An Amazing Light Show, p. 87

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COMMUNICATIONS & TECHNOLOGY

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On the Cover: Organizers of the 3YØJ mega-DXpedition to Bouvet had big plans. Mother Nature had her own, allowing them only one tent and three multiband vertical antennas. Story on page 8.

steppIR

TESTIMONIAL

LARRY G. PATTEN
K9OQ

I have been using the Steppir 4 element Yagi with the 40/30 loop dipole and 6m passive elements options, for a number of years! What a joy it is to not only run 1:1 SWR on 40 through six meters, but to also to be able to reverse the antenna electrically and create another Yagi at 180 degrees opposite direction – in 2 seconds. The bi-directional mode adds an entirely new experience to my operations. But recently, I found out why having a SteppIR product is so important. My measure of quality customer service is not how the company acts when things are going well – it's how they respond when there are problems. Working with engineering manager Jeff Woehlert N7CID, and CEO John Mertel WA7IR was a pleasure – this team went to great lengths to get me back on the air when I recently had an issue. It was unbelievable to experience such genuine concern from the SteppIR team. At times I thought they were more driven to get me back up and running than I was! Jeff was emailing me constantly. John was always part of the conversation and as a result, my Yagi is now working like a charm! One word of caution I would give, is don't try a shortcut solutions with others, if you are having any issues with your product – go directly to SteppIR for your support and they will take care of you like they did me. In having a SteppIR Yagi I get the very best performance, and thankfully, also the best support - that really is a dream come true.

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announcements

MAY

CADILLAC, MICHIGAN — The Wexaukee Amateur Radio Club will hold the 63rd Annual Cadillac Amateur Radio and Computer Swap beginning 8 a.m., Saturday, May 6 at the Mackinaw Trail Middle School, 8401 S. Mackinaw Trail. Website: <www.wexaukee.org>. Talk-in 146.980. VE exams, card checking.

CEDARBURG, WISCONSIN — The Ozaukee Radio Club will hold its 43rd Spring Indoor Swapfest from 8 a.m. to noon, Saturday, May 6 at the Ascension Columbia St. Mary's Center, W67N890 Washington Avenue. Contact Tom Trethewey, KC9ONY, Phone: (262) 421-6351. Email: <swapfest@ozaukeeradioclub.org>. Website: <www.ozaukeeradioclub.org>. Talk-in 146.97- (PL 127.3).

GALES FERRY, CONNECTICUT — Southeastern CT Amateur Radio Society will hold its SECARS Auction from 9 a.m. until all items are sold, Saturday, May 6 at Our Lady of Lourdes Church Hall, 1650 CT Route 12. Contact Mark Noe, KE1IU, Phone: (860) 326-8025. Email: <KE1IUMark@gmail.com>. Website: <https://secars.org>. Talk-in 146.730 MHz, PL 156.7 Hz

SUPERIOR, WISCONSIN — THE A.R.A.C. Arrowhead Radio Amateurs Club will hold its ARAC Hamfest from 9:00 a.m. to 1:00 p.m., Saturday, May 6 at the Head of the Lakes Fairgrounds, 4700 Tower Ave. Contact Robert Schulz, KC0NFB, Phone: (218) 390-5000. Email: <ARAC_HAMFEST@CHARTER.NET>. Website: <www.THEARAC.org>. Talk-in 146.940 (-) 103.5. VE exams.

BOONSBORO, MARYLAND — The Antietam Radio Association will hold The Great Hagerstown Hamfest from 7:00 a.m. to 1:00 p.m., Saturday, May 6 at the Washington County Ag Ed Center 7313 Sharpsburg Pike, Route MD-65 South Boonsboro. Contact: Steve Struharik, WA8EIH, Phone: (240) 818-1248. Email: <struhariks@gmail.com>. Website: <http://W3CWC.org>. Talk-in 146.730- (PL 100). VE Exam and card checking.

BRISTOL, PENNSYLVANIA — The Warminster ARC will hold The Warminster ARC Hamfest, ARRL Eastern Pennsylvania Section Convention from 7:00 a.m. onward, Sunday, May 7 at the Bucks County Community College, Lower Bucks Campus, 1304 Veterans Highway (Route 413). Contact: George Brechmann, N3HBT, Phone: (215) 443-5656. Email: <WARMrcinfo@gmail.com>. Website: <http://www.k3dn.org>. Talk-in 147.090 131.8. VE Exam and card checking.

MOUNTAINVILLE, NEW YORK — The Orange County Amateur Radio Club will hold The Orange County Amateur Radio Club Hamfest from 8:00 a.m. to noon, Sunday, May 7 at the Black Rock Fish and Game Club, 5 Pleasant Hill Road. Contact: Mickey Favoino, K2NRS. Phone: (845) 562-7366. Email: <newbrghrsq@aol.com>. Website: <http://ocarcny.org>. Talk-in 448.325 (123).

SANDWICH, ILLINOIS — The Kishwaukee Amateur Radio Club will hold The DeKalb Hamfest from 8:00 a.m. to 1:00 p.m., Sunday, May 7 at the Sandwich Fairgrounds, 1401 Suydam Road. Contact: Bob Yurs, W9ICU, Phone: (815) 757-3219. Email: <w9icu@arrl.net>. Website: <www.karc-club.org>. Talk-in 146.730- (PL 100).

TOLEDO, OHIO — The Lucas County ARES will hold its Trunk Sale & Swap Meet from 9:00 a.m. to 1:30 p.m., Sunday, May 7 at the Toledo Speedway, 5639 Benore Road. Phone: (419) 370-2882. Email: <swap@lucasares.org>. Website: <http://www.swap.lucasares.org>. Talk-in 146.940- (PL 103.5).

PRESCOTT VALLEY, ARIZONA — The Yavapai Amateur Radio Club will hold the 2023 Prescott Hamfest from 8:00 a.m. to noon, Sunday, May 13 at the Granville Elementary School, 5250 Stover Drive. Contact: John Stover, KT7P, <hamfest@w7yrc.org>. Website: <www.prescotthamfest.org>. Card checking.

STANWOOD, WASHINGTON — The Stanwood-Camano Amateur Radio Club will hold the SCARC 30th Annual Electronic Flea Market & Hamfest from 9:00 a.m. to 1:00 p.m., Saturday, May 13 at the Stanwood Middle School, 9405 271st Street NW. Email: <scarchamfest@yahoo.com>. Website: <www.scarcwa.org>.

UNION GAP, WASHINGTON — The N7YRC Group will hold the N7YRC Tailgate Party on Saturday, May 20 at the Dept of Emergency Management, 2403 S. 18th Street. Contact: Rodney Rath, KC7VQR. Phone: (509) 952-6077. Email: <kc7vqr@arrl.net>. Website: <n7cfo.com>. Talk-in: 444.7500 repeater +5Mhz 131.8 pl.

XENIA, OHIO — The Dayton Amateur Radio Association will hold the Dayton Hamvention 2023 from 9:00 a.m. to 5:00 p.m., Friday, May 19; 9:00 a.m. to 5:00 p.m., Saturday, May 20; and 9:00 a.m. to 1:00 p.m., Sunday, May 21 at the Greene County Fair and Expo Center, 210 Fairground Road. Phone: (937) 276-6930. Email: <info@hamvention.org>. Website: <www.hamvention.org>. Talk-in 146.94- (PL 123). VE exams, card checking, special event station W8BI.

PINELLAS, FLORIDA — The Glorious Society of The Wormhole will hold WormFest 2023 from 7:00 a.m. onward, Saturday, May 27 at the Freedom Lake Park 9990 46th Street. Contact: Bill Williams, AG4QX. Email: <ag4qx@arrl.net>. Website: <https://w4orm.org>. Talk-in 146.850 - 146.2.

June

DEN HELDER, NETHERLANDS – Dutch Navy Radio Amateur Club (MARAC) will hold the Museum Ship Weekend on Saturday, June 3 on the Abraham Crijnssen, moored off the Navy Museum at Hoofdgracht 3, 1781 AA. Contact: Willem Van Essen, PA3CNI. Email: <pa3cni@hotmail.com>. Website: <http://www.marac-radio.nl/>.

HILTON, NEW YORK – The Rochester Amateur Radio Association will hold the Rochester Hamfest 2023 on Saturday, June 3 at the Hilton Exempt Club137 South Ave. Contact: Tim Guyot , KB1POP. Email: <timguyot@gmail.com>. Phone: (585) 210-8910. Website: <https://rochesterham.org>.

HUDSONVILLE, MICHIGAN – The Independent Repeater Association will hold the IRA Hudsonville Hamfest from 8:00 a.m. to noon., Saturday, June 3 at Hudsonville Fairgrounds 5235 Park Ave. Contact: Tom Bosscher, K8TB. Email: <hamfest@w8ira.org>. Phone: (616) 209-9296. Website: <http://www.w8ira.org >. Free VE testing.

MANASSAS PARK, VIRGINIA – The W4OVH Ole Virginia Hams will hold the W4OVH Ole Virginia Tailgate from 8:00 a.m. to 2:00 p.m. Saturday, June 3 at the Field Across from Signal Hill Park 9300 Signal View Dr. Contact Don Meyerhoff, WA2SWX. Email: <wa2swxdm@gmail.com>. Phone: (703) 597-3211. Website: <https://w4ovh.net/tailgate/>. Talk-in: 146.970.

MANITOWOC, WISCONSIN – The USS Cobia Amateur Radio Club will be participating in the Museum Ships Afloat Week-end on Saturday June 3 and Sunday June 4 on the submarine USS Cobia SS-245, located in the docks next to 75 Maritime Dr. Contact: Anne Dirkman, KC9YL. Email: <kc9yl@arrl.net>. Website: <https://www.qrz.com/db/NB9QV>.

ham radio news

HamCation Reports Attendance of Nearly 22,000

Post-Covid hamfest attendance continues to rebound, with the Orlando HamCation reporting a 2023 attendance of 21,830, its third-largest number ever. This represents a 12% increase from the 2022 attendance of 19,500. Orlando is the second-largest hamfest in the U.S., behind only the Dayton Hamvention®

FreeDV Project Gets Major ARDC Grant

The FreeDV Project has received a grant of $420,000 from ARDC, the Amateur Radio Digital Communications foundation, to further develop FreeDV and advance the state of the art in HF digital voice. According to the *ARRL Letter,* FreeDV is an open-source amateur radio technology that allows any SSB transceiver to be used for low bit-rate digital voice. The grant will fund ongoing work to improve speech quality and low signal-to-noise ratio operation; inclusion of FreeDV in some commercially manufactured transceivers and other development projects. More information on FreeDV is available at <www.freedv.org>; ARDC's website is <http://ardc.net>.

Amateur Radio Included in FEMA Emergency Guide

The latest functional guidance document from the Federal Emergency Management Agency (FEMA) includes amateur radio as part of the web of public and private communication resources for emergency managers to turn to in an emergency or disaster. The *ARRL Letter* reports that the March 2023 version of the National Incident Management System Information and Communications Technology guide has an expanded Communications unit structure, which includes the Auxiliary Communicator role, a function that specifically includes amateur radio. The complete NIMS ICT guide is available as a PDF at <https://tinyurl.com/bd233bd>.

Amateur Radio Gets a Full Morning at National Hurricane Conference

The value of amateur radio in hurricane preparedness and response was on full display at this year's National Hurricane Conference, held in-person and over Zoom in early April. A full morning of the conference program was dedicated to various aspects of amateur radio activity, according to the ARRL. Specific presentations included the WX4NHC ham station at the National Hurricane Center, the Hurricane Watch Net, the VoIP Hurricane Net, an overview of SATERN (the Salvation Army Team Emergency Radio Network), and the importance of amateur radio surface reports to forecasters at the National Hurricane Center. The amateur radio presentations were livestreamed and were being recorded and posted to YouTube after the conference ended.

Milestones: WD9HBA Named Chief of Air Force MARS

Air Force MARS (Military Auxiliary Radio System) has a new Chief, David Antry, Jr., WD9HBA. A ham since 1977 and a retired Air Force Master Sergeant, Antry has been an active MARS member for over a decade and most recently served as Operations Officer for the 51st Air Force MARS Communications Group, it was reported in the *ARRL Letter*. He also served as a logistics manager in the 635th Supply Chain Operations Wing War Reserve Materiel Program Integration Office. Antry will be based at Scott Air Force Base in Illinois. Additional information about Air Force MARS may be found at <www.mars.af.mil>.

Milestones: Hamvention Leader Ron Cramer, KD8ENJ, SK

Past Dayton Hamvention® General Chairman Ron Cramer, KD8ENJ, became a Silent Key on March 11. Among other things, Cramer oversaw the Hamvention's move from Hara Arena to the Greene County Fairgrounds in Xenia, Ohio, in 2017. According to the *ARRL Letter,* Cramer was also a past president and current vice president of the Dayton Amateur Radio Association, which sponsors Hamvention.

Two RIBs on a Boat … For Two Years

Two hams from the U.S. have embarked on a two-year ocean voyage with two goals in mind: 1) Activate rare water-only grids in the Pacific Ocean (*CQ DX Field Award hunters take note! – ed.)* and 2) Field-test two remotely-operated "Radios in a Box" or RIBs. These are self-contained stations built to be set up in locations that are inhospitable for in-person DXpeditions and then to operate them remotely from a boat offshore. According to *Newsline*, George Wallner, AA7JV, and Michael Snow, KN4EEI, set sail from Costa Rica aboard George's yacht, the Magnet. They will be operating from various locations, using a mix of their own call signs and that of the Dateline DX Association, KH7Z/MM.

Oklahoma Repeater Destroyed by Fire

A "controlled burn" that got out of control was apparently responsible for the destruction of the W5BLW repeater in southern Oklahoma. *Newsline* reports that the repeater was a critically important resource for SKYWARN, the Red Cross and other emergency communications groups. A spokesman for the Ardmore Amateur Radio Club, which owns the repeater, says it will be replaced but will take quite a while before it is fully back in service.

The OMIK POTA Challenge

For the rest of this year, the OMIK Amateur Radio Association is encouraging its members to activate Parks on the Air (POTA) program sites with special significance to African American heritage. OMIK was founded 70 years ago by a group of Black radio amateurs from Ohio, Michigan, Indiana and Kentucky (thus the name) to help Black travelers with information on places where they could safely eat and stay overnight. Today, the group has a multi-racial and multi-cultural worldwide membership. According to the *ARRL Letter*, the OMIK POTA Challenge is an effort to promote the club as well as parks with connections to African American culture. Members are encouraged to sign up to use the club call sign, K0MIK, during POTA activations. The group hopes to have members make at least 750 contacts from various parks and historic sites between April 1 and December 31, 2023. For more information on OMIK, visit <http://omikradio.org>; POTA info may be found at <https://parksontheair.com>.

contents

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ON THE COVER:

One operating/sleeping tent and three vertical antennas were all that the 3YØJ DXpedition team was able to erect in the wild weather of Bouvet Island, #2 on the DX most-wanted list. The team managed 19,000 QSOs amid massive pileups and QRM. The "inside story" of the adventure begins on page 8, followed by a "CQ Classic" on an earlier trip to Bouvet (p. 14) and a special story from the other end of the pileup (p. 18). (Cover photo by Mike Crownover, AB5EB)

features

FOCUS ON: Ham radio and the human connection … Using radio equipment to keep in touch with other humans is the best part of DXing. From contests to emergency communications, people across the globe are brought together through the act of using ham radio. Even in countries embroiled in war, that simple feeling of being able to reach out using a radio and saying, “Hi. I’m here,” can be as important to someone (page 18) as communicating with emergency services during a storm (page 40). New equipment to facilitate these conversations is also important, and is a constantly evolving field, such as on page 58 – what an exciting time to live in!

columns

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zero bias: a cq editorial

BY RICH MOSESON,* W2VU

The McIntosh Maximum?

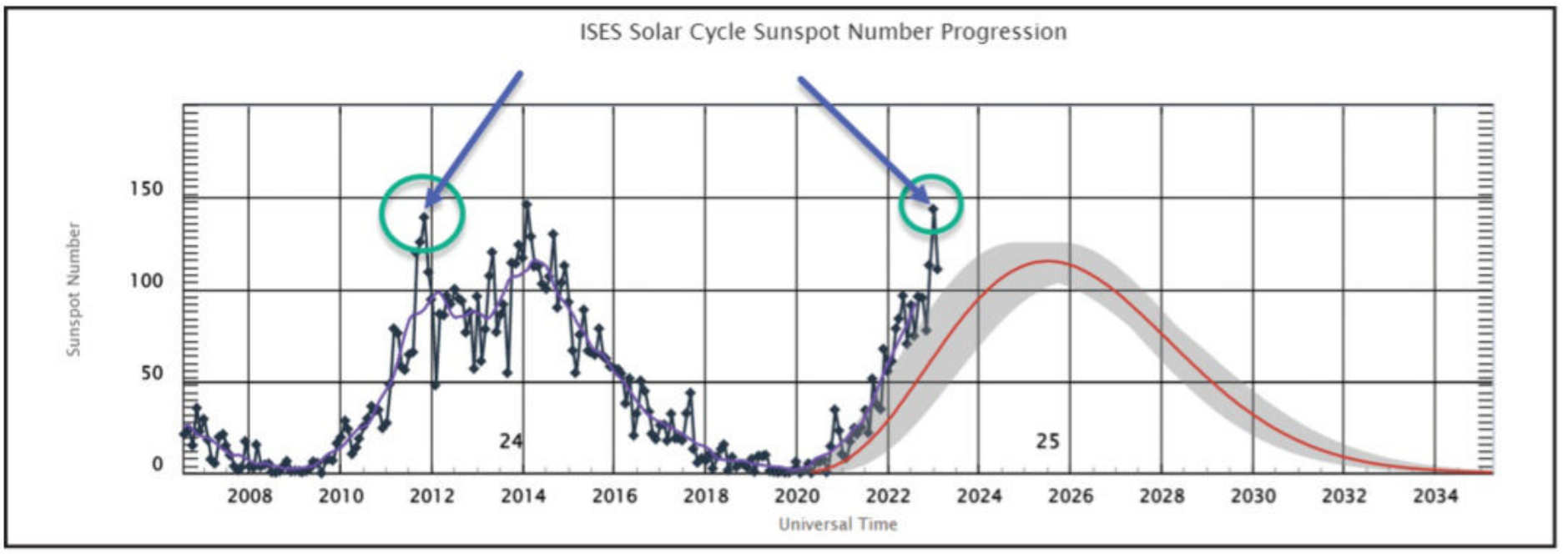

Figure 1. Sunspot numbers so far in Cycle 25 are rising much more quickly and sharply than in Cycle 24, and are way ahead of the "official" prediction. The 10.7-centimeter radio flux readings (page 94) show an even more dramatic increase. (Source: NASA Space Weather Prediction Center)

Many hams who have been around for a few solar cycles, or who have studied ionospheric propagation, are familiar with the Maunder Minimum, a period between 1645 and 1715 during which there were virtually no sunspots and no evidence of solar cycles.[1] Of course, this didn't have much impact on the primary communication method of the day, which was written correspondence carried on horseback (plus the occasional carrier pigeon).

Today, of course, solar activity and its impact on our planet and ionosphere are much more important for everything from our electric grid to our ever-growing network of communication satellites. For hams, the solar cycle's impact on ionospheric propagation is of major interest, so it was not good news when the Solar Cycle 25 Prediction Panel (SC25PP), a NASA/NOAA co-chaired international group of space science experts, predicted in 2019 that Cycle 25 would be very similar to the just-concluded Cycle 24 – the weakest in most of our memories.[2]

There was one outlier among the pessimists – an international team led by Dr. Scott McIntosh of the National Center for Atmospheric Research in Boulder, Colorado. Dr. McIntosh and his fellow researchers developed a theory that there is a "terminator event" at the end of each 22-year solar cycle (the Sun's magnetic field flips during the start of each new 11-year cycle, but it takes roughly 22 years to return to the starting point), and that this terminator event says a lot about the magnitude of the coming cycle.

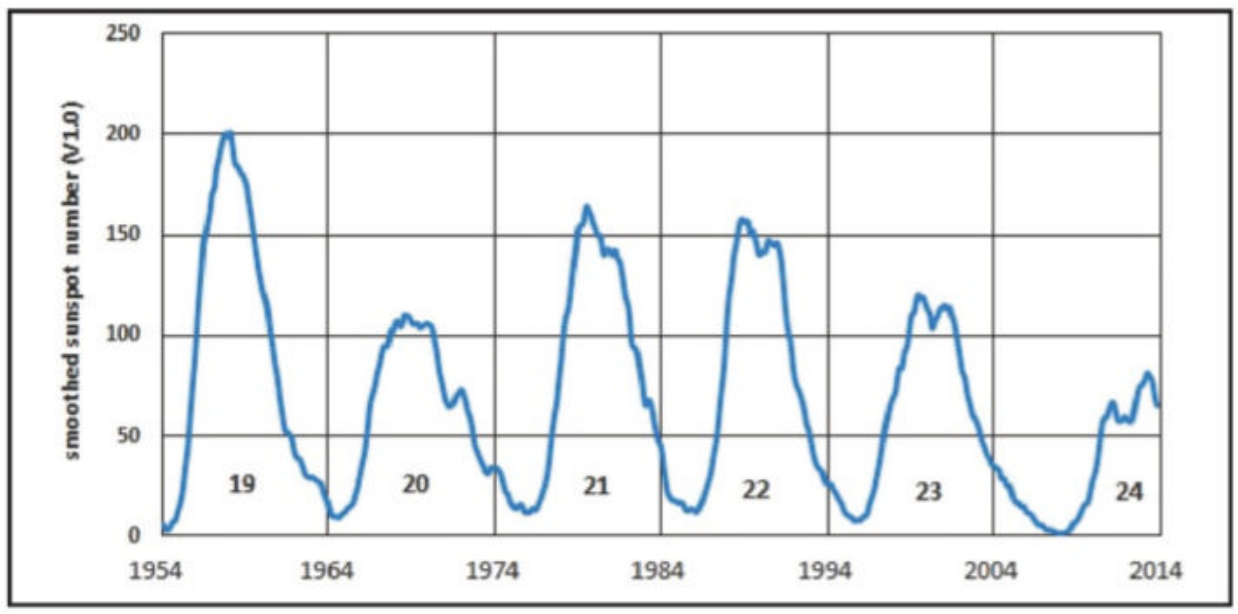

Figure 2. The rise in Cycle 25 seen in Figure 1 looks much more like the strong Cycles 21 and 22 of the 1980s and early '90s than the weaker and more recent Cycles 23 and 24. Dr. McIntosh predicts that the current cycle could even compare with the "once in a lifetime" conditions enjoyed in Cycle 19. (Source: The CQ Shortwave Propagation Handbook, 4th edition, p. 2-7)

Their conclusion: "Our method predicts that SC25 *could* be among the strongest sunspot cycles ever observed … and it is highly likely that it will certainly be stronger than present SC24 (sunspot number of 116) and most likely stronger than the previous SC23 (sunspot number of 180). This is in stark contrast to the consensus of the SC25PP, sunspot number maximum between 95 and 130, *i.e.,* similar to that of SC24."[3]

We are now roughly two-and-a-half years into Cycle 25 and all indications so far are that Dr. McIntosh's team is much closer to the mark than the "official" panel of experts. If you look at Figure 1 (borrowed from this month's Propagation column), you will see that

(Continued on page 61)

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

news bytes:

AccuWeather Predicts "Average" Atlantic Hurricane Season

The National Weather Service had not yet issued its official outlook for the 2023 Atlantic hurricane season as we went to press, but private forecasting service AccuWeather released its own forecast in late March.

AccuWeather's meteorologists are predicting a less active season than we've seen recently but one that is closer to the 30-year average of 14 named storms, 7 hurricanes and 3 major hurricanes (Category 3 or higher on the Saffir-Simpson scale). According to their forecast, we should expect 11-15 named storms, 4-8 of which will become hurricanes, 1-3 major hurricanes and two-to-four direct hits on the United States, including Puerto Rico and the U.S. Virgin Islands.

They noted that a major influence on the hurricane season will be whether the current "neutral" phase of the El Niño Southern Oscillation (ENSO) which has followed the end of a 3-year-long La Niña will remain neutral or whether a new El Niño will develop. According to AccuWeather, the long-term La Niña pattern was responsible for the very active seasons in 2020 and 2021, and that an emerging El Niño pattern tends to result in a quieter-than-normal hurricane season.

The forecasters say the U.S. areas at greatest risk for hurricane impact this year will be Florida and the Atlantic coast up through the Carolinas. They expect reduced risks for the western Gulf coast and the Northeast.

Hurricane season officially runs from June 1 through November 30, although recent years have seen hurricanes form "out of season." For more detailed information, visit <https://tinyurl.com/2wp3mb4r>.

AccuWeather

2023 Atlantic Storm Names

The World Meteorological Organization has designated the following names for Atlantic tropical systems in 2023:

Arlene	Harold	Ophelia
Bret	Idalia	Philippe
Cindy	Jose	Rina
Don	Katia	Sean
Emily	Lee	Tammy
Franklin	Margot	Vince
Gert	Nigel	Whitney

BY BOB SCHENCK,* N2OO

To Bouvet and Back – the Inside Story of 3YØJ

BY MIKE CROWNOVER, AB5EB

DXpeditions to the rarest of the rare, especially those to the sub-Antarctic, are dangerous and just plain hard to do. This month, Mike Crownover, AB5EB (with some additional photos from Adrian Ciuperca, KO8SCA) will take us along for the ride aboard Marama to one of the most remote islands on earth, Bouvet. The 3Y0J DXpedition is over now, and it was quite a roller coaster ride for the team, as well as for us DX chasers. I hope that Mike's story will give us all a little more insight into how scary and dangerous these DXpeditions can be. This team deserves our deep appreciation for going above and beyond in order to activate the #2 rarest DX entity in the world for us all. It was not easy. Bouvet has again proved to be a daunting challenge. This team would not give up when seemingly unsurmountable challenges presented themselves. A special THANKS to the entire team and the crew of Marama. Also, thanks to Mike and Adrian for helping to put together this article on short notice! – Bob, N2OO

Somewhere in the South Atlantic, two or three days' sail northeast of the South Sandwich Islands, the Marama (Photo A) was making her way towards Bouvet. Already 10 days into the voyage, the crew of 3YØJ was eager to arrive. The South Atlantic had decided to speed things up … we had a strong 40-knot wind and well-spaced 20-foot waves from our starboard side. The captain had reefed the Genoa sail considerably to keep our speed to about 12 to 16 knots. The Marama was very heavy with all of our gear and the captain did not want to push her too much. Pete Meyer, NØFW, and I were at the helm with the captain keeping tabs on our direction and the radar. It was only a few days earlier that we had seen icebergs, prompting us to take a more northerly route (Photo B). There was plenty to consider as we approached Bouvet.

* Email: <n2oo@comcast.net>

Photo A. The 3Y0J team and Marama crew are ready in the Falkland Islands for the trip to Bouvet Island. (Photos courtesy of the 3Y0J team, except as noted)

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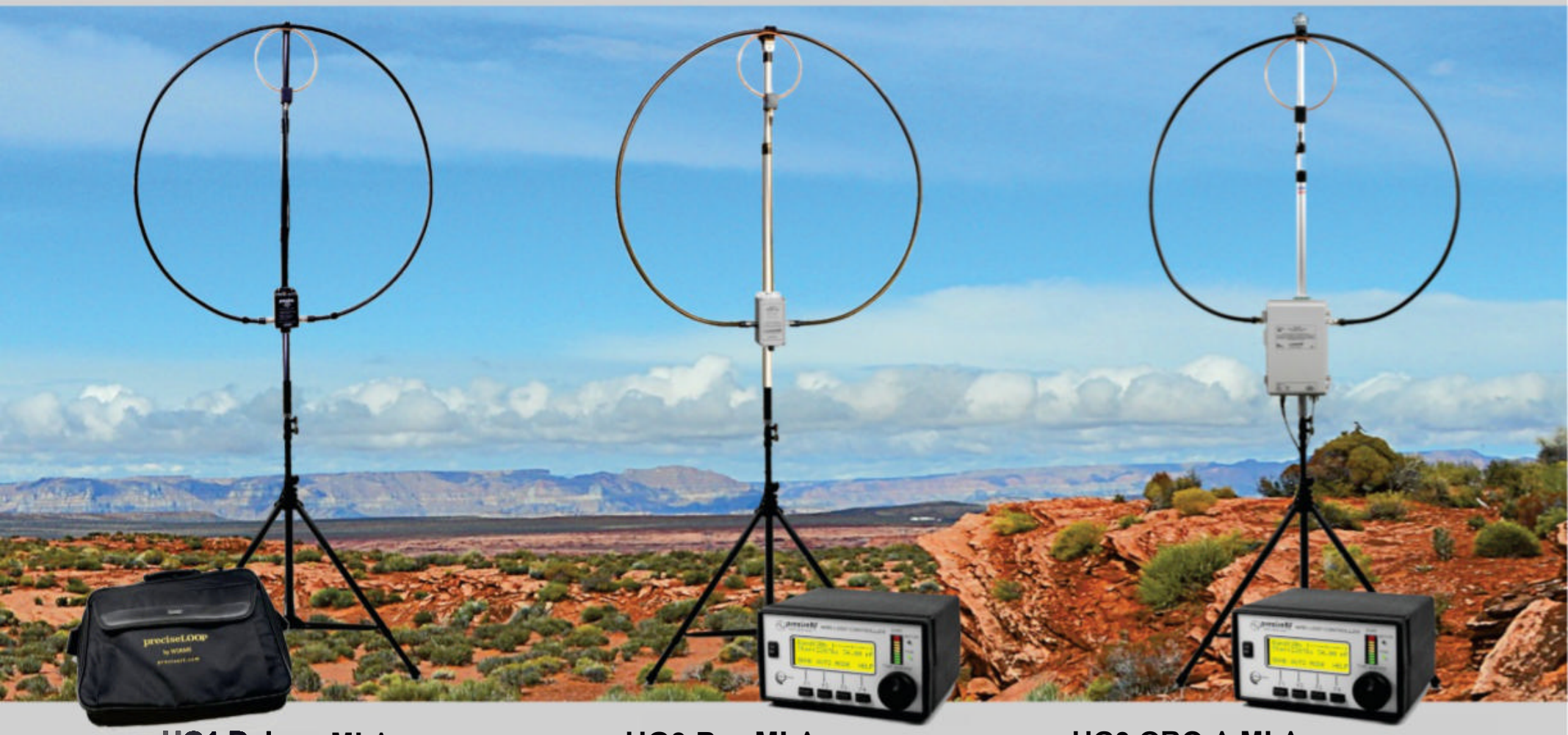

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- LMR600 Radiation Loop
- Calibrated 6:1 Manual Tuning Dial

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5/23 QS 1.0

Pete and I were about halfway into our 90-minute shift at the helm and evening was approaching when things started to get exciting. Pete was at the wheel and I sat just behind him facing the port side watching the waves as the Marama went up the side of one wave and back down. On the crests, we could see the sea of waves, with an occasional "large wave." We began to climb the side of another wave when, at about the time I thought we should just about be at the top, I heard Pete yell, "hold on!" I think he may have actually said a few other words as well, but we will keep this family-friendly. I looked to the starboard side to see that we were nowhere near the top of the wave we had been climbing. As the Marama heeled more to port, I put my foot on the port side support post of the canopy, and the Marama started her slide back to the

Photo B. The first sighting of an iceberg in the Southern Atlantic Ocean created excitement for everyone on Marama.

Photo C. The 3YØJ camping site on Bouvet Island as seen from Marama before landing. (AB5EB photo)

Photo D. Scouting team in a Zodiac heading towards the shores of Bouvet Island

base of the large wave. She slammed into the water at the bottom, throwing a large amount of water on Pete and me. Although it felt as if she was ready to capsize, once at the bottom of the wave she quickly righted herself, in the process turning 90 degrees starboard. The captain quickly reassured us to turn hard back to our course. It was a rough minute or so, but Pete and I were both able to turn the rudder, getting us back on course. At the end of our shift, we were greeted by wide-eyed 3YØJ members wondering what happened. It was a question that would be asked many times more as we took on the challenge of Bouvet. Mother Nature, as expected, had much more in store for us.

Three or four days later, we arrived at Bouvet towards the evening. Despite our excitement, we could barely make out the island through the fog and evening light. The Marama anchored on the southeast corner near Bouvet, in calm seas. We slept well that evening. Expecting a possible weather window around noon the next day, we were eager to get up the next morning to see Bouvet in the daylight (Photo C). The weather window was earlier than expected and we were ready to make our initial landing to secure the route up to Cape Fie as well as prepare the beach for landing (Photo D).

Peter (our guide); Ken Opskar, LA7GIA; Dave Jorgensen, WD5COV, and I were the first to land on the island. Peter and Ken went first with climbing equipment and their emergency bags. Dave and I followed next. We had been planning our approach to Cape Fie with a satellite image that was five years old. Our research had yielded no new information on the location such as the makeup of the beach or if Cape Fie was gravel, broken rock, or solid rock. With a blurry satellite picture, we had to make the best plans we could and ultimately knew we had to plan for the unknown, as we did not know what we would find when we arrived, nor did anyone else.

Shortly after the four of us had landed on the island, Ken and Peter had already secured the route up the glacier. The glacier had drastically changed in the past five years and it was now only 8 feet tall along the west end of the beach (Photo E). We had been able to quickly walk up the side of

Photo E. Bouvet's shores are mostly made up of inaccessible vertical blocks of ice and snow.

Photo F. Team members arrive on Bouvet Island using a rope system and swimming in survival suits.

the glacier that was covered in about a foot of blown snow, so we never had to walk on glacier ice and we walked only a foot or so from the exposed hill that sloped under the glacier. It was an easy walk up. We quickly found suitable locations for our camp and antennas. However, after 20 minutes on the island, as we were waiting for the next Zodiac to bring our initial supplies, the sea conditions changed. Although efforts were made, it soon became clear that we would have to spend our first night on Bouvet, with only what we had brought along with us. Fortunately we had extra clothes, food, water, and several emergency heated blankets with us. However it still made for a very long night. It would be another four days before we could leave Bouvet, although we were able to be supplied by the Marama the next day. As Peter had told us, landing on Bouvet wouldn't be much of an issue. The challenge would be getting off.

It was clear that the plan to activate the island was going to need drastic

Photo G. Arctic Lavvo, the Norwegian-made tent, held well even during the strong Bouvet storms.

Photo H. A view of the 3YØJ camp site with the frozen glacier to the left and the Atlantic Ocean to the right.

Photo I. Meal time: Add hot water to the MRE (Meal Ready-to-Eat) and you get a tasty warm meal!

Photo J. Our tent on Bouvet Island kept us warm but was certainly not a luxury dwelling.

(Continued on page 75)

CQ CLASSIC

What Goes Around Comes Around…

Since this month's DX column features the 3Y0J DXpedition to Bouvet, we thought it might be instructive to look back at an earlier expedition to the same chunk of rock in the South Atlantic Ocean, the 3Y5X operation in December 1989 and January 1990. If you change the dates and the call sign, VP2ML's April 1990 commentary could apply equally well today. Technology has changed greatly in the past three decades, but Mother Nature and human nature have not. When it comes to Bouvet, it seems, the more things change, the more they stay the same.

BY CHOD HARRIS, VP2ML

DX

NEWS OF COMMUNICATION AROUND THE WORLD

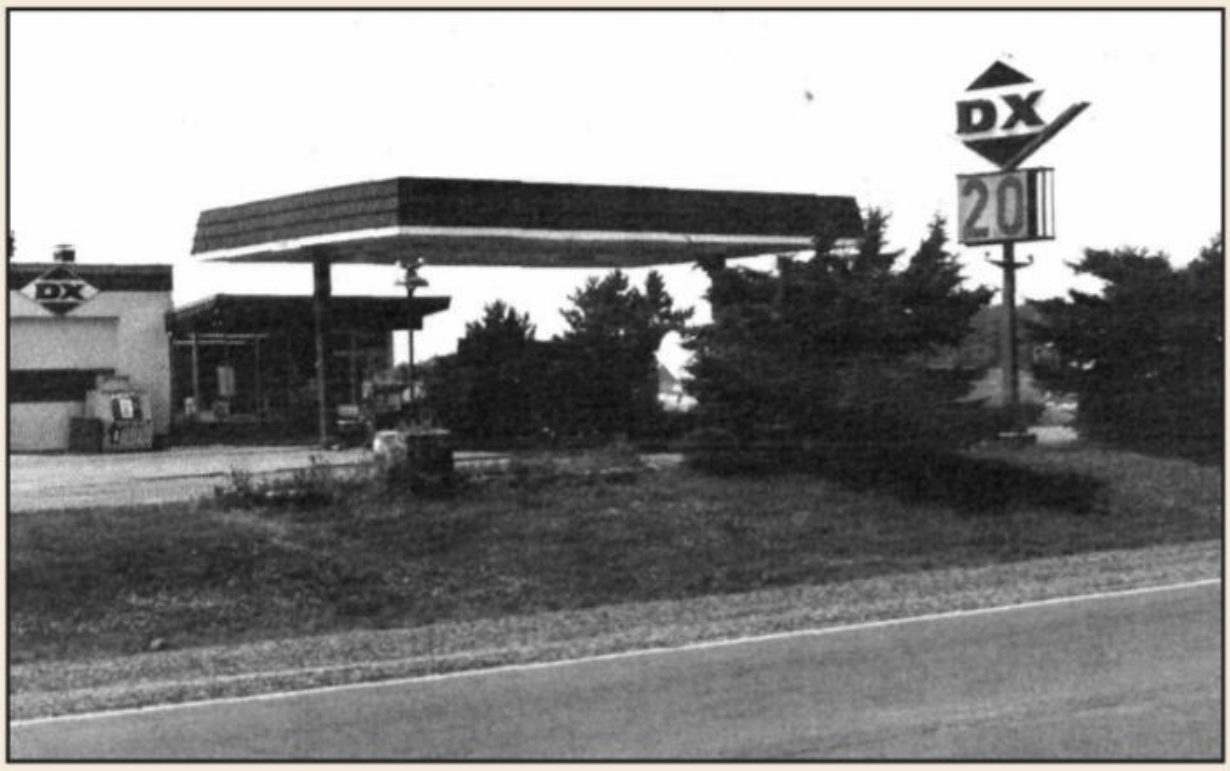
Bouvet

The 3Y5X Bouvet operation by Club Bouvet is over, thank goodness. The team arrived at Bouvet on schedule on Christmas day, but was unable to land on Bouvet for several days, as high winds and waves eliminated a boat landing and heavy fog grounded the helicopter. The operators finally set up their first station on December 28. What followed was one of the sorriest stories of DX.

The 3Y5X signal on 14145 kHz was strong, as the team enjoyed some of the best propagation they would get for the next two weeks. The pile-up grew quickly, and very soon matters got completely out of hand.

A major operation from an extremely rare country brings everyone out of the woodwork—experienced DXers and newcomers; operators highly proficient in split-frequency operation and DXers who don't know on which VFO they are transmitting; well-meaning, self-appointed DX "policemen"; and dozens of the most ill-spirited individuals (I won't call them DXers) this writer has heard in 20 years of radio.

One can forgive the occasional, inadvertent transmission on 14145 kHz. In the excitement of an all-time new one, some DXers aren't sufficiently careful to completely eliminate transmitting on the wrong VFO. One might think that the added incentive of avoiding a "pink ticket" from the FCC would reduce the chances of a DXer accidentally transmitting out of band, but the opposite seemed to be true. If a strong-stomached FCC engineer monitored 14145 kHz, he could have identified hundreds of violations.



The next time you call "CQ DX 20" don't be surprised when you work this gas station spotted by Woody Miner, K9EF/8R1K, three miles outside of St. Croix Falls, Wisconsin

Also, one can almost forgive the "policemen," even though their actions are illegal, have no value, and disrupt the DXpedition. At least the policemen yelling "wrong VFO" or "listening up" meant well. These operators were obviously neither experienced nor clear-thinking, as they caused far more interference than they prevented, and were deliberately violating the terms of their license. Even though it makes me grit my teeth and want to throw my shoe, I can stand a small dose of DX policemen.

But what occurred on 14145 kHz (and to a lesser extent on 14022 kHz) was the worst mess this DXer has ever heard. The deliberate jamming, catcalls, tape recordings, false identifications, name calling, and flat-out gross

obscenities forced this DXer to turn off his radio after only a few minutes. Fortunately I was using headphones, so the secretaries in the office weren't offended by the mess. (One of the few benefits of being a DX newsletter editor is I get to have a radio in my office.)

I received dozens of complaints about the horrible mess on the 3Y5X frequency, all demanding I do something about it. But what can a DXer do? Certainly not get on the air and tell the jammers to stop. That's exactly what they want the DX community to do—notice them. Besides, that would only add to the problem. I can preach (as I did just three months ago) that DX policemen not only don't help, they add to the problem, but then I am appealing to the jammers' intelligence and good nature, two qualities the jammers clearly do not have.

So what does the well-meaning, thoughtful (that eliminates the DX policemen) DXer do about the situation? There are several possibilities.

First, we can give up DX all together and take up some less frustrating activity such as collecting stamps. But this is difficult for most DXers. I gave up DX several times during the first few days of the 3Y5X operation, swearing that if this is what DX had come to, I wanted no part of it. A few hours later I was back at the rig. The DX bug bites hard.

Second, we can breathe a sigh of relief that the operation is over, and hope that the situation doesn't arise again. Such wishful thinking ranks in probability with having an Albanian station answer your "CQ DX." With Southern Sudan, South Sandwich, South Georgia, Malpelo, United Arab Emirates, maybe Bhutan, and yes, even Albania coming on the air in the next year, we can only look forward to more of the same.

Third, we can convince the FCC that this is the most pressing problem their enforcers face and enlist the resources of their sophisticated signal-tracing abilities to identify, arrest, and prosecute these violators. However, even if the amateur community could convince the FCC that DX jammers are the most serious problem in telecommunications, we would lose the respect of the commissioners of the FCC and the telecommunications world at large. No, asking for help from the FCC is not the answer.

The only thing we as DXers can do may be the most difficult choice of all: ignore the jammers. If these misguided individuals (I can't even bring myself to call them amateurs) have any reason for what they do, it is to attract attention to their antics. If the DX community can deny them this small satisfaction, eventually they will tire of their meaningless game and return to whatever activity they pursue between major DXpeditions, such as torturing children or drowning kittens.

You don't need a great location, high power, and big antennas to work DX. Chuck Joseph, N5JED, runs barefoot into a 54 inch long MFJ portable antenna inside his home. Despite the minimal station, Chuck has logged 134 DXCC countries on all continents and even has a VP2ML QSL card on his wall.

For this tactic to be successful, both sides of the pile-up must cooperate. Not only must the DXer resist the nearly overwhelming urge to tell off the jammers (thereby adding to the problem), but the DXpedition operator must also do his or her part. The DXpedition operator can announce a new transmitting frequency while the jammer is transmitting, or simply slip away, and let the experienced DXers hunt him down. If this is unacceptable to the DXpedition operator, he or she can simply fake it. If the DXpeditioner even appears to be unaffected by the jamming, the jammer will soon give up. Or the DXpeditioner can use the trick we used to employ on 75 meter traffic nets: transmit on two frequencies at the same time.

Whatever approach the DXpeditioner wishes to use, the intent should be the same: to convince the jammer that the jamming is ineffective, without ever acknowledging that the jammer is even there.

Does the DX community have the discipline to make this work? Why not try it, at least. It can't be less successful than the futile attempts to chase the jammers off the 3Y5X's transmit frequency.

Working Split

The Bouvet operators made most of their contacts with wide frequency splits, listening as much as 150 kHz from their transmitting frequency. Monitoring the other end of the pile-up showed that many (most?) DXers don't know how to successfully operate split frequency.

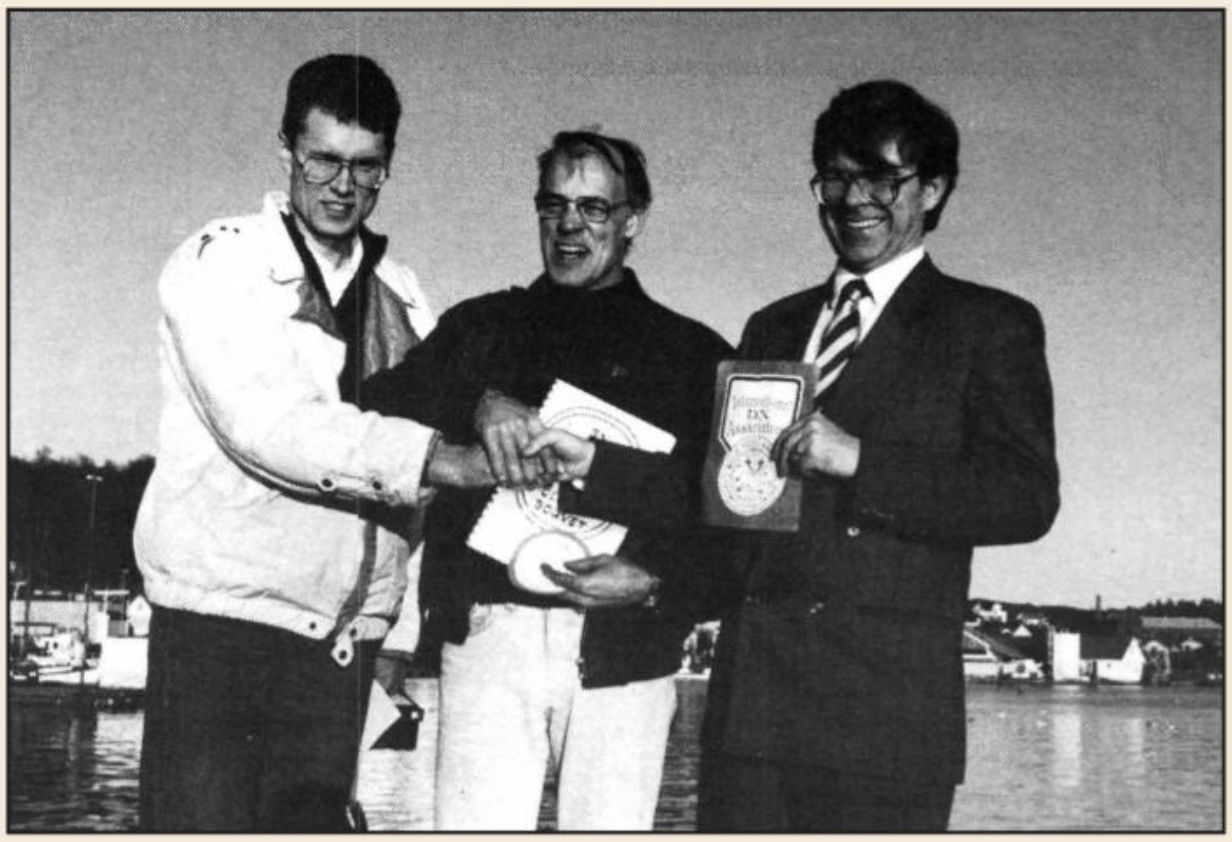
The first requirement is to have some means of listening to your own transmitting frequency. While the new breed of transceivers features two complete receivers so that you can listen to both the DX station and your own transmitting frequency simultaneously, you don't need to remortgage your home nor sell your children into slavery to have this capacity. Any rig with "two VFOs" provides the ability to switch back and forth quickly between two receive frequencies. You don't even need to have a separate VFO. All you really require is an inexpensive additional receiver. Wire the receiver to mute when your rig is transmitting, and use it to monitor the DX station's transmit frequency. Then you can use the transceiver's receiver to listen to your transmitting frequency.

The second step in snagging a split-frequency contact is to determine exactly where the DX station is listening. Employ the most useful DX tool in your shack— your ears. Flip back and forth between the DX station's announced listening frequencies and his transmit frequency. Eventually you will hear both sides of a QSO. Then, and only then, do you transmit on the exact frequency of the previous VFO, waiting of course for the last QSO to finish.

If your timing is good and you are proficient at this skill and locate the DXpeditioner's listening frequency before everyone else does, you can put a new one in the log.

If you miss or are simply not loud enough to compete with the other DXers who can locate the listening frequency as fast as you can, go back to listening. Almost every DXpeditioner has a pattern of shifting frequency. Eric, SM0AGD, switches through announced discrete frequencies on SSB. Whenever enough DXers found his listening frequency to make contact impossible, Eric punched into another memory button and started listening 20 kHz away. One of the 3Y5X operators was consistently moving 1.8 kHz up the band when the pile-up became too large. The intelligent DXer could locate the current listening frequency and transmit 1.8 kHz higher. Eventually the DXpeditioner would shift up and find this DXer waiting for him.

From the sounds of the 3Y5X pile-ups, relatively few DXers were using this technique. Even the ones who were transmitting on the correct VFO were usually calling "blind" somewhere in the



The organizers of the highly successful 3Y5X Bouvet operation are (from left to right) Einar, LA1EE, Erling, LA6VM, and Kaare, LA2GV. Erling was unable to get enough time off from work to travel to Bouvet, but he's in the thick of the action as head of the QSL team.

announced listening range. Many of these DXers must have been extremely frustrated with the 3Y5X operators, many of whom listened far away from their announced listening frequencies. For example, the operator would announce "listening 14200-220," and actually be listening on 14348 kHz.

"Foul play," you cry. "Unethical DX behavior. The DXpeditioner is actually lying about where he is listening." Some of the locals were most upset about this deceptive trick. But the technique did allow the DXpeditioner to work DXers at a fine rate. And it rewarded the DXer who tuned around the band to find the real listening frequency. In other words, the 3Y5X was separating the experienced DXer from the more casual operator. The latter group was upset, but perhaps by the time the next major DXpedition comes on the air, they will have honed their DX listening skills and be among the successful DXers who catch the DXpeditioner 130 kHz away from his announced listening frequency.

DX News

The Saturday Evening Post Society's planned Bouvet/South Sandwich/South Georgia operation was scrubbed in late December. Mike Koss, the leader of the DXpedition, was unable to locate a suitable ship and experienced crew for the lengthy trip. He hasn't given up, however, and may be able to reorganize the operation to activate another rare Antarctic spot.

The good news on the Antarctic front is that Tony DeParto, WA4JQS, is moving ahead with his plans to operate from both South Sandwich and South Georgia November 15 to December 15. The trip will cost more than $100,000, and DXers who want to help make this one a reality should send their donations to AA6BB.

Another very rare country may be coming on the air about the time this issue arrives in your hands. John Fung-Loy, PA3CXC, has negotiated with Sudan officials to stage a major DXpedition in Southern Sudan ST0. South Sudan ranked 19th on The DX Magazine's 1989 Most Wanted Countries list, with more than half of all survey respondents indicating that they needed ST0. John is planning a two-week operation around the end of March using the callsigns 6U0DX and 6U0CW. Again, the success of this DXpedition depends on the generosity of amateur radio manufacturers, DX foundations, and individual amateurs. Send your donations to John at Strausslaan 4, 2551 NM s'Gravenhage, The Netherlands, Europe.

DX Activities and Events of the Month

April is a busy month for DXers. The month kicks off with the International DX Convention in Visalia, California, which starts with a Friday evening cocktail party hosted by yours truly. I hope to see many of you there.

Then on April 21 the Cornish Radio Amateur Club of England sponsors International Marconi Day in celebration of Guglielmo Marconi's birthday. (Marconi is the inventor of wireless communications.) Among the special-event stations that will be active that day are GB2IMD, GB4IMD, GBØIMD, EI2IMD, K1VV/IMD, DAØIMD, IY1TTM, IYØTCI, IY4FGM, VO1IMD, VE1IMD, and ZS6RSA. You can qualify for an award by working ten of these station on April 21. Send your log data to CRAC, P.O.Box 100, Truro TX1 1RX, Cornwall, United Kingdom.

April finishes with *the* DX event of the year: the Dayton Hamvention, where more DXers from around the world gather in one place than at any other event. The Hamvention weekend starts early for DXers with an informal gathering in the bar at the top of the Dayton Stouffers hotel Thursday night. The main DX event on Friday is the Annual DX Dinner, also at Stouffers. Sponsored by the Southwest Ohio DX Association, this event is in its fifth year, and it gets better every year. Advance reservations are required, so send your $23 to Scott Lehman, N9AG, P.O. Box 803, Greenville, OH 45531 with an SASE for the return of your ticket. After the banquet the DXers congregate in the many DX hospitality rooms in the same hotel. The Southeastern DX Club and the Kansas City DX Club always have great gatherings, with videos, contests, prizes, and the inevitable lies about how you worked 3Y5X on the first call with 1 watt into a bent coat hanger, etc. On Saturday the DX Forum in Room 1 at the Hara Arena always draws a good crowd. Saturday evening those DXers who can still stand again hit the hospitality rooms at Stouffers. And anyone at the Arena should stop by and say hello. I'll be at the CQ booth or at my own The DX Bulletin booth. See you in Dayton.

QSL Notes

QSL the St. Kitts operations in 1989 as follows: V47K and V47KS via WB2P; V47KO via K3NZ; V47KH via K3IPK; V47QQ via W9QQ; V47KR via K2DOX. QSL PJ4U via K3IPK.

DK9FN, QSL manager for 8Q7CQ, reports that 1200 cards have been sent out direct, and the rest of the cards answered via the bureau.

Dick, K4UTE, handles the cards for the *CQ* WW 1989 SSB operation of HSØE, as well as the Oct. 27,1989 QSOs.

Bouvet wasn 't the only very rare country on the air at the end of 1989. Mr. Inh Siphachanh, on the left, is the licensee of XW8KPL in Vientiane, Laos. Yoshi Hayashi, JA1UT, on the right, was instrumental in setting up the XW8KPL station. (Photo by Mobile Ham Magazine of Japan.*)*

6DZU (left) and F9RM, both top WPXers, going through QSLs looking for that new one.

Juan Galvezc, CEØOGZ, has a new QSL address: P.O. Box 4178, Valpariso, Chile.

Veikko Komppa, OH5VD, handles cards for his own operations as FRØVD 1989, VK9YD 1987, and VK9YD/VK9 1987/1988. His address is Paaskynkula 7, SF-03100 Nummela, Finland.

Mauri Lehtosaari, OH4ML, has returned to Finland after his 30,000-plus QSO tour of the Pacific. QSL his OH4MU H44, 5W1ML, A35ML, and 3D2ML operations to his home call: P.O. Box 13, 19601, Hartola. Include the callsign worked and mode on the outside of the envelope to speed processing.

Roland Halmann, DJ4LK, can confirm his 1977-1980 ZS3LK operations from possible new DXCC country Walvis Bay.

Eric Sjolund, SMØAGD, will QSL his recent African operations by his home address: Ormbersvgen 17, S-19300 Sigtuna, Sweden. He does not collect cards, so you don't need to waste a fancy QSL to get his in return. Simply send him your QSO data in QSL card format, with your call clearly indicated in large letters, along with your SAE and IRCs or SASE.

The TU4B and TU4DT operations from November can be confirmed via Arlen Turriff, K6VNX, 8819 East Callita St., San Gabriel, CA 91775.

The LOSE operation can be confirmed by Marcelo Avila, LU5EIC, P.O. Box 41, 1655 Jose Leon Suarez, BA, Argentina.

The CT500- operations can be confirmed via P.O. Box 2483, Lisbon 1112, Portugal.

Keith Hoyt, K6GXO, who operated as J6LRV, reports that his mail box has been blown up, literally. Thus, mail will get to him faster via his new address: P.O. Box 901846, Palmdale, CA 93590.

QSL AI, ZF2LY, via Page Pyne, WA3EOP, 109 S. Artizan St., Williamsport, PA 21795 with SASE or SAE and one or two IRCs.

Duane Heise, AA6EE, will confirm his XE2GCK and XE2/AA6EE cards direct: 16832 Whirlwind, Ramona, CA 92065.

JE1JKL handles cards for NH6J/KH0, NH6J/NH8, NH6J/NHØ, KC6CS, 9M6NA, 5Z4CS, 5Y4CS, 5W1EZ, JE1JKL/9M6, SM3/JE1JKL, XE2VJO, JY9SY, and the Oct. 1979 operation of KC6SZ.

DLØMAR and other — MAR calls from the Medical Assistance Radio team can be confirmed via DL8XAR.

KC3EK reports that he can no longer confirm contacts with 8P6RE, HK1AMW, 6Y5HN, and 6Y6A. Try direct.

QSL VP2VE and VP2V/NP2CG via Howard Messing, WA2NHA, 90 Nellis Drive, Wayne, NJ 07470.

Eric Scace, K3NA, can handle OHØMM cards for his May 1988 and August-September 1988 operations only, and not for the CQ WW CW operation. Cards for the latter operation should be sent to OH2MM. Eric is forwarding missent OHØMM cards, so you don't need to resend cards.

Veka Nurminen, OH2VB, made about 15,000 contacts in his Pacific trip with OH2BGD. QSL 3D2VB, A35VB, 5W1VB, and ZK2VB via OH3GZ.

The South African Radio League has a new QSL bureau address: P.O. Box 807, Houghton 2041, Republic of South Africa.

Baldur, DJ6SI, confirms that he will not respond to cards sent via the DARC bureau. He says he will confirm cards sent with a self-addressed, stamped envelope with German postage, or SAE and US $1.00.

Brett Graham, VS6BG/XX9TDM, and ex-VS6UP QSLs with the aid of a computer and will confirm all QSLs with a station at one time. Once the cards have been sent, he does not send duplicate cards. QSL direct only to P.O. Box 12727, Hong Kong. He reminds DXers that cards sent to Hong Kong stations who have moved away, or cards sent via the bu reau to temporary Macau XX9 stations will not be delivered. The only XX9 callsigns that can be confirmed via the bureau are AN, JN, KA, MD, YN, CT, DX, and TDM.

QSL ZF2BB, ZF2HM, and ZF2KE via K9QVB.

A noted DXer and DXpeditioner from Ukraine, now a refugee in Finland along with his family, makes a very special first contact with his new Finnish call sign.

"A Little Bit of Joy" – An Important Step Forward in My Ham Radio Life

BY ALEX YAKOVLEV,* UT5UY/OH5UY

I became interested in amateur radio when I was ten years old, back in 1983 in my native city of Kharkiv, Ukraine. Like many others, I started my journey as an SWL. Then, when it became clear that this hobby began to fascinate me more and more, my father brought me to the club station UB4LWB (UR4LWB after the ITU assigned Ukraine its own call sign block following the collapse of the Soviet Union in 1989) of the Regional Station of Young Technicians (Photo A). My first mentor was a great man, retired Colonel Victor Yarosh, RB5LA (later UT3LA, now SK).

It is important to note that I was born into a family of circus artists. Not just artists, but a well-known circus dynasty. Therefore, since my childhood, I have traveled a lot, accompanying my relatives on tours. This thirst for travel affected my main interest in ham radio – DXing. In 1989, I got my first personal callsign, UB4LUG (later UR4LUG). In 2004, I moved to Kyiv for work and got a new callsign, UT5UY, which I continue to hold. My salary was rising and I wanted to be on the other side of the pileup. I organized my first IOTA DXpedition as C93DY on Chiloane Island, Mozambique, a new IOTA activation, AF-098 (Photo B). That was a great expedition with an amazing team of like-minded people (Photo C). Nearly 20 years have passed since that DXpedition. AF-098 is again in the IOTA most wanted list. However, during these 20 years, no one has been able to activate Chiloane Island again, although I know for sure that there were those who wanted to.

My path in radio includes many stories from my subsequent DXpeditions, but it would be a long story and I will save it for my retirement! There is one event I would like to mention: In 2016, I got my DXCC Honor Roll #1 (Photo D). I'm especially glad that this happened before the era of digital modes and web receivers.

Photo A. A young Alex at the UB4LWB club station in Kharkiv, Ukraine, in 1988. Standing (l to r): Victor Yarosh, RB5LA (Alex's mentor, now SK) and Vlad, UB4LUF; seated in the center with headphones: Alex, UB4LUG (now UT5UY/OH5UY); seated in the front (l to r): Vadim, RB5LMV; Oleg, RB5LAV, and Tolia, SWL (later UR7LW). (Photos A-E courtesy of the author)

Now … About Current Times

In 2014, Russia launched a war against sovereign Ukraine, occupying Crimea and part of Donbass. On February 24, 2022, Russia started a full-scale war against Ukraine. Hundreds of thousands of dead and millions of Ukrainian refugees around the world resulted in a global crisis.

I have heartfelt gratitude to Finland and the kind Finnish people for providing protection for my family. Our life as war refugees has been quite eventful here in Finland. My son studies at a Finnish school, my wife and I attend integration courses where we learn Finnish, study Finnish law and culture, and do volunteer work for Ukraine.

Of course, ham radio is still a very important part of my life. That is why, even for a temporary stay in Finland, I managed to activate all Finnish DXCC entities: OH/OHØ/OJØ/UT5UY. For this, I am sincerely grateful to my Finnish friends: Martti Laine, OH2BH, Pasi Vesterinen, OH2MZB, Timo Rinne, OH5LLR, Pekka Holstila, OH2TA, Miika Heikinheimo, OH2BAD, Henri Olander, OH3JR, and Jarmo Saarijärvi, OH9EGH. All my activities were held under the slogan: Never Give Up, NGU!

