4LX	21	98,160	457	26	94
*ER2RM	1.8	6,396	165	6	35
*ER1BF	AA	345,540	1102	56	204
*ER3DX	"	12,191	63	31	42

Monaco

3A2MG	A	114,444	292	55	143

Montenegro

4O3A	A	8,161,884	5873	160	569
(OP:9A3A/E73A)					
*4O7CC	AA	780,192	1854	72	272

Netherlands

PC2T	A	763,668	1400	79	245
PB7Z	"	456,190	818	80	263
PAØJNH	"	219,328	397	75	223
PA1NHZ	"	186,590	517	61	174
PA3CJP	"	115,159	399	50	159
PA9DD	"	4,712	60	11	20
PA4B	14	38,192	264	22	66
PA9M	7	302,600	1623	30	106
PA3A	"	2,520	63	6	30
PA1CM	1.8	168	14	2	12
*PA3BUD	A	361,760	689	73	250
*PA9IGB	"	294,752	566	64	180
*PD5DJ	"	280,391	817	51	148
*PA3DBS	"	211,904	550	56	168
*PAØAGA	"	207,460	705	54	151
*PH2A	"	194,340	494	59	178
*PA2W	"	135,744	424	46	156
*PG1R	"	122,811	424	43	158
*PA1TO	"	118,745	497	39	148
*PE1EWR	"	100,701	348	49	152
*PAØEMO	"	97,734	488	39	140
*PA8ZB	"	92,496	366	40	124
*PG2P	"	75,740	300	36	104
*PE2HLA	"	75,660	340	38	118
*PD1B	"	71,145	260	42	111
*PD5CW	"	63,510	240	40	106
*PA2PCH	"	51,300	213	47	124
*PA3ATZ	"	51,152	199	43	96
*PA3RIS	"	46,860	191	45	87
*PC1H	"	45,903	243	35	108
*PBØACU	"	44,407	204	33	88
*PD5JFK	"	38,528	238	31	97
*PDØMHZ	"	33,397	296	18	73
*PH4E	"	27,972	170	29	79
*PA3HCC	"	21,100	159	26	74
*PE1OFJ	"	20,586	114	33	61
*PD1TV	"	18,012	119	23	56
*PA3DTR	"	17,466	102	29	53
*PA9X	"	15,965	110	35	68
*PD1RJV	"	10,800	107	18	54
*PA1VC	"	10,472	98	23	54
*PA3I	"	8,757	99	16	47
*PA5JD	"	8,142	78	18	41
*PA5SKY	"	7,684	71	20	48
*PD1BHZ	"	7,650	53	20	30
*PA1CWI	"	6,440	86	20	50
*PD4M	"	5,778	81	13	41
*PE1LTY	"	5,208	62	19	37
*PC4Y	"	4,814	66	16	42
*PC3H	"	4,692	74	15	36
*PE1KVL	"	2,992	53	14	30
*PD3RFR	"	2,688	32	13	29
*PA2DK	"	1,656	28	9	14
*PA3CVR	"	992	34	10	22
*PA8B	"	576	29	5	19
*PA7MDJ	"	468	10	8	10
*PAØB	28	24,924	220	15	47
*PA3DVA	"	8,595	97	14	31
*PD3MGA	"	1,032	20	9	15
*PA3BPV	21	288	10	6	10
*PD1ROT	14	10,726	133	14	48
*PDØMGX	"	9,150	123	11	39
PA3AAV	AA	2,928,870	2567	140	490
PF1MO	"	585,778	1077	76	270
PC2D	"	574,548	1082	87	261
PA3GVI	"	284,214	529	79	224
PA2LO	"	191,744	395	73	183
PC4H	"	138,852	396	52	151
PE1HWO	"	57,222	180	52	101
PA1CA	"	42,560	177	49	111
PA1NL	"	34,338	158	39	79
PI4F	"	16,425	136	22	51
(OP:PA3HGT)					
PA5KT	"	10,773	110	14	49
PA1T	14A	7,392	101	11	45
PA5MW	7A	11,925	120	14	61
PA3CWN	"	4,089	32	21	26
*PA3T	AA	652,688	1054	79	282
*PA1PE	"	546,897	677	99	280
*PAØMIR	"	496,230	727	86	271
*PHØAS	"	480,800	742	97	303
*PB2A	"	423,632	645	84	248
*PE4BAS	"	279,300	545	76	209
*PA2CVD	"	218,316	659	50	176
*PA3DDP	"	205,918	444	66	232
*PA2C	"	193,856	584	53	180
*PD1RO	"	188,550	506	58	167
*PE1FTV	"	179,064	507	53	163
*PH7A	"	167,314	298	78	188
*PA3DAT	"	159,012	457	62	190
*PA5AD	"	107,793	422	48	155
*PG2AA	"	99,225	291	52	123
*PA8KW	"	92,259	302	53	148
*PE2W	"	73,776	223	55	104
*PA2GRU	"	72,478	293	44	123
*PH2L	"	70,950	245	47	118
*PDØME	"	61,791	246	34	95
*PA3GDD	"	61,686	252	41	108
*PA1VD	"	54,316	197	48	100
*PDØJMH	"	54,125	266	30	95
*PD1AT	"	44,759	169	40	103
*PC4C	"	26,730	154	31	79
*PA3GDG	"	25,538	148	32	81
*PA1DI	"	14,500	125	28	72
*PD9DB	"	13,193	117	21	58
*PC5Q	"	11,929	100	22	57
*PD8A	"	10,430	114	18	52
*PD1AFF	"	10,005	102	19	50
*PAØRHA	"	7,800	99	16	59
*PD3OES	"	6,765	65	19	22
*PE1RMO	"	5,488	72	14	42
*PA3MRO	"	5,310	42	19	26
*PD8J	"	3,243	46	17	30
*PD2GSP	"	1,920	30	15	17
*PA1RT	"	1,800	46	10	35
*PE1NBD	"	1,600	27	10	22
*PA3JEM	"	1,365	29	12	23
*PA1BV	"	475	23	8	17
*PD7H	28A	1,998	46	11	16
*PD1D	7A	62,084	734	16	67

Northern Ireland

GI4VHO	A	59,882	303	35	123
*GI7AXB	A	301,586	761	59	143
*MIØRRE	"	147,407	392	52	169
*MIØULK	"	26,578	208	26	71
*GI4SJQ	AA	304,950	516	73	212
*MIØSMK	21A	180,147	558	37	122
*GI6K	14A	638,880	1540	36	129
(OP:GIØKOW)					

Norway

LA6VQ	A	1,058,696	1263	98	374
LA5UF	"	424,588	774	84	274
LB7ZG	"	258,995	689	65	212
LA1PHA	"	36,960	171	43	97
LA5PRA	"	28,024	116	48	76
LA3QPA	28	63,125	333	22	79
LA5HPA	"	558	17	7	11
LA8FTA	21	39,468	235	21	71
LA5YJ	1.8	12,393	244	6	45
*LA2ONA	A	179,718	551	55	176
*LA6GX	"	177,003	583	51	162

*LB5BG	"	128,140	475	49	166
*LA2XNA	"	115,420	448	48	151
*LA8OKA	"	110,448	408	46	162
*LA1VNA	"	105,072	412	43	156
*LA7TN	"	65,912	374	32	122
*LA8OSA	"	46,506	235	34	104
*LA2QJA	"	45,752	218	36	97
*LA4AAA	"	44,616	246	39	117
*LA6PBA	"	35,712	187	38	90
*LA8RTA	"	35,332	218	30	91
*LA1HL	"	26,532	148	29	105
*LB8CG	"	12,166	138	19	58
*LA9VKA	"	6,936	80	17	51
*LA7DOA	"	6,612	86	12	45
*LB1KG	"	5,412	67	20	46
*LB3AG	"	2,788	28	18	23
*LA7SI	"	2,592	46	18	30
*LA7USA	"	1,408	41	7	25
*LA9NKA	28	18,130	93	19	55
*LA7IJA	"	1,504	23	12	20
*LA4PGA	14	120	12	4	11
LB8IB	AA	5,890,608	4233	139	545
LA3BPA	"	1,102,050	1399	112	338
LA8HGA	"	412,515	854	56	211
LA2HFA	"	265,683	625	69	222
LA6UL	"	232,086	539	63	219
LA3ZPA	"	195,138	332	93	200
LA7GNA	"	171,666	493	57	130
LA6ZFA	"	122,292	327	58	200
LB5WB	"	41,734	139	35	119
LA3DNA	"	6,279	50	24	45
LA9DFA	"	192	6	6	6
*LA3S	AA	1,209,818	1344	104	374
(OP:LA3BO)					
*LA5LJA	"	327,420	499	88	233
*LA9TY	"	266,016	450	84	242
*LA2US	"	39,125	264	27	98
*LB1LE	"	34,000	144	38	98
*LB5HG	"	5,440	66	21	43
*LA4NL	"	5,429	49	23	38
*LA3LJA	"	5,320	69	17	39
*LA4PM	"	418	12	9	10
*LB8AG	"	140	8	6	8

Poland

SP9LJD	A	2,527,448	2403	116	368
SN7D	"	2,240,568	2687	108	343
(OP:SQ7D)					
SP6IEQ	"	476,748	702	86	256
SP9M	"	235,680	379	76	164
SP9CLO	"	207,459	511	65	194
SQ5Q	"	192,276	590	64	154
SP8CIV	"	153,599	378	71	198
3Z6O	"	135,401	422	47	156
SP3CYY	"	105,248	356	50	134
SP8BQL	"	79,866	262	58	116
SQ6VIA	"	74,760	218	57	111
SP3IOE	"	58,090	202	46	111
SP3CMX	"	53,550	156	58	95
SP2XX	"	45,640	212	43	120
SP8MRD	"	29,532	136	33	74
SP5ICS	"	29,000	118	38	78
SP5BUJ	"	25,956	158	36	90
SP8HXN	"	6,210	41	21	33
SP1O	"	198	6	5	6
SP5AUY	28	119,833	376	30	103
SQ6R	"	77,147	353	28	79
SP1QY	"	30,132	148	27	66
SQ9V	21	461,600	1302	36	124
SP8ICV	"	25,992	195	19	53
SN7O	"	18,531	125	16	55
(OP:SP7IVO)					
SP9NSJ	14	15,732	189	16	53
SP9MAT	"	11,712	112	19	42
SQ1OD	1.8	35,972	531	11	57
SP6EUA	"	5,208	130	5	37
*SQ2WHH	A	788,895	1180	97	326
*SP1DSZ	"	708,971	822	95	354
*SQ6H	"	686,700	1402	76	251
(OP:SQ6PLH)					
*SQ8MFM	"	435,132	917	79	237
*SQ2BNM	"	349,569	690	75	246
*SP1RKR	"	281,496	603	69	248
*SP5DXU	"	273,224	546	70	217
*SQ3WW	"	237,440	552	60	205
*SP9EMI	"	229,593	437	75	198
*SP5PDA	"	208,608	624	56	190
*SP1V	"	206,062	508	57	140
(OP:SP1QXK)					
*SP9NLX	"	199,296	399	72	216
*SP3POW	"	173,475	424	71	186
*SO7BIT	"	160,056	601	42	186
*SQ8BGR	"	152,256	405	55	153
*SQ3SWD	"	142,952	445	51	163
*SP1FRC	"	142,738	413	52	162
*SP4SHW	"	132,408	485	46	170
*SP7WJ	"	128,700	271	76	158
*SQ3MZM	"	115,680	441	43	117
*SP5DRE	"	115,635	350	53	142
*SP5CWQ	"	114,741	432	45	164
*SP8SN	"	112,401	263	58	123
*SP9VFR	"	90,600	267	47	104
*SP5LKJ	"	82,992	296	53	129
*SP1DMD	"	76,895	254	53	116
*SP3JUN	"	76,194	259	48	118
*SP3BES	"	74,240	306	44	116
*SQ9FQY	"	71,100	313	41	117
*SP9GMI	"	68,796	273	42	114
*SQ8NGV	"	64,185	314	39	126
*SQ6SGV	"	58,320	261	44	118
*SP9Z	"	56,816	250	40	94
*SP8P	"	47,232	187	40	83
*SQ9NIU	"	46,101	313	25	102
*SP5YAM	"	45,820	199	40	105
(OP:SQ5NWI)					
*SQ5TDZ	"	45,630	172	43	92
*SP5Z	"	45,216	250	38	106
*SQ5SAA	"	43,680	200	35	85
*SQ2EAN	"	41,400	223	37	113
*SQ6WZ	"	39,875	153	45	100
*SP9PBH	"	38,924	163	48	100
(OP:SP9MRR)					
*SP8EEX	"	38,752	140	41	71
*SP6DNZ	"	38,532	148	38	76
*SP3JZX	"	37,680	242	28	92
*SP9R	"	37,674	219	36	90
*SP9IBJ	"	36,963	294	21	90
*SQ8MXK	"	32,265	188	35	100
*SQ8EP	"	31,122	158	38	88
*SQ8NQW	"	30,114	155	37	89
*SP4GHL	"	28,896	144	41	88
*SQ3TGX	"	27,974	125	46	96
*SP2CYK	"	26,196	120	43	68
*SP5GDY	"	23,534	103	36	46
*SQ5SUL	"	23,210	138	33	77
*SQ6RKY	"	19,109	111	35	62
*SQ7ACP	"	18,816	141	24	60
*SQ4G	"	17,490	197	17	49
*SN1J	"	16,350	92	30	45
(OP:SP1MWF)					
*SP3UCW	"	16,110	103	29	61
*SP2GOW	"	15,928	77	30	58
*SP9IHP	"	15,120	84	27	43
*SN1K	"	12,352	102	22	42
*SQ5AM	"	12,052	102	31	61
*SP3BBS	"	12,006	90	26	61
*SP3YM	"	11,700	89	26	52
*SP3LD	"	10,251	101	18	49
*SQ3LMK	"	9,900	98	23	52
*SP5BYC	"	9,724	75	26	42
*SP6CZ	"	9,603	113	13	20
*SP7BYU	"	9,306	128	14	52
*SP2BLC	"	8,610	100	24	46
*SQ5KWJ	"	8,568	69	26	46
*SQ6PLD	"	8,208	48	31	41
*SP9IKN	"	8,190	97	18	60
*SQ9NFC	"	6,762	54	26	43
*SP7JB	"	6,110	62	22	43
*SP5JTW	"	5,936	100	9	44
*SP9A	"	5,632	42	25	39
*SP2HMN	"	5,130	52	22	35
*SP5XZM	"	3,795	45	24	31
*SQ5DA	"	3,744	54	19	33
*SQ8UPS	"	3,599	48	20	41
*SP4ICN	"	3,367	43	16	21
*SP4DDS	"	2,773	51	16	31
*SP9BMH	"	2,706	28	16	25
*SP7FBQ	"	2,516	32	14	23
*SP2UU	"	2,491	41	18	35
*SP9IVQ	"	2,436	55	14	28
*SP8PZI	"	1,960	25	15	25
*SP8VJV	"	1,428	19	12	16
*SQ7SAX	"	1,287	45	11	28
*SQ5ESM	"	1,152	18	10	14
*SP9SCZ	"	1,073	19	13	16
*SP3AYA	"	1,025	15	12	13
*SQ7LQJ	"	925	15	11	14
*SO1MK	"	396	16	7	11
*SP7QPG	"	336	10	6	6
*SP5LGN	"	168	10	5	7
*SP3LWP	28	77,952	285	27	89
*SP7VTQ	"	45,784	198	27	70
*SQ5AAG	"	22,866	147	24	50
*SP2GCE	"	20,079	138	18	51
*SQ3POS	"	16,225	114	19	36
*SQ9MEE	"	15,872	110	23	41
*SQ1SNN	"	8,960	110	14	26
*SQ8JLF	"	8,643	99	14	29
*SQ7OVT	"	3,496	50	13	25
*SP9EWM	"	2,905	31	14	21
*SP9NWN	"	2,088	41	9	15
*SO5FF	"	1,104	26	10	14
*SQ2SIQ	"	408	16	6	11
*SP2RAK	"	252	7	6	6
*SP2UKM	"	25	3	2	3
*SP8IMG	21	191,465	625	31	118
*SP8H	"	39,512	284	21	67
*SQ6POM	"	29,640	195	20	56
*SP6GTN	"	22,152	118	21	57
*SP4MPA	"	19,592	167	18	44
*SQ7BTY	"	8,466	99	18	33
*SP8AB	"	3,441	55	11	26
*SQ9KPK	"	3,330	58	15	30
*SP9W	"	2,376	43	9	15
*SP5MBI	"	1,980	32	9	21
*SP2JMR	"	825	17	10	15
*SP9KJU	"	243	9	5	4
(OP:SP9MDY)					
*SP3DRM	14	37,145	312	19	66
*SP6TRH	"	10,075	107	16	49
*SP2NNO	"	6,050	107	10	40
*SP8IOV	"	2,775	35	10	27
*SP6EIY	"	2,632	36	11	36
*SP3QFZ	"	2,553	51	10	27
*SO5K	"	525	23	8	17
*SQ7NSN	7	108,150	868	20	85
*SP1FPG	"	47,244	373	18	75
*SQ8SET	"	14,616	247	9	49
*SP5ETS	"	2,442	52	8	29
*SQ4PBE	"	440	22	5	17
*SQ7PGW	"	14	4	3	4
*SP4SHD	3.7	33,672	434	11	58
*SP9BGS	"	8,748	147	9	45
*SP4CGJ	"	4,860	96	9	36
*SP4AAZ	"	4,815	106	7	38
*SP6MCW	"	380	21	4	15
*SQ6IYV	"	361	22	4	15
*SP6PWW	"	342	23	4	15
*SQ9IAU	1.8	23,265	431	7	48
*SP9DLY	"	4,158	102	5	37
SO2O	AA	8,168,004	4277	171	635
(OP:SQ2GXO)					
SO9T	"	4,086,775	3756	123	482
(OP:SQ9ORQ)					
SP3LPG	"	3,656,340	2719	146	520
SQ9KEJ	"	783,990	889	109	356
SP6ZT	"	724,587	899	93	354
SO7O	"	458,990	572	104	311
(OP:SP9OHP)					
SP2TQI	"	352,284	582	102	270
SP2YWL	"	351,135	650	72	217
(OP:SP2FWC)					
SP1MVG	"	295,095	390	96	213
SP9IVD	"	147,256	264	75	158
SQ5LTT	"	124,392	320	72	220
SP6RLK	"	119,271	269	71	178
SQ3JPV	"	116,620	298	65	173
SN7Q	"	114,405	195	73	190
SQ7PGO	"	78,605	195	59	140
SQ1BHH	"	72,611	183	58	103
SP7TEX	"	51,988	199	52	112
SQ6LJV	"	42,480	179	29	51
SP9ATE	"	35,836	117	32	92
SP9DEM	"	30,456	102	46	62
SP2FWC	"	28,552	159	26	60
SP4W	"	26,040	125	38	82
SP1MWN	"	20,970	89	38	52
SP9HZW	"	18,382	99	31	60
SP4D	28A	210,686	645	34	115
SP5ENA	"	18,170	94	25	54
SP1MGM	"	10,395	59	21	42
SP6TRX	"	884	18	11	15
SN5X	21A	1,443,736	2804	40	163
(OP:SP5GRM)					
SN2M	"	1,397,676	2929	40	156
(OP:SP2XF)					
SP3A	"	132,164	394	34	114
SP4R	"	92,919	298	34	107
SP5SR	"	58,617	222	26	91
SN3A	7A	772,740	2606	40	140
(OP:SP3GEM)					
SP2QG	"	88,477	752	21	82
SP3JZI	"	320	16	4	16
SP9RCL	3.7A	140,481	1184	19	80
SP8K	"	61,600	785	13	64
SP5GMM	"	19,120	176	13	67
SP5LS	1.8A	53,720	812	11	57
SP3GTS	"	22,490	328	11	54
SP5ELA	"	13,364	274	8	44
*SQ3R	AA	571,680	749	93	304
(OP:SQ3HMM)					
*SP3NYC	"	536,538	648	93	308
*SQ9DXN	"	371,840	630	81	251
*SQ2W	"	236,826	554	59	164
*SP9GFI	"	234,300	514	61	239
*SP2AYC	"	206,701	566	57	196
*SQ6DGO	"	171,041	498	59	164
*SQ4JEN	"	170,680	396	70	181
*SQ6RGG	"	144,600	436	60	181
*SP9RM	"	115,884	442	38	136
*SQ8ERS	"	113,092	323	60	136
*SP8FB	"	107,724	365	49	142
*SP3JHY	"	104,992	298	57	136
*SP6AO	"	85,626	226	58	143
*SP2WGB	"	45,296	220	45	104
*SQ6PWJ	"	38,875	167	42	83
*SP7LIE	"	33,440	112	42	68
*SP8BOZ	"	20,492	158	30	79
*SQ1GQT	"	20,335	99	31	52
*SQ5PFH	"	16,456	87	27	61
*SP9EML	"	13,020	73	30	54
*SP6MLX	"	6,032	40	24	28
*SO6R	"	5,796	54	19	44
*SP6ADI	"	3,834	48	16	38
*SQ5JUP	"	3,780	34	20	25
*SP6BMW	"	2,250	32	18	27
*SP5XOV	"	2,183	24	17	20
*SQ5PMB	"	1,188	29	10	26
*SP2DKI	"	884	16	11	15
*SP6PYP	"	228	7	6	6
(OP:SP6T)					
*SQ3KKO	28A	32,578	158	25	66
*SP5ES	"	20,748	121	24	54
*SQ9HHG	"	6,560	60	16	25
*SP6IHE	"	5,590	46	16	27
*SP6DHH	"	4,400	58	13	31
*HF3T	"	4,384	57	12	20
(OP:SP3FYX)					
*SQ5NRY	"	945	15	9	12
*SP9TTT	"	912	26	8	11
*SN7C	21A	237,291	671	38	143
(OP:SP7CHS)					
*SP6DVP	"	152,490	588	28	102
*SP5IVC	"	111,198	445	27	102
*SP6A	"	45,045	180	27	90
*SQ9T	14A	132,704	563	32	111
*SP7SZK	"	30,084	216	20	72
*SP8AWL	3.7A	12,240	107	16	56
*SO5MAX	"	10,944	245	8	40
*SQ9BDB	"	6,880	177	6	37
*SQ5ASR	1.8A	2,952	82	5	31

Portugal

CT7ACG	A	1,475,656	1914	83	281
CT1IW	"	30,016	120	46	88
CR6T	21	1,512,368	4005	39	137
(OP:CT1ESV)					
CT7AIU	"	272,376	1239	29	88
CR5C	14	1,403,061	3741	37	146
(OP:OK4PA)					
CT1ASM	"	1,833	25	17	22
*CT2JBD	A	80,030	310	34	117
*CT7ABE	"	19,470	87	41	69
*CT2HPN	"	10,150	83	26	44
*CT1EPQ	"	2,001	27	14	15
*CT1AVC	"	1,519	19	12	19
*CR5M	28	99,552	438	26	96
(OP:CT1HSN)					
*CT7AIX	"	37,260	208	19	62
*CT1DJE	21	57,640	257	21	89
*CT1AGF	"	10,763	97	18	29
*CT1DZY	"	713	17	9	14
CT1EAV	AA	387,192	531	92	350
CT1BOL	28A	715,716	1676	38	150
*CT1FHL	AA	524,208	946	77	249
*CT1BWU	"	255,475	387	90	185
*CT1AGS	"	169,510	308	75	178
*CT7AGN	"	94,822	325	53	129
*CT7ADH	"	27,060	138	33	77
*CR7AFM	"	616	12	10	12
*CT2IVH	28A	161,838	789	27	84
*CT1EXR	"	6,820	61	15	29
*CS7AHQ	"	6,048	64	15	39
*CT1EVE	21A	157,108	942	23	101
*CT1ETX	14A	160,225	585	32	113
*CQ7X	7A	235,480	1194	31	114
(OP:EA7JX)					