According to Finnish law, I could use my OH/UT5UY callsign for only the first six months. Then I needed to get a regular Finnish callsign. In between integration courses, I began to prepare for the exam for obtaining a Finnish amateur radio license. I passed the exam successfully in January 2023. My examiner was the legendary Jukka Heikinheimo, OH2BR. Luckily, the callsign OH5UY was available, and I was able to get it as a vanity callsign.

On February 10th, I "unboxed" my brand new OH5UY callsign. With whom to make the very first QSO? With 3YØJ, Bouvet Island, #2 DXCC most wanted, of course (Photo E)! Many thanks to Martti Laine, OH2BH, and the brave 3YØJ team (operator Mike Crownover, AB5EB) for making my dream come true, with a second call, under very weak signals from Bouvet (*see Mike's report on the DXpedition in this issue's DX column – ed.*). Indeed, Martti's stacked

* *E-mail: <ut5uy@ukr.net>*

Photo B. The C93DY team activating a new IOTA counter AF-098, Chiloane Island, Mozambique, in 2005. Standing (l to r): Alex, UT5UY; Boris Samartsev, UT7UT; Andy Chucha, OK8ANM; Alex Pavlenko, UXØLL; Andy Kotovsky, UU4JMG. Sitting (l to r): Serge, C91EL; Max Oskoma, UR7HTZ; Dima Stashuk, UT5UGR, and Roman Tkachenko, URØMC.

Photo C. Alex, UT5UY, making the first QSO from IOTA AF-098, Chiloane Island, Mozambique, as C93DY in 2005.

Photo D. Alex, UT5UY's DXCC HR#1 plaque, 2016, Kyiv, Ukraine.

beams were a great help. Afterward, I was able to reach out to Mike to thank him for his efforts and he had this to say in response:

Alex,

It was a real pleasure to get you in the log. Of course, I did not know your new call but how exciting that your first QSO was with 3YØJ! The pileups were intense and it was very difficult to get stations in the log. Having to call you multiple times was just part of the 3YØJ experience that was unique for me. It was frustrating to have to call stations over and over and many times I would just have to move on to the next station. To have the stations stick with the QSO and finally come through in the sea of calling stations was always rewarding. With the challenges that you and your family have endured over the past year, I am glad 3YØJ could bring you a little bit of joy.

73, Mike AB5EB/3YØJ

But Wait! There's More!

Today, February 12th, as I write this story, a wonderful sequel has appeared. I have come to visit my friend Pasi Vesterinen, OH2MZB. From his shack, I made a second QSO as OH5UY. It was with Thierry Mazel, FT8WW, on the Crozet Islands, #3 on the DXCC most wanted list! So #2 and #3 from the DXCC most wanted list are already in my log. Is P5 next?

Unfortunately, when I left Pasi at 7:00 p.m., he still had not made a QSO with 3YØJ. This is an ATNO (All-Time New One) for him. I felt how much he was suffering about it. I returned home and saw in the cluster that Bouvet had appeared on 15-meter CW and was barely audible. The fact that this was the genuine 3YØJ was confirmed by a message from the expedition pilot, Steve Hass, N2AJ. I forwarded this information to Pasi immediately. Just at the same moment, it was announced that the 3YØJ DXpedition was going QRT the next day. Pasi saw this announcement and was very

Photo E. Alex's first QSO as OH5UY, contacting 3YØJ on February 10, 2023, from OH2BH's superstation in Finland.

So, it is quite logical to end my story with my favorite slogan: "Never Give Up!"

upset after having tried to hear 3YØJ for several days and ultimately turned off the equipment. But after my message, he returned to the shack. MAGIC had happened! Pasi got lucky – 3YØJ is in his log! So, it is quite logical to end my story with my favorite slogan: "Never Give Up!"

73, Alex OH5UY/UT5UY

Where do we go next...

A Little Bit About AB5EB

Mike Crownover, AB5EB, is a veteran IOTA expeditioner and an emergency room physician. Even though he was not a member of the 3YØJ leadership, he turned out to be the unknown hero of 3YØJ's 18,623 QSOs, as well as of the well-being of the group (Photos F and G). It is well-known that doctors by their very nature not only look after themselves but for also after the others around them, in this case the 3YØJ team. – OH5UY/UT5UY

Photo F. Mike Crownover, AB5EB, on the air from 3YØJ. (KO8SCA photo)

Photo G. The last four 3YØJ operators to leave Bouvet. From left: Otis Vicens, NP4G; Mike Crownover, AB5EB; Gjermund Bringsvor, LB5GI, and Adrian Ciuperca, KO8SCA. (NP4G photo)

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CW Results of the 2022 CQ World Wide DX Contest

The CQ WW Contest Continues to be Phenomenal!

"It still amazes me what fun you can have with just a piece of wire"–M6W (G3WW)

BY JOHN DORR,* K1AR

The U.S. Department of Commerce reports that in 1948, the average cost of a house in the United States was $7,700. Gasoline averaged about 16 cents per gallon. A loaf of bread cost 14 cents. And you were a well-paid employee if you were making $2950 per year. It turns out that on November 5-7,1948, the first CQ WW CW contest also took place (ironically, now the scheduled weekend for the ARRL CW Sweepstakes contest). Like the price of bread, inflation has impacted the WW. In its first year, approximately 550 CW logs were received with the winning entry coming from GI6TK, who posted a final score of 452K (817 QSOs/31 Zones/66 countries). It is indeed amazing to examine our CQ WW roots in what most will agree is amateur radio's premier operating event.

Needless to say, today's CQ WW contest continues to fill the bands. And, with Cycle 25 well underway, that's especially the case on the high bands, including the favorite choice of many, ten meters! What a treat it was to return to the land of 28 MHz and hear signals filling the entire band from one end to the other.

Although the number of submitted logs was slightly down from last year, I'm pleased to report that we still received 7700 logs, representing 4.6M QSOs. The overall accuracy of your log submissions continues to hold steady with a median average error rate of about 2.7% resulting in reductions averaging about 8.8% after penalties. Yes, there's always room for improvement.

One area of the contest that I especially enjoy reviewing is the soapbox comments that many of you include with logs. You can see them for yourself at: <https://cqww.com/soapboxcw.htm?yr=2022>. Here's just a small sample of what you'll find:

"Didn't have the time, but, even 5 minutes of CQWW CW is worth it! Till the next year." – EA1PJ.

"This is my 1st CW try. Thank you." – JK3OTH.

"I even had a decent run on 15 Saturday morning. Who says an indoor mag loop doesn't work?" – KV8O

Let's get on with the results!

Another Year of Incredible CQ WW Contest Operating!

Producing a final score that makes the leader table in the CQ WW contest results is a tremendous achievement

This is BD3TE operating from one of the three sites used in their BY3CQ Explorer multi-op effort in the 2022 CQ WW CW Contest.

Here is the innovative AA7JV "rig-in-a-box" technology used in the remotely-run C6AGU Multi-2 operation.

*Email: <cqk1ar@gmail.com>

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- DSP noise canceling versions EQ20-DSP, EQ20B-DSP with added Bluetooth on input

QST Dec 2019 review "*easy-to-use device that improves the audio clarity of amateur signals*"

In-Line Module

Dual In-Line

Great review in Jan '23 QST!

- 5W amplified DSP noise canceling In-Line module
- 8 filter levels 8 to 40dB - Use in-line with a loudspeaker
- Audio bypass feature - 3.5mm mono inputs and outputs
- Headphone socket - Audio input overload feature

Fully featured flexible dual channel DSP noise canceling unit

- 8 Filter levels 9 to 40dB
- 3.5mm mono or stereo inputs
- Line level input/output
- 7 watts mono speaker output
- Headphone socket
- Easy to use controls

Compact In-Line

- Portable DSP noise canceling unit
- Simple controls
- Use in-line with speakers or headphones
- Line/speaker level inputs
- Use with AA batteries or 12V DC supply

New NEDSP1962-KBD 5W amplified DSP noise canceling speaker retrofit pcb module now available!

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- 5W DSP Noise Canceling Speaker - 8 filter levels
- Compact speaker for for mobile or base station
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10W amplified DSP noise canceling speaker

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- 8 filter levels
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regardless of operating category. As we experienced in the 2022 contest, some of those scores simply boggle the mind. The World Single Op battle was won again by Juan, EA8RM, with a 14.6M point final result, beating out Andy, N2NT, who came in second at 13.3M. Losing by only 1.3M, however, from a "2-point" country is a significant achievement, nevertheless.

The U.S. Single Operator, All-Band results are perhaps the highlight of the 2022 contest. Kevin, N5DX, operating remotely from the N2QV superstation produced an incredible final score of 11.6M, racking in nearly 5900 QSOs, shattering the 8-year-old record of K3CR (operated by LZ4AX) by over 1 million points. Kevin averaged 123 QSOs/hour for the entire 48 hours of the contest, operating in every one

2022 CQWW DX CW PLAQUE WINNERS AND DONORS

SINGLE OPERATOR, ALL BANDS

World
Juan Hidalgo, EA8RM
Donor: Vibroplex

World - Low Power
V26K (Opr.: Bud Trench, AA3B)
Donor: Slovenia Contest Club

World - QRP
PZ5CO (Opr.: Dimitry Kryukov, RA3CO)
Donor: Bob Evans, K5WA

World - Assisted
P44W (Opr.: John Crovelli, W2GD)
Donor: Robert McGwier, N4HY

World – Assisted Low Power
Zvi Stessel, 4X6FR
Donor: Mike Charteris, VK4QS

World – Assisted QRP
DM2M (Opr.: Pit Schmidt, DK3WE)
Donor: Steve "Sid" Caesar, NH7C

U.S.A.
Kevin Stockton, N5DX
Donor: Frankford Radio Club

U.S.A. - Low Power
Larry G Schimelpfenig, K7SV
Donor: North Coast Contesters

U.S.A. - QRP
Doug Zwiebel, KR2Q
Donor: Andy Blank, N2NT - W3ZZ Memorial

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

U.S.A. – Assisted Low Power
Steve Sluz, NY3A
Donor: LA8W/LN8W & LA Contest Club

U.S.A. - Zone 3
NO6T (Opr.: Axel W Bruderer, KI6RRN)
Donor: Arizona Outlaws Contest Club

U.S.A. - Zone 4
Steve London, N2IC
Donor: Central Texas DX and Contest Club - K6RV Memorial

U.S.A. - Zone 5
Greg Cronin, W1KM*
Donor: Carolina DX Association - N4ZC Memorial

Europe
CR6K (Opr.: Filipe Lopes, CT1ILT)
Donor: Florida Contest Group - W3AU Memorial

Europe - Low Power
IY3A (Opr.: Matteo Marzilli, IZ3EYZ)
Donor: Tim Duffy, K3LR

Europe - QRP
Gediminas Lucinskas, LY9A
Donor: Sergio Cartoceti, IK4AUY - I4FAF Memorial

Europe - Assisted
Jon Zumalabe, EA2W
Donor: IR4X Monte Capra Contest Team - I4IND Memorial

Europe - Assisted Low Power
ES7A (Opr.: Kristjan Kaas, ES7GM)
Donor: John Rodgers, WE3C

Africa
3B9KW (Opr.: Kazunori Watanabe, MØCFW)*
Donor: Ralph "Gator" Bowen, N5RZ - K5KA Memorial

Asia
C4W (Opr.: Marios Nicolaou, 5B4WN)
Donor: DFW Contest Group - W5PG Memorial

Carib./C.A. – High Power
V47T (Opr.: Andrew Blank, N2NT)
Donor: DFW Contest Group - W5PG Memorial

Carib./C.A. – Low Power
VP2MJA (Opr.: Dennis Gasparotto, VA3WB)*
Donor: Albert Crespo, NH7A

Oceania
9M6NA (Opr.: Saty Nakamura, JE1JKL)
Donor: Ken Hoppe, KH7R

Oceania – Assisted
Ron Schiltmans, DU3T
Donor: Koa Contest Club, Hawaii

South America
Alexey Ogorodov, HC2AO
Donor: Dave Farnsworth, WJ2O

South America - Southern Cone (CE, CX, LU)
LW1F (Opr.: Jesus Rubio, LU5FC)
Donor: Dale Long, N3BNA

Scandinavia (LA, OH, OZ, SM)
OHØZ (Opr.: Tomi Ylinen, OH6EI)
Donor: Chas Weir, Jr., W6UM - W3FYS Memorial

Baltic (ES, LY, YL)
Agris Belasovs, YL2VW
Donor: Lithuanian Radio Sports Federation - LY2OO Memorial

Canada – High Power
VE2IM (Opr.: Yuri Onipko, VE3DZ)
Donor: John Sluymer, VE3EJ & Jim Roberts, VE7ZO

Canada – Low Power
VE3MIS (Opr.: John Rudy Koren, VA3JK)
Donor: Maritime Contest Club - VE1AL Memorial

Japan – High Power
Masa Okano, JH4UYB
Donor: Phil Yasson, AB7RW

Japan - Assisted
Hajime Hazuki, JR2GRX
Donor: Aki Nagi, JA5DQH

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V8, YB, DU)
V85RH (Opr.: Hajime Kato, JO1RUR)*
Donor: Champ C. Muangamphun, E21EIC - SIAM DX GROUP

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V8, YB, DU) - Assisted
Galih Suryananto, YC2VOC*
Donor: Champ C. Muangamphun, E21EIC - SIAM DX GROUP

SINGLE OPERATOR, SINGLE BAND

World - 28 MHz
D4L (Opr.: Luca Aliprandi, IK2NCJ)
Donor: Joel Chalmers, KG6DX

World - 21 MHz
KH7Q (Opr.: Jim Neiger, N6TJ)
Donor: CWOps

World - 14 MHz
Brian Edward, N2MF
Donor: North Jersey DX Association - W2JT Memorial

World - 7 MHz
Nick Hacko, VK9DX
Donor: John Rodgers, WE3C

World - 3.5 MHz
4L/LY4ZZ (Opr.: Algirdas Sadaunikas, LY2BMX)
Donor: Family of Fred Capossela, K6SSS

World - 1.8 MHz
Ilya Semichastnov, 4L9M
Donor: Kenneth Byers, Jr., K4TEA

U.S.A. - 28 MHz
Jay E. Camac, N4OX
Donor: John Rodgers, WE3C

U.S.A. - 21 MHz
Peter Bizlewicz, KU2M
Donor: Adrian Ciuperca, KO8SCA

U.S.A. - 14 MHz
Dan Handa, W7WA*
Donor: Northern Illinois DX Association

U.S.A. - 7 MHz
Charlie Hansen, NØTT
Donor: Gene Shablygin, W3UA

U.S.A. - 3.5 MHz
Steven Sussman, W3BGN
Donor: Bill Feidt, NG3K

U.S.A. - 1.8 MHz
Jeffrey T. Briggs, K1ZM
Donor: Jeffrey T. Briggs, K1ZM

Europe - 28 MHz
YUØT (Opr.: Branko Vidakovic, YU1WS)
Donor: Jay Pryor, K4OGG

Europe - 21 MHz
Leo N. Xhoko, S5ØR
Donor: John Rodgers, WE3C

Europe - 14 MHz
OH8X (Opr.: Pasi Luoma-aho, OH6UM)
Donor: John Rodgers, WE3C

Europe - 7 MHz
Vladimir Pusec, OK1Z
Donor: Ivo Pezer, 9A3A

Europe - 3.5 MHz
ISØ/OM2TW (Opr.: Richard Gasparik, OK8WW)
Donor: Frankford Radio Club - K3VW Memorial

Europe - 1.8 MHz
Laci Nemeth, OM5NL
Donor: Pat Barkey, N9RV & Terry Zivney, N4TZ

Asia – 14 MHz
Mamuka Kordzakhia, 4L2M
Donor: Ralph "Gator" Bowen, N5RZ - W5FO Memorial

Asia – 7 MHz
P35A (Opr.: Roman Thomas, 5B4AQN)
Donor: Rich Gelber, K2WR

Carib./C.A. (21 MHz)
WP4WW (Opr.: Jose A. Rivera-Salaman, KP4JRS)
Donor: David Hodge, N6AN

Canada (21 MHz)
Michael Smith, VE9AA
Donor: John Sluymer, VE3EJ - VE3TA Memorial

Japan - 21 MHz
Akito Nagi, JA5DQH
Donor: Bob Wilson, N6TV

Japan - 14 MHz
Syuichi Sato, JA7FTR
Donor: Charlie Morrison, N1RR - N1XS Memorial

OVERLAY CATEGORIES

World – Classic
KP2M (Opr.: Philip Allardice, KT3Y)
Donor: CWops

of them! The horserace was much closer for the remainder of the top-10 U.S. SOAB scores, with Greg, W1KM, delivering a second-place result of 7.5M, a huge increase from his first SOAB effort of 1.8M points back in 1979.

Domination is also the operative word for the World LP group, as Bud, AA3B demolished the competition with an amazing score of 12.9M. Perhaps more impressive about Bud's result is that he would have placed #3 in the world amongst the high power entries, all with only 100 watts! Location, station design, and operating skill all contribute to these amazing numbers.

Speaking of amazing, how about that QRP score from PZ5CO, who managed to produce a dominating 6.3M tally, generating over 4400 contacts? That's a new record that's

U.S.A. – Classic
Doug Grant, K1DG
Donor: CWops

World – Rookie
Justin Ogle, N9TTK
Donor: CWops

U.S.A. – Rookie
Dennis Tune, W9DCT*
Donor: CWops

Europe – Rookie
Zdeslav Cerina, 9A5RTW
Donor: EA Contest Club

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V8, YB, DU) – Rookie
Manatchai Suwannasri, E25CRF
Donor: Champ C. Muangamphun, E21EIC - SIAM DX GROUP

World – Youth
Kees Van Oosbree, WØAAE
Donor: Zoli Pitman, HA1AG

North America – Youth
Maria Polyanska, VE3OMV*
Donor: IARU Region 2 for YOTA

Europe – Youth
William Eustace, MØWJE
Donor: IARU Region I Youth Working Group

South America – Youth
Leonardo Timoteo Silva, PY2POA
Donor: IARU Region 2 for YOTA

Africa – Youth
No Entries
Donor: IARU Region I Youth Working Group

Asia – Youth
Jian'ang Zhu, BD4VGZ
Donor: YOTA Japan

Oceania – Youth
Karunya Saka Listianto, YD2UWF
Donor: IARU Region 3

World Single-Operator – Explorer
Oscar Vais, LU6OA
Donor: World Wide Radio Operators Foundation

World Multi-Operator – Explorer
OT7T (Oprs.: OP4K, OP5T, OQ4U, OT5Z, OR5T, OT6E, OQ5M, OO7J, ON4CAU, ON4FI, ON4IT, ON4PQ, ON5JT, ON5TN, ON5OO, ON5XX, ON7MV, ON7TK, ON9EEE, ON5RA)
Donor: World Wide Radio Operators Foundation

MULTI-OPERATOR, SINGLE TRANSMITTER

World
P33W (Oprs.: RA3AUU, RW4WR, LZ2HM, LZ3SM, EW1NY)
Donor: Friends of Rich - KL7RA Memorial

World – Low Power
FY5KE (Oprs.: F4CWN, F5HRY, FY5FY, F6FVY)
Donor: EA Contest Club

U.S.A.
K1LZ (Oprs.: AC1NU, K1LZ, K2SSS, K3JO, NA1NA, W1ADI, W2ID)
Donor: Douglas Zwiebel, KR2Q

U.S.A. – Low Power
W4KZ (Oprs.: W9SN, W9RNY)
Donor: CWOps

Africa
TY5AF (Oprs.: OH2TA, OH5BM, OH5LLR)
Donor: John Rodgers, WE3C

Asia
UP2L (Oprs.: R9CM, R9HBA, R9IR, RM9I, RU9I, UA9MA, UC9A, UNØL, UNØLM, UN6LN, UN7LZ, UN9L, UN9LG)*
Donor: Steve Merchant, K6AW

Carib./C.A.
ZF1A (Oprs.: NN1C, W9KKN, N5KO, N6MJ)
Donor: CWOps

Europe
LZ5R (Oprs.: LZ1NK, LZ1YQ, LZ1ZF, LZ2BE, LZ2PL, LZ2XA, LZ3ND, LZ3ZZ, LZ5DB, LZ5DD, YO9WF)
Donor: Gail Sheehan, K2RED

Europe – Low Power
IB9T (Oprs.: IT9BLB, IT9EJW, IT9GAC, IT9RZU, IT9VDQ)
Donor: Marco Holleyn, DJ4MH

Oceania
AH2R (Oprs.: NH2C, WI3O)
Donor: Junichi Tanaka, JH4RHF

South America
PJ4A (Oprs.: K4BAI, KU8E, N8VW, PJ4NX)
Donor: Araucaria DX Group

Japan
JH8YOH (Oprs.: JR8VSE, JE8KKX)
Donor: Madison Jones, W5MJ

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V8, YB, DU)
7A2A (Oprs.: YBØECT, YC1SDL, YB2DX, YB2XVT)
Donor: Bruce Frahm, KØBJ

MULTI-OPERATOR, TWO-TRANSMITTER

World
CR3DX (Oprs.: HA3NU, OM2VL, OM3BH, OM3GI, OM3RM, OM7LW)
Donor: Array Solutions

U.S.A.
W3LPL (Oprs.: W3LPL, NI1N, K3MM, N3OC, N3QE, K3RA, NN3W, WR3Z, KD4D)
Donor: Robert Kasca, S53R

Europe
TKØC (Oprs.: S53CC, S53F, S53MM, S53RM, S53WW, S53ZO, S55OO, S57AL, S57C, S57K, S57L, S57VW)
Donor: D4C Monteverde Contest Team - IR4X Monte Capra Contest Team - I4EAT memorial

Carib./C.A.
HQ9X (Opr.: K1TR, K1XM, KQ1F, SM7IUN, W1UE)
Donor: South East Contest Club

South America
PJ4K (Oprs.: WA3LRO, K1XX, W4PA, W1MD, K3CT, G3NKC, GD4XUM, N3RD)
Donor: PJ4A Team (Jeff Clarke, KU8E and John Laney, K4BAI)

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V8, YB, DU)
E2A (Oprs.: 5B4AGN, DL3DXX, E2ØNKB, E21EIC, E25KAE, E29TGW, HS3PIK, HS4RAY, LA7JO, SM3DYU, VE3LA, W2YR)
Donor: Champ C. Muangamphun, E21EIC - Siam DX Group

MULTI-OPERATOR, MULTI-TRANSMITTER

World
CN3A (Oprs.: OK1CZ, OK1FFU, OK1GI, OK1GK, OK1HGM, OK1JKT, OK1MV, OK1NY, OK1RI, OM6NM, CN8WK)
Donor: The K2GL Operators - K2GL Memorial

U.S.A.
K3LR (Oprs.: N8AMY, K3LR, WF7T, K3UA, N2NC, W2RQ, N3SD, N9RV, K4RO, N6TV, KG5HVO, N3GJ, VE3RA)
Donor: Ham Radio Outlet - W6RJ & N6RJ Memorial

Europe
9A1A (Oprs.: 9A5W, 9A9A, 9A6A, 9A7R, 9A5E, 9A3SMS, 9A8A, 9A2EU, 9A6M)
Donor: SRAL (Finnish Amateur Radio League – OH2SB Memorial)

Africa
CR3W (Oprs.: DJ2YA, DK7YY, DL1CW, DL5AXX, DL5CW, DL5LYM, DL7UGN)*
Donor: EA9EO Memorial

Asia
A44A (Oprs.: A41JZ, IK1YDB, IK2PFL, IK1HJS, SV5DKL, IK1QBT, A45TT, A45VU, A41CK)
Donor: Nodir Tursun-Zade, EY8MM

CONTEST EXPEDITIONS

World Single Operator
3B9KW (Opr.: Kazunori Watanabe, MØCFW)
Donor: Friends of Phil - N6ZZ Memorial

World Multi-Operator
K8H (Oprs.: W7YAQ, K7AR)
Donor: CWOps

SPECIAL AWARDS

World SSB/CW Combined Unassisted
P4ØT/VE2IM (Opr.: Yuri Onipko, VE3DZ)
19,859,532
Donor: Hrane Milosevic, YT1AD

U.S.A. SSB/CW Combined Unassisted
Ed Sawyer, N1UR
9,733,666
Donor: Bob Shohet, KQ2M

Europe SSB/CW Combined Unassisted
OM7K (Opr.: Richard Tucek, OM7RU)
6,751,357
Donor: Marko Myllymaki, N5ZO

Europe SSB/CW Combined – Low Power
Jiri Cernoch, OK2MBP
2,265,354
Donor: EU1AA Memorial

Triathlon Award - World RTTY/SSB/CW Combined
VE3DZ/P4ØT/VE2IM (Opr.: Yuri Onipko, VE3DZ)
22,277,204
Donor: DX Lodge Roatan (HQ9X)

Triathlon Award - Europe RTTY/SSB/CW Combined
Branislav Hacko, YT3D
6,682,943
Donor: Bavarian Contest Club – LX1WW Memorial

World Combined SSB/CW Score 16Ø Meters
OK4U (Opr.: Tom Stepnicka, OK1TP)
63,891
Donor: Team IB9T/IR9Y - IT9ZGY Memorial

World Combined SSB/CW Score – Multi-Operator, Multi-Transmitter
CN3A (Oprs.: IK2QEI, OK1RI, IK2SGC, IZ1LBG, IZ2ZOZ, OM6NM, OK1NP, OK1DO, OK6RA, OM1RI, OK1VVT, CN8WK, OK1CZ, OK1FFU, OK1GI, OK1GK, OK1HGM, OK1JKT, OK1MV, OK1NY)
91,428,337
Donor: Friends and Family of Gene – N2AA Memorial

CLUB SCORES

U.S.A. SSB/CW
Frankford Radio Club
464,Ø27,502
Donor: Northern California Contest Club

DX SSB/CW
Bavarian Contest Club
347,677,055
Donor: John Rodgers, WE3C

* Second Place

2022 CQWW DX CW TOP SCORES

WORLD

SINGLE OPERATOR
HIGH POWER
All Band

EA8RM 14,633,647
V47T (N2NT) 13,330,347
CR6K (CT1ILT)...12,835,488
N5DX (@N2QV) .11,640,105
VE2IM (VE3DZ)..10,460,793
VY2TT (K6LA) 9,215,920
EF6T (EA3M).....9,008,166
TO5Z (N6GQ).....8,092,887
W1KM.....7,496,808
XL3T (VE3AT) 7,468,593

28 MHz

D4L (IK2NCJ) 1,142,280
EF8BBM (EA4BQ)...989,050
LW1F (LU5FC) 934,362
OA4O (EA7TN).....906,803
5Z4VJ 667,183
JS6TSE (JM1UWB) 495,992
KH7M (KH6ZM) 433,596
YUØT (YU1WS) 397,578
LU2D (LU2DX) 394,130
YU7EE.....310,365

21 MHz

KH7Q (N6TJ @KH6YY) 859,856
VE9AA.....667,440
KU2M.....658,360
K3RV 633,840
S5ØR.....629,788
N5AW 614,295
TM6X (F5VHY) 584,982
JA5DQH 572,040
WP4WW (KP4JRS).....557,190
RC3U.....550,246

14 MHz

N2MF.....930,560
OH8X (OH6UM) 846,612
DMØA (DK3DM).....764,005
4L2M.....586,432
JA7FTR 458,234
W7WA 406,262
JR2SCJ 343,560
KW9A 329,814
XE1CT.....324,736
YT7B.....322,344

7 MHz

VK9DX.....1,005,471
OK1Z 791,700
P35A (5B4AQN) 756,069
OM2XW 701,415
EA8/GU4YOX (GU4YOX) 654,500
OM5R (OM5WW) 633,984
JJØVNR.....566,568
JA6SHL 406,575
R4SA 194,292
LZ7M (LZ5VK) 151,286

3.5 MHz

4L/LY4ZZ (LY2BMX) 520,498
ISØ/OM2TW (OK8WW) 429,282
G4FNL.....258,520
S53X.....252,700
W3BGN 126,400
OK1TN.....118,141
K9ZO 94,256
DK2CF.....79,776
YL7A.....77,995
IR2R (IZ2EWR) 71,682

1.8 MHz

4L9M.....153,738
NP2J (K8RF) 101,844
VE3ZI.....91,572
K1ZM.....48,807
VE3PN.....45,155
WF2W.....36,267
OK4U (OK1TP).....36,167
M6N (MØNPK) 29,610
YO3APJ.....27,880
HL5IVL.....24,360

LOW POWER
All Band

V26K (AA3B) 12,962,248
IY3A (IZ3EYZ) 5,079,492
HC2AO 4,572,040
VP2MJA (VA3WB).....4,428,456
K7SV 3,507,995
K1BX 2,798,455
6Y6N (DK9PY) 2,638,840
VP5M (K4QPL).....2,610,374
K1VUT 2,140,261
N4TZ.....2,078,676

28 MHz

CX2AQ 439,161
HI3Y.....351,540
CS2C (OK1RF).....308,826
PR1T (PY1ZV).....295,390
4K6FO 258,000
NP3A 253,692
JA2KKA 249,984
LZ4TX.....236,880
HZ7C (7Z1SJ) 213,226
L5ØDY (LW3DG).....185,031

21 MHz

N8II 503,276
FR8UA.....456,710
S5ØA 375,804
EU8U 369,895
YT9W.....330,625
JA6WFM.....237,060
WB4TDH 232,624
JR3EOI 231,894
W6YX (N7MH).....221,186
OA4DX 207,466

14 MHz

PY2NY.....394,822
DL9ZP 191,565
DL4AAE.....175,336
EW1TZ 174,432
IK4MTF.....140,049
ON3PAT 130,416
NU8A.....118,854
JHØEPI.....112,700
GD5F (GD4RFZ) 108,847
R3AQ.....108,480

7 MHz

OM3ZWA.....172,500
C56DF (G3XTT) 120,967
IV3EAD.....118,762
OH9SE (OH9HDH)..104,412
LZ1BP.....103,014
OK2HBR.....92,926
HA9RP.....89,712
YO5ODT.....86,016
DK4LX 81,002
JRØBQD.....69,445

3.5 MHz

OK5D (OK1DTP) 135,072
OL5J (OK1RZ).....77,120
CO2AN 77,117
CO2JD.....66,898
SP3JUN.....62,694
E77BW 50,504
DL6KWN.....42,490
S57X.....35,280
IK2ULV 34,386
HB9CPS 33,924

1.8 MHz

OM5NL 57,304
SM6CNN 51,675
LC9X (LA9XGA) 20,124
OK1MNW 19,719
HA4N 19,656
MØNDZ 17,700
EA4IE 14,310
DLØMCM (DL6KWN) 12,255
RA3UAG.....11,825
UF5A 10,545

QRP
All Band

PZ5CO.....6,335,373
KR2Q.....1,375,470
LY9A.....1,078,742
DK7HA.....888,440
JH1OGC.....576,232
JR4DAH.....493,344
DL1MAJ.....490,560
HA5BA.....482,895
N8AA 371,616
K8MR.....369,460

28 MHz

4F3OM.....101,181
OM7PY 41,031
US5VX.....31,450
F8AKC.....24,081
YO6EX.....20,367
NH6O.....17,888
CO6EC 13,158
HF5WIM 12,934
G3L (G3LHJ) 10,035
W7USA.....9,947

21 MHz

LZ2RS 114,885
HA3JB 92,340
JQ1NGT 54,320
YV5EN.....52,850
JR1NKN.....50,220
EA2BO.....46,720
M7R (GØTPH).....43,092
JR2EKD.....26,432
SP4NKJ.....25,704
G3YMC.....23,973

14 MHz

FS/KØCD.....124,236
RT4W 65,270
JE1RZR.....65,145
YU1RK.....50,320
DL2TM.....39,591
G2X (GØDCK).....25,593
YO4BEX 18,360
DH1AKY 12,818
SP2HMY.....7,750
EA3BES.....5,720

7 MHz

YU1RA.....104,839
OK6OK 70,752
DM2DZM 38,511
F5MOG.....34,444
GM1J (MMØBQI).....30,528
HA3GC 28,880
M3F (G3WZD) 28,248
OK1LO.....12,862
UT5UUV 7,050
IZ5OVP.....3,864

3.5 MHz

YT5YTT 43,736
YO8RAA 22,836
SM6DOI.....18,135
IO5K (IK5TBK).....17,216
SP8OOE.....11,289
YO8RIX 9,744
DMØY (DH8BQA).....8,046
G3YHF.....7,990
OH1RX 7,696
UT1WW 5,236

1.8 MHz

GM3YEH 19,740
LY4T 12,432
UR5FEO.....10,200
DL1AOB 8,850
HA1TI 7,200
IK1RAC.....1,408
OU2V (OZ1FJB) 1,404
IZØORT 660
URØFF 342
OH5LAQ (OH5CW) 40

SINGLE OPERATOR
ASSISTED
HIGH POWER
All Band

P44W (W2GD)....13,457,875
K5ZD 11,150,100
EA2W 9,184,725
VA2WA 9,157,896
K3WW 8,659,726
SN7Q (SP7GIQ)...8,641,836
K1ZZ.....8,631,612
UW1M (UR5MW)..8,197,727
KP3DX (NP4Z) 7,212,387
II2S (IK2QEI) 7,005,284

28 MHz

LU8DPM (LW8DQ)..935,887
LT6M (LU8MHL).....779,160
CX2BR.....762,669
9A5Y (9A7DX) 648,200
4L8A 628,269
PY4BZ 527,498
HA3LN.....518,064
9A5D (9A5DU).....517,820
KV2K (K2NG) 478,950
Z35T 477,795

21 MHz

V31CQ (K5PS) 942,704
XQ1KZ.....927,055
4X1MM 919,181
HA5JI.....848,144
OM8CW.....845,920
S5ØK.....826,920
YTØZ (YU1ZZ) 755,650
YT9A.....753,666
SN2M (SP2XF).....730,334
RL3A (RL3FT) 675,078

14 MHz

DL6FBL 1,002,840
YT3X.....984,725
HGØY (HA7GN) 921,519
UB7K 890,928
HA8A (HA8DZ) 880,821
K8CX 854,712
OMØM (OM3CGN)..849,680
OL9Z (OK2PVF) 834,716
S57Z.....819,408
S57DX 818,832

7 MHz

SN3A (SQ2GXO)..1,233,900
S53M (S51FB).....1,111,352
OK6W (OK1MU)...1,069,752
S51YI.....943,428
S52AW 916,994
VE3VN.....896,124
NH7T (@KH6YY) 875,550
S57WJ.....762,528
KA1IS 757,044
R3ZZ.....729,570

3.5 MHz

HA1TJ.....493,878
MW5B (G3WVG) 478,682
YL9W (YL3DW) 438,360
LZ6Y (LZ1MC).....421,448
SN2B (SP2MKI).....405,444
OL3A (OK1DX).....361,383
DJØMDR 307,051
PA1CC.....284,440
9A8M (9A3XU) 267,159
OM5CM 247,200

1.8 MHz

S51V.....164,808
YL3FT.....147,402
S53O 138,123
R9PS 126,522
RX3APM.....113,565
HA8BE.....86,480
SP3HLM 79,900
S56X.....79,650
RG2A.....76,077
DM7C (DL6CX) 75,650

LOW POWER
All Band

4X6FR 7,837,438
ES7A (ES7GM) 5,379,230
NY3A 4,856,628
UN4Q (UA4Z) 4,261,446
PP5BZ 3,670,056
DJ5MO 3,457,212
KS1J 3,393,390
OL5Y 3,390,340
OL9R (OK6RA).....3,357,746
OHØV (OH6LI) 3,256,152

28 MHz

AH6KO 391,482
FR8TZ 284,513
EA6SX.....263,755
XQ3WD 261,600
PY4XX.....256,891
HK1N.....240,670
HGØR (HAØNAR) ...235,445
4XØA.....228,872
PY2RSA 220,528
PY7RP.....168,087

21 MHz

UN4L 423,913
V55Y (V51WH) 400,320
CT7/DL6IAK (DL6IAK).....378,099
EE5K (EA5DF) 329,935
ED7O (EA7EU).....310,488
BA5CW.....300,989
JF3BFS.....276,479
OM5KM 263,702
W9XT.....256,452
TA2DA.....250,070

14 MHz

9Z4Y 599,250
IR9R (IT9WDC) 407,805
RA9AP.....403,106
YU5M.....346,560
M6W (G3WW) 323,856
OL3R (OK1VWK) 318,164
IZ8EFD 256,168
EA3IN 250,062
G4ERW 232,224
E7AA (E73AA).....185,328

7 MHz

YT2AAA.....424,700
YU7WW.....346,527
EU2F 336,746
ES7GN 325,304
HA7I (HA7JTR).....312,002
CO8ZZ.....276,471
OM3TZZ 271,414
VE9BK.....236,680
OM5ALL 194,951
YT2B.....189,552

3.5 MHz

S57AW 169,592
4Z4KX.....147,760
YO5AVN 136,344
E79D.....130,707
YU1ED.....92,652
Z33F 92,430
YT1WA 85,941
OK1AY.....79,887
OK1USP 65,700
UT7NY.....62,560

1.8 MHz

HAØHV.....70,933
OK6Y (OK2PTZ).....53,058
SNØR (SQ9IAU).....52,785
G5Q (G3SVL) 28,182
UR7MZ 27,328
DF7GG 25,740
DL5ANS.....10,123
IH9YMC 9,360
R9LM 8,976
LZ7R.....7,938

QRP
All Band

DM2M (DK3WE)...2,312,442
EF3O (EA3O) 1,519,600
JA6GCE.....1,109,988
KA4RRU 985,226
OMØRX.....880,400
MW9W (GWØKRL) 723,247
HG5O (HA5OB).....579,018
K8ZT.....538,800
G1G (G4KIV) 459,081
YU1LM.....409,200

28 MHz

LT7D.....142,155
EA3QP.....116,928
DL1EFW.....97,080
SP7M.....72,358
UX9Q (UR9QQ).....51,040
YP8A 33,934
LY2OU.....31,740
4Z4UO.....23,312
IK4OMU.....20,768
3G3O (XQ3OP) 18,018

21 MHz

M3A (MØUKR) 220,864
HA6FQ.....209,300
HA8RD 124,488
M3E (G4CWH) 95,079
HG3C (HA3HX) 85,065
K6JS 80,172
YC1LJT.....22,737
OQ4B (ON4BHQ) 18,048
ON/S58J (S58J) 16,758
UY5LW 16,697

14 MHz

HG5A (HA5IW) 222,358
S58WW 150,060
DM7AA 109,242
IZ8NWA.....100,776
K3TW.....63,420
LY4BF.....50,869
JK7DWD.....46,818
KO1H.....33,580
W1IE.....33,535
W2VRK.....31,980

7 MHz

F5MMX.....65,504
HA4FY.....58,548
S58R.....54,048
IW3ILM.....19,032
SP5FKW.....16,200
S52CQ.....16,055
SP6EIY 5,502
KQ2RP 5,074
DL4CF 4,816
EI3CTB 546

3.5 MHz

OL4W (OK1IF).....71,467
S5ØXX.....62,100
YT8A.....56,070
SP5ES 40,014
S51Z 24,857
SQ9MR.....14,442
OK6DJ 11,825
PF5T.....8,211
DO6SR 5,546
UW1U (UT7UA).....3,306

1.8 MHz

YO8WW.....8,046
RM4W.....3,526
EA5Y 2,769
DL5SFC.....2,183
UT4UBZ.....1,312
V31MA.....592
JH4RUM 6

MULTI-OP
SINGLE-TRANSMITTER
HIGH POWER
All Band

P33W.....25,580,949
ZF1A.....18,548,608
LZ5R.....17,603,784
PJ4A.....16,826,600
UP2L.....16,739,261
K1LZ.....16,690,848
OM7M.....16,672,638
TM6M 16,218,862
IR4M.....14,628,636
E7DX 14,487,240

LOW POWER
All Band

FY5KE 13,695,220
WP3C 9,497,412
IB9T 6,822,036
W4KZ.....5,619,065
IO3F.....4,884,492
9H6WW 4,572,500
E7CW 4,516,272
EA5KM 4,446,064
IR6T.....3,862,510
E7GZ 3,556,750

MULTI-OP
TWO-TRANSMITTER
All Band

CR3DX 39,611,468
PJ4K.....31,331,662
TKØC.....24,525,288
W3LPL.....19,462,500
P44X.....19,119,034
EF2X.....17,979,101
HQ9X.....16,696,400
ED1R.....16,422,876
OL3Z.....14,245,326
II9P 14,177,150

MULTI-OP
MULTI-TRANSMITTER
All Band

CN3A.....44,014,817
CR3W.....41,003,743
PJ2T 33,708,798
3B8M 29,016,903
9A1A.....25,217,834
K3LR.....23,705,156
YT5A.....22,879,624
M6T 22,742,406

A44A.....20,965,527
LZ9W.....20,944,836

EXPLORER
SINGLE-OP
HIGH POWER
All Band
LU6OA.....1,053,592
SP5ATO 290,920
C6AZT 258,336
S53K.....211,024
WX8S 189,666
OH2XX 38,872
NØUJT.....31,824
K7RB 18,715
YO2GL.....15,714

EXPLORER
MULTI-OP
HIGH POWER
All Band
OT7T 16,360,290
ZM1A.....14,301,232
C6AGU 12,615,785
EA4URE 9,150,408
YPØK.....3,758,307
ZL3X.....3,533,658
BY3CQ 1,232,763
EA6URL.....534,567

ROOKIE
HIGH POWER
N9TTK 2,770,979
9A5RTW 1,051,050
W9DCT.....723,976
EI6LA.....637,096
K3AK 266,485
EA4HQV 181,300
HA5MIG.....143,312
EA5JDN.....44,400
KD2UBH 7,107
JK1BAB 238

LOW POWER
KY4ID 710,973
VA3OKG.....689,913
EA4HKF.....596,755
KY4GS.....573,016
AEØDX.....443,368
VE3KOT 359,968
KD2ZEL 204,930
UBØAZR.....201,894
4X6FB.....170,841
JK1AUY 155,220

CLASSIC
HIGH POWER
KP2M (KT3Y) 5,145,882
ED8M (EA8DIG) ...4,758,704
K1DG.....4,278,254
KQ2M 3,935,016
VA2EW 3,648,886
3B9KW
(MØCFW) 3,386,060
N4AF 3,195,840
OHØZ (OH6EI) 3,143,880
DL2CC.....3,121,938
YT3D 3,085,780

LOW POWER
K1BX 2,798,455
VP5M (K4QPL).....2,610,374
9A1AA 1,748,028
K3AU (K2YWE) 1,324,632
DL2NBU 1,272,866
CR5O (CT7AJL) ...1,189,875
EA8CN.....1,180,098
HA5PP.....1,171,698
EA4KD.....1,166,241
4U1UN
(KO8SCA).....1,146,831

YOUTH
HIGH POWER
WØAAE 2,272,125
MØWJE 341,880
SA6NIA.....163,780
EI8KW 133,575
HA3MAR.....13,132

LOW POWER
BD4VGZ 571,200
VE3OMV.....268,641
IUØLJD.....220,884
DL7PIA 180,400
BH2SWB 159,274
YD2UWF 134,820
YL3JA.....119,528
DS1TUW 102,227
BI4MPH 39,697
DK1YH.....36,372

UNITED STATES
SINGLE OPERATOR
HIGH POWER
All Band
N5DX
(@N2QV).....11,640,105
W1KM.....7,496,808
N2IC 5,956,685
NO6T (KI6RRN
@WA6TQT).....5,767,692
N1UR.....5,697,900
NR3X (N4YDU) 5,681,676
W9RE 5,346,486
NN7CW 5,192,950
NA8V 4,876,106
K1DG.....4,278,254

28 MHz
N4OX.....275,709
N5YT 109,383
AH2O.....39,600
AF2F.....36,210
K4RDU 35,752
W9OP.....35,700
NC4S.....15,642
K1IB.....4,114
K7IU.....324

21 MHz
KU2M.....658,360
K3RV 633,840
N5AW 614,295
W6YA 480,240
N6KN.....198,153
WØYK.....171,308
N4KS 165,792
K5QR.....155,477
NIØK.....44,088
K7NT 15,890

14 MHz
N2MF.....930,560
W7WA 406,262
KW9A 329,814
W7UT 47,430
W3AKD.....12,675
KØQEI 8,517
WØTY.....2,812
AK5Y 204

7 MHz
NØTT.....111,320
WO3Z 51,709
K8GU.....49,708
NIØC.....21,462
N7RK.....10,498
K2AF.....5,967
W7ID.....2,310
AA8BV 1,593
AA2DT 1,239

3.5 MHz
W3BGN 126,400
K9ZO 94,256
W1HI.....55,250
KØPJ 32,802
W6RKC.....663
K5IB.....627

1.8 MHz
K1ZM.....48,807
WF2W.....36,267
W1HIS 3,552
WA1BXY.....2,430

LOW POWER
All Band
K7SV 3,507,995
K1BX 2,798,455
K1VUT 2,140,261
N4TZ.....2,078,676
WW4XX (LZ4AX)..1,884,008
K3AU (K2YWE) 1,324,632
N1DC.....1,063,474
K1HT 894,704
W1NN.....859,527
AA8CA.....823,768

28 MHz
N4AO (WC4E).....100,440
AB1J.....61,290
W4RYW.....58,996
N4NM 44,620
W8JGU.....34,408
KD2P 29,308
NIØG 26,980
WNØL.....13,293
K2CS 12,300
W2YK 12,208

21 MHz
N8II.....503,276
WB4TDH 232,624
W6YX (N7MH).....221,186
WA7BNM.....115,696
K4AMC 65,320
WB9HFK.....59,994
AF8A.....49,364
N6RM 36,244
WA8ZNC 28,014
W9QL 25,050

14 MHz
NU8A.....118,854
W8GOC.....33,930
N8ET 30,342
K1EFI.....29,835
W2TZ.....27,542
NW4V 16,100
N7SE 3,800
W3EH 2,160
W6YOY.....1,421
AA1ZX 510

7 MHz
K9UIY 61,812
W4TJM 25,661
AC8CE.....11,172
W8NNC 2,232
KA9A 725
KT5LA.....660
KI5PED.....598
KW4FAB.....104
K6AUS.....48
WS5D 12

3.5 MHz
KC4WQ 814
KE6GLA.....112

1.8 MHz
WD8DSB 1,704
N8UX 70

QRP
All Band
KR2Q.....1,375,470
N8AA 371,616
K8MR.....369,460
W6JTI 357,744
AC2YD.....285,056
WB2CPU 209,520
W6QU (W8QZA).....160,461
NDØC.....156,891
K4PQC 152,342
N7RCS 123,402

28 MHz
W7USA.....9,947
K3UT 7,800
N1AIA 7,084
N3HCN 4,625
WA6FGV 3,770
KJ5T 1,000
NØJK.....60

21 MHz
KF4AV 22,126
WW2G (WU2M).....18,711
KEØTT.....13,195
WC7S 8,601
AB8DF.....2,310

14 MHz
N5GSG 32

7 MHz
WA2NYY 1,917

SINGLE OPERATOR
ASSISTED
HIGH POWER
All Band
K5ZD 11,150,100
K3WW 8,659,726
K1ZZ.....8,631,612
N3RS.....6,928,620
W8FJ 6,698,250
AB3CX.....6,593,694
N2YO.....6,471,840
AA1K 6,379,416
K1AR 6,214,725
N2SR.....5,889,646

28 MHz
KV2K (K2NG) 478,950
N6SS 252,453
N4ZR 222,080
K5KG 218,694
K4WI.....204,378
NE8P 148,953
W8AV 135,346
N2OO 113,088
W4DD 92,628
AG9S.....59,202

21 MHz
WB9Z.....571,704
AA7A 490,889
N7AT (K8IA) 459,669
N9CO.....438,353
N7DD.....427,040
W7RN (K5RC).....383,396
NC1CC 290,440
W2AW (N2GM).....253,614
K7SS 231,750
KE4S 150,930

14 MHz
K8CX 854,712
N7TU 116,348
K7PI.....56,854
WA5YOM.....39,144
KA6BIM 26,574
NN3W.....10,800
AA2EQ.....8,424
K3KEK.....3,420
K4MQM 1,400
KE4KDY 756

7 MHz
KA1IS 757,044
K7NJ.....423,500
WK1O 399,355
W9PA 340,650
N7KU (NJ6D).....261,513
N9AU 149,467
N7WA 146,520
W9RN 103,936
AD8J.....69,984
NI2M 60,495

3.5 MHz
K9GS 225,375
W3NO.....132,374
K3MM 80,928
W4PK 27,335
W5JMW 7,008

1.8 MHz
K5UR.....12,749
K2KW 11,387
N9AW 3,040
W6XI.....966
W7RH.....740

LOW POWER
All Band
NY3A 4,856,628
KS1J 3,393,390
W3KB 2,286,526
W1QK.....1,957,005
KG9X.....1,949,480
N1EN.....1,946,819
WE9R 1,794,654
NS3T 1,549,776
WO1N.....1,540,962
N4XL.....1,504,956

28 MHz
N1DG.....138,861
N3UA.....101,673
W9ILY.....63,852
AA4LS 62,062
KKØU 60,096
K6AAM 29,388
K1NY 16,920
K3STX 9,536
N2WLG.....6,808
W6JPL (K6ICS) 540

21 MHz
W9XT.....256,452
WA1FCN 178,553
N5JR.....148,626
W2UP 123,625
WV7S 21,574
W3IDT 14,000
WØBF.....11,375
N2BEG 8,100
N3TTT 1,000

14 MHz
W1ZZ.....64,414
N2EIM.....38,064
K1IG 33,250
N7ESU.....5,311
NNØJS 20

7 MHz
AA4NP.....112,980
K9JY 55,120
K1IM 44,270
W1FIF.....35,520
K3ORC 19,604
NS4T 15,246
NN4RB 6,040
K9MCK 2,414
N4ELC 1,247
NS5S 405

3.5 MHz
N4IJ 54,238
KØKT.....14,012
K7LU.....5,125
KTØP.....434
NR1K.....132

QRP
All Band
KA4RRU 985,226
K8ZT.....538,800
KB9RPG.....89,414
KW2A 62,088
W4ER 55,872
W7RY 52,805
KU4A 39,294
WQ6X.....15,480
KJ4YM.....8,614
W6SIY 8,362

28 MHz
KE1AK.....12,036
W3EK 5,633
NV1W 88

21 MHz
K6JS.....80,172

14 MHz
K3TW.....63,420
KO1H.....33,580
W1IE.....33,535
W2VRK.....31,980
K9AXT 6,975
N8URE 2,241
KC1DVT 1,364
K2GMY 760
K6BBQ.....195

7 MHz
KQ2RP 5,074

MULTI-OP
SINGLE-TRANSMITTER
HIGH POWER
All Band
K1LZ.....16,690,848
KC1XX.....14,063,840
W2FU 10,907,217
K8AZ.....8,472,700
K9RS 8,034,042
K5TR 7,530,566
KQ2F 6,754,100
W7RM.....5,193,500
W9VW 4,599,000
AA9A 4,119,580

LOW POWER
All Band
W4KZ.....5,619,065
AD4ES.....3,517,458
K3AJ.....2,725,236
W3ZGD.....1,634,886
NX6T 1,504,413
W4TG 732,672
K1RQ.....715,176
KT4XA 604,116
W5WZ.....144,536
W6DER.....17,459

MULTI-OP
TWO-TRANSMITTER
All Band
W3LPL.....19,462,500
N4WW 11,418,402
K9CT 11,255,326
N2AA 10,162,074
K2AX 9,029,108
K2LE.....8,974,852
ND7K.....7,923,960
W4NF 7,593,597
K8LX.....7,156,592
W2CG.....5,944,647

MULTI-OP
MULTI-TRANSMITTER
All Band
K3LR.....23,705,156
K1TTT.....16,173,416
K1RX 14,347,200
KØRF.....9,555,724
N1RR.....8,576,325
N6RO.....6,739,395
K1KI.....5,149,575
W2AA 4,856,334
K3PH 4,055,000
WT3K.....3,129,540

EXPLORER
SINGLE-OP
HIGH POWER
All Band
WX8S 189,666
NØUJT.....31,824
K7RB 18,715

ROOKIE
HIGH POWER
N9TTK 2,770,979
W9DCT.....723,976
K3AK 266,485
KD2UBH 7,107

LOW POWER
KY4ID 710,973
KY4GS.....573,016
AEØDX.....443,368
KD2ZEL 204,930
KC3SVR 48,094
W1FIF.....35,520
KI2D.....26,106
W3OY 22,680
N3HRO.....11,730
KO4AWC 4,816

CLASSIC
HIGH POWER
K1DG.....4,278,254
KQ2M 3,935,016
N4AF 3,195,840
K2NV 2,404,448
K1RU.....2,115,195
K4ZW.....1,962,281
NØAX 1,583,163
K9MA.....1,523,743
KZ5D 1,513,926
W1JQ.....1,420,510

LOW POWER
K1BX 2,798,455
K3AU (K2YWE) 1,324,632
N1DC.....1,063,474
K1HT 894,704
W1NN.....859,527
NØUR.....747,994
NK4O.....620,961
W6TK.....533,392
K2ZR 521,236
N8II.....503,276

YOUTH
HIGH POWER
WØAAE 2,272,125

LOW POWER
K4IEY 15,652
KO4GOF.....6,550
NR1K.....132

likely to stand for some time (replacing the 1999 5.0M point effort of P40W (W2GD operator).

While on the subject of Aruba, perennial CQ WW operator, W2GD, won the assisted SOAB category from P44W, racing to a 13.5M point win, beating out 1410 other competitors in that operating class. Randy, K5ZD, delivered a #2 World result at 11.1M, from his improved Uxbridge, MA, station.

The Classic overlay continues to grow in popularity, largely in keeping with the overall advancement of our communities' average age! Phil, KT3Y, beat them all with an outstanding 24-hour result of 5.1M. There's a lot to be enjoyed from an investment of only 24 hours in operating time. As a reminder, you can continue to operate beyond the 24-hour period, while still submitting a valid Classic score. You'll note in the results that many Classic entries are also listed elsewhere in the line scores with higher numbers, reflecting this operating approach.

The titans of contesting, multi-op stations, continued to populate the bands. The P33W team showed everyone how to effectively run a Multi-Single operation, delivering a 25.5M final result. The Multi-Two race was also an impressive display of talent as the CR3DX team handily beat out the emerg-

Table 1

Op Hrs	AF	AS	EU	NA	OC	SA	ALL	% of all	Cum %
0.1 - 5	9	133	342	293	24	18	819	16.5%	16.5%
5.1-10	2	140	478	389	23	18	1050	21.1%	37.6%
10.1-15	6	102	437	340	18	17	920	18.5%	56.0%
15.1-20	4	121	350	227	15	16	733	14.7%	70.8%
20.1-25	3	82	276	217	10	15	603	12.1%	82.9%
25.1-30	–	59	160	118	9	6	352	7.1%	90.0%
30.1-35	–	32	98	95	3	3	231	4.6%	94.6%
35.1-40	1	27	63	50	3	1	145	2.9%	97.5%
40.1-45	–	12	39	36	1	5	93	1.9%	99.4%
45.1-48	2	5	16	4	3	1	31	0.6%	100.0%
ALL	27	713	2259	1769	109	100	4977	100.0%	
Median Hours	10.7	13.8	13.6	12.9	10.9	14.3	13.3		

Table 1. Operating Time by Continent in the 2022 CQ WW CW Contest

2022 CQWW DX CW 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
EA8RM	288/10/47	943/20/70	1721/29/83	1344/26/82	2186/31/95	2113/32/98
V47T	268/13/47	947/20/73	1953/32/91	1868/31/94	2188/32/94	1702/24/82
*V26K	154/9/23	896/17/68	1901/31/96	1616/29/89	2516/32/96	1758/24/84
CR6K	533/16/59	1218/25/84	2338/32/99	1846/31/94	2175/29/98	1443/28/86
N5DX	99/16/56	703/18/76	1859/34/110	1274/34/110	1127/28/99	809/24/96

USA TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
N5DX	99/16/56	703/18/76	1859/34/110	1274/34/110	1127/28/99	809/24/96
W1KM	85/12/45	704/18/74	1067/26/83	1002/27/92	932/24/86	699/21/76
N2IC	26/10/16	133/22/51	1166/36/92	569/33/93	1252/33/108	536/28/71
NO6T	19/9/10	215/22/41	1173/35/97	811/34/99	962/34/101	662/28/67
N1UR	68/11/34	436/17/66	857/24/87	774/28/95	591/24/91	790/22/86

WORLD SINGLE OPERATOR ASSISTED ALL BAND

P44W	174/15/42	619/23/86	1222/32/112	1069/36/114	1394/33/118	1776/30/114
K5ZD	88/15/51	501/22/87	1446/32/118	1097/38/127	1110/31/121	753/28/110
EA2W	87/14/55	687/26/90	1501/36/124	1201/36/119	1076/37/129	732/37/122
VA2WA	354/15/58	616/21/86	1201/29/105	1043/36/118	1028/29/114	601/29/104
K3WW	42/13/25	369/20/82	1164/29/113	1036/36/118	1111/29/118	685/25/101

USA SINGLE OPERATOR ASSISTED ALL BAND

K5ZD	88/15/51	501/22/87	1446/32/118	1097/38/127	1110/31/121	753/28/110
K3WW	42/13/25	369/20/82	1164/29/113	1036/36/118	1111/29/118	685/25/101
K1ZZ	67/14/49	342/22/88	1140/34/119	964/35/123	819/31/123	487/28/115
N3RS	60/13/42	224/19/77	849/33/112	818/36/122	646/31/118	699/29/108
W8FJ	73/16/50	353/21/83	1007/33/115	791/35/121	697/30/120	251/27/99

WORLD MULTI-OPERATOR SINGLE TRANSMITTER

P33W	380/21/77	1112/33/112	2283/39/133	2166/38/140	1917/39/142	1755/36/141
ZF1A	251/18/60	836/24/89	2465/36/127	2097/37/127	2126/36/130	1614/31/117
LZ5R	100/24/82	1150/35/119	2515/38/135	2306/38/136	1630/37/141	1172/36/135
PJ4A	185/16/55	282/25/86	2566/36/123	1303/37/124	1404/35/123	1621/34/114
UP2L	261/15/60	1233/32/109	2358/38/133	1360/38/130	1280/36/128	961/28/100

USA MULTI-OPERATOR SINGLE TRANSMITTER

K1LZ	161/20/71	899/30/108	2016/37/132	1462/38/140	1195/34/129	984/29/120
KC1XX	93/21/71	838/27/103	1902/36/131	1046/38/135	997/31/125	898/28/120
W2FU	60/16/58	546/26/94	1446/36/120	1141/35/128	999/32/123	724/26/107
K8AZ	50/15/48	343/23/86	1080/35/121	1042/36/125	943/29/120	448/28/106
K9RS	45/15/44	456/22/85	890/33/110	1159/35/127	722/30/123	536/28/106

WORLD MULTI-OPERATOR TWO TRANSMITTER

CR3DX	462/18/73	1671/33/107	3377/36/130	2646/38/135	3557/37/139	3068/36/141
PJ4K	198/17/48	1293/27/93	3374/36/128	2678/39/136	3297/36/130	2133/33/119
TKØC	967/20/78	2325/33/108	3471/37/133	2688/37/129	3005/37/140	1776/35/131
W3LPL	107/19/62	1101/28/103	2195/38/129	1758/37/132	1839/35/137	1113/29/116
P44X	65/15/33	754/24/87	1657/32/111	2088/36/119	2524/35/124	1772/32/110

USA MULTI-OPERATOR TWO TRANSMITTER

W3LPL	107/19/62	1101/28/103	2195/38/129	1758/37/132	1839/35/137	1113/29/116
N4WW	76/14/49	560/25/92	1277/36/128	1103/37/131	1505/34/127	654/30/119
K9CT	65/16/36	507/26/82	1542/36/127	1428/36/129	1316/32/126	541/29/103
N2AA	59/14/41	423/21/87	1360/33/115	1130/33/117	1225/29/121	692/28/102
K2AX	76/14/43	462/21/85	883/29/109	1007/35/123	1066/31/123	826/26/109

WORLD MULTI-OPERATOR MULTI-TRANSMITTER

CN3A	931/21/75	2206/30/102	3453/36/130	3561/38/137	3290/38/139	3267/37/130
CR3W	816/22/71	1946/29/104	3265/36/130	3439/39/139	2975/37/143	2849/35/128
PJ2T	575/18/66	1450/30/97	3251/33/121	3129/37/125	3533/36/125	2242/32/109
3B8M	305/14/53	719/32/94	1859/36/118	2900/38/130	3212/38/135	2985/33/122
9A1A	1385/28/94	2058/32/113	3570/39/142	2777/38/139	2179/38/143	1129/36/132

USA MULTI-OPERATOR MULTI-TRANSMITTER

K3LR	223/23/70	1229/29/100	2403/38/137	2642/37/144	2076/35/139	1201/30/126
K1TTT	226/19/66	897/26/93	1698/34/115	2044/36/130	1629/31/118	1055/28/116
K1RX	267/14/52	799/24/91	1245/30/109	1947/37/136	1497/32/122	989/29/108
KØRF	71/14/29	311/25/71	1294/35/124	1425/37/125	1213/33/125	686/32/101
N1RR	37/11/21	405/21/80	594/30/110	1102/34/119	1433/29/114	822/27/109

ing PJ4K group with a final tally of 39.6M. In the U.S., Frank, W3LPL's team, has joined the ranks of the Multi-Two competition, placing #4 in the world at 19.4M.

The World Multi-Multi battle was intense this year as the head-to-head battle between CN3A and CR3W continued. The gang at CN3A took top honors this year with an amazing result of 44M, representing over 16,700 QSOs! CR3W was indeed on their heels but falling just short at 41M. The team at K3LR won the U.S. fight, also placing #6 in the world with 23.7M points.

Our enthusiastic Youth and Explorer groups continued to enjoy their newfound status in the results. While youth activity on CW was relatively low, it continued to grow as word spreads about the availability of awards and other incentives

Table 2

Category	AF	AS	EU	NA	OC	SA	ALL	% of Total
SOAB High (A)	6	127	557	689	13	19	1,411	26.8%
SOAB High (U)	7	137	193	249	27	4	617	11.7%
SOAB Low (A)	4	147	645	371	20	39	1,226	23.3%
SOAB Low (U)	9	271	727	402	39	31	1,479	28.1%
SOAB QRP (A)	1	10	49	14	2	2	78	1.5%
SOAB QRP (U)	–	21	88	44	8	5	166	3.1%
Explorer-Multi	–	1	4	1	2	–	8	0.2%
Explorer-Single	–	2	4	4	–	1	11	0.1%
Multi-2	1	5	27	18	2	3	56	1.1%
Multi-Multi	4	8	11	12	4	1	40	0.8%
Multi-Single High	1	18	66	29	3	9	126	2.3%
Multi-Single Low	–	7	34	11	1	1	54	1.0%
ALL	33	754	2,405	1,844	121	115	5,272	100.0%
% by continent	0.6%	14.3%	45.6%	35.0%	2.3%	2.2%	100.0%	

Single band entries not included in analysis

Table 2 – Entry Category Analysis by Continent for 2022 CQ WW CW

Our enthusiastic Youth and Explorer groups continued to enjoy their newfound status in the results.

EUROPE TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
CR6K	533/16/59	1218/25/84	2338/32/99	1846/31/94	2175/29/98	1443/28/86
EF6T	459/12/51	1385/24/77	2065/28/86	1541/31/76	1994/31/89	938/24/60
EB7A	165/11/45	721/19/70	1840/24/82	1493/28/73	1351/25/69	862/23/63
YR8D	251/11/45	1026/21/74	1295/28/81	1598/28/82	1471/32/89	265/24/65
G9W	142/8/37	654/17/67	1315/33/86	1298/31/81	1026/33/95	591/30/80

EUROPE SINGLE OPERATOR ASSISTED ALL BAND

EA2W	87/14/55	687/26/90	1501/36/124	1201/36/119	1076/37/129	732/37/122
SN7Q	299/18/67	833/32/98	1182/36/119	1016/35/109	1113/36/123	427/36/119
UW1M	109/11/44	635/15/70	2526/35/119	1434/34/117	1120/34/113	820/32/115
II2S	196/15/62	583/27/92	1067/37/126	1039/35/117	589/35/114	526/36/118
HG8R	236/16/62	693/24/86	1441/34/111	1019/33/113	672/33/105	206/33/97

EUROPE MULTI-OPERATOR SINGLE TRANSMITTER

LZ5R	100/24/82	1150/35/119	2515/38/135	2306/38/136	1630/37/141	1172/36/135
OM7M	228/25/85	1051/31/113	2357/39/136	2011/38/137	1370/36/136	946/37/128
TM6M	198/17/70	836/29/103	2356/39/132	2087/38/134	1596/38/138	959/35/129
IR4M	133/18/73	977/34/109	2034/37/128	1790/38/130	1171/36/131	959/37/131
E7DX	237/21/80	708/32/108	2371/37/132	1529/37/133	1904/35/135	752/37/133

EUROPE MULTI-OPERATOR TWO TRANSMITTER

TKØC	967/20/78	2325/33/108	3471/37/133	2688/37/129	3005/37/140	1776/35/131
EF2X	411/17/70	1581/31/107	2483/38/127	1863/38/131	2428/38/139	1202/36/127
ED1R	446/19/76	1321/27/95	2575/36/124	2048/37/131	2217/38/134	1160/34/122
OL3Z	329/16/62	1601/32/109	2109/38/132	1852/37/120	1131/36/133	813/36/123
II9P	295/19/68	1326/30/100	2402/36/122	1504/38/110	1809/37/130	1099/35/125

EUROPE MULTI-OPERATOR MULTI-TRANSMITTER

9A1A	1385/28/94	2058/32/113	3570/39/142	2777/38/139	2179/38/143	1129/36/132
YT5A	1071/22/81	2204/36/119	3451/39/141	2619/38/133	1998/36/136	1292/37/135
M6T	991/20/78	2181/35/119	3755/38/139	2588/39/142	1781/36/136	1443/35/137
LZ9W	1053/16/72	1986/34/121	3304/37/133	2718/39/126	2138/36/134	1238/36/124
DFØHQ	1010/22/81	1982/33/116	2892/37/138	2042/36/138	1302/37/138	829/36/139

TOP SCORES IN VERY ACTIVE ZONES

Zone 3

NO6T (KI6RRN @WA6TQT).....5,767,692
K6XX 3,127,850
K6NA 2,228,208
WJ9B 1,669,910
K6NR 1,099,185

Zone 4

XL3T (VE3AT) 7,468,593
N2IC 5,956,685
W9RE 5,346,486
NA8V 4,876,106
WXØB (AD5Q) 4,041,994

Zone 5

N5DX (@N2QV) 11,640,105
VY2TT (K6LA) 9,215,920
W1KM.....7,496,808
N1UR.....5,697,900
NR3X (N4YDU) 5,681,676

Zone 14

CR6K (CT1ILT) 12,835,488
EF6T (EA3M) 9,008,166
EB7A 6,719,692
G9W (MØDXR) 6,439,264
GM5X (GM4YXI) 5,227,544

Zone 15

*IY3A (IZ3EYZ).....5,079,492
OM7K (OM7RU).....3,716,190
9A2AJ.....3,342,054
OHØZ (OH6EI).....3,143,880
YT3D 3,085,780

Zone 20

YR8D (YO8TTT).....6,494,840
C4W (5B4WN).....5,985,396
*YR2X (YO2LEA) 986,870
LZ7J (LZ1CI) 940,005
P35A (5B4AQN) 756,069

Zone 25

JH4UYB.....4,296,240
JF2QNM 2,183,103
DS4EOI 1,969,034
*JA1BJI.....1,839,410
*JI1RXQ 1,816,920

*Low Power

Ben Buettner, DL6RAI (P44X), John Crovelli, W2GD (P44W), and Wolf Klier, OE2VEL (P44X) meeting (l-r) at Linda's Dutch Pancake House in Aruba for breakfast after the 2022 CQ WW CW contest.

Table 3

Call (Operator)	Continent	Power	Raw QSOs
ZD7BG	AF	HIGH	1410
ED8M (EA8DIG)	AF	HIGH	3623
JI1RXQ	AS	LOW	1601
9N7AA (S53R)	AS	HIGH	2811
JS1OYN	AS	LOW	1306
F5SGI	EU	LOW	1207
OZ8AE	EU	LOW	1103
YL2VW	EU	HIGH	2132
OK2MBP	EU	LOW	1854
DL8ULF	EU	LOW	1129
DL2NBU	EU	LOW	1690
EU4E	EU	HIGH	2282
LY9A	EU	QRP	1819
HB9ARF	EU	LOW	1615
LN3C (LB8DC)	EU	HIGH	2226
KR2Q	NA	QRP	1064
N2GC	NA	HIGH	1558
WW4XX (LZ4AX)	NA	LOW	1426
N2IC	NA	HIGH	3710
NB1N	NA	HIGH	1432
K1BX	NA	LOW	2181
K6NA	NA	HIGH	1664
K1DG	NA	HIGH	3395
VA1MM	NA	HIGH	1633
K4ZW	NA	HIGH	1631
V85RH (JO1RUR)	OC	HIGH	3060
WH7T (WH7W)	OC	HIGH	2308

SOAB Unassisted only
99+% callsign precision w/>1000 QSOs, listed in order of accuracy

Table 3 – Single Op Accuracy Champions (>1000 QSOs) for the 2022 CQ WW CW Contest

for this important part of our contest community. Congratulations to Kees, W0AAE, for powering his way to a 2.3M youthful World High victory. The innovation of the Explorers is also impressive as this small group of creative contesters demonstrate what can be done with emerging technologies and new approaches to operating.

Lastly, a shoutout goes again to the Frankford Radio Club and Bavarian Contest Club who continued their multi-year domination (7 straight years for FRC and 16 for the BCC) in the U.S. and DX club competitions.

Spending Time in the CQ WW CW Contest

The overwhelming majority of participants in the CQ WW do not operate a full weekend in the contest. In fact, that's one of the aspects of the event that make it special. Many of you simply operate as time allows, while you go up against different competitor – the demands of weekend life. On average, 13 hours appears to be the magical median number of operating time with over a third of you investing less than 10 hours. There's no doubt that age is also a factor as well. In the end, however, there were 9 "iron men" who operated for the entire 48 hours: HG8R, JH4UYB, N5DX, OL9R, RM5F, UW1M,

Table 4

Year	# DX Entities Active
2022	178
2021	177
2020	166
2019	198
2018	194
2017	201
2016	260
2015	248
2014	263

Table 4– Number of Active DX Entities in the 2022 CQ WW CW Contest

Table 5

Continent	# Logs Received
EU	20
AS	8
NA	5
OC	3
SA	1
ALL	37

Table 5 – Total Number of Youth Entries Received by Continent in 2022 CQ WW CW Contest

V47T, YR8D, and YT7R. For the rest of us, that achievement is a distant memory, if having ever been achieved. Congrats to all, whether you worked 10 or 48 hours. As EA1PJ aptly stated in his soapbox comments, "…even 5 minutes of the CQ WW is worth it!"

Categories, Categories, Categories

In developing the analysis being reported in Table 2, one conclusion can be made: considerable support remains for both the assisted and unassisted single operator categories. A review of the data shows that 51.6% of all SOAB operators entered the assisted category while 42.9% chose to go without assistance (Note: This data does not reflect single-band entries). It's interesting to report that this split was not the case on SSB, where the Unassisted crowd won that battle. For now, the debate about combining single operators into one assisted/unassisted group will continue.

This Year's Accuracy Champions

The callsigns identified in Table 3 represent a list you want to be on. Each one of these operators achieved a major contest milestone – greater than 99% callsign accuracy in their submitted logs for the 2022 CQ WW CW Contest. Put another way, if you logged 3000 QSOs, your log had to have less than 30 busted calls to be included. That's a fantastic accomplishment and one that demonstrates why each operator is consistently at the top of their game. Congratulations!

There's a Lot of DX to Work in the WW!

For reasons that no one fully understands, there has been a drop-off in total country participation in the CQ WW over the past decade. This statistic is in sharp contrast to the number of logs received and total active contest participants, which has steadily grown over the same period. In Table 4, you can see the impact from the COVID pandemic as most operators chose to stay home in 2020. And, while we are steadily coming back, there is a long way to go to reach the heydays of ten years ago. Perhaps, it a combination of economics and our aging population? No matter what, the heartbeat of the WW remains strong when one looks at activity overall.

The CQ WW Fountain of Youth!

Last year, we introduced a new overlay for the CQ WW, recognizing Youth operators that were 25 years old or younger. While the numbers are not large, Europe stands out as the leader of the global youth movement on CW (the same was true for SSB as well) as seen in Table 5. Keep spreading the word as we hope this opportunity for our youth continues to take off in future WW contests.

Some Speedy Operators!

In days gone by, we used to brag about our hard-earned ability to work 100 QSOs in one hour of the CQ WW. It was one of those milestones that made you feel like you've graduated to a new level of operating skill. Now, with the advent of two-radio operating for many single operators, the numbers are now simply off the charts (see Table 6)! It's hard to say whether K3WW's 271 hourly rate or that of V47T (N2NT operator) working 345 QSOs in 60 minutes is the most impressive – one from the US and other from Zone 8. Or, perhaps that of PJ2T, who reigned in 638 contacts in one hour as a multi-multi operation. Regardless of

Table 6

Category (High)	CALL	Highest Hour	Category (High)	CALL	Highest Hour
SOAB (A)	K3WW	271	SOAB (U)	V47T	345
SOAB (A)	UW1M	264	SOAB (U)	CR6K	345
SOAB (A)	P44W	259	SOAB (U)	EF6T	321
SOAB (A)	ER1KAA	253	SOAB (U)	SOAB (U)	285
SOAB (A)	EA2W	252	SOAB (U)	N5DX	281
Category (Low)	**CALL**	**Highest Hour**	**Category (Low)**	**CALL**	**Highest Hour**
SOAB (A)	NY3A	193	SOAB (U)	V26K	296
SOAB (A)	OH0V	187	SOAB (U)	HC2AO	247
SOAB (A)	4X6FR	184	SOAB (U)	6Y6N	185
SOAB (A)	TA7I	183	SOAB (U)	K1BX	181
SOAB (A)	KP3N	182	SOAB (U)	VP5M	178
Category (QRP)	**CALL**	**Highest Hour**	**Category (QRP)**	**CALL**	**Highest Hour**
SOAB (A)	PC5Q	84	SOAB (U)	PZ5CO	255
SOAB (A)	SF0A	73	SOAB (U)	LY9A	107
SOAB (A)	IZ8JFL	73	SOAB (U)	FG/VE3RSA	81
SOAB (A)	DL1YAW	72	SOAB (U)	RZ4AZ	75
SOAB (A)	DM2M	71	SOAB (U)	OP4F	74
Category	**CALL**	**Highest Total Hour**	**Category**	**CALL**	**Highest Total Hour**
Multi-2	TK0C	592	Multi-M	PJ2T	638
Multi-2	CR3DX	488	Multi-M	CR3W	599
Multi-2	PJ4K	426	Multi-M	CN3A	581
Multi-2	HQ9X	395	Multi-M	M6T	549
Multi-2	W3LPL	393	Multi-M	3B8M	514
Category (High)	**CALL**	**Highest Total Hour**	**Category (Low)**	**CALL**	**Highest Total Hour**
MSH	P33W	419	MSL	FY5KE	231
MSH	LZ5R	402	MSL	9H6WW	202
MSH	ZF1A	390	MSL	WP3C	189
MSH	TM6M	370	MSL	IB9T	175
MSH	E7DX	322	MSL	W4KZ	167

Table 6 - High Hourly QSO Rates for the 2022 CQ WW CW Contest

how you view this data, there is one thing we is obvious – we have some amazing operators in our midst. Rate records for previous years are available on the cqww.com Web site.

Some Thoughts from Your Director

Well, another CQ WW contest is in the books. As with every year, incremental progress continues to be made in our log checking capabilities although we are a long way from simply pushing a button to pop out the results. Our post-contest SDR recording capabilities have grown to the point that we can find and listen to virtually any QSO in the contest. Log checking software continues to advance, resulting in our ability to crosscheck nearly 94% of all submitted QSOs in the contest. A significant number beyond that can be verified with

Youthful Experiences in the CQ WW

Here is the smiling face of Youth operator Pia Wurster, DL7PIA, from her station in southern Germany.

My name is Pia (DL7PIA). I am 16 years old, having passed my Class A amateur radio license in July 2019, at the age of 12 years old. From the very first moment, I was fascinated and enchanted by amateur radio's exciting way of communications and the wide range of possibilities it offers (e.g., portable operations, different modes, building your own antennas, contests, etc.). Just a few months before the CQ WW CW Contest I decided to learn the Morse code, and immediately fell in love with CW from the very first moment. All this would not be possible without my great and very helpful friend, Mitch, KH6M. I would like to take this opportunity to thank Mitch for all of his help and support!!

In recent years I participated in some SSB contests. Now I was really excited and ready to experience how a CW contest would compare to one on SSB. In particular, I was curious if anyone would even be able to copy my call because I was working with only with a 100-watt Yaesu FT-991A and homemade wire loop and dipole antennas.

I started the big adventure in the 2022 CQ WW CW during the last weekend in November and it was incredible! My goal was to gain experience, to improve my CW skills, find out what´s possible with a Morse key, an FT-991A and home-made wire antennas, work new and rare countries, and above all, to have fun. It was really amazing how many stations were QRV during this weekend. In fact, one can call it DXers paradise!

I really enjoyed the contest and had many nice and special QSOs with radio amateurs from the Turks and Caicos Islands, Greenland, Norfolk Island, Grenada, Guam, New Zealand, Australia, and Bahamas, to name just a few. I want to thank all of the stations who answered my calls. It was great to have a CW QSO with you! There is no comparable feeling like the moment when a station copies your call sign through a big pile-up or working a rare DX-station with simple homemade antennas.

I'm grateful to be a part of the big world of amateur radio and I'm looking forward to many more unforgettable QSOs with all of you!

73 & 88 de Pia, DL7PIA

My name is Leonardo (more commonly known as Léo) and I live in the city of Poá, Brazil, where I received the callsign, PY2POA, to honor my city and the former owner. I'm 16 years old and am passionate about DXing and even more with contests. When I participated in my first contest, I thought it was really cool, and since then I haven't slowed down. When I finally participated in my first CQWW, I thought it was fantastic because of the large number of operators from all over the world, making QSOs with several new countries. I really enjoy the CQ WW, which in my opinion has been getting better every year. The CQ WW has always been good to me because I always work at least one new country! A big thank you to all the organizers for your hard work!!

73, Léo, PY2POA

Remember your first WW? This is Leo Silva, PY2POA, celebrating his initial entry as a Youth operator in the 2022 CQ WW CW contest.

databases and other methods. As a participant, you can feel good that the final results, while not perfect, are an accurate reflection of what really happened in the contest.

We continue to experience sadness in our ranks as more of ham radio's giants leave us. You'll recall from last month, that I reported the loss of our beloved friend, Fred Laun, K3ZO. Sadly, this month, I am sharing the loss of another giant, Rod Linkous, W7OM. We'll miss both of them, but will equally cherish the memories and experi-

Keep an eye on this 12-year-old Youth operator, Ryan Morrison, EI8KW. Ryan worked over 500 QSOs in the 2022 CW event with many more CQ WW contests in his future!

Hello from Ireland. I am Ryan, EI8KW, and am 12 years old. I first became aware of the Morse code after visiting the Titanic Museum in Belfast, Ireland. I especially became interested in the Morse code used in the Titanic's SOS distress call. It was at that moment that I decided to learn CW and later took the required examinations, which brought me into the world of amateur radio. After passing the Morse test, I discovered that I also needed to pass a theory test to obtain a valid license. After a lot of time studying basic radio principles, I passed the theory test and received my callsign, EI8KW, in August, 2020. Almost immediately, I purchased an IC-7300 and some wire and went live for the first time. My signal was not very strong, so I mainly operated on CW.

Soon after, I started listening to the contests on weekends and began operating in them. I found all of the activity and the loud signals on the bands to be really exciting. My current strategy is to mainly operate and give out as many points as possible with the big contest stations usually being able to pull me in. I love the energy on the bands during the big contests like the CQ WW CW and especially enjoy listening to the really good operators running large pileups.

When operating in the big contests I don't really have any other strategy except to operate for as much time as possible and contact anyone that can hear me. I mainly search and pounce around the bands as I don't work as many by calling CQ. At the end of the CQ WW, it's amazing to see the signals disappear and bands go quiet; it's all over until next year.

I always send in my log to the contest organizers so everyone's QSOs with me can be verified. In addition, I upload to LoTW and most of the other electronic platforms as well as sending my log into super check partial *(ed—is this how you were thinking when you were 12 years old?).*

I hope to meet you in the next contest.

73, Ryan, EI8KW

CLUB SCORES

UNITED STATES

Club	# Entrants	Score
FRANKFORD RADIO CLUB	244	464,027,502
YANKEE CLIPPER CONTEST CLUB	256	413,542,478
POTOMAC VALLEY RADIO CLUB	233	217,062,987
SOCIETY OF MIDWEST CONTESTERS	163	94,265,104
NORTHERN CALIFORNIA CONTEST CLUB	83	74,607,532
ARIZONA OUTLAWS CONTEST CLUB	73	69,544,228
FLORIDA CONTEST GROUP	86	67,304,129
MINNESOTA WIRELESS ASSN	134	51,607,635
SOUTHERN CALIFORNIA CONTEST CLUB	71	50,919,845
NORTH COAST CONTESTERS	19	49,131,846
CENTRAL TEXAS DX AND CONTEST CLUB	32	36,197,659
SOUTH EAST CONTEST CLUB	48	34,500,365
TENNESSEE CONTEST GROUP	44	28,829,708
WILLAMETTE VALLEY DX CLUB	63	27,747,196
BAY AREA DXERS	19	25,659,489
GRAND MESA CONTESTERS OF COLORADO	42	25,221,760
DFW CONTEST GROUP	43	23,130,268
ALABAMA CONTEST GROUP	29	19,525,472
HUDSON VALLEY CONTESTERS AND DXERS	40	18,386,691
SWAMP FOX CONTEST GROUP	20	16,182,784
WESTERN WASHINGTON DX CLUB	53	15,747,727
MAD RIVER RADIO CLUB	25	14,725,723
NORTHEAST MARYLAND AMATEUR RADIO CONTEST SOCIETY	26	13,674,803
SOUTHEASTERN DX CLUB	4	12,628,780
KENTUCKY CONTEST GROUP	21	11,876,461
NIAGARA FRONTIER RADIOSPORT	22	9,671,262
CAROLINA DX ASSOCIATION	28	9,295,380
ARKANSAS DX ASSOCIATION	14	7,765,047
DEEP DIXIE CONTEST CLUB	10	7,529,705
TEXAS DX SOCIETY	18	6,675,695
BIG SKY CONTESTERS	10	6,169,400
KANSAS CITY CONTEST CLUB	15	4,905,728
NORTHEAST WISCONSIN DX ASSN	5	4,760,762
SPOKANE DX ASSOCIATION	22	3,936,381
THE VILLAGES AMATEUR RADIO CLUB	13	3,021,988
HILLTOP TRANSMITTING ASSN	4	2,694,568
ORDER OF BOILED OWLS OF NEW YORK	7	2,513,564
MISSISSIPPI VALLEY DX/CONTEST CLUB	7	2,273,617
CWOPS	4	2,021,023
MOTHER LODE DX/CONTEST CLUB	15	1,893,506
CTRI CONTEST GROUP	7	1,878,084
SOUTH JERSEY RADIO ASSOCIATION	9	1,823,457
ROCHESTER (NY) DX ASSN	14	1,816,436
BRISTOL (TN/VA) ARC	12	1,680,749
DAYTON AMATEUR RADIO ASSOCIATION	5	1,540,543
CENTRAL VIRGINIA CONTEST CLUB	4	1,492,692
MERIDEN ARC	6	1,235,890
PORTAGE COUNTY AMATEUR RADIO SERVICE	9	1,012,474
NEW PROVIDENCE ARC	7	964,925
HEARTLAND DX ASSOCIATION	8	878,664
REDWOOD EMPIRE DX ASSOCIATION	6	865,964
FORT WAYNE RADIO CLUB	5	827,978
SILVER COMET AMATEUR RADIO SOCIETY	5	797,016
NORTHERN ARIZONA DX ASSN	8	763,997
NORTH FULTON AMATEUR RADIO LEAGUE	6	689,483
KANSAS CITY DX CLUB	4	574,571
SKYVIEW RADIO SOCIETY	5	561,891
METRO DX CLUB	10	420,431
ARC EMCOMM SRVC	6	323,507
BOLINGBROOK ARS	4	296,712
ALEXANDRIA RADIO CLUB	4	289,210
HILL COUNTRY AMATEUR RADIO CLUB	9	271,988
HAMILTON AMATEUR RADIO CLUB	7	265,522
STERLING PARK AMATEUR RADIO CLUB	7	247,804
SIERRA NEVADA AMATEUR RADIO SOCIETY	4	217,824
LONG ISLAND CW CLUB	7	216,03
PORT LAVACA AMATEUR RADIO CLUB	4	137,926
OH-KY-IN ARS	6	132,777
PANHANDLE AMATEUR RADIO CLUB	4	97,780
GREAT PLACES CONTEST CLUB	4	92,249
YORK COUNTY AMATEUR RADIO SOCIETY	9	72,541
HAZEL PARK AMATEUR RADIO CLUB	4	70,825
PHIL-MONT MOBILE RADIO CLUB	5	66,034
LAKE AREA RADIO KLUB (SD)	4	21,118
UTAH DX ASSOCIATION	4	15,058

DX

Club	# Entrants	Score
BAVARIAN CONTEST CLUB	314	347,677,055
ITALIAN CONTEST CLUB	272	311,152,448
EA CONTEST CLUB	107	224,490,956
RHEIN RUHR DX ASSOCIATION	149	141,531,863
CONTEST CLUB ONTARIO	96	122,981,453
CROATIAN CONTEST CLUB	46	92,565,865
ARAUCARIA DX GROUP	61	79,838,022
CLIPPERTON DX CLUB	32	68,606,304
CONTEST CLUB SERBIA	46	62,517,271
BALTIC CONTEST CLUB	20	62,150,183
RUSSIAN CONTEST CLUB	42	57,101,556
LU CONTEST GROUP	35	56,139,670
CONTEST CLUB FINLAND	54	51,629,274
HA-DX-CLUB	20	49,222,472
BELOKRANJEC CONTEST CLUB	14	44,304,254
UKRAINIAN CONTEST CLUB	98	42,733,686
VK CONTEST CLUB	35	37,830,327
RIO DX GROUP	108	32,486,997
LA CONTEST CLUB	12	32,054,938
SP DX CLUB	92	28,008,188
BELARUS CONTEST TEAM	15	25,031,154
CATALONIA CONTEST CLUB	29	21,994,874
CONTEST GROUP DU QUEBEC	20	21,903,821
UNCC	10	21,537,206
SLOVENIA CONTEST CLUB	42	21,527,387
WORLD WIDE YOUNG CONTESTERS	9	18,448,850
ORCA DX AND CONTEST CLUB	30	18,267,497
SIAM DX GROUP	22	16,948,334
THREE A'S CONTEST GROUP	7	16,013,476
NICOSIA CONTEST GROUP	4	15,530,482
DANISH DX GROUP	34	15,019,936
CONTEST CLUB BELGIUM	31	14,856,943
CZECH CONTEST CLUB	24	14,794,284
INTEREST GROUP RTTY *	12	13,257,926
LATVIAN CONTEST CLUB	30	13,145,478
GMDX GROUP	19	11,284,867
NORFOLK AMATEUR RADIO CLUB	9	11,007,218
CE CONTEST GROUP	11	10,658,758
RADIO AMATEUR ASSOCIATION OF WESTERN GREECE	7	10,500,508
CHILTERN DX CLUB	25	10,255,230
BELARUS CONTEST CLUB	22	9,431,125
599 CONTEST CLUB	20	9,407,328
JSFC	5	8,973,198
ARIPA DX TEAM	7	8,318,606
BOSNIA AND HERZEGOVINA CONTEST CLUB	4	8,262,098
RTTY CONTESTERS OF JAPAN	6	8,007,207
EUROPEAN DX CONTEST CLUB *	7	7,738,784
SAUDI CONTEST GROUP	5	7,466,336
VU CONTEST GROUP	21	7,399,696
URAL CONTEST GROUP	10	6,172,873
CS PETROLUL PLOIESTI	5	5,930,724
MARITIME CONTEST CLUB	17	5,923,421
YB-LAND DXING PASSION IS	227	5,911,318
SOUTHERN OSAKA CONTEST CLUB	11	5,557,113
WEST SERBIA CONTEST CLUB	13	5,374,418
GUNMA CONTEST CLUB	12	4,914,693
RUSSIAN CW CLUB	23	4,822,320
THRACIAN ROSE CLUB	37	4,740,586
COCKENZIE AND PORT SETON ARC	5	4,738,469
OKAYAMA DX CLUB	10	4,635,904
ASSOCIACAO DOS RADIOAMADORES DO PARANA	11	4,561,812
CABREUVADX	38	4,530,882
RADIOCLUBUL RADU BRATU	7	4,493,338
CSTA SUCEAVA	4	4,382,462
TRAC	6	4,307,555
ORARI LOKAL BEKASI	4	4,171,374
MEDITERRANEO DX CLUB	8	4,026,700
VRHNIKA CONTESTERS	5	3,987,193
THAILAND DX ASSOCIATION	6	3,669,575
RSGB CONTEST CLUB	11	3,648,992
RADIOSPORT MANITOBA	6	3,637,996
TRAC TRABZON	5	3,620,425
ISRAEL AMATEUR RADIO CLUB	6	3,567,653
5NNDXCC	39	3,560,390
VERON A63 FRIESE WOUDEN	6	3,097,348
GIRESUN TELSIZ VE RADYO AMATORLERI DERNEGI	4	2,806,303
CSA STEAUA	4	2,716,200
GRIMSBY AMATEUR RADIO SOCIETY	6	2,631,855
FUCHU AMATEUR RADIO CLUB	9	2,525,496
PZK OT-01	8	2,468,434
LITHUANIAN CONTEST GROUP	5	2,415,390
KOREA DX GROUP	10	2,410,752
ESSEX CW AMATEUR RADIO CLUB	5	2,343,038
UA2 CONTEST CLUB	7	2,299,051
STOCKPORT RADIO SOCIETY	6	2,236,432
RADIO CLUB KVARNER RIJEKA	10	2,192,490
CSM CRAIOVA	8	2,118,646
SK6AW HISINGENS RADIOKLUBB	9	2,032,530
ALBERTA CLIPPERS	4	2,026,366
SHARKS DX TEAM	5	2,025,118
CSU PITESTI	5	1,955,144
SASKATCHEWAN CONTEST CLUB	9	1,912,393
S51DSW	6	1,889,035
UNIVERSITY OF TOKYO CONTEST CLUB	7	1,888,169
ADMIRA ARAD	7	1,850,236
IVANOVO DX CLUB	6	1,750,996
599 DX GROUP	8	1,700,679
ESPIRITO SANTO CONTEST GROUP	7	1,694,167
SK0QO SODERTORNS RADIOAMATORER	4	1,685,739
KEYMEN'S CLUB OF JAPAN	30	1,674,582
NORFOLK COAST AMATEUR RADIO SOCIETY	4	1,534,008
SK6DG RADIOCLUB VASA	4	1,505,733
CDR GROUP	30	1,405,396
UNION FRANCAISE DES TELEGRAPHISTES	8	1,371,319
JAPAN LID CLUB	4	1,371,230
SPANDAU DXERS	7	1,324,906
TRUJILLO ALTO CONTEST CLUB	5	1,311,036
CSR BRAILA	9	1,296,323
SAYAN DX CLUB	4	1,290,593
KAUNAS UNIVERSITY OF TECHNOLOGY RADIO CLUB	16	1,275,562
SP-CW-C	8	1,273,894
LA2T TRONDHEIMSGRUPPEN AV NRRL	4	1,193,199
RIIHIMAEN KOLMOSET	6	1,180,809

Club	# Entrants	Score
RAAC CYCLADES DX CLUB	7	1,142,451
PHILIPPINE AMATEUR RADIO LEAGUE	9	1,130,539
ZRHB	6	1,080,086
AMSTERDAM DX CLUB	4	1,045,551
YB LAND DX CLUB	22	1,020,954
GRUPO ARGENTINO DE CW	4	993,013
YO DX CLUB	12	979,749
SERRA DO LOPO DX GROUP	7	951,399
7A DX-CONTEST CLUB	14	944,834
CW QRS TELEGRAM GROUP	4	910,340
ARCK	9	890,490
RADIO CLUB VENEZOLANO CARACAS	7	868,899
KING'S LYNN AMATEUR RADIO CLUB	4	832,915
ARABIAN GULF DX GROUP	4	831,428
SHARP HAM CLUB	9	807,581
GPDX-PORTUGUESE DX GROUP	4	794,481
HOLYLAND DX GROUP	4	792,701
DX101 CONTEST CLUB	9	766,236
NEWBURY & DISTRICT ARS	4	751,680
JAPAN CONTESTER'S CLUB	5	745,582
SWINDON & DISTRICT AMATEUR RADIO CLUB	6	728,438
SK6EI SKOVDE AMATORRADIOKLUBB	6	720,189
UNIO DE RADIOAFECCIONATS DEL VALLES ORIENTAL	6	715,147
YYP CLUB	5	705,952
RADIO CLUB VENEZOLANO	5	702,508
GLOUCESTER AMATEUR RADIO & ELECTRONICS SOCIETY	4	671,150
BRISTOL CONTEST GROUP	5	655,804
ARKTIKA	6	606,225
E74FRS	9	578,419
NATIONAL CHILDREN'S PALACE	8	523,619
HERMOSILLO CONTEST GROUP	6	523,386
LITTLE GUN CLUB	4	458,967
CWSP	7	453,429
FALCONS DX GROUP	16	424,849
CLUB RADIOAMATEUR VE2CWQ	5	401,265
USRA	5	397,416
LKK LVIV SHORTWAVE CLUB	5	395,810
S53EOP	4	381,667
CS SILVER FOX DEVA	6	377,887
SK5AA VASTERAS RADIOKLUBB	5	376,351
SPORT CLUB MIERCUREA-CIUC	4	367,630
HALIFAX AMATEUR RADIO CLUB	4	364,393
TALL TREES CONTEST GROUP	5	349,784
BT CW CLUB	7	329,554
VRZA VERENIGING VAN RADIO ZEND AMATEURS	4	323,979
CSU BRASOV	6	318,719
SP9PBB	13	318,274
CHILEAN PACIFIC DX GROUP	9	312,880
PETERBOROUGH AMATEUR RADIO CLUB	4	307,715
ONLINE AMATEUR RADIO COMMUNITY	6	294,463
LOMA DEL TORO DX CLUB	4	287,618
JUST FOR FUN CONTEST CLUB	6	282,921
ORARI LOKAL BOGOR	10	259,645
CSM BOTOSANI	6	238,261
CWJF GROUP	4	227,243
GERMAN DX FOUNDATION	5	222,951
LA-DX-GROUP	4	217,243
GUARA DX GROUP	12	210,665
RADIOCLUB LJUBLJANA S53AJK	5	190,804
ALRS ST PETERSBURG	5	168,964
ORARI LOKAL KEDIRI	18	168,512
RADIO CLUB DE COSTA RICA	4	164,816
BA3RA	4	160,128
BAKTRAD	4	151,394
RU-QRP CLUB	4	148,226
KOREA CONTEST CLUB	4	146,983
GRUPO DXXE	5	131,495
ROYAL	5	131,054
LA4O	6	128,854
RADIOCLUBUL QSO BANAT TIMISOARA	4	128,659
HEREFORD AMATEUR RADIO SOCIETY	4	127,869
CSM TIMISOARA	4	123,505
CSA STEAUA BUCURESTI	4	119,481
CLUB DE RADIO EXPERIMENTADORES DE OCCIDENTE	6	105,312
LOMZA AND DISTRICT RADIO SOCIETY CONTEST GROUP	5	101,706
SPDXT	7	94,870
CMDXGROUP	6	93,313
RADIOFAROL DX GROUP	9	92,940
SHIJIAZHUANG AMATEUR RADIO CLUB	4	83,966
YB6_DX COMMUNITY	11	80,588
JARL KYOTO CLUB	4	79,699
ORARI LOKAL BLITAR	5	68,152
THE AKITA DX ASSOCIATION	5	67,949
ECHELFORD ARS	6	62,118
EDIT14	5	58,981
TORBAY ARS	4	58,265
VLADIMIR CONTEST GROUP	4	54,229
A1CLUB	6	51,834
RADIO CLUB DE PANAMA	4	47,693
DX2EVM SCAN INTERNATIONAL	5	43,268
WEST BORNEO DX CLUB	6	37,508
CHIANGRAI DX & CONTEST GROUP	4	24,965
OLDHOUSERADIOCLUB	4	507

Club scores with 4 or more entries.
* This club does not meet eligibility rules.

Stories from our CQ WW Explorers

A Bahamas Adventure, by Gregg Marco, W6IZT

The availability of the Explorer category proved to be a perfect match for the goals of our C6AGU operation. The team was operating from an uninhabited island in classic DXpedition style. There was no hotel withing 100 miles of our location.

Operating via remote access from our boat, we utilized RIB (radio-in-a-box) hardware. The RIB configuration, developed by George, AA7JV, and funded by the NCDXF, was comprised of a Flex 6700 transceiver, operating with 100 watts. The antenna was an N6BT V8 vertical fed through an automatic L-network tuner mounted to the base of the antenna, placed a few feet above the high tide line. Power was supplied by a solar array and batteries. George, AA7JV, and Mike, KN4EEI, set up the station a few weeks before the contest, which remained in place and in use from our unmanned location until early January 2023.

Deployment of the station involved using a landing craft that carried two RIBs, a generator and fuel. We also transported the UHF IP-link needed to connect the RIBs to the boat. A short video on how we deployed the RIBs on the island can be found here: <https://www.dropbox.com/s/7dge5250hljq743/RIBlandingCraft.mp4?dl=0>.

Remote access was accomplished using AnyDesk remote desktop software.Receive audio (with sidetone) was available using SonoBus. Our contest logging software was N1MM+, which also delivered CW keying. The internet connection utilized StarLink, much like what was accomplished in the recent Bouvet DXpedition.

Operating this station remotely during a contest was a joy, easily exceeding our expectations. The Codec in Sonobus provided outstanding audio quality. Jitter, or variations in network latency can be problematic over satellite or cellular connections. The ability to manually control buffer depth in Sonobus was key to realizing an optimal user experience.

In the end, we had a blast, and were very pleased with the results. A huge thank-you goes out to the NCDXF and George, AA7JV, for making this possible.

Exploring from ZL3!

The ZL3X (Quake Contesters) team proudly entered the Explorer category in the 2022 CQ WW CW Contest. Normally we would have been operating as a Multi-2 from my QTH (ZL3PAH), but this year one of our ops, Geoff, ZL3GA, had COVID in their household. Given my daughter was getting married shortly afterwards, we did not feel comfortable hosting our usual operating team together in one shack. The Explorer category was the perfect solution! Mark, ZL3AB, and I operated from my Motueka, Tasman shack while Geoff, ZL3GA, operated from his home QTH in Christchurch.

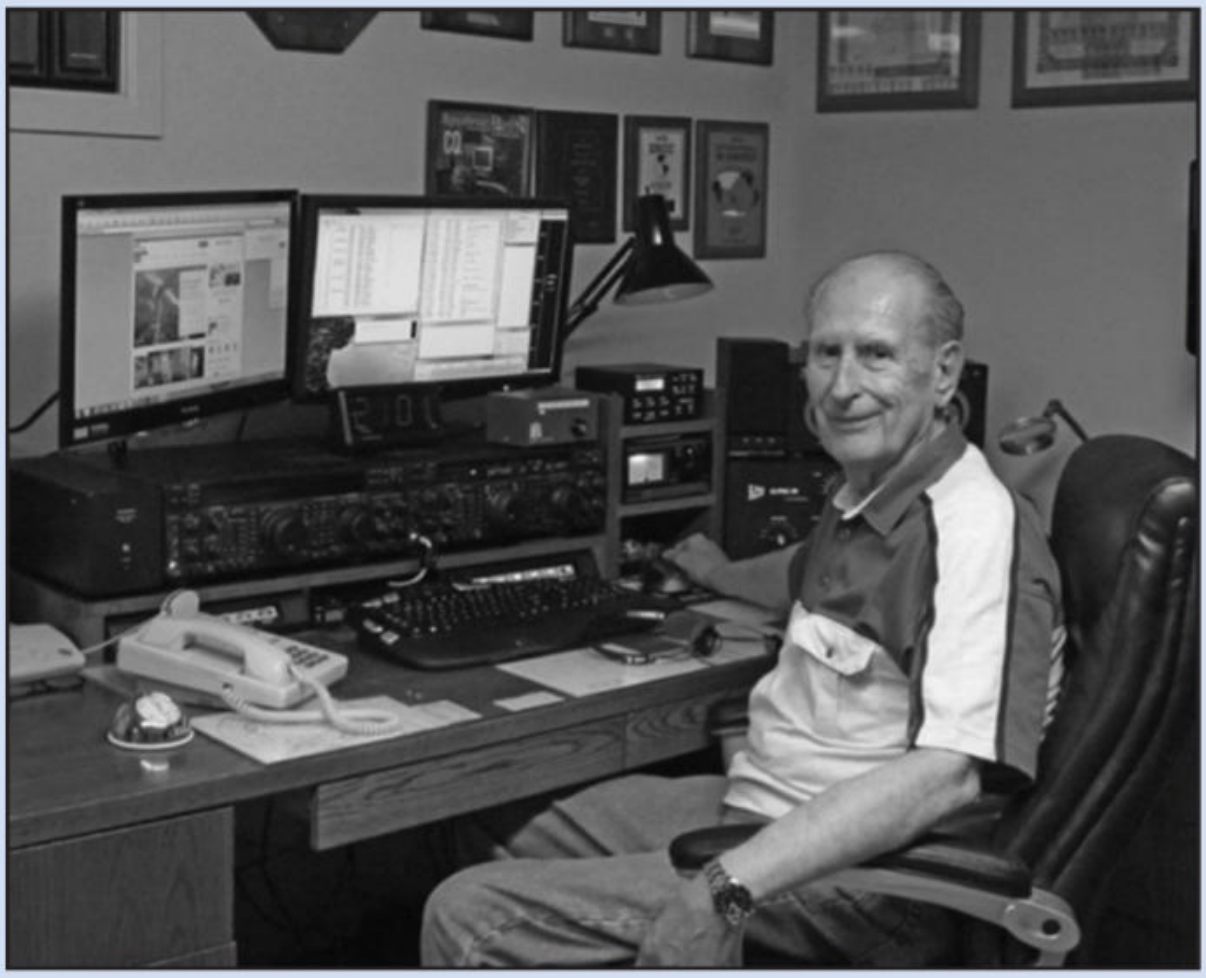
We used a K3 & K3S alongside SPE-1K and SPE-1K5 amplifiers. Our antennas were a 40-10m 2/3-El Ultrabeam at 18 meters, plus a 5-element 15-meter beam, 15 meters in the sky. We also used home-built band pass filters between transceivers and linears to allow multiband operation with very little interference on each band. Utilizing N1MM+ connected over the Internet, we could easily view how each station was doing and make strategic operating decisions on the fly.

Exploring may not be for everyone, but it sure worked for us!

73, Phil, ZL3PAH/ZL3P

A Tribute to Rod Linkous, W7OM

BY TOM OWENS, K7RI



Rod Linkous, W7OM, at home in one of his favorite places; the ham radio shack!

November 30, 2022. Indeed, Rod's passing shortly after his 88th birthday was a very sad day. A hearty amen to all the nice things that have been said about Rod and his accomplishments in ham radio.

Rod was real gentleman. In all my years of knowing Rod, I never heard him say a disparaging word about anyone. Rod received his first license in 1949 when he was 15 years old – W7KIM – the beginning of a passion for ham radio that he enjoyed for the rest of his life. Rod's first station was a set of ARC-5 aircraft radios and simple wires in trees. Years later, he became W7YBX and finally, W7OM, in 1977.

Rod entered the US Air Force aviation cadet program after high school, having already received his pilot's license. He opted to attend airborne radio/radar school with his first assignment being an airborne operator at an airbase in Japan. Many years later, in 1979, an Air Force posting took him to his first stop at the Pentagon. In 1961 he was also hired by Boeing on their aerospace program, which required a lot of traveling in the mid-1970s and beyond – both nationally and internationally. Many trips to the Washington, DC area ensured where, in his spare time, he made lifelong amateur radio friends. Rod retired from Boeing in 1993. In addition, after a distinguished 41-year career, Rod retired from the Air Force in late 1994, having attained the rank of Major General.

During his first week at the University of Washington in 1958 Rod met Donna, his Scottish lass, who survives him. They were married in 1960 and in 1963 bought their home in West Seattle. A year later there was a 60-foot tower and a tri-bander in the backyard. Over the years the antenna farm varied and grew to its present state: three slopers on 80- and 160-meters and a SteppIRDB-18E at 60 feet. All in all, he enjoyed good coverage for 40 through 6 meters – neatly snuggled on a 50x128-foot city lot. Oh, did I forget? Rod received an Electrical Engineering degree from the UW in 1961. Most of his contesting and DX chasing from the West Seattle QTH was low power out of respect for his neighbors.

For around five years, during the 1970s, Rod was an Assistant DX Editor for *CQ* magazine. And, over the years he authored several articles that were available in various amateur radio publications on topics that were of interest to fellow amateurs around the world.

Rod's operating numbers are right at the top of the standings in all categories, including DXCC totals of 373/Mixed, 370/Phone and 350/CW as well as CQ's elusive 5BWAZ achievement. The shack is adorned with several plaques for first-place, low power entries in QSO parties and other operating events. In addition, several Air Force plaques and awards which commemorate his service to our country.

In summary, Rod was a quiet, unassuming but excellent enabler. His drive and enthusiasm were responsible for many positive results. In addition to being an effective mentor and willingness to share his wisdom and time with others, Rod was the dynamic force that made many things successful. Mentioning two will have to suffice:

- **The Western Washington DX Club (WWDXC) – the early years**

  In the early 1950s Rod became the Club President and served in that role for many terms. Under his guidance, membership grew from 31 members to several hundred. Three major factors facilitated the growth: (1) a chain of buffet restaurants with free meeting rooms; (2) dinner meetings raffles, which financed the club for many years without the need for dues; and (3) excellent programs on topics of interest at each meeting, which was a magnet for attendance. Interest in DX and contesting thrived, and the club became known worldwide for its *Totem Tabloid* publication, *The Washington Totem Award* (still sought after by amateurs worldwide all these years), and the club's excellent contest.

- **Monthly Lunch Meetings**

  With the demise of many buffet restaurants, it became significantly more difficult to find cost-effective venues that could accommodate 100+ people for dinner meetings. Membership fell considerably, as has dinner meeting attendance. Accordingly, Rod was instrumental in establishing monthly lunch meetings which continue to this day, providing a needed boost to the club.

Thank you, Rod. There is no doubt that you will be greatly missed by all who knew you in the hobby and outside of radio as well. You were one of a kind!

What a fantastic set-up at the Multi-2 2022 CQ WW CW operation of VA2UR, manned by station owner, Guy Lemieux, VE2BWL, and Don Girard, VE2IR!

ences of getting to know these outstanding contributors to our hobby and the world at large.

One final note of encouragement. As sophisticated as our stations are becoming, nothing beats what you can process between your two ears. We see many logs containing calls based on what the spotting computers are reporting as opposed to the actual stations being worked. Embracing the long-standing strategy of "trust but verify" what you see on the screen as an assisted operator will always result in a higher final score.

Without Further Ado…

This is my second and final opportunity this year to recognize the individuals who do the real work behind the scenes for the CQ WW contest. Without these dedicated volunteers, we would have no contest. It's my honor to acknowledge the following members who made it happen this time around: Bud Trench, AA3B; CT1BOH, José Nunes; EA4KD, Pedro Vadillo; ES5TV, Tonno Vahk; F6BEE, Jacques Saget; G0MTN, Lee Volante; IK2QEI, Stefano Brioschi; JH5GHM, Katsuhiro (Don) Kondou; K1DG, Doug Grant; K1EA, Ken Wolff; K3LR, Tim Duffy; K3WW, Charles Fulp; K3ZO, Alfred A. (Fred) Laun, III; K5ZD, Randy Thompson; KR2Q, Doug Zwiebel; LA6VQ, Frode Igland; OH6LI, Jukka Klemola; PA3AAV, Gert Meinen; RA3AUU, Igor (Harry) Booklan; S50A, Tine Brajnik; S50XX, Kristjan Kodermac; UA9CDC, Igor Sokolov; VE3EJ, John Sluymer; VK2IA, Bernd Laenger; YO3JR, Andrei (Andy) Ruse.

And finally, if current band conditions are any indicator, this fall contest season bodes for an amazing set of CQ WW contests. Amazingly, it's only five months away. See you in October and November 2023! *73, John, K1AR*

(Scores on page 95)

Announcing:

The 2023 CQ World Wide VHF Contest

Starts: 1800 UTC Saturday, July 15, 2023
Ends: 2100 UTC Sunday, July 16, 2023

***IMPORTANT NOTE:* Paper logs are no longer accepted, see Section XII**

I. Contest Period

27 hours for all stations, all categories. Operate any portion of the contest period you wish. *(Note: Exception for QRP Hilltopper.)*

II. Objectives

The objectives of this contest are for amateurs around the world to contact as many amateurs as possible in the contest period, to promote VHF, to allow VHF operators the opportunity to experience the enhanced propagation available at this time of year, and for interested amateurs to collect VHF Maidenhead grid locators for award credits.

III. Bands

All amateur radio frequencies on 50 MHz (6 meters) and 144 MHz (2 meters) may be used as authorized by local law and license class. Note exceptions in Rule XI for common repeater frequencies and 146.52 MHz.

IV. QSO Alerting Assistance

Definition: The use of any technology or other source that provides callsign or multiplier identification along with frequency information about a signal to the operator. This includes, but is not limited to, use of DX Cluster, packet, local, or remote callsign and frequency decoding technology (e.g., CW Skimmer or Reverse Beacon Network), or operating arrangements involving other individuals.

1. All stations are allowed to use QSO Alerting Assistance. No self-spotting or asking to be spotted is allowed.

2. Stations attempting digital EME or digital meteor-scatter QSOs are allowed to spot the callsign, frequency, and sequence only. Caution: To ensure strict compliance with these rules, the adjudication process will include review of real-time and archived transcripts from websites used to coordinate alerting data during the contest period.

3. The use of non-amateur means to effect a QSO is not allowed. This includes use of the telephone, and website posts providing information beyond that of callsign, frequency, and sequence.

4. Rovers may use APRS to announce their location.

V. Categories of Competition

For all categories (except Rover): Transmitters and receivers must be located within a 500-meter diameter circle or within the property limits of the station licensee's address, whichever is greater.

1. Single Operator—All Band. Only one signal allowed at any one time; the operator may change bands at any time.

2. Single Operator—Single Band. Only one signal allowed at any one time.

3. Single-Operator All-Band QRP. There are no location restrictions — home or portable — for stations running 10 watts output or less.

4. Hilltopper. This is a single-op QRP portable category for an all-band entry limited in time to a maximum of 6 continuous hours. Backpackers and portables who do not want to devote resources and time to the full contest period are encouraged to participate, especially to activate rare grids. Any power source is acceptable.

5. Rover. A Rover station is one manned by no more than two operators, travels to more than one grid location, and signs "Rover" or "/R" with no more than one callsign.

6. Multi-Op. A multi-op station is one with two or more operators and may operate 6 and 2 meters simultaneously with only one signal per band.

Stations in any category, except Rover and QRP Hilltopper, may operate from any single location, home, or portable.

VI. Exchange

Callsign and Maidenhead grid locator (4 characters, e.g., EM15). Signal reports are not required and should not be included in the log entry.

VII. Multipliers

The multiplier is the number of different grid locators worked per band. A grid locator is counted once per band. Exception: The rover who moves into a new grid locator may count the same grid locator more than once per band as long as the rover is himself or herself in a new grid locator location. Such change in location must be clearly indicated in the rover's log.

1. A rover station becomes a new QSO to the stations working him or her when that rover changes grid locator.

2. The grid locator is the four-character Maidenhead grid (e.g. EM15).

VIII. Scoring

One (1) point per QSO on 50 MHz and two (2) points per QSO on 144 MHz. Allowed modes are "PH" (SSB, AM, FM), "CW" and "DG" ("digital" modes such as FT8, FT4, and MSK144). Entrants are requested to stop using "RY" or "PH" for QSOs made using "digital" modes. Work stations once per band, regardless of mode. Multiply total QSO points times total number of grid locators (GL) worked.

Rovers: For each new grid locator visited, contacts and grid locators count as new. Final Rover score is the sum of contact points made from each grid locator times the sum of all grid locators worked from all grids visited.

Example 1. K1GX works stations as follows:

50 QSOs (50 x 1 = 50) and 25 GLs (25 multipliers) on 50 MHz

35 QSOs (35 x 2 = 70) and 8 GLs (8 multipliers) on 144 MHz

K1GX has 120 QSO points (50 + 70 = 120) x 33 multipliers (25 + 8 = 33) = 3,960 total points.

Example 2. W9FS/R works stations as follows:

From EN52: 50 QSOs (50 x 1 = 50) and 25 GLs (25 multipliers) on 50 MHz

From EN52: 40 QSOs (40 x 2 = 80) and 10 GLs (10 multipliers) on 144 MHz

From EN51: 60 QSOs (60 x 1 = 60) and 30 GLs (30 multipliers) on 50 MHz

From EN51: 20 QSOs (20 x 2 = 40) and 5 GLs (5 multipliers) on 144 MHz

W9FS/R has 230 QSO points (50 + 80 + 60 + 40) x 70 multipliers (25 + 10 + 30 + 5) = 16,100 total points

IX. Awards

Electronic certificates will be made available for download for everyone who submits an entry.

Geographic areas include states (U.S.), provinces (Canada), and countries, and may also be extended to include other subdivisions as justified by competitive entries. U.S. Rover certificates are issued on a regional basis.

Plaques will be awarded to the highest scoring stations where sponsored. They are offered in various categories on a sponsored basis. Clubs and individual plaque donors are sought and may find information on how to sponsor a CQWW VHF Contest plaque at <www.cqww-vhf.com/plaques.htm>.

X. Club Competition

The club score is the total aggregate score from logs submitted by members. There are two separate club competition categories.

1. USA Clubs: Participation is limited to club members residing within a 250-mile radius circle from the center of club area.

2. DX Clubs: Participation is limited to club members residing within EITHER the DXCC country where the club is located OR within a 400-kilometer radius circle from the center of club.

General club rules:

1. National organizations (e.g., JARL, REF, or DARC) are not eligible for the club competition.

2. Spell out the full name of the club. See examples of active club names at <https://cqww-vhf.com/clubnames.htm>.

3. Single-operator entries may only contribute to one club. Multi-operator scores may be allocated to multiple clubs as a percentage of the number of club members participating in the operation. The log entry must spell out the full club name (and club allocations if multi-op).

4. A minimum of three logs must be received for a club to be listed in the results. Checklog entries are not counted for the club score.

XI. Miscellaneous

An operator may sign only one callsign during the contest. This means that an operator cannot generate QSOs by first signing his callsign, then signing his daughter's callsign, even though both callsigns are assigned to the same location.

A station located exactly on a dividing line of a grid locator must choose only one grid locator from which to operate for exchange purposes.

A rover cannot give out a different multiplier without moving the complete station at least 100 meters.

Making or soliciting QSOs on the national simplex frequency, 146.52 MHz, or your country's designated national simplex frequency, or immediately adjacent guard frequencies, is prohibited. Use of commonly recognized repeater frequencies is prohibited. Recognized FM simplex frequencies such as 146.49, .55, and .58, and local-option simplex channels may be used for contest purposes.

Aeronautical mobile contacts do not count.

Contestants should respect use of the DX window, 50.100-50.125 MHz, for intercontinental QSOs only. UTC is the required logging time.

XII. Log Submissions

Log entries must be submitted by July 26, 2023 to be eligible for awards.

The CABRILLO file format is the standard for logs. See <cqwwvhf.com/cabrillo.htm> for detailed instructions on filling out the CABRILLO file header. Note: U.S. stations must indicate the station location in the CABRILLO header (e.g., LOCATION: OH).

Web upload of Cabrillo log files is the only method of log submission. Web upload is available at <cqww-vhf.com/logcheck>.

An ADIF Converter is provided for convenience and, at present, is suitable only for FIXED station logs (sorry Rovers). It is available at <https://cqwwvhf.com/adif/>.

Entry Confirmation: All logs received will be confirmed via email. A listing of logs received can be viewed at <https://cqww-vhf.com/logs_received.htm>.

XIII. Declaration

Your submission of a log entry affirms that: (1) you have abided by all the rules of the contest as well as those of your country's licensing authority; (2) you accept any decisions made regarding your entry by the contest's adjudication process which are official and final.

Message from the Director

Thank you all for your interest and participation. Let's hope for some good propagation conditions on the 50- and 144-MHz bands during this coming July. And don't let your computer make all of your contacts. Remember that microphones and keys can also be used and such use is encouraged.

Please check for last-minute updates at <https://www.cqww-vhf.com/rules.htm>.

emergency communications

BY JOHN FERGUSON,* K3PFW

Whatcha Gonna Do When the Lights Go Out?

ex·pe·di·ent: something done or used to achieve a particular end, usually quickly or temporarily.

Hams, by their very nature, are creative and adaptive folks, no more so than when things have proverbially "just left for Hades in a wicker basket." The gust front from the thunderstorm that is now giving you about two inches of rain an hour, and just took out your antennas, has effectively taken you off the air. Oh, and the electricity is out too. Now what are you going to do for power? You now need that "expedient" solution to get back on the air for the Skywarn Net. Have you thought about this possibility?