Romania

YPØC	A	2,933,317	4205	103	346
(OP:YO3CZW)					
YO7CJB	"	250,551	616	61	230
YO3IYO	"	211,950	695	55	170
YO8THG	"	83,356	321	48	134
YO2MFC	"	11,520	78	24	56
YO9FLD	"	3,016	42	12	17
YO7HUZ	"	1,008	36	9	27
YO2LEL	28	75,578	299	26	80
YO8CIY	"	15,390	128	19	38
YO3RU	21	131,040	654	31	95
YO8BFC	"	39,516	242	22	67
YO3JW	"	10,614	125	17	41
YO2MTG	3.7	988	39	5	21
*YO4RDW	A	724,523	1137	91	300
*YO2LEA	"	723,539	1196	80	257
*YO7CDB	"	613,734	1186	82	292
*YO5FMT	"	327,849	683	77	232
*YO4RST	"	195,804	434	65	187
*YO8SMM	"	193,007	475	63	194
*YO4AAC	"	155,268	426	57	170
*YO6DBL	"	141,600	419	52	184
*YO7CVL	"	96,832	286	54	124
*YO4SI	"	72,362	236	58	136
*YO9IAB	"	66,960	354	33	122
*YO2MOH	"	66,815	203	48	113
*YO8PN	"	59,346	299	34	123
*YO9BXE	"	54,810	176	49	125
*YO7DBR	"	46,110	178	45	100
*YO8BSE	"	43,218	249	37	110
*YO7LDT	"	41,720	206	43	106
*YO9IJP	"	39,672	121	55	97
*YO7NSP	"	36,852	230	40	108
*YO3GGO	"	36,378	212	33	96
*YO5DAS	"	35,346	166	38	99
*YO2LDU	"	35,217	233	27	90
*YO8CRU	"	34,133	191	28	79
*YO7DJ	"	24,617	183	26	77
*YO8RKP	"	21,406	187	39	100
*YO9CKJ	"	17,177	85	37	52
*YO4GPC	"	16,920	136	24	70
*YO7LPZ	"	15,486	162	21	68
*YO5NY	"	15,476	128	30	76
*YO9HRB	"	15,045	141	19	66
*YO5TP	"	14,381	99	26	47
*YO7MPI	"	13,289	103	35	62
*YO7BPC	"	12,663	139	18	49
*YO9IOE	"	10,640	123	16	60
*YO2BPZ	"	4,154	53	20	42
*YO8SYS	"	2,520	40	11	31
*YO5POO	"	1,925	45	10	25
*YO7YO	"	1,881	29	14	19
*YO8DHA	28	53,244	297	24	63
*YO8MI	"	29,625	192	24	55
*YO4JQ	"	13,281	89	20	37
*YO6FPW	"	13,248	93	21	43
*YO4BXX	"	12,993	127	19	42
*YO5AYT	"	3,526	56	14	29
*YO2GL	"	1,922	46	12	19
*YO9HOW	"	1,900	34	9	16
*YO9CWY	21	22,839	209	17	52
*YO3GD	"	16,260	143	14	46
*YO9HG	"	8,007	109	11	40
*YO4DI	"	6,533	97	11	36
*YO9IPF	14	10,203	139	10	47
*YO5BQQ	"	9,100	106	11	39
*YO4AJ	"	8,964	132	11	43
*YO4BEX	"	7,548	120	9	42
*YO2MJZ	7	5,405	63	11	36
*YO8BGE	3.7	18,760	223	11	59
*YO5OHY	"	8,379	154	8	41
*YO8RZJ	1.8	12,528	237	8	46
*YO9DBP	"	943	42	5	18
YP7P	AA	3,262,690	2958	136	505
(OP:YO7LFV)					
YQ6A	"	743,580	947	107	352
(OP:YO6BHN)					
YO3APJ	"	533,808	899	87	309
YO3GNF	"	249,645	589	65	202
YO2LXW	"	38,070	217	36	99
YO6FKB	"	8,556	54	27	42
YO3FGO	28A	116,510	458	28	94
YP5A	21A	125,511	661	27	80
(OP:YO5AM)					
YO6PVK	"	42,770	262	20	71
YO3HOT	3.7A	28,490	306	13	64
*YO5LD	AA	366,376	599	87	241
*YO7ARY	"	293,355	648	67	198
*YO9GSB	"	184,234	395	66	185
*YO2CMI	"	175,895	348	72	205
*YO5OBA	"	168,555	398	58	197
*YO6LA	"	152,131	534	48	163
*YO4FKO	"	111,744	296	56	138
*YO4ATW	"	100,084	334	57	134
*YO6HSU	"	95,613	256	60	143
*YO6OEK	"	15,795	83	31	50
*YO9GDN	"	4,902	47	14	24
*YP7A	28A	168,980	575	31	109
(OP:YO7MGG)					
*YO2MSP	"	25,772	157	22	46
*YO8BFB	"	20,264	136	23	45
*YO9HP	14A	439,200	1541	38	142
*YO2MHJ	"	35,741	230	27	76
*YO8WW	"	29,492	150	29	72
*YO9FYP	"	19,760	252	13	52
*YO4NF	7A	54,468	476	16	73
*YO2MBG	"	1,995	61	6	29
*YP9D	3.7A	832	29	5	21

Sardinia

ISØBSR	A	294,056	1137	44	134
*ISØDCR	A	183,120	495	59	181
*ISØFFD	"	5,568	44	21	27
*ISØGSR	28	11,295	119	12	33
*ISØDFC	14	1,334	52	6	23
*ISØGRB	3.7	4,332	111	6	32

Scotland

GM2V	A	2,450,760	2348	115	405
(OP:GM3WOJ)					
MM3T	"	479,562	1160	66	245
(OP:GMØELP)					
GM3TAL	"	145,600	381	53	155
MM2R	28	69,350	419	23	72
(OP:GM3YOR)					
GM4O	14	251,264	1039	28	100
(OP:KQ8Z)					
*MM3NRX	A	87,242	294	52	129
*GMØWED	"	32,079	227	32	79
*MMØHNR	"	29,070	236	22	73
*MM3Z	"	20,976	176	26	66
*2MØBEC	"	2,376	46	20	46
MM2N	AA	1,083,980	1595	89	326
(OP:MMØGPZ)					
GMØOQV	"	515,214	855	87	195
MM8Z	21A	137,127	591	28	101
(OP:GM7VSB)					
MMØSVK	"	17,181	150	16	53
*MM1E	AA	730,380	1000	87	333
(OP:MMØGOR)					
*MM6PHG	"	13,530	118	19	63
*MMØTKE	"	238	10	7	10
*GM7TUD	21A	178,405	608	35	120
*MMØHDQ	14A	14,580	213	11	49
*GM2Y	"	504	26	3	15
(OP:MMØDXH)					
*MM4D	7A	21,240	239	14	58
(OP:GM4ATA)					
*MMØGHM	"	13,888	259	10	46
*GM1C	3.7A	6,664	123	6	43
(OP:GM1BSG)					

Serbia

YU1USA	A	150,290	423	59	167
YU2STR	"	17,526	167	34	93
YT8WW	21	832,161	2466	36	115
YU1SMR	"	23,475	210	19	56
YT1A	14	617,264	2308	35	138
YT7A	7	672,588	2437	38	119
(OP:YU7GM)					
YTØW	"	82,585	809	17	66
(OP:YT1RA)					
YU1DW	"	21,700	306	12	50
YT4A	3.7	125,766	987	21	81
(OP:YT1AA)					
YUØT	1.8	27,170	398	10	55
(OP:YU1WS)					
*YT8A	A	2,312,859	2473	111	426
(OP:YU1EA)					
*YU1JW	"	121,758	345	58	165
*YT9ØIARU	"	55,272	315	34	113
(OP:YU3VIP)					
*YU1ML	"	990	27	9	21
*YTØI	"	306	11	7	11
*YT9W	28	35,672	171	27	64
*YU1VG	21	77,811	413	24	87
*YU4MLD	"	27	8	4	5
*YT2DDK	14	57,834	592	16	65
*YU1TY	"	6,860	119	8	41
*YT7DB	7	16,064	212	11	53
*YU1NIM	"	7,203	107	9	40
*YU1RA	"	6,540	70	11	49
*YU1SMA	"	1,904	55	6	28
YU2DBZ	AA	184,496	499	51	157
YT9A	"	55,977	192	39	102
YU2M	"	18,228	138	24	69
YU1M	"	2,812	37	15	22
(OP:YU1MM)					
YT2R	28A	855,225	2046	37	152
(OP:YU1AU)					
YTØZ	"	847,098	1980	38	151
(OP:YU1ZZ)					
YT7R	"	522,000	1238	36	138
(OP:YU7BW)					
YU1EW	21A	1,112,450	2678	39	151
YU5R	"	487,207	1492	35	128
(OP:YT3PL)					
YT2AZD	14A	203,623	1015	34	99
YU5C	"	66,102	248	31	107
YT2ISM	"	63,190	540	21	68
YU7U	7A	390,390	1433	35	119
YT3PL	3.7A	17,640	251	8	55
*YU1EL	AA	561,162	737	100	334
*YT5IVN	"	327,137	873	60	217
*YT45N	"	6,728	108	13	45
(OP:YU7AF)					
*YU1LA	28A	33,888	174	23	73
*YT3TPS	"	7,520	76	14	33
*YU2A	"	3,939	45	14	25
*YU1EXY	21A	20,944	157	20	57
(OP:YU2DOC)					
*YT1WA	"	4,988	75	10	33
*YU4RIS	"	108	9	5	7
*YT2AAA	14A	226,292	1197	30	109
*YT5CT	7A	75,362	426	22	76
*YU1DX	"	35,948	310	17	69
*YT3TA	"	6,256	95	10	36
*YUØU	3.7A	56,628	651	11	67

Shetland Islands

GZ5Y	A	547,434	1107	66	240
(OP:GM4SSA)					

Sicily

IT9BII	A	22,425	142	31	84
IW9FI	21	26,057	225	17	54
IT9DKI	14	67,425	618	20	73
*IT9FRX	A	377,931	1057	62	201
*IT9BDW	"	89,250	405	43	127
*IT9AZK	"	38,690	201	38	108
*IT9GAK	"	20,900	152	26	69
*IT9BDR	"	10,472	94	21	47
*IT9IMF	"	1,798	41	23	35
*IT9NAN	28	44,080	260	22	73
*IT9ACJ	"	20,493	140	21	48
*IT9EWR	21	199,320	725	33	99
*IT9DVZ	"	107,852	603	27	91
*IT9AXQ	"	23,856	177	20	64
*IT9BDM	14	186,160	1075	28	102
*IR9Z	"	64,068	743	15	61
(OP:IT9VCE)					
*IT9PZM	"	53,544	417	21	76
IT9/K7ZSD	AA	76,734	263	50	124
IT9JOF	28A	384,648	1381	30	102
IW9GTD	21A	509,820	1765	39	135
IT9IMJ	"	35,945	324	17	62
IT9STX	14A	448,221	1732	37	122
II9W	"	195,776	827	36	125
*IW9HRZ	AA	384,416	784	68	225
*IR9W	28A	739,576	1884	36	157
(OP:IWØHBY)					
*IW9FRA	"	202,100	584	36	136
*IT9YAO	21A	191,664	964	30	102
*IT9IQQ	"	94,512	387	29	103
*IT9KCD	"	59,904	276	31	97
*IB9P	14A	194,142	1453	24	90
*IT9DGG	"	102,432	523	30	102

Slovak Republic

OM1DK	A	1,184,550	1865	76	242
OM4KK	"	678,912	1092	90	294
OM5WW	"	279,328	634	76	225
OM6AL	"	179,716	586	55	196
OMØWR	14	181,188	1053	31	95
OM7RU	3.7	91,245	1119	12	65
OM4M	"	35,309	492	12	55
(OP:OM4KK)					
*OM2VL	A	2,846,894	2319	145	477
*OM7AB	"	409,860	910	69	255
*OM2BK	"	351,080	726	76	259
*OM2DT	"	263,099	522	71	236
*OM7ZM	"	210,129	443	70	197
*OM7JM	"	103,331	407	45	146
*OM3KWZ	"	79,323	297	51	142
(OP:OM7AA)					
*OM7AG	"	61,419	287	43	134
*OM7LW	"	60,444	315	38	100
*OM4J	"	26,676	225	20	94
(OP:OM4JD)					
*OM7SR	"	10,092	112	24	63
*OM4ANO	"	1,521	33	14	25
*OM7AX	28	17,810	132	21	44
*OM8AHJ	21	13,053	157	15	42
*OM2AGN	"	10,004	72	18	43
*OM8JP	14	33,180	333	14	65
*OM4ASI	3.7	3,240	98	7	29
*OM8ADM	"	1,829	65	4	27
*OM4WW	1.8	10,441	212	7	46
*OMØDC	"	4,600	122	5	35
OM3RRC	AA	1,099,294	1468	107	359
(OP:OM6MW)					
OM7LM	28A	34,125	139	25	66
OM7PY	7A	32,370	308	16	67
*OM5UM	AA	94,720	433	41	144
*OM4O	"	83,352	253	54	130
(OP:OM3NI)					

*OMØATP	"	55,130	175	45	140
*OM5XX	28A	56,210	207	27	83
*OMØA	21A	3,135	41	10	23
					(OP:OMØAAO)
*OM6TX	3.7A	20,237	324	10	49

Slovenia

S53F	A	935,132	1694	90	311
S57C	"	375,936	703	62	202
S59AA	"	216,315	383	76	209
S58D	28	756,613	2192	36	107
S51YI	7	698,804	2394	37	127
*S5ØA	A	3,308,688	2503	138	483
*S56WYB	"	224,976	531	64	194
*S51AC	"	179,935	585	64	201
*S56AX	"	147,552	412	55	177
*S5ØBH	"	104,832	416	40	152
*S53NW	"	97,152	404	42	142
*S52WD	"	59,670	218	45	108
*S58RU	"	33,888	209	28	68
*S59D	"	22,660	120	33	77
*S54G	"	15,936	122	20	63
*S52WW	"	7,598	99	13	45
*S52C	"	7,590	97	16	53
					(OP:S51AC)
*S57SWR	"	7,100	79	22	49
*S57KM	"	3,312	59	12	36
*S51FO	"	1,920	48	11	29
*S5ØDX	28	312	10	5	7
*S57PKT	14	46,228	306	24	67
*S53Q	7	67,304	604	19	75
					(OP:S5ØX)
S54ZZ	AA	4,904,375	3654	118	507
S52ZW	"	3,720,392	2651	143	521
S58M	"	2,359,058	2743	119	414
S57AL	"	1,260,534	1116	122	416
S51TA	"	741,441	1155	76	227
S58MU	"	367,087	1257	56	173
S54O	"	315,180	575	81	228
S57K	"	142,560	392	52	113
S58Q	"	138,087	389	58	143
S57S	"	64,009	295	35	86
S52GP	"	4,940	58	14	24
S5ØXX	28A	634,816	1515	35	147
S59A	21A	1,425,450	3030	40	155
S5ØK	"	1,237,902	2722	39	154
S56Y	"	455,616	1239	37	131
S5ØO	"	248,040	813	35	124
S57DX	14A	1,173,826	3157	37	156
S57AW	"	1,118,798	2999	39	155
S58J	"	220,248	830	34	118
S56X	7A	453,167	2061	34	109
S53O	1.8A	63,992	812	12	64
S57O	"	8,712	227	6	38
*S56A	AA	891,032	930	116	392
*S52BT	"	428,064	614	80	256
*S51Z	"	42,607	141	46	91
*S57YX	"	30,096	159	30	84
*S55RD	"	24,307	147	33	76
*S57ZT	"	16,926	105	30	61
*S57LR	"	6,935	62	23	50
*S56M	21A	385,745	923	39	140
*S52OT	14A	391,248	1355	36	140

Spain

EA3CI	A	2,378,300	3175	99	326
EA5DFV	"	2,255,850	2768	102	303
EA5/LB7Q	"	389,277	880	70	189
EA3HJO	"	277,346	1032	45	157
EA3DJL	"	251,720	569	71	219
EA7TG	"	224,817	615	48	89
EA5/LA7VK	"	178,766	595	50	176
EA5FL	"	169,235	704	48	133
EA2KR	"	125,020	466	41	99
EA4YC	"	119,279	285	58	123
EA5FIV	"	100,440	418	35	85
EA7JQT	"	40,800	221	49	121
EA5CRC	"	18,096	98	40	76
EA3HSD	"	17,808	138	28	84
EA4EIY	"	9,292	83	29	63
EA5DIT	"	2,673	35	15	18
EA7JEG	"	2,652	31	22	30
EE3A	28	912,819	2375	36	123
					(OP:EA3ATM)
EA5IGO	"	35,672	175	23	81
EA3MR	"	3,430	92	9	26
EC7WR	21	549,360	1974	35	105
EE7L	14	406,161	1788	32	115
					(OP:EA7HLU)
EA4TD	"	292,758	1613	30	88
EA7KB	3.7	28,478	300	11	47
EA5RU	1.8	21,534	305	12	62
*ED5N	A	3,808,761	3638	120	427
					(OP:EA5KA)
*EF2A	"	3,542,272	3016	123	425
					(OP:EA2OT)
*EA3FF	"	1,052,650	1448	88	282
*EE7R	"	662,200	989	85	300
					(OP:EA7IA)
*EA7YV	"	313,344	716	71	217
*EA1JO	"	279,424	635	66	230
*EA5MON	"	243,807	686	43	138
*EA3NA	"	243,663	464	75	208
*EA3GCT	"	196,119	517	56	175
*EA1IJF	"	183,792	551	49	119
*EA3FZT	"	178,139	485	46	147
*EA1SV	"	164,808	395	65	187
*EA4EF	"	151,641	372	61	142
*EA5DNO	"	144,088	344	56	161
*EA4DXP	"	135,473	326	57	164
*EE2A	"	126,046	363	49	165
					(OP:EA2SN)
*EA2RW	"	104,400	294	59	166
*EA5WP	"	93,740	514	30	79
*EC4TR	"	79,730	247	52	118
*EA3ODC	"	77,004	252	49	137
*EA7GTJ	"	73,008	249	44	100
*EA4GQS	"	69,408	246	36	108
*EA5DB	"	68,796	289	34	83
*EA4CFY	"	62,678	322	28	126
*EA2GM	"	58,384	274	30	52
*EA3WX	"	57,663	214	37	92
*EA3DNC	"	53,664	266	38	134
*EA1AJV	"	52,850	257	41	110
*EA5HKV	"	50,868	213	44	113
*EA1DOB	"	48,100	207	38	110
*EA7VJ	"	44,268	161	36	88
*EC4RC	"	42,496	167	39	89
*EA5SM	"	36,328	131	50	102
*EA2DMH	"	35,760	195	33	87
*EA1IIP	"	28,320	181	29	91
*EA3EAN	"	28,270	176	28	82
*EA1OL	"	27,830	141	38	83
*EA5LH	"	24,871	132	35	84
*EB7HQE	"	21,631	99	36	61
*EB2DPT	"	21,357	140	33	80
*EA5HZZ	"	20,246	127	31	75
*EA7CWA	"	19,435	107	37	78
*EA4FET	"	18,746	144	29	74
*EA1HTF	"	17,658	217	44	118
*EA3FAJ	"	16,732	108	29	60
*EA1IMP	"	12,300	109	24	51
*EA4CTM	"	10,353	55	36	51
*EA7JMO	"	9,401	75	23	56
*EA4FLZ	"	7,920	58	27	45
*EA1CM	"	7,560	59	18	36
*EA7IZZ	"	5,644	54	27	41
*EA2DDE	"	4,674	38	23	34
*EA5AVW	"	2,964	41	15	24
*EB5DXJ	"	2,565	44	12	33
*EA3HWC	"	2,204	34	14	24
*EA3EYO	"	2,009	35	14	27
*EA4GIL	"	1,755	40	12	33
*EA5IMM	"	1,599	29	12	27
*EA4FVT	"	960	14	10	14
*EA3GYT	"	825	27	8	17
*EA1DZL	"	729	18	10	17
*EA7FIQ	"	510	21	5	5
*EA5AMK	"	144	12	8	10
*EA7DZ	"	117	7	6	7
*EE7Y	28	437,670	1633	30	105
					(OP:EC7WA)
*EA3LA	"	218,940	924	31	92
*EA7AAF	"	158,025	607	31	98
*EA1CCM	"	94,875	394	23	92
*EA1BFZ	"	67,305	304	23	82
*EA2CE	"	50,190	229	24	81
*EA1ABS	"	45,180	231	21	69
*EB3WH	"	36,450	224	19	56
*EA7FRX	"	33,117	183	19	64
*EA5IIK	"	23,932	150	18	44
*EA5HRT	"	23,232	232	17	49
*EB5CS	"	10,089	100	14	43
*EA1GET	"	8,869	99	16	33
*EA3HKY	"	3,977	52	14	27
*EA3HLM	"	3,731	50	14	27
*EA2ECA	"	3,069	59	11	20
*EA4CRP	"	1,372	24	10	18
*EE1B	21	164,475	616	27	102
					(OP:EA1YB)
*EA3KT	"	87,136	440	23	89
*EA7HE	"	12,537	117	14	49
*EA1ASC	"	10,545	93	15	42
*EA4RCT	"	312	12	4	9
*EA2DNR	14	195,054	1173	25	93
*EA2KV	"	79,200	500	24	86
*EA4FJX	"	53,300	424	23	77
*EA1DHB	"	19,668	261	11	55
*EA4RT	"	15,360	216	13	51
*EB3TR	"	7,884	134	10	44
*EB4ERS	"	864	26	6	18
*EA4AAI	3.7	16,632	244	8	58
*EE4EA	"	1,134	32	6	21
					(OP:EA4GHB)
*EA1DFP	1.8	108	6	3	6
EF1W	AA	3,543,120	3371	112	420
					(OP:EA1WS)
EF1A	"	991,015	1179	102	343
					(OP:EA1XT)
EA1BLI	"	954,995	1326	92	297
EA3YK	"	626,640	1242	81	292
ED4A	"	611,184	1041	84	273
					(OP:EA4TV)
EA1DAX	"	460,840	612	82	246
EA7IQM	"	288,500	781	57	193
EA1MV	"	261,244	584	60	181
EA5GMB	"	174,196	491	59	155
EA1BNF	"	105,020	273	53	125
EA5GX	"	83,000	391	31	69
EB4SM	"	53,508	199	44	112
EA1WX	"	11,524	118	17	50
EA7AHA	"	6,853	54	30	47
EA4EQD	"	5,162	39	22	36
EA3XL	"	2,067	25	16	23
EA1BD	28A	617,265	1825	34	131
EA7ZY	"	312,488	1259	31	103
EA4TX	"	153,064	618	25	81
EA5BB	"	19,454	133	24	47
EA7GV	"	18,128	172	14	30
EA1AA	"	15,360	86	18	46
EC1DBO	21A	761,608	2276	37	129
EA3KN	"	130,968	452	35	118
EF5R	"	120,360	497	30	106
					(OP:EA5BWR)
EB3CW	"	31,768	172	19	57
EA4IF	14A	17,577	251	14	49
EC1AE	7A	8,704	70	14	50
EA2KB	3.7A	127,748	779	20	89
EA3GHZ	"	119,136	824	18	84
ED7O	"	92,700	696	19	84
					(OP:EA7EU)
EA3BOX	"	40,248	413	14	58
EA5DM	"	17,892	212	13	58
EA4DB	"	17,780	200	13	57
*EC2DX	AA	5,377,401	3482	154	565
*EA1FA	"	385,719	914	71	232
*EA5FWW	"	340,614	606	62	236
*EA2DPS	"	332,555	596	71	222
*ED3T	"	319,770	513	83	240
					(OP:EA3HSO)
*EA4UV	"	281,050	388	101	284
*EA1AS	"	213,844	465	67	210
*EA1CQ	"	174,064	435	62	191
*EA7MT	"	109,710	292	54	153
*EA5IJG	"	107,156	429	38	134
*EA1CS	"	104,696	271	50	134
*EA2AF	"	55,601	256	37	132
*EA1AW	"	45,018	154	43	79
*EA4EUW	"	37,122	181	36	102
*EA4TA	"	27,264	151	36	92
*EA7AQR	"	26,910	100	41	74
*EA4GSL	"	25,380	181	25	69
*EA1HHT	"	25,200	130	35	85
*EA1YD	"	21,525	125	30	75
*EB1EB	"	19,292	133	30	76
*EB5TC	"	14,952	86	27	62
*EA4GST	"	9,638	95	22	57
*EA5HQY	"	5,133	41	24	35
*EA3FZY	28A	262,200	1038	28	86
*EA4EUI	"	230,124	664	33	118
*EA5TS	"	71,709	235	27	96
*EA1QS	"	70,296	290	26	90
*EA4LO	"	53,244	267	30	72
*EA4AA	"	47,855	230	22	63
*EA4BZ	"	38,967	183	21	72
*EA2WD	"	12,650	113	16	30
*EA5AJB	"	12,005	100	14	35
*EA5WA	"	7,314	78	15	38
*ED7C	"	2,070	32	8	15
					(OP:EA7KJ)
*ED7R	21A	209,088	1037	24	84
					(OP:EA7IZJ)
*EC7MA	"	58,936	323	21	85
*EC7DDZ	"	22,058	139	16	66
*EB7AA	"	3,360	35	15	25
*EA7JXZ	14A	96,404	368	32	122
*EB1ADD	"	70,906	389	27	94
*EA5FCW	"	13,987	162	15	56
*EA5EUV	"	2,006	55	6	28
*EA1FCH	7A	51,940	383	16	82
*EA3AR	"	7,946	81	15	43
*EC7KW	3.7A	2,624	74	8	33
*EC7AT	"	588	27	4	17