We hams should be ready to serve our neighbors and communities in times of disaster. That means we need to do the "*what ifs*" and figure out solutions ahead of time. Yes, plan for the unthinkable and then you won't have to think when it happens! Make a plan, test the plan, and then work the plan when the time comes. Stockpile the necessities to get you

Photo A. Back on the air again … wire ground plane on PVC conduit

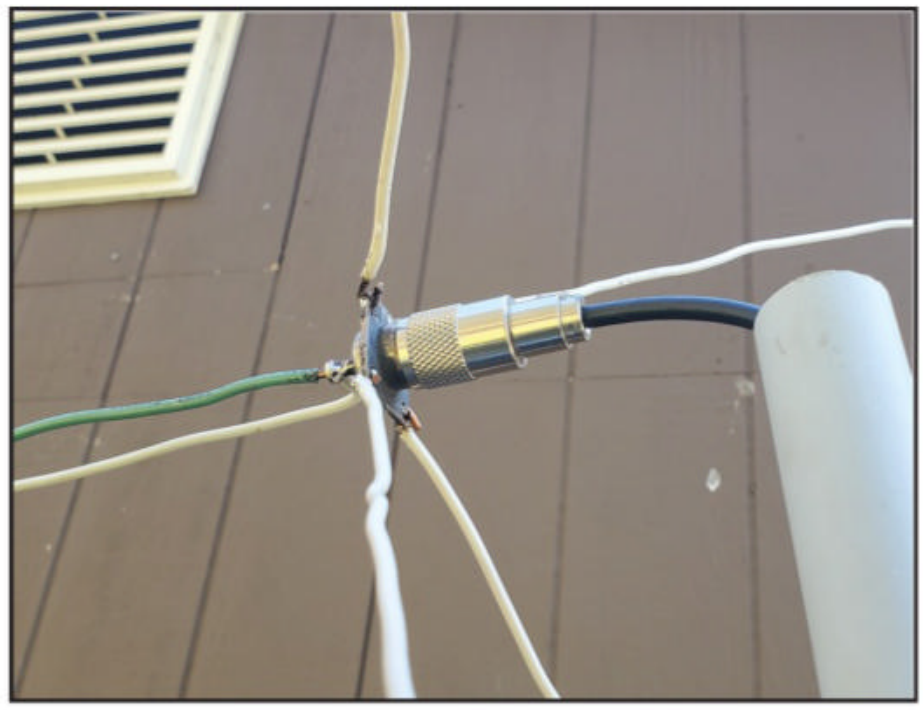


Photo B. Detail of wire ground plane

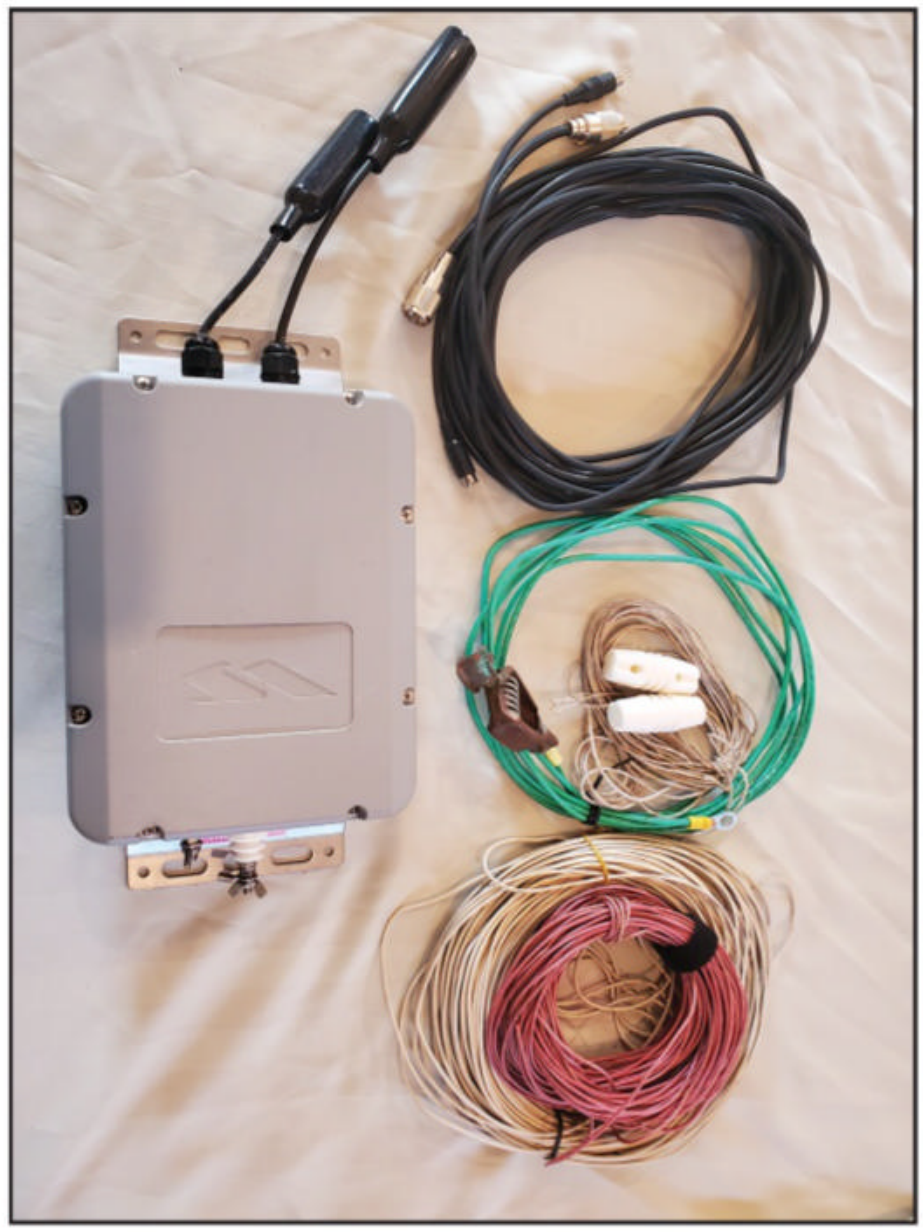


Photo C. Author's "Go Kit" HF tuner, control cable, coax, antenna wire, counterpoise, ground cable, insulators and nylon string (grounding is for safety)

** 20116 Donovans Rd.*
Georgetown, DE 19947
Email: <K3PFW@cq-amateur-radio.com>

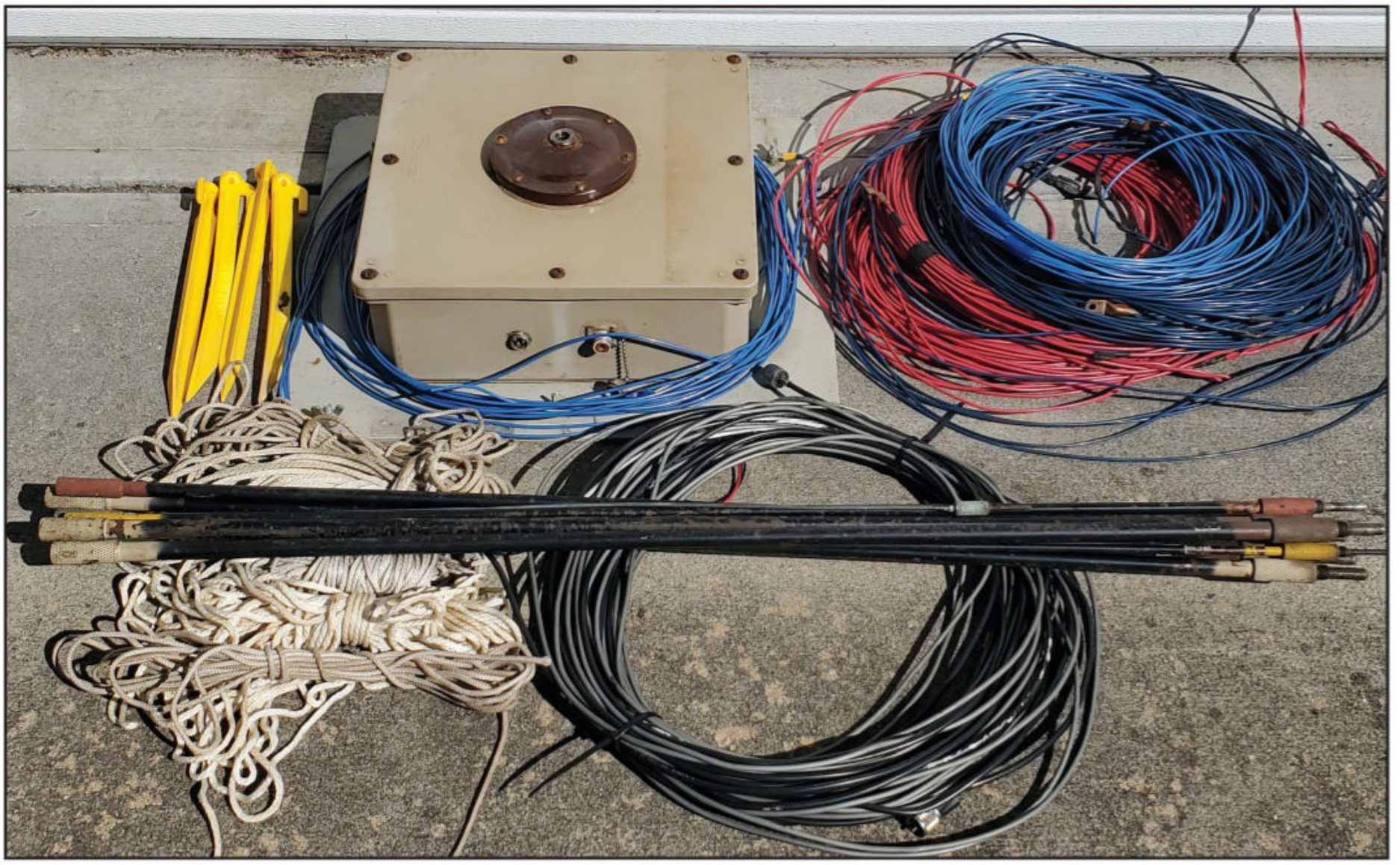


Photo D. Author's homebrew portable HF vertical. Sectional whip, base insulator, and aluminum plate salvaged from an Army "26 Delta." The weatherproof PVC junction box has an SGC circuit board auto tuner inside. Radials, power cable and coax, nylon cord and anchor stakes complete the package.

through an emergency. I discussed that in a previous column in terms of you and your family prepared for an emergency. Now, let's look at some possibilities for operating under a disaster condition.

We start with the premise that "all disasters are local." That's where the effects are first noticed and felt. That's where the first of the recovery process starts, you and your family. It is family first! That's about as local as it gets. Once that situation is at least stable, then consider what's next. To communicate you will need a radio, an antenna, and power, for starters. Which bands you will operate on will be dictated by local practice and the situation, and in a disaster that changes almost hourly. The local plan and practice will give you a starting point. For most situations, the VHF and UHF repeaters in your area will be where the most activity is, if they're operational. If not, try simplex on the output frequency, with the appropriate tone for that machine. This is a de facto ARES standard practice over most of the continental U.S. Your local groups should have this in their emergency operation instructions. Well, if you're fifteen miles from the repeater with an HT and a "rubber ducky", maybe this won't work. Do you have an adapter that will allow you to connect to a better antenna? How about your mobile, if you have one … is it operational?

If the conditions allow you to remain at your residence, your options are probably pretty good for coming up with something. If, however, it's like the recent train derailment in East Palestine, Ohio, and you are under an immediate evacuation order, your options just got reduced, dramatically! Again, the safety of you and your family is first on the priority list. The situation will dictate how fast you need to leave. "If" – there's that little big word again, if your Go Kit is always packed and ready, close at hand, grab it too, and git gone! Anything from there on is going to be what it is, and very unpredictable. Your previous family disaster planning will be a big help in making your evacuation as comfortable as it might be. You do have a plan, don't you?

What and how you get back on the air, if you are staying in place, again depends on the situation at hand, as well as the weather conditions. What's salvageable from the damaged antennas, and what resources you have for power should be evaluated first. Time taken now, despite the perceived pressure to get on the air, to carefully evaluate the situation, sort of inventory what you have to work with, and think through what might work; will save you time and frustration in the long run. Unless you are really practiced at this sort of thing, the immediate situation can be overwhelming. "Taking stock", as they say, of the situation and considering options will be a big help.

As part of this column's preparation, I went to the shop and, using what was on hand, made two antennas. Photo A is a "back on the air again" antenna made out of some wire and an SO-239 coaxial socket. It sits on a piece of 3/4-inch PVC conduit. Photo B shows some detail. I was quite pleased with the little ground plane. At seven feet off the ground, I was able to work through seven 2-meter repeaters and three 70-centimeter machines from the home QTH on low power. This is also a test of my idea to have a low height, low gain, antenna for the shack, as mentioned in my column on rebuilding the station here. An internet search will turn up multiple iterations of this design.

The expedient and itinerant antenna situation and selection today is a lot better than in the past. The development of "end fed" antenna designs for HF and the wide selection

of “dual band” antennas for V/UHF is now more of a “wallet” question than an availability one. Having a backup antenna handy is a good place to start your planning.

HF Expedience

Expedient antennas for HF by and large fall into two categories: resonant and non-resonant. Almost anything will radiate; however, efficiency should be considered if you want to be heard. I mentioned previously the “end fed” antenna. This is a really handy design for portable and temporary work. It is literally fed at one end rather than the middle, or something off center around the thirty something percent point, as in the off-center-fed (OCF) dipole. The simplest of these is just a wire, fed with a wide range tuner, working against some sort of ground or counterpoise. The longer the wire the better. It’s what I carry in my all band go kit.

For something a little more elegant and easier to “install,“ check out the manufactured (you can homebrew one) “end-feds.“ They come in basically two versions, the end-fed half-wave (EFHW), and an interesting variation, the end-fed random wire, although it isn’t truly a ‘random’ length. The primary difference, other than length, is the ratio of the balun at the feed end. It’s usually a 49:1 ratio for the EFHW, and a 9:1 for the ‘random wire’ version. The advantage to the ‘random wire‘ version is it can be shorter than the EFHW for a given lowest band coverage. Unlike the usual dipole, you only need to get one end up in the air. Having something like this rolled up and stored away for an emergency is something you should consider. Photo C, the Yaesu FC-40 remote tuner, along with some accessories, is what I have in my travel go kit. With the tuner, the antenna working against ground or a counterpoise, it is essentially an “end fed,“ the tuner taking the place of the balun. Photo D is my portable vertical, which was a project from some years ago. It still gets frequent use around here because of its simplicity, quick set-up and versatility. The Power Pole strip (Photo E) usually rides along in the same box as the portable vertical. It’s great for clipping onto the battery posts of the vehicle. I like the meter to monitor the voltage.

VHF and UHF

At VHF and UHF, things are a little simpler, mainly due to the shorter wavelengths involved. Having something functional on V/UHF is probably more critical than having something for HF. Most of the response and recovery work by hams in a disaster is in this range. Getting something efficient, and high enough to get some simplex coverage (you sort of count on the repeaters going down at least initially) is often your biggest problem. There are all sorts of compact roll-up antenna designs for V/UHF, most based on the classic Zepp design (yes, the same thing they dragged behind the German airships), a parallel conductor half wave radiator and quarter-wave matching stub. There are multiple examples of these deigns made from 300-ohm twinlead. For a compact roll-up design, I personally like the coaxial dipole (Photo F) made out of coax. Search the internet for multiple examples of instructions for these antennas.

Whatever you are using, you are probably going to need a “skyhook” of some sort, particularly if there aren’t any handy trees or clothesline posts around. Try for non-conductive, if you can, like wood, fiberglass or PVC. Again, there are lots of nice manufactured examples out there, but not a lot of help if you have to wait for one to be delivered, if it can be delivered at all in the current circumstances. The opportunity to “roll your own” here is limited only by your imagination, what you can find, and last but not least, your pocketbook. Painters’ poles are a good choice for relatively low heights and light

Photo E. Power Pole distribution with # 8 wire and big clips

Photo F. Coaxial dipole comprised of RG 58/U and a coax connector

loads. After those you need to look at telescoping masts, which are more or less made for the purpose.

Any large-scale disaster is going to be accompanied loss of services. The type of disaster will usually dictate the services that are impacted. Winter storms with ice, wind, freezing temperatures, and heavy snow will take out power, disrupt communication, and make transportation difficult. Other losses will follow due the loss of heating ability and freezing temps. Regional floods are just about a totality of destruction in and of themselves, and recovery is slow. If I have to have a disaster, tornados aren't bad, unless it's you it hits! There's usually limited loss of power; transportation isn't a major issue, and so response is quick. The weather is usually gorgeous after it passes. With just a path of destruction, you can get your responding units to both sides of the destruction, a readymade task for the mutual assistance plan!

Power Up!

The disaster has hit! Well now, with a rig, a feedline, and an "ethereal adornment" (antenna), all you need now is a power source. If the lights are still on, you are in good shape for the moment. Charge your batteries while you can! The fact that you have "lights on" is also a fair indication that communications are probably still somewhat intact, at least for you. If you are lucky enough to be outside of the more heavily impacted areas, you may end up as a net control station. But if there are no lights, what are you going to do for a power source? And it's now going to need to also run a light so you can see to write (and read). Batteries are your first choice, followed by some sort of generator. Have you planned for this? There's always your mobile station, at least for an initial short duration solution. Can you operate on a "reduced power budget"? Now is not the time for QRO! Think QRP, conservative operating practice, and as efficient an antenna as the circumstance will allow. An interesting note, the noise floor in the early part of a disaster scenario is lower than normal; all the offending electrical devices that generate RF hash are off.

Batteries, whether they are NiCad, lead acid, lithium, or whatever, they have a finite discharge level, and will need to be recharged, by a generator of some type, fossil fuel, wind or solar. Those of you who have pursued and developed your own "off the grid" lifestyle will probably do fine in these circumstances. Generators need fuel, and fossil fuels are flammable and explosive. Observe appropriate safety precautions. Don't compound the situation by having a mini-disaster of your own making. Never, ever, run a fossil fuel generator inside your residence! Never! The resulting carbon monoxide is a notorious silent killer, and it will make you and yours dead.

Safety First!

Maybe you will have gained some ideas from this discussion. Hopefully, we've started your creative thoughts flowing. To cover itinerant and expedient solutions to the issues of emergency communications requires a very wide range of topics and subjects. One of the more critical, and only briefly mentioned in this month's column, is safety. It should be first and foremost in all your planning and activities involved in the support of emergency and disaster communication. Stay safe out there. Dry and warm ain't too shabby, either. 73, John K3PFW

learning curve

BY RON OCHU, KOØZ

To CW or Not to CW? That is the Question!

I've been thinking about writing on this topic for quite a while. There is a lot of interest in learning Morse code and communicating via CW (continuous wave). And just like the amount of interest in Morse, there's no shortage of methods to learn it. By the way, CW, or continuous wave, simply means turning your transceiver's transmitted RF (radio frequency) signal on and off by using a key or paddle (Photo A).[1] A short pulse of RF (CW) is sent over the air. The combination of frequency pulses and time between pulses is the method used to transmit and to receive Morse code via radio. In February 2007, the FCC (Federal Communications Commission) removed the Morse Code requirement for a ham radio license. Some pundits at the time predicted that it wouldn't be long before CW all but vanished from the ham radio bands. Only the Morse code die-hards would remain as relics to a distant past, they

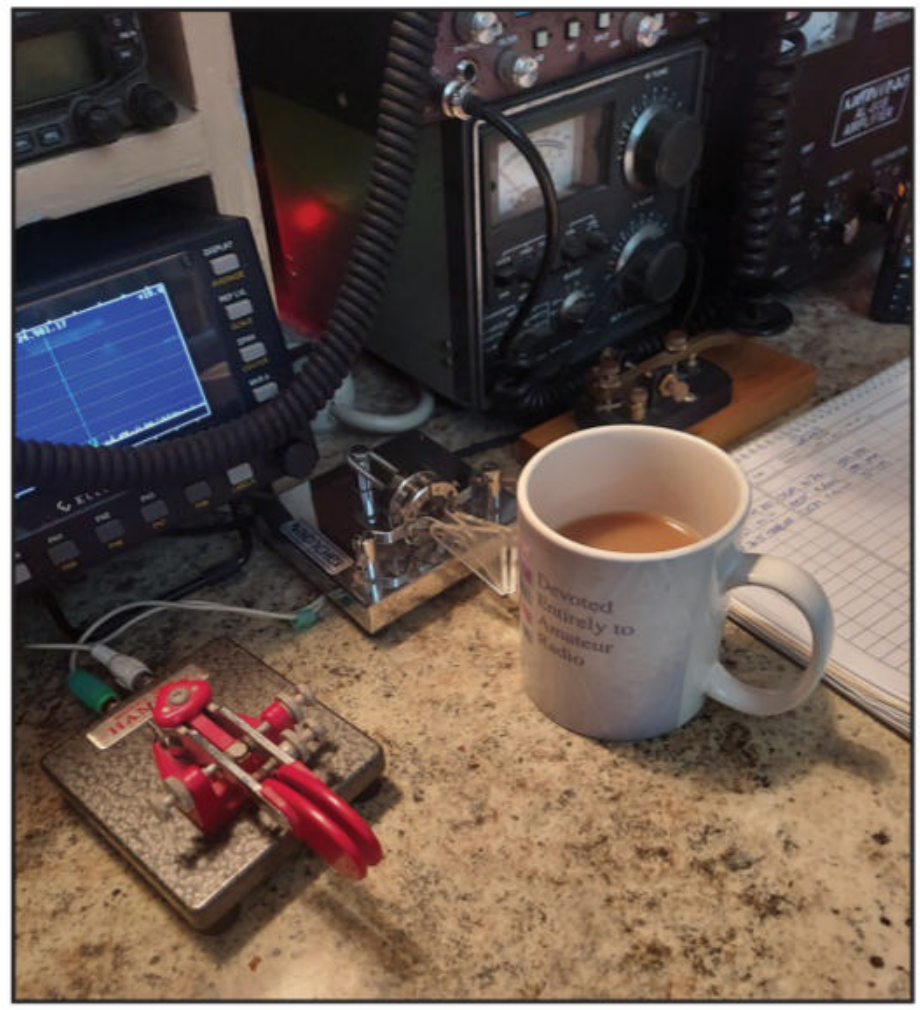


Photo A. Paddles and keys found in your editor's shack. On the left is my Hamkey paddle. Next to it is my Bencher paddle and to its right is my Nye-Viking straight key with a Navy knob. Another essential CW accessory is a cup of piping hot coffee! →

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

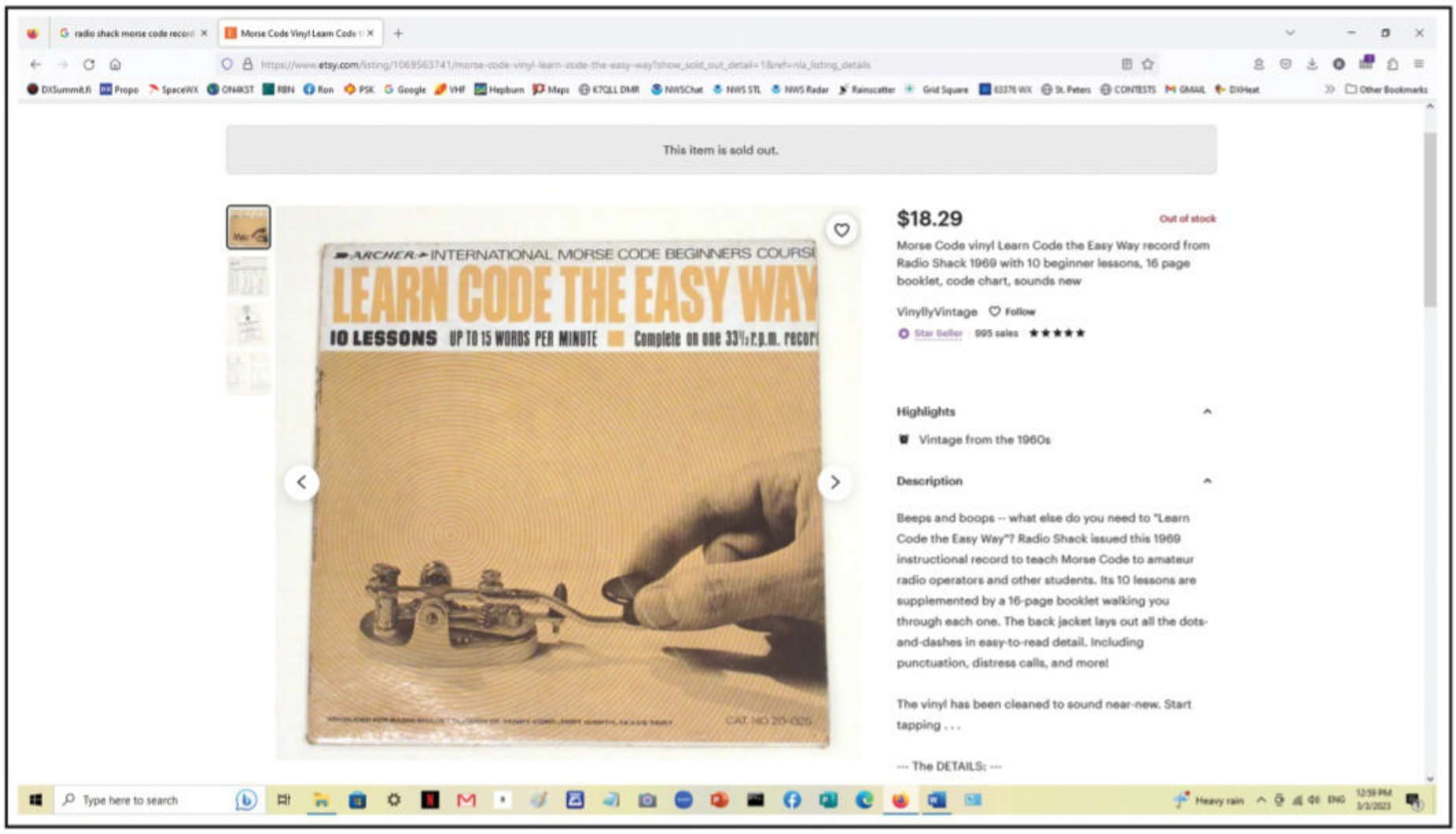


Photo B. Screen shot of RadioShack's Archer Morse code learning program. Your author "cut his" Morse code teeth with this program back in the day.

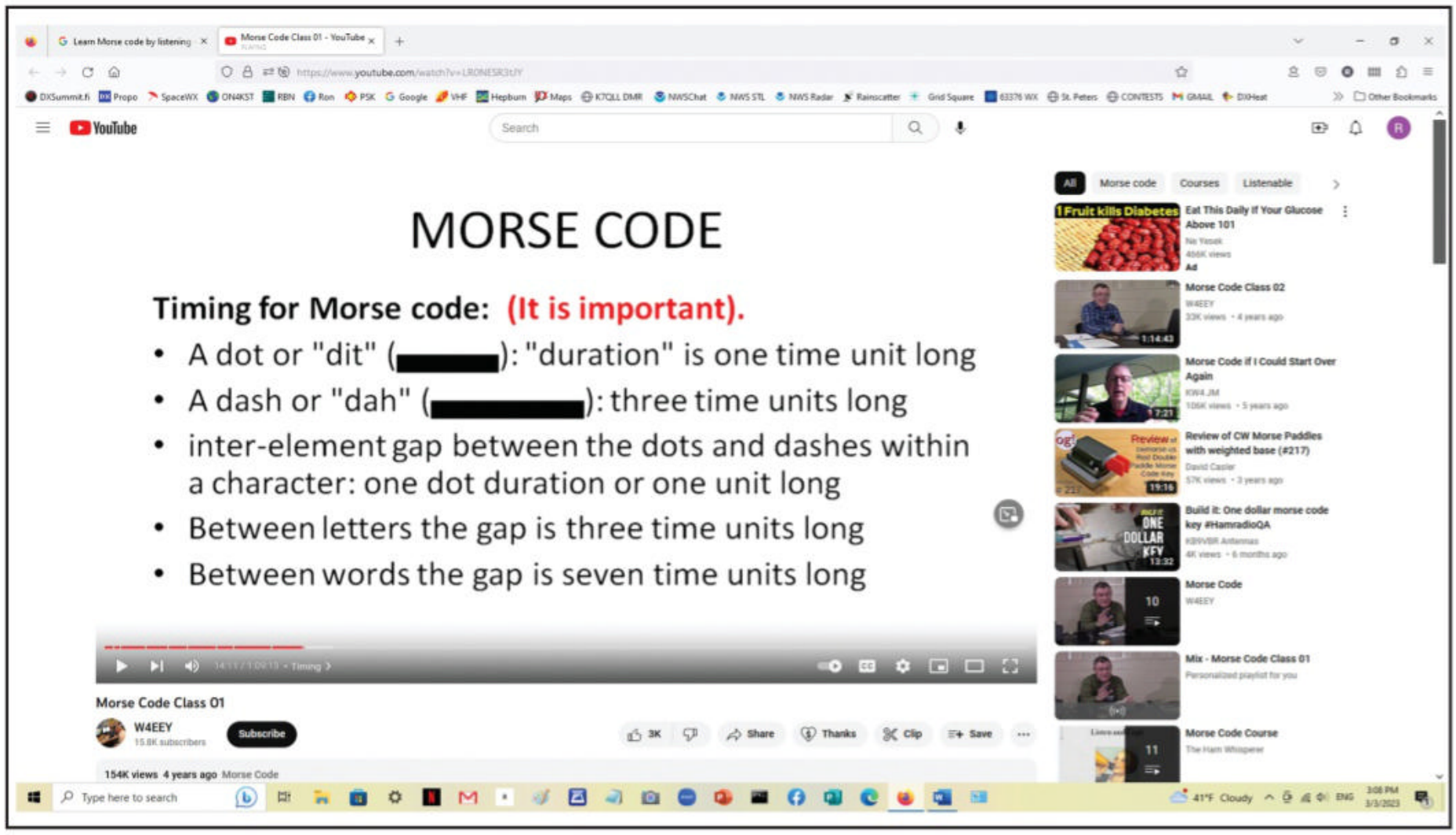


Photo C. Screenshot of Ryan Wheeler, W4EEE's, YouTube Morse code learning video. Learning timing is essential to learning Morse.

said. Contrary to their predictions, CW didn't vanish. Instead, CW is flourishing!

CW & Weak Signal Copy

There are several reasons why CW is flourishing. Besides being fun, it is perfect for weak signal communications. What do I mean by weak signal communications? Turn on your transceiver and listen to the static. That is your transceiver's "noise floor." Some days have more static than others. Sometimes, when the static levels are very high, it seems like nothing will punch through the noise. Often a CW signal, even a weak one, can punch through QRN (static) to be successfully copied. It may be a struggle on both ends of the radio, but it can be done.

Bandwidth

The amount of RF spectrum a modulated signal occupies is called its bandwidth. It is measured in Hertz (Hz). For example, a typical single sideband (SSB) signal is around 2.8 kilohertz (kHz) wide, whereas a CW signal is around 150 Hz. CW occupies a significantly smaller amount of RF real estate, and therein lies its ability to outperform wider signals when it comes to signal-to-noise ratios. More of the transmitter's power is contained in a smaller space as opposed to being distributed over a wider spectrum like a voice or television signal. Concentrated power in a smaller space makes for a stronger signal. Do you remember the film "The Karate Kid"? Do you remember Mr. Miyagi instructing Daniel-san to focus his punch into an area of one square inch? Bandwidth and power are similar.

Another way to look at it comes from a good friend, Eric Koch, NFØQ (SK). He would challenge his physics students to determine the power released from a 20-kiloton atomic bomb and compare their findings to a typical, garden variety thunderstorm. His students were amazed to discover more energy is released in a T-storm. The difference is that the energy released in a T-storm is spread over a much wider area. When all else fails, CW usually punches through the noise.

Learning CW

How should one go about learning Morse code? I'm reminded of the beginning of Elizabeth Barrett Browning's poem, "How do I love thee? Let me count the ways." This is apropos because Morse code enthusiasts love CW and there are many ways to learn it! The trick is to find a method that works for you. Once you've found a suitable method, commit to it. Devote time each day, without fail, to learning code. Fifteen to 20 minutes daily is recommended. If you stay with it, before long the sounds associated with Morse code will sound more natural. You'll know your persistence is paying off while driving and you hear someone honking a horn in traffic and instead of beeps you will hear the letter "S" or "H." That actually happened to me more than once, and I found myself anticipating the angry motorist's next two letters. Fortunately for me, I wasn't the source of the disgruntled motorist's ire, nor did he send any additional letters in code. Another time, while learning code, I heard an oscillating desk fan's blade sending what sounded like a string of "Vees." The point is you know you're making progress with pattern recognition. Find a suitable method to learn Morse and then stick with it. Persistence is the key to success!

My Morse Code Learning Experience

Today, there are a lot of methods available for learning Morse code. Not so much when I started to learn code. When I began my ham radio journey in the early 1970s, knowing Morse code was mandatory for earning an FCC Amateur Radio Service license. Back then, there were five classes of ham radio licenses. The Novice and Technician licenses required examinees to receive and send Morse code at 5 words per minute (wpm).

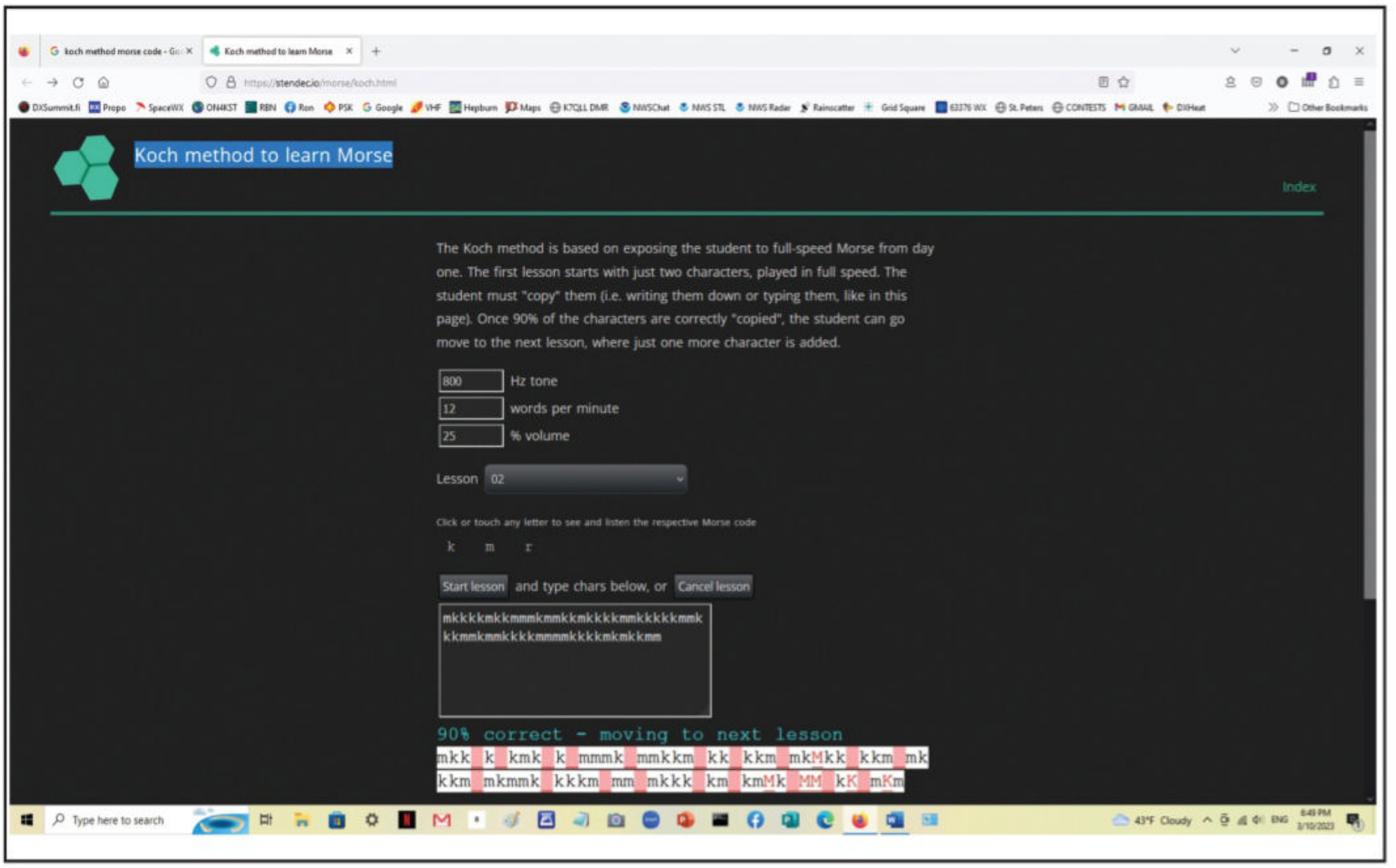


Photo D. A popular way to learn Morse code is via the Koch method. The idea is not to count the individual dits *and* dahs*. Rather, hear the sound* dit *and* dah *combinations make.*

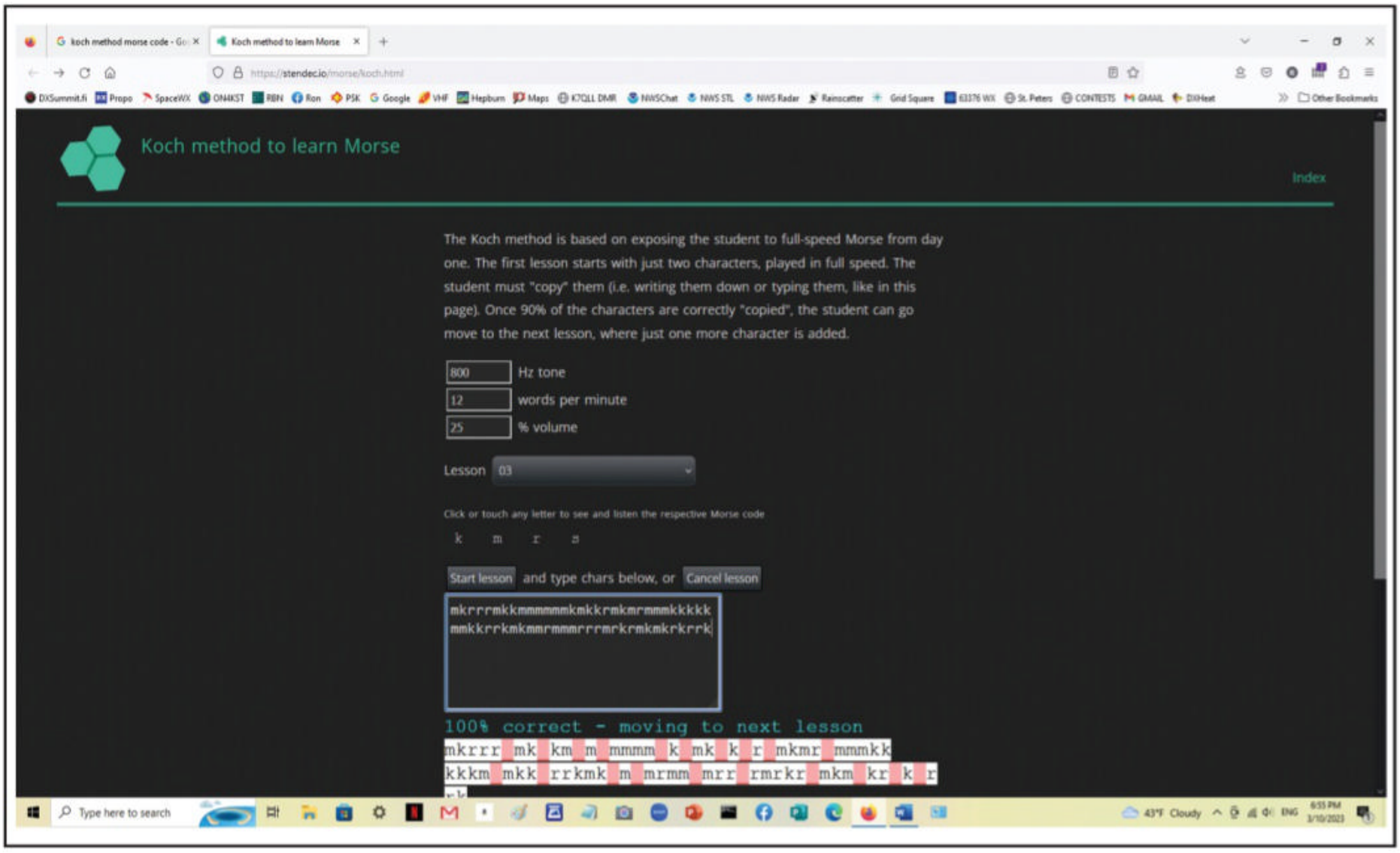


Photo E. Your author obtained 100% correct using the Koch method.

The General and Advanced class licenses required passing a 13-wpm test. Extra class required 20 wpm proficiency.

If I wanted a ham radio license, then I needed to pass a Morse code test. Some people were discouraged by this FCC requirement. When I was a Boy Scout, I learned Morse code to earn my First-Class Scout rating. However, the FCC Morse code exam was more rigorous, and anxiety-ridden.

RadioShack sold an LP record by Archer that taught code (Photo B). Back then, record players had multiple speed settings in revolutions per minute (rpm). Changing the record speed let you play the code lessons at either 5, 10 or 15 wpm! Included with the record was a short manual that offered a lot of tips and lessons. The lessons familiarized students with like-sounding characters. For instance, the letters E, I, S, H and the number 5 were taught first. The letter E is a simple *dit*. I is two *dits*, S is three *dits*, H is four *dits*, and 5 is five *dits*. A series of Es were sent, then I's, and so on. I found learning code to be fun and easy. After mastering E, I, S, H, and 5, the course introduced us to *dah* sounds. The letter T is one *dah*. M is two *dahs*, O is three *dahs*, and the number 0 is five *dahs*. Before long, I was not only copying letters but simple words such as SOS, MOM, HOT, SET, SIT, and HIT. I was making measurable progress, and it was fun! This achievement was a real motivator for me. Next, we learned *dit* and *dah* combinations such as A which is *didah*. Notice I didn't write it as *dit dah*. The reason being when A is sent, it sounds more like a *didah* as opposed to a single *dit* and a *dah*, which could be mistakenly copied as the letters E and T. Other combinations were introduced to us along the way.

The record used 5-character groupings in columns. Students played the record and copied the letter, number, or prosign combinations. Afterwards, you could compare your copy with the printed lesson. There were so many lessons that it would be difficult to memorize them. The problem with this method of learning code is it takes more work to copy code correctly at higher speeds.

Dot/Dash vs *Dit*/*Dah*

Somewhere along the line, I read the suggestion to eliminate dot and dash from your mind. Sure, the letter A is depicted as a dot and a dash (. -) in a Morse code chart. However, I have never heard a dot or a dash transmitted over the air. On the other hand, I have heard *dits* and *dahs* over the airwaves. Run together to form letters like A, I hear *didah* or *dahdit* for the letter N. This is an important step to learning the code and making copy over the radio easier. So how long is a *dit* as opposed to a *dah*? That depends on the sending speed. A *dit* is a short closure of the telegraph key. Gary Wise, W4EEY, teaches that a *dit* is a unit and that a *dah* is three times as long (Photo C). Current theory suggests students should not learn code by sight. So, rather than seeing *didah*, hear the letter A as *didah*. Likewise for remaining characters. This technique goes a long way towards reducing learning plateaus.

Morse Teaching Methodologies

Thinking of Morse code characters according to their sound (*dit* and *dah*) is a big first step in learning code. Currently there are two main approaches to teaching code. The Koch and the Farnsworth methods.

Koch Method

According to the "Koch method to learn Morse" website <https://tinyurl.com/37vdsmmh>, "The Koch method is based on exposing the student to full-speed Morse from day one." This website offers an interactive platform to learn Morse

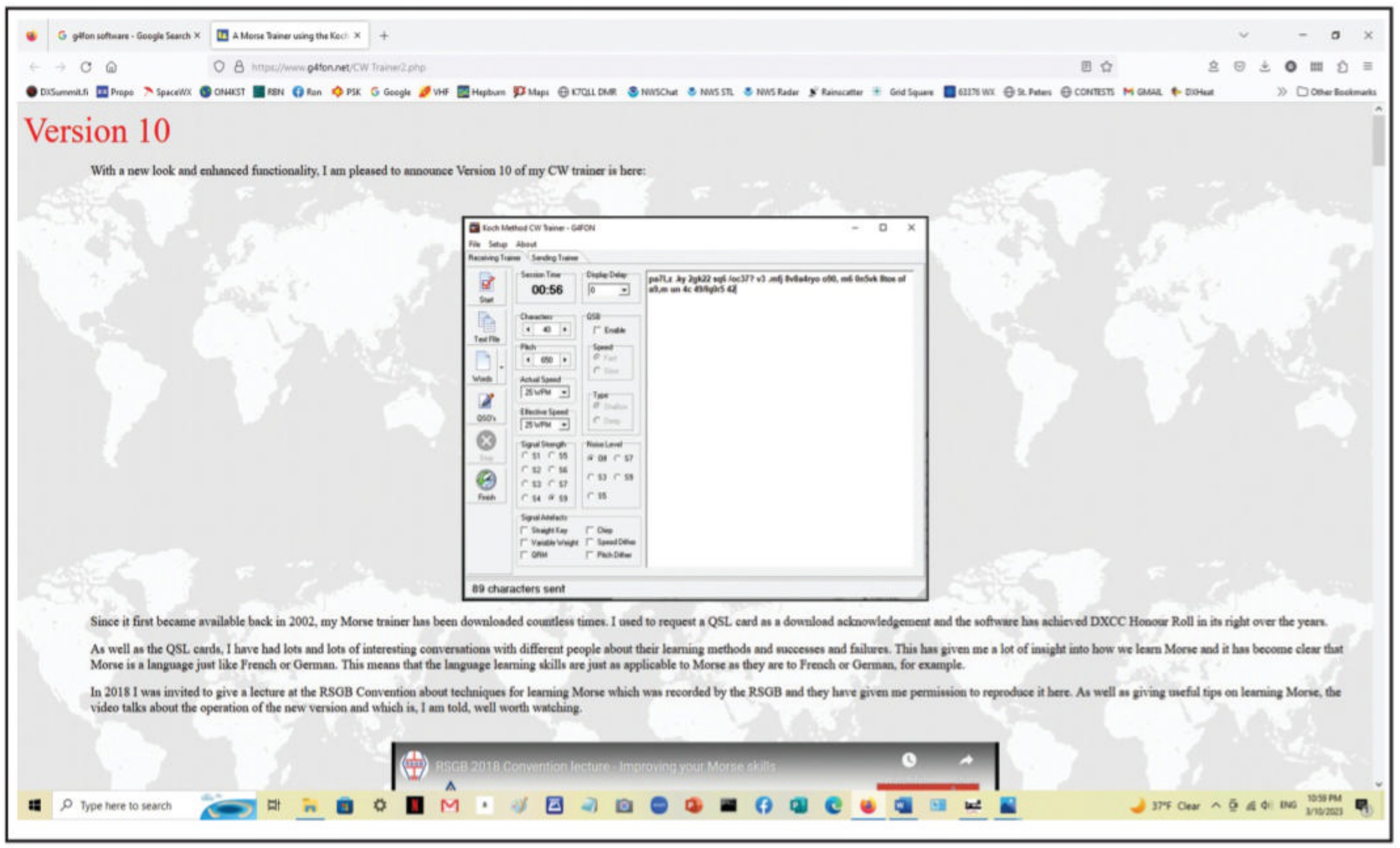


Photo F. Screenshot of G4FON's CW Trainer. Version 10 is a popular Koch method Morse code learning platform.

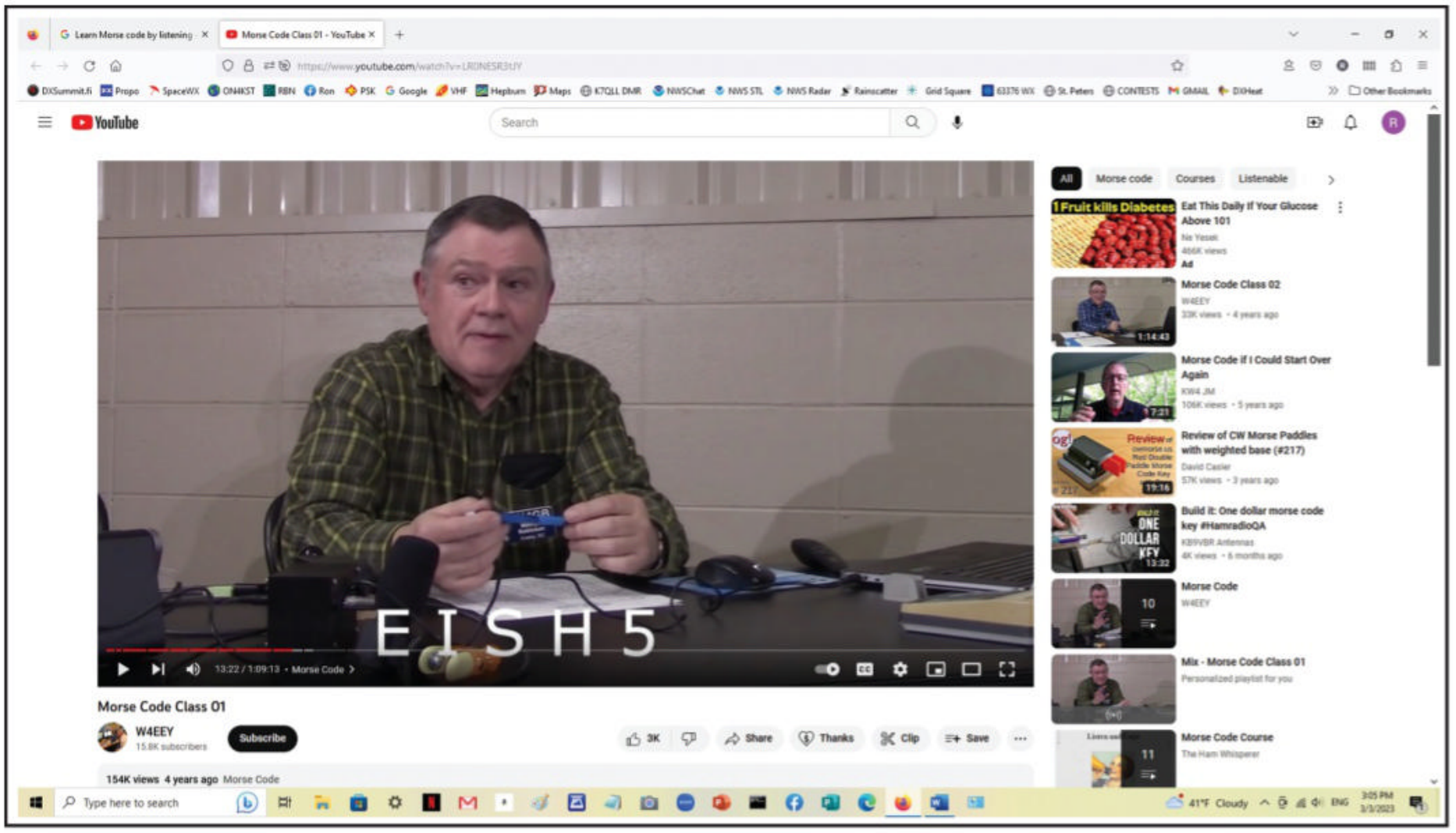


Photo G. Melvyn Robinson, KN4GB, is the narrator of W4EEY's YouTube Morse code video course.

code at full speed. The user sets the speed. The program uses your computer's sound card to transmit two lines of characters or about 62 characters. You type in the letters. There are visual clues. About midway down the webpage, just below the Lesson box, the lesson's letters are shown. Clicking on the letter(s) will allow you to hear them.

Now it's time to begin the lesson. This forces you to listen and to memorize the sounds. After the two lines are sent, the program will compare your input to what was actually sent. I tried out lesson 1 at 12 wpm which introduced me to the letters K and M. I scored 90% which entitles me to go to the next lesson, which will add another character (Photo D). For a beginner, this may at first seem like a frustrating way to learn code, but persistence is the key. Keep practicing lesson one until you obtain 90% or better proficiency. This trains your brain to listen to the code and not to visualize the code. I noticed that the program also looks for spaces. It will send several characters in a row, pause, and then send more characters. You'll need to press the space bar during those slight pauses/breaks in sending. Lesson two adds another letter, in my case the letter R (Photo E). This program builds upon success through repetition and listening. I believe making the transition from a computer program to being on the airwaves will be much quicker using this method.

G4FON Morse Trainer

If you don't wish to train online, there is a free Koch method browser program that can teach Morse at <https://tinyurl.com/msnsmufx>. Ray Burlingame-Goff, G4FON (SK) developed it and made it available to radio amateurs (Photo F). "Koch CW Trainer Version 10" is similar to the online "Koch method to learn Morse" online program in that it also uses the Koch method. However, along with sending the letters to be learned, it also displays them on the screen. You do not need to respond to each character by typing it with your computer. The program does not test your input. The idea is to listen to the characters being sent without looking at them and to copy them down onto paper as you hear them. You look at the characters on the screen after the session to check for accuracy. It's up to you to check your progress. The program setup is intuitive and friendly.

Farnsworth Method

Another popular Morse code teaching platform is the Farnsworth method. The website "Just Learn Morse Code" explains the method, "…characters are sent at the same speed as at higher speeds, while extra spacing is inserted between characters and words to slow the transmission down. The advantage of this is that you get used to recognising (sic) characters at a higher speed, and thus it will be easier to increase the speed later on." Farnsworth timing was invented by Donald R. Farnsworth, W6TTB (SK) in the late 1950s. The ARRL uses Farnsworth timing for transmissions, practice and test tapes up to 18 WPM. The site is located at <http://www.justlearnmorsecode.com>. It's a free Morse code training program download that I found useful. This program uses the Koch method with Farnsworth timing. It is user intuitive and friendly. At the top of the program there is a drop-down menu and below it there is a tool bar. The tool bar contains the start and stop keys as well as user parameters like characters, speed, wpm, pitch and volume. To the right of them, you'll find alphabet letters, numbers and special characters. Clicking on them will let you hear the character in Morse. Highlighted letters will be the ones used in a lesson.

When I tried the program for the first time it offered the letters K and M. I discovered correctly typing the Ks and Ms wasn't enough. I also needed to indicate spaces or pauses between letter groups. To someone listening to code for the first time, it seems nearly impossible to detect

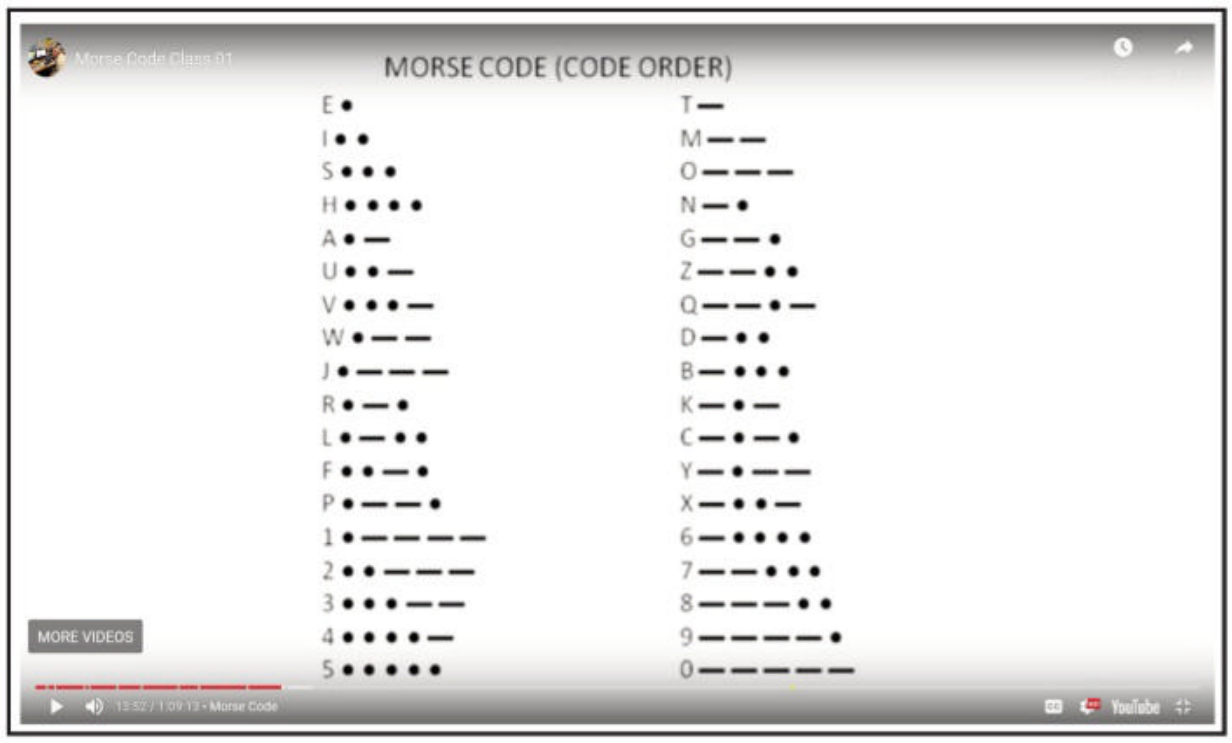


Photo H. W4EEY and KN4GB present Morse code characters in a particular order.

any breaks or spaces at all! For experienced CW aficionados who send at 30 wpm, spaces sent at 5 wpm seems interminably long. I must make note here, first class radio operators will gladly adjust their sending speed to match that of the transmitting station's.

Getting back to letter group breaks, I found out I needed to use my space bar. I needed a bit more work on my spacing between letter groups. Sending Morse code requires proper spacing between letters and words. Typically, if a *dit* is one unit and a *dah* is 3 units, then the spacing/break between letters is recommended to be 3 units long and 7 units long between words. Why is timing/spacing important? Let's say I am in a CW QSO with another ham. I am sending, "Hello, my name is Ron and my QTH is St. Peters, MO." However, if my timing is off, this is what the operator at the other end of my radio transmission may have copied: "Hell om yn ame isr on an dmy qt h is st . pet ers ,mo." The "Just Learn Morse Code" program will give you a good feel for proper timing/spacing. Once I feel I have consistently obtained 90% or better, I go onto the next lesson by placing my cursor over the characters portion of the toolbar and increasing the number of characters from 2 to three. Let the learning continue!

For Visual and Auditory Learners

Although Morse code is an auditory medium, visual learners among us may feel learning code to be too daunting. Please don't despair. During my research I came across a fun to watch, very informative YouTube video from Gary Wise, W4EEY <https://tinyurl.com/7w4z7ckt>. "Morse Code Class 01" features Melvyn Robinson, KN4GB (Photo G). Melvyn served as a radio operator aboard merchant ships and he is very proficient with Morse code. The course offers sight and sound instruction. I noticed Melvyn teaches Morse code using a code order. His code order groups letters by similar sounds (Photo H). Much like I learned, years ago, with my Archer record. Looking at Photo H, notice that the letters E, I, S, and H are taught first. There are ten lessons in total that visual learners may find useful and encouraging.

N3FJP Software

If video lessons aren't your thing and you're looking for a simple, straightforward Morse code program to run on your computer, then Scott Davis,

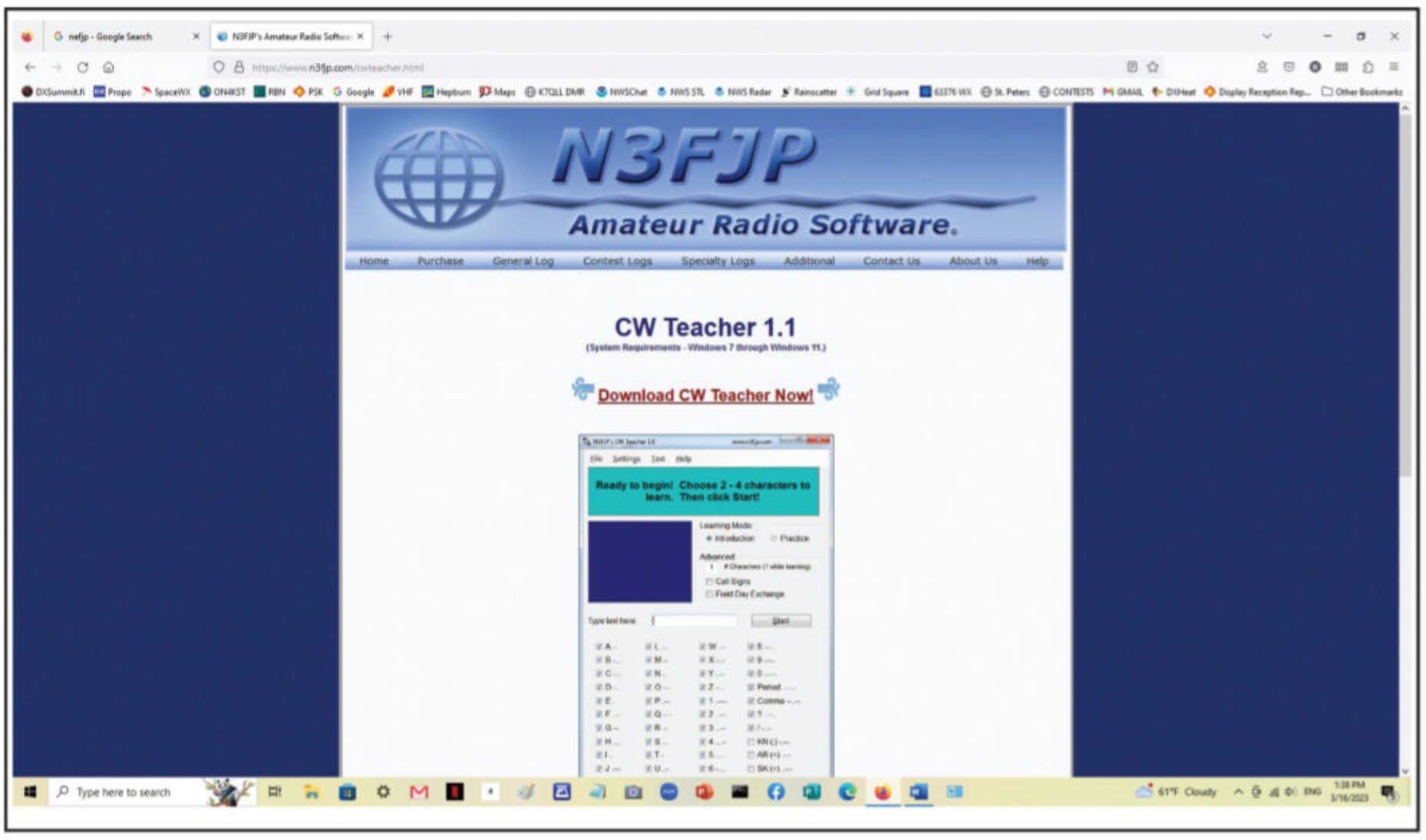


Photo I: Scott Davis' free software Morse code program, CW Teacher.

N3FJP's, "CW Teacher" (Photo I) may be just for you. Scott and his family offer a complete software suite of ham radio logging and contest software at <https://tinyurl.com/2py773dt>. N3FJP offers this program for free, and offers this advice with his code program: "Keep the character speed at 18 wpm or higher. You want to train your ear to associate a sound with a letter. If you learn the sound too slowly, it will take longer to transition to a functional speed. In learning mode, the software will wait until you identify the character, so there is no rush, even at high speed."

MFJ

For people on the go, using a computer or viewing a video may not be a good option. Although I haven't personally used it, I came across the MFJ-418 Pocket Morse Code Trainer (Photo J). As its name suggests, it easily fits into a shirt pocket, and it offers Morse code lessons. The lessons can be taught with or without Farnsworth spacing. The MFJ-418 is battery powered and has an instant replay feature, allowing you to check your copy. This allows various code speeds from beginner to high speed. For those who frequently travel or for those looking for a portable Morse code trainer, this may be just what you're looking for. Currently, it retails from MFJ for $129.95.

So, what now?

To CW or not to CW? There is no question. Of course, you should learn Morse and pursue CW! I've given you a lot to peruse and to choose from. By no means have I exhausted all of the available programs out there. I have given you a good sampling and a good spot from which to embark. In my mind, the very first step I would recommend is to commit yourself to learning Morse code. Don't be in a hurry, rather, enjoy the journey. Learning code won't occur overnight. There may be some setbacks, but a steady pace will win the race. Shop around and find a comfortable Morse code program. Now, commit yourself to between 20 and 30 minutes a day. The more you practice, the more quickly you'll become proficient. Spending quality time practicing with a program will develop neural pathways in your brain. Before long, code will become more familiar and less alien-sounding. Success will build upon success. As you gain proficiency, you'll find that there are certain letters that throw you off. I found it challenging to distinguish the letter H (four *dits*) from the letter S (three *dits*). However, I had little problem distinguishing between an H and the number 5 (five *dits*). Go figure! I remember the letter F being a bit challenging for me as well. I persevered and now this memory is a fun bit of trivia to recall.

Finally, let me offer some suggestions that will make learning Morse easier and quicker. Do not count *dits* and *dahs*. Do not verbalize out loud, do not use any look up tables, pictures, etc. Avoid memorization gimmicks like N is the reverse of A. Start off learning code characters sent at higher speeds such as 13 wpm or 18 wpm, that way it'll be more natural for communication. Having written that, commitment and persistence are the key. Make the time! You'll be opening another fun, useful, rewarding, and exciting dimension! Thank you for reading *CQ* and I hope to meet you on the air!

73, Ron KOØZ

Notes:

1. Actually, there's a little more history behind the term CW. In the earliest days of radio, Morse was the only means of communicating and transmitters used spark gaps, which produced "damped waves" that started out strong and slowly weakened. The first major advance in radio technology came with the development of transmitters that could produce "continuous amplitude waves," which were much more frequency-efficient and maintained the same strength throughout a transmission. Continuous amplitude waves were soon referred to as continuous waves and then as CW. – W2VU

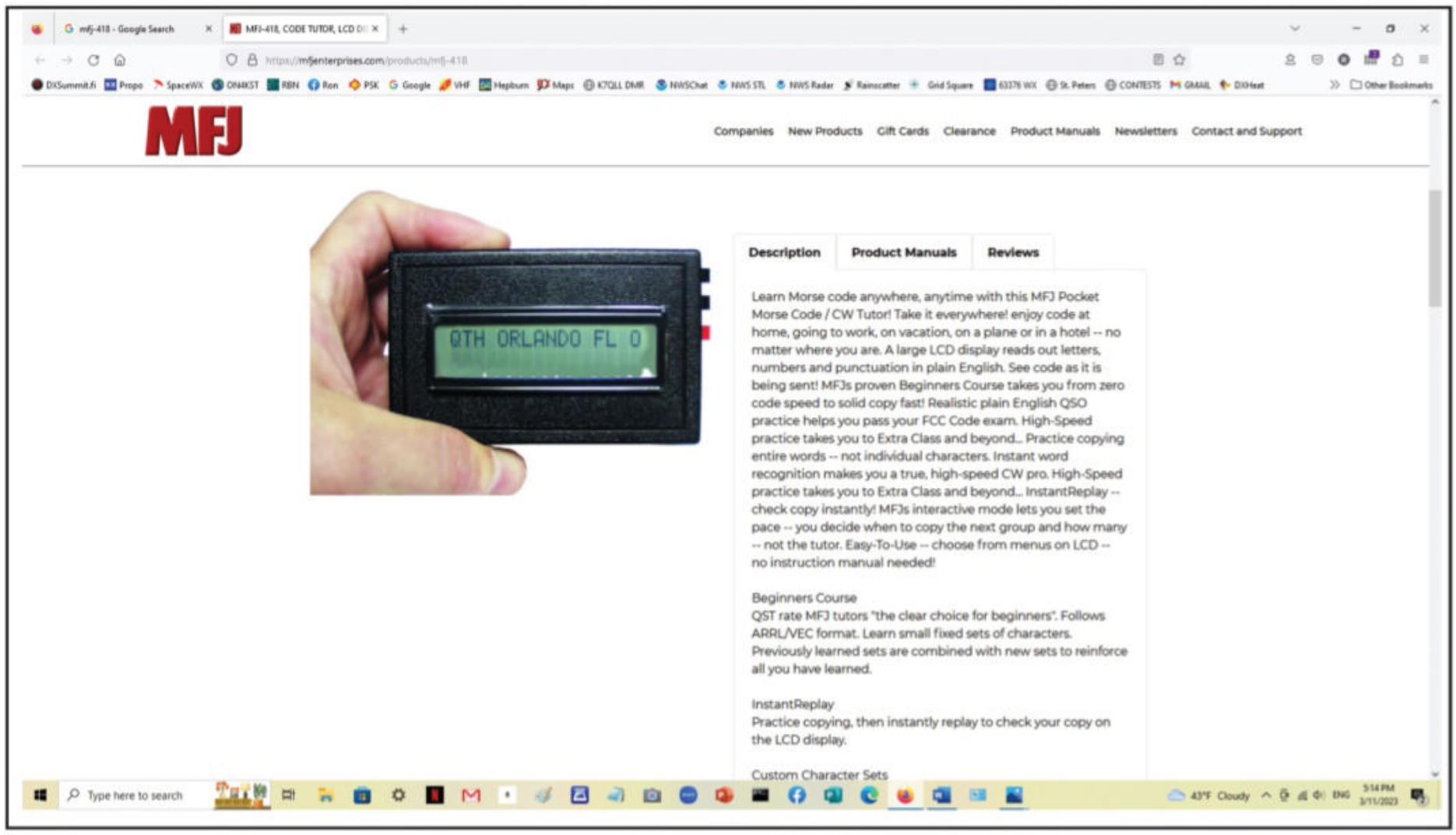


Photo J. MFJ-418 Pocket Morse Code Trainer for Morse students on the go.

digital connection

BY DON ROTOLO,* N2IRZ

The Whys and Which(es) of Networks

Help Deciding What You Need

Recently, I got a nice email from Bill Dornbush, AA6BD, over in Chattanooga, asking about building a packet radio network. He already uses packet for APRS and Winlink, but he and some of his friends want to do more with it, perhaps building a network. But, which flavor of network should they build, and – more importantly – why?

Why, indeed. In fact, that cuts directly to the most important issue here: What, exactly, do you want to do with your network? That answer will mostly dictate what kind of network you should build. But Bill is asking me what he can do with a packet network, so let's start there.

Thinking about what a network might be good for, the first thing that comes to mind is email. A Bulletin Board System (BBS) is an email server, and there are many packet BBS applications available. But I'm not speaking of email in the sense of "anywhere there is internet coverage", but in the sense "a nice platform for the locals to trade messages." I send these columns up to *CQ* by email, but I doubt there is a packet network that can move a multi-megabyte message from Atlanta up to Long Island. Clearly, the internet is my only option for large messages over great distances.

*c/o CQ magazine
Email : <N2IRZ@cq-amateur-radio.com>

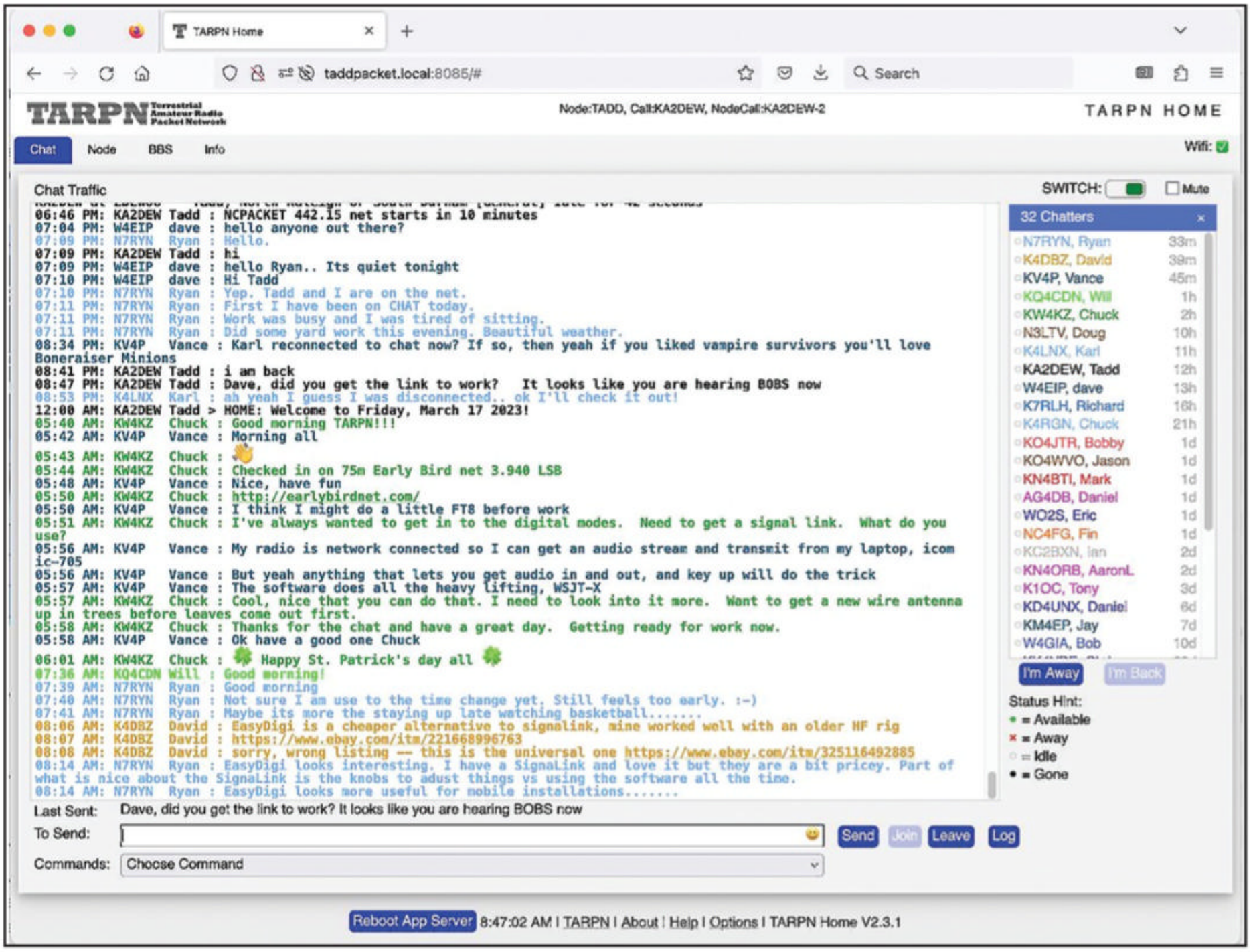


Figure 1. An example of the Chat feature in TARPN Home, showing several users connected to the chat and some recent traffic on a relatively slow day. Just like Slack or Discord, this packet app keeps like-minded locals in touch with each other. TARPN Home lets you use your phone or other device at home to chat or operate your node.

"Using non-amateur methods for playing amateur radio is counterproductive."

On the other hand, Winlink actually does this. Maybe not really large messages, but it definitely reaches places where internet does not. Many (non-commercial) ships at sea depend on Winlink for routine communications and, sometimes, emergencies. But other than being just another amateur radio email application – perhaps one with unusual capabilities even in this modern world – it isn't really a big bunch of fun. But a local BBS can be.

Related to email is another application, Chat, which is a lot like the local 2-meter repeater, but text-based. Chat is a G8BPQ feature, which is incorporated into the TARPN Home application. In the NCPacket network, I have seen over 30 local hams connected to the chat application at once, with several of them actively engaging in discussions about one thing or another (see Figure 1). Until you've participated in something like this, I really can't explain just how much fun it really is.

TARPN Home is also a very helpful feature. In addition to making Chat more user-friendly, you can also use it to access your node from other devices on the same Wi-Fi network. For example, you can use your cell phone to use Chat. TARPN Home also lets you play with your own node, connect out to other nodes, and provides convenient access to your own BBS server.

Some of us enjoy building networks just to learn more about networks. It isn't as easy as it sounds, but it is most certainly educational. Not just gathering and assembling hardware and software to make packet work, but antennas and propagation and line-of-sight paths, making sure that multiple radios on the same band don't interfere with each other, and the art of Linux. Watching the network operate, from the inside, is exciting to many hams. And you don't need to be a data geek to learn how it all works. Like many things in amateur radio, the learning is not only fun, it's likely to help you in your career someday.

This shouldn't be underestimated. Just like the pleasure found in (finally!) getting your DXCC, the satisfaction from getting everything together to make a functioning network is a big draw for many. It is for me, certainly. I mean, the internet can move far more data, far more quickly, than any packet network. But what fun or challenge is there in that? Why do people ride bicycles when they have a car?

Many ham groups build their packet networks to help with emergency communications. A robust network, properly designed and built, won't get killed when the network traffic spikes higher, a good thing when all heck breaks loose. If each node is hosted by a builder, such a network is likely to be far more survivable than anything commercial. If my station goes down for whatever reason, I have all the knowledge I need to get it working again, essentially the definition of resiliency.

What doesn't work is when you have an EmComm group that either doesn't have the expertise to fix what's broken, or never tests equipment to find out what needs fixing. Or both. You never know if your network will work when you really need it if you are not using it almost every day. When it breaks, having to wait on someone else for a repair isn't going to cut it when the chips are down.

There is really no limit to what you can do on packet ... except there is. Many packet links still operate at 1,200 baud, so a media-rich web server won't work well. Even 9,600 baud, fast by packet standards, is too slow for streaming video. But those of us old enough to remember dial-up modems understand how to create useful web pages that don't use a lot of bandwidth. Methods for optimizing (i.e., minimizing) data size are hardly ever used these days, but way back when, lots of clever schemes were created. What is old can be new again, right?

Photo A. A two-port packet node built to TARPN standards. The radio power system is at the bottom, two link radios and NinoTNCs take up two of the shelves, and the top (with the cover open) has the Raspberry Pi, battery-backed power, and the node controller board.

Other things you can do? Maybe a web page showing your weather station's current readings. Or someone hosting network map files. Club announcements, maybe info about the last (or next) meeting? What is it that you want?

The bottom line is that anything you can do on the internet, you can, in some fashion, do on packet. Not as fast, perhaps not as easily, and in some cases not legally (I'm thinking of the pecuniary rule of Part 97 here), but a web server on packet was done 20 years ago, and it can be done again.

Which brings up the question of architecture: pure RF or commercially-assisted? As in a contest, pouncing on CQs yourself or getting spots from the server? (Ah. DXCluster. Another packet application). If efficiency and speed are your goals, use the internet. But if you want to use amateur radio, then use it without crutches. Can't get a link up from Chattanooga to Atlanta? Keep at it. Need is a wonderful motivator.

It is my opinion that using non-amateur methods for playing amateur radio is counterproductive. If you have a task to get

done, then by all means use whatever will work, but if you're doing this for pleasure, then do it on RF. But be warned: even one tiny crutch (i.e., non-radio link) will bring on eventual failure, and I have seen this happen too many times to count.

Some groups promote their own style of architecture. I've found that most of them that have info on their website generally subscribe to the "Put up whatever user ports and links you can, however you can" methods used 30 years ago. It used to work, but since then better ways have been found.

Having a caste system of users and operators tends to hurt a network. User ports seem like a good idea, until you find that users resent the operators because they won't provide (service-name-here) that a user thinks is needed. Operators start resenting users since all the money, time and effort is coming from operators to support ungrateful users. And, when the network fails, or operators leave, the poor user (who has no experience or visibility into network operations) has absolutely no idea how to proceed.

In contrast, NCPacket in North Carolina is also running a few dozen G8BPQ nodes in a TARPN network. Each node is at the operator's house or easily-accessible workplace (Photo A), and there are no user ports: If you want to get onto the network, you have to run a node. Everyone is a user and operator. No caste system, and everyone can repair their own equipment (such as in an emergency). You must have skin in the game to play, a good recipe for success.

Their nodes' G8BPQ software runs on a Raspberry Pi computer, with virtually every aspect of building a node clearly documented and widely available (recent Raspberry Pi shortages notwithstanding) at the TARPN website <http://tarpn.net>.

The TARPN architecture model has several rules. For example, it insists that every link is a dedicated point-to-point link, and only RF links are allowed. The only way for data to get onto the network is by typing it in – automated connections are not allowed. They call it "Networking on Purpose." Perhaps this helps explain why I write about it so frequently.

While NCPacket is always looking for new participants, they are not interested in growth for growth's sake. Instead, they want to be the kind of club that welcomes newcomers and Elmers them towards proficiency. They'd enjoy having HF links to other TARPN networks

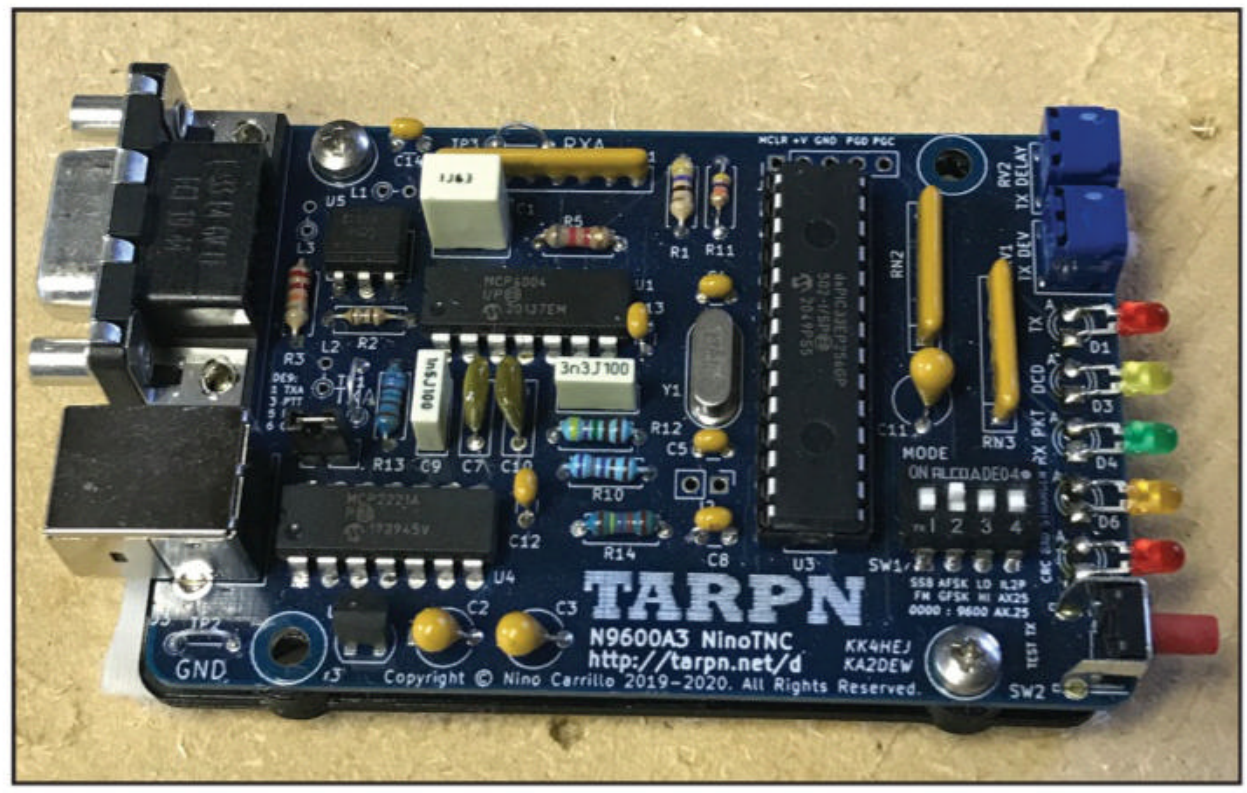


Photo B. An assembled NinoTNC. These are currently supplied as a bare board plus processor for about $12 on Etsy, along with a bill of materials costing about $25 on Mouser or DigiKey. A fully-assembled surface-mount version is in development. Capable of speeds from 1200 to 9600 baud (set with a DIP switch), and featuring IL2P forward error correction for a 3 dB coding performance gain, it is an excellent TNC choice.

(but not to individuals) and are uninterested in Winlink or other internet "radio" applications.

Other architectures – hub and spoke for example – don't work. As with user ports in most terrain, you have the problem of Hidden Transmitter Syndrome (HTS), where two stations both see the station between them but not each other. This allows one station to transmit while the other is (unknowingly) also transmitting, meaning that neither station gets through. Not a recipe for performance. Point-to-point is just about the only RF architecture worth considering. A duplex repeater just perpetuates the user-operator mentality.

So, what is the big impediment to building networks? It isn't equipment: Unlike 30 years ago, the TNC (Terminal Node Controller) is not a significant cost anymore. The NinoTNC (Photo B) can be had for under $40, and used PacComms are maybe $10 at a hamfest. Even radios are cheap: I paid $20 for four Kenwood TK-762G radios (2m, 25W) at Hamvention last year. In fact, the biggest cost is the antenna and feedline.

No, finding others interested enough to get involved is the hardest thing. Most older hams remember packet, and since their local user ports suffered HTS and their network likely had worst-case architecture, they just figured that packet didn't work and was a waste of time. Well, it wasn't packet, it was the architecture.

Lastly, there's networking software. G8BPQ is a very popular and well-sup-

Crystals

I recently heard from a newer ham who was trying to find information about the TEKK KS-900 data radios that many packet networks used to run 9600 baud on 70 cm. I didn't find a whole lot of information on the internet, instead finding the KS-960, but I did advise him that TEKK International <https://tekk-radios.com/> is still in business and might be helpful. I also mentioned that Bomar Crystal Company <http://bomarcrystal.com> was the company that I'd always used for radio crystals, and surely they can make crystal sets for the TEKK – or most anything, I suppose. Perhaps this information will help someone else out as well.

That being said, the last time I ordered crystals they ended up being a significant fraction of the cost of the radio. Today, with KS-900 radios going for $10 in eBay, I suspect the fraction has become quite a bit larger. Compare that to my TK-762G purchase at Hamvention, four for $20. Add in some sweat equity for the 9k6 modification, and you're way ahead.

Photo C. The TARPN network demonstration booth at the Stone Mountain (GA) hamfest in 2021. With five portable nodes, each with a computer and actual radios (using dummy loads though) attendees were able to see and hear how the network operates in real time. The same setup has been used for club meeting demonstrations and could be deployed in minutes as a functioning network in the real world.

ported implementation of TheNET/NetRom. FlexNet has good technical performance due to its self-configuring link parameters, but this removes a significant layer of potential education for how networks operate. Although widely used in Europe, it is not as well supported these days. ROSE also hides the routing from users and (like TheNET) is only useful in a Z80-based TNC, a somewhat ancient architecture. There are others, too, but they are all relatively minor players.

Although there are some efforts underway to replace AX.25 with something 'better,' there's little new there as these groups debate the meaning of 'better.' This means that virtually all VHF-and-above networking today is done using G8BPQ software. In contrast, HF is like the wild west, with new better-faster-cheaper protocols coming out seemingly every day. AX.25 can be done on HF, but there are far more robust options (like VARA), too many to list here.

So, how does one get started building a packet network? If you have some ham friends, start by seeing if there is any interest. Make sure you can talk to each other on FM simplex, which is a key requirement. Here in Atlanta, Bob and I want to start a TARPN network, and we tried to speak on 2 meters at a distance of 11 miles, but couldn't get a signal through. Tony, 50 miles north of us both, isn't interested in packet but hears both of us full-quieting. Dang it!

The next step, once all the friend links are exhausted, is to visit local clubs. Talk to the folks there, maybe do a presentation (using actual nodes, not PowerPoint), and see if there's interest. Volunteer to Elmer someone in simplex range, and eventually they might want to join a network. Remember, everyone knows someone, so encourage others to spread the word. Like anything, you just need that one person to get traction and drive the program to success.

Research has found that the critical mass for a successful network is five users. Find four others in range, get together to assemble equipment and plan links, then put it all on the air. Then, promote the heck out of it. Get a vendor booth at your local hamfest and link into the network (Photo C). Or use your multi-station demo network (the one you used at the clubs) and a couple of computers to let folks play with it. Most hamfests offer free or cheap tables for clubs and non-commercial booths.

As they say, getting there is half the fun. The learning curve is not too steep, and there are dozens of hams who are happy to offer their help and advice. Visit <https://groups.io> and join the TARPN and NinoTNC groups to find them. And then maybe you'll write and tell me about your network?

That's all I have this time. As I mentioned in March, I'll be at Hamvention in my bright yellow FRC Robot Inspector cap, poking around the bargain bins and looking for things to write about. If you see me, stop and say hello!

Until then,

73 de N2IRZ

homing in

BY JOE MOELL,* KØOV

Close Encounters of the Law-Enforcement Kind

It started out like any other Saturday night mobile T-hunt. April Moell, WA6OPS, and I, with a ride-along observer, were cruising through downtown Fullerton (California). We had lost the hidden transmitter's two-meter signal upon our descent from the starting hilltop, but that's not unusual. It was probably at least 20 miles away, and we planned to follow our original bearing until we got in range.

The hider announced on the 224-MHz coordination repeater that he would raise the hidden transmitter power briefly for a couple of late-arriving hunters. Good, maybe we can get another fix. Wait a minute! What are those flashing lights in the rear-view mirror? We're being stopped by the police!

Two cruisers pulled up behind as I rolled into the closest parking lot. The officers were smiling as they approached the van. They flashed their lights all over the inside and outside as I offered my license. What a time for this to happen. There goes our chance to get another bearing.

These wide-eyed cops were the youngest rookies I had ever seen. They looked just like the Police Explorer Scouts that we see doing traffic control duty at public service events. They seemed to be in awe of the four-element quad on top of the van, with the mast going through the roof.

"What did I do?" I asked, as April offered one of them a copy of my T-hunt information sheet.

"Nothing," was the reply. "We just wanted to see if you had a scanner in there."

"Why?" I asked, silently wondering if he recognized the Regency MX-7000 on top of the dash, hooked to the Roanoke Doppler RDF box. It had only ham frequencies in it, of course. (Well, mostly.)

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"We've had a lot of burglaries," the neophyte cop answered, "and it's illegal to have a scanner in your car."

That was my cue to give him a friendly briefing on the fun and usefulness of competitive radio direction finding (RDF). I also pointed out that we weren't listening to his frequencies, but it would not be illegal to do so in California. One of them disappeared for a minute. After a check on his radio with the Watch Commander, he sheepishly admitted that I was right about scanners and sent us on our way. Well, at least now we had a good excuse for finishing second in the hunt.

Getting stopped in the city during a T-hunt is unusual here in laid-back southern California, where VHF hunts have been going on for 65 years or so. Veteran officers are used to our strange antenna arrays and slightly erratic driving. The give friendly waves as they pass by the hilltop starting points lined with hunters' vehicles, and usually ignore the fact that a couple of them protrude into the traffic lanes. Normally, it takes something blatant to get them to pull you over – such as the hunter who backed down a freeway on-ramp some years ago.

It was different in the early days. Some old-timers tell stories of the two-meter hunts in the 1960s, complete with Gonset Communicators and dynamotor B+ supplies. One night, several hunters found themselves under arrest, albeit briefly. They weren't doing anything illegal, but a homeowner had complained about the strange people with radio gear tramping through the countryside. One officer crashed his patrol car in the fog that night.

Worried residents still call 911, but now dispatchers summon the helicopter patrol to check out the scene. Several times, my hiding spots have been in the spotlight from above. Usually Angel (that's what they call the chopper) hovers just long enough to give away the location to the close hunting teams (drat!), and then disappears.

The big parking lot at Montgomery-Gibbs Executive Airport serves as starting point for many mobile transmitter hunts in the San Diego area. Most of the teams on this hunt are using rotatable two-meter quad or Yagi antennas for RDF. (Photo by Joe Moell, KØOV)

Occasionally, it gets dicey. One night, April and I hid at the site of a new home that was being built in Anaheim Hills by its owners, a couple of our friends. These folks discovered at the last minute that they couldn't be there to hide with us. We decided to go ahead anyway.

After a dozen hunters converged on the place, it wasn't long before the chopper and spotlight arrived, followed by a patrol car. The neighbor who called in came over to insist that we were trespassing. We had no proof that the owners had given permission. There was a hurried autopatch call to the owners – no answer. Eventually we prevailed, but we learned an important lesson: It may be okay to hide on private property, but you must be able to prove that you're allowed to be there.

By the way, that was a challenging hunt from a technical standpoint. The AC wiring for the new house was complete, except there was no breaker box and no lines to Edison's power pole. We connected the output of my fraction-watt transmitter to one of the long Romex cables, then buried the transmitter next to the foundation.

Old-timers may remember the newspaper ads: "Turn all your house wiring into a giant TV antenna!" That's just what happened. Everyone DFed their way to the house with no problem. Then they wandered the property trying to identify the antenna. (No wonder the neighbor panicked.) "All the outlet boxes sure are hot with RF," they kept saying. Yup.

Befriend a Cop

Consulting with the authorities ahead of time can pay dividends. One night we hid the flea-power rig inside a porta-potty in a new construction area in Yorba Linda. While setting up, we made friends with the security guard at the site. He got so enthusiastic about our prank that he let us use one of the vacant houses being built as a lookout post and we were allowed to hide our vehicle in its garage.

For a while, southern California hunt rules recommended advance notice to police of the transmitter's location, so that dispatchers could reassure concerned citizens who called in to report strange sightings. That practice didn't last long. It was a lot of bother and there were suspicions that advance hiding spot information was finding its way to some of the hunters. (I think I would have been tempted to "plant" some false stories when hiding, to see what happened.)

Certainly, there are enough hams with police connections to make me think twice before I disclose my clever hiding spots to them. Some years ago, Don Lewis, KF6GQ, put on a hunt with the low-power transmitter in a box under the reception desk at the Monrovia police station. All the bearings from every outside corner of the building pointed inside, of course. But it took a lot of courage to walk through the door with a hand-held "sniffer" to probe the lobby of a precinct house.

On the other hand, it might be good to keep the authorities in the know about our RDF activities. One afternoon I spent quite a bit of time in a residential neighborhood of a nearby city as I searched for the source of distorted TV station audio that was appearing intermittently in the 6-meter ham band. I would stop on the streets to wait for the signal and rotate my big van-top six-meter shrunken quad to get bearings.

When it disappeared and didn't return, I headed out onto the freeway for the 15-mile drive home. In the rear-view mirror, I saw a pickup truck trailing me very closely. It tailed me to my exit, then continued to follow all of the way until I pulled into my driveway. The driver parked in front of my house, got out and began to loudly berate me and threaten to call the police on me.

Michael Olbrisch, KD5KC, and daughter Heidi Wilden, KE5BHT, of El Paso, Texas were happy after their first mobile transmitter hunt, which they won. Heidi built this two-meter quad, which she held out the van window as Dad drove. Next time, she plans a better mounting system! (Photo courtesy KD5KC)

When I calmly asked what triggered his anger, he began to rant about how he was sure that one of his family members was being stalked and he was convinced that I was parked near his house to perform some sort of electronic surveillance on them. After I explained what I was doing and told him I that would call police myself to let them sort it out, he finally backed off and went home.

In the days to follow, while carefully avoiding this fellow's house, I found out more about the TV audio intruder. It turned out to be wireless headphones connected to the DVR of a hearing-impaired homeowner. The transmitter for these imported 49 MHz phones was emitting spurious signals in the 6-meter band.

Help Them Get Started

Last year, my May column promoted the *CQ* Worldwide Foxhunting Weekend by telling tales of clever hams who put on difficult and dastardly mobile T-hunts. That's an excellent challenge and lots of fun for experienced hunters, but newcomers who come out on such hunts often give up and are reluctant to try again.

If your local hunt participation is falling because the hunts are too hard for some, why not have a well-publicized mobile

hunt once in a while that's designed just for beginners? It's definitely possible to have fun on simple hunts. The result might be more capable foxhunters who can respond when skilled RDF is needed for search and rescue or interference tracking.

For a successful mobile foxhunt that encourages first-timers, the teams should all start from the same location. The fox's signal should be strong enough and there should be a huntmaster at the start to help new teams get their initial bearings, if necessary. Everyone should understand the boundaries for the hunt, with maps supplied if the boundaries are irregular.

I think that beginner foxhunts should be scored by mileage, not by time-to-find. Getting bearings and navigating can be tricky enough without the added pressure of trying to get to the fox before the other hunters. The huntmaster should log starting odometer readings to be compared with ending readings at the fox's location. Lowest elapsed mileage determines the winner. This eliminates the urgent rush from the start point when the hunt begins. It encourages careful bearing-taking and map-plotting. It's not uncommon for the last team arriving at the fox to end up as the winner

There should be only one transmitter. To help beginners get good bearings, the fox's antenna should be up in the air, not next to the ground. It should be stationary, in the clear away from obstructions, and polarization should be constant. If any hunters are using Doppler sets, the polarization should be vertical.

The fox should be reasonably close to the start. Twenty miles is too far. Transmissions should be continuous, if possible, with modulation and identification that ensures that hunters are following the correct signal. The fox may be on private property, but must be in a place that is accessible to the public with no admission charge.

Hunters should be able to drive close enough to the transmitter to identify the endpoint of the hunt. The longstanding Fullerton Radio Club rule is that "the transmitter shall be within 100 feet of access by standard passenger car." If the hiders want hunters to "sniff out" the transmitter on foot at the end, they should have on-foot RDF gear available for them to use if they don't have any. The hider must keep safety in mind when placing the transmitter and antenna.

If the hunt is running long and some hunters are getting stumped, it's OK for the hider to give hints and clues, but it should be done in a way to ensure that all hunters hear them. It might be a good idea for the hider to provide a cell phone number that teams giving up the hunt can call to be told how to get to the fox location to join in any post-hunt activities, such as a visit to a restaurant.

Try It on Foxhunting Weekend

An excellent time for your club to have foxhunting fun is the annual *CQ* World Wide Foxhunting Weekend, which takes place May 13 and 14, 2023. This is the most informal of all *CQ* contests – just an opportunity for your club or other ham group to have some fun finding transmitters, either in vehicles or all on foot. Use the international rules or write your own. Make it easy or hard, depending on the skill level of the foxhunters in your area. Talk it up on the local repeater and social media to find out what your friends have in mind.

More about Foxhunting Weekend is in the February and April 2023 issues of *CQ*. It's also in my website. After the foxhunting, be sure to send me stories and photos for the follow-up article. I'm looking forward to hearing from you.

Happy hunting!

kit building

BY JOE EISENBERG,* K0NEB

DZ Kit SR-74: A New Twist On An Old Favorite

The Heathkit GR-64 was one of the kit radios that gave many people their introduction to both amateur radio and shortwave listening. With its coverage ranging from the AM broadcast band up to 30 MHz, it was one of many radios popular in the 1960s and 70s. One has to wonder in this age of software defined radio (SDR) how the appearance and simplicity of the GR-64 can be reconciled with today's SDR receivers and DSP-based receivers (Photo A). Brian Wood, WØDZ, of DZ Kit, has come up with just that. It takes the simplicity of the GR-64, built on SDR technology, and made it in kit form.

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Photo A. Brian Wood, WØDZ, shows the original Heathkit GR-64 next to the new DZ Kit SR-74 Saguaro receiver kit.

Photo B. A box of many of the parts needed for assembly, packaged in labeled antistatic bags.

The DZ Kit SR-74 "Saguaro" is based on the SDRplay RSP1A and the Raspberry Pi 4B (Photo B). Using the supplied DZ Kit software, the frequency coverage goes up to the FM broadcast band at 88-108 MHz. There is also Cubic SDR software supplied that allows reception up to 2 GHz. You will have to select which program to use – and keep in mind that the Cubic software is more traditional SDR and does not have the "traditional" radio feel to it as the DZ Kit Saguaro software does. There is a 7" color touch screen display, and the screen appearance is similar to the slide-rule type dial in the original Heathkit receiver. Similar to the Heath days, the parts come in several labeled bags instead of paper envelopes and the assembly instructions harken back to those good old days (Photos C and D). The manual is a high quality printed spiral-bound book and uses a very detailed approach to assembly. When I saw the large number of parts, I found out that the estimate of about 12 hours of labor to complete assembly and testing seemed about right.

Building the Saguaro

The assembly procedure begins with placing the front panel label on the chassis. I flunked stickers in kindergarten, so I was relieved to see that Brian has provided a means to make the alignment of this large sticker go a lot more easily (Photo E). Provided in the kit are two red 3D-printed guides

Photo C. The instruction manual resembles what we remember when looking back at the older Heathkits.

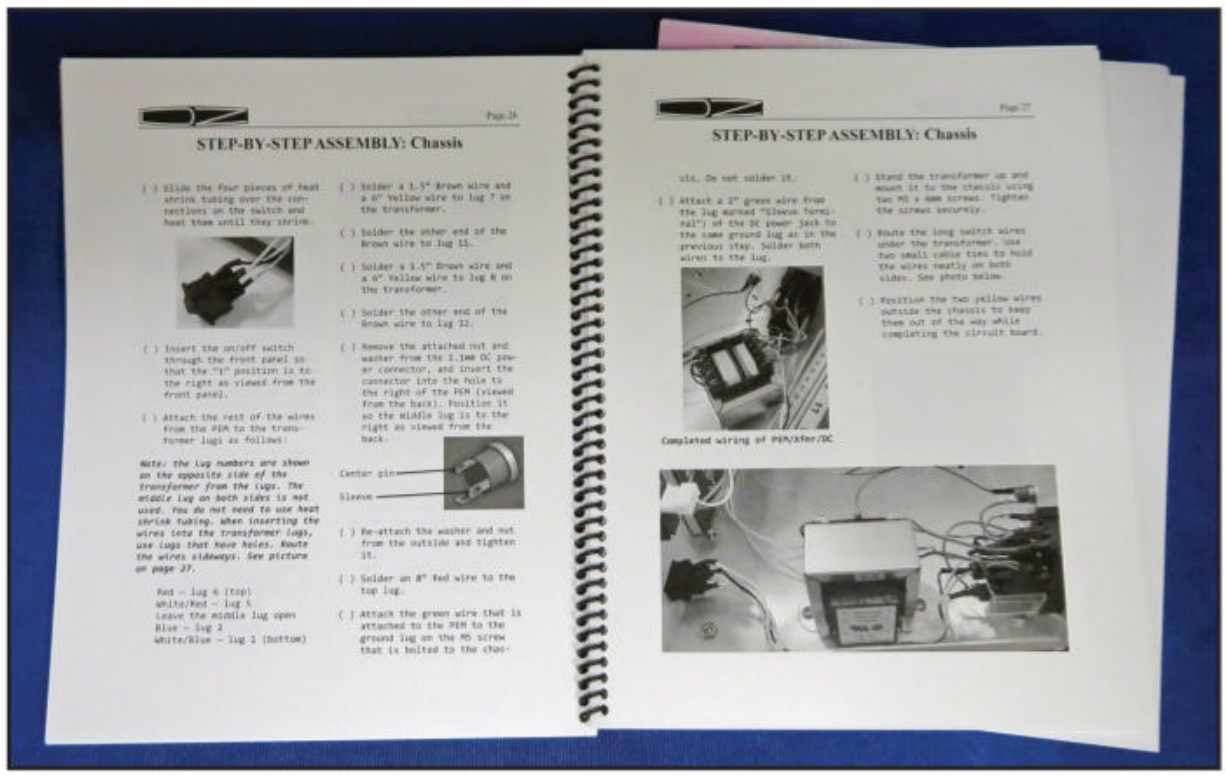

Photo D. The pages are well-printed with plentiful photos to guide you through the assembly process.

Photo E. The chassis is ready for the application of the front panel sticker.

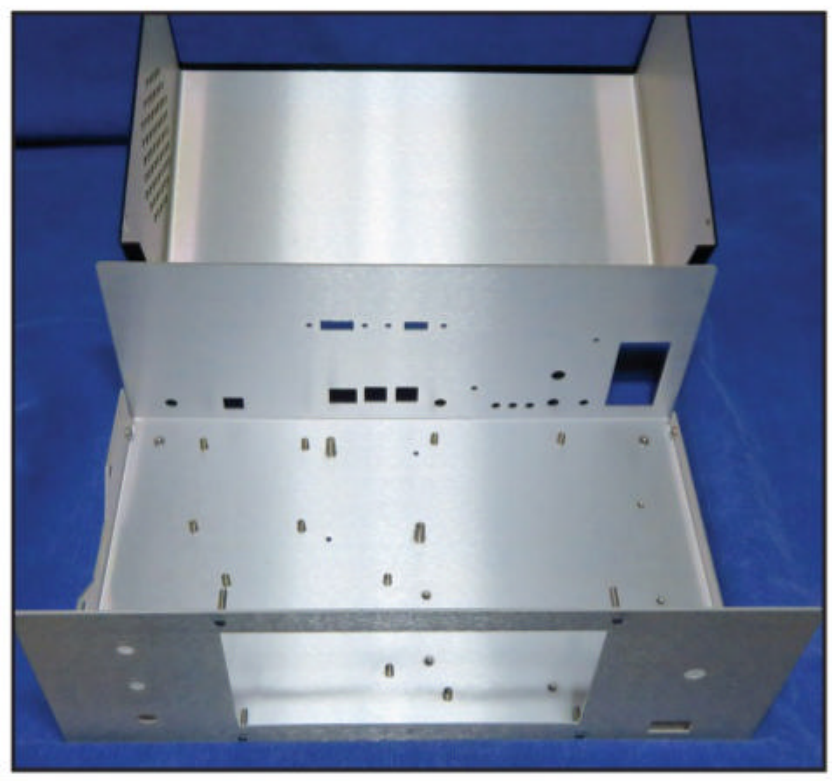

Photo F. The sticker is supplied in a thick plastic bag for protection. The speaker and power transformer are installed during the chassis portion of the assembly.

that are taped into place, poking through two holes on the front panel. These serve as guides to make sure that the label is lined up when carefully lowered onto the front panel. The guides are taped into place temporarily and are removed once the front panel sticker is in place. I can see why this task is the very first step, as it is one of the most exacting procedures in the kit (Photo F). Although these two 3D-printed parts can be discarded once the sticker is in place, there is another 3D-printed part supplied in the kit that becomes a permanent part of the radio. That part becomes a safety shield and is made from a light-colored filament. The rubber feet come next and it will help to have them in place during the rest of the assembly.

The assembly process continues on from the front panel and encompasses the power supply, the controls, and the Raspberry Pi, as well as the SDR modules (Photo G). The wiring process for the power entry module and the transformer involves a lot of wires and the need to cut them to various lengths, stripping and tinning each end of the wires before using them. The lengths of the wires and the amount of heat shrink tubing used in their installation are care-

Looking Ahead

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

- *CQ* Interviews: IARU Region 2 VP PT2ADM
- Results: 2022 CQ DX Marathon
- A Tale of Two Baluns

Plus...

- CQ Book Review: "The CW Way of Life"
- A University Foxhunt in India
- A Skeleton Slot Antenna for HF Through 432 MHz

Do you have a hobby radio story to tell? A new circuit you've designed? An operating adventure? *CQ* covers the entire radio hobby. See our writers' guidelines on the CQ website at <http://bit.ly/2qBFOdU>.

Photo G. The Raspberry Pi 4B and the heat sink, along with the SDRplay and the touch screen are also ready for assembly.

Photo H. The Irwin Vise-Grip automatic wire stripper was very useful in preparing the many wires in this kit.

fully chosen. If cut and stripped correctly, the wires are the right lengths for their purposes (Photo H). I found a tool sold by Irwin/Vise-Grip to be very helpful during the wiring process. This tool is an automatic wire stripper and, although a bit big, it does a great job. This wire stripper from Irwin is numbered 2078300 and is available at Lowe's as well as online on Amazon, etc. for about $25. This tool made the stripping process go quickly. Just be sure to shake out the bits of insulation that sometimes get left in the tool.

The "smarts" of this kit are in three modules, the SDRplay, the Raspberry Pi4 and the main CPU controller board (Photo I). The controller board has two surface-mount components already pre-mounted, but the rest are all assembled by the builder. I was surprised to learn that the main board also has a code practice keyer built in. There is a jack on the back panel which allows you to plug in a paddle and practice your CW skills while using this radio. I think this is a unique feature of this receiver.

When beginning the assembly of this kit, it is best to separate out the chassis parts before unpacking the controller board parts (Photo J). This will reduce the chance of losing or confusing the parts. The speaker is a high quality dual-cone design capable of producing very clear sound. There is also a headphone jack for plugging in a stereo headset. Note that plugging in a headset does not totally mute the speaker, but it reduces its output greatly (Photo K).

The Saguaro's RF input uses the SMA panel connector supplied with the SDRplay, so be sure that you have an

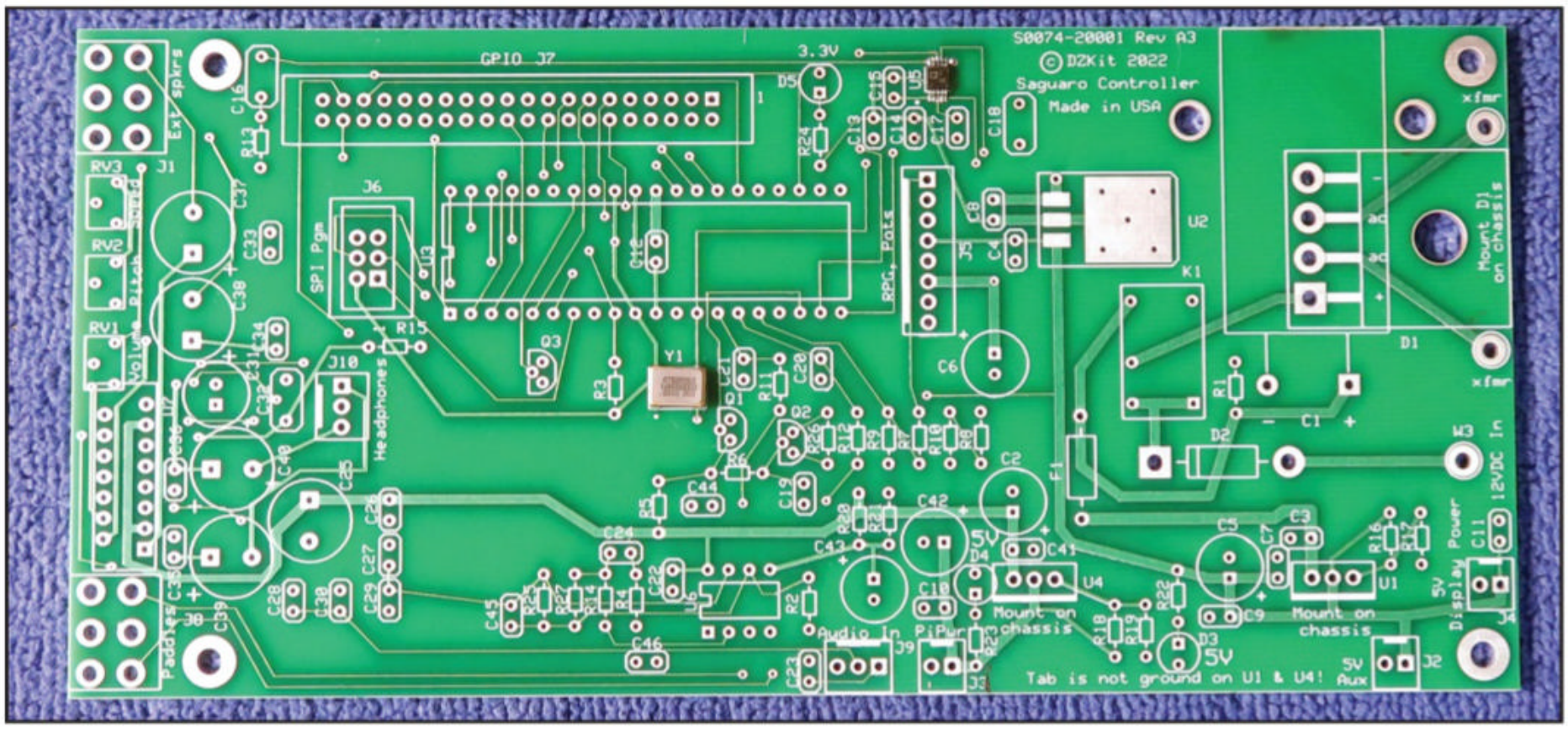

Photo I. The main controller board has two surface mount parts already installed. The rest are added by the builder.

adapter available to connect your antenna. I often use either a BNC or PL-259 connector to connect my kit radios to my antennas. Since an RF adapter is not supplied, be sure to have the RF adapter that suits your shack antennas. The internal AC power supply allows for both 120 and 230VAC input so it is able to be used on most worldwide power sources. In addition, it can run from 12 VDC, which is great for taking it portable. Coming up, I will complete and test the Saguaro and I'll report on the final assembly and testing of this great new kit. The SR-74 Saguaro is available from DZ Kit at <www.dzkit.com>. Prices vary depending on the options you choose and if you are supplying the Raspberry Pi or SDRplay, etc.

Look for me wearing my traditional Hamvention Hat at not only the Dayton Hamvention in May, but many others this year as we celebrate getting together again at many hamfests.

Until next time,
73 de KØNEB

Photo J. The parts for the main controller board are packaged in labeled bags and even a hand tool needed in the process is supplied.

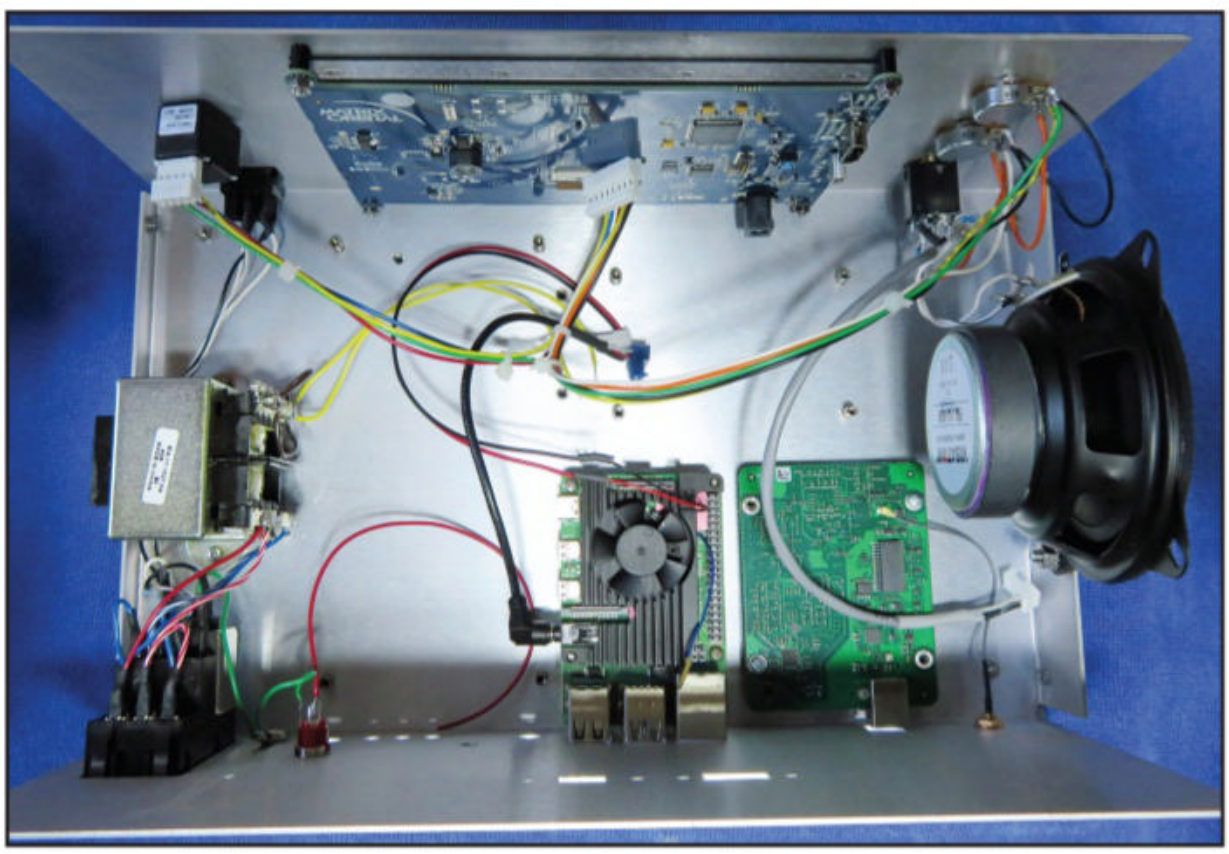

Photo K. The chassis part of the assembly is completed and awaiting the main controller board.

Zero Bias *(from page 6)*

the actual number of sunspots has risen much more sharply than predicted and has already exceeded the first peak of Cycle 24, with about two years still to go on the upward portion of the cycle. The rise is even more dramatic in the 10.7-centimeter radio flux graph on page 94.

If you compare the rise of Cycle 25 in Figure 1 to the previous cycles shown in Figure 2, you'll see that it looks much more like the climbing phases of Cycles 21 and 22 in the 1980s and early '90s than the more recent (and much weaker) Cycles 23 and 24. Dr. McIntosh and his team believe the current cycle could even rival Cycle 19 in the late 1950s, which so far has set the benchmark for a super-strong solar cycle. On-air experience suggests that he could be right, with the high HF bands hopping with worldwide DX after many years in the doldrums, and F^2 propagation even extending to 6 meters and allowing intercontinental DX there as well.

During the long solar minimum between Cycles 24 and 25 (roughly three years), and with the pessimistic SC25PP prediction, some hams wondered whether we were entering into another Maunder Minimum. The reality, however, is that we might instead be heading to a McIntosh Maximum. Here's hoping!

In This Issue

Our focus in this issue is on DXing and contesting, with three stories related to the 3Y0J DXpedition to Bouvet Island in the far South Atlantic, plus the CW results of the 2022 CQ World Wide DX Contest. Finally, Propagation Editor NW7US discusses (p. 87) another aspect of this very active sunspot cycle – solar flare-induced auroras visible much farther south than usual, and their impact on propagation.

Enjoy the spring weather and, if you're going, the Dayton Hamvention (we hope to return next year).

73, Rich W2VU

Notes:

1.Leutzelschwab, et. al., *The CQ Shortwave Propagation Handbook, 4th edition,* p. 2-7, CQ Communications, Inc., 2021. The Maunder Minimum was named for Walter Maunder, who first described the phenomenon, based on historical data, in the 1890s.

2.NOAA/NASA Solar Cycle 25 Forecast Update, 12/9/2019 <https://tinyurl.com/yntph8uz>

3.McIntosh, S.W., Chapman, S., Leamon, R.J. *et al.*, Overlapping Magnetic Activity Cycles and the Sunspot Number: Forecasting Sunspot Cycle 25 Amplitude. *Sol Phys*295, 163 (2020). <https://doi.org/10.1007/s11207-020-01723-y>

vhf plus

BY TRENT FLEMING,* N4DTF

Best Options for Software Defined Radios on the VHF-Plus Bands

This month, a potpourri of musings on matters (hopefully) of interest to VHF plus operators, or those who wish to be. Sporadic E season is in full swing in May, and increasing sunspots are providing additional opportunities on 6 meters. Looking toward the summer VHF contests, many folks are adding bands, updating antennas, or otherwise working to improve their station in preparation for a full season of VHF plus activity.

Software Defined Radios and Transverters

Recently, a brand new Icom radio was announced, designed for the VHF plus market, the IC-905. We have talked about this a couple of times, including last month, but my point is that we saw lots of comments from US amateurs about the lack of 222 MHz and 902 MHz bands. This is really no surprise, however, because these bands are largely limited to North America, with certain exceptions, like portions of the Caribbean and South America for 222 MHz. We are, however. seeing growing interest in these bands, especially 222 MHz. This begs the question, what are amateurs doing to be active on weak signal work for these bands? While there are a couple of older rigs that provide all mode access, the answer, for the most part, is using a transverter.

Recently, I was able to speak to Mike Walker, VA3MW, at Flex Radio about their position on, and interest in, VHF and above amateur frequencies. In addition to his role at Flex Radio, Mike is a regular on my favorite Amateur Radio podcast, "Ham Radio Workbench". Finally, Mike is active on many amateur bands, including 10 GHz. So, he "gets us." Mike was kind enough to give me time to discuss software defined radio, VHF plus, and related matters.

Flex, which celebrates 20 years in business this year, is one of a handful of amateur transceiver manufacturers located in the US and focused on SDR (software-defined radio). I asked Mike about VHF and above, especially whether Flex would be producing such a radio. The success of the Icom 9700, which is built around SDR technology, is perhaps an example of amateur interest in such radios. Mike said Flex has had ongoing discussions about producing a VHF plus radio, but nothing is in the build stage yet. Resources are always a consideration to manufacturers, as well as pricing, potential number of units to be sold, and related matters. However, rest assured there are VHF plus enthusiasts at Flex, and their HF radios are currently designed to support transverters in an impressive way. First, one of the units features a 2-meter option, and all of their current rigs can be ordered with one or two transverter ports.

Using an SDR to drive a transverter means that all of the functionality of the SDR, including surveying the entire spectrum at once, is available to the operator. Problems that arise around bandwidth don't phase the SDR, because you can allocate as small or as large a slice of spectrum as you need. For example, I realized when setting up my 222 MHz transverter with my HF rig that I could not test by using the local repeater on 224.78 because my rig would not transmit [even into the +10db (10 milliwatt) transverter port] above 30 MHz. So, using the standard 28 MHz IF for the transverter, 222.100 equals 28.100, but 224.78 was out-of-band on 10. A similar situation occurs when using a 28 MHz IF for 6 meters. Anything above 50.2 is "out-of-band" So an SDR rig that opens up the entire spectrum from 30 kHz to 54 MHz will solve that issue.

Further, if you have used a radio with a spectrum scope, you understand the value of seeing across a selected frequency range. When a band is open, it can help you to see and work more signals. I often use a mouse to point and click to the next strong signal because I can clearly see it on the scope. Using your HF rig with this capability will allow you to expand it to any VHF plus band that you have a transverter for, and will improve your operation on those bands, especially when there aren't many signals, by helping you find activity.

One question I had for Mike is whether "serious" VHF plus weak signal operators were using his radios with transverters, and he assures me that there are many. I suspected that would be the case. Mike's official recommendation is that you use an SDR (he recommends Flex, of course!) to drive transverters for the bands of your choice. In today's environment, that is your best option for building a solid VHF-plus station. But it's okay to continue to dream about that multi-mode VHF/UHF/SHF rig with 222 MHz and 902 MHz built in!

My thanks to Mike for his time, expertise, and insights.

Field Day

It is mid-March as I write this, but I know some of you are already thinking about Field Day – when most of us will have better weather! I wanted to remind you that VHF and above does have a place in your Field Day operations. Six meters has been great already this spring and will likely get better. Field Day is generally in the peak of the E_S season, but no doubt we will have F^2 propagation as well. Whether you setup a GOTA station, or operate full time, VHF should be a part of your Field Day. I'm eager to hear your stories and see your photos of VHF-plus operations during Field Day.

Items of Interest

222 Activity Night

Last evening, March 21 local time, I joined in the fun – or at least attempted to – in the 222 MHz activity night, that generally starts around 6 p.m. local time and goes until there's no one left. While this idea started in the Northeast, pockets around the country, including the Pacific Northwest, the Southeast, and around the Great Lakes are becoming more active. The best way to get in on the action is to log into the ON4KST page <www.on4kst.com> and select IARU Region 2 144/432 chat. You'll see stations chatting and attempting QSOs. This is a very welcoming group, and modes include SSB, CW, and FT8, with a little EME thrown in for good measure. I heard a couple of stations, but was unable to be heard, thus I have more work to do here in the shack.

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Release of Icom 905

The long-awaited VHF/UHF/SHF radio will likely be available by the time you read this, as general availability was announced this week (mid-March). While there has been a lot of speculation around pricing, the announced retail pricing that I saw from one vendor is about what I expected. Producing an integrated unit, with available accessories designed specifically for it, is of course the point of this radio, and I believe that Icom has hit that mark. There's still quite a difference in home-brewing equipment versus buying such a radio, but that difference is, of course, more than just about price. Many SHF folks take pride in developing and building their own equipment, and the accompanying tweaking that goes along with it, and I don't think that will change. Such activities are as much a part of ham radio as operating. But the availability of a commercial rig as a way to get started on the microwaves is simply outstanding and bodes well for adding to the number of operators. Whether you choose to purchase such a rig or not, I think we can all commend Icom for taking this step forward. I realize I have written about this radio more than once, but I truly believe that in a few years we will look back on this moment as an important turn in the awareness and use of our microwave amateur frequencies. I look forward to hearing your thoughts and experiences!

New Beacon on the Air

Art Jackson, K7DWI, reports that a new 2-meter beacon is operating from northeastern Texas. The WA5VHU beacon is operating on 144.276 MHz. It is located in Cooper, Texas, EM23di. Signal reports are of course welcome to WA5VHU. You may recognize Art as the chief snake handler for the "Sidewinders on Two" 2-meter weak signal group.

Propagation on Six and Two Meters

Increasing sunspots bring exciting times, we are seeing spots for a wide variety of propagation types, especially on 6 meters, which now likely includes F^2. I've even seen some spots for E_S activity on 2 meters. I hope that those who are spotting are taking time to evaluate distances, signal strength, and signal quality to try and give us an accurate idea of the propagation they are enjoying, but it is certainly fun to see all the activity! As always, your reports of operating activity are encouraged.

Letters! We Get Letters!

I'm always pleased when someone takes the time to call, write, email, or text to let me know about their activities. Our friend Don Woodward Jr., KD4APP, in EM84 recently sent me a report on his current antenna project and offered some thoughts on the Icom 905. Don, thanks for sharing with us:

> "I have a tower project at my home underway and it will have 222, 432, 902,1296 (MHz) and 6 meters- all fed by 7/8" heliax except the 1296 MHz, which will be 1-5/8" heliax and the 6 meter will have 1/2" heliax. I am looking forward to better coverage – my current antennas are all under 20' on two 10' masts with a rotor in the middle, and are mostly blocked except south. I've also recently added transverters for 2304, 3400 & 5760 - looking forward to roving on those bands as well as 1296 MHz & 10 GHz, where I have had roving stations for a while.
>
> I saw your other email about my thoughts on the Icom 905 – I believe it will help infuse more activity into the SVHF bands only if the price is palatable. When the Icom 705 came out I got one of the first units for my rover station and the waterfall interface is great for finding weak signals on the SVHF bands and I recently added an Icom 9700 to use as a base radio on 144, 432, and 1296. This radio has really helped pull in weak signals on the 432 morning net – I previously used my Yaesu FT-991a there. I live in the north Georgia mountains so an Icom 905 base probably would be impractical, but as a rover station I could take it to Brasstown Bald (7.5 miles west of me and the highest mountain in Georgia) and use it up there if it's compact enough to get on their shuttle. My blog has quite a bit of info on all my activities as well as my radio lab here at home. It's at <https://kd4app.blogspot.com>."