Sweden

SM3C	A	907,536	1191	99	345
					(OP:SM5CCT)
SCØN	"	647,572	983	95	293
					(OP:SMØNCS)
SM5Q	"	535,612	772	92	315
SE6Y	"	311,982	624	74	245
					(OP:SM6DED)
SK7A	"	187,916	505	57	161
					(OP:SA7AOI)
SM5B	"	148,654	412	59	174
					(OP:SM5EMR)
SI3A	"	37,368	200	29	79
					(OP:SM3LIV)
SAØBMV	"	10,875	96	23	64
SA3CAT	"	1,824	19	16	16
SM6CMU	28	16,608	118	16	32
SA6BET	7	67,872	587	21	80
*SM2T	A	644,003	993	97	322
					(OP:SM2EZT)
*SM6Y	"	276,381	555	70	217
					(OP:SM6DER)
*SF3A	"	219,978	529	61	181
					(OP:SM3CER)
*SM2S	"	167,796	360	69	168
*SL7ZAY	"	73,080	205	49	96
*SM7RZJ	"	56,322	276	36	113
*SM5ACQ	"	51,256	223	40	109
*SM5DXR	"	37,375	218	35	90
*SE5L	"	30,397	173	34	79
					(OP:SM5ALJ)
*SM3HBV	"	28,167	173	30	93
					(OP:SMØHBV)
*SM3KJA	"	24,684	162	30	91
*SM4LWY	"	19,895	99	31	84
*SF6C	"	19,584	135	28	68
*SAØBVA	"	19,313	175	23	66
*SGØW	"	18,530	138	29	80
					(OP:SAØCAM)
*SMØTCZ	"	5,106	70	22	52
*SM4DDY	"	3,690	64	13	28
*SM5BJT	"	2,320	50	21	37
*SM6XUZ	"	1,591	47	10	27
*SK6NL	"	1,219	21	8	15
					(OP:SA6BXG)
*SM5OSZ	"	1,120	23	13	19
*SA6SKA	"	1,015	41	5	24
*SM6OPW	"	899	29	7	22
*SG3O	28	240	8	7	8
					(OP:SM3AGO)
*SE4E	14	18,480	238	13	53
					(OP:SM4DQE)
*SM6C	"	17,958	195	15	58
*SM3WHL	"	4	2	1	1
*SM7MX	3.7	4,312	97	6	38
					(OP:SM5MX)
8SØC	AA	2,228,160	1491	139	521
					(OP:SMØMPV)
SM5S	"	720,450	1056	94	356
					(OP:SM5SIC)
SJ2W	"	528,360	648	88	252
					(OP:SM2WMV)
SGØU	"	478,668	666	89	250
					(OP:SMØCXS)
SM6BGG	"	436,632	686	87	252
SM7E	"	359,040	725	76	254
					(OP:SM7BHM)
SE3X	"	271,183	754	54	223
					(OP:SA3BYC)
SA6U	"	251,160	419	81	231
					(OP:SM6LJU)
SE2T	"	114,240	232	63	209
SM3PXO	"	40,480	138	40	75
SA6P	"	38,703	198	37	96
SM3LBP	"	1,665	21	17	20
SMØNJO	"	880	16	9	11
SM5CEU	21A	197,936	509	39	139
SE6W	14A	103,152	710	28	84
					(OP:SM6XKB)
SM7THS	3.7A	29,964	404	13	53
SM6NOC	1.8A	3,403	73	6	35
*SG6T	AA	236,694	531	65	244
					(OP:SM6WET)
*SE5S	"	136,484	357	57	172
*SE5N	"	113,820	348	54	156
					(OP:SM5ISM)
*SM6MVE	"	108,936	367	49	155
*SK3GA	"	74,391	307	49	132
					(OP:SA3BPE)
*SE6N	"	27,709	171	35	86
					(OP:SA6AXR)
*SM3EAE	"	22,295	131	24	67
*SA7AOI	"	780	13	9	11
*SM6IQD	28A	19,028	159	18	49
*SM6Q	7A	12,366	183	11	43
*SM6FJY	1.8A	9,435	198	8	43

Switzerland

HB9TOC	A	1,057,630	1601	93	313
HB9EFJ	"	96,222	271	55	182
HB9AJP	"	18,312	87	39	70
HB9VID	28	26,860	132	30	55
*HB9AWS	A	431,205	773	81	242
*HB9AA	"	349,904	704	73	231
					(OP:HB9ARF)
*HB9FLX	"	93,456	321	46	130
*HB9MXY	"	52,728	200	43	113
*HB9AYZ	"	13,604	109	25	51
*HB3YGD	"	11,900	115	22	46
*HB9FHV	"	9,632	96	25	61
*HB3YKU	"	6,897	86	19	38
*HB9FSE	"	2,842	32	21	28
*HB9DHZ	"	2,688	31	18	30
*HB9/DG2FDE	"	1,638	42	12	27
*HB3YGG	21	3,666	48	12	27
*HB3YRU	"	3,465	57	10	25
HB9EYP	AA	2,018,992	2310	113	401
HB9TJR	"	1,285,713	1627	78	255
HB9DVH	"	73,692	191	60	78
HB9ODK	"	130	5	5	5
HB9FKK	28A	10,725	71	21	44
					(OP:IK1PMR)
*HB9FBP	AA	422,037	747	68	229
*HB9CIC	"	164,334	353	62	121
*HB9CSA	"	12,728	133	17	57
*HB9ARK	"	5,720	52	21	34
*HB9FUH	"	780	32	8	22

Ukraine

UW2M	A	8,424,752	6397	155	548
					(OP:URØMC)
UW5Y	"	3,539,536	3319	129	487
					(OP:US2YW)
US5D	"	2,969,760	2991	122	430
					(OP:UT7DX)
UV5U	"	2,179,889	2030	131	458
					(OP:UX1UA)
UT7QL	"	768,012	1237	95	351
UT6EE	"	611,754	859	94	309
UT7EL	"	349,592	586	93	263
UT2UB	"	278,949	639	75	246
US7IID	"	168,560	515	49	196
US6IKF	"	136,704	351	71	185
US7U	"	115,668	419	52	186
UV5EEO	"	93,744	329	47	142
UX3IT	"	67,306	333	30	116
USØUX	"	44,086	198	40	94
UR4EI	"	40,602	182	40	94
UT9ER	"	39,270	194	54	116
UV5EVW	"	28,496	188	37	100
UT3UV	"	26,000	167	32	98
UT8IK	"	12,384	78	32	64
UR5WX	28	13,248	105	19	45
UT7CA	21	180,075	731	29	118
UT7HA	"	33,276	355	13	34
UX3HA	14	51,057	400	22	71
UT1PG	"	41,292	303	18	75
UXØKN	7	31,525	198	18	79
UY3AW	"	5,950	81	11	39
UT6UD	1.8	21,515	348	9	56
UYØZG	"	1,500	49	5	25
*USØHZ	A	786,210	1140	94	344
*UT3UZ	"	495,653	796	81	280
*UT1UL	"	476,238	711	83	274
*UX7MR	"	449,512	1006	79	270
*UY5AR	"	362,406	689	81	242
*UY6U	"	353,750	804	66	217
					(OP:UX7UU)
*UT8AL	"	320,825	767	73	240
*UT8IM	"	260,934	733	57	220
*UR7QC	"	257,174	575	72	226
*UY1IP	"	234,240	732	70	186
*UW7RV	"	192,750	405	74	183
*UW2Q	"	190,855	528	56	189
					(OP:UR6QS)
*UY5QJ	"	188,738	326	61	192
*UR2LX	"	185,250	400	72	178
*UYØCA	"	167,980	457	57	170
*UT5PY	"	145,992	479	55	182
*UTØCK	"	121,758	405	51	172
*UT5HX	"	117,614	473	47	170
*US7LM	"	98,440	243	64	166
*US4IQS	"	95,282	522	40	102
*US5MEU	"	87,074	277	50	147
*UR5AMJ	"	85,272	280	47	140
*UR5WFP	"	80,100	345	38	142
*UT5UN	"	75,078	219	55	139
*UT7AT	"	71,024	278	47	137
*UTØMF	"	66,933	202	54	147
*UX7BV	"	66,640	251	45	125
*UR5UJ	"	65,772	200	49	125
*UT8UD	"	54,511	270	35	116
*UR5RP	"	48,425	223	39	110
*UT3IA	"	43,200	198	45	115
*UX1VX	"	43,086	174	42	87
*US8IEU	"	41,250	203	32	93
*UX4MX	"	35,682	133	43	71
*UT4MW	"	34,080	182	33	87
*UR5ZTH	"	33,280	155	38	90
*UX5TQ	"	31,320	127	39	96
*UR5QW	"	31,242	121	44	83
*UT2AA	"	30,885	159	35	110
*UT4MM	"	30,873	202	27	96
*UT7HM	"	29,376	168	37	99
*UT2HC	"	27,370	119	34	85
*UYØHY	"	22,385	94	41	80
*US3IZ	"	18,685	152	21	80
*UZ5ZV	"	15,853	77	31	52
*UT5UHX	"	7,238	75	25	52
*UR5ZDZ	"	6,468	89	26	58
*US5WFV	"	2,244	50	12	22
*UX7BA	"	2,050	42	9	32
*UR5WPR	"	1,160	26	12	17
*UW3HM	"	1,140	22	12	18
*UTØFC	"	897	56	13	26
*USØTA	"	594	13	10	12
*UT1DX	28	221,880	582	35	137
*UR7CT	"	70,446	295	26	92
*UR5EAF	"	39,510	210	25	65
*US5AT	"	36,800	180	29	71
*UR5WHQ	"	27,864	154	25	56
*UT5ULQ	"	22,704	174	21	45
*UR4LFA	"	15,064	151	14	42
*UR5LAK	"	13,300	86	20	50
*USØIW	"	10,240	107	17	47
*UR7HDP	"	1,736	28	10	21
*UT3EK	21	104,784	527	25	93
*UT3QD	"	51,204	317	26	76
*US8IM	"	27,348	187	20	66
*UR5MM	"	24,192	131	21	75
*UR8UZ	"	16,416	128	18	54
*UTØNB	"	15,600	148	14	46
*UR1YDD	"	11,024	145	11	42
*UR8QAF	"	9,699	119	14	39
*UR3RAA	"	9,150	143	10	40
*UR3QTN	"	2,368	56	8	24
*UT3EV	14	128,355	746	29	100
*UR8QR	"	69,856	339	27	91
*UX7U	"	39,600	336	22	66
(OP:UX7UA)					
*UX1CL	"	30,889	312	16	63
*UR5EFL	"	12,095	192	10	49
*UR5VR	"	2,914	38	16	31
*UX4CR	7	50,414	432	17	74
*UY3CC	"	33,196	366	17	69
*UT8AS	"	23,560	232	16	60
*US7IY	"	9,384	149	10	41
*UR5WT	"	4,000	105	10	40
*UX1LW	"	3,605	39	12	23
*US5IIM	"	2,356	26	13	25
*UT5AX	"	1,575	40	7	28
*USØFF	3.7	2,016	72	5	27
UW7LL	AA	6,704,232	4917	162	660
UW5ZM	"	2,925,036	3121	128	430
UR5WCQ	"	427,570	728	85	253
UX5UO	"	385,020	563	92	253
UR5E	"	93,297	202	69	158
					(OP:UR5EDX)
USØLW	"	61,936	160	51	107
US1IV	"	14,014	67	35	63
UTØRM	"	9,211	88	16	45
UR4MM	"	2,009	33	12	29
UR3LPM	"	272	9	8	8
UT2AB	28A	41,409	171	25	82
UR5EPG	"	34,265	166	23	66
USØMS	14A	157,342	624	32	119
UZØU	"	153,057	495	35	128
UXØRR	"	129,456	779	29	95
US1I	7A	356,440	1501	36	116
					(OP:UX2IO)
UX2U	"	22,287	265	13	56
					(OP:UU4JMN)
UR7EN	3.7A	49,053	502	16	67
UR5AS	1.8A	34,580	413	14	62
*UR6EA	AA	2,084,212	2593	112	426
*UY7MM	"	1,322,360	1711	109	411
*UT5EO	"	1,222,450	1632	122	453
*UT8EL	"	900,207	1346	96	337
*UT1US	"	622,790	698	100	334
*UV7V	"	607,975	1039	92	323
					(OP:UX1VT)
*US5QUB	"	309,060	652	63	243
*UV3QF	"	220,928	550	60	196
*UX3IW	"	169,020	241	109	161
*UV5EVZ	"	163,350	313	83	214
*UR7HCX	"	158,900	449	63	164
*UX2X	"	156,513	371	65	192
					(OP:UT2XQ)
*UR3CMA	"	138,040	426	53	150
*UT3C	"	133,540	361	55	165
*UY1HY	"	106,343	264	52	141
*UT4XU	"	104,286	318	48	134
*UX3IO	"	99,229	202	70	151
*UX2QA	"	99,000	201	84	180
*UY5TE	"	97,658	393	42	151
*UR3QM	"	85,008	298	44	140
*UT4UB	"	79,827	297	48	129
*UT3WX	"	66,048	291	40	132
*UX7QV	"	33,153	208	32	97
*UT3WM	"	30,105	148	36	99
*UR8IDX	"	21,131	98	38	75
*UX7QG	"	19,030	127	31	79
*US8QQ	"	13,973	61	36	53
*US8MS	"	10,494	122	28	78
*UX5IZ	"	7,735	57	22	43
*USØSY	"	6,762	61	19	27
*UT9UZ	"	3,796	35	21	31
*UX6IR	"	1,881	24	14	19
*UTØHB	"	494	25	9	17
*UR4HAA	"	24	5	3	5
*UW1M	28A	431,490	1267	38	152
*UW5U	"	297,660	856	33	131
					(OP:UY2UA)
*UX7IW	"	173,151	611	34	125
*UT5CW	"	34,232	206	23	65
*UX1UX	21A	159,951	854	30	101
*UR6IJ	"	154,512	601	31	113
*UXØFF	"	17,710	133	19	58
*UR5FCM	"	3,120	78	8	22
*UR2Y	14A	619,362	2091	35	136
					(OP:USØYW)
*UT3RS	"	78,474	428	27	96
*UR7EW	"	49,955	350	21	82
*UT1AA	"	29,783	267	18	61
*UZ2I	1.8A	16,492	268	9	53
					(OP:UT2II)
*UX5MC	"	2,508	69	8	30
*UW1U	"	110	11	2	8
					(OP:UT7UA)

Wales

GW9X	A	1,694,530	2205	96	314
					(OP:MW1LCR)
GW3NAS	"	614,196	746	100	323
GW4BLE	21	1,139,874	2763	38	136
*MW1MDH	A	117,180	443	40	149
*GW7ERI	"	93,288	301	43	126
*GWØBBO	"	51,303	249	36	111
*GW4EVX	14	67,528	476	18	74
*MW8C	7	2,310	69	6	27
GWØRYT	AA	110,400	425	30	90
MW7X	21A	284,012	1049	33	115
					(OP:GØTSM)
MWØCRI	"	62,073	407	26	73
GW4BKG	7A	58,028	467	17	72
*GW6J	AA	1,241,724	1267	108	398
					(OP:GWØGEI@GW6LHF)
*2WØWOD	"	57,876	311	31	128

OCEANIA

Australia

VK4SDD	A	1,121,180	1647	77	167
VK2IR	"	971,208	1465	87	159
VK2CZ	"	289,170	471	79	159
VK4VI	"	176,790	398	59	107
VK3AVV	"	124,960	270	58	118
VK3JA	"	102,144	316	43	69
VK4CAG	"	84,545	168	59	126
VK2TTP	"	72,782	184	56	95
VK6DW	"	32,116	114	55	69
VK2GR	"	30,847	103	48	61
VK5ZZ	"	14,288	72	32	44
VK7BO	"	10,205	59	26	39
VK3VH	"	7,000	48	20	36
VK2KTT	"	1,375	19	9	16
VK4CL	28	24,766	154	22	36
VK4TL	21	116,208	446	28	80
VK4DMC	"	113,526	407	29	77
VK3AVZ	"	4,532	53	18	26
VK6SMK	14	116,688	436	31	71
*VK4ATH	A	92,508	223	60	96
*VK6VAX	"	72,352	239	40	93
*VK2FCOR	"	70,490	268	39	56
*VK4BRT	"	65,847	185	46	95

*VK5LTD	"	64,320	201	51	83
*VK4SP	"	57,625	170	44	81
*VK4EJ	"	18,300	98	33	42
*VK2WFT	"	11,644	74	33	38
*VK4HEC	"	10,764	64	29	40
*VK7BEN	"	8,220	59	22	38
*VK3HXT	"	6,844	45	21	38
*VK2NP	"	5,880	48	19	30
*VK5MTM	"	5,292	59	22	27
*VK6WE	"	4,104	39	26	31
*VK3NRW	"	2,368	27	9	23
*VK4GSW	"	2,294	25	16	21
*VK3HOW	"	1,218	16	14	15
*VK3JL	"	984	17	8	16
*VK6TKR	"	952	19	13	15
*VK2PV	28	6	1	1	1
*VK3VTH	14	21,442	115	24	47
*VK6AS	"	18	3	3	3
*VK3ZGP	"	6	1	1	1
VK3GK	AA	115,872	304	53	89
VK3DGN	"	85,527	205	51	102
VK2BCQ	"	50,752	165	45	77
VK1OO	"	44,428	156	43	73
VK2PN	"	13,250	99	25	28
VK3VT	"	8,520	54	23	37
VK4UC	28A	226,070	860	25	69
*VK1NS	AA	6,136	51	25	34
*VK6WX	"	529	12	12	11
East Malaysia					
9M8K	28	341,660	1062	32	78
(OP:JR3WXA)					
*9M6LZY	A	38,318	169	40	58
*9M6ZIM	"	5,192	47	20	24
*9W8DEN	28	44,096	255	20	44
*9W6ZUL	"	4,212	56	10	17
*9M6ZAE	14	836	18	10	12
*9W6IVY	7	14,427	93	21	42
9M6XRO	AA	803,880	936	96	223
*9W6AJA	AA	696	21	11	13
*9W6EZ	28A	51,888	273	25	44
Fiji					
*3D2KM	A	17,794	95	35	47
(OP:W6ZL)					
Guam					
KG2A/KH2	A	1,336,930	1809	85	184
NH2P	"	56	5	4	4
NH2DX	AA	1,947,456	1856	101	277
(OP:KG6DX)					
Hawaii					
KH7M	A	5,355,560	4305	147	287
(OP:N6TJ)					
NH7A	"	3,168,294	3359	124	215
NH6WZ	"	394,839	817	76	95
WH7W	"	273,288	520	79	114
KH6QJ	"	104,804	310	57	76
(OP:T32AZ)					
KH6DL	"	1,800	33	11	13
KH6Y	21	3,801	73	10	11
*KH6CJJ	A	628,080	922	91	149
*KH7T	"	170,784	423	62	82
*NH7PE	28	11,880	95	19	35
NH6Y	AA	702,219	911	90	191
NH7U	"	49,784	203	43	55
Indonesia					
YB9WZJ	A	285,714	504	75	159
YBØJZS	"	151,938	284	71	136
YB8IBD	"	105,968	312	62	86
YB3HJM	21	1,272	21	10	14
YBØOHG	14	1,664	34	10	16
YE3AA	"	945	17	10	11
(OP:N1IP)					
YB1KI	7	92,610	390	22	68
YD9SBP	"	11,914	110	20	26
YBØCOU	3.7	475	16	10	9
*YB6IXJ	A	168,036	324	64	137
*YC2MDU	"	136,206	330	60	101
*YB8ROP	"	104,988	299	60	96
*YB8BRI	"	62,832	199	47	89
*YB3JOS	"	58,671	183	43	80
*YB6HAI	"	28,943	137	36	67
*YB1TJ	"	26,030	102	30	65
*YB1CYD	"	25,721	120	38	51
*YB6LAY	"	18,000	90	27	48
*YBØIBM	"	15,470	77	22	48
*YC9IPJ	"	11,232	74	30	42
*YB8HZ	"	10,494	70	28	38
*YC6UAK	"	1,976	54	21	31
*YBØUNC	"	1,488	23	13	18
*YCØIEM	"	1,078	18	11	11
*YBØMWM	"	756	14	9	12
*YB1BGI	28	157,410	507	26	84
*YB9WAN	"	20,988	129	25	41
*YB6DE	"	18,688	117	18	46
*YBØVB	"	10,494	74	19	34
*YBØCOX	"	7,104	72	12	25
*YB9GV	21	108,992	392	26	78
*YB8EDO	"	57,519	270	21	56
*YC1CZZ	"	36,686	200	23	60
*YC9WIC	"	36,328	195	26	50
*YC8XOB	"	31,533	176	20	49
*YC2TDA	"	29,151	156	26	53
*YB8TM	"	25,296	153	18	50
*YE4IJ	"	23,115	129	20	47
*YC8VRA	"	20,923	132	22	39
*YC1KA	"	19,520	125	19	42
*YB2CPO	"	15,708	88	22	44
*YCØCCW	"	15,544	105	16	42
*YB1TIA	"	14,892	103	21	52
*YCØPDZ	"	10,434	97	17	30
*YC1LS	"	10,092	65	19	39
*YCØKBE	"	9,075	65	18	37
*YC1ZBI	"	7,776	70	16	32
*YC9FAR	"	7,124	72	20	32
*YB1TS	"	5,633	57	15	28
*YE1FTK	"	5,588	74	16	28
*YB9VL	"	2,619	49	12	15
*YC8HG	"	2,592	44	15	12
*YBØKTT	"	1,426	38	13	18
*YC1QL	"	836	18	9	10
*YB1EGP	"	420	10	7	8
*YE2BEM	"	396	19	8	14
*YC1HUG	"	299	11	6	7
*YF3BPL	7	50,373	234	30	57
*YD1IMK	"	3,040	45	15	23
*YC2NBY	"	2,516	37	16	21
*YD6BTI	"	2,320	49	9	20

*YB8XM	"	2,314	40	11	15
*YC5EGN	"	1,166	34	9	13
*YD2IJD	"	990	23	14	16
*YD9CMA	"	589	25	9	10
*YC5KIK	"	392	27	6	8
*YD8VHS	"	96	10	4	4
*YC8VIT	"	72	5	4	5
*YD1HFN	"	48	6	6	6
YB2TX	AA	335,070	506	75	180
YB8QF	"	9,900	72	27	39
YB3PBF	"	1,428	37	18	33
YB1FWO	28A	190,809	601	30	81
YBØDJ	"	106,526	392	22	76
YB3IZK	"	63,168	278	22	62
YB3BX	21A	714	26	8	9
YB8TK	14A	35,866	200	24	55
YBØNDT	7A	178,427	618	32	81
*YC8QT	AA	331,868	787	66	97
*YB1UUN	"	145,844	263	68	134
*YC6GV	"	89,973	305	35	82
*YC9GWR	"	36,888	150	40	66
*YC1HLT	"	30,888	126	42	66
*YC2NDX	"	27,968	128	31	61
*YB2ECG	"	18,640	116	38	42
*YC7BHK	"	3,784	33	18	25
*YC6MYO	"	2,220	32	17	20
*YD4IRS	"	63	11	3	4
*YC1BET	28A	9,843	65	14	37
*YB1MBA	"	120	5	5	5
*YC8RBI	21A	65,000	382	19	46
*YC8UTI	"	43,428	245	24	53
*YC1CSV	"	13,504	89	19	45
*YC2OBI	"	11,051	99	16	27
*YB1OZ	"	7,728	75	16	32
*YB5BOY	14A	89,965	357	22	73
*YB8SX	"	26,199	155	23	48
*YB8RW	"	3,990	43	15	27
*YG3CYU	7A	5,980	53	20	32
*YG3CYT	"	5,900	54	20	30
*YG3CYS	"	5,760	50	20	28
*YD1DMK	"	3,360	54	17	18
*YD3GOQ	"	2,340	30	13	17
*YD1EAV	"	1,430	32	11	11
*YD8ROY	"	893	33	9	10
*YC3RPW	"	861	15	9	12
*YDØRJQ	"	120	8	4	6
*YC5HEE	"	108	16	5	7
*YC6JRT/Ø	3.7A	288	10	6	6
Micronesia					
V6AAA	A	40,920	292	22	33
(OP:NHØAA)					
New Zealand					
ZM2IO	A	4,246,200	3313	121	329
(OP:ZL3IO)					
ZL1HD	"	1,061,724	1285	100	209
ZL1WN	"	174,475	398	66	109
ZL2BCO	"	47,343	169	49	80
ZL1YE	3.7	390	15	7	8
*ZL1FLY	A	25,389	123	42	51
*ZL1EL	"	24,570	101	41	64
(OP:ZL2CQ)					
*ZL/K7ST	"	23,364	97	44	55
*ZL1CTC	14	5,300	46	17	33
ZL2AJ	AA	626,880	721	113	207
ZL1T	"	90,048	208	55	113
(OP:ZL1ANH)					
ZL4NR	"	19,352	88	30	52
ZL2CC	7A	28,944	189	26	41
*ZL2MM	AA	26,362	112	37	61
*ZL3TE	28A	62,284	473	21	25
(OP:W3SE)					
Palau					
T88ZO	A	2,087,848	2294	101	221
Philippines					
DU7JAY	A	716,201	1339	74	125
DU1IVT	"	611,129	1082	69	130
DU1AV	"	368,810	1063	56	74
DU1RB	21	148,820	766	24	46
DU1JI	14	42,978	283	22	36
DW3TRZ	7	8,052	85	17	27
*DU1JM	A	301,087	558	62	137
*DU2XXA	"	38,829	123	48	81
*4F3FSK	"	21,490	137	30	40
*DV7EIU	"	5,104	56	19	25
*DU3LA	28	42,552	283	20	34
(OP:NØQM)					
*DU2BOQ	"	6,142	62	12	25
*DU1AVC	"	4,026	42	12	21
*DU3/W6QT	21	13,156	125	18	26
*DV8RS	"	4,655	64	15	20
*DU4PMA	"	1,950	47	11	15
*DU4JT	14	4,961	64	15	26
*DU7OK	7	2,552	50	12	17
*DU9BX	"	2,187	48	11	16
*DV7DRP	"	77	5	3	4
DU1EG	21A	33,440	310	17	23
DU1EV	7A	7,455	89	13	22
*DU3BC	AA	1,812,216	1988	98	224
Samoa					
5W1SA	14	721,215	1575	38	127
South Cook Islands					
E51EAQ	14	853,468	2023	36	118
(OP:SP5EAQ)					
Timor-Leste					
4W/JE1CKA	A	58,896	449	21	27
Tonga					
*A35JP	A	149,036	379	58	90
(OP:JAØRQV)					