Listen for Don on the air from EM84 in Georgia!

That's it for this month – get on the air and make some noise and we'll be listening for you! One serious note – my mention of product names here doesn't constitute an endorsement. I find it helpful to speak in real terms about real radios, and that's all I'm doing. Thanks!

Transverter Options

There are many options for transverters, but in case you are investigating for the first time, here are some names to consider. Please feel free to suggest others or let us know about your home brew projects.

Here's my partial list

- Down East Microwave
- Q5
- SSB Electronics
- Kuhne
- Ukrainian models available on eBay

mobiling

BY JOHN KITCHENS,* NS6X

Mobile Awards and Activities

While I was preparing to write this column, I was thinking (and that can be somewhat dangerous) about why we would operate or need to operate mobile. Other than just having fun while driving, maybe it is staying in contact with friends and fellow hams via the local repeater while taking a trip to Costco, or looking for Bouvet Island while taking the kids to water polo practice. There are also awards that are earned by working mobile operators, or being the mobile operator.

For example, *CQ* provides several awards, found at the *CQ* website, <http://www.cq-amateur-radio.com>. Along the left column there is an awards tab. Of the award programs listed, at the bottom is the USA-CA, the United States of America Counties Award (not California). The basic award is given after working 500 different counties and receiving a QSL card or approved electronic verification. There are a total of seven award levels, including working all 3,077 USA counties. Methods of approved electronic QSL verification can be found at <https://tinyurl.com/yyzjzwur>, but basically at this time, the only electronic confirmations accepted are via eQSL.cc. Rules and access to a county-hunter spotting network are available at the *CQ* website, and at <www.countyhunter.com>. There used to be a county-hunter HF net, but that is no longer formally operating. The county hunter spotting system is available for hunters to know where county activators are located and operating, and for the activator to enter their location and frequency, the "spot."

Parks on the Air® (POTA), is fast becoming popular. There are YouTube channels devoted to videos of the operators POTA activations. One of the approved POTA parks is the San Bernardino National Forest. I have a house within the forest, in Big Bear City. I had to ask what the rules were for operating POTA from a private residence. For one, the activation site needs to be publicly accessible. So my house would not be approved within the intent and spirit of the POTA program. However, anywhere in the forest that had public access would be approved. There are many smaller parks and recreation areas within the forest, each with its own POTA identifier, such as the Silverwood Lake Recreation Area (K-3569) or the Sand to Snow National Monument (K-4545), so operating from one of those areas would provide a two-fer status – two parks from one location. The activator would need to submit two different ADIF logs, one for each POTA activation.

Photo A. Steve Taylor, K6UFX, of the WIN Repeater System is standing in front of the compartment where he keeps his 446.88-MHz portable repeater. The short-range repeater operates while driving down the road, allowing multiple hams traveling together to use it as they drive. The repeater is beneath the yellow funnel.

A Visit to Quartzfest

Portable operation will be a part of this column, as I see it as a form of mobile communications. More than 200 vertical antennas were supported by campers in tents, small RVs, and coaches at the Quartzfest hamfest in January. Quartzfest is a hamfest on federal Bureau of Land Management (BLM) land, where the camping is free, about six miles south of Quartzsite, Arizona. Go south from Quartzsite on 95 and look for the antennas on the right. The camping is free for up to a two-week maximum stay before the camper must move. If you're planning to stay longer, long-term camping is available with registration. It's still free. Many of the Quartzfest attendees live in their RVs, staying on BLM land for free.

With close to 400 attendees signed-in, the variety of radios and antenna systems was endless. One of the different mobile installations was a mobile 446.88 repeater in the coach of Steve Taylor, K6UFX (Photo A.). He is the board chairman and treasurer of the WIN System, <www.winsystem.org>, a repeater group with members and repeaters linked throughout the world. Steve's son, Bob Taylor, KF6QYX, built a repeater from two Kenwood handhelds, using a Raspberry Pi to run the controller and system. There were six duplexers mounted inside the repeater box, with a rechargeable battery. The repeater was operated while enroute, allowing a caravan to talk amongst themselves. K6UFX

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Photo B. CQ columnist Gordon West, WB6NOA, and his mobile command post.

Photo C. WB6NOA's mobile communications unit operating position.

said the repeater had a range of a few miles, maximum. The box is self-contained, able to be carried about to use as a portable repeater. The duplexer allows one rubber duckie antenna to be used for receive and transmit.

Getting to think about the portable repeater, I found a controller built for the TYT and Baofeng radios for $15 on eBay. Amazon has the Baofeng UV-5R radios, new with all accessories, for $23. So, for $61, I have the basis for a portable and mobile repeater. I added a duplexer that I was not using. It works well as is. I have a programmable repeater, VHF or UHF. For my use, it seems the duplexer might not be needed, but I will look for a reasonable, low-price, UHF duplexer that can be tuned to my frequency, following the band plan.

At Quartzfest, there is an antenna walk, taking a look at many of the antennas used, with the host telling the antenna story. There were commercial antennas and homebrewed antennas. Most of the antennas were verticals using a collapsible fishing pole, or a more expensive collapsible mast, to hold up a wire that was matched with many different types of matchboxes, sometimes called antenna tuners. Radials were constructed from individual wires and ribbon cable. Baluns, ununs, and other matching devices were also commercial or homebrewed. My *CQ* colleague Gordon West, WB6NOA, was there with his communication van, showing off not only his antenna system (Photo B) but also his equipment layout (Photo C) and power distribution system (Photo D).

One of the masts was made from a gardening pruning pole, extended 50 feet as used by Stuart Anthony, KE6NCU. Stu used three sections of the pruning pole that he got through eBay. David Fisher, NX6D used a 35' pushup fiberglass mast to hold a G5RV. He had

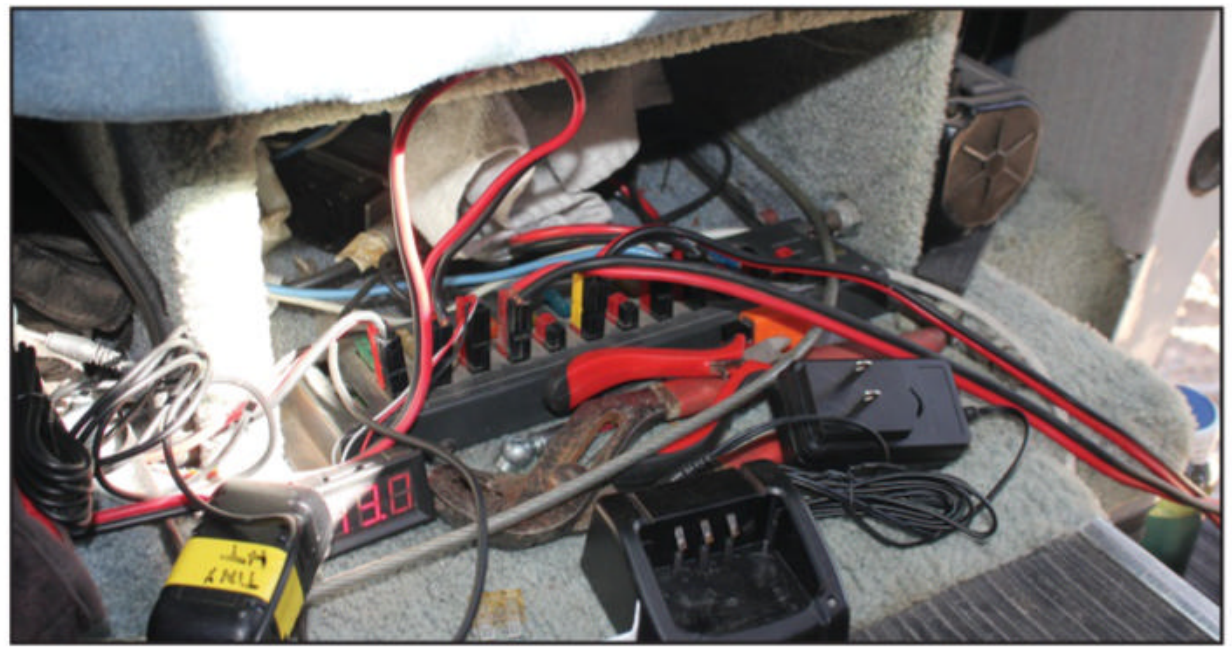

Photo D. WB6NOA's mobile communications unit power distribution block.

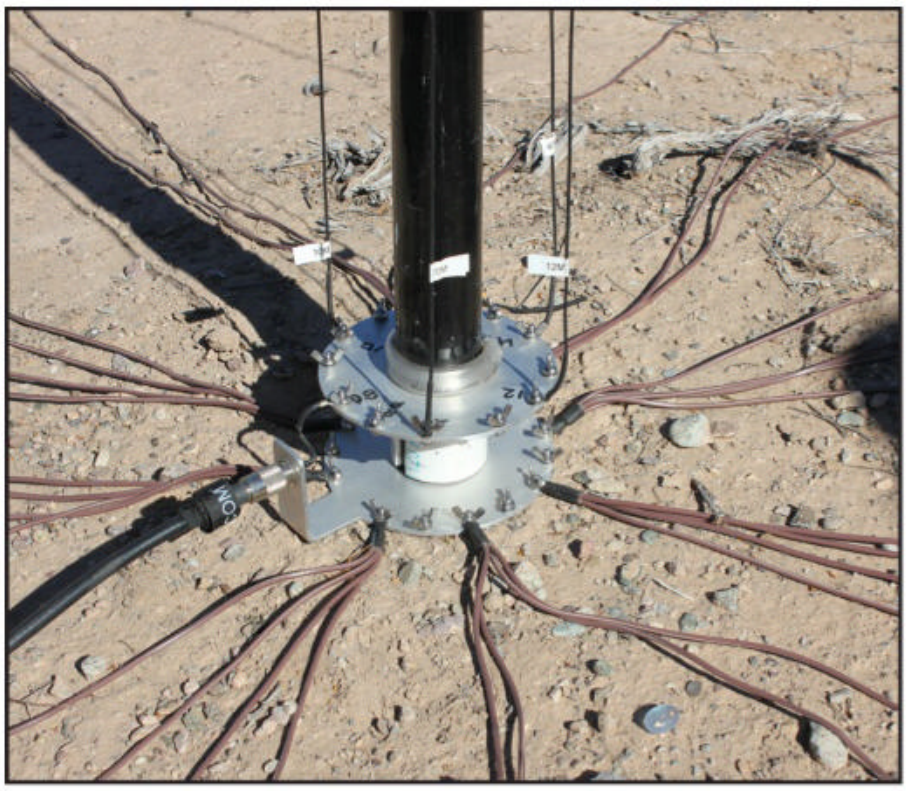

Photo E. A homebrew antenna, patterned after the DX Commander, and the radial system. Built by Michael Powell, KJ7LPO.

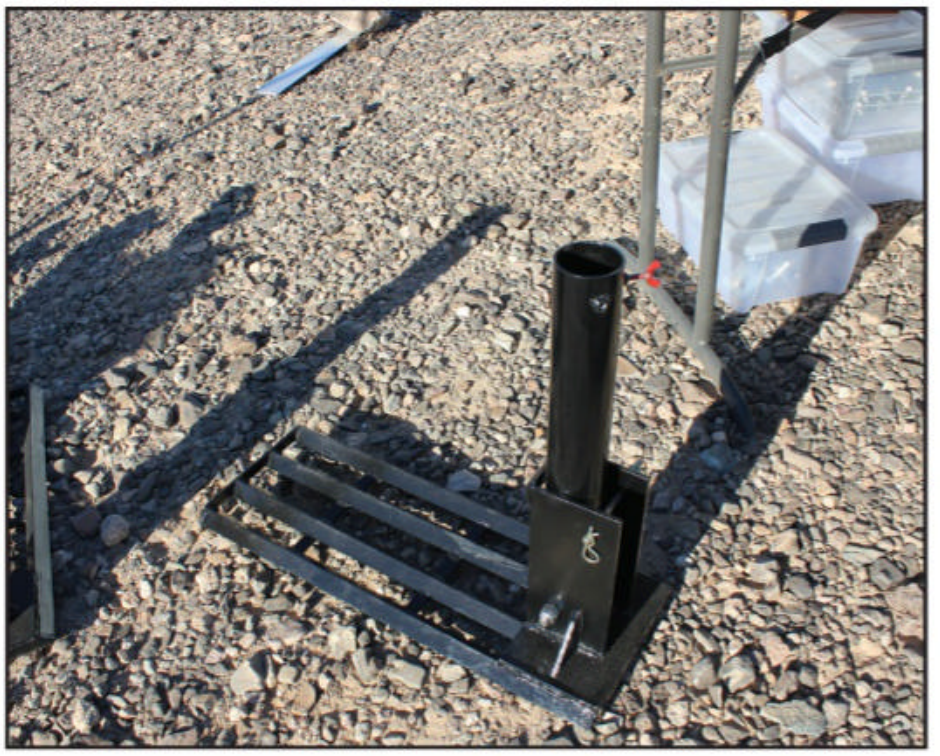

Photo F. An idea for a portable antenna mount. Drive over the flat part, holding the mount in place with the vehicle tire. The tilt-over vertical mast support makes erecting and working on the antenna relatively easy.

made a QSO with New Zealand. Mike Powell, KJ7LPO had a Spider Beam up 40' on a mast that was copied from a DX Commander (Photo E). Another ham demonstrated a drive-on mast support for portable operation (Photo F).

Back to My New Truck

In the last column, I began to talk about my 2022 Ford F150 pickup and the mobile radio installation process. I have finally formulated a plan after allowing life to get in the way. I sent to Ford for information about installing radios into the truck. The dealer had told me to not install radios, as they could interfere with the computers in the truck and cause problems that would not be covered by the warranty. I received from Ford a carefully worded reply, but no technical bulletin. I was told that installing a radio system was not advised, but if I did, to not allow the radio system to interfere with the truck's computers. There are many microcontrollers in the truck – controlling the hotspot, Wi-Fi, navigation system, and all aspects of the engine operation. I was also told that connecting a "foreign" electrical system to the starting battery would cause the electrical system to see an unauthorized device and confuse the computers. I was told to isolate the truck battery from the radio system.

I had been thinking about many different types of systems, all using a standalone battery for power. The latest plan was to attach a solar panel on the rack on the bed shell. I have two 100-watt panels that I am not using for

Photo G. Chip Lohman, NN4U, installed a Tarheel antenna <https://www.tarheelantennas.com> on his F-150 pickup. He also mounted the Yaesu FT-891 on a cup holder mount from <lidoradio.com>. He has an aluminum body truck that does not directly accept a magmount antenna. He solved that issue by placing a six-inch "donut" magnet on the inside of his moon roof glass with the magmount antenna attached through the glass. I would not drive with that arrangement, and would probably want a better ground plane. Things to think about.

Photo H. Gary Marks, WD8ICX, has installed an Icom IC-7100 and Icom V-800, with tuners and the control for his Tarheel antenna, using a RAM mount system. Gary operates multiple modes from his driver seat position. His laptop is resting on a support that is attached to the steering wheel of his Chevy Silverado.

anything else. I have breakfast weekly with the ROMEO club (Retired Old Men Eating Out), all hams. I had been talking about the installation with them. Rob Hanson, W6RH, had an RV battery isolator that he was not using and brought it to breakfast. I had planned to use a separate battery and was looking for a way to charge it.

Rob brought the Precision Circuits Inc. BIM160. It will do the job, but requires some searching for power to control the charging circuit. The isolator will connect to both the vehicle battery and the ".coach" battery. The isolator is connected to the ignition switch, or some other power source that is energized when the ignition switch is turned on, which closes the circuit between the two batteries to allow the alternator to charge both batteries. It is a one-way device which prevents power coming from or to either battery when the ignition switch is turned off. The power cables for the radios are connected directly to the "coach" battery, allowing power for the radios when the ignition switch is turned off, until the battery is depleted. My plan was to connect a power distribution bar to the battery for power to the two radios, as well as handheld and phone charging. The Ham Radio Workbench podcast guys offered an Anderson Power Pole distribution box kit for sale from their website, and the user would add the Power Poles.

A better, simpler system had to be available. The BIM160 would work, but there needed to be a separate connection to the switched power source. An SPST switch would work to make the internal system work, but even that would create one more step. I forget stuff. I would forget to turn off or on the switch to charge or disconnect the radio's battery.

The West Mountain Radio IsoPwr battery isolator was found <https://tinyurl.com/mr372dha>. I am sure that there are other similar battery isolators available, but the IsoPwr is a device that is simple to connect. The box comes with three Power Poles built in: one for the vehicle battery, one for the radio battery, and one to power the radios. There is no need to find a switched power source. When the charging system begins to look for the vehicle battery, the IsoPwr system becomes activated. It is a simple one connection to the vehicle battery, one connection to the radio battery, both via Power Poles on the IsoPwr side, and one connection to the radios or power distribution device. Wires and cabling still need to be provided between the different sources, but it becomes easier with the Power Poles and battery terminal connections. The isolator is not supposed to cause the vehicle's electrical system to become confused and think that there is a foreign electrical device connected to the vehicle battery.

The IsoPwr provides 40-amp service, plenty for the radios and power source for phone and handheld radio chargers. The power system is solved, for now. The solar panels, or one, will still be placed on the roof rack to charge a battery and other systems when the vehicle is parked. There are probably too many power sources in the arsenal. There are half a dozen different-sized Bioenno batteries for portable and SOTA work, with a solar charged "generator" producing 2.4 kilowatts. So, yes, there is radio power.

The next column will be the installation of the mobile radio system, with pictures.

Keep Those E-Mails (and Photos) Comin'

Your input is always appreciated. I heard from Bob Kimbrell, W0AO, and his youthful adventures in the 1960s as bicycle mobile and his three half-wave collinear array for his Heathkit Twoer. Chip Lohman, NN4U, provided info for the next column, talking about how he has had no problem with RFI in his F-150, with pictures of his Tarheel antenna (Photo G). Gary Marks, WD8ICX, showed pictures and comments about his Icom IC-7100 and Icom V-8000 (Photo H). Gary also uses a Tarheel controlled with the MFJ SDC-104 screwdriver antenna controller.

Scott Hanley, WA9STI, reminded me that I sold him a Yaesu FT-690 many years ago. He still has the radio – maybe he would sell it back? Scott invited me to join the International Police Association Amateur Radio Club net. The net operates twice each week, Sunday and Wednesday at 1700Z, on 14.240 up to 18.127, depending upon propagation.

Send your comments, ideas, pictures, experiences, mobile trips, POTA events and anything else that you feel would be relevant to John at <NS6X@cq-amateur-radio.com>. Until next month, 72/73.

awards

BY STEVE MOLO,* KI4KWR

King Charles III Coronation Award

While looking for new and updated awards from around the world, I was actually contacted by several hams in Europe about a special award from the United Kingdom. With 2023 marking the coronation of King Charles III following the passing of Queen Elizabeth II, the W.A.B. Awards Group is marking the event with an award. W.A.B. stands for Worked All Britain and the group supports many awards (see <http://wab.intermip.net>). The coronation award is very straightforward and below are the criteria to be met for obtaining the award.

NOTE: This information is direct from the website and accurate as of this writing, but changes were being made as this was written, so we would suggest checking the website for updates <https://tinyurl.com/3wzj48bv>. "Squares" mentioned in the criteria refer to 10-kilometer by 10-kilometer grid squares within the United Kingdom. See <https://tinyurl.com/bdfktdxm> for details.

Criteria

The award is open to all and will be available on all modes and all frequencies.

The squares and members elements of this award may again this year be worked monthly for credit. The credit for any squares, and members not counted in the monthly round down will be carried forward to the next month.

Contacts with xx03 and xx33 Squares, Islands, Large Squares and with the W.A.B. club calls also form part of the award.

The initial certificate will be awarded for 10 points with endorsements for each subsequent 10. A new certificate and trophy will be awarded for each multiple of 100 points.

All contacts must be made within the 2023 calendar year, i.e. January 1 – December 31, 2023.

Points – UK HF

- 3 points each 33 squares. The same square may be worked each month for credit
- 3 points each 33 members. The same member may be worked each month for credit
- 1 point each 3 Large Squares during the year
- 1 point each 3 Islands during the year
- 1 point each "03" or "33" Square during the year, e.g. JØ3, NH33, TG33
- 1 point each W.A.B. club callsign (Gx4WAB, Gx7WAB, Gx3ABG). The callsigns may be worked each month for credit. See the calendars (*on website – ed.*) for available dates, and if you wish to book one of the calls, please contact Kevin Hale, GØAKH at <g0akh@worked-all-britain.org.uk>. Due to license conditions, only full license holders may use the club callsigns.

There is a mandatory requirement of at least 33 Squares per stage to the first Trophy.

Points – Others (EU HF, Data Modes)

- 2 points each 11 squares. The same square may be worked each month for credit
- 2 points each 11 members. The same member may be worked each month for credit
- 2 points each 3 Large Squares during the year
- 2 points each 3 Islands during the year
- 2 points each "03" or "33" Square during the year, e.g. JØ3, NH33, TG33
- 2 points each W.A.B. club callsign (Gx4WAB, Gx7WAB, Gx3ABG). The callsigns may be worked each month for credit.

There is a mandatory requirement of at least 16 Squares per stage to the first Trophy.

Points – Others (UK VHF, Outside EU, Activated)

- 4 points each 11 squares. The same square may be worked each month for credit
- 4 points each 11 members. The same member may be worked each month for credit
- 1 point each Large Square during the year

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• 1 point each Island during the year
• 4 points each “03” or “33” Square during the year, e.g. J03, NH33, TG33
• 4 points each W.A.B. club callsign (Gx4WAB, Gx7WAB, Gx3ABG). The callsigns may be worked each month for credit.

There is a mandatory requirement of at least 8 Squares per stage to the first Trophy.

For the activated category, members worked and W.A.B. club callsigns worked/activated will count towards the award. The club call must be worked/activated other than at the usual QTH of the station.

Trophies will be presented at the W.A.B. A.G.M. and claims for such must reach the Awards Manager by the end of February preceding the A.G.M.

Please ensure you are using the latest version of the trackers. The latest version is v1.4 (version history: v1.3 has corrected totals on Special Squares tab – v1.4 has corrected totals on Monthly tabs March to December)

Some people seem to be having trouble with the trackers in OpenOffice and LibreOffice. We are investigating if a solution is possible.

One thing I would like to point out for this award and likely the others this wonderful group offers is this warning mentioned on their website:

The W.A.B. Awards Group draws your attention to the fact that some aspects of the W.A.B. scheme may be difficult to activate. Some may lie on private land. Activations may require members to be in possession of certain physical skills and be in a good state of physical fitness and health. When proposing a potentially difficult activation, members are advised to consult the relevant local organisation (e.g. the Coastguard or Mountain Rescue Services). Where an activation will be on private land, members are advised to seek permission from the owners before attempting the activation.

The Worked All Britain Awards Group does not take responsibility for damage to equipment, personal injury, or legal action resulting from any activity connected with the awards scheme.

the ham notebook

TEXT AND PHOTOS BY WAYNE YOSHIDA*, KH6WZ

Getting Ready for the Maker Fire

My Mission Continues

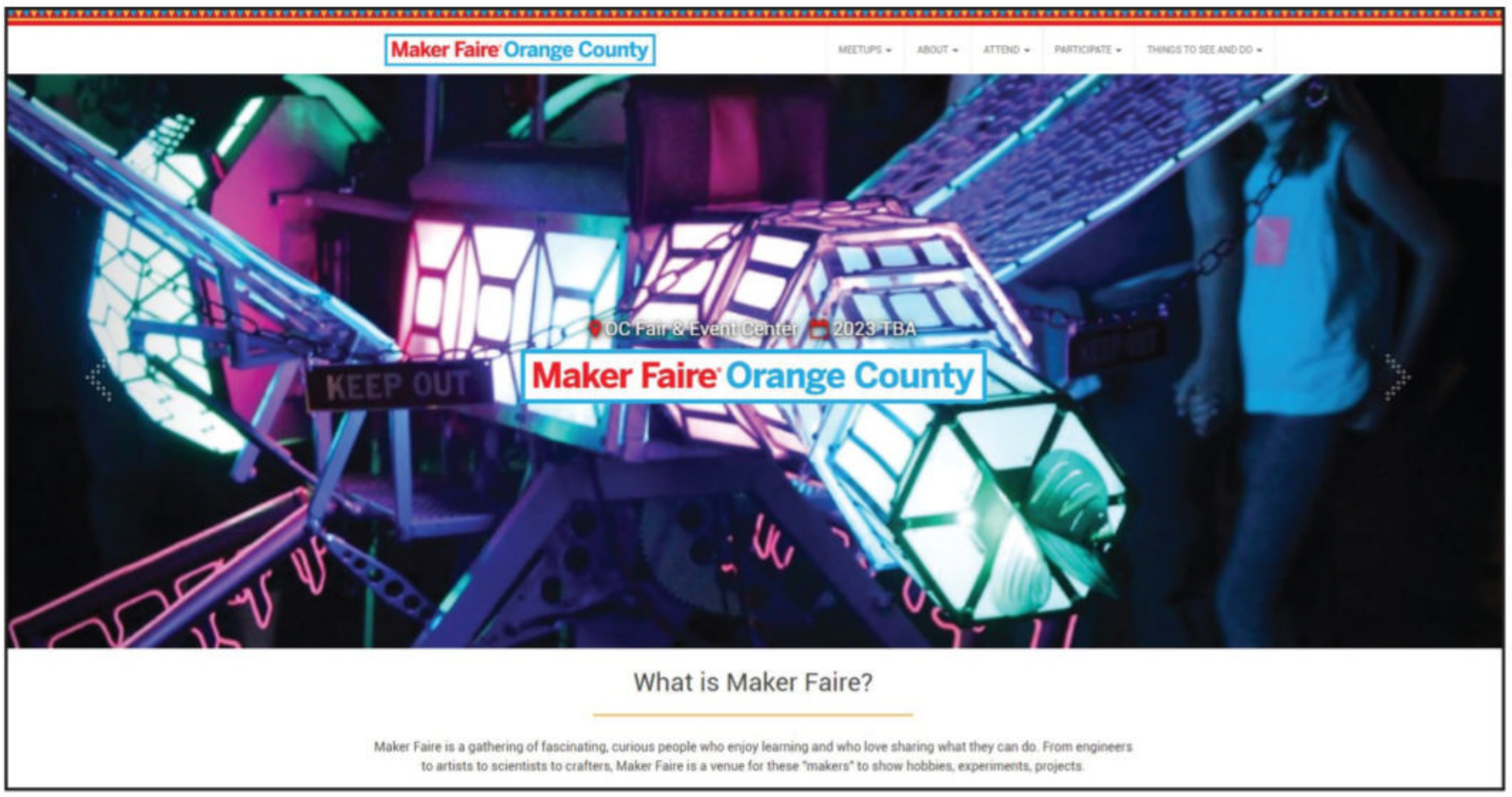

Photo A. Maker Faire Orange County (California) is October 23, 2023.

Last September, a local Maker Faire event took place and I almost missed it. I accidently found out about the event on Facebook, and I was just in time to submit an application to earn a place to be a Maker at the event. (Makers are "exhibitors" at these events.)

This year, I am making plans now for the event on October 23 (Photo A). I am also promoting the event and hope to encourage others to join me with their own booths so we can increase ham radio visibility.

To this end, I am writing this article to help inspire others to demonstrate ham radio to a mostly non-ham radio audience. I will also share some of my hints for success and other things that will make your exhibit more enjoyable for both you, your team and the event audience.

Start with Why

It might be a good idea to start this article with a quick section on why participating in a Maker Faire event – or other public display or demonstration – is a good idea. Here are just a few reasons:

- It produces positive publicity for ham radio's role as a valuable and free emergency communications service to the community.
- It is educational and can be a positive influence on children and young adults.
- It can be a place to find new club members.
- It can help rejuvenate club members to participate in a group activity.
- It can generate interest in getting people interested in getting a ham license

Photo B. Getting kids interested in electronics, radio, and science is one of our Maker Faire Missions.

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Linkedin: www.linkedin.com/in/wayneTyoshida

- It can be a great place to meet new people, and possibly new career opportunities.
- It is fun.

Plan, Prepare, Publicize

The Maker Faire experience should start many weeks before the event happens. This includes recruiting a team of enthusiastic people who can organize and execute assignments and tasks. If this sounds like Field Day planning, it should. All the elements for a successful Field Day apply to the Maker Faire.

Leverage social media and follow the appropriate hash tags to help find and exchange news and related information for your event. Include science, education and hardware hacking among the tags, such as #makers, #stem, #hamradio, #scienceeducation, and others.

What's Your Mission?

Creating a mission statement will help you focus on specific goals for what you and your team will demonstrate (Photo B). For example, my Maker Faire Mission Statement has always been, and continues to be:

- To show people what today's ham radio operators are doing with the newest technology.
- To change the image of ham radio, making it contemporary and chic in a hi-tech way.

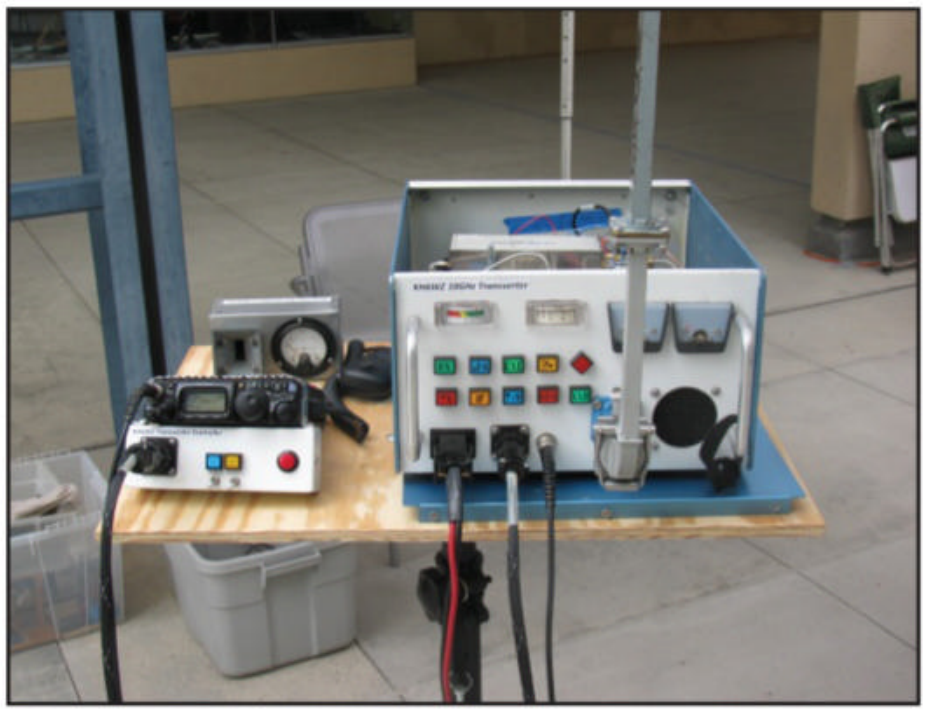


Photo C. Microwave transverter systems are ideal for demonstration stations, since the antennas are usually small and the rigs are portable. And they are a very different kind of radio.

Photo E. This is a close-up of the Mini Tesla Coil.

Photo D. The Mini Tesla Coil is shown on the right. A plastic medicine bottle covers the output. Holes are made so an insulated probe can be used to draw sparks and create artificial lightning.

Photo F. The lightning detector is always a popular item in the booth. The large analog meter and flickering light attracts attention.

- To emphasize how ham radio can be used for science and technology education and a possible career path for youngsters.

Our projects demonstrate how ham radio technology changes with the times, yet still includes both past and present to accomplish one thing: Creating ways to communicate voice and data over the ether, without wires.

Ham radio has always included teaching, learning, making, modifying, hacking, and networking. We want to remind people this "new Maker Movement" is not really a new idea. Read my LinkedIn post called "The Original Makers" to learn more about this.

The Demonstrations

We try to accomplish our mission statement by demonstrating our projects in a non-traditional way. Rather than simply setting up a radio station to talk to other ham radio operators, the radio projects become a major part of the demonstration. In most cases, we do not talk to other stations at all.

Instead, we become control operators, and allow the non-licensed visitors operate the equipment, making contacts across the room or within the booth. The rigs are usually connected to dummy loads, short whips, or even tape-measure antennas. This is also why microwave rigs make great demo stations, since the antennas are very small and the rigs can be portable, especially if the rigs are made for rovers (Photo C). And since this is a Maker Faire display, the covers are removed, so hardware hackers can see what is inside.

Often, we run into visitors who are hams, and we sometimes hear something like, "I have never seen radios like this before." That comment is satisfying for me to hear, since we demonstrate microwave- and millimeter-wave rigs, and it becomes a great way to recruit hams onto these higher frequency bands.

For example, my 10-GHz transverter system is used to demonstrate frequency up- and down-conversion, radio wave polarization, and antenna gain and directionality.

Over the years, the demonstration projects include Maker Faire-specific units, and expanded the gear to be "radio-related" rather than limiting things to ham radio units. The Mini Tesla Coil, Lightning Detector, ADS-B Receiver, and the art project called, "Inventory Reduction" are examples of this. (Photos D-H).

Photo G. The ADS-B receiver shows an example of kid-proofing. The notebook computer is placed under the explanatory poster to prevent keyboard access.

Safe and Kid-Friendly

Photo I shows one of my favorite signs I have ever seen at a Maker Faire. I like it because it summarizes one aspect of a Maker Faire in just two lines.

On a more serious note, a few of my projects may be harmful for little ones, especially the curious ones who like to touch things. Touching things should not be a problem, and is in fact expected, at a Maker Faire. Just like the sign says, something is dangerous, but come closer, we will keep you safe.

Photo H. Curiously, my do-nothing panel always gets lots of visitors. One momentary toggle switch activates a loud buzzer. .

Photo I. One of my favorite Maker Faire warning signs.

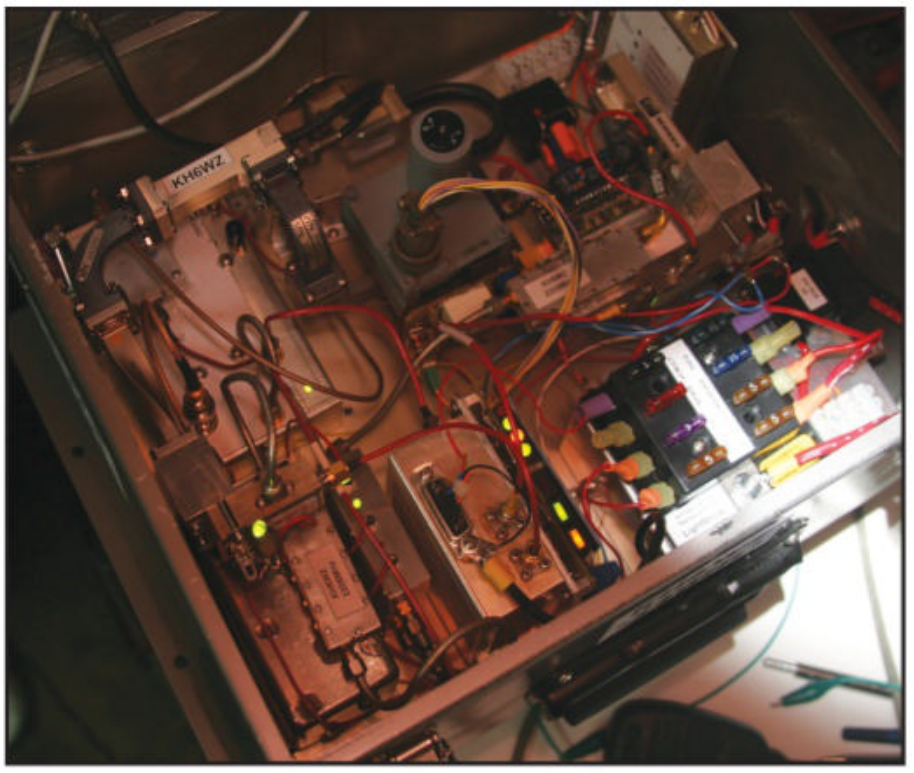


Photo J. My 24-GHz transverter includes various LEDs to indicate voltage and status. It can be fascinating for non-hams to see and hear relays clicking, lights switching, and meter needles wiggling. It can also be a lesson in radio concepts like frequency multiplication (conversion) and other things.

Photo K. Good graphics create a professional look to Maker Faire exhibits.

The lightning detector is built into a small LCD monitor cabinet. The monitor fell off my shelf one day, making it useless. Rather than putting it into the hazardous e-waste bin at the office, I took it apart, keeping the power supply, speakers, and audio amplifier sections. The right side of the unit contains a small switching power supply, with 12- and 5-volts output. However, the AC mains input is exposed inside, and if someone accidently pokes a finger into just the right place,

Photo L. This is a rear view of the booth. Tablecloths, signs, and professional-looking posters enhance the experience for everyone.

Photo M. Jeri Ellsworth, AI6TK, is an honorary member of the KH6WZ Maker Faire Team.

it will not be a pleasant experience. So, a clear plastic shield covers the opening from curious probing.

Maker Faire Marketing Communications: MarCom

As a technical writer with marketing communications and advertising experience, I always consider Maker Faire events as trade shows since we are performing marketing and branding as well as educating and exposing people to ham radio.

I try to make my projects visually appealing, by including indicator lights and meters to show the working state of the equipment. I may add additional lights just for show, but not always. My call sign is always visible on my projects since this is also part of my personal brand. Photo J is a view under the top cover of my 24-GHz transverter. Various LED colors indicate voltage and status: For example, 5 volts on transmit-only, 12 volts for both receive and transmit.

Posters are made to help explain what is happening and add visual elements to the booth. All posters have a consistent appearance and format which helps unify everything in the booth. I use Microsoft PowerPoint to make 11 x 17-inch color prints and then have them mounted to foam core boards at the local FedEx Kinko's center. They are durable and can be framed when I retire them from being displayed at events (Photos K & L).

Posters and banners must be supported safely and securely, and must not be attached to any walls or venue surfaces. Most booth spaces will have pipes and drapes to delineate booth spaces, but not always. In one case, there were no drapes or supports at all, only duct tape or chalk marks on the concrete floor showed exhibitors where their spaces were.

Because of this, I had to come up with a cheap, sturdy and easily transportable support for my posters and banner. And I needed it immediately. I grabbed my woodworker's pipe clamps, added a threaded PVC tee to the top, and used some solid copper wire to make a small hook to support the big yellow banner. Then I used some more wire to go across the back of the table, creating a "clothesline" to support the posters. If you look closely, you can see the pipe clamp gripping the table. Although heavy, they worked very well, and I spent zero dollars on the support system.

Speaking of the tables, for some reason, I always seem to get the rattiest, most splintered and stained tables at these events. So several years ago I bought some disposable picnic tablecloths from the grocery store. They worked but were too thin and lasted only for one show. But tablecloths hide the ugly tables and increase the contrast for the items on display. Always watching my budget, I bought some curtains from the local Ikea as-is section for about five dollars. They are nice and thick, machine-washable and work wonderfully.

As a final touch to the unified identity and branding of the KH6WZ "Not Your Grandpa's Ham Radio" team, Dennis Kidder,W6DQ, made custom polo shirts for us with our logo on them. (Our logo is an upside down "electrical hazard" symbol.) In Photo M, Jeri "Circuit Girl" Ellsworth, AI6TK, receives one of our shirts, as an honorary member of our team.

Maker Faire Go-Kit

One last thing. Like my emergency communications go-kit, I have a Maker Faire go-kit (actually, it is the same thing). It includes tools and spares so if any project breaks or a fuse blows, I can get the item back on the air to make sure the show goes on (Photo N). Sharp-eyed readers can spot one of my "waiting tools" when things are on hold: A vintage Duncan yo-yo.

Maker Faire events all over the world are great venues to help make learning science, technology, engineering and math fun. Combined with other Maker elements such as sculpture, kinetic art and other amazing things, there is surely something for everyone to enjoy.

What will you or your radio club bring to the Maker Faire? 73, Wayne

Photo N. The Maker Faire go-kit includes a small tool kit so repairs can be made in the field.

References

Maker Faire Orange County, CA: <https://oc.makerfaire.com/>
Maker Faire website: <https://makerfaire.com/>
Make: <https://make.co/>
"The Original Makers": <https://tinyurl.com/yrfkykeu>
"A Paradigm Shift: Turn Your Ham Radio Station into a Demonstration Station" in *CQ* magazine for July 2015.
Jeri Ellsworth AI6TK on YouTube: < https://tinyurl.com/3k73p72x >

DX *(from page 13)*

changes for us to get on the air. After developing a smaller initial approach, eight operators landed on Bouvet with two radios and three vertical wire antennas (Photo F). We planned to use the much smaller 1.8-kilowatt Honda generator that had initially been brought to run power tools. Just about everything we did on Bouvet took much longer than it would have under reasonable conditions. In Norway, the team was able to put up the tent in under 30 minutes. However, in the howling winds of Bouvet and gravel ground requiring much more work on the anchoring, it took us as a team about two hours to put up the same tent (Photo G). It took the team 12 hours to land on the island and build the camp (Photo H). As the sun went down on our first day back on Bouvet, we had not even begun to put up antennas or get radios out. After a warm meal in our secure tent, we went to sleep(Photo I). We just had our mats to sleep on (Photo J). However, we were all warm and woke up ready to get 3YØJ on the air.

Photo K. Setting up a vertical antenna on Bouvet during a short period of good weather.

It still took us about six hours to put up the three verticals (Photo K), make proper adjustments, and put the stations together (Photo L) as well as finish up some work needed to complete preparations for an upcoming storm. Our initial forecast showed the storm coming from the northeast, which we had prepared for. We woke to a forecast now that said the winds would be from the southeast, so we took further precautions to anchor the tent. Again, the howling winds made every step outside the tent a challenge. It was finally time to get on the air and Ken Opskar, LA7GIA, and Erwann Merrien, LB1QI, were the first to put 3YØJ on the air (Photo M).

Within minutes the pileups were spilling across the band, although not as we had anticipated, but 3YØJ was on the air. We settled into 2-hour shifts and ran SSB and CW for the first few days. With our 100 watts into vertical wire antennas, we had a weak signal compared to the beams and amps we had planned on using. This added an extra layer of difficulty to working the pileups. It was not unusual to have to call a station five times before they would hear our weak signal through the QRM. It was no doubt frustrating on both sides of the pile.

Unfortunately, our weather window that would allow us to land more equipment in three days kept getting pushed back. Having good conditions at the beach on Cape Fie did not necessarily mean that the Marama was having the same conditions. We needed both the beach conditions and the conditions on

Photo L. The 3YØJ team used the battle-tested Elecraft K3S radios to operate from Bouvet.

CQ DX Awards Program

CW Endorsement

N3RC.....326

RTTY Endorsement

WK3N.....339

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.

The WPX Program

SSB

4467 .....W5IO
4468 .....VE3SVQ

Mixed

4563.....YCØBJJ
4564 .....KC9QFH
4565 .....KI4CYB
4566 .....K2GRI
4567 .....W9LRG
4568 .....KEØRUJ
4569 .....WØGN
4570 .....K7NX

Digital

1899 .....W5IO
1900 .....AF1SL
1901 .....KC9QFH
1902 .....AC8VZ
1903.....JAØCJK
1904 .....N6AVI
1905 .....KI4CYB
1906.....K4WY
1907 .....KC3VMI
1908.....KE8RPJ
1909 .....W9LRG
1910.....W7CHW
1911.....JK1NPH
1912 .....KEØRUJ

CW: 950 WØGXA. 1500 HB9JOE. 4450 I7PXV

SSB: 500 KV8P. 750 HB9JOE

Mixed: 400 KEØRUJ. 450 KC9QFH, K7NX. 500 KI4YCB. 650 NR6AM. 700 WØGN. 750 IW7DVM. 800 N6ZDH. 1000 YCØBJJ, AJ6X. 1050 JHØEYA. 1100 N1HO, N2TC. 1250 KD2NF. 2000 WD8ANZ. 2050 HB9JOE. 2100 WD8ANZ

Digital: 350 AC8VZ, K4WY, W7CHW. 400 KI4CYB, KEØRUJ. 450 KC9QFH. 600 NR6AM. 800 N6ZDH. 850 N1HO. 950 AJ6X. 1000 N2TC. 1050 JHØEYA. 1200 KD2NF. 2150 EA3EQT

80 Meters: NR6AM, EA3EQT
60 Meters: KD2NF
40 Meters: KD2NF, JHØEYA, EA3EQT
30 Meters: KD2NF
20 Meters: KD2NF, KV8P, KC9QFH, JAØCJK, JHØEYA, WØGXA
17 Meters: N1HO, KD2NF
15 Meters: YCØBJJ, KD2NF, NA5WH, AJ6X
12 Meters: DU1/NFØO
10 Meters: WØGXA, KC3VMI

Africa: IW7DVM
Asia: NR6AM, YCØBJJ, JAØCJK, WØGXA, JK1NPH, WØGN
Europe: YCØBJJ, KV8P, KI4CYB, JHØEYAM WØGXA, WØGN
Oceania: JAØCJK, JK1NPH
North America: YCØBJJ, KC9QFH, AC8VZ, N6AVI, KI4CYB, JHØEYA, WØGXA, K2GRI, W9LRG, W7CHW, KEØRUJ, VE3SVQ, WØGN, K7NX

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 Marama to line up at the same time. This became very frustrating for the team to watch as the conditions to land were good but the conditions at the Marama would be too rough, causing her to seek safer conditions elsewhere. As time went on and days slipped by, the hope of bringing in more equipment beyond the necessary basics was looking less likely. Oftentimes on DXpeditions, you experience challenges with some balance of good luck. However, Bouvet did not seem to offer many breaks, it just kept pummeling us.

A week had passed since we landed on the island and we had only been able to resupply essential needs. Our time on Bouvet was running short and we were now to a point where, even if we could get the generators and fuel on the island in the next weather window, if we had another week of bad weather we would not be able to leave Bouvet when we needed to. Also, the team realized that getting the supplies off the island would be harder than bringing them on. As we watched our fuel supplies dwindle and seas continue to churn at Cape Fie, the reality was setting in that we might need to leave Bouvet early as supplies would run low. This was a very dif-

5 Band WAZ

As of March 15, 2023
2474 stations have attained at least the 150 Zone level, and 1133 stations have attained the 200 Zone level.

As of March 15, 2023
The top contenders for 5 Band WAZ (Zones needed on 80 or other if indicated):
CHANGES shown in BOLD

Callsign	Zones	Zones Needed
AK8A	199	17
DF2GH	199	31
DM5EE	199	1
EA5RM	199	1
EA7GF	199	1
H44MS	199	34
HA0HW	199	1
HA5AGS	199	1
I5REA	199	31
IK0XBX	199	19 on 10M
IK1AOD	199	1
IT9GSF	199	1
IZ3ZNR	199	1
JA1CMD	199	2
JA5IU	199	2
JA7XBG	199	2
JH7CFX	199	2
JI4POR	199	2
JK1BSM	199	2
JK1EXO	199	2
K1LI	199	24
K3LR	199	23
K4HB	199	26
K5TR	199	22
K7UR	199	34
KZ4V	199	26
N3UN	199	18
N4NX	199	26
N4WW	199	26
N4XR	199	27
N8AA	199	23
N8DX	199	23
N8TR	199	23 on 10M
RA6AX	199	6 on 10M
RW0LT	199	2 on 40M
RX4HZ	199	13
RZ3EC	199	1 on 40M
S58Q	199	31
SM7BIP	199	31
SP9JZU	199	19 on 10M
US0SY	199	1 on 15M
VE2EBK	199	26
VK3HJ	199	34
VO1FB	199	19
W1FJ	199	24
W1FZ	199	26
W3LL	199	18 on 10M
W3NO	199	26
W4LI	199	26
W6DN	199	17
W6RKC	199	21
W6TMD	199	34
W9OO	199	18 on 10M
W9XY	199	22
9A5I	198	1, 16
AB4IQ	198	23, 26
DL6JZ	198	1, 31
EA5BCX	198	27, 39
F5NBU	198	19, 31
F6DAY	198	2 on 10M & 15M
G3KDG	198	1, 12
G3KMQ	198	1, 27
G4OWT	198	1, 27
HB9FMN	198	1 on 80M & 10M
I1EIS	198	1 & 19 on 10M
JA1DM	198	2, 40
JA3GN	198	2 on 80M & 40M
JA7MSQ	198	2 on 80M & 10M
JH1BNC	198	2 on 80M & 10M
JH1EEB	198	2, 33
KØDEQ	198	22, 26
K1BD	198	23, 26
K2EP	198	23, 24
K2TK	198	23, 24
K3JGJ	198	24, 26
K3WA	198	23,26
K3XA	198	23,34
K4JLD	198	18, 24
K9MM	198	22, 26
KI1G	198	24, 23 on 10M
KZ2I	198	24, 26
LA3MHA	198	31 &32 on 10M
N4GG	198	18, 24
NXØI	198	18, 23
ON4CAS	198	1,19
OZ4VW	198	1, 2
RL3FA	198	2 on 80 & 10M
UA4LY	198	6 & 2 on 10M
UN5J	198	2, 7
US7MM	198	2, 6
W5CWQ	198	17, 18
W7AH	198	22, 34
W9RN	198	26, 19 on 40M
WC5N	198	22, 26
WL7E	198	34, 37
Z31RQ	198	1, & 2 on 10M
ZL2AL	198	36, 37

The following have qualified for the basic 5 Band WAZ Award:

Callsign	5BWAZ #	Date	# Zones
TA2LG	2440	01/21/2023	192
W9WO	2441	01/22/2023	165
JE1FQV	2442	01/25/2023	200
KC1OPD	2443	01/25/2023	181
JG1PUW	2444	01/25/2023	171
JF1UVJ	2445	01/27/2023	200
LX1JH	2446	01/29/2023	167
JE1SYN	2447	01/29/2023	200
AA8KY	2448	01/29/2023	151
K9NR	2449	01/29/2023	181
AA5NT	2450	02/03/2023	172
JH1GZE	2451	02/03/2023	200
JL1SAM	2452	02/04/2023	200
WO2T	2453	02/05/2023	184
JA4LKB	2454	02/11/2023	200
JR0QFA	2455	02/11/2023	175
DL6UAA	2456	02/11/2023	192
VK2HV	2457	02/11/2023	151
JH3VWN	2458	02/11/2023	200
JK1GOK	2459	02/17/2023	200
JF3KON	2460	02/17/2023	200
K9UO	2461	01/02/1900	159
JH1IFS	2462	02/19/2023	200
JK1DDG	2463	02/19/2023	168
VA2ZO	2464	02/25/2023	199
PC3T	2465	02/28/2023	200
HB9DQV	2466	03/01/2023	188
JH4ALY	2467	03/04/2023	200
JR7FRW	2468	03/06/2023	200
JN1XNI	2469	03/07/2023	179
JK1VXE	2470	03/08/2023	154
JG2TSL	2471	03/11/2023	170
N5WA	2472	03/11/2023	180
W8UV	2473	03/12/2023	184
S57AT	2474	03/12/2023	195

Updates to the 5 Band WAZ list of stations:

Callsign	5BWAZ #	Date	# Zones
HI8RD	2372	5/16/2022	192
IT9DAA	2414	10/9/2022	193
JK1AJX	1078	5/8/1998	200
G4OWT	1614	11/1/2008	198
N6PF	1877	6/14/2014	200
JA1QJI	1988	4/21/2018	200
JA6GPR	2174	12/13/2019	189
W2IRT	1546	5/11/2007	200
EU1KY	2329	10/15/2021	200
VO1HP	2302	4/12/2021	194
KJ6NZ	2308	6/1/2018	200
W6WF	2213	5/10/2023	166
VU2LBW	1966	2/13/2018	178
E72A	2263	12/28/2020	200
K8DV	2391	7/3/2022	190
JH7XRG	2045	6/9/2018	200
VE2EBK	2332	11/3/2021	199
DF2GH	2032	5/28/2018	199
K3STX	1701	11/9/2010	191
WB7QXU	2221	5/31/2020	187
LU4FPZ	1679	3/17/2010	196
JK1DDG	2462	2/19/2023	170

New recipients of 5 Band WAZ with all 200 Zones confirmed:

5BWAZ #	Callsign	Date	All 200 #
1078	JK1AJX	1/23/2023	1113
2442	JE1FQV	1/25/2023	1114
1877	N6PF	1/25/2023	1115
2445	JF1UVJ	1/27/2023	1116
1988	JA1QJI	1/29/2023	1117
2447	JE1SYN	1/29/2023	1118
2451	JH1GZE	2/3/2023	1119
2452	JL1SAM	2/4/2023	1120
1546	W2IRT	2/11/2023	1121
2454	JA4LKB	2/11/2023	1122
2458	JH3VWN	2/11/2023	1123
2329	EU1KY	2/17/2023	1124
2459	JK1GOK	2/17/2023	1125
2460	JF3KON	2/17/2023	1126
2308	KJ6NZ	2/18/2023	1127
2462	JH1IFS	2/19/2023	1128
2263	E72A	2/28/2023	1129
2265	PC3T	2/28/2023	1130
2467	JH4ALY	3/4/2023	1131
2045	JH7XRG	3/6/2023	1132
2468	JR7FRW	3/6/2023	1133

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, Jose Castillo, N4BAA, 6773 South State Road 103, Straughn, IN 47387. 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 Jose Castillo. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N4BAA may also be reached via email: <n4baa@cq-amateur-radio.com>.

*Please note: Cost of the 5 Band WAZ Plaque is $100 shipped within the U.S.; $120 all foreign (sent airmail).

CQ DX Field Award Honor Roll

The CQ DX Field Award Honor Roll recognizes those DXers who have submitted proof of confirmation with 175 or more grid fields. Honor Roll lisiting is automatic upon approval of an application for 175 or more grid fields. To remain on the CQ DX Field Award Honor Roll, annual updates are required. Updates must be accompanied by an SASE if confirmation is desired. The fee for endorsement stickers is $1.00 each plus SASE. Please make all checks payable to the Award Manager, Keith Gilbertson. Mail all updates to Keith Gilbertson, KØKG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604.

Mixed

K2TQC 288	HA1RW 239	WI8A 219	KF8UN 205	ON4CAS 194	K2SHZ 182
W1CU 269	VE3XN 239	HA1AG 218	OM2VL 205	HB9DDZ 193	KJ6P 180
VE7IG 254	I6T 230	JN3SAC 217	K1NU 204	N4NX 192	W6XK 180
HAØDU 253	K8OOK 229	WA5VGI 216	K1NV 204	HA1ZH 190	W5ODD 177
OM3JW 253	N8PR 229	HA9PP 213	VE7SMP 204	BA4DW 188	NØFW 176
W6OAT 252	HA5AGS 228	IV3GOW 211	RW4NH 203	K2AU 187	WA9PIE 176
HA5WA 250	9A5CY 227	W4UM 210	HB9AAA 200	K8YTO 186	HB9BOS 175
IK1GPG 245	K9YC 227	N4MM 208	N5KE 200	WO7R 185	NKØS 175
OK1ADM 245	VE3ZZ 226	OK1AOV 208	W3LL 199	N3RC 184	
K8SIX 240	KØDEQ 221	F6HMJ 206	NIØC 196	W9RPM 184	

SSB

W1CU 249	VE7SMP 201	W4UM 198	N4MM 189	W3LL 187	DL3DXX 175
W4ABW 202	KØDEQ 198	JN3SAC 192	WA5VGI 189	NØFW 176	

CW

N3RC 326	DL6KVA 233	DL3DXX 210	OK1AOV 198	HB9DZZ 189	N4NX 177
W1CU 254	KØDEQ 214	DL2DXA 209	WA5VGI 197	N4MM 186	N7WO 175
HA5WA 234	JN3SAC 211	W4UM 201	NIØC 196	OK2PO 184	

Digital

W1CU 206	JN3SAC 178	HA5WA 177	KØDEQ 175

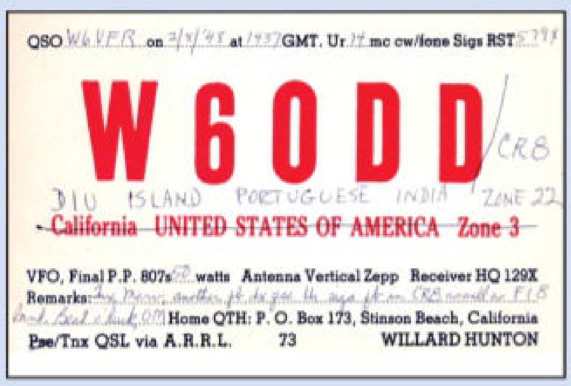
RTTY

WK3N ....339 ..

QSL of the Month: W6ODD/CR8 –

Diu, Portuguese India (1948)

Here is this month's installment in our new "QSL of the Month" series, provided by Tom Roscoe, K8CX, of the K8CX Ham Gallery <www.hamgallery.com>. Tom provides the backstories as well as the card images. We hope you enjoy seeing some very cool QSLs from the past! – N2OO



This is the W6ODD/CR8 QSL card from the ARRL DXCC deleted entity of Damao, Diu. The card may not look like much but is considered one of the rarest QSL cards in the world. Operator Willard Hunton, now SK, made the only operation from this entity from Diu Island, Portuguese India, on September 2, 1948. He only made around 55 QSOs. If you were not on 20-meter CW that morning, or didn't have propagation, you never added this rare entity to your DXCC total. Five of these QSL cards are known to exist.

73, Tom, K8CX

ficult decision to consider, involving multiple discussions both with team members on the island and with the crew on the Marama. Bouvet had taught us to not look too far ahead. We were finally going to have a half-day window, which would be followed by worsening conditions in the evening and another storm with sustained winds of 50 knots the following day.

The question posed to the team was simply: Should we try to bring on the generator? There was no reason to bring any other equipment unless we could get the diesel generator on the island. We had seen a week of surf and wind on Bouvet and we had learned that a weather opening on this tiny island in the middle of the Atlantic was something very different from a larger land mass that was able to

Photo M. Ken Opskar, LA7GIA, and Erwann Merrien, LB1QI, operating from the 3YØJ radio-shack.

provide more reasonable conditions. Ultimately, the co-leaders decided that the time left to operate and the risk involved in bringing on the supplies did not make sense, so we would use the coming window to leave Bouvet.

Later that evening our generator died and Bouvet was off the air. We went to sleep early that night, as we needed to wake at 3:30 a.m. to start tearing down camp so we would be ready for the Marama to possibly start taking us off the island at 5 a.m. It was an exceptionally cold night and we burned some extra paraffin in the morning to heat the tent. By the time the sun was rising, our personal supplies were packed and we quickly took down the antennas. The decision was made not to start taking down the tent until after we saw the weather hold and the first load of supplies was on its way to the Marama around 7 a.m. With 6-foot waves, Peter was able to skillfully land the Zodiac on the beach. It took 6 or 7 loads to get us all off the island. Within several hours of being back on the Marama, the winds increased and the weather window was gone.

We would spend the next two days in 40- to 50-knot winds, waiting for our chance to leave Bouvet. In still poor conditions, but better than the last two days, the Marama's John Deere engine was turned on and we made our way around the southeast end of Bouvet in hopes of taking a few pic-

The WAZ Program

SINGLE BAND WAZ

6 Meter

205 ..... JR0QFA
206 ..... JG2TSL

12M CW

115 ..... K3XA

12M Digital

11 ..... IW3GJF

15M CW

385 ..... F4BKV

15M Digital

20 ..... F4BKV

17M CW

141 ..... F4BKV

17M Digital

36 ..... KJ7TEA
37 ..... K0BBC
38 ..... JJ1QUV
39 ..... JF1DMY

20M CW

691 ..... N5WA
692 ..... S57AT

20M Digital

65 ..... JO1ABS
66 ..... JR3VMJ
67 ..... JF1WHJ
68 ..... WF8R
69 ..... JH7HIQ
70 ..... HB9DQV
71 ..... HP2AT
72 ..... N1RR
73 ..... K9UO
74 ..... JN1XNI

30M Digital

26 ..... K0BBC

40 CW

342 ..... F4BKV
343 ..... JF3LOP

ALL BAND WAZ

Mixed

10413 ..... K9UO
10414 ..... KT4O
10415 ..... JE1PEN
10416 ..... G4DDL
10417 ..... N9MR
10418 ..... JL2ULM
10419 ..... JR3ADB
10420 ..... W7QF
10421 ..... N4NYY
10422 ..... JP7SOZ
10423 ..... JR1IXK
10424 ..... N4SV
10425 ..... N9AVC
10426 ..... JF1WHJ
10427 ..... JM1GDA
10428 ..... JH2GSW
10429 ..... JK1DDG
10430 ..... KK4AUM
10431 ..... WF8R
10432 ..... JH8PFW
10433 ..... JH7HIQ
10434 ..... K6DLB
10435 ..... W3LJ
10436 ..... W8MK
10437 ..... NO0B
10438 ..... N9IO
10439 ..... VA2ZO
10440 ..... DL1LTG
10441 ..... K5OMC
10442 ..... JN1SUT
10443 ..... IK0TUM
10444 ..... K7NX
10445 ..... JH4ALY
10446 ..... KM4HQE
10447 ..... OH3KAV
10448 ..... JH1IHD
10449 ..... KM9E
10450 ..... JA3JFT
10451 ..... N9DMM
10452 ..... JR7FRW
10453 ..... JN1XNI
10454 ..... N5WA
10455 ..... LU4FPZ
10456 ..... N9TTK
10457 ..... W6RA
10458 ..... N1RB
10459 ..... JH8MZF
10460 ..... SP7C
10461 ..... K3DFL
10462 ..... SM6YEC
10463 ..... HB9TOC

CW

1235 ..... JF3KON
1236 ..... KD8BZY
1237 ..... G4DDL
1238 ..... W0GXA
1239 ..... N3CW
1240 ..... E72A
1241 ..... PC3T
1242 ..... K8DV
1243 ..... JK7LXU
1244 ..... N5WA
1245 ..... LU4FPZ
1246 ..... SP7C
1247 ..... 9A5SSS
1248 ..... W8UV
1249 ..... HB9TOC

Digital

440 ..... K9UO
441 ..... JA2KFQ
442 ..... JE2WNL
443 ..... JL2ULM
444 ..... JP7SOZ
445 ..... JR1IXK
446 ..... N4SV
447 ..... JF1WHJ
448 ..... JH2GSW
449 ..... JK1DDG
450 ..... WF8R
451 ..... JH8PFW
452 ..... JH8HIQ
453 ..... W3LJ
454 ..... NO0B
455 ..... JA9OJM
456 ..... DL1LTG
457 ..... JN1SUT
458 ..... K8DV
459 ..... OH3KAV
460 ..... K1BDC
461 ..... JA1IHD
462 ..... JH6QOK
463 ..... N9DMM
464 ..... WA6YOU
465 ..... JA0WJA
466 ..... JK7LXU
467 ..... JN1XNI
468 ..... LU4FPZ
469 ..... JH8MZF
470 ..... S57AT
471 ..... K3DFL

SSB

5554 ..... EL2HRH
5555 ..... JK7LXU
5556 ..... HB9TOC

RTTY

320 ..... HB9TOC

Satellite

67 ..... IK3ITB, 25 Zones
68 ..... XE1L, 25 Zones
69 ..... DG9MA, 25 Zones
70 ..... W8LR, 25 Zones
71 ..... EA4M, 25 Zones
72 ..... W0NBC, 25 Zones
73 ..... DK9JC, 25 Zones
74 ..... AC9DX, 25 Zones
75 ..... JN1BPM, 25 Zones
76 ..... K9UO, 26 Zones
77 ..... JG2TSL25 Zones
78 ..... WB7QXU, 25 Zones
79 ..... DL5GAC, 38 Zones
80 ..... UX0FF, 33 Zones

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*Please note: Cost of the 5 Band WAZ Plaque is $100 shipped within the U.S.; $120 all foreign (sent airmail).

tures of the weather station that could be shared with the Norwegian government to help understand the current condition of the station. As we finally headed north toward Capetown, South Africa, the captain told us to prepare for three days of rough seas.

Bouvet was finished, not how we had hoped to finish, but how Bouvet allowed us to. After two years of planning, we left Bouvet falling short of our intended QSO goals. However, we had no injuries, not even a sprained ankle. We left with our health and much knowledge about Bouvet. We had taken our best shot at the number-2 most-needed entity in the world. Bouvet had proven again to be a formidable adversary and with our successes and failures, it had no doubt been the trip of a lifetime.

The WPX Honor Roll

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive. Visit <https://tinyurl.com/mrxuvwvv> for current listings.

MIXED

9676 9A2AA	4757 I2MQP	3077 K1PL	2391 WO7R	1746 K6UXO	1422 I2VGW	1141 4F3BZ	1000 WB6IZG	661 AL4Y
8663 9A2NA	4703 IK2ILH	3028 IK2DZN	2391 IZØFUW	1741 N6PEQ	1408 NH6T	1137 YO5BRZ	999 N3DF	633 TI5LUA
8196 W1CU	4668 JH8BOE	2992 W2YR	2386 JH1QKG	1711 NS3L	1398 ES4RLH	1136 KO9V	995 PU2GTA	621 K4HDW
8188 K2VV	4574 JN3SAC	2987 AG4W	2356 NE6I	1707 K4WY	1361 VA3VF	1116 YU7FW	966 W6WF	616 AC6BW
7059 EA2IA	4461 K1BV	2968 AB1OC	2225 JH1APK	1684 W1FNB	1333 AF4T	1112 N6MM	953 JP1KHY	605 IW2FLB
6955 KF2O	4423 N1RR	2963 N3RC	2203 KI1U	1672 WU9D	1322 AA4FU	1107 PY2MC	919 ON7MIC	
6139 KØDEQ	4417 WD9DZV	2697 AK7O	2176 V51YJ	1667 AD3Y	1301 KB9OWD	1100 WA3GOS	908 N2YU	
5908 ON4APU	4342 WB2YQH	2651 HK3W	2159 VA7CRZ	1643 SV1DPI	1301 K1DX	1109 KE8FMJ	889 WU1U	
5859 ON4CAS	4298 VE3XN	2642 AA8R	2133 KØKG	1639 N7QU	1301 KM5VI	1088 NJ4Z	866 K2KJ	
5715 S53EO	4241 N6QQ	2616 9A2GA	2113 W2FKF	1616 TA1L	1299 JA6JYM	1084 KG4JSZ	857 R1AV	
5597 N4NO	4215 W3LL	2591 IK2RPE	2056 NKØS	1590 JF1LMB	1295 NIØC	1069 IZ4MJP	835 K6RAH	
5511 N8BJQ	4201 YO9HP	2589 DG7RO	2046 YO8CRU	1570 PY5VC	1280 WF1H	1058 N6DBF	803 AB1Q	
5482 VE1YX	3818 K9UQN	2583 PA2TMS	2016 N2WK	1568 N3AIU	1260 UR6LEY	1036 DL5KW	758 N4JJS	
5453 YU1AB	3793 AB1J	2583 AE5B	1995 JR3UIC	1547 KC1UX	1219 K6HRT	1032 DG5LAC	757 WB3D	
5409 N6JV	3538 9A4W	2550 K6ND	1972 K3CWF	1524 NH6T/W4	1217 AB1QB	1023 N4WQH	736 JA3MAT	
5387 W9OP	3459 W9IL	2457 K5UR	1955 NIØC	1484 FG4NO	1204 VA2IG	1016 W9QL	711 AG1T	
5215 I5RFD	3130 SV1EDY	2538 K4HB	1945 N5KAE	1480 K4JKB	1201 K9BO	1012 NØVVV	695 W8WDW	
5172 W9OO	3109 W6XK	2465 N6PM	1828 K7LV	1462 AC7JM	1167 WA9PIE	1010 VE3RZ	682 AI8P	
5018 WA5VGI	3151 NXØI	2420 WA6KHK	1824 WF7T	1462 DL4CW	1153 N3CAL	1007 AA4QE	678 WE8L	
4763 KW9A	3099 N6FX	2400 N7ZO	1821 PY5FB	1447 K3XA	1148 SP8HKT	1006 NØRQV	674 N5JED	

SSB

7045 OZ5EV	3184 N1RR	2576 AA1VX	2129 AE5B	1646 VE7SMP	1258 N1KC	1031 K4CN	854 K6HRT	700 JA1PLL
6334 9A2NA	3174 I3ZSX	2568 SM6DHU	2113 W2FKF	1641 AE9DX	1222 YF1AR	1031 IK8OZP	833 DK8MCT	694 KG4HUF
6145 K2VV	3172 YO9HP	2515 W9IL	2112 WD9DZV	1622 K5CX	1187 IZ1JLG	1022 NW3H	808 UR6LEY	690 W6PN
5404 VE1YX	3141 DL8AAV	2483 AG4W	2094 I8LEL	1611 W2ME	1183 KI1U	1012 KU4BP	802 N6OU	684 KO9V
5149 KF2O	3139 N8BJQ	2451 EA3GHZ	2093 W2WC	1587 N3XX	1151 W6XK	1006 NJ4Z	801 K3XA	675 F1MQJ
4916 EA2IA	3108 I4CSP	2443 JN3SAC	2084 K5UR	1550 IK2RPE	1150 VE6BMX	1004 K4HB	766 I2VGW	655 VA3VF
4410 I2MQP	3104 WA5VGI	2335 KG1E	2076 K2XF	1449 N5KAE	1146 SQ7B	1004 WA5UA	763 K4JKB	647 YB8NT
4192 KØDEQ	3067 N6QQ	2327 K1PL	2048 W4QNW	1442 DG7RO	1136 K3CWF	978 EA7HY	758 IV3GOW	640 UA9YF
3723 I8KCI	2990 KF7RU	2326 CX6BZ	1955 EA3NP	1389 NKØS	1112 NH6T	957 W9QL	724 WF1H	637 K5WAF
3681 N4NO	2984 KI7AO	2209 IK2QPR	1935 SV1EOS	1386 HK3W	1098 K4CN	934 PY5VC	724 W3TZ	630 W6US
3585 SV3AQR	2946 PT7ZT	2201 NQ3A	1884 WA6KHK	1386 IK4HPU	1096 JA7HYS	931 YB1AR	717 KØDAN	624 K6KZM
3535 KW9A	2903 IN3QCI	2200 N6FX	1879 K3IXD	1371 VE6BF	1093 N6MM	929 NS3L	717 N3JON	606 KJ4BIX
3456 W9OO	2857 4X6DK	2198 AB1OC	1848 AB5C	1338 NE6I	1089 IZ8FFA	919 KA5EYH	714 YB2TJV	604 GØBPK
3416 W3LL	2650 IK2DZN	2183 NXØI	1825 KQ8D	1334 EA3EQT	1089 IT9ABN	893 W9RPM	713 JH1APK	
3348 CT1AHU	2595 EA1JG	2155 K9UQN	1812 K6ND	1264 N6PEQ	1042 IZØBNR	889 N3AIU	710 WA9PIE	
3274 YU7BCD	2582 PA2TMS	2131 N3RC	1699 W2YR	1262 K7LV	1032 DG5LAC	875 K7SAM	700 N4FNB	

CW

7543 WA2HZR	4076 I7PXV	2943 N6QQ	2203 NXØI	1620 DG7RO	1210 DL4CW	891 DK8MCT	722 WA9PIE	
7200 K2VV	3974 JN3SAC	2915 KA7T	2022 AF5CC	1595 PY5FB	1196 N3AIU	890 NS3L	720 K4CN	
6024 9A2NA	3804 W9OO	2811 OZ5UR	1998 K5UR	1555 K1PL	1098 LU5OM	889 N3AIU	652 IK2DZN	
5392 EA2IA	3773 KW9A	2679 W9IL	1973 N3RC	1508 W6XK	1088 AE5B	864 YO5BRZ	636 NKØS	
5311 N6JV	3647 N1RR	2548 EA2CIN	1905 WA6KHK	1483 VE1YX	1062 K3XA	848 PY5VC	629 IV3GOW	
5261 KF2O	3504 YU7BCD	2531 I2MQP	1832 N4YB	1480 WO3Z	1036 DL5KW	822 N5KAE	620 AF5DM	
5160 N4NO	3462 K9UQN	2497 W3LL	1762 K6ND	1458 AG4W	997 N6PEQ	821 HB9DAX	615 JH6JMM	
5013 W8IQ	3279 IØNNY	2490 N6FX	1744 NE6I	1443 WA2VQV	992 F5PBL	783 YB1AR	608 W9RPM	
4916 IZ3ETU	3220 WD9DZV	2477 VE6BF	1727 K6UXO	1421 KN1CBR	968 K3CWF	752 K6HRT	600 NY4G	
4914 KØDEQ	3214 SM6DHU	2424 W2WC	1708 NIØC	1389 IT9ELD	962 K7LV	743 JA5NSR	600 IK2SGV	
4886 I3FIY	3041 YO9HP	2357 W9HR	1691 KI1U	1342 VE6BMX	944 AB1OC	738 NH6T/W4		
4769 N8BJQ	3031 EA7AAW	2291 N3XX	1672 W2YR	1235 JH1APK	908 NH6T	732 SQ7B		
4164 WA5VGI	2948 IK3GER	2212 AC5K	1633 W6XK	1220 AA4FU	897 HK3W	727 JF1LMB		

DIGITAL

3347 KØDEQ	2251 EA2IA	1759 N7ZO	1426 AB1OC	1108 KE8FMJ	1002 NØRQV	866 SQ7B	750 ON7MIC	636 W9RPM
3137 KF2O	2242 HK3W	1727 W2YR	1378 K3CWF	1093 KI1U	992 N3DF	862 JP1KHY	750 NH6T/W4	611 KO9V
2996 W3LL	2345 WA5VGI	1704 IK2DZN	1353 K1PL	1091 VA3VF	992 K9UQN	855 R1AV	681 PY5VC	600 ADØFL
2978 N8BJQ	2308 N6PM	1638 N1RR	1333 W1FNB	1089 AC7JM	983 PU2GTA	812 UR6LEY	680 K2KJ	
2929 WD9DZV	2217 YO9HP	1643 N3RC	1308 NKØS	1060 AF4T	966 NS3L	811 WF1H	672 K9AAN	
2628 W6XK	1836 AG4W	1501W2/JR1AQN	1227 ES4RLH	1054 KW9A	947 I2VGW	810 N3CAL	670 IV3GOW	
2558 NT2A	1818 W1EQ	1500 JH1APK	1189 JF1LMB	1051 KH6SAT	917 K7LV	800 WA3GOS	668 KA5EYH	
2518 K2YYY	1811 NXØI	1459 KC1UX	1149 W9IL	1047 RW4WZ	881 NE6I	783 YB1AR	654 JA3MAT	
2345 WA5VGI	1790 JN3SAC	1461 WU9D	1112 AB1QB	1009 GUØSUP	870 WB6IZG	758 N4JJS	640 WA9ONY	

REMOTE OPERATION

CW	MIXED	SSB	DIGITAL
7277 K9QVB	4026 N1RR	2953 N1RR	671 N1RR
3292 N1RR			

contesting

BY TIM SHOPPA,* N3QE

Do Contesters Respond to Per-Mode Point Differentials in Contest Rules?

Only a handful of large contests are multimode – that is, they allow both CW and SSB contacts to count for points in the same contest weekend. Three such contests are administered by the ARRL: ARRL Field Day, the ARRL 10-Meter Contest, and the IARU HF Contest. The Russian DX Contest and nearly all state QSO parties are multimode as well. The sponsors sometimes tweak the rules for these events to award a different number of points for CW QSOs than for SSB QSOs. Let's look at the historical justifications for the point differentials offered by the ARRL at the time of their announcement and examine how (or even if) contesters responded in their on-air activity these weekends.

Field Day

Starting in 1975, ARRL Field Day has awarded two points for CW contacts and one point for SSB contacts. Dave Sumner, K1ZZ, in his June 1975 *QST* editorial, described this as a "trial" to "bolster CW activity" after observing that the plurality of Field Day operations used SSB only. This trial became permanent in 1977. Actual mode usage in Field Day submissions in 2022 is shown in the Venn diagram at the top of Figure 1. We see the lure of higher CW points over the past 50 years hasn't flipped the trend towards SSB activity that the ARRL was responding to – the most common mode choice made by Field Day efforts remains SSB-only.

Field Day isn't exactly a typical contest – in fact, the ARRL rarely includes the word "contest" in describing it, and much of the effort is better described as being built around maximizing summer outdoor fun and food instead of points. (*Officially, the primary focus is on practicing and demonstrating emergency preparedness. – ed.*) Very few of the callsigns I work on Field Day are ones I recognize as the regular contesters I work nearly every contest weekend. Possibly many club efforts aren't even aware of the allure of higher CW points, or they choose to emphasize SSB operation because few of their members feel confident on CW. So it's likely the point differential has little to do with mode choice.

ARRL 10-Meter Contest

The ARRL 10-Meter Contest, starting in 1983, has similarly awarded twice as many points for CW QSOs than SSB QSOs. According to the introduction in *QST* to the rules that year, this change was made to "promote CW activity." As on Field Day, stations may be contacted once per mode in this contest; unlike Field Day, the 10-meter weekend event includes the word "contest" in its title. If we look at the Venn diagram for the ARRL 10-Meter Contest in the second panel of Figure 1, we might conclude that the point differential favoring CW operation is working – CW activity is in fact favored in the 2022 logs for this event.

IARU HF Championship

For a contrast in rule choices, a contest that has the same number of points for CW and SSB contacts is shown in the bottom of Figure 1. The Venn diagram for mode choices in the IARU HF Championship looks remarkably like the Venn diagram for the ARRL 10-Meter Contest. Perhaps many members of the contester community make their mode choices based on personal preference, rather than purely on points; after all, there are entirely independent mode-specific entry classes for both IARU HF and the ARRL 10-Meter contests.

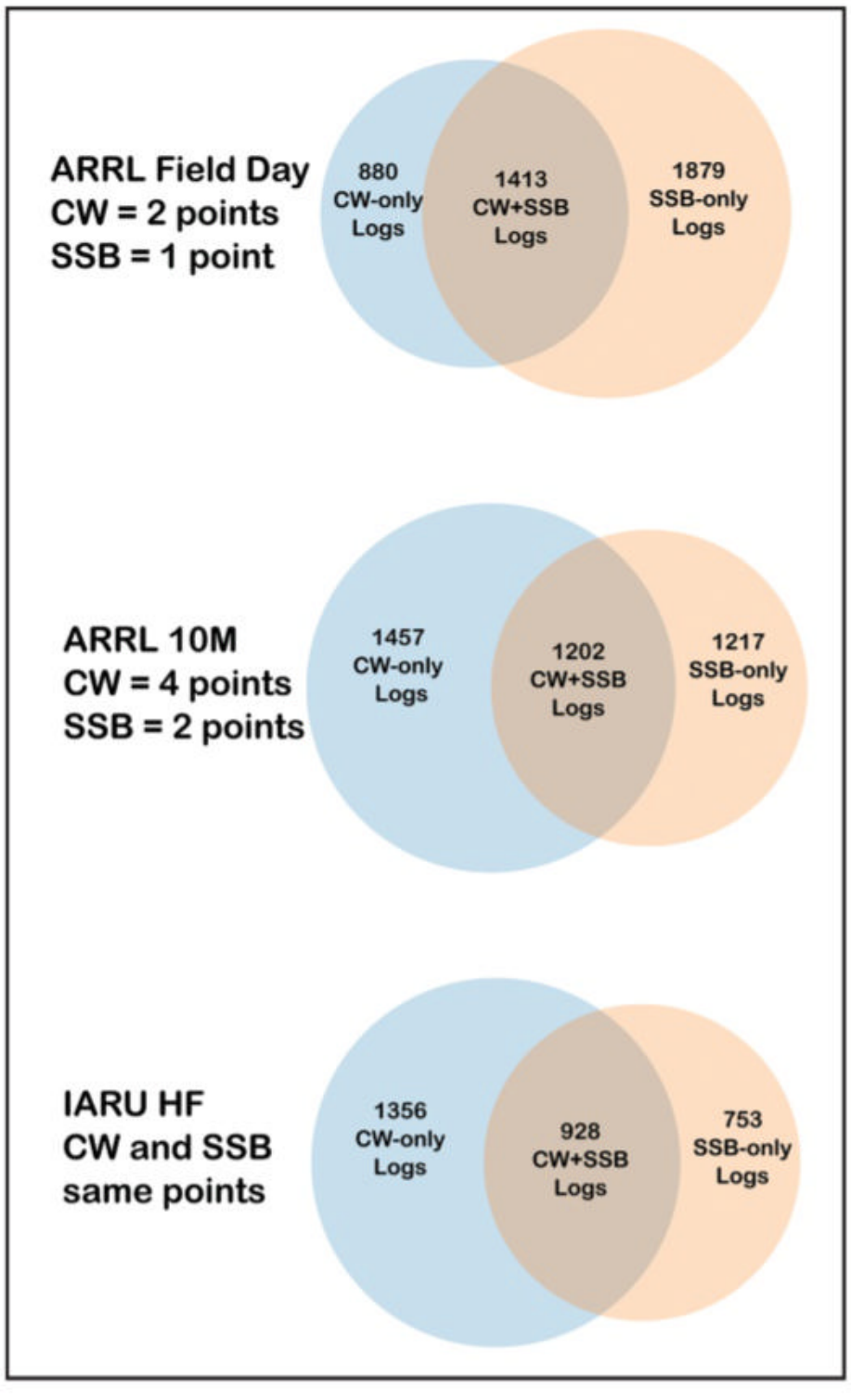

Figure 1. Mode choices made by hams in three ARRL multimode contests held in 2022. Data for Field Day is from the SSB and CW columns of the CSV results file at <https://tinyurl.com/3ez2f59f>; data for the 10-Meter Contest and IARU HF are from the public logs at <https://contests.arrl.org>.

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It's worth noting that for these three contests, the multiplier structures are radically different. In ARRL Field Day, there are no multipliers. In IARU HF, multipliers count once per band regardless of mode. Finally, in the ARRL 10-Meter Contest, multipliers count per mode. I am surprised that less than a third of ARRL 10-Meter entrants choose to operate both modes as they could have nearly doubled their multipliers, and also their final scores, by splitting their efforts about evenly between the two modes. Perhaps for the vast majority of entrants, their efforts in multi-mode contests are not strongly influenced by any point differential.

WRTC Competitors Will Adapt to SSB QSOs Being Worth More Points Than CW QSOs This Summer

The Italian organizers of the upcoming World Radiosport Team Championship (WRTC), held as a "contest inside a contest" during July 2023's IARU HF Championship, last fall announced a point differential that awards more points for SSB contacts than for CW contacts. This point differential for different modes is a first for the WRTC – all previous events awarded the same number of points per mode. As a WRTC competitor this summer myself, I had previously been conscious that I had to build my skills in both modes. The announced point differential has influenced me to prepare by emphasizing my SSB skills, especially pulling full callsigns out of a pileup, during high-rate SSB contests.

Carlo De Mari, IK1HJS, in announcing this scoring change, emphasized that the "WRTC must test operator skills in both modes, not only CW." Indeed, in the 2018 WRTC held in Germany, only one team – VY2ZM and KK6ZM operating under the Y87B call – made more QSOs on phone than CW, and they ended up with the lowest competition score. There was, however, a special prize for the top phone-heavy team, which they did win. The other 62 teams strongly preferred CW, with winning team Y81N (LY9A and LY4L operators) making 70 percent of their QSOs on CW. At the very high end of CW emphasis, the 2018 WRTC team of E21EIC and 9M2ZAK, using the call Y86P, made 96 percent of their QSOs on CW.

The WRTC 2022 qualification period, that ran from 2019 through 2020, included scores from five CW-only events, five SSB-only events, and two mixed-mode contests. So there's

Calendar of Events

All year	CQ DX Marathon	bit.ly/3FyPiui
May 1	AGCW QRP/QRP Party	<https://www.agcw.de/contest/qrp-qrp/>
May 3	VHF-UHF FT8 Activity	<http://www.ft8activity.eu/index.php/en/>
May 4-5	MIE 33 Contest	<http://www.ztv.ne.jp/isoda/33/index-e.html>
May 6	Microwave Spring Sprint	<http://bit.ly/3XM4RpW>
May 6-7	7th Area QSO Party	<http://ws7n.net/7QP/new/Page.asp?content=rules>
May 6-7	10-10 Spring CW Contest	<http://bit.ly/1FrFeBc>
May 6-7	ARI DX Contest	<http://www.ari.it/>
May 6-7	Delaware QSO Party	<https://www.fsarc.org/qsoparty/rules.htm>
May 6-7	F9AA Cup, Digi	<http://bit.ly/3l41gWx>
May 6-7	Indiana QSO Party	<http://www.hdxcc.org/inqp/index.html>
May 6-7	New England QSO Party	<http://www.neqp.org/rules/>
May 6-7	SBMS 2.3 GHz and Up Contest and Club Challenge	<http://www.n6nb.com/sbmsrules.htm>
May 6-7	Veron SLP Contest	<http://bit.ly/2L9eT1L>
May 7	WAB 7 MHz Phone	<http://bit.ly/31yE4kT>
May 8	RSGB 80m Club Championship, SSB	<http://bit.ly/3TxCrxl>
May 10	VHF-UHF FT8 Activity	<http://www.ft8activity.eu/index.php/en/>
May 13	FISTS Spring Saturday Sprint	<http://www.fistsna.org/operating.html>
May 13-14	Canadian Prairies QSO Party	<https://cpqp.ve6hams.ca/>
May 13-14	CQ WW Foxhunting Weekend	<http://www.homingin.com/joek0ov/nfw.html>
May 13-14	CQ-M International DX Contest	<http://cqm.srr.ru/en/rules/>
May 13-14	Portuguese Navy Day Contest - CT1DBS Memorial	<https://nra.pt/index.php/dm-2022/>
May 13-14	Volta WW RTTY Contest	<http://www.contestvolta.it/>
May 13-14	50 MHz Spring Sprint	<http://bit.ly/3XM4RpW>
May 17	RSGB 80m Club Championship, Data	<http://bit.ly/3TxCrxl>
May 17	VHF-UHF FT8 Activity	<http://www.ft8activity.eu/index.php/en/>
May 18	QRP Minimal Art Session	<http://qrpcc.de/contestrules/mas/index.html>
May 20-21	Arkansas QSO Party	<https://arkqp.com/arkansas-qso-party-rules/>
May 20-21	Baltic Contest	<http://www.lrsf.lt/en/>
May 20-21	EU PSK DX Contest	<https://eupsk.club/eupskdx/eupskdxrules.pdf>
May 20-21	His Majesty King of Spain CW Contest	<https://bit.ly/3IWxYjf>
May 20-21	NZART Sangster Shield Contest	<http://bit.ly/3aviX6h>
May 20-21	SARL VHF/UHF Digital Contest	<http://bit.ly/H0IqQf>
May 21	FISTS Spring Sunday Sprint	<http://www.fistsna.org/operating.html>
May 22	QRP ARCI Hoot Owl Sprint	<http://www.qrpcontest.com/>
May 22	RSGB FT4 Contest Series	<bit.ly/3TxCrxl>

a balance in WRTC qualification that wasn't being reflected in the actual on-air mode usage during the WRTC itself, and I applaud the choice by the Italians to make a small rule change that has stimulated much discussion about the point differential.

Like all recent runnings of the every-four-year WRTC, the competing teams this year are limited to 100 watts of power. Carlo, in explaining the reasoning behind the point differential, pointed out that holding a run frequency with 100 watts in a phone band packed not just by high-power contesters, but also by high-power flagship HQ stations, is exceedingly difficult. The point differential is, he hopes, how the organizers will motivate the intensely score-driven WRTC teams.

Another factor steering mode choices made by WRTC competitors in the past decade has been the widespread use of CW Skimmers in the Reverse Beacon Network. After calling CQ a couple times, CW contesters are immediately spotted in Telnet clusters that include Reverse Beacon spots, even further motivating CW activity. There is no equivalent to skimmer spots for SSB, so another way to think of the point differential announced by the organizers is as a countering factor to the recent innovation of skimmer spots.

So how will WRTC competitors steer their mode usage? We are likely to see some WRTC teams, despite the point differential, continuing to emphasize CW for its innate advantages at holding a run frequency at lower power levels and automatic skimmer spots. Other teams might choose a stronger SSB emphasis for the point advantage, possibly choosing less-crowded bands – e.g., 40 meters in broad daylight – or staking out a run frequency very high in the 10-meter phone band, where there is more spectrum to expand, during summer, the ideal time of year for high-band short skip inside Europe.

You can find more in the upcoming WRTC event – including the week of ham radio activities preceding the on-air competition – at <https://www.wrtc2022.it>. I certainly look forward to sharing my experience as a competitor, and analyzing mode usage by the different teams, in an upcoming column.

Maximize Your Power Multiplier On Field Day With Battery-Powered QRP Radio And Computer

ARRL Field Day is the weekend of June 24th and 25th, and point-driven contesters who join in this activity enjoy reading through the dense rules to find the combination of power

May 25	RSGB 80m Club Championship, CW	<bit.ly/3TxCrxl>
May 27-28	CQ WW WPX CW Contest	<http://www.cqwpx.com/>
June 2-4	PODXS 070 Club Three Day Weekend Contest	<http://bit.ly/2Srdp8A>
June 3	UKSMG Summer Es Contest Rules	<https://uksmg.org/summer-contest-rules.php>
June 3-4	10-10 Open Season PSK Contest	<http://bit.ly/1FrFeBc>
June 3-4	ARRL Inter. Digital Contest	<https://contests.arrl.org/dig/>
June 3-4	IARC Region 1 Field Day	<http://bit.ly/3cC0HKf>
June 3-4	Kentucky QSO Party	<http://www.kyqsoparty.org/>
June 3-4	RSGB CW Field Day	<bit.ly/3TxCrxl>
June 3-4	Tisza Cup CW Contest	<https://www.tiszacup.eu/index.php/en/contest-rules>
June 5	RSGB 80m Club Championship, Data	<bit.ly/3TxCrxl>
June 7	VHF-UHF FT8 Activity Contest	<http://www.ft8activity.eu/index.php/en/>
June 10	Asia-Pacific SSB Sprint	<http://jsfc.org/apsprint/>
June 10-11	Portugal Day Contest	<https://portugaldaycontest.rep.pt/rules.php>
June 10-11	REF DDFM 6M Contest	<http://concours.r-e-f.org/index.php>
June 10-11	GACW WWSA CW DX Contest	<bit.ly/425Ee23>
June 10-11	VK Shires Contest	<http://www.wia.org.au/members/contests/wavks/>
June 10-12	ARRL June VHF QSO Party	<http://www.arrl.org/june-vhf>
June 14	RSGB 80m Club Championship, CW	<bit.ly/3TxCrxl>
June 14	VHF-UHF FT8 Activity Contest	<http://www.ft8activity.eu/index.php/en/>
June 17	AGCW VHF-UHF Contest	<https://www.agcw.de/contest/vhf-uhf/>
June 17	ARRL Kids Day Contest	<http://www.arrl.org/kids-day>
June 17	FIRAC VHF Contest	<http://www.firac.de/html/contest.html>
June 17-18	All Asian CW DX Contest	<https://bit.ly/3HVjkra>
June 17-18	IARU Region 1 50 MHz Contest	<https://bit.ly/3r1kqvT>
June 17-18	SMIRK Contest	<http://www.smirk.org/contest.html>
June 17-18	Stew Perry Topband Challenge	<https://www.kkn.net/stew/stew_rules.html>
June 17-18	West Virginia QSO Party	<http://bit.ly/3l3K6Z7>
June 18	WAB 50 MHz Phone	<http://bit.ly/31yE4kT>
June 21	VHF-UHF FT8 Activity Contest	<http://www.ft8activity.eu/index.php/en/>
June 22	RSGB 80m Club Championship, SSB	<bit.ly/3TxCrxl>
June 24	UFT QRP Contest	<https://www.uft.net/concours-qrp-uft/>
June 24-25	ARRL Field Day	<http://www.arrl.org/field-day>
June 24-25	His Maj. King of Spain SSB Contest	<http://bit.ly/1cKAR5V>
June 26	RSGB FT4 Contest Series	<bit.ly/3TxCrxl>
July 15-16	CQ WW VHF Contest	<http://www.cqww-vhf.com>

sources, power levels, and mode usage that will maximize their scores. An appealing combination is to go with battery power QRP, less than 5 watts, for a power level multiplier of five, as opposed to the 2x power level multiplier for stations running between 6 and 100 watts.

If you look in detail at Field Day rule 6.11, you'll see that to claim the power multiplier of five, the batteries must be charged by something other than a motor-driven generator or AC power. Balancing your battery budget, given the vagaries of, say, solar charging, becomes an essential matter of preparation.

Rig choice is an essential component in a battery-powered ham operation. A very common battery-powered rig choice by both QRP contesters and POTA (Parks on the Air) activators the past several years, has been the Elecraft KX3 that sips as little as 150mA on receive. A serious Field Day effort will also likely bring a logging computer – I can't imagine trying to fill out a dupe sheet in this day and age. Let's look at the power consumption and usability of extremely low-end and portable DC powered computers.

The "Beelink T4 Pro Mini" I got from Amazon for $140, is the lowest of the low-end Windows 10 machines I tried. This tiny lightweight plastic-encased PC, on the left side of Photo A, is about the size of two or three stacked mug coasters. It comes with a 12VDC 2A wall wart for home use. For Field Day battery use, I've tested the Beelink T4 under a range of conditions and have found that it averages only 600mA current consumption while running the N1MM+ logging software, and it reliably operates in my tests with a DC supply anywhere from 8V to 14V.

The Beelink T4 has 4 GB of RAM and 64 GB SSD soldered to the tiny mainboard – so there is no possibility of RAM or HD upgrades. This is at the very low end of support for a modern Windows 10 installation. I found that it was not a speedy computer at all – it took me about 20 minutes to walk through initial boot-up, removal of OneDrive software, get to the N1MM+ website, and get the N1MM+ full download. And another 10 minutes to install N1MM+. Subsequent start-ups of the operating system and logging software took less than 2 minutes, which I regard as entirely acceptable.

I stress-tested the user experience of this low-end PC as a logger by opening up a Telnet window and populating the bandmap with CW spots in a Wednesday morning CWT. Clicking on spots, and using standard logger features like Super-Check Partial window and available mults and Q's window, seems to work fine with only a slight lag in the visual updates.

I used an attached K1EL keyer in my testing, and the CW performance with this outboard smart keyer was fine. Using direct "serial keying" of my radio didn't go so well; the CW was incredibly choppy and seemed to be at its worst when Telnet spots demanded CPU attention. I would strongly recommend that you use an external keyer for computer-generated CW.

Opening windows and repositioning them on the Beelink T4 was especially sluggish; this isn't a N1MM+ performance issue, it's an issue with the CPU inside this tiny PC apparently having little or no help from any graphics engine. Memory usage with just N1MM+ running and the usual windows is circa 2.5 GB out of the available 4 GB.

I shut down N1MM+ and started the Edge browser and navigated my way around a couple ARRL/CQ contest websites. Web log submission forms are fully accessible. I wouldn't recommend browsing the internet using this little PC at the same time as logging – the graphics lag of moving one window behind the other was quite noticeable.

I also tested the power consumption of the Intel NUC6i3SYH that I've been using for the past 7 years as a "travel PC" for both ham and work applications. Unlike the T4, this unit can be configured with a comfortable amount of RAM (I have 32 gigabytes in mine) and your choice of hard drive or SSD. While the power jack on the Intel NUC is specified as 19 volts, and it comes with a 19-volt wall wart, the formal spec of the NUC says it will accept 12 volts on the power jack. As configured, my Intel NUC operated at voltages as low as 10 VDC, and often was drawing as much as 1.2 amps of current, or about twice as much as the Beelink T4.

A display device is also needed with a portable PC. 12-volt-powered HDMI monitors for in-vehicle use as backseat entertainment are commonly available, but I went a step further by using a 7-inch HDMI monitor marketed for use with Raspberry Pi microcomputers. These monitors draw only 500 mA at 5 volts over a USB cord, easily and efficiently supplied by 200 mA of current being converted by a 12-volt input switch-mode USB charger that, or by a charging-capable USB jack on your logging PC. The 7-inch screen is by no means large, but does handily support the QSO entry window, a Super Check Partial window, a tiny log pane, and even a tiny shrunk-down band map.

Photo A. Two small 12VDC-powered logging computers you might consider as part of a battery-powered effort on Field Day. On the left is the Beelink T4; on the right is the Intel NUC.

Totaling up the current consumption budget for a 12-VDC storage-battery powered field-day logging event, I arrive at an average of 500 mA usage by an Elecraft KX3 operated at about 25% key-down transmit duty cycle, another 600 mA for a Beelink T4, and 200 mA for powering the screen. For a full-time 24-hour effort, take the total power usage (1.3A) and multiply by 24 to arrive at a figure of 35 Amp-hours. This could be supplied by a small marine deep-cycle lead acid battery, a larger 12-volt

vehicle battery (you don't want to drain this all the way), or by a lightweight (but more expensive) LiPo battery pack.

Minor ARRL Field Day Rule Updates for 2023

In February of this year, the ARRL PSC (Programs and Services Committee) voted to make CW and SSB QSOs worth the same number of points in Field Day. This was quickly walked back, and the final rules for 2023 ARRL Field Day were released in March with the same points differential for these modes that began 47 years ago.

You can find the final 2023 Field Day rules at <https://field-day.arrl.org>. I'd like to note that, as was begun 2020 in response to the pandemic lockdowns, Class D stations (home stations, not using emergency power) may continue to work other Class D stations for points.

Among the changes for 2023 are:

Rule 6.4 now makes clear that fully-automated contacts are prohibited. This is undoubtedly in response to the use of fully-automated robots for the FT4/FT8 modes.

Rule 7.2 allows power output up to 500 watts for stations in classes A, B, and C (but not other classes). You might recall that in 2022, the high-power option had been eliminated for all classes in Field Day. Note that operating any station above 100 watts reduces your Field Day efforts score multiplier to just 1, halving your final numerical score.

Rule 7.3.13 (also mentioned in Rule 4.1.1.5) is revised to no longer limit the number of contacts made by GOTA (Get On The Air) station. GOTA station contacts are worth 5 points regardless of mode – much more than the 1 or 2 points earned by SSB and CW QSOs at the same station.

I strongly support both the prohibition of automatic contacts and allowing unlimited contacts by the GOTA station. With an increasing number of licensed hams subject to HOA limitations on home station antennas, increasing your own club's Field Day effort to publicize it as an opportunity for any area ham to get on the air would be a very positive step in introducing hams to contesting through Field Day fun.

May and June Contest Highlights

If you're heading to Hamvention in Xenia, Ohio the weekend before Memorial Day, consider showing up a couple days early for Contest University. Although the classes – which vary in topics and/or content each year - don't start until Thursday morning, I'd recommend arriving Wednesday night, May 17, to catch the first of the 4 pizza parties. Find full details at <https//www.contestuniversity.com>.

Work both domestic and international contacts in the action-packed CQ WPX CW contest that starts May 27 UTC; single-operator entries my operate up to 36 of the 48-hour weekend. I expect superb high-band conditions, especially on the 10- and 20-meter bands, but take note that a well-balanced full-time effort will include operation on the 40- and 80-meter bands to take advantage of the 6 points for each intercontinental QSO. Find full rules at <https://cqwpx.com>.

The ARRL June VHF Contest is being held June 10-11 this year; the 6-meter contest action will be in a frenzy with DX opportunities now that solar cycle 25 is fully in swing. The action spans all modes, and with conditions peaking up for much of the weekend, you will find that your QSO rate on SSB will often be much higher than on FT8. Find full rules at <https://cqwpx.com>.

PROPAGATION

BY TOMAS HOOD,* NW7US

An Amazing Light Show!

Quick Look at Current Cycle 25 Conditions:
(Data rounded to nearest whole number)

Sunspots:
Observed Monthly, February 2023: 111
12-month smoothed, August 2022: 92

10.7-cm Flux:
Observed Monthly, February 2023: 172
12-month smoothed, August 2022: 134

One Year Ago:
(Data rounded to nearest whole number)

Sunspots:
Observed Monthly, February 2022: 66
12-month smoothed, August 2021: 36

10.7-cm Flux:
Observed Monthly, February 2022: 109
12-month smoothed, August 2021: 86

March 2023 marked the first spectacular light show of Solar Cycle 25 (yes, there have been many days with aurora, but this March saw the most striking of this cycle so far). A powerful geomagnetic storm commenced toward the end of March 23, and by the early hours of March 24 reached a level G4 (Severe Geomagnetic Storm; see Figures 1 and 2). The Northern Lights were seen as far south as New Mexico and Virginia. Those witnessing the show at higher latitudes were awed by multi-colored aurora—including red, blue, green, and white!

It is somewhat unusual to see such a glorious multi-color display of the Northern Lights (*Aurora Borealis*). Most auroral events so far in Cycle 25 have had the typical green glow.

With March and September being the peak months for auroral events, this March delivered a real treat of both an intense visual display and a strong radio event on VHF. These two peak months each year are tied to Earth's orientation relative to the Sun.

During the spring and autumnal equinoxes (in the Northern Hemisphere, March 21 is the vernal, or spring, equinox, when the Sun crosses northward across the celestial equator), the tilt of both the solar and Earth's axis to the ecliptic plane align. As Earth orbits around the Sun each year, it experiences the Interplanetary Magnetic Field (IMF) from different latitudes of the Sun, which is tilted at 8 degrees. The Earth's axis is tilted as well, but at 23 degrees. During March and September, the daily average angle of Earth's magnetosphere, tied to the axis, is greatest in relation to the IMF.

The event of March 23 through March 24 was the result of a large coronal hole that appeared on the surface of the Sun. Such weak regions on the Sun are sources of higher plasma solar wind streams. This coronal hole resulted in solar wind speeds in excess of 500 miles per second.

Solar plasma escaping the Sun's gravitational hold streamed outward, riding the IMF, coming into contact with Earth's magnetosphere. When the orientation of the IMF turned southward, it opened a window into our magnetosphere allowing the solar plasma to ride the magnetic fields down to the magnetic poles. This triggered the eye-catching aurora that was witnessed in both hemispheres far from the polar regions, much closer than typical to the equatorial zones.

It is somewhat unusual to see such a glorious multi-color display of the Northern Lights (Aurora Borealis). Most auroral events so far in Cycle 25 have had the typical green glow.

How far away from the polar regions the auroral oval stretches correlates to the intensity of the geomagnetic activity, which is indicated by the Planetary K-Index (K_p). When the K_p exceeds 5, the auroral oval can begin to grow into lower latitudes (see Figure 3). The key to the strength of a geomagnetic storm is the orientation of the solar wind's magnetic field structure as it stretches away from the Sun on the Parker Spiral, also known as the solar current sheet (Figure 4), as well as the intensity of the solar wind along with the volume of solar plasma.

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LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for May 2023

	Expected Signal Quality			
Propagation Index	(4)	(3)	(2)	(1)
Above Normal: 2,5-7,10-13,15,20-23,29	A	A	B	C
High Normal: 1,3-4,8,14,16,19,25, 27-28,30-31	A	B	C	C-D
Low Normal: 9,24,26	B	C-B	C-D	D-E
Below Normal: 17-18	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. Using the Propagation Charts appearing in "The CQ Shortwave Propagation Handbook, 4th Edition," by Carl Luetzelschwab, George Jacobs, Theodore J. Cohen, and R. B. Rose.

a. Find the *Propagation Index* associated with the particular path opening from the Propagation Charts.

b. 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 4 will be excellent on May 1 through May 8, good on May 9, and so forth.

2. Alternatively, you may use the *Last-Minute Forecast* as a general guide to space weather and geomagnetic conditions throughout 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 geomagnetic conditions. In general, when conditions are *High Normal* to *Above Normal*, signals will be more reliable on a given path, when the ionosphere supports the path that is in consideration. This chart is updated daily at <https://SunSpotWatch.com> provided by NW7US.

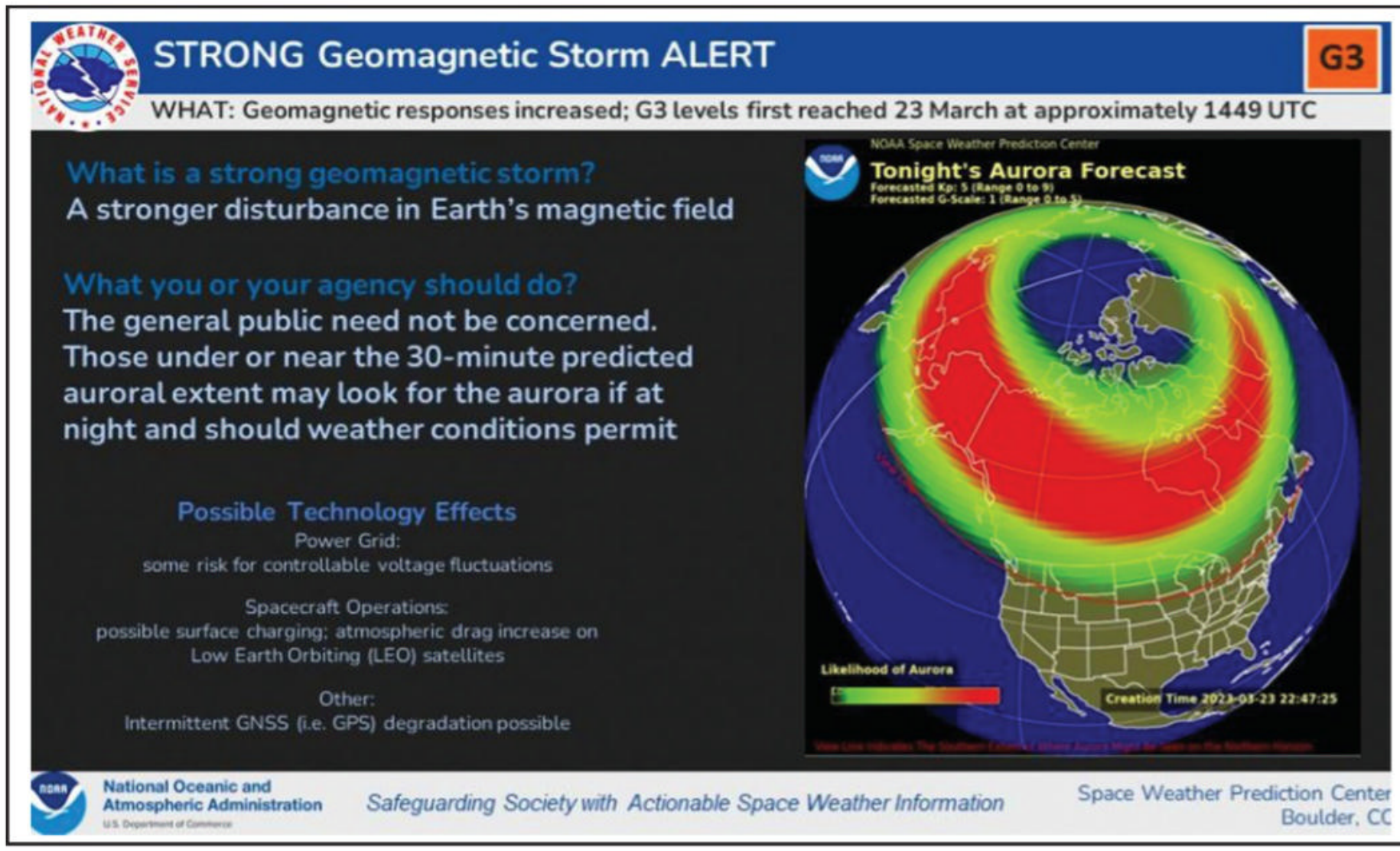

Figure 1. On March 23, 2023, at about 14:49 UTC (first of the two alert images), NASA's Space Weather Prediction Center (SWPC) issued a G3-level alert, indicating that a strong geomagnetic storm was in progress (see text). A G3-level storm can cause false alarm conditions in power grids and significant aurora. By about 04:30 UTC on March 24 2023 (second of the two alerts), the SWPC issued a G4-level alert, a severe geomagnetic storm. The G scale runs from 1 (minor) to 5 (extreme). At G4, widespread power system voltage control problems can occur, as well as pipeline currents, satellite navigation degradation, and adverse impacts on HF propagation. And, of course, trigger very strong aurora (see text). (Credit: Space Weather Prediction Center/NASA)

On March 23 and 24, all these factors were favorable to triggering much stronger aurora. The K_p rose to about 8, which is nearly at the top of the scale of 9. This level of geomagnetic storminess triggered both visual and radio aurora.

The shades of an aurora are determined by the atmosphere's composition. More oxygen in the air produces greens and yellows, while more nitrogen makes an aurora look dark red or blue (Figure 5).

Geomagnetic Storms

Scale	Description	Effect	Physical measure	Average Frequency (1 cycle = 11 years)
G 5	Extreme	**Power systems:** Widespread voltage control problems and protective system problems can occur, some grid systems may experience complete collapse or blackouts. Transformers may experience damage. **Spacecraft operations:** May experience extensive surface charging, problems with orientation, uplink/downlink and tracking satellites. **Other systems:** Pipeline currents can reach hundreds of amps, HF (high frequency) radio propagation may be impossible in many areas for one to two days, satellite navigation may be degraded for days, low-frequency radio navigation can be out for hours, and aurora has been seen as low as Florida and southern Texas (typically 40° geomagnetic lat.).	Kp = 9	4 per cycle (4 days per cycle)
G 4	Severe	**Power systems:** Possible widespread voltage control problems and some protective systems will mistakenly trip out key assets from the grid. **Spacecraft operations:** May experience surface charging and tracking problems, corrections may be needed for orientation problems. **Other systems:** Induced pipeline currents affect preventive measures, HF radio propagation sporadic, satellite navigation degraded for hours, low-frequency radio navigation disrupted, and aurora has been seen as low as Alabama and northern California (typically 45° geomagnetic lat.).	Kp = 8, including a 9-	100 per cycle (60 days per cycle)
G 3	Strong	**Power systems:** Voltage corrections may be required, false alarms triggered on some protection devices. **Spacecraft operations:** Surface charging may occur on satellite components, drag may increase on low-Earth-orbit satellites, and corrections may be needed for orientation problems. **Other systems:** Intermittent satellite navigation and low-frequency radio navigation problems may occur, HF radio may be intermittent, and aurora has been seen as low as Illinois and Oregon (typically 50° geomagnetic lat.).	Kp = 7	200 per cycle (130 days per cycle)
G 2	Moderate	**Power systems:** High-latitude power systems may experience voltage alarms, long-duration storms may cause transformer damage. **Spacecraft operations:** Corrective actions to orientation may be required by ground control; possible changes in drag affect orbit predictions. **Other systems:** HF radio propagation can fade at higher latitudes, and aurora has been seen as low as New York and Idaho (typically 55° geomagnetic lat.).	Kp = 6	600 per cycle (360 days per cycle)
G 1	Minor	**Power systems:** Weak power grid fluctuations can occur. **Spacecraft operations:** Minor impact on satellite operations possible. **Other systems:** Migratory animals are affected at this and higher levels; aurora is commonly visible at high latitudes (northern Michigan and Maine).	Kp = 5	1700 per cycle (900 days per cycle)

Figure 2. This chart outlines the five geomagnetic storm levels defined by the National Oceanic and Atmospheric Administration (NOAA). The storm witnessed on March 24, 2023 reached the Severe G4 level (see text). (Credit: NOAA)

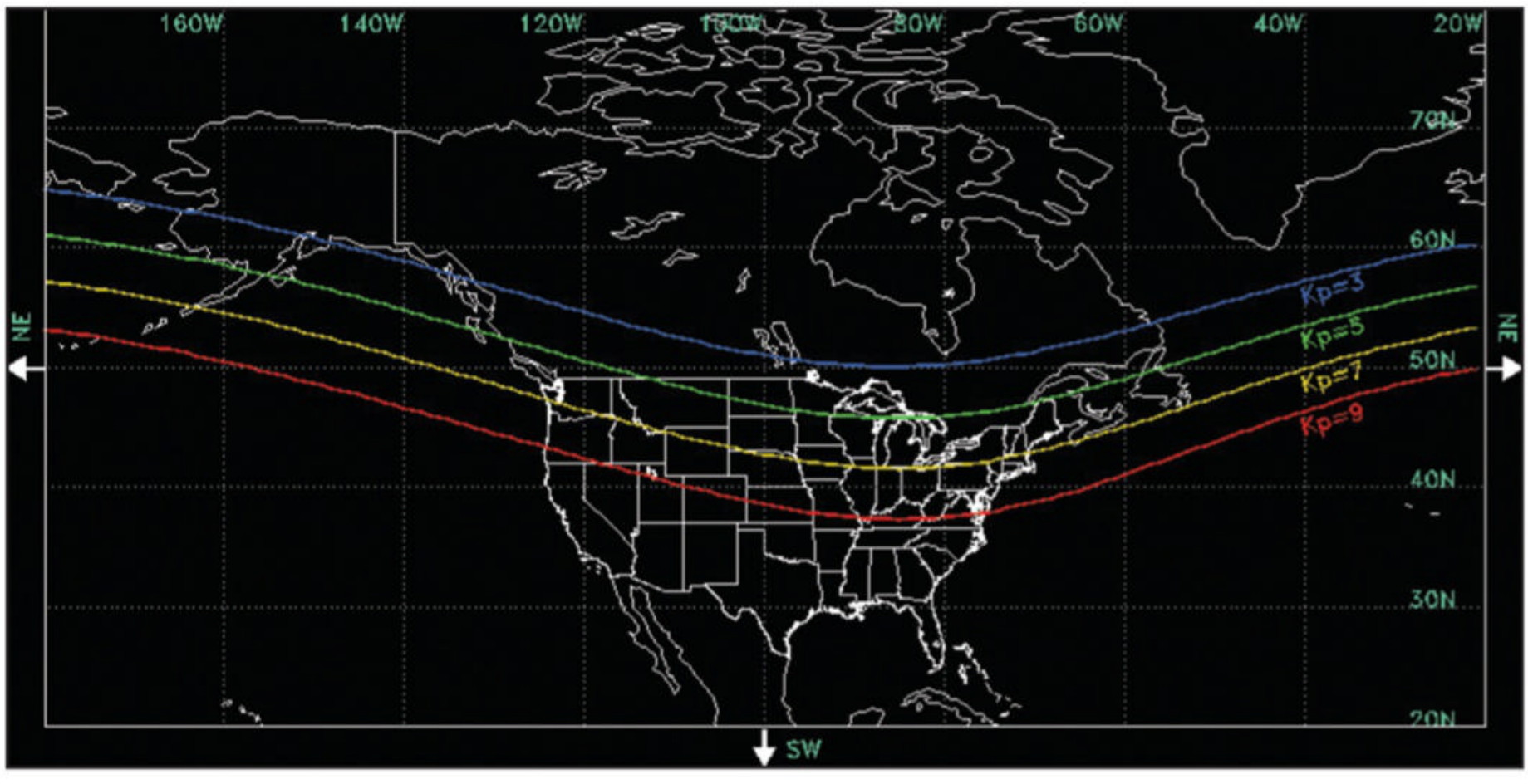

Figure 3. This map indicates the approximate viewing opportunity of visible aurora during geomagnetic storms, if aurora is active during such storms. For instance, between March 23 and 24, 2023, the Planetary K-Index reached at least 8, and aurora was witnessed as far south as New Mexico (see text). (Credit: NOAA)

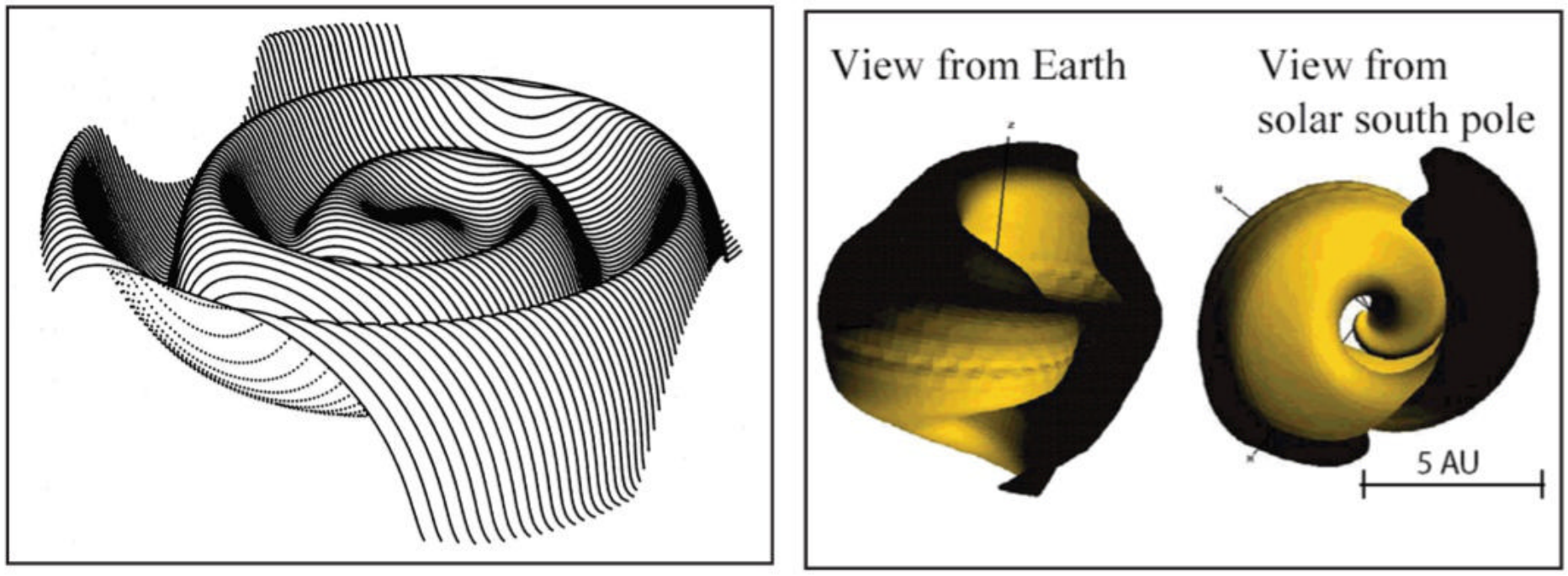

Figure 4. (Left) The heliospheric current sheet is shaped like a ballerina's skirt. The heliospheric current sheet extends to the outer reaches of the solar system, resulting from the influence of the Sun's rotating magnetic field on the plasma in the interplanetary medium. On this sheet rides the solar winds (see text). (Credit: J. R. Jokipii, University of Arizona); (Right) The shape of the heliospheric current sheet in March 2000 as calculated by the Blue Horizon supercomputer using data from several space craft. (Source: NASA)

Spectators around the world got to witness this wonderful phenomenon because the auroral oval extended into the mid-latitudes (as could be seen from space, Figure 6). Social media exploded with eyewitness accounts and great photos of the light show (Figures 7 and 8). Make no mistake, this bodes well for radio propagation on VHF, even if it degrades HF communications. Six meters was alive with activity because of this March geomagnetic storm. Such activity will increase over the next few years as we approach Solar Cycle 25 maximum.