SOUTH AMERICA

Antarctica					
*RI1ANZ	A	48,642	144	42	79
(OP:RW6ACM)					
Argentina					
LP7D	A	819,102	1487	63	148
LU5AB	"	414,434	972	53	105
LU7HN	"	95,195	455	36	43
LU4JEA	"	192	13	6	6
LTØH	28	629,862	1988	28	85
(OP:LU3HY)					
LU5VV	"	553,014	1707	23	91
LU3HS	"	279,310	1209	21	64
LQ7E	"	250,684	960	23	75
(OP:LW3DN)					
LU8DY	"	51,240	225	21	63
LW3DG	"	43,650	516	14	16
LU8ADX	"	25,456	212	12	31
LW9ETQ	"	9,168	86	13	35
LU1QAH	21	60,847	318	24	47
LU9MBY	14	235,132	786	32	84
LU8XW	"	85,345	338	28	73
(OP:LU8XP)					
LU1IBL	"	3,298	35	9	25
LU6FL	3.7	702	23	6	7
LU2DKT	1.8	616	17	10	12
*LU4EG	A	261,716	585	57	125
*LU7MCJ	"	223,200	582	48	96
*LU5FF	"	176,443	583	36	71
*LU2JCW	"	18,786	72	35	58
*LU7FP	"	12,566	103	27	34
*LU1JHF	"	8,357	49	26	35
*LU8EHR	"	1,596	37	13	15
*LU3HIP	28	222,918	740	28	78
*LW1EUD	"	200,208	851	26	60
*LU3DK	"	120,175	487	23	72
*LU5EVK	"	107,067	439	25	64
*LW7DJ	"	73,290	416	22	48
*LU4DPL	"	56,950	362	20	47
*LW5DPG	"	36,159	332	12	39
*LU6DU	"	34,605	269	12	33
*LU1MPK	"	25,728	149	21	43
*LU2EGI	"	25,192	197	21	46
*LU2FDA	"	18,290	121	20	39
*LU6FLZ	"	17,385	136	16	41
*LU1DTL	"	6,302	64	13	33
*LR1A	"	4,235	51	11	24
(OP:LU1AS)					
*LW5ER	"	3,930	60	13	17
*LO7D	"	1,666	41	8	9
(OP:LW1DRH)					
*LU6EBF	"	1,248	33	11	13
*LU4WG	21	22,617	145	23	40
*LU5MT	"	14,800	121	17	33
*LU7DUE	"	192	7	5	7
LP1H	AA	7,318,072	4679	134	422
(OP:LU5HM)					
LU1HLH	"	1,330,051	1431	101	246
LU7YZ	"	393,888	1117	53	79
LU1DZ	"	165,977	345	57	124
LU3CW	"	127,604	504	41	51
LU1ALF	"	68,688	240	42	66
LU9MDH	"	40,248	203	21	57
LU6QI	"	180	6	6	6
LR1E	28A	1,906,736	3725	37	141
(OP:LW6DG)					
*L77D	AA	816,902	1232	73	166
(OP:LU6DC)					
*L33M	"	191,121	523	47	86
(OP:LU3MAM)					
*LU6HDV	"	7,420	48	24	29
*LU7DH	28A	565,920	1664	29	91
*LU3DX	"	441,630	1258	30	96
*LT7F	"	250,847	646	31	106
(OP:LU6FOV)					
*LW7DBA	"	60,800	230	25	75
*LU9EHU	"	46,123	258	20	57
*LW5EAE	"	14,742	153	13	29
*LU7CAW	"	9,504	66	17	37
*LU9CBL	"	6,594	63	12	30
*LU7ADN	21A	66,248	290	25	66
Aruba					
P49Y	A	6,930,818	5121	111	355
(OP:AE6Y)					
P4ØA	AA	8,176,630	5122	133	441
(OP:KK9A)					
*P4ØW	AA	8,641,514	4589	144	514
(OP:W2GD)					
Bolivia					
*CP1FF	A	10,496	72	33	49
Brazil					
PS2T	A	2,317,350	2305	97	253
(OP:PY2ZEA)					
PY2MC	"	2,240,440	2527	91	225
PY2SBY	"	498,182	831	68	155
PY9ØIARU	"	284,900	551	52	133
(OP:PY2ZZZ)					
PY2MSR	"	80,216	295	52	96
PY4NY	"	61,480	217	46	70
PP5JY	"	61,116	193	43	89
PY2KP	"	42,441	138	52	89
PY5KA	"	38,948	180	44	63
PV8BR	"	12,870	73	21	45
PV8ADI	"	8,874	101	37	65
ZY2B	28	1,502,904	3313	32	124
PY2EJ	"	16,592	111	19	42
PY2JNV	"	8,084	69	14	29
PY5JQ	"	5,856	48	17	31
PY5ZD	21	708,099	1679	33	114
PT2AC	"	308,700	1038	32	94
PY1VOY	"	120	5	4	4
PY5QW	7	150,052	597	27	65
*PY1NX	A	3,460,229	3026	104	297
*PY2LPM	"	296,920	514	75	185
*PY2VOX	"	225,435	684	45	88
*PY3FOX	"	138,774	258	67	135
*PY2RF	"	82,170	221	57	109
*PY1RY	"	72,072	312	33	51
*PY2QM	"	66,975	273	45	96
*PY4RL	"	45,784	217	38	80
*PY1NS	"	45,639	195	33	66
*PP6ZZ	"	44,750	156	44	81
*PY2GZ	"	34,947	195	38	61
*PU3KNG	"	33,051	184	20	49
*PV8AX	"	23,166	112	34	65
*PT2AW	"	20,271	95	32	55
*PY2CTA	"	17,004	119	27	51
*PY2AXH	"	11,926	105	25	42
*PP6MS	"	6,510	104	26	36
*PY3ZZR	"	6,413	82	22	31
*PP5ASF	"	6,325	73	26	29
*PY2AB	"	6,018	55	18	33
*PY2YR	"	3,382	40	13	25
*PY2DR	"	2,070	62	19	26
*PY1CDR	"	1,978	54	20	23
*PT9JFM	"	1,080	32	12	15
*PY2LCW	"	891	33	15	18
*PY3ASQ	"	286	23	10	12
*PU2WDX	28	402,215	1397	24	79
*PU5DTH	"	156,869	594	23	80
*PU4GOD	"	149,226	503	25	89
*PP5NS	"	86,403	410	23	60
*PU9ATH	"	70,191	322	26	73
*PU2TES	"	40,875	224	19	56
*PU2LEW	"	39,864	242	24	64
*PY2EM	"	39,648	206	19	65
*PU2VCP	"	38,537	192	23	66
*PU8PSF	"	26,624	195	16	48
*PU2LPV	"	22,632	169	17	52
*PY5WH	"	21,791	126	22	55
*PS1M	"	14,392	144	16	40
(OP:PY1MK)					
*PU1VGD	"	13,338	139	16	38
*PY1DO	"	13,328	96	16	40
*PU5RHT	"	12,040	88	18	38
*PU4ABA	"	11,704	149	16	40
*PY2DPM	"	7,524	83	10	34
*PY1TL	"	6,786	70	13	26
*PU2RDB	"	5,368	75	12	32
*PS2R	"	5,092	65	16	22
(OP:PY2TI)					
*PY4RR	"	3,570	63	12	22
*PY4WWW	"	2,997	44	14	23
*PY2VTC	"	2,490	66	13	17
*PU2AAW	"	2,332	82	12	32
*PU2PSP	"	2,112	72	19	47
*PU1SSH	"	1,230	40	16	25
*PY2XQ	"	1,197	29	10	11
*PY4ASW	"	1,121	29	6	13
*PU2VGU	"	720	17	7	13
*PU2GMM	"	500	39	10	10
*PU2TYA	"	483	27	8	13
*PU2STQ	"	147	7	3	4
*PY3CEL	"	98	8	4	3
*PU1WTM	"	9	3	2	1
*PY3BEG	21	288	13	7	9
PX5E	AA	11,073,697	5560	156	545
(OP:PP5JR)					
ZZ2T	"	6,181,824	4033	124	404
(OP:PY2MNL)					
ZV1ØM	"	2,217,492	2890	75	204
(OP:PT7ZT)					
PY5AB	"	2,087,176	1968	100	276
PY2KJ	"	2,019,584	1885	89	279
PR7AB	"	1,221,792	1720	73	194
PY5IN	"	497,906	773	76	165
PP1CZ	"	407,472	718	60	148
PY7VI	"	377,610	682	59	146
PY1WS	"	246,688	417	72	136
PY3PA	"	146,046	530	48	53
PY2AE	"	82,824	212	59	115
PR7RBA	"	48,888	208	35	91
PY2YP	"	47,615	162	29	78
PY7ZY	"	44,550	241	23	43
PY2MPG	"	26,852	119	34	64
PY2TOP	"	24,153	114	29	54
PT2ZM	"	2,016	89	11	17
PV8DX	"	620	38	14	17
PY5ZHP	28A	369,892	1092	30	94
PU2YZP	"	303,710	1039	29	92
PY2XC	"	300,150	923	28	87
PY2XJ	"	38,088	216	26	66
PY5DC	21A	418,616	1036	37	105
PY2MP	"	44,382	207	20	58
PY2AA	"	2,432	32	11	21
(OP:PY2RH)					
PP5ZP	14A	60,660	271	23	67
PY1KR	"	27,790	169	27	43
PY5BH	7A	67,599	287	28	83
PY5ZW	"	1,288	27	12	16
*PR9M	AA	1,200,897	1101	95	328
(OP:PY9MM)					
*PY5FO	"	642,756	1302	60	114
*PW2A	"	597,780	903	64	179
(OP:PY2DV)					
*PY2COY	"	493,668	1005	70	119
*PY2VZ	"	290,394	509	73	148
*PY1SX	"	197,568	365	48	148
*PY1FI	"	134,589	452	45	74
*PY4LH	"	99,330	314	48	81
*PT3A	"	94,464	246	59	105
(OP:PY3IT)					
*PS8BR	"	93,408	293	32	107
*PY2ABN	"	73,700	301	33	67
*PY2BEK	"	38,896	165	38	66
*PY2VOA	"	30,627	192	26	57
*PY2PRB	"	24,119	111	29	60
*PY2XV	"	18,880	94	23	57
*PY3DJB	"	17,005	90	40	55
*PY2LW	"	14,940	82	29	54
*ZW2F	"	8,352	67	21	37
(OP:PY2LCD)					
*PY2KG	"	5,874	75	26	40
*PV8AZ	"	4,361	37	17	32
*PY2ALC	"	4,128	40	14	29
*PY1FOX	"	2,176	52	14	20
*PY1SGT	"	1,456	43	14	14
*PP5GEL	"	990	37	14	16
*PV8DR	"	352	10	7	9
*PY3MU	28A	383,032	1196	27	89
*PU2UAF	"	253,208	841	30	94
*PP5UP	"	167,388	526	24	87
*PY4XX	"	154,018	543	26	80
*PY2ZR	"	128,820	684	19	57
*PU5AGM	"	97,857	438	20	63
*PU2STZ	"	93,122	344	24	77
*PU8TAS	"	65,688	291	25	77
*PU1KTZ	"	47,970	294	21	44
*PY5JR	"	46,852	318	15	38
*PU5DUD	"	32,967	187	24	57
*PP5DZ	"	31,734	160	25	57
*PU2MTV	"	31,724	142	25	78
*PY2FSR	"	25,155	176	19	46
*PY2TTE	"	23,828	130	27	65
*PU2BRU	"	16,632	184	19	44
*PY2WK	"	15,748	118	17	45
*PU2YVW	"	13,983	123	23	36
*PU8YPL	"	13,804	118	14	44
*PU3MUS	"	13,237	107	17	44
*PY2IQ	"	10,560	119	14	19
*PU4HUD	"	10,550	96	16	34
*PU5IKE	"	4,635	88	17	28
*PT9BM	"	4,029	32	22	29
*PU1MIL	"	3,456	67	13	19
*PU2WSQ	"	2,646	38	8	19
*PU7DEF	"	2,409	54	12	21
*PU1TMU	"	1,920	52	13	17
*PU1KVA	"	1,728	42	11	13
*PT2LA	"	840	32	11	13
*PP5FMM	"	370	15	5	5
*PY2HT	21A	154,700	582	25	75
*PS8ET	"	27,040	130	20	60
*PP5NY	"	24,570	175	20	43
*PY8WW	14A	195,300	618	31	93
*PY1MT	7A	80	4	4	4
Chile					
CE3CT	A	6,066,240	4768	128	317
3G6S	"	1,585,360	2001	94	210
(OP:XQ6OA)					
CE6DFY	28	54,150	302	17	58
CE3NR	14	47,520	197	29	70
3G3PR	"	15,275	117	26	39
(OP:CE3LQH)					
*CE1UGE	A	385,800	710	66	134
*CE2SQE	"	47,244	147	48	79
*CE3DNP	28	36,966	214	19	42
*CE2LML	"	16,974	268	9	14
*CE3SBQ	"	10,763	118	15	32
*CE3TMM	"	1,247	53	10	19
*XQ1TUW	"	800	41	7	9
*CE3GDR	14	11,446	77	23	36
CE3MDA	AA	9,246	55	29	40
3G3O	28A	126,582	646	23	50
(OP:CE3OP)					
CE2MVF	14A	1,054,296	2255	37	125
CE3WYZ	"	14,388	101	26	40
*CE7KF	AA	139,732	303	62	131
*CB3F	"	71,151	252	40	71
*CB3L	"	3,354	51	19	20
*CA3CBM	28A	175,942	645	25	76
*CA3JRI	"	18,500	160	16	34
*XQ3UP	21A	9,964	89	18	35
Colombia					
HK3JJH	A	457,488	793	62	154
HK4L	"	179,444	338	69	157
HK3C	14	754,459	1925	28	109
*HJ4ZJS	AA	69,052	241	28	94
*HK6JIL	"	255	10	8	7
Ecuador					
*HC5VF	A	208,772	495	54	110
HC2AO	14A	563,834	1340	32	119
*HC1YC	AA	3,478	45	19	28
Fernando de Noronha					
*PYØF/AA4NC	28	281,925	973	22	83
French Guiana					
*TO2A	A	7,035,756	4602	121	425
Paraguay					
*ZP6DYA	28	514,856	1362	30	109
ZP5DBC	AA	4,242,020	3358	110	342
*ZP6DEM	28A	332,800	975	30	98
Peru					
OA4SS	A	2,355,792	3029	88	184
*OA6Q	A	204,546	378	68	151
Suriname					
PZ5RA	AA	2,317,760	2521	83	237
Trinidad & Tobago					
*9Y4D	14	1,275,340	2662	35	135
9Y4W	21A	1,495,224	3056	36	135
Uruguay					
CX2DK	28	2,325,162	4816	36	130
*CW5W	A	3,299,027	2680	115	318
(OP:CX6VM)					
*CX9AU	"	1,686,492	1936	94	222
*CX9BU	"	63,928	253	41	81
*CX7BBR	28	90,320	479	21	59
*CX2TG	"	19,215	116	18	45
CX5UA	AA	1,237,680	1650	76	194
CX4AT	28A	27,886	165	18	55
CV7S	21A	238,428	848	28	83
(OP:CX7SS)					
CX7ACH	14A	354,342	914	35	111
CX4BW	"	334,048	842	36	110
CX4SS	"	141,102	442	35	99
*CX6DRA	28A	77,264	341	24	64
*CX2CC	21A	637,637	1648	33	110
Venezuela					
YW4D	A	7,570,360	3987	150	515
(OP:YV1DIG)					
YV6CR	"	1,197,207	1410	91	228
4M5W	3.7	42,978	277	14	43
YW4V	1.8	2,496	42	7	19
(OP:YV4DYJ)					
YV5IAL	"	286	14	2	11
*YY4RDC	A	62,098	228	29	93
*YY6CAM	"	29,574	135	22	71
*YV4ET	"	24,645	100	25	68
*YY5GJC	"	5,035	40	22	31
*YY5AFJ	"	575	15	10	15
*YV6YV	28	133,705	632	23	62
*YV4AW	14	110,400	428	24	76
*YV8ER	7	157,080	559	25	85
*YV4MY	"	12,685	120	11	32
*YY4GOR	"	112	12	5	9
YV6BXN	AA	31,428	144	33	64
YV4NN	21A	1,542,240	3416	36	134
YV5PM	7A	437,880	1280	26	97
*YV8AD	AA	929,070	1121	82	228
*YV5EAH	"	925,274	1102	80	221
*YY6SEW	"	105,360	366	35	85
*YV5KG	"	20,553	117	36	57
*YY1YLY	28A	692,886	2375	23	79
*YY4KCV	"	118,125	656	23	52
*YV4GLY	"	357	19	7	10
*YV1KK	21A	1,229,658	2463	35	139
*YV2CAR	"	850,096	2229	31	103
*YY4TSS	7A	42,642	260	16	53
*YV4DX	"	15,576	105	13	53
*YV4NY	3.7A	704	25	6	16

QRP

VE3VN	A	677,340	775	72	246
DK3WE	"	642,208	990	83	293
JR4DAH	"	500,678	679	87	191
JH1OGC	"	485,010	575	106	211
UX2MF	"	425,548	615	85	297
K8ZT	"	340,075	424	77	228
G4CWH	"	290,418	551	68	223
IZ1ANK	"	287,328	637	72	220
W6QU	"	236,610	371	79	160
(OP:W8QZA)					
NDØC	"	235,554	357	70	179
W1JCW/5	"	223,965	354	64	173
RW3AI	"	203,988	573	57	210

UN7EG	"	172,473	340	49	142
SBØA	"	169,812	557	51	161
					(OP:SMØLPO)
UT5EOX	"	160,888	408	61	177
IZ8EWD	"	158,976	463	51	165
KA8SMA	"	151,891	296	55	138
HB9ZAG	"	139,680	479	45	149
KT8K	"	121,974	262	50	124
DL2JRM	"	117,216	357	60	162
YB9KA	"	116,466	345	69	108
N8XA	"	111,910	224	53	137
K2YGM	"	102,879	230	45	116
KH6KG	"	99,960	259	66	81
SN5L	"	96,255	449	45	162
N1TM	"	95,568	205	45	131
JA1HNW	"	89,060	232	54	92
F4BYB	"	86,112	408	42	142
F4EJW	"	76,976	318	33	103
VA3WR	"	76,650	182	54	121
VE3SD	"	73,308	207	46	103
UR3AFS	"	67,860	297	39	156
R9AT	"	66,304	200	41	107
DO8CW	"	61,380	414	42	113
IK3XTY	"	61,344	289	36	106
UT4UFZ	"	58,506	244	40	107
VE3LJQ	"	58,506	164	41	106
EA1GT	"	56,700	260	34	106
DJ3GE	"	56,548	254	37	97
IN3UFW	"	55,632	293	35	117
SQ3OGP	"	43,722	198	38	88
MØKWK	"	35,574	205	33	114
IWØQO	"	32,750	164	41	90
LA1DSA	"	30,848	187	31	97
DL8MF	"	29,945	143	34	79
DDØVS	"	29,890	153	39	83
RZ4WZ	"	28,919	147	35	86
DL5EC	"	28,783	150	34	73
2EØLJZ	"	28,182	162	32	90
UN8PT	"	27,768	159	23	55
TA3IW	"	27,542	125	23	71
R6KY	"	24,966	126	34	80
DL/SP2UUU	"	21,112	196	28	88
WBØIWG	"	21,080	100	30	55
UR3PHG	"	20,736	223	17	79
LB1JG	"	20,628	136	28	80
N4ZAK	"	20,332	105	28	64
VA3PCJ	"	20,090	108	27	55
LZ2JR	"	19,673	132	27	76
DO1DJJ	"	18,980	130	22	43
LZ7V	"	18,312	135	31	78
					(OP:LZ3GH)
CS7AFI	"	18,084	135	23	43
PDØPMS	"	17,200	190	14	66
RZ3ARO/6	"	16,456	135	21	67
9A7JZC	"	16,328	108	30	74
R3AP	"	16,324	76	44	62
F4GPZ	"	15,486	102	32	55
RU7A	"	15,486	64	32	57
VK4FAAS	"	15,477	93	30	37
W4TTZ	"	14,620	62	31	55
PY2BN	"	14,364	98	27	36
RØJF	"	14,280	69	29	56
EA4CU	"	13,124	89	24	44
SY1AQG	"	9,504	87	24	64
BD9ATY	"	9,450	64	24	46
LB1LG	"	9,198	124	20	53
G4SGI	"	8,496	98	21	51
IZ1DBY	"	8,360	53	26	50
UA3DOA	"	7,860	51	25	35
EA3FHP	"	7,504	62	25	42
YBØANN	"	6,840	60	21	24
IW2NRI	"	6,273	64	16	35
WFØT	"	6,120	47	21	30
WP4DT	"	5,848	69	18	25
USØYA	"	5,830	38	22	31
LZ1UBO	"	5,796	95	16	53
JN3DMJ	"	5,650	53	22	28
EA8/DL7ULM	"	5,289	45	14	27
KA3UOL	"	4,806	38	20	34
KP4LE	"	4,715	46	18	23
WB2R	"	3,690	35	13	28
					(OP:W2MFT)
ON4ANE	"	3,150	58	14	36
LY5G	"	2,880	46	13	27
US1UU	"	2,562	51	11	31
AB3WS	"	2,550	40	18	33
IN3FOX	"	2,303	41	16	31
HB9EMS	"	2,268	36	16	26
SP5NZZ	"	2,220	22	19	18
VE5DLD	"	1,890	49	12	9
LA/OZ1RD	"	1,802	52	19	34
DO1JC	"	1,768	34	10	16
SQ3MVK	"	1,728	22	15	21
EA3GYE	"	1,700	31	13	21
YU3VIP	"	1,610	22	16	19
VE3IQZ	"	1,152	22	15	17
R2WW	"	1,020	29	8	26
KC9LVT/8	"	720	13	11	13
KH6CS	"	338	10	6	7
UB3DDA	"	276	17	9	14
N2ASD	"	24	2	2	2
PU1MHZ	28	122,910	546	22	63
I5KAP	"	54,431	276	24	55
WA6FGV	"	43,758	211	22	56
LU9HW	"	27,619	165	21	50
DF7LS	"	25,668	175	19	50
HP1RIS	"	20,139	164	17	32
JA4DQX	"	16,146	113	18	36
UA6BFE	"	15,330	140	22	51
UR3PGW	"	13,224	108	18	39
PU2TRX	"	11,952	157	18	30
KM4VR	"	9,464	66	14	42
BH4OUF	"	7,938	98	15	34
DG6TOM	"	5,576	69	13	28
UN7JID	"	4,896	51	6	26
SP5FKW	"	3,456	46	11	21
KIØG/5	"	3,120	38	13	26
N8XX	"	1,200	19	8	16
YO4LHR	"	836	20	7	12
AA2VK	"	630	19	5	10
KF7SJE/6	"	484	20	11	11
EW6BN	"	230	11	3	7
OE3VET	"	204	8	5	7
US5VX	"	182	8	5	8
KM4NKO	"	168	7	3	5
W1TEF/4	"	110	6	4	6
BH2RFQ	"	80	6	4	4
SQ8AL	"	30	4	2	3
DD2TT	"	6	3	1	1
YT7Z	21	103,740	447	28	105
					(OP:YU7SK)
SP5DDJ	"	83,520	349	28	92
YT1CS	"	75,068	482	17	81
GJ3YHU	"	52,917	246	19	74
SP4LVK	"	46,563	289	21	62
I4PZP	"	43,452	221	24	78
F4HLR	"	41,382	251	20	79
JR2EKD	"	38,325	198	25	50
7N4WPY	"	26,280	149	23	50
SP4GFG	"	22,922	179	19	54
JQ1NGT	"	19,546	140	20	38
JR6HMJ/1	"	17,490	127	19	34
N3UR	"	16,464	112	10	46
JR1NKN	"	14,500	125	20	30
9A2EY	"	13,804	157	12	46
HAØGK	"	10,070	104	16	37
JI3CJO	"	8,720	86	15	25
RA7RA	"	8,692	122	11	42
PY2BI	"	8,478	74	17	37
MW8T	"	7,470	92	13	32
					(OP:MMØCWJ)
DL9OHA	"	7,425	88	11	34
DO7PRM	"	5,891	75	12	31
DD1OPI	"	2,890	53	12	22
F6KQV	"	2,232	34	11	20
					(OP:F1UIH)
YC1UUU	"	2,184	32	13	15
BI4OJF	"	1,593	64	12	15
W2JEK	"	966	17	8	15
UR5KBP	"	819	28	7	14
GU4YBW	"	625	21	9	16
TA1CH	"	506	27	6	16
JS1SDU/3	"	280	20	6	8
F4GLD	"	190	26	6	13
JO7FGZ/1	"	128	6	3	5
JA1POS	"	42	4	3	4
AB1HD	"	24	2	2	2
SQ5NBE	14	58,290	511	18	69
IN3HUU	"	11,780	145	11	51
R2ABT	"	11,286	174	11	46
G3ZNR	"	10,123	157	11	42
DK1MIR	"	6,720	130	8	40
					(OP:E73WM)
WB3D/4	"	6,624	58	14	32
S52GO	"	4,532	73	9	35
CO8FD	"	2,660	47	12	23
HB9ENI	"	2,412	61	7	29
9A5HZ	"	2,304	74	7	29
LA5ZTA	"	1,276	42	6	23
KK7VL	"	989	21	9	14
CT1ERW	"	832	30	5	21
RN1CW	"	828	14	9	14
KG5GMN	"	561	17	7	10
SQ9JXH	"	550	33	5	17
IZ2QKG	"	527	27	4	13
WN4AFP	"	416	13	5	11
VR2UNG	"	405	11	7	8
R2EL	"	170	15	4	13
IU2DMG	"	160	8	5	5
JG1GPY	"	117	7	4	5
KU4QO	"	45	3	2	3
F1UIH	"	28	5	2	5
CT1BXT	7	37,570	299	15	70
UT5UUV	"	12,264	178	9	47
IZ2JPN	"	11,456	154	10	54
IZ4VQS	"	8,000	141	8	42
F/OM2ZA	"	6,867	140	11	52
E72NA	"	6,160	101	8	48
OK6OK	"	4,859	105	8	35
S52CQ	"	2,660	77	6	32
YV6GM	"	512	15	7	9
IU2EBO	"	380	26	3	16
SQ8BRZ	"	156	14	3	9
VA6TDG	"	12	3	1	2
WB3LGC	"	6	1	1	1
AC2RJ	"	0	1	1	1
VK4FBED	"	0	1	1	1
OL4W	3.7	13,872	286	6	42
					(OP:OK1IF)
SQ8MFB	"	6,020	139	6	37
RA4FWA	"	3,936	71	10	31
DO4HZ	"	3,880	97	6	34
EA1TI	"	2,660	67	6	32
PAØAWH	"	1,904	76	3	25
EC4AA	"	703	31	3	16
E77CV	"	144	15	3	9
HA1TI	1.8	2,883	99	5	26
RM5O	"	936	38	5	19
S59GS	"	627	32	4	15
M6Z	"	8	3	1	3
					(OP:MØSTY)
RT4W	AA	678,300	1152	97	328
IZ8JFL/1	"	444,087	920	74	297
RA4AAT	"	417,125	758	83	272
IZ3NVR	"	358,474	701	70	232
DD5FM	"	334,196	722	58	210
OK2FD	"	221,112	528	63	186
YU1LM	"	195,337	596	50	179
SP9RQH	"	141,949	343	65	176
UR5XMM	"	89,180	221	56	126
LZ7H	"	74,036	325	36	130
PH4X	"	62,909	197	57	152
PE2K	"	45,885	293	31	102
JK1TCV	"	39,732	118	55	74
RAØAY	"	38,376	148	40	77
HA5BA	"	23,086	145	35	84
LZ1YE	"	16,562	99	30	61
YO8SEP	"	16,254	157	22	64
ES7GN	"	12,267	110	27	60
PY2VQ	"	9,452	89	27	41
IC8SCI	"	7,725	59	27	48
UT3IT	"	7,102	54	22	45
HS3IAT	"	6,885	87	20	31
PY2MIG	"	6,255	85	20	25
PY4WJ	"	1,350	51	12	18
LZØM	"	1,140	22	12	18
					(OP:LZ2SX)
BD4HHZ	"	868	21	14	14
Z32ID	"	460	13	9	11
7L1AVS	"	440	15	9	11
DG9BEG	"	210	8	7	8
IK2WQH	"	70	7	7	7
SP5EWX	28A	162,960	416	36	132
JR3RWB	"	117,645	400	31	84
R7NA	"	96,480	424	29	91
MØOSH	"	87,202	378	28	90
PU2KKE	"	54,896	300	19	54
MIØLLG	"	28,917	215	21	60
KB2HSH	"	11,232	84	13	41
JRØBUL	"	10,530	96	18	27
PP5XA	"	9,040	111	15	25
RD7K	"	8,112	108	10	42
ES7MB	"	6,321	79	14	35
ED4T	"	5,738	51	13	25
					(OP:EA4CWN)
PY1CMT	"	4,061	60	8	23
OK1GK	"	3,102	37	13	20
JH1WGW	"	880	16	11	11
PU2DMM	"	600	17	9	11
NK5G	"	128	6	4	4
HK3W	"	6	1	1	1
OH2BV	21A	178,416	527	37	131
II3W	"	165,240	499	37	125
					(OP:I3VFJ)
BD9XE	"	73,440	356	25	77
LZ2A	"	73,030	395	25	84
					(OP:LZ2DB)
J43N	"	40,140	317	21	69
NØUR	"	20,808	107	15	57
R7FO	"	19,920	149	18	62
W9SUN	"	17,871	92	16	53
N8HP	"	16,614	86	16	55
YU1ANO	"	990	23	8	14
K3QF	"	828	19	8	15
JH3DMQ	"	96	4	4	4
ES7CE	"	45	15	4	11
MWØJRX	14A	201,720	1200	25	98
YT4T	"	71,536	335	30	106
IZØFUW	"	43,344	403	18	66
ES7AM	"	21,756	229	15	59
N9NBC	"	19,512	112	17	55
IK4OMU	"	18,304	202	12	52
LZ2TU	"	16,569	211	12	51
UA1CEC	"	2,673	84	6	27
SY1BCC	"	182	16	3	10
IQ3KU	7A	23,400	239	14	64
					(OP:IZ3IBL)
SV3GKU	"	13,662	157	14	52
IZ1DGG	"	10,761	190	9	42
K3TW/4	"	8,195	62	14	41
GØW	"	5,175	104	7	38
					(OP:GØVDZ)
WB4OMM	"	2,607	30	9	24
YD1CW	"	1,679	29	10	13
BG9XL	"	1,150	39	11	14
ES7A	"	651	28	5	16
TA8AT	"	576	13	6	10
K2GMY/6	"	308	16	6	5
RØAFF	"	143	8	5	6
TA4CS	"	105	5	2	5
DL/PE1EXD	"	81	12	2	7
EW1IP	3.7A	24,640	353	8	56
ES7RIX	"	4,536	136	6	30
9A4AA	"	3,465	100	5	30
NN7SS	"	360	15	6	4
					(OP:K6UFO)
YP8A	1.8A	3,116	73	6	35
SP6OJK	"	1,710	58	5	25
US2ITU	"	48	6	2	6

MULTI-OPERATOR SINGLE TRANSMITTER NORTH AMERICA

United States

District 1

K6ND/1	8,571,060	4194	157	608
N1MM	5,578,752	2981	144	537
N2GZ/1	2,209,695	1285	133	482
K1VR	1,899,852	1221	115	441
W1AN	1,195,092	850	124	410
N1EV	269,807	430	71	198
W1YK	170,448	495	52	149
W1AW	4,794	47	12	35
***NM1C**	1,667,925	1145	108	417

District 2

W2FU	6,447,080	3095	164	596
N2GC	2,162,398	1280	130	471
AB2DE	564,633	543	101	286
WA3AFS/2	290,184	329	89	250

District 3

W3MF	3,545,320	2071	129	481
K3MD	3,013,280	1893	128	464
K3OQ	410,880	476	80	240
W3SQ	259,392	437	45	179
***W3HAC**	260,848	364	71	203
*KA3PCX	222,925	360	55	186

District 4

WW4LL	6,141,788	3080	166	600
AD4ES	2,289,708	1659	140	433
W5MX/4	909,090	1192	69	201
W4NC	516,516	554	79	285
***KT4ZB**	1,423,148	1070	113	386
*WA1F/4	503,440	583	76	234
*K4RC	401,790	525	65	230
*NN4SA	166,860	293	69	137
*KM4HXI	23,192	100	35	69

District 5

KN5TX	2,567,504	1971	141	451
K5KDX	458,784	542	86	238
KN8KAZ/5	40,920	162	43	77

District 6

K6MMM	705,802	911	82	201
K6ZED	535,390	531	101	269
N6MI	318,423	500	77	180
N6YG	303,500	494	81	169

District 7

K2RD/7	3,503,722	2045	149	477
K7RI	2,243,979	1701	133	368
K7ZS	1,696,611	1353	126	341
K7JR	1,528,866	1240	124	347
W7FSL	1,455,681	1209	121	358
KD7VIK	66,352	201	61	82
***K7JAN**	80,388	210	54	100
*N7ZUF	21,840	100	31	47
**KG7OSO*	3,996	58	23	31

District 8

K8AZ	8,447,173	3998	166	597
W8PR	2,985,400	2027	130	420
WA8MCD	1,729,132	1217	122	416
***W8AJT**	251,902	367	66	200
*N8YXR	42,500	134	39	86

District 9

NV9L	7,142,818	3423	170	608
AA9A	5,778,120	2955	161	555
KD9BVD	42,036	126	37	87
***K9SOU**	37,845	103	42	103

District Ø

KØGEO	1,779,492	1189	138	423
KØJE	258,121	287	90	269
W9ELN/Ø	127,312	221	65	153
WØPPF	120,240	273	48	132

Alaska

KL7JRC	47,895	212	43	60

Bermuda

***VP9I**	6,784,064	4715	134	474

British Virgin Islands

VP2V/N3DXX	6,018,750	4782	119	416

Canada

VE3JM	11,383,692	5486	159	630
VE6SV	6,527,928	4570	164	468
VE3MIS	5,099,156	3192	140	482
VE7GL	4,512,480	3612	143	401
VB2T	890,652	1280	87	235
VE7SAR	257,796	491	63	154
VE3WPZ	229,440	415	69	171
VE6AO	174,045	373	69	136
***VE2CWQ**	201,144	358	60	172
***VE3KTB/VYØ**	151,470	488	42	111
*VE2CSL	272	9	8	8

Costa Rica

TI5/W3TB	1,855,040	2597	86	255

Dominican Republic

***HI3K**	3,988,962	3588	121	380

El Salvador

YS1YS	1,088,875	1811	68	213

Mexico

**XE1SIX*	11,900	98	28	42

Panama

HO1C	29,712	304	14	34
***HO2C**	672,735	1394	56	159

Puerto Rico

***KP4BD**	4,309,425	3659	123	412

San Andres & Providencia

***5JØB**	1,483,272	2131	78	249

St. Kitts & Nevis

V47T	23,721,177	11655	172	671

St. Martin

TO1E	5,080,714	3557	130	459

Turks & Caicos Islands

VP5DX	10,885,440	6928	148	532
VP5S	6,807,276	5211	130	458

U.S. Virgin Islands

NP2N	2,008,164	2088	105	321

AFRICA

Canary Islands

EF8R	30,859,830	11594	184	743
***EE8V**	145,904	355	42	134

Madeira Islands

CR3A	26,524,220	10281	181	714
***CR3Z**	116,560	278	43	112

ASIA

Asiatic Russia

RWØA	10,465,470	5398	159	588
RTØC	7,783,830	5089	159	476
RT8U	3,422,496	2993	109	354
RU9CZD	2,598,940	2430	96	302
RK9CYA	2,238,510	1883	103	362
RKØW	262,848	483	61	161
UIØL	227,850	606	75	135
***RYØA**	1,137,150	1284	83	259
***RD8D**	558,780	660	78	257

Asiatic Turkey

TC2C	6,064,716	4648	102	374
TCØF	3,437,636	3167	85	319
YM7KA	2,864,862	2863	84	294
***TC3O**	131,340	302	38	127

China

B7M	3,078,490	3088	107	315
BA4DL	1,508,286	1957	106	260
B4T	799,370	1233	90	196
BY9CA	506,160	997	61	167
BY6DX	245,708	478	74	170
BY6LY	182,910	518	67	143
***BY7KTO**	306,250	572	73	172
*BG7RCX	90,450	350	47	103
**BD1LT*	70,584	337	33	69
*BY2HIT	67,732	249	54	110
*BH2RO	10,080	107	32	40
*BH3CWL	3,735	74	18	27

Cyprus

P33W	25,506,000	10102	177	723

Isreal

4X7R	7,153,830	4112	137	469

Japan

JR5YCE	9,704,595	4928	170	547
JA7ZFN	6,558,672	3664	161	481
JM1LPN	4,418,823	2721	151	448
JI2ZJS	2,889,660	2171	140	370
JI2ZEY	1,743,000	1770	120	255
JA2YKA	459	17	7	10
***JJ2YNR**	148,554	341	71	118
*JA2YEF	100,050	251	59	115
***JJ1YAF**	368	9	7	9

Kazakhstan

UP2L	19,342,103	8258	170	689
UP9L	1,915,056	2048	76	275

Kuwait

9K2HN	16,026,408	7139	166	635

Saudi Arabia

***HZ1TL**	1,846,962	1922	86	265
*7Z1OO	111,125	329	30	97

Singapore

9V1YC	3,511,370	3356	122	348

Thailand

E2X	1,882,684	1902	111	322
***HSØZIA**	2,143,960	1879	111	323
*HS4OI	6,976	78	24	40

United Arab Emirates

A61BK	6,155,590	3602	135	523
A61ZX	2,651,292	2950	78	256

West Malaysia

9M2SI	554,120	978	79	201
***9M4SG**	143,655	398	63	120
*9M4CPM	51,308	227	46	81
*9M2JKL	5,785	47	25	40

EUROPE

Austria

OE5XIL	832,275	1267	86	319
OE5XRL	77,715	269	46	111
OE1XAW	46,740	242	46	118
***OE2S**	2,863,344	2042	137	559

Azores

CU4DX	8,356,143	6785	135	454
CQ8M	1,667,586	1988	97	352

Belarus

EU1WW	3,427,713	3062	145	522
***EW4WE**	138,244	525	47	167

Belgium

***OT5X**	797,160	1671	80	285

Bosnia-Herzegovina

E7DX	14,454,180	7569	183	740
***E73EKK**	84,337	373	41	146
*E71AVW	40,950	313	19	72
*E71EEE	23,166	198	21	78
*E74CVZ	15,072	160	20	76
*E73ELS	3,344	96	7	31

Bulgaria

LZ5K	2,218,872	2616	109	363
**LZ7M*	380	14	7	12

Croatia

9A7A	13,337,564	6840	178	721
9A8M	9,012,876	5431	167	635
***9A3B**	2,493,120	2480	124	464
*9A6V	871,625	1074	101	374
*9A5G	161,229	449	56	185

Czech Republic

OK7O	5,875,884	4911	130	458
OL7T	3,822,388	3203	141	521
OK2KOJ	1,684,770	1807	111	423
OK1KQH	1,369,626	1927	96	342
OL1Z	1,165,440	1252	104	376
OK5N	5,290	115	6	40
**OK1KCF*	43,840	188	45	92

England

G2F	8,906,183	5647	154	639
MØNKR	3,373,920	3256	128	440
G3B	2,073,284	1892	127	460
G1T	829,464	1196	83	325
M4U	735,660	1508	78	288
MØREG	317,856	624	74	234
MØWAF	129,000	485	28	101
***GØGHK**	614,246	921	94	300
*G3YNN	311,920	646	67	213

Estonia

***ES5YG**	117,384	406	51	168

European Russia

RU1A	14,297,500	7541	175	700
RT6A	11,003,194	7330	179	719
RM3F	8,691,480	5515	172	668
RC3W	3,085,920	2855	144	576
RT4D	2,686,608	2363	143	548
RO2E	2,341,872	2108	141	561
RK3VWA	1,805,859	2043	118	443
UF5D	1,540,962	2186	119	412
RU3C	681,450	1165	85	265
RO1A	69,713	339	40	121
RK4W	67,760	398	32	108
R5DV	23,364	190	24	75
UD3D	3,239	101	20	59
***RY4F**	1,265,172	1431	114	423
***RK3PWR**	730,448	1594	73	211
***UA6ABE**	10,164	110	15	51
*RA6X	2,632	52	12	35
*RZ3DZI	1,584	35	11	25

Finland

OH5Z	7,560,378	4677	171	655
OH6K	1,655,970	1949	119	454
OH2BAH	1,186,410	1305	112	314
OH2FNR	409,220	618	92	278

France

F6KOP	201,500	686	31	94
F6KFA	98,496	258	54	138
F8KFS	76,608	261	51	120
F6KBF	50,827	162	47	90
***TM1T**	2,477,220	2074	130	485
*TM5CD	709,857	973	97	334

Germany

DKØWRTC	5,766,552	3704	161	631
DP7D	4,728,950	3166	150	548
DL1T	1,492,476	1543	120	434
DJØA	1,397,816	1388	102	334
DR3W	1,324,521	1195	121	440
DKØTU	1,012,770	1262	108	357
DLØML	873,639	1178	89	304
DR1E	745,914	1381	93	345
DLØLK	706,048	906	99	349
DL1M	601,325	753	88	271
DR2P	263,406	546	68	239
DK6MP	217,770	506	68	187
DKØIW	138,710	388	48	146
***DLØDX**	1,021,115	1107	105	338
*DFØIA	145,200	467	57	163

Greece

J43TR	3,126,870	4043	108	447
***SZ1A**	2,942,055	2933	143	560

Hungary

HG2ITU	6,698,944	4243	162	625

HG6ITU	971,652	1971	84	290
***HG5A**	**475,410**	**873**	**83**	**262**
*HG5P	296,245	660	77	254
Iceland				
TF2LL	**5,259,250**	**4948**	**111**	**434**
TF3W	9,747	90	17	40
Ireland				
EI7M	**16,988,367**	**8723**	**176**	**701**
EI1Y	8,708,274	5555	159	615
***EI1E**	**1,084,248**	**1344**	**87**	**357**
Italy				
IR4X	**14,857,570**	**6999**	**182**	**728**
IR4M	13,842,504	6610	181	716
IR8C	8,713,958	5176	171	691
II2S	5,468,036	3590	163	639
4U5F	3,002,133	3262	127	462
IQ2MI	2,129,106	2028	127	495
IB3A	1,467,429	1613	115	386
II1W	1,064,770	1844	93	317
IQ0LT	939,339	1104	112	419
II6T	751,983	1272	82	285
IN3EQD	511,098	1221	63	238
IQ3WW	298,768	508	79	205
IQ5FI	165,880	428	66	194
IQ7IW	81,216	239	56	132
***IQ3RK**	**2,226,336**	**1815**	**134**	**538**
*IQ4AD	934,200	1182	103	347
*IQ3BM	403,325	788	77	288
*IQ2CU	378,900	978	70	230
*IQ1AO	212,436	543	69	212
Jersey				
GJ2A	**3,205,740**	**2791**	**124**	**482**
Kaliningrad				
UA2F	**12,942,210**	**6530**	**186**	**720**
Latvia				
YL1ZT	**996,990**	**2016**	**95**	**303**
YL1ZX	339,250	818	67	228
Liechtenstein				
HBØA	**1,629,264**	**2268**	**77**	**296**
Lithuania				
**LY1BWB*	*15,660*	*118*	*30*	*60*
Netherlands				
PA4O	**3,853,254**	**3115**	**132**	**497**
PI4ZU	1,476,369	2692	88	281
PA6V	1,455,753	1723	114	375
PI4YLC	627,418	1286	87	274
PI4Z	351,568	556	75	226
PA9ØIARU	295,152	802	45	131
PI4ZOD	67,344	287	40	143
***PI4DLZ**	**10,452**	**103**	**21**	**57**
Norway				
LA4C	**895,122**	**1358**	**97**	**349**
LA3T	562,400	852	86	284
LA1T	147,615	403	58	137
Poland				
SN8B	**8,557,934**	**4689**	**175**	**679**
SO4B	5,561,926	3644	161	605
SN1D	3,351,813	2710	146	567
SP9KAO	2,097,152	2476	108	404
SP9KDA	1,896,882	2172	121	465
SP2KPD	1,553,211	1813	113	428
SP5KAB	646,129	949	100	289
SP3KRE	35,802	248	27	90
***SP7PCZ**	**573,988**	**792**	**92**	**299**
**3Z1K*	*556,428*	*1056*	*80*	*276*
*HF6K	260,586	635	69	210
*SP3YOR	51,022	210	30	67
*HFØWFF	42,700	288	30	110
*SN5I	5,785	61	23	42
Portugal				
CR6K	**10,356,255**	**5500**	**173**	**670**
CR5L	1,930,251	1934	98	351
Romania				
YP8T	**6,554,746**	**4350**	**151**	**592**
YR8E	2,542,428	2677	123	444
YR8D	1,411,800	1646	120	423
***YO4KAK**	**104,894**	**350**	**47**	**132**
Sardinia				
***ISØFFV**	**103,200**	**359**	**54**	**161**
Serbia				
YT6T	**2,828,576**	**2888**	**122**	**470**
***YU1BBV**	**24,926**	**189**	**31**	**90**
*YU1HFG	3,510	94	7	32
*YT5L	80	11	2	6
Sicily				
II9P	**11,810,904**	**6292**	**187**	**729**
***IR9F**	**2,095,632**	**2366**	**128**	**488**
Slovak Republic				
OM7M	**13,899,150**	**6851**	**183**	**739**
***OM6H**	**274,175**	**672**	**62**	**213**
Slovenia				
S51A	**5,573,840**	**3716**	**154**	**618**
S53EA	3,987,360	3501	138	501
S5ØW	3,379,341	2863	139	512
S54K	1,760,904	2421	102	342
S59T	3,876	63	14	43
***S5ØD**	**473,044**	**935**	**75**	**211**
Spain				
ED3X	**10,673,192**	**5766**	**172**	**670**
EE5T	5,911,851	3963	160	599
EE2K	5,242,380	3974	137	523
ED5O	4,845,885	4132	130	515
EE5M	4,841,280	4407	129	447
ED2C	2,483,780	2614	118	415
EF1S	1,547,832	1697	100	392
EE1G	1,146,718	1313	110	383
EG2ATU	890,838	1646	72	210
EF2O	391,776	990	51	125
EA2RCP	333,520	781	53	167
***EF7X**	**5,370,786**	**3511**	**151**	**620**
*ED1B	3,910,548	2995	134	540
*EC1DD	2,170,560	2116	114	446
*ED7B	1,483,790	1746	104	366
*ED3D	531,380	1082	77	249
*EB2ESS	72,450	286	48	127
Sweden				
SK7K	**3,192,145**	**3114**	**131**	**504**
SK2T	2,682,012	2299	128	508
SI9AM	1,340,916	2616	88	305
SKØOO	998,498	1304	97	336
SK6AW	534,819	991	73	264
SE3Y	*89,199*	*298*	*47*	*140*
***SJ3A**	**284,856**	**525**	**87**	**225**
*SK6EI	2,679	49	16	31
*SA6BPD	1,760	45	8	24
Switzerland				
HB9H	**7,262,704**	**4589**	**163**	**633**
HB9EOU	4,186,488	3360	138	524
HB9PUE	1,798,342	2210	117	457
HB9ZZ	1,115,310	1258	98	372
HB9OK	812,808	1307	100	377
HB2S	*626,808*	*1172*	*78*	*216*
HB2C	313,005	758	66	205
Ukraine				
UW9I	**2,344,524**	**2911**	**119**	**427**
UW7W	817,238	1113	89	312
UR4RWW	301,892	794	62	222
UR4PWC	12,672	100	22	50
***UW6M**	**564,480**	**1083**	**81**	**303**
*UT4IXZ	3,192	55	13	29
*UT2HZT	858	26	11	22
OCEANIA				
Australia				
VK4NM	**6,219,812**	**4832**	**125**	**336**
VK6NC	*3,007,188*	*2789*	*118*	*294*
VK2AU	2,619,156	2137	122	322
VK2GGC	2,261,616	2158	118	263
**VK8RD*	*7,168*	*63*	*29*	*35*
Brunei Darussalam				
***V84O**	**785,213**	**1379**	**83**	**138**
**V84CQ*	*213,408*	*616*	*49*	*95*
East Malaysia				
9M6SDX	**273,713**	**664**	**74**	**93**
Hawaii				
KH7CW	**4,993,280**	**3758**	**148**	**322**
KH6/AA4V	2,765,090	2908	122	213
Indonesia				
YE2A	**5,113,648**	**3892**	**129**	**343**
YEØX	88,672	284	61	102
YB3MM	70,850	233	37	72
***YE1ZAT**	**764,694**	**976**	**80**	**214**
*YB3ZBN	49,920	186	46	84
*YC1ZAD	14,504	106	25	49
*YB8ZCM	11,560	72	36	49
Marshall Islands				
V73D	**3,686,760**	**3472**	**126**	**259**
New Zealand				
ZL1X	**1,662,669**	**1852**	**102**	**231**
ZL1AM	653,632	1134	81	143
SOUTH AMERICA				
Argentina				
LT1F	**10,629,312**	**5662**	**156**	**511**
LU1VM	**1,751,861**	**2027**	**102**	**211**
Bonaire				
PJ4X	**18,425,844**	**8236**	**165**	**609**
Brazil				
PQ5B	**10,195,540**	**5966**	**145**	**465**
PR7AA	3,252,002	2459	111	383
PT2AP	371,756	563	78	206
PV8AA	115,442	259	59	138
PU5PEO	17,094	268	10	12
***PR1T**	**3,841,830**	**2703**	**117**	**393**
*PQ5A	289,500	1070	29	71
**PT9AA*	*8,784*	*85*	*25*	*36*
Chile				
XR6T	**730,206**	**1280**	**73**	**153**
CE6TRA	351,190	842	54	119
***CA3LMO**	**132,521**	**619**	**21**	**68**
*CE2MT	120,832	412	46	72
*CE5JA	111,440	348	45	95
French Guiana				
***FY5KE**	**14,118,480**	**6758**	**159**	**561**
Uruguay				
***CW1DC**	**1,023,492**	**1711**	**66**	**162**
MULTI-OPERATOR				
TWO TRANSMITTER				
UNITED STATES				
KC1XX	**18,105,815**	**7813**	**176**	**669**
K9CT	**11,482,330**	**5544**	**171**	**616**
NQ4I	**10,526,440**	**5149**	**162**	**614**
NØNI	**6,898,755**	**3768**	**167**	**576**
K4TCG	5,673,734	3340	149	489
N7AT	**5,020,014**	**3762**	**156**	**462**
W2CG	**4,652,645**	**2727**	**138**	**497**
W2YC	3,561,890	1973	139	516
WA3EKL	**3,414,960**	**1963**	**145**	**503**
K2AX	2,720,835	1682	125	460
NØMA	2,013,752	1382	135	443
W8BI	**1,883,840**	**1236**	**140**	**440**
NW8U	1,309,425	1202	89	306
WG3J	1,199,730	1098	97	338
NC7M	922,264	930	107	276
N4SVC	921,680	904	103	307
W4UQ	899,856	829	102	330
W8DGN	392,557	527	67	214
K5GDX	**381,425**	**496**	**71**	**204**
W1FM	301,328	406	80	216
W4MLB	223,284	378	66	210
KN5S	163,625	325	52	135
KCØYFC	6,944	54	27	35
NORTH AMERICA				
TO4K	**19,705,908**	**12485**	**144**	**543**
V26B	**18,635,988**	**10523**	**160**	**572**
T42US	**2,305,210**	**3941**	**84**	**206**
VE6FI	**1,466,718**	**2228**	**99**	**214**
VE7SCC	**1,381,848**	**2244**	**97**	**215**
COØCT	847,550	1568	78	197
TI5M	**712,950**	**973**	**101**	**249**
KP4QQ	**351,050**	**663**	**56**	**182**
AFRICA				
CN2R	**36,582,798**	**13906**	**183**	**734**
CN3A	34,973,452	13802	176	717
ED9K	**16,893,920**	**8893**	**142**	**538**
ASIA				
C4A	**20,307,184**	**8778**	**166**	**663**
A73A	**19,171,206**	**8956**	**175**	**624**
BY5CD	**6,513,771**	**4842**	**144**	**417**
UI9I	**6,082,094**	**4166**	**129**	**457**
B7P	5,332,880	4284	137	398
JE1ZWT	**5,164,192**	**3492**	**148**	**396**
B1Z	4,013,766	3852	125	353
TC3P	**2,363,595**	**2486**	**82**	**263**
9M2M	**1,869,056**	**2260**	**105**	**287**
JA1ZGP	1,768,520	1813	110	270
BD3RX	*738,474*	*1126*	*100*	*234*
E2E	**555,363**	**917**	**93**	**214**
BV6ØCRA	**299,796**	**1246**	**66**	**106**
E2A	67,840	319	52	76
XU7AJA	**19,662**	**122**	**33**	**54**
EUROPE				
ED1R	**16,387,272**	**9560**	**179**	**712**
HG1S	**15,782,688**	**8616**	**171**	**693**
PI4DX	**14,090,195**	**7993**	**175**	**658**
IB9T	**13,550,884**	**8376**	**170**	**687**
HG7T	13,197,780	7434	188	720
SK3W	**12,606,057**	**7550**	**165**	**672**
YT5A	**10,817,136**	**7703**	**168**	**624**
SO9Q	**10,352,124**	**6527**	**165**	**636**
LY2W	**10,337,991**	**6548**	**173**	**684**
M6T	**10,307,130**	**6360**	**160**	**630**
DR5N	**10,050,400**	**5663**	**169**	**681**
DLØCS	9,942,192	6306	164	682
DL1A	8,831,900	5468	160	654
RM5A	**8,416,904**	**5994**	**162**	**634**
IK2YCW	**8,183,424**	**5145**	**169**	**639**
HB2T	**7,271,495**	**5537**	**143**	**564**
CR6P	**6,457,230**	**6184**	**125**	**460**
M4A	6,442,002	4580	149	589
DP6T	5,889,672	4323	151	581
PI4COM	5,769,080	5109	121	498
CR5T	5,720,736	4448	141	531
G5O	5,577,930	4444	137	520
GM2T	**5,526,472**	**5027**	**134**	**530**
IO9A	4,722,658	4708	124	477
DP6A	3,982,496	3063	162	574
DKØEE	3,692,094	2810	144	570
OE5T	**3,360,656**	**2743**	**129**	**475**
LZ7A	**3,222,807**	**3968**	**121**	**460**
DFØAT	*2,694,960*	*2423*	*142*	*542*
IR3Z	2,679,846	2271	141	522
E73ESP	**2,433,376**	**3840**	**110**	**386**
JW5E	**1,565,564**	**2065**	**94**	**280**
DL6O	1,537,438	1545	121	448
PAØAA	*1,094,780*	*1413*	*103*	*327*
ES1O	**925,980**	**1473**	**102**	**358**
ISØM	**896,112**	**1799**	**83**	**298**
ED1WW	849,332	1289	84	314
ISØAML	818,258	1272	84	308
ED4P	724,605	1507	79	256
F6KDL	**507,000**	**843**	**87**	**288**
SM5F	143,360	486	44	116
LN2T	**123,942**	**487**	**41**	**141**
OCEANIA				
AHØK	**11,744,820**	**6541**	**163**	**476**
AHØBT	11,205,000	6589	156	444
VK4KW	**10,604,610**	**6853**	**147**	**398**
AH2R	**6,593,832**	**4696**	**137**	**367**
VK4HH	400,640	616	86	170
SOUTH AMERICA				
PJ4Q	**23,660,020**	**11100**	**155**	**585**
PX2A	**16,904,300**	**8618**	**155**	**545**
PT2CM	8,937,693	5526	134	457
CB1H	**5,685,150**	**4192**	**129**	**373**
LU8YE	**4,699,315**	**4313**	**104**	**291**
CB3W	3,947,100	3307	121	325
CV3D	**3,787,840**	**3907**	**100**	**280**
CE3TAZ	104,255	295	54	91
MULTI-OPERATOR				
MULTI-TRANSMITTER				
UNITED STATES				
K3LR	**31,602,915**	**12458**	**195**	**786**
W3LPL	23,637,570	9852	187	726
WE3C	19,324,062	8202	184	714
VK1Q	**12,144,725**	**5722**	**167**	**644**
W4RM	**10,249,351**	**5176**	**155**	**576**
K1KP	8,168,305	4652	139	520
NA2U	**4,097,366**	**2260**	**140**	**518**
W5CT	**4,038,540**	**2424**	**158**	**502**
NE3F	3,642,939	2119	136	503
W1CSM	2,558,786	1650	124	438
W4AAW	*1,594,804*	*1168*	*117*	*382*
N6AA	**1,448,904**	**1470**	**132**	**306**
NQ9A	**739,190**	**701**	**92**	**294**
NORTH AMERICA				
KP2M	**13,722,888**	**9115**	**148**	**516**
KL7RA	**11,733,120**	**8874**	**148**	**412**
VE5PV	**3,314,083**	**3312**	**124**	**319**
VE3DC	**1,177,566**	**1459**	**91**	**312**
AFRICA				
CN2AA	**69,993,040**	**23344**	**205**	**835**
ASIA				
A71CV	*21,896,738*	*10150*	*172*	*651*
JA3YBK	**15,441,568**	**7659**	**174**	**578**
JA7YRR	**7,248,290**	**4531**	**158**	**437**
D7ØLW	**2,235,168**	**2258**	**111**	**321**
JA1YPA	**154,850**	**379**	**44**	**119**
TC3T	**10,126**	**73**	**20**	**41**
JA2YGP	**8,704**	**60**	**29**	**39**
EUROPE				
DFØHQ	**23,497,428**	**12558**	**192**	**786**
9A1A	**23,148,840**	**13407**	**185**	**738**
LZ9W	**18,088,200**	**11381**	**194**	**742**
OT5A	**14,764,596**	**9982**	**169**	**667**
C37N	**12,537,963**	**10634**	**138**	**561**
EA3CCN	**9,597,732**	**6919**	**154**	**607**
PI4CC	**9,434,192**	**6495**	**162**	**634**
LY7A	**8,830,170**	**7558**	**154**	**584**
EI9E	**8,054,120**	**6418**	**151**	**592**
GM9N	**5,090,490**	**4820**	**139**	**555**
PI4M	5,060,588	5145	125	489
OMØM	**4,253,845**	**3349**	**141**	**518**
PI4D	1,307,826	1683	114	372
IR5A	**1,033,848**	**1183**	**111**	**408**
G5N	**823,991**	**1589**	**75**	**296**
G3V	253,422	564	61	186
MØHFC	224,700	613	52	162
M3P	103,684	409	46	150
IO8WF	3,402	61	16	47
9A7B	1,776	34	16	21
OCEANIA				
KH6J	**15,793,945**	**9030**	**173**	**440**
YB1C	**3,017,697**	**2615**	**128**	**319**
DX9M	**726,624**	**1220**	**77**	**155**
DX1DBT	89,352	349	58	95
SOUTH AMERICA				
HK1NA	**30,132,705**	**13317**	**173**	**638**
PJ2T	**27,166,178**	**12883**	**162**	**599**
ZW5B	**21,068,295**	**9643**	**174**	**621**
HCØE	**5,581,706**	**4212**	**125**	**369**
ZY2A	4,672,696	3721	111	350
ROOKIE				
United States				
District 1				
KG5HEW/1	**7,872**	**50**	**22**	**42**
***KC1BOH**	**205,425**	**278**	**61**	**214**
*KC1AXJ	84,508	220	39	109
*KC1ACN	64,719	190	42	111
*KC1ANM	42,720	142	34	86
*KC1CRS	33,401	107	44	83
*KC1AJT	3,828	36	17	27
*K1MTD	3,150	30	18	27
*KC1DKY	2,176	30	9	23
District 2				
***KD2JOE**	**109,032**	**248**	**43**	**125**
*W2RES	61,061	155	40	103
*KD2HFN	22,256	78	34	73
*AC2MT	15,580	80	24	52
*N2CEC	8,624	75	12	37
*KG2DWS	2,574	33	9	24
AC2RJ	*0*	*1*	*1*	*1*
District 3				
***W3ZX**	**62,370**	**171**	**34**	**101**
*WS3S	8,418	59	19	42
AB3WS	2,550	40	18	33
*KC3CNT	1,700	23	13	21
*KC3DEI	506	11	11	11
District 4				
W4FS	**2,813,586**	**1800**	**124**	**442**
ND7J/4	355,320	401	80	249
KM4CPA	35,306	140	41	86
KK4PC	29,785	98	43	72
K8EAB/4	90	5	2	4
***N4LAG**	**52,875**	**136**	**43**	**98**
*KN1FE/4	51,238	141	47	90
*N4CVN	49,780	149	34	97
*KK4PUX	41,888	140	30	89
*AE4FH	26,418	102	36	75
*KV4LV	13,552	95	12	44
*KM4HVE	10,672	88	19	39
**W7ZP/4*	*8,568*	*51*	*21*	*42*
*AB4VT	3,182	32	17	26
*K4ISR	2,405	28	16	21
**KM4HQL*	*2,349*	*40*	*11*	*16*
*W4HRL	1,305	27	12	17
*KM4MBG	1,269	21	12	15
*KK4UON	418	16	9	13
KM4NKO	168	7	3	5
**KV4UV*	*36*	*3*	*2*	*2*
District 5				
KG5CIK	**364,212**	**461**	**91**	**211**
KG5CIJ	98,306	212	65	134
***KF5VDX**	**363,090**	**489**	**82**	**203**
*KF5YUB	45,240	143	40	80
*K5TMH	19,592	102	26	53
*KF5WVJ	14,356	59	42	55
*N5CWA	12,403	68	26	53
*N5STT	7,104	41	24	40
*K5BKW	2,982	41	20	22
*K5MLY	2,178	24	14	19
*KF5TXU	1,102	26	8	11
KG5GMN	561	17	7	10
*AF5OI	42	4	3	4
District 6				
AI6EG	**13,135**	**77**	**30**	**41**
KK6IVX	2,478	76	24	35
***KK6NON**	**79,624**	**236**	**54**	**94**
*KK6PTS	5,376	49	26	30
*AI6CN	4,644	38	25	29
*KK6RDY	1,886	43	19	22
District 7				
W7CYL	**211,640**	**311**	**81**	**179**
N7DXT	37,720	122	49	66
***NS7I**	**20,293**	**91**	**35**	**56**
*AF7EL	11,760	98	28	42
*KNØJI/7	10,296	90	35	37
*K7VAP	6,096	70	24	24
*K1AUS/7	2,800	33	14	21
**KG7HSN*	*820*	*19*	*10*	*10*
*KE1DS/7	384	15	7	9
*KG7UET	304	10	8	8
*KB7JJG	247	7	6	7
*KG7SNE	117	5	5	4
*AF7QI	81	8	5	4
District 8				
AC8TO	**55,094**	**128**	**58**	**111**
***AC8XI**	**161,138**	**260**	**62**	**164**
*W8WDW	30,562	109	42	76
*KE8ANS	26,793	106	40	77
*W8AYL	23,638	84	33	73
*W8DWC	2,898	31	17	29
*W4YPW/8	2,870	35	14	27
District 9				
***WK9U**	**137,164**	**281**	**59**	**153**
*KC9ZJI	78,870	184	47	118
*KA9BBQ	3,818	36	19	27
*KD9BPQ	2,898	34	18	24
*W3ZAP/9	1,560	21	11	19
*KD9DEY	360	12	9	9
*K9SGB	240	10	7	9
District Ø				
NØAXE	**32,332**	**126**	**36**	**82**
***KEØCRP**	**187,543**	**319**	**60**	**163**
*AEØEE	165,000	303	63	137
*WØLSB	16,434	83	32	51
*KDØWUQ	2,664	32	15	21
*KEØCCI	1,408	19	13	19
*NØFN	567	14	9	12
*KDØWUF	49	4	3	4
Alaska				
***AL4Y**	**67,716**	**257**	**52**	**56**
Barbados				
***8P9EH**	**419,152**	**1294**	**33**	**103**
Bermuda				
***VP9NNO**	**2,280**	**27**	**10**	**20**
Canada				
VE3TCV	**224,576**	**353**	**65**	**177**
VE3LJQ	**58,506**	**164**	**41**	**106**
VA6TDG	**12**	**3**	**1**	**2**
***VE5SDH**	**54,412**	**201**	**40**	**82**
**VA3PDG*	*38,781*	*187*	*31*	*62*
*VA3MQS	15,147	74	21	60
***VE4DPR**	**3,649**	**37**	**13**	**28**
*VE3BLU	2,178	26	10	23
Mexico				
XE1/N4DMH	**2,394**	**62**	**9**	**10**
Puerto Rico				
***WP4PHY**	**102,860**	**285**	**37**	**102**
U.S. Virgin Islands				
***WP2SC**	**9,384**	**62**	**27**	**42**
Asiatic Russia				
RØAEW	**112,578**	**276**	**45**	**129**
***RØAEE**	**297,297**	**663**	**51**	**138**
***UB9UAT**	**113,568**	**513**	**19**	**65**
*RCØLAD	50,697	167	56	73
RØAFF	475	14	9	10
Asiatic Turkey				
TA2AKX	**14,399**	**92**	**22**	**55**
***TA3IUY**	**6,897**	**57**	**20**	**37**
*TA4APR	70	4	3	4
*TA4ALQ	42	3	3	3
Bahrain				
A92AA	**853,160**	**1037**	**69**	**239**
China				
***BG2CTX**	**639,840**	**1014**	**88**	**222**
*BG8INK	85,754	354	28	78
*BH4TQX	65,667	222	61	98
*BD7IAL	48,929	296	38	75
*BH1SCW	36,240	189	47	73
*BH4OEW	22,400	119	28	52
*BG6LQZ	8,599	74	24	43
BH4OUF	7,938	98	15	34
BI4OJF	1,740	65	13	16
India				
***VU2NFG**	**180,096**	**377**	**54**	**138**
*VU2WE	22,600	107	32	68
*VU3NPI	12,516	79	30	54
*VU3RTL	8,030	78	17	38
*VU2UUU	6,634	55	25	37
*VU3MEY	1,500	30	10	15
*VU3CML	1,440	27	11	21
Japan				
JH1WGW	**880**	**16**	**11**	**11**
***JR2MIO/2**	**43,008**	**152**	**46**	**66**
***JM8FEI**	**27,354**	**114**	**40**	**57**
***JJØSOQ**	**6,555**	**49**	**23**	**34**
*JM8GJB	3,200	36	16	24
Kazakhstan				
***UN5GAV**	**65,600**	**166**	**52**	**112**
*UN7GOD	532	10	9	10
Saudi Arabia				
HZ1HZ (OP:OE1LZA)	*2,372,356*	*2205*	*88*	*298*
Thailand				
***HS5SRH**	**152,500**	**542**	**31**	**91**
*HS5IHQ	8,883	68	25	38
United Arab Emirates				
***A61DA**	**227,879**	**491**	**54**	**127**
West Malaysia				
***9W2LWO**	**80**	**4**	**4**	**4**
Austria				
***OE6FTE**	**19,740**	**131**	**27**	**78**
*OE1VMC	1,680	48	11	17
Belarus				
EW6W	**3,240,975**	**3133**	**125**	**422**
***EW4FG**	**277,695**	**611**	**61**	**194**
*EW1TO	74,106	342	42	137
*EW4CDC	15,244	92	28	46
Belgium				
***ON3PGL**	**50,862**	**248**	**35**	**112**
*ON1TO	15,260	244	8	62
Bosnia-Herzegovenia				
E73SDM	**460**	**30**	**5**	**18**
Bulgaria				
LZ1UBO	**5,796**	**95**	**16**	**53**
Croatia				
***9A3DZH**	**14,579**	**156**	**15**	**46**
*9A3CJW	6,786	71	18	40
Denmark				
***OZ4MU**	**63,961**	**233**	**44**	**123**

England

*M4P	315,248	699	56	216
(OP:MØPMV)				
*2EØIFC	127,488	338	52	140
*MØOSA/M	34,254	186	25	74
*2EØSDV	25,200	334	15	60
*2EØKDT	24,780	120	35	83
*M6WID	1,518	42	8	25
*MØTRJ	1,014	19	12	14
*M6HKD	368	23	3	13
*M6FCY	238	17	4	10

European Russia
District 3

R3MAL	33,066	158	47	120
*R2DGD	106,926	344	53	160
*R2AHS	86,848	350	39	145
*R2DGG	12,460	103	26	63
R2ABT	11,286	174	11	46
*R3THA	9,702	104	18	45

Finland

*OH5CZ	391,575	722	82	263
*OH5CY	125,990	330	57	158
*OH8EJW	85,020	274	48	147
*OH6EHZ	68,170	295	44	126
*OH5BW	46,190	239	40	115
*OH5BK	45,844	251	36	110
*OH6EPM	15,824	126	23	69
*OH5ELX	676	22	9	17

France

F4HJG	281,748	990	35	124
F4HLR	41,382	251	20	79
*F4HFQ	7,869	67	22	39
*F4HLL	520	18	10	16

Germany

*DL5LB	239,058	636	55	178
*DO5LO	45,080	202	35	80
*DL4LT	37,401	216	31	106
*DO7RU	19,256	138	22	36
*DO5DC	16,500	149	19	47
*DL2IC	10,360	68	24	50
*DO2MRC	9,000	112	20	52
*DO6SI	8,320	111	14	50
*DO2MWR	7,370	67	20	47
*DO5MSN	6,771	72	20	41
*DO6FC	4,128	95	9	39
*DL3PW	3,510	64	17	37
DO1JC	1,768	34	10	16
*DO4GR	1,264	29	8	8
*DK9MOS	1,258	37	10	27
*DK2IC	912	22	9	15
*DL5BL	325	21	7	18
*DL6MJ	35	5	3	4

Greece

*SY1BFI	47,034	224	33	101
*SV8PMM	17,578	147	25	69
*SV1PIZ	16,380	107	34	71
SY1AQG	9,504	87	24	64
SY1BCC	182	16	3	10

Iceland

*TF8KY	41,730	211	33	97

Italy

IU4AZC	142,748	802	29	98
IU5BKR	136,484	356	55	174
IU8FRE	73,875	212	50	147
IU6AKY	35,236	359	21	71
IZ2ZQP	1,593	31	10	17
*IU3BXO	101,016	312	48	135
*IU4AOS	61,202	185	54	88
*IU4FJI	39,655	201	29	74
*IU2DUP	34,408	157	27	61
*IU1FIB	32,385	185	28	99
*IU7BOE	8,614	74	22	51
*IU1CYF	8,591	72	24	47
*IU4AOP	6,720	48	27	33
*IU4AOW	4,012	56	18	41
*IU8DKG	3,692	61	14	38
IN3FOX	2,303	41	16	31
*IU4BIP	1,443	25	16	23
*IU2BFT	260	10	5	8
*IZ3ZLP	24	2	2	2

Lithuania

*LY4SA	10,270	97	24	55

Luxembourg

*LX1DKE	21,320	139	31	73

Netherlands

*PA9IGB	294,752	566	64	180
*PA1DI	14,500	125	28	72
*PD9DB	13,193	117	21	58
*PD1ROT	10,726	133	14	48
*PD1BHZ	7,650	53	20	30
*PD7H	1,998	46	11	16
*PA1RT	1,800	46	10	35

Northern Ireland

MIØLLG	71,040	287	39	89

Norway

LB7ZG	258,995	689	65	212
LA8FTA	45,084	240	26	76
*LB5BG	128,140	475	49	166
LB1JG	20,628	136	28	80
*LB8CG	12,166	138	19	58
LB1LG	9,198	124	20	53
*LB5HG	5,440	66	21	43
*LB1KG	5,412	67	20	46
*LB3AG	2,788	28	18	23
*LB8AG	140	8	6	8

Poland

SQ6VIA	74,760	218	57	111
*SO7BIT	160,056	601	42	186
*SP6AO	85,626	226	58	143
*SQ6SGV	58,320	261	44	118
*SQ5TDZ	45,630	172	43	92
*SQ6RKY	19,109	111	35	62
*SO5MAX	10,944	245	8	40
*SO5DA	3,744	54	19	33
*SQ8UPS	3,599	48	20	41
*SO5FF	1,104	26	10	14
*SO5K	525	23	8	17
*SQ4PBE	440	22	5	17
*SQ2SIQ	408	16	6	11
SQ8BRZ	156	14	3	9

Portugal

*CS7AHQ	8,908	73	21	47

Romania

*YO7NSP	36,852	230	40	108
YO8SEP	16,254	157	22	64
*YO8SYS	2,520	40	11	31

Scotland

*MM6PHG	13,530	118	19	63
*MMØTKE	238	10	7	10

Serbia

YU2DBZ	184,496	499	51	157
YU1USA	150,290	423	59	167
*YT5IVN	327,137	873	60	217
*YT9ØIARU	55,272	315	34	113
(OP:YU3VIP)				
*YU1EXY	20,944	157	20	57
(OP:YU2DOC)				
*YU1SMA	1,904	55	6	28
YU3VIP	1,610	22	16	19
*YU4RIS	108	9	5	7
*YU4MLD	27	8	4	5

Sicily

*IT9GAK	20,900	152	26	69

Slovak Republic

*OM4ASI	3,240	98	7	29
*OM8ADM	1,829	65	4	27

Spain

EA3HSD	17,808	138	28	84
*ED3T	319,770	513	83	240
(OP:EA3HSO)				
*EA5IJG	107,156	429	38	134
*EA4GSL	25,380	181	25	69

Sweden

*SL7ZAY	73,080	205	49	96
*SF6C	19,584	135	28	68

Switzerland

*HB9FSE	2,842	32	21	28
*HB9FUH	780	32	8	22

Ukraine

UR3AFS	67,860	297	39	156
UT4UFZ	58,506	244	40	107
*UR3RAA	9,150	143	10	40
*UR3QTN	2,368	56	8	24
*US5WFV	2,244	50	12	22

Australia

*VK2FCOR	70,490	268	39	56
*VK3HXT	6,844	45	21	38

East Malaysia

*9W6IVY	14,427	93	21	42

Indonesia

YD9SBP	11,914	110	20	26
*YG3CYU	5,980	53	20	32
*YG3CYT	5,900	54	20	30
*YG3CYS	5,760	50	20	28
*YC7BHK	3,784	33	18	25
*YD1DMK	3,360	54	17	18
*YD6BTI	2,320	49	9	20
*YD1EAV	1,430	32	11	11
*YDØRJQ	120	8	4	6
*YD8VHS	96	10	4	4

Brazil

*PU8TAS	65,688	291	25	77
*PU5RHT	12,040	88	18	38
*PU4ABA	11,704	149	16	40
*PT9JFM	1,080	32	12	15

Venezuela

*YY1YLY	692,886	2375	23	79
*YY5GJC	5,035	40	22	31

Classic
United States
District 1

NN1N	1,729,920	1331	122	358
W1WEF	1,424,280	1272	100	315
W1GXZ	134,064	283	43	125
W1NSK	40,252	133	34	82
KB1GKN	7,700	56	13	37
*K1BX	1,538,685	1189	103	362
*K1HT	738,360	717	93	267
*K1IX	315,268	432	70	199
*W1CCE	244,296	371	70	191
*N1DC	231,280	378	64	172
*W1JQ	213,248	351	54	170
*WC4E/1	200,999	327	64	175
*K1VSJ	168,670	302	45	157
*KG1V	143,090	276	55	150
*K1LOG	44,296	139	29	84
*NM1G	37,288	170	19	60
*NQ1C	24,099	113	23	64
*KA2DTH/1	4,698	40	22	32

District 2

W1WV/2	460,970	526	78	232
WB2KLD	250,472	377	65	174
KW2J	179,154	312	60	162
WB2WGH	82,050	203	38	112
N2JJ	59,670	161	38	97
N2AMW	4,840	47	7	33
KA2BXH	1,525	22	8	17
*WA2TYK	67,734	163	50	109
*KD2BXD	30,392	98	29	87
*KC2OSR	19,789	104	22	55
*W2VU	18,146	84	22	64
*AD2EE	17,451	110	14	49
*KX1W/2	14,418	91	30	51
*KC2ASA	11,524	61	22	45
*N2VIG	10,200	73	14	46
*AG2AA	294	11	4	10

District 3

AA1K/3	2,653,530	1704	124	437
K3CCR	652,979	695	79	270
			(OP:N3UM)	
N3XF	162,604	285	66	146
KA3YNV	59,640	176	36	104
KC3II	56,672	181	25	87
W2CDO/3	16,268	79	27	56
*NA1DX/3	367,319	493	80	209
*N3OJL	307,664	423	67	201
*KB3LIX	174,264	293	48	164
*W3IUU	143,871	253	66	155
*K3MSB	96,250	320	24	86
*K3NDM	90,768	203	51	135
*W3BC	88,920	199	49	131
*N3MWQ	66,766	200	33	100
*WA3AAN	58,725	167	36	99
*K3JD	47,838	136	39	95
*KK6L/3	39,904	138	36	80
*W3GY	31,941	121	40	77
N3UR	16,464	112	10	46
*KC3CIP	15,824	75	31	55
*KB3RKM	14,744	77	23	53
*WW3N	8,619	62	11	40
*N3TWM	6,480	48	19	35
*KB3GJT	1,870	23	13	21
*N3VKK	660	15	9	11
WB3LGC	6	1	1	1

District 4

W4GE	877,734	789	91	312
W4KW	804,841	788	96	293
KA8Q/4	734,040	716	78	282
W4QK	418,728	518	73	219
N4GU	199,184	340	55	156
K4CEB	186,866	309	65	168
WB5WAJ/4	178,760	327	57	148
W3SA/4	175,189	323	52	151
AE4VJ	107,350	207	47	143
N4LZ	104,940	238	43	116
N4CU	69,300	174	44	110
K4UN	62,986	166	53	101
K4BAI	8,272	71	21	26
*KK4RV	347,706	486	64	210
*KC4TEO	293,625	429	60	201
*KV4KY	137,104	251	54	155
*AI4GR	135,200	249	62	146
*K4DMH	119,972	274	55	123
*KR4M	102,935	220	48	125
*N4GBK	94,570	187	57	136
*W4PFM	82,665	199	49	116
*K4ML	52,452	158	32	92
*KM4HRG	50,740	159	26	92
*W4DHT	50,416	141	42	95
*KD9LA/4	41,309	151	28	73
*KE4VH	37,752	134	40	92
*K4WQ	33,428	108	42	80
*W4AFB	30,480	101	40	80
*WX4TV	29,304	118	35	76
*W4FRA	26,208	103	30	66
*NY4D	23,108	86	40	69
*NC4MI	18,952	90	38	65
*WU2T/4	18,720	97	22	58
*N8SK/4	16,320	82	26	59
*K9HVW/4	14,400	89	23	49
*NØKOE/4	13,040	89	20	60
*KI4NVK	11,169	56	23	50
*KS3K/4	7,748	59	16	36
WN4AFP	7,626	53	21	41
WB3D/4	6,624	58	14	32
*WA4JA	4,095	43	13	26
*AK4RO	3,738	38	13	29
*KK4CCH	3,344	36	14	30
*N4DCT	1,947	33	10	23
*N4ARO	1,242	19	11	16
*KJ4CEG	840	18	10	14
KU4QO	45	3	2	3
*AI4UN	24	2	2	2

District 5

N5RZ	958,176	849	117	315
WG5H	327,700	551	67	159
K5YM	95,744	206	52	124
W5CO	80,028	187	53	109
N5GI	36,888	128	41	75
WV5Y	30,690	125	40	70
*NW5Q	122,672	258	55	121
*KC5QIH	55,772	155	49	97
*K1JHS/5	39,894	133	43	79
*KF5SLK	39,176	134	38	80
*K5OLV	35,880	118	46	84
*KF5CYZ	32,851	133	25	66
*NT5TM	12,648	81	19	43
*K5KLA	11,682	65	18	48
*AA5WZ	10,919	73	23	38
*AF5JG	10,620	77	24	36
*WA5DSS	7,437	54	28	39
*KB6OJE/5	1,820	27	16	19
*K5IX	1,677	24	17	22
*K5UNX	1,125	23	13	12

District 6

NN6DX	522,460	645	90	212
			(OP:W1PR)	
WØYK/6	407,296	723	96	160
K6SCA	382,382	531	91	195
WW6O	189,818	340	70	144
K6YK	175,890	332	65	130
WA6URY	93,480	235	65	87
WA6MRK	51,205	153	54	79
NBØO/6	8,357	53	25	36
W6RKC	3,924	44	14	22
W6NS	3,640	36	17	18
WA6ERA	2,898	29	16	26
*N6PZK	101,270	227	75	130
*KE6WC	43,121	148	46	61
*K6CSL	25,542	110	45	54
*N6BHX	25,330	113	38	47
*K6PVA	20,181	95	35	58
*KB6A	16,776	102	30	42
*N6ENO	16,728	91	35	47
*KA9A/6	15,050	87	30	40
*KJ6PTX	13,328	78	27	41
*AG6GL	12,692	72	32	44
*KJ6TTR	8,909	63	28	31
*KB6VME	6,972	60	21	21
*AF6VT	4,108	39	26	26
*AE6YB	3,052	42	10	18

District 7

K9JF/7	1,060,618	1092	110	251
KE2VB/7	955,080	938	107	272
NX1P/7	886,800	1182	106	194
N7RVD	330,966	584	79	148
NK7L	314,826	452	85	189
AK7AT	208,926	352	72	147
N7XCZ	172,353	299	75	144
W6ZQ/7	105,450	226	70	115
NE7D	49,385	155	38	81
W7MCM	41,375	126	47	78
KØJJL/7	40,500	148	50	85
W7ON	33,282	147	23	63
W7ZZ	3,663	44	11	22
N7LR	620	13	11	9
*N7VZU	257,094	397	69	174
*N7MZW	153,408	312	68	120
*W8BFX/7	150,282	270	73	125
*K3WYC/7	80,768	244	42	86
*K7RBT	46,215	154	43	74
*N7XY	37,147	122	50	71
*W7ZI	34,000	110	50	75
*N6LB/7	19,906	117	24	50
*W7FYW	18,816	87	26	58
*KI6LTC/7	17,850	85	34	51
*KE7DZ	13,158	72	37	49
*K7KU	7,400	59	16	34
			(OP:KØKR)	
*K7GZP	4,914	49	19	23
*WA7CC	368	10	9	7

District 8

N8II	1,609,685	1391	95	312
K8NWD	558,424	616	89	243
N8BJQ	304,090	468	64	171
W8MSP	184,124	328	69	172
KC8QDQ	169,274	311	60	154
KC8YVP	70,056	182	43	96
KD8IIN	25,300	100	37	73
W8DPK	10,816	62	21	43
*N8SBE	170,362	314	59	147
*W8TM	164,430	289	45	158
*NE8O	150,144	297	47	137
*N8PPF	119,002	243	61	138
*N8JE	70,873	159	63	124
*WA8LE	56,040	169	32	88
*K7DR/8	53,907	176	36	83
*WA8YVF	46,008	151	29	79
*N8DRG	31,824	109	39	78
*W8PEN	22,413	96	28	65
*K8WAY	17,775	95	23	52
*WA8AXF	13,040	68	31	49
*N8FYL	7,540	53	26	32
*NR8U	3,648	36	15	33
*KC8WGA	3,053	30	17	26
*W8UMH	1,740	25	9	20
*WE8UPJ	1,274	19	11	15
*KD8RJT	532	11	9	10
*KC8NLP	425	13	10	7
*KC8EVS	342	13	10	9

District 9

W9GT	1,003,392	968	94	290
AC9KW	510,984	662	67	215
W9GL	190,238	460	34	112
KJ9C	163,400	319	56	144
KC9WAV	115,230	357	26	89
K9IDQ	25,949	133	21	56
KJ9P	9,240	53	29	48
*WD9CIR	260,150	406	63	179
*NG9M	102,304	211	54	130
*NJ9R	101,035	231	50	117
*NJ9U	41,448	139	47	85
*KD9BNP	36,792	124	40	86
*KG9HG	34,452	112	38	78
*KC9VYX	23,842	111	24	67
*KE5RHE/9	5,900	43	22	37
*KC9DOA	3,168	36	19	25
*KB9O	2,484	26	16	20

District Ø

NEØU	750,666	777	97	269
WØOVM	504,450	632	72	223
WBØQLU	207,126	349	53	169
NUØC	123,892	250	67	121
K9DU/Ø	23,622	101	28	65
WØRU	10,032	61	29	37
KV6O/Ø	5,635	40	15	34
*WØYJT	279,876	446	66	183
*NØECK	189,738	296	81	168
*WØZF	107,730	236	55	116
*KDØOYC	81,776	211	52	100
*KBØPPA	66,462	167	58	101
*ADØJA	66,150	197	47	100
*NØAB	45,960	165	36	84
*KA8HDE/Ø	41,720	116	52	88
*AAØA	37,884	114	39	84
*KBØJIT	34,542	124	41	73
*KØCS	15,352	102	24	52
*KØPFZ	9,782	61	26	41
*NØBAK	8,128	54	26	38
*KJØP	2,212	33	12	16
*WB9QAF/Ø	1,260	27	15	20
*KDØPNH	861	16	7	14
*N8TUT/Ø	90	22	8	7
*KDØGJD	49	4	3	4

Barbados

*8P6ET	154,077	736	21	66

Belize

*V3A	1,918,290	2602	89	241
			(OP:V31MA)	

Canada

VE2EBK	553,080	612	80	250
VA3TIC	392,882	590	67	199
VE7BC	338,184	589	83	148
VA3XH	295,545	389	80	205
VE3GYL	184,552	392	52	132
VE6IVN	124,488	277	59	123
VA3FP	57,024	204	24	75
VE4AKF	7,661	75	18	29
VE3UZ	5,265	53	11	28
*VE3DZ	3,526,202	2181	135	479
*VA7CRZ	632,502	849	98	208
*VE3RX	230,912	343	75	181
*VA2ES	213,807	390	51	158
			(OP:VE2AXO)	
*VE1SQ	94,164	314	23	91
*VE3XQ	22,873	116	25	64
*VA2SCH	18,690	121	19	51
*VA7BWG	17,822	109	33	34
			(OP:VE7GM)	
*VE3DVY	12,928	74	20	44
*VE3SB	8,178	56	22	36
*VE3EP	6,313	47	22	37
*VE3EDY	4,522	149	6	11
*VA7QD	4,260	46	28	32

Cuba

*CO8DM	233,244	498	60	149
*CO6LE	154,560	669	27	78

Mexico

XE1H	46,764	600	16	20

Puerto Rico

KP3BR	12,600	96	13	43
*WP3EF	184,208	298	74	158
*NP3OT	15,423	149	26	27
KP4LE	4,715	46	18	23

Sint Maarten

*PJ7PL	297,704	1103	39	97
			(OP:WA1ZAM)	

Benin

*TY4AB	925,344	1293	64	188

Canary Islands

*EF8O	530,622	745	61	185
			(OP:DJ1OJ)	

Madagascar

*5R8SV	464,641	721	54	175

South Africa

*ZS1BHJ	38,376	116	37	86

Afghanistan

*T6TM	103,952	300	45	101

Asiatic Russia

R9AE	981,460	1264	79	231
R8WF	99,424	376	23	81
RW9CD	84,159	396	14	67
RD9SA	12,204	98	11	43
*RT9TM	223,317	351	53	190
*UA9R	216,550	690	28	94
*UA9NP	195,940	389	51	143
*R9QQ	187,434	391	41	137
*R9RA	80,288	309	25	79
*RAØWHE	70,000	217	32	93
*RA9AEA	62,756	209	29	87
*UA9SMU	26,908	162	13	49
*R9AAL	24,253	135	19	60
*RD9D	22,806	92	43	83

Asiatic Turkey

TC4A	38,250	169	20	70
			(OP:TA4CS)	
TA7AO	902	28	10	12
*TA2EJ	130,500	316	42	132
*TA2AET	11,656	99	19	43
*TA5ISJ	10,670	69	13	42
*TA8A	408	10	7	10

China

*BG8IL	75,472	297	28	78
*BG6AHD	43,050	211	23	59

Georgia

4LØA	5,500,828	3819	109	405
			(OP:4L4WW)	

Hong Kong

VR2XMC	21,420	116	32	58

India

VU2CVS	81,838	225	53	113
VU2TO	28,203	122	47	72
VU2JOS	24,905	134	25	60
VU2BL	10,368	96	13	41
*VU3TYG	104,319	257	56	117
*VU2GRM	53,907	175	46	105
*VU2KWJ	33,496	138	29	77
*VU2NSL	5,460	46	21	31
*VU2IBI	3,772	48	17	29
*VU3LMS	1,092	25	10	16
*VU2YE	84	14	6	8

Isreal

*4Z5MY	3,535	39	9	26

Japan
District 1

JE1LFX	1,040,706	1279	105	201
JI1LET	616,926	988	76	153
JH1QDB	432,135	543	92	205
JA1GVM	188,936	331	80	146
JH1CTV	80,592	251	56	90
JA1NFD	65,856	272	29	67
JM1NZJ	33,390	142	41	49
*JG1OWV	244,068	364	101	157
*JF1WNT	108,750	243	71	103
*JJ1KZZ	108,720	236	64	116
*JA1CRJ	101,569	227	59	110
*JF1MQS	97,300	274	46	93
*JA1GFB	69,525	203	53	82
*JH1GLJ	16,820	119	21	37
*JG1SWV	13,651	69	32	41
*JK1EXF	8,060	53	26	36
*JH1RDU	7,425	69	20	25
*7J1ABD	6,235	51	20	23
*JH1OIB	5,904	70	17	24
*JE1SPY	1,900	34	13	12
*JH1HHP	361	15	9	10
*7L1AFS	130	5	5	5

District 2

JA2JWH	167,660	343	74	128
JE2BOM	31,680	149	26	54
*JR2FJC	46,208	165	51	77
*JA2KKA	10,450	82	21	34
*JO2XYK	1,863	31	11	12
*JR2AAN/2	1,647	27	12	15
*JL2OGZ/2	264	11	3	5

District 3

JA3QOS	657,287	817	95	212
JR3BOT	299,592	521	74	145
JR3RIU	204,876	410	61	128
*JJ3TBB/3	32,870	147	37	58
*JR3JRI	5,304	52	31	37
*JA3HKR	2,730	30	16	19
*JG3SVP	1,946	55	7	7
*JR3NDM	780	15	9	11
*JG3EHD	90	5	2	4

District 4

JA4DPL	203,832	436	54	117
*JA4TUJ	140	6	6	4

District 5

JE5JHZ	32,340	144	32	45
JJ5GSY	544	15	8	8

Oops...

Similar callsigns can get one's fingers confused, and resulted in an unintentional "mix & match" in February's "Zero Bias" editorial. Just to be clear, *CQ* Contesting Editor David Siddall's call is K3ZJ; CQ World Wide DX Contest Director Randy Thompson's call is K5ZD. (Tnx N6XI for the catch)

Looking Ahead in CQ

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

- CW Results, 2015 CQ World Wide DX Contest
- W7DXX Remote: 15 Years and Counting
- Radio Manuals on Your iPhone

Upcoming Special Issues

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

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

District 6

*JH6FTJ	138,782	322	49	112
*JK6CSW	10,248	74	23	38
*JA6EMA	4,773	45	17	26

District 7

JA7QVI	640,770	1467	39	120
JG7AMD	217,638	407	74	140
JA7VEI	199,728	350	75	144
*JA7HYS	201,711	343	71	142
*JI7EMD	14,260	98	18	44

District 8

*JA8JTZ	1,860	24	11	19

District 9

*JA9LX	4,324	44	19	27
*JA9EJG	391	9	8	9

Kazakhstan

UN5J	24	2	2	2
*UP2F	2,470	33	6	20
			(OP:UN8FM)	

Laos

XW1IC	1,269,544	1829	80	216
			(OP:E21EIC)	

Macao

*XX9LQ	10,251	105	27	40

Thailand

HSØZCW	672,192	1023	91	197
HS7BHK	152,100	396	60	135
*E2ØQVD	95,570	215	68	122

United Arab Emirates

A65BP	2,882,180	2180	117	373

Vietnam

*XV4Y	48,246	178	49	80

Aland Islands

OHØV	3,050,431	2668	144	445
			(OP:OH6LI)	
*OHØBR	59,040	502	17	73
			(OP:OH2BR)	

Austria

*OE6Z	2,402,244	2204	119	403
			(OP:OE6MBG)	
*OE4WWL	56,722	208	48	110
			(OP:OE1WWL)	
*OE6RAD	2,730	32	15	20
*OE3MCS	2,223	36	14	25

Belarus

EW2A	552,780	1413	37	143
EW8OP	165,726	1257	22	77
EW8Y	163,464	1463	18	80
EW8GL	30,250	128	38	72
EW8W	8,684	158	11	41
*EW8R	443,856	880	81	255
*EW2BO	118,984	387	30	109
*EU1DX	41,138	139	47	87

Belgium

ON5GQ	500,448	661	96	305
*OQ4B	51,948	209	29	79
			(OP:ON4BHQ)	
*ON5GF	14,250	187	10	47

Bosnia-Herzegovina

*E74KM	17,290	199	12	58

Bulgaria

*LZ5IL	27,084	126	32	90

Croatia

*9A9J	620,114	935	89	308
			(OP:9A7ZZ)	
*9A8FCC	172,800	448	63	162
*9A5ST	30,494	283	15	64
*9A5BAA	20,570	124	35	75
*9A6TAQ	20,430	111	28	62

Czech Republic

*OK7PY	14,495	153	16	49
*OK1TA	649,020	836	107	328
*OK2BEN	316,128	637	72	224
*OK1PMA	148,894	434	56	162
*OK1ULL	30,847	208	25	84
*OK2TC	18,297	130	33	74
*OK1FHI	15,480	102	22	50

Denmark

OZ7EA	83,616	290	48	153

England

G5W	2,456,904	2306	111	390
			(OP:5B4WN)	
G4DBL	404,460	680	78	243
G3VGZ	199,689	496	54	205
G5E	188,935	586	34	111
			(OP:G3RAU)	
G3SVD	115,080	437	32	105
G1SCT	83,284	287	48	140
G4HYG	76,540	350	38	134
G4OCO	68,224	438	22	82
G4DBW	36,632	463	13	63
MØRBE	32,205	147	35	78
G8JVV	11,625	141	17	58
*G8AFN	149,526	396	48	165
*G4DDL	121,954	395	45	172
*M5T	118,560	710	27	87
			(OP:G7SKR)	
*G8ZRE	91,492	418	36	142
*G4DDX	82,368	299	46	146
*MØAUG	80,755	348	40	115
*G3PRI	56,916	295	32	121
*MØRNW	46,717	232	34	103
*G1EIX	45,024	238	37	97
*MØTQR	35,581	164	33	86
MØKWK	35,574	205	33	114
*GØWAT	34,036	193	33	94
*G3YRZ	31,980	275	17	61
*G7UGC	31,500	228	19	56
*GØIZM	27,240	180	26	94
*G4OTU	25,040	179	20	60
*GØWWD	13,662	120	28	71
*G8GHD	10,212	100	15	31
*MØPKZ	4,602	61	16	43
*GØFPU	1,430	23	10	16
M6Z	8	3	1	3
			(OP:MØSTY)	

Estonia

*ES5RIM	15,810	193	14	48

District 1

RW1CW	941,160	1010	118	388
RU1AB	593,169	735	112	335
RA1AL	541,488	1012	85	263
R1MA	45,570	183	38	109
*UA1CUR	315,976	695	72	239
*U1BA	76,825	277	46	129
*UA1NFA	71,100	309	35	123
*UA1ZIK	24,860	102	40	73

District 3

UA3VFS	986,990	1426	94	364
RT5K	775,560	2206	38	146
R3KM	316,827	1227	30	111
R3ZV	190,721	497	71	198
R3GZ	141,904	422	58	123
RA3THN	11,151	67	24	39
*UA3BL	634,513	1027	96	311
*RA3RLJ	287,040	702	61	199
*UA3IVF	51,895	274	27	70
*RA3RA	30,084	163	25	67
*RD3FV	15,486	178	15	43
*RA3DGH	13,091	186	10	43
*R2SA	10,920	148	13	47
*R2RAU	4,602	65	17	42
R2WW	1,020	29	8	26

District 4

*RU4AA	476,076	776	88	300
*R4IB	190,816	516	72	196
*RK4FAO	164,388	539	49	179
*RW4HZ	105,565	258	57	158
*R4CO	99,910	313	50	144
*RQ4C	57,466	397	27	91
*RN4ACX	20,904	184	16	51
*RU4PAA	12,012	84	29	62
*R4SAJ	7,865	106	12	43
*RA4L	117	10	3	10

Finland

OG7O	1,214,640	1573	118	386
			(OP:OH1VR)	
OH1B	59,070	202	42	123
			(OP:OH1BOI)	
OG3I	35,148	238	18	69
			(OP:OH9MM)	
OG7M	26,035	109	36	91
OH3BCX	21,316	175	15	58
			(OP:OH1ZAA)	
OH5ZA	7,540	113	11	41
			(OP:OH1ZAA)	
*OH1RX	233,840	503	74	242
*OH5TS	102,934	269	64	150
*OG3P	92,169	327	60	149
			(OP:OH3P)	
*OH2HZ	60,390	399	27	95
*OH2LU	54,812	230	38	104
*OH3WR	40,293	206	22	77
*OH1LAR	38,760	210	49	121
*OH2JLN	2,622	57	10	36
*OH9GIT	320	12	9	11
*OH7EML	136	10	7	10

France

F4FET	282,336	1029	34	102
F1MLN	120,228	325	56	116
F5VIF	8,385	75	13	30
*F4ETG	244,184	583	61	172
*F5RVO	27,000	152	19	56
*F4GFT	3,672	52	15	39
*F4FLO	1,216	20	14	18
F4GLD	190	26	6	13

Germany

DL1WA	1,894,844	1916	107	411
DL5DTG	579,514	823	92	311
DL4WA	541,660	801	90	275
DK7VW	189,800	447	67	193
DJ6TF	187,693	686	31	120
DL4ABR	80,106	313	43	126
DK8EY	52,668	214	35	98
DC1JAG	36,448	159	39	97
DK1FW	17,568	198	15	57
DLØESA	15,745	116	17	50
			(OP:EA1HEO)	
DL2YCD	650	18	10	15
*DK1KC	493,768	839	79	283
*DL1MHJ	406,700	673	80	252
*DL1ATZ	365,712	640	73	231
*DL1MAJ	356,022	536	90	252
*DG8OBN	237,832	612	58	216
*DL3SKY	199,804	537	54	185
*DF5BM	178,245	499	53	180
*DK2WU	137,904	364	57	151
*DO1KRT	121,396	430	41	137
*DF6RI	103,776	329	50	138
*DL2AMT	93,812	358	40	148
*DH9DX/P	70,000	250	44	131
*DO9SR	64,500	288	35	90
*DG1EKL	60,590	290	35	131
*DJ6HR	57,681	246	37	116
*DO3PKE	44,034	239	34	89
*DK6SP	36,918	195	31	95
*DL4JWU	31,590	206	31	104
*DF1JC	28,080	163	18	54
*DL1RPR	27,474	158	37	77
*DL1IF	25,038	120	30	87
*DL7FUA	24,000	147	33	87
*DP4M	23,298	185	18	48
			(OP:DJ4MH)	
*DC1LEX	22,922	143	27	46
DL/SP2UUU	21,112	196	28	88
*DL2RZG	17,745	120	19	46
*DL2AL	16,443	89	31	56
*DK8HE	14,700	100	27	73
*DH5WB	12,096	103	17	37
DO7PRM	5,891	75	12	31
*DG5YHK	5,220	54	23	35
*DJ6DP	2,769	35	16	23
*DC1DB	2,128	40	12	26
*DO3NO	1,484	31	11	17
*DC4LW	891	23	10	17
*DK9OS	837	27	9	22

Greece

*SV1KYC	95,485	345	39	130
*SV8DTD	74,120	284	32	77
*SV7CUD	21,691	114	37	72

Guernsey

*MUØFAL	164,376	455	49	167

Hungary

HG3R	2,883,540	2733	119	395
HA5UA	50,025	221	39	76
*HA5BI	13,860	203	9	51
*HA7AVU	12,320	206	9	47
HA1TI	2,883	99	5	26

Iceland

TF4X	1,874,026	1979	103	370
			(OP:N5ZO)	
*TF3EK	476	23	9	19

Ireland

EI9CN	252,705	508	58	197
*EI4GNB	458,328	869	67	272
*EI3CTB	149,632	457	49	175

Italy

IK7HTB	641,072	971	84	305
IZ6ERS	611,876	1177	87	301
IØLYO	517,024	754	91	337
IK7NXU	293,700	482	75	225
IK3SSW	232,670	532	61	204
IZ8LMA	231,246	425	65	196
IW2CTQ	152,558	468	54	184
IR2L	137,588	607	29	77
			(OP:IW2LLH)	
I1DXD	51,408	175	45	123
IZ5MOQ	40,960	494	16	64
IK8JDH	39,456	184	37	100
IZ1YCG	28,625	166	31	94
IW3FVZ	27,417	151	35	76
IX1CVF	20,640	163	27	93
IK2YYL	5,742	57	18	40
IZ3WFD	2,501	30	17	24
IU8FRF	1,305	19	12	17
IZ1ANK	245,572	530	72	220
*I5DOF	182,522	481	59	204
*IK4BEI	167,466	444	56	170
*IV3ONZ	126,477	429	46	161
*IZ2SXZ	87,360	283	47	109
*IZ2YAF	84,534	306	47	146
*IV3ARJ	80,755	252	47	108
*IW2EVH	73,630	261	51	134
IK3XTY	61,344	289	36	106
*IX1CLD	59,488	243	44	132
IN3UFW	55,632	293	35	117
*IZ5UGE	53,375	241	36	89
*IK2OFS	48,822	198	39	64
*IZ7DOK	46,276	271	24	68
*IU4FIT	42,768	188	43	119
*IØZUT	37,873	167	38	83
*IK2YSJ	33,565	191	35	102
IWØQO	32,750	164	41	90
*IN3ADW	32,032	221	30	82
*IN3JRZ	30,720	227	28	92
*IZØFKE	29,094	170	22	56
*IZØRJR	27,336	158	39	95
*IZ1JOB	22,563	160	27	82
*IV3NVB	22,144	106	40	88
*IZ8YAA	17,622	162	21	68
*IZ1HBC	16,116	111	24	55
*IK2REA	14,616	104	25	62
*IU3BRB	8,600	87	28	58
IZ1DBY	8,360	53	26	50
*IW5EHL	6,840	71	21	51
*I5YKQ	5,220	59	20	40
*IK3MLF	5,145	43	20	29
*IZ2EEV	4,760	79	9	31
*IK5YJK	4,704	54	18	30
*IN3RWF	4,060	60	17	53
*IK6IOQ	4,047	64	16	41
*I3LGP	3,600	54	11	34
*IW5ELA	2,574	23	17	22
*IK1NPE	2,322	46	11	32
*IW3GNS	1,968	40	16	32
*IZ8GEX	1,786	29	15	23
*IZ1RHY	1,380	22	12	11
*IW1BNZ	888	19	11	13
*IK1ZNU	726	38	3	19
*IZ1DLY	378	14	7	11
*IU1FID	255	13	6	11
*IW4ECF	128	12	5	11
*IZ8IBC	96	4	4	4
*IK8VVU	2	1	1	1

Latvia

YL6W	1,194,579	1540	106	295
			(OP:YL2GD)	
YL2CI	309,078	1310	35	119
YL2UI	38,016	201	21	75
*YL2II	5,304	79	18	50

Lithuania

LY4T	970,426	1314	100	367
LY4OO	416,625	835	78	225
*LY6A	814,618	1085	100	334
*LY1K	26,660	210	22	102
*LY2ND	18,830	189	19	51
*LY3IV	15,392	169	18	56

Luxembourg

*LX1IQ	59,985	206	51	104

Macedonia

*Z35F	104,640	639	28	81

Moldova

*ER4LX	124,803	490	32	115

Netherlands

PAØJNH	219,328	397	75	223
*PA3BUD	361,760	689	73	250
*PA3DBS	211,904	550	56	168
*PG1R	122,811	424	43	158
*PG2P	75,740	300	36	104
*PBØACU	44,407	204	33	88
*PD1TV	18,012	119	23	56

Northern Ireland

*GI7AXB	301,586	761	59	143
*MIØRRE	147,407	392	52	169
*MIØULK	26,578	208	26	71

Norway

LA5PRA	28,024	116	48	76

LA5YJ	**12,393**	**244**	**6**	**45**
***LA8OKA**	**110,448**	**408**	**46**	**162**
*LA7TN	65,912	374	32	122
*LA6PBA	35,712	187	38	90
*LA1HL	26,532	148	29	105
*LA7DOA	6,612	86	12	45
LA5ZTA	1,276	42	6	23

Poland

SP9LJD	**2,527,448**	**2403**	**116**	**368**
SP6IEQ	476,748	702	86	256
SQ5Q	192,276	590	64	154
3Z6O	135,401	422	47	156
SP3CMX	53,550	156	58	95
SP5ICS	29,000	118	38	78
SP8ICV	25,992	195	19	53
SP1O	198	6	5	6
***SQ6H**	**686,700**	**1402**	**76**	**251**
			(OP:SQ6PLH)	
*SP1DSZ	624,110	722	95	354
*SP1RKR	281,496	603	69	248
*SP3POW	173,475	424	71	186
*SQ3SWD	142,952	445	51	163
*SP4SHW	132,408	485	46	170
*SP7WJ	128,700	271	76	158
*SQ3MZM	115,680	441	43	117
*SP5DRE	115,635	350	53	142
*SP1DMD	76,895	254	53	116
SQ5NBE	57,942	507	18	69
*SP7VTQ	45,784	198	27	70
*SP9PBH	38,924	163	48	100
			(OP:SP9MRR)	
*SQ8MXK	32,265	188	35	100
*SP2GCE	20,079	138	18	51
*SQ3LMK	9,900	98	23	52
*SQ1SNN	8,960	110	14	26
*SQ7BTY	8,466	99	18	33
*SP5JTW	5,936	100	9	44
*SP8AB	3,441	55	11	26
*SP2UU	2,491	41	18	35
*SP9IVQ	2,436	55	14	28
SP5NZZ	2,220	22	19	18
*SQ7SAX	1,287	45	11	28
SQ9JXH	550	33	5	17

Portugal

CT1IW	**30,016**	**120**	**46**	**88**
***CR5M**	**99,552**	**438**	**26**	**96**
			(OP:CT1HSN)	
*CT7AIX	37,260	208	19	62

Romania

*YO3JW	10,614	125	17	41
***YO4RST**	**195,804**	**434**	**65**	**187**
*YO7CVL	96,832	286	54	124
*YO9BXE	54,810	176	49	125
*YO8DHA	53,244	297	24	63
*YO2LDU	35,217	233	27	90
*YO8CRU	34,133	191	28	79
*YO8BGE	22,842	229	16	65
*YO8RKP	19,182	159	39	100
*YO4GPC	16,920	136	24	70
*YO7LPZ	15,486	162	21	68
*YO7MPI	13,289	103	35	62
*YO4BEX	12,702	144	16	57
*YO8RZJ	12,528	237	8	46
*YO9IPF	10,203	139	10	47
*YO4AJ	8,964	132	11	43
*YO9HG	8,007	109	11	40
*YO7YO	1,881	29	14	19

Sardinia

***ISØDCR**	**183,120**	**495**	**59**	**181**

Scotland

GM2V	**2,450,760**	**2348**	**115**	**405**
			(OP:GM3WOJ)	
MM3T	479,562	1160	66	245
			(OP:GMØELP)	
MM2R	69,350	419	23	72
			(OP:GM3YOR)	
***MMØHNR**	**29,070**	**236**	**22**	**73**

Serbia

***YU1JW**	**121,758**	**345**	**58**	**165**
*YT7DB	16,064	212	11	53

Shetland Islands

GZ5Y	**547,434**	**1107**	**66**	**240**

Sicily

IT9BII	**22,425**	**142**	**31**	**84**
***IT9EWR**	**199,320**	**725**	**33**	**99**
*IR9Z	64,068	743	15	61
			(OP:IT9VCE)	
*IT9PZM	53,544	417	21	76
*IT9NAN	44,080	260	22	73
*IT9AZK	38,690	201	38	108
*IT9BDR	10,472	94	21	47
*IT9IMF	1,798	41	23	35

Slovak Republic

OM4KK	**519,936**	**820**	**90**	**294**
OM4M	35,309	492	12	55
			(OP:OM4KK)	
***OM7SR**	**10,092**	**112**	**24**	**63**

Slovenia

S53F	**935,132**	**1694**	**90**	**311**
S57C	375,936	703	62	202
S59AA	216,315	383	76	209
***S56WYB**	**222,396**	**523**	**64**	**194**
*S51AC	179,935	585	64	201
*S56AX	147,552	412	55	177
*S5ØBH	104,832	416	40	152
*S53NW	97,152	404	42	142
*S53Q	67,304	604	19	75
			(OP:S5ØX)	
*S57PKT	46,228	306	24	67
*S52WW	7,598	99	13	45

Spain

EA5DFV	**2,255,850**	**2768**	**102**	**303**
EA4TD	291,224	1608	30	88
EA7KB	28,478	300	11	47
EA3MR	3,430	92	9	26
***EA7YV**	**313,344**	**716**	**71**	**217**
*EA2DNR	223,914	1183	31	103
*EA3LA	218,940	924	31	92
*EB3WH	152,150	425	48	131
*EA4DXP	135,473	326	57	164
*EE2A	126,046	363	49	165
			(OP:EA2SN)	
*EA2KV	79,200	500	24	86
*EA3KT	77,840	409	23	89
*EA4CFY	62,678	322	28	126
*EA2GM	58,384	274	30	52
*EA3DNC	53,664	266	38	134
*EA1DHB	19,668	261	11	55
*EA4FET	18,746	144	29	74
EA4CU	13,124	89	24	44
*EA7JMO	9,401	75	23	56
*EA2DDE	4,674	38	23	34
*EA3EYO	2,009	35	14	27
*EA5IMM	1,599	29	12	27
*EA4CRP	1,372	24	10	18
*EE4EA	1,134	32	6	21
			(OP:EA4GHB)	
*EB4ERS	864	26	6	18
*EA1DZL	729	18	10	17
EC4AA	703	31	3	16
*EA1DFP	108	6	3	6

Sweden

SCØN	**647,572**	**983**	**95**	**293**
			(OP:SMØNCS)	
SM5B	148,654	412	59	174
			(OP:SM5EMR)	
SA6BET	104,856	642	31	105
***SM2T**	**643,165**	**990**	**97**	**322**
			(OP:SM2EZT)	
*SF3A	219,978	529	61	181
			(OP:SM3CER)	
*SAØBVA	19,313	175	23	66
*SGØW	18,530	138	29	80
			(OP:SAØCAM)	
*SM7MX	4,312	97	6	38
			(OP:SM5MX)	

Switerland

HB9EFJ	**96,222**	**271**	**55**	**182**
HB9VID	26,860	132	30	55
***HB9AA**	**349,904**	**704**	**73**	**231**
			(OP:HB9ARF)	
*HB9MXY	52,728	200	43	113

Ukraine

UR4EI	**40,602**	**182**	**40**	**94**
***USØHZ**	**786,210**	**1140**	**94**	**344**
*UT8IM	248,746	693	57	220
*UT5PY	145,992	479	55	182
*UT7AT	71,024	278	47	137
*UTØMF	66,933	202	54	147
*UR5UJ	65,772	200	49	125
*UR8UZ	16,416	128	18	54
*UR1YDD	11,024	145	11	42

Wales

GW9X	**1,694,530**	**2205**	**96**	**314**
			(OP:MW1LCR)	
***GW7ERI**	**89,908**	**283**	**43**	**126**
*GWØBBO	51,303	249	36	111
*MW8C	2,310	69	6	27

Australia

VK2TTP	**72,782**	**184**	**56**	**95**
VK6SMK	70,686	271	31	71
VK4CL	28,644	159	25	41
***VK6VAX**	**64,505**	**210**	**40**	**93**
*VK3VTH	21,442	115	24	47
*VK2WFT	11,644	74	33	38

East Malaysia

***9W8DEN**	**44,096**	**255**	**20**	**44**

Fiji

***3D2KM**	**17,794**	**95**	**35**	**47**
			(OP:W6ZL)	

Hawaii

WH7W	**273,288**	**520**	**79**	**114**
KH6QJ	104,804	310	57	76
			(OP:T32AZ)	
***KH6CJJ**	**571,200**	**839**	**91**	**149**
*KH7T	170,784	423	62	82

Indonesia

YB9WZJ	**285,714**	**504**	**75**	**159**
YB3HJM	9,768	68	28	38
YE3AA	945	17	10	11
			(OP:N1IP)	
***YC2MDU**	**136,206**	**330**	**60**	**101**
*YB1TJ	26,030	102	30	65
*YC8VRA	21,798	133	23	40
*YB2CPO	15,708	88	22	44
*YBØIBM	15,470	77	22	48

New Zealand

ZL1WN	**174,475**	**398**	**66**	**109**
ZL1YE	493	16	8	9
***ZL/K7ST**	**23,364**	**97**	**44**	**55**

Philippines

DU1AV	**369,200**	**1062**	**56**	**74**
***4F3FSK**	**21,490**	**137**	**30**	**40**
*DU2BOQ	6,591	63	13	26
*DU9BX	2,187	48	11	16

Samoa

5W1SA	**721,215**	**1575**	**38**	**127**

Argentina

LU5VV	**1,278,175**	**2086**	**60**	**155**
LU7HN	95,195	455	36	43
LU8ADX	25,456	212	12	31
***LU4EG**	**261,716**	**585**	**57**	**125**
*LU2JCW	18,786	72	35	58

Aruba

P49Y	**6,930,818**	**5121**	**111**	**355**
			(OP:AE6Y)	

Bolivia

***CP1FF**	**10,496**	**72**	**33**	**49**

Brazil

PS2T	**2,317,350**	**2305**	**97**	**253**
			(OP:PY2ZEA)	
PY2MC	1,779,080	2009	91	225
PY2MSR	80,216	295	52	96
***PY2VOX**	**225,435**	**684**	**45**	**88**
*PP6ZZ	44,750	156	44	81
*PY2DPM	9,412	89	14	38
*PY3ZZR	6,413	82	22	31

Chile

***CE1UGE**	**385,800**	**710**	**66**	**134**
*CE3SBQ	10,763	118	15	32
*CE3TMM	1,247	53	10	19
*XQ1TUW	800	41	7	9

Colombia

HK4L	**179,444**	**338**	**69**	**157**

Peru

OA4SS	**2,355,792**	**3029**	**88**	**184**

Venezuela

***YY4RDC**	**62,098**	**228**	**29**	**93**
*YY4GOR	112	12	5	9

Check Logs

4Z4DX, 9A4WY, 9M6YBG, AB1J, AI9K, AK2L, BA2BI, BD4FFM, BD6AHP, BD6AHU, BG4FRZ, BH4BUI, BH4SYG, C91EP, CE1CA, CT1EPC, CT3IA, CX4AD, DD4SG, DF7GG, DG3NCZ, DHØJAE, DH3SR, DJ3IW, DJ5MO, DK1TF, DK4MDA, DK5CF, DK7MD, DK7OG, DL1EAL, DL2DXA, DL3KVR, DL3MVC, DL3OC, DL4ME, DL5JMN, DL6ER, DL6GV, DL6UAM, DL7LF, DL7UGO, DL9NO, DU7HF, E72U, EA1AF, EA1AUS, EA1FDI, EA2CW, EA3DU, EA3GCV, EA3NT, EA3WD, EA4AFP, EA5EJ, EA5YI, EA7JW, EA7KP, EA8DO, EC1RS, EC5EA, EC7ABV, ED5T, EI7JK, EI9KC, ER2OW, EU1FQ, EU1KY, EU6RO, EW2DZ, EW4RF, F/E72T, FG4NO, GØOZS, G3UHU, HAØITU, HA1DAE, HA3A, HA3HX, HB9RB, HB9TRR, HGØITU, HK4KM, I3VJW, IK1YDB, IK2FDV, IV3FZN, IV3OKO, IV3ZCS, IZ1HDR, IZ4MJP, IZ8XLP, JAØQNJ, JA1JPM, JA1PCM, JA2KVD, JA5TNF, JF1UOW, JF1UOX, JG1ELE, JK1MZT, JN1VFF, JR1CBC, JS1IFK, JY9FC, K1MC, K1SX, K6III, K7BX, K7LU, KB1HNZ, KD9EIO, KE7XM, KJ6MBW, KV4OS, L47H, LA9FA, LA9FFA, LU1CX, LY2BVB, LY2CO, LY4S, LY7M, LZ1GU, LZ1MS, LZ1QN, LZ1ZU, LZ4TU, LZ5R, LZ5Z, MØLDW, M1MBZ, MW5R, N2CG, N4KXO, N9WL, NP2L, NW3U, OE5FZO, OH2IS, OH3HP, OH4MFA, OK1AVV, OK1KEO, OK1MP, OK1PFM, OK2EQ, OK2PAY, OK2UHP, OK3C, OK6CX, OK7CM, OM7KW, ON4WW, OT4T, OZ4RT, PAØRBO, PA9HR, PC1EMR, PE4A, PH2M, PJ2BVU, PP2RON, PU1KGG, PU8MET, PY3YD, PY4EK, PY5DD, PY5SAT, PY5XH, RØAET, R2LAC, R3AT, R3GM, R4IO, R6FK, R6YY, R7CK, R7FK, R7HF, R7IA, R7LA, R9SA, RA3M, RA3WDK, RA3XDX, RA4DB, RA6YJ, RA9AMO, RA9AU, RA9CMO, RA9CNF, RA9DZ, RD3BZ, RK4HYT, RK9DR, RL3FA, RM5M, RM6AA, RN3FT, RN9T, RO7T, RT7F, RT7N, RT9S, RU3EJ, RU3GF, RU6AV, RV6ASU, RW3DIA, RW3QM, RW4NN, RW4O, RW6AF, RW9AW, RW9MZ, RX3I, RZ1O, RZ3AUL, RZ6DX, RZ6FA, RZ6HX, SA3V, SA5M, SC2M, SF7WT, SMØQ, SO3F, SP2DCT, SP2MHD, SP2MKT, SP2MSF, SP3CFM, SP3DV, SP3J, SP3L, SP3QYQ, SP3UY, SP5DLX, SP5PBE, SP5XSD, SP6P, SP7AWG, SP7CVW, SP7ICE, SP9CVY, SP9CXN, SP9FKQ, SP9GFY, SP9GKJ, SP9LAS, SP9MRK, SP9ODY, SP9TPV, SP9YFF, SQ3TCE, SQ4AVD, SQ6PNP, SQ7OBD, SQ9IWT, SQ9MZ, SQ9ONP, SQ9ZBC, SV1GRB, SV1XV, SV3GKW, SV3QUP, SV4LQW, TY2CD, UAØLBF, UAØWG, UA1AFT, UA1RG, UA3AAJ, UA3EDQ, UA3IFF, UA3S, UA4NCI, UA4SJS, UA6AAK, UA6ACA, UA6F, UA6FF, UA6GG, UA6HI, UA6YI, UA7T, UA9CEP, UA9CNX, UA9JLL, UB3DAO, UDØW, UD4FD, UF1M, UI3A, UN7ECA, URØHQ, UR4LRG, UR5EDX, UR5IFX, UR5QU, US2IW, US4IRT, US7IB, UTØEK, UTØUY, UT2IV, UT6EY, UT7LW, UU4JMN, UW1WU, UW5Q, UX2IB, UX5UN, UY5QQ, VA3OB, VE3JSO, VE3ZN, VK7XX, VU3DMP, W1SFS, W6/UA3TT, W6HYI, W6YA, WA2OMT, WA6HGA, WK2X, WN8QGV, WN8U, XX9TIH, XX9TUD, YB6LD, YCØQR, YL3GDM, YO2AQO, YO2MNZ, YO3DDZ, YO3IPR, YO3JR, YO4FZX, YO5CUQ, YO9DF, YO9IIF, YR5N, YTØA, YU1BAU, YV4MT, YV4NR, YY5AJI

Log Withdrawn: DL2R, Z3B

Disqualified: *4L9QO, BA7QT, E70A, EI9HX, G5RR, H2X, HG3ITU, II0I, IN3EIS, IQ5PO, IZ5WTV, IZ8IFL, J42T, LZ2JE, M1U, NP2P, ON4MW, R3GMT, R7AW, R8LA, R8UT, RK6CC, RW3DU, RW9JZ, RY3D, S52NR, S54I, SO4R, SP5C, SP5DL, SV9RGI, TG9ANF, UT2T, UT7E, UZ4I, YT1S, YV4YC, Z62FB, ZP9MCE*

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Spring 2016

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As of 2/1/16, the IC-7300 has not been approved by the Federal Communications Commission. THis Device may not be sold or leased, or be offered for sale or lease, until approval of the FCC has been obtained.
*Frequency coverage may vary. Refer to owner's manual for exact specifications.

ID-5100A

VHF/UHF Dual Band Transceiver

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