May Shortwave Propagation

It is springtime. As we move closer to summer, DX signals on the higher bands become weaker and openings sparser. Long-distance *F*-layer propagation via 10 meters through 15 meters will degrade somewhat compared to the conditions

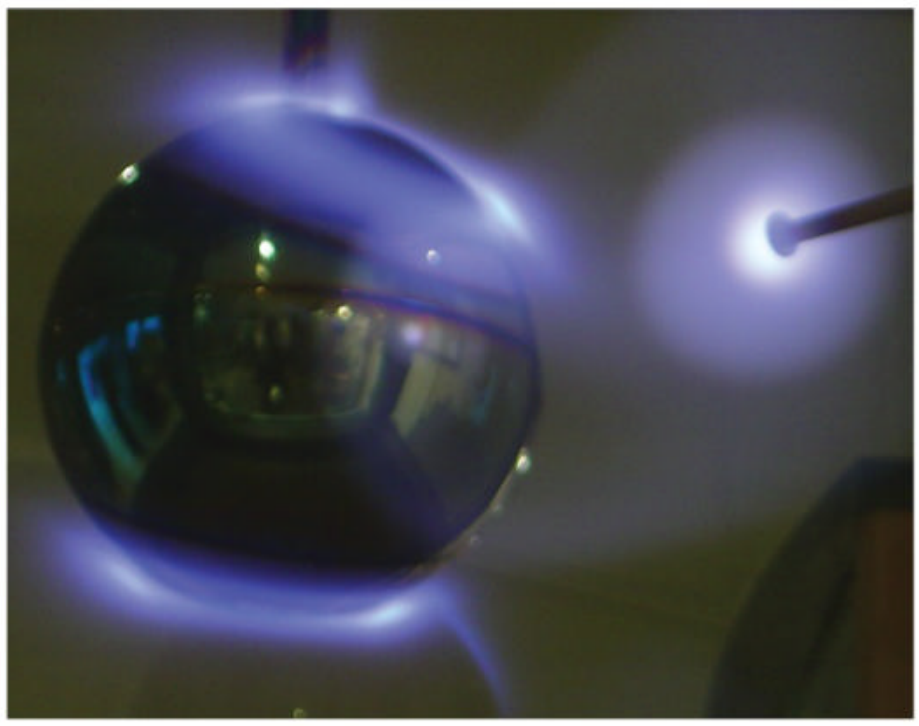

Figure 5. A terrella (Latin for "little earth") is a small magnetized model ball representing the Earth, that is thought to have been invented by the English physician William Gilbert while investigating magnetism, and further developed 300 years later by the Norwegian scientist and explorer Kristian Birkeland, while investigating the aurora. 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. [Credit: Wikipedia / Université Paris-Sud (Orsay) – Journées de la Science, 2005 Copyright © 2005 David Monniaux]

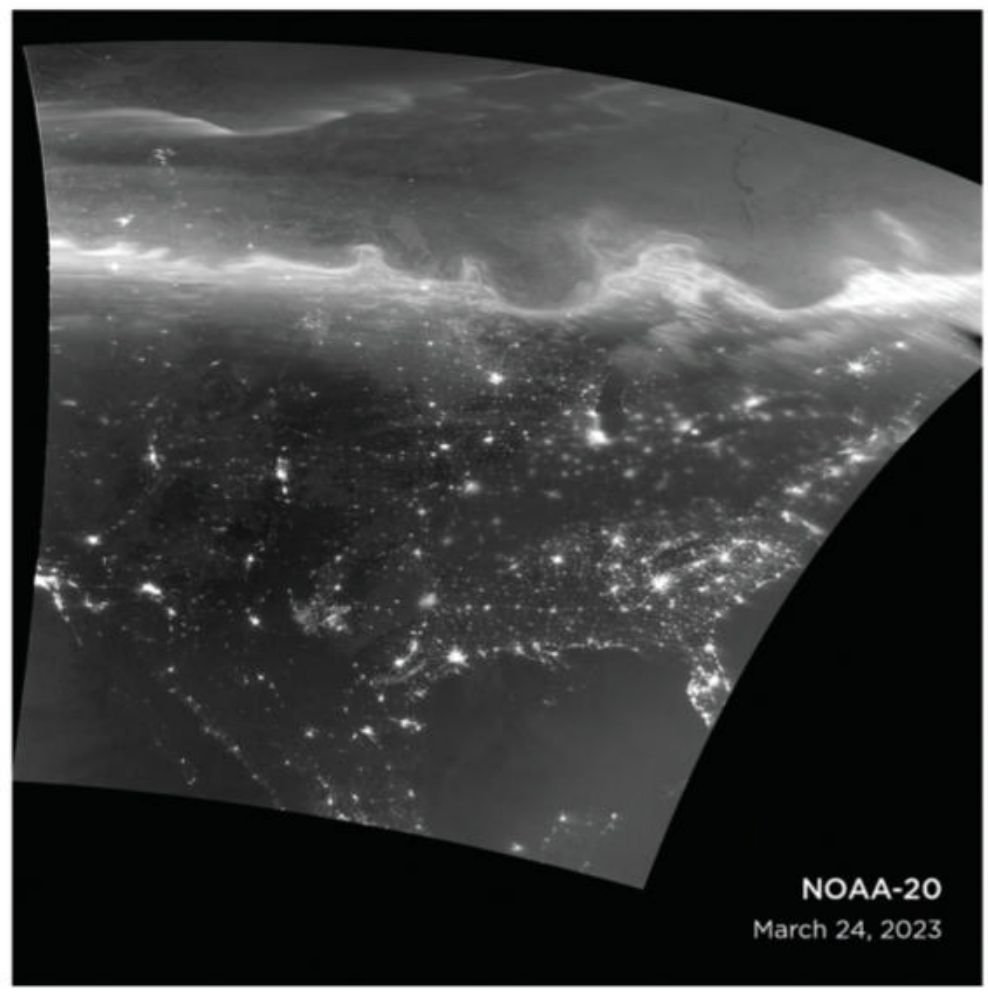

Figure 6. In this image captured on March 24, 2023 by spacecraft NOAA-20, we can see the very active Northern Lights spread across North America, which were viewed as far south as New Mexico (see text). (Credit: NOAA)

Figure 7. Social media was alive with widespread sharing of the incredible aurora as seen on the night of March 23, 2023 (and into early March 24). These are four such tweets representing views from southern Canada and as far south as New Mexico. (Credits: Tweets made by Gunjan Sinha, Ph.D., @gunjansinha2017; Kyle Brittain, @KyleBrittainWX; Peter Forister, @forecaster25; Lauren Thompson @landscapesbyLT) *(Continued on next page)*

of winter. We know this as the "summer doldrums," caused by the chemical changes in the upper atmosphere. The Maximum Usable Frequencies (MUF) average lower during the summer in the Northern Hemisphere. Optimum frequencies for DX propagation are lower during most of the daylight hours, and higher during the late afternoon, early evening, and nighttime hours than were observed during the winter months.

Not all is lost on the higher bands, though. During May, occasional Sporadic-E (E_S) propagation pops up on the highest HF bands and even on 6 meters. While seasonal static is increasing during May on lower frequencies, Sporadic-E brings some excitement to the on-air chase for signals.

The following is an overall picture of high frequency amateur band openings expected during May 2023. For day-to-day propagation conditions expected during the month, see the Last-Minute Forecast which appears on <https://SunSpotWatch.com>.

Ten, 12 Meters: Expect daytime openings to southern and tropical areas, though these openings are shorter and less frequent than during the winter months. The afternoon hours are the best time to check for DX openings. Frequent short-skip openings between distances of approximately 750 and 1,400 miles, however, should be possible.

Fifteen Meters: A seasonal decrease in DX openings is normal for May. Some fairly good openings still are possible towards the south during the late afternoon and evening. Numerous short-skip openings, between about 600 and 2,300 miles should be possible almost daily.

Seventeen, 20 Meters: These should be the best bands for DX during May. Opening shortly after sunrise, good DX conditions are expected to one area or another through the evening hours. These bands may also remain open to southern and tropical areas through much of the nighttime hours as well. DX conditions should peak during the late afternoon and early evening, with openings possible to almost all areas of the world. Very frequent short-skip openings are also forecast for distances between about 350 and 2,300 miles. Quite often, especially during the late afternoon, optimum conditions may exist for both the short and long skip and stations

Figure 7 continued.

a few hundred miles away will be heard at the same time as DX stations from several thousand miles away, causing considerable QRM.

Thirty Meters: This band will often play a major role in DX propagation, with somewhat better daytime propagation than 40, and solid nighttime propagation into some areas of the world. Exotic DX can be found here on CW and other digital modes. Check this band often throughout the day.

Forty Meters: Fewer DX openings are expected because of the shorter hours of darkness and the higher level of static. Good openings should still be possible, however, to several areas of the world from shortly before sunset, through the hours of darkness, until shortly after sunrise. Good daytime short-skip openings can be expected over distances of between approximately 150 and 750 miles, with nighttime openings extending up to the one-hop limit of 2,300 miles.

Sixty, 75, 80 Meters: Fewer hours of darkness and higher static levels are also expected to reduce DX openings on these bands, but a few fairly good openings should be possible. Check during the hours of darkness. Excellent short-skip openings are forecast for the daylight hours over distances ranging between 50 and 250 miles. During the hours of darkness, the short-skip range should increase up to approximately 2,300 miles.

The 160-Meter Band: Propagation conditions on this band have passed their seasonal peak and should decline until early autumn. Openings up to 1,000 miles or so should be possible this month during the hours of darkness. An occasional opening well beyond this range may also be possible when static levels are exceptionally low!

VHF Conditions

This month of May should see an increase in Sporadic-E, especially at the end of the month. Solar activity is expected to be high enough to support long-range DX on the 6-meter band, so be alert for openings via the F region, providing world-wide propagation.

With Sporadic-E ionization expected to increase, look for short-skip openings, likely to occur over distances of approximately 1,000 to 1,400 miles. Although Sporadic-E openings can take place at just about any time, the best time to check is between 10 a.m. and 2 p.m. and again between 6 p.m. and 10 p.m. local daylight time.

During periods of intense and widespread Sporadic-E ionization, two-hop openings considerably beyond 1,400 miles

should be possible on 6 meters. Short-skip openings between about 1,200 and 1,400 miles may also be possible on 2 meters.

Auroral activity is generally lower than March and April, due to the change in the orientation and position of the earth and magnetosphere in relation to the solar wind. Watch for K_p values above 6, which occur on days of Below Normal and Disturbed HF conditions (refer to the *Last-Minute Forecast* for those days in May that are expected to be in these categories). Point your antenna toward the north when this condition exists. You will find that CW is the modulation mode of choice, as the signals you will hear on Aurora will be raspy and very distorted.

For a detailed list of meteor showers, check out <https://tinyurl.com/mr3nfzkv> for a complete calendar of meteor showers in 2023.

If you use Twitter, you can follow <@hfradiospacewx> for hourly updates that include the K index numbers. You can also check the numbers at <https://SunSpotWatch.com>, where this columnist provides a wealth of current space weather details as well as links. Please report your observations of any notable propagation conditions, by writing this columnist via Twitter, or via the Space Weather and Radio Propagation Facebook page at <https://fb.me/spacewx.hfradio>.

Current Solar Cycle Progress

As we pointed out before, Cycle 25 could be one of the strongest since record-keeping began. Look at the progress of the cycle in Figure 9!

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for February 2023 was 110.9, down from the cycle's high (so far) of 143.6. The

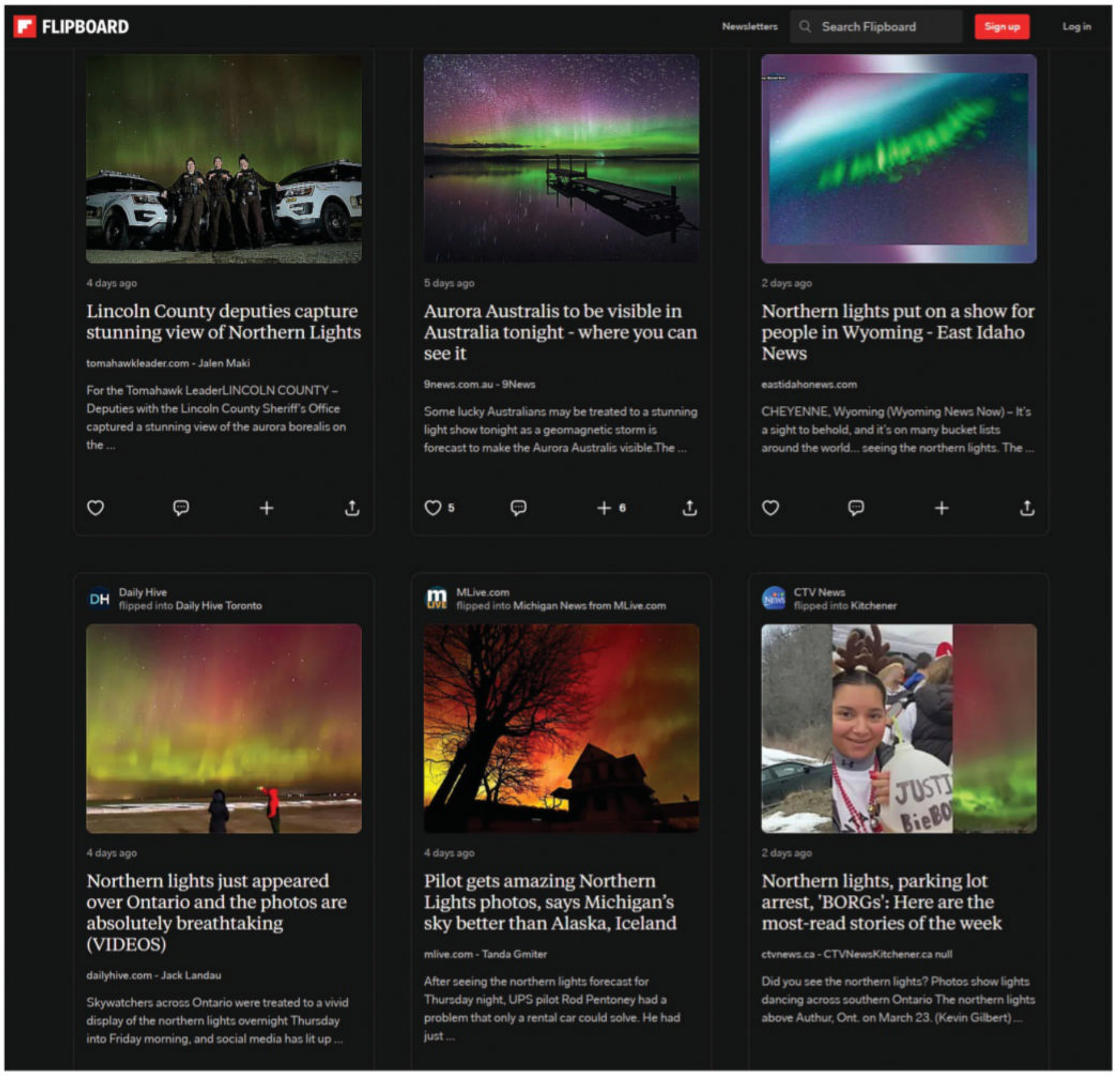

Figure 8. Flipboard was alive with many news stories from around the world regarding the March 24 2023 aurora event. The verdict: After nearly six years, the light shows are back in spectacular display. (Credit: Flipboard)

twelve-month running smoothed sunspot number centered on August 2022 is 92.3, the highest so far in Cycle 25. A smoothed sunspot count of 90, give or take about 9 points is expected for May 2023.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 172.09 for February 2023, down from the current highest value of Cycle 25: 182.47, which is higher than the peak of Cycle 24! The twelve-month smoothed 10.7-cm flux centered on August 2022 is 133.8, the current highest value for Cycle 25. The predicted smoothed 10.7-cm solar flux for May 2023 is 126, give or take 7 points.

Geomagnetic activity level this month is expected to range from quiet to stormy, resulting in occasional degraded propagation this month.

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. You may e-mail me, write me a letter, or catch me on the HF Amateur bands. If you are on Facebook, check out <https://fb.me/spacewx.hfradio> and <https://fb.me/NW7US> — speaking of Facebook—check out the CQ Amateur Radio Magazine fan page at <https://fb.me/CQMag>. Also, please check out the new alternative social networking ham radio group at <https://amateurhamradio.locals.com> and please share this with your amateur radio friends and clubs.

73, Tomas, NW7US

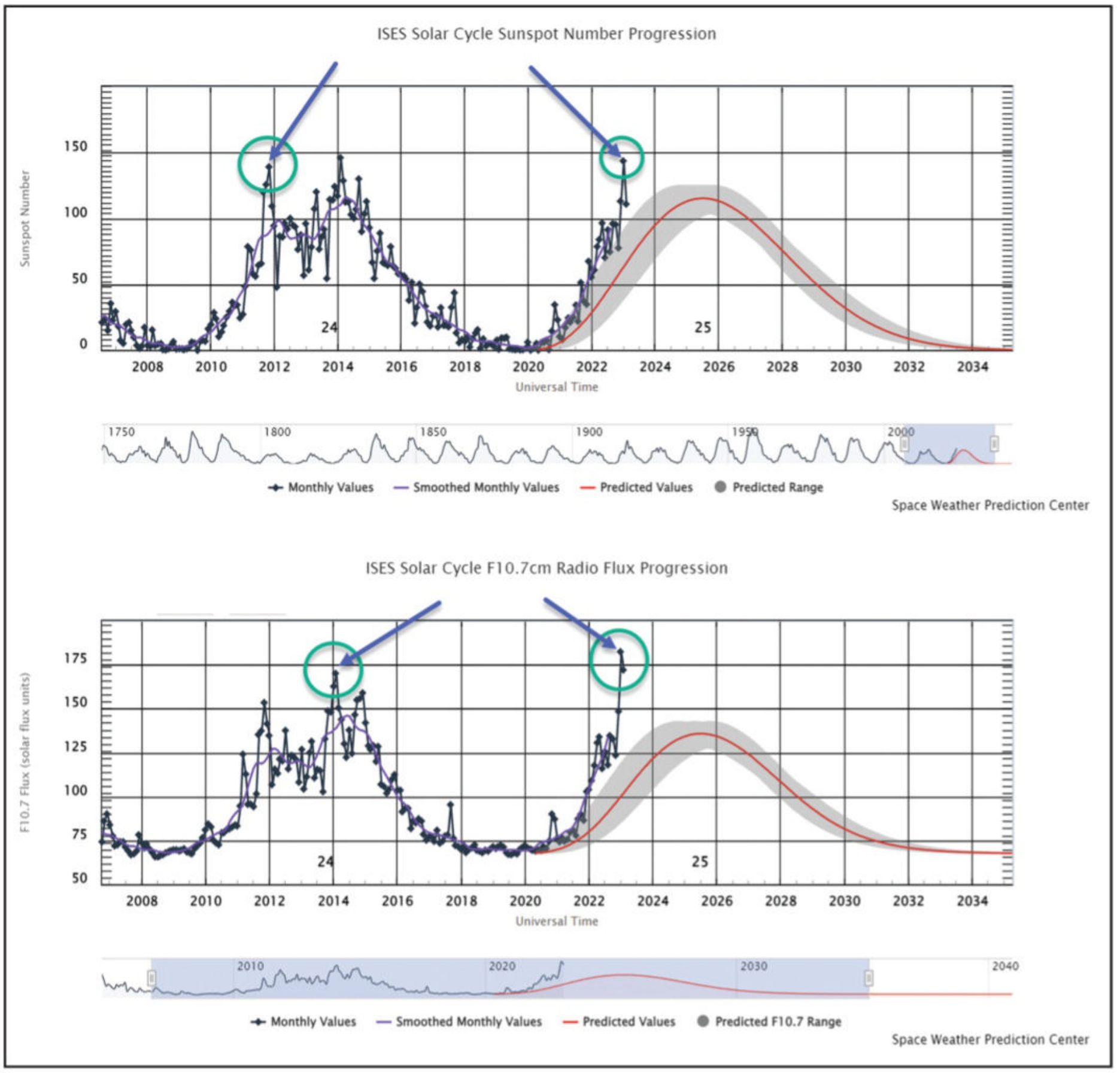

Figure 9. It is no longer wishful thinking that Solar Cycle 25 is passing Cycle 24, as we see the F10.7-cm monthly value exceeding the peak of Cycle 24. Further, the first peak so far in Cycle 25's sunspot number progression is higher than the first peak from Cycle 24. We can wish that the second peak in this current cycle will also exceed the peak of Cycle 24! (Credit: SWPC/NASA)

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.)

2022 CQWW DX CW RESULTS

SINGLE OPERATOR NORTH AMERICA

United States

District 1

W1KM	A	7,496,808	4489	128	456
N1UR	“	5,697,900	3516	126	459
K1DG	“	5,620,932	3368	131	448
KQ2M	“	3,946,824	2864	118	374
W1WEF	“	3,835,410	2655	116	403
W1JQ	“	2,482,500	1809	114	386
K1RU	“	2,115,195	2178	81	264
NB1N	“	1,581,910	1421	87	307
K1RM	“	1,190,350	1184	84	266
N2ZA	“	684,817	689	91	270
WA1T	“	331,149	458	73	200
N1NN	“	169,100	321	48	142
W1OHM	“	47,616	152	38	90
W1IS	*“*	*23,956*	*96*	*35*	*71*
W1/PY1MX	“	14,841	94	37	60
W8HMK	“	4,256	56	21	35
AE1D	“	576	12	6	10
K1IB	28	4,114	47	13	21
W3AKD	14	8,925	85	13	38
W1HI	3.5	55,250	242	17	68
K1ZM	1.8	48,807	222	21	66
W1HIS	“	3,552	38	10	27
WA1BXY	“	2,430	51	10	20
*K1BX	A	2,820,103	2164	101	350
*K1VUT	“	2,140,261	1650	108	359
*N1DC	“	1,063,474	1009	88	291
*K1HT	“	894,704	796	95	303
*K1YT	“	758,002	683	99	307
*N1CGP	“	481,770	565	77	241
*KI1U	“	235,563	365	56	177
*W1EDX	“	116,028	275	57	141
*KX1E	“	85,058	213	30	112
*W1ZU	“	69,600	185	39	111
*W1MJ	“	62,729	160	44	105
*N1SP	“	62,357	186	36	91
*W1VIV	“	51,322	188	33	101
*K1AV	“	39,270	142	31	71
*WA1LAD	“	37,050	113	52	98
*KA1DBE	“	22,448	120	28	64
*K1ARR	“	7,176	64	28	41
*AJ1DM	“	6,579	48	17	34
*N1CEO	“	6,104	58	24	32
*KB1FGC	“	5,580	62	24	38
*N1AM	“	4,935	40	19	28
*WA1K	“	3,496	55	19	27
**KB1BCT*	*“*	*1,204*	*17*	*12*	*16*
*WA1YGT	“	0	26	8	15
*AB1J	28	61,290	244	20	70
*W1TO	“	3,658	41	7	24
*N1VVV	“	1,764	28	9	19
*W5OV	21	450	12	3	12
*AA1ZX	14	510	10	7	10
*K6AUS	7	48	16	5	7

District 2

N5DX	A	11,640,105	5871	154	547
					(OP: @N2QV)
K2NV	“	3,065,198	2131	121	388
N2GC	“	2,405,720	1549	123	425
KR2AA	“	2,086,884	1724	102	350
W2XL	“	1,912,407	1714	95	304
KN2M	“	1,395,968	1137	109	339
W2OIB	“	686,585	695	98	291
WS9M	“	604,624	622	98	270
NS2N	“	378,508	536	61	190
WA2JQK	“	320,144	438	99	275
KE2SD	“	247,536	447	51	165
KD2EPM	*“*	*203,762*	*369*	*55*	*166*
KN2U	“	114,762	251	54	132
W2KU	“	67,500	211	48	132
WA2BMH	“	57,670	145	47	99
K2UA	“	56,257	197	25	76
K2YY	“	49,442	151	34	84
N2AXX	“	24,687	88	47	70
W2CN	“	21,888	90	35	61
KD2UBH	“	7,107	53	27	42
KC2KZJ	“	5,500	51	12	32
AH2O	28	39,600	160	19	71
AF2F	“	36,210	150	19	66
KU2M	21	658,360	1558	32	119
N2MF	14	930,560	2100	36	124
K2AF	7	5,967	76	11	28
AA2DT	“	1,239	20	6	15
WF2W	1.8	36,267	361	18	59
*K2ZR	A	521,236	643	80	231
*KE2WY	“	488,053	607	74	249
*N2RI	“	302,960	417	75	205
*KA2FIR	“	281,952	404	73	194
*KD2ZEL	“	204,930	377	68	185
*WB2FUV	“	202,016	325	60	176
*K2TWI	“	194,469	326	55	158
*W2NTV	“	113,400	214	56	144
*AC2OC	“	105,732	224	53	125
*AA2ZW	“	82,688	272	44	108
*WA2VQF	“	63,222	180	27	96
*N2BZD	“	43,810	131	32	98
*K2MEN	“	34,656	130	34	80
*W2QL	“	27,800	116	28	72
*W2BEW	“	27,468	117	35	74
*WC2Y	“	25,877	99	41	72
*W2NPT	“	18,758	87	28	55
					(OP: NP4H)
*KB2GD	“	13,520	62	29	51
*K2MN	“	11,856	72	23	53
*AI2U	“	8,715	107	23	60
*K2SCH	“	7,259	48	17	44
*K3WHD	“	4,307	50	20	39
*K2JF	“	4,160	44	17	35
*KZ2I	“	3,360	35	19	29
*KD2SRI	“	2,808	25	15	24
*WB2KWC	“	2,304	30	11	21
*K2IZ	“	1,891	26	9	22
*WA2VAM	“	520	12	9	11
*KD2P	28	29,308	157	17	51
*K2CS	“	12,300	97	15	35
*W2YK	“	12,208	79	13	43
*W2LC	“	7,638	70	8	30
*W2TZ	14	27,542	208	7	40
*W3EH	“	2,160	30	11	19

District 3

K3ZO	A	3,624,080	2520	124	385
K3UL	“	2,277,254	1587	138	415
WG3J	“	2,127,125	1785	108	347
K3TC	“	1,363,332	1032	113	376
N3FCP	“	1,223,163	1015	99	338
W3KL	“	779,418	878	82	236
K3VA	“	358,092	515	61	191
KE3GK	“	214,092	384	51	177
NC3Y	“	179,157	344	49	134
WS3M	“	91,690	311	43	130
K2ACX	“	64,008	177	36	90
WA3GM	“	43,164	132	40	92
KJ3I	“	31,978	108	34	84
N3WMC	“	19,215	90	36	69
K3ISH	“	13,984	68	28	48
K3DU	“	216	6	6	6
K3GW	21	4,180	37	14	30
WO3Z	7	51,709	214	24	65
W3BGN	3.5	126,400	548	20	80
*K3AU	A	1,325,796	1255	94	294
					(OP: K2YWE)
*K3SWZ	“	710,190	680	101	289
*K3HW	“	443,703	522	86	281
*N2EM	“	326,400	426	90	210
*N2EY	“	218,496	410	42	150
*W3PNM	“	215,968	359	70	202
*KD9QS	“	191,586	352	59	163
*WB2FUE	“	177,160	327	56	150
*N3FR	“	147,960	268	69	147
*KA3JNN	“	128,000	248	61	139
*WB3DPS	“	53,730	156	36	99
*KF3G	“	53,400	183	31	89
*WA3EOQ	“	51,984	155	44	100
*WA4GUD	“	46,095	158	28	77
*AC3EK	“	35,532	132	35	91
*N5TB	“	25,511	100	32	65
*W3OY	“	22,680	81	46	74
*K3KU	“	18,426	85	30	53
*WD8RYV	“	15,470	86	25	60
*WB3EGD	“	7,688	50	25	37
*N3JNX	“	7,482	82	22	36
*WA3RSR	“	4,576	55	22	30
*WA1HEW	28	8,281	73	13	36
*KE3ZT	21	21,648	119	15	51
*K1EFI	14	29,835	150	20	65

District 4

NR3X	A	5,681,676	3575	144	458
					(OP: N4YDU)
NN7CW	“	5,192,950	3689	127	391
N4AF	“	3,195,840	2340	104	376
K4ZW	“	1,962,281	1617	103	318
K4PV	“	1,903,990	1811	103	315
N4CW	“	1,712,625	1596	82	293
KØEJ	“	1,518,208	1345	106	303
W4CB	“	1,209,245	1173	89	276
					(OP: W2RU)
K2PS	“	1,149,588	1051	97	299
WN7S	“	1,005,082	959	89	314
W4NZ	“	833,185	837	100	255
N6NT	“	770,070	723	98	301
WX4G	“	738,364	810	87	259
AI4WW	“	647,130	751	80	238
N2FT	“	582,000	671	98	277
K4WW	“	562,922	696	71	227
N4CF	“	507,647	584	85	244
W4TMO	“	475,242	586	74	235
AC4G	“	452,295	498	100	245
W8FN	“	451,528	543	73	235
NN4SS	“	442,530	574	73	225
N5TOO	“	350,796	577	72	174
W3SA	“	269,016	394	71	193
N4EK	“	253,270	415	55	160
N4JVP	“	218,193	315	85	198
KO2Q	“	211,904	334	59	165
KT4XN	“	176,616	365	53	145
NQ3N	“	152,308	321	59	143
WF3T	“	143,856	254	70	146
K4FOY	“	142,992	307	62	154
K7OM	“	141,316	276	66	140
N9CB	“	136,128	295	56	136
W4ZYT	“	103,812	239	43	121
KQ4R	“	52,535	148	43	90
K4AVX	“	51,208	174	49	99
W4UEF	“	49,368	154	52	84
N2UO	“	43,596	125	35	91
KW4CW	“	33,232	111	49	75
WA4EUL	“	25,066	120	26	57
N4WE	“	20,828	96	23	59
W4UT	“	15,247	71	31	48
AA2KD	“	11,160	73	28	44
NX4N	“	7,137	50	26	35
KA3MTT	“	6,273	100	17	34
WH6LE	“	1,749	23	11	22
N4OX	28	275,709	784	30	103
K4RDU	“	35,752	158	22	60
NC4S	“	15,642	124	17	49
K3RV	21	633,840	1466	32	120
N4KS	“	165,792	667	20	68
*K7SV	A	3,507,995	2403	126	409
*WW4XX	“	1,884,008	1416	119	357
					(OP: LZ4AX)
*NK4O	“	620,961	692	89	252
*KC4TEO	“	537,481	585	94	249
*K4EJ	“	473,880	533	89	241
*N4HA	“	390,728	489	72	217
*WA1S	“	333,203	497	68	179
*K4ORD	“	333,091	438	79	204
*KB4CG	“	314,280	497	77	214
*K4IE	“	260,352	399	71	185
*WF7I	“	237,195	369	71	180
*W3DQS	“	203,616	317	75	177
*N4DJ	“	201,968	354	58	150
*WZ4M	“	182,125	296	70	165
*KI3C	“	171,700	310	53	149
*K4FTO	“	145,314	292	58	149
*W4SPR	“	138,645	282	65	130
*K4FJW	“	126,256	244	62	146
*K4NO	“	109,624	281	46	96
*AA4SD	“	98,044	247	57	136
*W3AJL	“	94,375	237	42	109
*WA8MDC/4	“	94,122	226	56	106
*W2ECK	“	80,325	199	46	107
*AE4Y	“	79,079	197	37	106
*N3GD	“	72,050	208	39	92
*WD4GBW	“	68,904	200	24	92
*WØNA	“	62,000	189	44	81
					(OP: W4RN)
*WBØCJB	“	56,889	172	53	94
*KK4WDP	“	56,026	194	26	83
*N2DA	“	49,665	151	36	93
*W4YE	“	47,955	142	54	85
**N4SD*	*“*	*47,652*	*137*	*43*	*89*
*NQ4K	“	47,336	139	36	86
*KB3FW	“	47,047	148	46	97
*W7HJ	“	45,095	124	46	99
*K3YDX	“	44,336	132	49	87
*W4IOD	“	43,566	130	51	86
*N4ARO	“	41,180	126	54	91
*K4RAB	“	33,000	119	32	68
*N4IU	“	31,752	115	33	75
*NA9J	“	30,132	106	47	77
*KM4CH	“	28,616	165	53	93
*KE4QCM	“	28,396	125	44	80
*K1TN	“	25,652	102	32	74
*K8LBQ	“	24,393	124	50	91
*K9HXO	“	23,989	176	47	102
*K6RM	“	22,707	153	25	62
*ND9M	“	22,425	113	21	54
*W9GOL	“	22,032	94	36	66
*N4AU	“	20,915	93	22	67
*W4ATL	“	19,700	77	38	62
*K4YCR	“	19,000	85	38	62
*K4LDI	“	18,700	85	34	66
*W4GO	“	18,144	82	29	55
*K4TZ	“	17,835	86	29	58
*KA3EHL	“	12,222	80	19	44
*WO8L	“	8,284	89	31	45
*KT4RH	“	7,776	59	30	42
*WB5KFP	“	7,040	45	27	37
*N8AID	“	6,552	51	17	35
*KO4GOF	“	6,550	46	18	32
*W3USA	“	5,016	47	11	27
					(OP: K8MR)
*K2TV	“	4,760	50	24	32
*KC4OBX	“	4,650	49	25	37
*KO4YNU	“	3,075	35	15	26
*WB2ART	“	2,618	30	16	18
*KA4JRY	“	2,254	41	18	28
*N1XI	“	2,046	30	13	18
*KC3O	“	1,824	36	16	22
*KM4SK	“	1,302	18	14	17
*KK4Z	“	780	22	13	17
*AI4UN	“	456	11	9	10
*N4AO	28	100,440	342	26	82
					(OP: WC4E)
*W4RYW	“	58,996	220	25	73
*N4NM	“	44,620	195	22	70
*N4OO	“	11,286	78	17	37
*WB4TDH	21	232,624	664	29	95
*K4AMC	“	65,320	252	23	69
*N5SMQ	“	1,736	24	7	21
*NW4V	14	16,100	87	18	52
*W4TJM	7	25,661	169	16	51
*KW4FAB	“	104	7	3	5
*KC4WQ	3.5	814	15	10	12
*N8UX	1.8	70	10	4	3

District 5

N2IC	A	5,956,685	3682	162	431
WXØB	“	4,041,994	2905	143	395
					(OP: AD5Q)
K5GN	“	2,995,335	2094	138	417
AD5A	“	2,456,832	2121	117	331
W5ZN	“	2,187,968	1563	138	406
KZ5D	“	1,513,926	1271	118	335
N4OGW	“	1,377,103	1223	101	308
WQ5L	“	784,441	809	92	251
K5BG	“	557,175	648	91	232
K5TA	“	276,352	393	76	178
WA5DSS	“	72,300	188	53	97
W9LCQ	“	67,592	189	45	97
N3BB	“	43,680	183	37	75
K5RM	“	38,556	146	32	76
KV5V	“	9,135	64	21	42
KA4OTB	“	6,834	56	16	35
N5YT	28	109,383	400	26	75
N5AW	21	614,295	1481	33	120
K5QR	“	155,477	418	31	102
AK5Y	14	204	25	6	6
*K5FUV	A	735,360	727	106	277
*WA5SOG	“	670,176	716	97	261
*KG5OA	“	420,614	622	75	203
*NN5T	“	351,204	497	80	179
*NO5W	“	231,192	384	63	165
*K5XU	“	225,649	339	74	177
*AJ4F	“	159,720	310	77	143
*N5KWN	“	156,016	292	58	138
*N5REL	“	112,362	261	62	121
*W8OV	“	96,906	206	65	121
*NK5G	“	77,844	209	51	105
*KD2KW	“	69,654	187	56	85
*KC7QY	“	67,473	173	58	95
*K9OZ	“	67,346	191	46	105
*KC2LM	“	31,330	125	49	81
*K5GQ	“	24,926	92	41	62
*WY6K	“	23,421	110	48	63
*AE5MM	“	22,050	97	34	56
*WB5BHS	“	17,094	85	30	47
*WC5D	“	14,136	64	42	51
*NA5YO	“	10,960	60	35	45
*K7ZYV	“	9,042	63	21	45
*AA5ET	“	6,545	56	24	31
*KI5FUY	“	4,704	38	21	28
*KE5MIS	“	3,577	44	19	30
*W8MC	“	3,355	53	28	27
*KD6UY	“	2,000	23	19	21
*WB5K	“	840	18	9	11
*KA5PMV	“	96	13	6	6
*N5DR	“	42	4	4	3
*KI5EGH	“	0	0	0	0
*WA5ZKO	21	23,660	128	19	51
*KI5PED	7	462	19	10	12
*WS5D	“	12	2	2	2

District 6

NO6T	A	5,767,692	3842	162	415
					(OP: KI6RRN @WA6TQT)
K6XX	“	3,127,850	2376	142	328
K6NA	“	2,228,208	1651	152	336
K6NR	“	1,099,185	1039	118	263
AJ6V	“	880,982	1148	96	182
W4EF	“	339,360	511	94	146
N6RK	“	312,120	600	73	107
K6YK	“	281,912	412	83	179
NN6DX	“	265,734	448	81	141
					(OP: W1PR)
K6RB	“	192,969	397	72	117
N3ZZ	“	150,943	312	71	150
NU6N	“	69,960	213	51	81
K6FA	“	69,462	193	63	90
KB6A	“	49,704	159	45	69
WA6URY	“	48,488	167	44	72
W6AYC	“	40,710	138	53	62
N6GP	“	36,162	115	53	73
AF6K	“	35,991	136	39	54
N6NZ	“	30,870	126	40	58
KJ6JUS	“	16,892	102	45	58
K6XC	“	15,910	78	33	41
W6GEE	“	7,747	56	28	33
KD6AMA	“	4,017	41	15	24
W6YA	21	429,534	1064	35	112
N6KN	“	198,153	572	33	90
WØYK	“	171,308	623	31	82
W6RKC	3.5	663	17	9	8
*W6TK	A	533,392	726	92	180
*N7VM	“	465,400	697	92	168
*N6PN	“	153,640	330	61	106
*N6YEU	“	143,005	282	64	121
*W7XZ	“	124,806	262	73	110
*N6RVI	“	52,029	175	51	72
*N6MU	“	32,130	100	43	76
*KF6NCX	“	28,405	125	43	52
*NC6V	“	9,604	73	24	25
*AI6SL	“	9,342	61	25	29
*K6UF	“	7,722	58	25	29
*K6GPB	“	4,268	38	22	22
*W6JBR	“	4,017	39	17	22
*WM6T	“	3,621	54	24	27
*AI6DO	“	3,239	30	19	22
*N6TTV	“	3,168	34	20	24
*KC8J	“	3,157	32	20	21
*N6EFF	“	2,695	44	24	25
*K9KJ	“	1,296	19	11	13
*NC6Q	“	725	19	14	11
*N6BHX	“	495	14	8	7
*N6HAN	“	290	14	5	5
*K6DGQ	“	132	14	6	5
*W6YX	21	221,186	650	30	92
					(OP: N7MH)
*WA7BNM	“	115,696	377	30	82
*N6RM	“	36,244	202	25	43
*W6YOY	14	1,421	31	14	15
*N6DVS	“	180	8	5	5
*KA9A	7	725	17	11	14
*KT5LA	“	660	21	11	11
*KN6TZK	“	0	1	1	1
*KE6GLA	3.5	112	7	4	4

District 7

KM7W	A	2,126,239	1749	147	352
					(OP: KL9A)
WJ9B	“	1,669,910	1726	121	253
KS7T	“	273,920	472	77	137
W7GTF	“	244,648	435	75	137
N6TR	“	227,000	409	77	123
K7JQ	“	214,467	394	71	130
KD7H	“	209,400	376	75	125
N7GP	“	160,230	270	89	156
KQ7I	“	134,640	289	76	104
K7ZA	“	125,123	263	82	129
W7GF	“	89,776	211	70	111
N7GR	“	83,250	218	67	118
K9JF/7	“	79,323	226	53	84
AD7XG	“	69,764	193	64	99
K7MY	“	56,736	170	52	92
W7PV	“	54,609	149	57	110
K7NO	“	52,416	175	53	91
K5MH	“	28,672	137	50	62
KE2VB	“	18,157	100	31	36
WU7W	“	10,626	73	30	36
N7XCZ	“	3,066	28	19	23
KG7MVH	“	1,161	27	14	13
W7TX	“	688	17	8	8
N7DWW	“	414	11	9	9
K7IU	28	324	9	6	6
K7NT	21	15,890	102	25	45
W7WA	14	406,262	1110	36	106
N7RK	7	10,498	71	23	35
W7ID	“	2,310	28	11	19
K5IB	3.5	627	20	9	10
*N7UVH	A	290,763	451	97	170
*K7NEW	“	165,822	370	62	112
*K7HBN	“	159,823	318	72	109
*W7ZI	“	152,975	273	72	139
*W7WSV	“	111,135	276	54	101
*W7MTL	“	98,854	237	71	90
*AF7NX	“	74,074	189	56	87
*K7AZT	“	60,984	177	55	77
*N7NWL	“	49,275	157	54	81
*AB7RW	“	38,115	140	41	58
*K7CW	“	33,456	122	43	59
*KE7AUB	“	29,939	122	38	53
*W9CF	“	27,768	103	46	58
*N7VS	“	27,072	129	44	50
*AG7NR/M	“	25,705	177	38	59
*WK7G	“	23,816	136	48	56
*K7ULS	“	22,016	100	30	56
*K7ROG	“	20,202	97	29	49
*NA7P	“	19,280	104	40	40
*KC7ITP	“	12,716	67	31	37
*KE7DZ	“	8,924	81	46	46
*WB7S	“	8,832	62	25	39
*W7ZDX	“	7,998	84	33	29
*KF7GGN	“	7,474	87	33	41
*K7ARJ	“	6,556	57	19	25
*N7JEH	“	4,510	83	28	27
*KB7AK	“	4,200	42	19	23
*N7LL	“	4,050	45	26	24
*K7GZP	“	3,549	44	19	20
*AC7AF	“	2,700	29	18	18
*W7RCS	“	2,414	30	18	16
*KX6X	“	976	24	8	8
*WB7TJI	“	440	23	11	11
*KI7N	28	756	18	9	9
*WA8ZNC	21	28,014	154	25	44
*W7TMT	“	18,306	128	21	33

District 8

NA8V	A	4,876,106	3067	145	441
K8GL	“	2,807,750	1852	134	416
K8PK	“	989,256	1035	91	285
K8MP	“	860,520	878	95	260
W8MET	“	495,204	555	89	259
KT8Y	“	304,668	478	57	177
KB8NNU	“	225,522	443	56	145
KW8N	“	191,862	353	63	135
W8TWA	“	130,500	259	54	126
WA8RCN	“	128,338	328	60	146
K3XO	“	100,893	226	48	121
N8IE	“	57,400	132	41	123
AB8RL	“	52,959	154	35	92
W8KTQ	“	21,700	111	40	84
KE8E	“	18,816	108	34	62
W8EOG	“	4,628	43	21	31
K8ALM	“	3,649	36	12	29
NS8O	“	360	10	8	10
K8GU	7	49,708	212	21	65
AA8BV	“	1,593	41	7	20
*W1NN	A	882,954	821	106	288
*AA8CA	“	823,768	782	99	308
*N8BJQ	“	688,703	727	90	263
*WB8YJF	“	488,250	560	96	254
*K8AJS	“	446,352	593	69	203
*KV8Q	“	415,985	589	66	205
*N8CWU	“	245,079	374	81	180
*NE3R	“	171,672	337	47	137
*WR8F	“	147,722	240	69	164
*KB8GAE	“	121,644	236	54	132
*K7DR	“	120,727	244	55	126
*NE8O	“	100,804	252	47	111
*KB8TL	“	100,408	235	45	118
*K3DMG	“	93,644	214	44	120
*N8HHG	“	63,842	185	44	93
*N6JRL	“	53,890	201	58	112
*K8WU	“	43,673	146	35	84
*N4HAI	“	28,615	123	31	66
*WA8UMT	“	27,966	88	42	76
*N8GZ	“	27,090	101	36	69
*KF8O	“	25,745	106	33	62
*NF8M	“	21,879	84	41	58
*AA8RV	“	13,700	92	38	62
*N8VWY	“	13,284	63	32	49
*W8KNO	“	8,844	58	27	40
*KD8W	“	7,505	82	30	49
*WB8MIW	“	6,930	61	19	36
*N8TCP	“	6,750	47	20	34
*K8RCT	“	4,459	42	21	28
*AA8SW	“	4,350	41	23	35
*W8RU	“	3,640	33	14	26
*W8VE	“	3,375	39	15	30
*WE8L	“	2,562	25	18	24
*K8RR	“	598	14	12	11
*AB8SF	“	380	11	9	11
*KC8JX	“	70	5	5	5
*W8JGU	28	34,408	158	22	66
*WB8JAY	“	10,712	73	15	37
*N8II	21	350,172	898	29	108
*AF8A	“	49,364	208	19	67
*NU8A	14	37,920	170	21	59
*W8GOC	“	33,930	148	25	65
*N8ET	“	30,342	164	22	56
*AC8CE	7	11,172	80	15	42
*W8NNC	“	2,232	44	9	22

District 9

W9RE	A	5,346,486	3380	139	440
K9MA	“	1,523,743	1338	103	300
N9DJ	“	669,768	684	97	257
K9BGL	“	454,781	585	91	192
KY9KYO	“	329,084	441	87	205
W9GT	“	287,250	441	72	178
KG9N	“	249,600	428	54	154
N9ZI	“	248,310	396	73	194
WA9AQN	“	231,440	378	65	155
KW9R	“	149,682	289	64	138
AA9JS	“	125,550	315	67	158
N9JR	“	113,200	291	60	140
W9LR	“	99,416	236	53	119
KX9DX	“	95,840	240	36	124
KØVW	“	89,544	217	51	117
W9DZ	“	59,584	189	30	82
KZ9DX	“	54,366	186	37	86
WG9L	“	48,714	137	52	86
KD9MS	“	39,444	132	43	71
W9FL	“	16,340	94	31	64
W9OP	28	35,700	183	23	62
KW9A	14	329,814	854	35	111
K9ZO	3.5	94,256	458	19	67
KØPJ	“	32,802	182	15	56
*N4TZ	A	2,078,676	1473	123	390
*K9WA	“	294,508	435	73	171
*WD9CIR	“	267,776	407	77	179
*KE9SA	“	201,291	344	66	163
*W9TD	“	129,116	269	59	132
*W8LVN	“	92,460	234	68	133
*WD8AHR	“	85,004	222	41	117
*AC9BJ	“	52,852	153	55	91
*WA9LKF	“	50,895	179	49	96
*WB9UGX	“	44,086	140	45	89
*K9PMV	“	40,736	118	51	83
*KE9V	“	28,462	118	33	74
*W9NXM	“	27,378	107	47	70
*W9VA	“	20,640	97	33	53
*W9MRH	“	9,520	87	26	42
*K9DUR	“	6,888	48	16	40
*N9BT	“	6,448	53	22	30
*W9SE	“	6,100	48	27	34
*KE9UA	“	4,230	42	14	31
*N9EDL	“	3,192	32	19	23
*KC9AAP	“	2,880	29	14	26
*KD9EBS	“	2,240	24	14	21
*KC9WIB	“	2,106	29	15	24
*NV9X	“	1,305	21	11	18
*K9TDW	“	975	42	12	13
*K9BRS	“	972	36	17	19
*K9WPV	“	110	7	5	5
*KD9HVW	28	6,579	56	15	28
*KJ9C	“	1,742	28	7	19
*WB9HFK	21	59,994	215	25	76
*W9QL	“	25,050	133	22	53
*K9UIY	7	58,800	264	25	73
*WD8DSB	1.8	1,704	33	9	15

District Ø

NØAX	A	1,583,163	1249	129	348
KØFX	“	734,873	855	103	256
W9MAF	“	525,528	568	85	239
WØETT	“	504,030	604	98	220
KØPK	“	296,750	433	80	170
KNØV	“	281,120	415	78	173
NØUY	“	250,439	399	90	179
KØJJR	“	217,382	352	71	170
NGØT	“	190,610	292	80	165
WØMB	“	137,685	269	71	130
NØOK	“	120,582	239	66	132
KJØI	“	101,010	212	65	130
KØTC	“	98,450	213	66	113
N7WY	“	82,218	211	40	102
N5TU	“	64,990	189	51	83
NCØB	“	57,018	190	52	77
ADØH	“	52,984	169	59	89
KØDME	“	18,492	158	30	62
N6RSH	“	10,465	65	30	35
KØES	“	5,775	59	27	28
NIØK	21	44,088	222	26	62
W7UT	14	47,430	199	23	70

KØQEI	“	8,517	117	14	37
WØTY	“	2,812	49	13	24
NØTT	7	111,320	378	29	86
NIØC	“	21,462	113	22	51
*NØUR	A	747,994	810	92	246
*KØEA	“	569,165	634	94	241
*NN7A	“	235,155	355	87	170
*W4IFI	“	188,044	391	78	134
*AEØEE	“	123,716	250	71	126
*WØRX	“	107,160	208	68	120
*KAØPQW	“	94,810	210	63	127
*WØPI	“	80,542	198	53	101
*WZØW	“	76,616	241	32	90
*KØALT	“	45,747	148	49	68
*N9CD	“	41,511	127	48	89
*WAØLIF	“	38,875	153	45	80
*NØZIB	“	24,823	113	31	72
*WB9YLZ	“	17,600	89	34	54
*KYØO	“	16,932	90	39	63
*NØUI	“	13,987	90	25	46
*WØZF	“	12,711	88	15	42
*AEØIB	“	12,672	68	21	51
*KBØNES	“	8,064	61	29	34
*NØDL	“	5,529	89	30	27
*ABØCD	“	3,248	44	26	30
*KØBL	“	3,159	35	15	24
*KØTI	“	3,055	34	23	24
*WXØZ	“	2,516	28	15	19
*AA5WZ	“	1,768	40	18	16
*KKØD	“	551	52	10	9
*AFØZ	“	513	11	9	10
*WØOP	“	36	17	7	11
*NIØG	28	26,980	142	24	52
*WNØL	“	13,293	105	21	42
*KØUU	“	3,924	48	13	23
*WA2JQZ	“	12	3	3	3
*N9HDE	21	20,700	128	18	51
*WUØA	“	2,407	40	11	18
*N7SE	14	3,800	104	16	22

NORTH AMERICA

Alaska

AL7LO	A	447,117	1048	71	116
AL1G	“	54,486	488	24	30

Antigua & Barbuda

*V26K	A	12,962,248	8841	142	456
		(OP: AA3B)			

Bahamas

*C6/KN4NTX	A	277,419	873	44	113

Belize

*V31YB	A	3,055	34	21	26

Canada

District 1

VY2TT	A	9,215,920	6502	124	436
		(OP: K6LA)			
VA1MM	“	1,154,244	1620	68	226
VE1JBC	28	30,780	145	22	59
VE9AA	21	667,440	1953	27	108
*VE1RSM	A	957,250	1137	85	265
*VE9KK	“	402,218	1099	38	128
*VY2LI	“	70,064	284	35	81
*VE1GN	“	50,400	151	37	89
*VE1GVY	“	35,550	188	21	69

District 2

VE2IM	A	10,460,793	7040	141	468
		(OP: VE3DZ)			
VA2EW	“	3,648,886	3081	104	354
VE2VIA	“	44,720	207	32	72
*VA2XZA	A	164,640	727	41	79
*VE2OXP	“	146,055	297	62	133
*VE2QV	“	63,838	211	37	81
*VE2ZT	“	51,183	228	30	69
*VA2KD	“	19,436	101	35	51
*VE2BVV	“	9,211	66	24	37
*VA2LGQ	“	24	4	2	2

District 3

XL3T	A	7,468,593	5566	129	432
		(OP: VE3AT)			
VA3AR	“	1,355,262	1870	73	248
VA3SB	“	983,801	1715	56	191
VE3KP	“	272,935	537	71	150
VE3KIU	“	255,592	734	50	122
VE3MDX	“	104,780	272	51	104
VE3MVM	“	37,664	182	32	75
VE3RIA	“	34,920	194	37	60
VE3EEJ	“	11,607	92	11	42
VE3UXJ	“	4,503	60	26	31
VE3ZI	1.8	91,572	574	17	61
VE3PN	“	45,155	424	13	42
*VE3MIS	A	1,643,295	2062	84	271
		(OP: VA3JK)			
*VA3FF	“	1,082,048	1391	80	239
*VA3OKG	“	689,913	815	83	246
*VE3MA	“	601,086	1072	64	185
*VE3KOT	“	359,968	693	57	167
*VE3OMV	“	268,641	728	53	118
*VE3NFN	“	166,250	400	45	145
*VA3WNO	“	131,355	285	57	132
*VA3DBT	“	91,200	274	48	104
*VA3FN	“	90,400	227	57	103
*VA3HDL	“	80,750	183	55	115
*VE3QO	“	73,920	222	50	90
*VE3EUS	“	73,060	231	40	90
*VE3LC	“	72,668	200	48	100
*VE3IKV	“	64,745	243	31	84
*VA3EON	“	38,796	147	36	70
*VA3KRJ	“	30,184	172	35	63
*VE3SST	“	25,553	109	38	63
*VE3AYR	“	23,622	115	31	62
*VA3PM	“	23,140	102	23	66
*VE3PQ	“	17,064	80	27	52
*VE3VIG	“	15,555	92	32	53
*VE3FAC	“	13,067	78	23	50
*VE3HLS	“	5,643	55	19	38
VE3OT	*“*	*5,280*	*45*	*23*	*37*
*VE3NKL	“	1,372	18	12	16
*VE3TM	21	152,076	521	24	90
*VE3TG	“	128,511	442	24	85
*VE3OSZ	7	24,000	175	16	48
*VE3ADQ	3.5	7,896	91	14	28
*VE3FNT	1.8	64	17	2	2

District 4

VE4IM	A	20,790	125	35	42
*VE4JBB	A	361,928	1189	58	103
*VE4XT	“	29,294	134	42	55
*VE4AKF	“	8,424	93	25	29

District 5

VE5CPU	A	19,691	118	44	53
*VE5UF	A	33,800	147	46	54
*VE5GC	28	6,984	136	11	13

District 6

VE6UM	28	66,727	618	18	35
*VE6WR	A	96,154	326	50	81
*VA6RCN	“	39,818	209	41	45
		(OP: VE3RCN)			
*VE6GK	“	1,872	32	16	20
VE6KK	*“*	*1,590*	*39*	*15*	*15*
*VA6WWW	28	21,420	215	17	28
*VE6IV	“	5,610	68	13	21

District 7

VA7ST	A	945,925	1863	87	154
VA7XU	“	241,930	898	55	75
VA7MG	“	148,004	393	66	97
VA7GI	“	102,340	302	72	98
VA7MM	“	34,416	242	29	43
*VE7VR	A	602,609	1212	84	133
*VE7NI	“	24,990	123	31	54
*VE7AB	“	2,769	32	22	17
*VE7BGP	“	2,760	42	17	13
*VE7GOG	“	2,400	33	19	13
		(OP: VA7QCE)			
*VE7ARN	“	1,925	35	15	10
*VE7BLW	“	1,350	21	13	12
*VE7AF	“	1,020	30	9	8
*VA7ZM	“	558	19	10	8
*VE7XFA	“	60	7	6	4

District 8

*VY1KX	A	17,395	107	33	38

Costa Rica

*N5NU/TI2	A	911,075	1494	78	197
*TI2OY	“	626,045	1387	69	148

Cuba

CO2ER	7	12,600	210	11	29
*CO8NMN	A	1,499,784	2691	72	192
*CM2ARZ	“	3,564	43	15	21
*CO6QK	14	705	37	8	7
*CM3OR	7	2,574	169	10	29
*CO2AN	3.5	77,117	586	14	53
*CO2JD	“	66,898	553	13	49
*CO2RQ	1.8	9,175	183	8	17

Dominican Republic

*HI8A	A	297,621	597	61	158
*HI3Y	28	351,540	1458	25	83

Jamaica

*6Y6N	A	2,638,840	3307	97	273
		(OP: DK9PY)			

Martinique

TO5Z	A	8,092,887	6142	139	430
		(OP: N6GQ)			

Mexico

XE2X	A	5,371,930	4354	143	395
XE1CT	14	324,736	1304	31	87
*XE2S	A	189,069	815	42	65
*XE1AY	“	76,796	616	32	41
*XE2AU	“	52,785	291	39	46
*XE1RE	“	48,764	366	32	41
*XE2T	“	45,371	390	32	27
*XE1O	“	7,381	48	26	35
*XE1AQY	28	12,444	79	22	39

Montserrat

*VP2MJA	A	4,428,456	4466	113	331
		(OP: VA3WB)			

Panama

*HP3SS	7	66,990	501	17	53

Puerto Rico

WP3E	A	10,010	69	30	35
		(OP: KP3B)			
WP4WW	21	557,190	1911	28	95
		(OP: KP4JRS)			
*KP4JFR	A	77,910	208	45	114
*NP3A	28	253,692	1306	23	64
*NP4AW	14	99,970	631	16	49
*NP3YL	7	28,896	288	9	34
*KP4DQC	“	5,495	67	9	26

Sint Maarten

*PJ7/G4JEC	A	458,367	889	55	164
		(OP: NØUK)			
*PJ7PL	“	32	4	2	2

St. Kitts & Nevis

V47T	A	13,330,347	8926	152	481
		(OP: N2NT)			

Turks & Caicos Islands

*VP5M	A	2,640,471	3379	83	256
		(OP: K4QPL)			

US Virgin Islands

KP2M	A	5,145,882	4386	118	365
		(OP: KT3Y)			
NP2J	1.8	101,844	609	18	64
		(OP: K8RF)			

United Nations HQ

*4U1UN	A	1,146,831	1708	71	220
		(OP: KO8SCA)			

AFRICA

Algeria

*7X2GK	A	4,998	50	21	28

Canary Islands

EA8RM	A	14,633,647	8595	148	475
ED8M	“	5,023,926	3597	116	358
		(OP: EA8DIG)			
EA8ZS	“	4,100	40	17	33
EF8BBM	28	989,050	2597	31	100
		(OP: EA4BQ)			
EA8/GU4YOX	7	654,500	1779	31	94
*EA8CN	A	1,180,098	1297	73	245
*EA8BQM	“	386,966	748	55	136
*EA8OM	“	321,000	525	55	159
		(OP: DJ1OJ)			
*EA8AQV	“	89,378	232	41	93
*EA8CYU	“	3,488	39	10	22
*EA8NQ	28	36	5	2	2
*EA8TZ	14	10,604	86	8	36

Cape Verde

D4L	28	1,142,280	2655	34	118
		(OP: IK2NCJ)			

Ceuta & Melilla

*EA9E	1.8	640	14	4	12

Chad

*TT8SN	A	912	16	7	12

Kenya

5Z4VJ	28	667,183	1727	29	102

Madagascar

5R8CG	A	1,507,838	1369	100	294
5R8WP	*“*	*332,085*	*775*	*50*	*119*
		(OP: PA3EWP)			

Madeira Islands

*CT9/DL3KWF	A	177,276	469	25	107
*CT9/DL3KWR	14	57,660	344	13	47

Malawi

7Q6M	28	262,600	908	25	75

Mauritius

*3B8HK	A	1,032	15	10	14

Namibia

*V51YJ	28	24,225	119	19	56

Reunion Island

*FR8UA	21	456,710	1468	25	84

Rodriguez Island

3B9KW	A	7,345,407	4857	134	385
		(OP: MØCFW)			

St. Helena

ZD7BG	A	1,030,500	1400	65	185

The Gambia

*C56DF	7	120,967	543	19	58
		(OP: G3XTT)			

ASIA

Asiatic Russia

District 9

RA9YE	A	227,205	442	73	170
R9LY	“	55,775	204	34	81
RW9USA	“	17,689	125	21	28
*RT9YA	A	407,345	546	87	230
*RA9SN	“	198,440	374	44	161
*R8JAJ	“	142,290	387	46	124
*R9JAP	“	132,111	315	55	134
*RN8C	“	72,562	203	36	106
*RA9W	“	59,340	209	31	98
*RA9AMC	“	43,956	143	26	82
*UA9CHL	“	33,633	128	34	67
*RF9C	“	23,040	103	26	54
		(OP: UA9CIR)			
*UA9OV	“	18,012	84	23	56
*RJ9M	“	15,132	73	22	56
*RX9CC	28	79,790	368	18	61
*RL9L	21	20,962	165	11	36
*RA9AFZ	14	8,362	81	8	29

District Ø

UAØDAR	A	1,300,840	1796	102	238
UAØOK	“	357,840	639	92	192
RCØCD	“	265,398	953	61	117
UAØJF	“	177,792	431	60	132
RWØUM	“	154,386	607	56	106
RØLN	“	6,156	49	24	33
RUØL	“	1,176	19	12	12
RAØACM	“	340	10	8	9
RØAA	28	20,081	169	10	33
*UBØAZR	A	201,894	425	61	148
*RØCBS	“	12,960	112	21	33
*RAØLE	“	870	22	14	15
*RØMZ	28	1,740	28	14	16

Asiatic Turkey

TA2TC	A	39,474	141	24	78
*TA3SA	A	180,950	389	46	129
*TA2L	“	50,050	145	54	100
*TA3DJ	14	46,726	268	14	47
*TA4AU	7	7,622	78	7	30
*TA2UCT	“	880	19	5	11

Azerbaijan

*4K6FO	28	258,000	942	23	77

Bahrain

A92GE	14	23,220	141	14	46

China

BA3MM	A	1,158,784	1749	105	247
BH4BFS	“	326,429	933	70	127
BG6SNJ	“	7,192	46	23	39
BA7NO	28	219,079	961	30	89
BA8CY	“	89,954	536	23	59
BG3ODZ	21	67,027	322	26	71
BI1JNP	“	18,176	153	22	42
BH4WPN	“	5,082	104	14	19
BD7OB	1.8	5,587	83	12	25
*BG2QMO	A	705,104	975	106	241
*BG8DIV	“	680,236	985	93	253
*BD4VGZ	“	571,200	996	82	190
*BI8CZM	“	471,614	717	76	210
*BG7XWF	“	255,672	759	72	129
*BG1WNU	“	230,010	694	87	159
*BH2SWB	“	159,274	465	70	124
*BA6KC	“	155,014	396	52	127
*BG5MVD	“	141,120	321	75	149
*BH3OQQ	“	133,865	356	66	139
*BI4QKE	“	115,840	301	67	114
*BD8FRF	“	113,072	391	68	123
*BA2BA	“	105,777	387	60	101
*BG6QAL	“	88,452	317	58	104
*BH4TYL	“	83,440	287	48	101
*BH6LIG	“	80,262	254	50	97
*BG3KKZ	“	72,364	324	55	103
*BD7BW	“	69,120	396	42	78
*BG7NRG	“	63,960	227	54	110
*BG2LAU	“	60,912	240	54	90
*BG5MWN	“	56,610	183	63	107
*BD6MM	“	49,368	246	53	79
*BD3OD	“	33,536	186	43	88
*BD2IAQ	“	29,344	142	43	69
*BD7JIR	“	8,113	83	28	33
*BD4UN	“	7,410	92	17	40
*BG2KZP	“	4,600	69	21	29
*BA7LCS	“	3,685	66	22	33
*BD4LB	“	2,562	27	18	24
*BG2KAJ	“	1,620	30	14	16
*BH4FNE	“	1,521	30	18	21
*BG2TAA	“	1,100	38	10	15
*BH1XEC	“	624	18	10	14
*BH1TZO	“	330	24	15	15
*BD8ALD	“	325	24	11	14
*BH8PZH	“	154	10	7	7
*BA6QH	“	54	3	3	3
*BG8KVC	28	26,460	208	14	40
*BG8BXM	“	9,900	112	13	32
*BG8FZU	“	9,154	129	18	28
*BD7NQA	“	9,150	88	18	32
*BD4SBH	“	2,156	41	11	17
*BD9AC	“	1,462	56	12	22
*BD8NG	“	1,290	29	13	17
*BG7SSK	21	84,288	399	27	69
*BG8PN	“	72,000	354	27	73
*BI4JCM	“	50,600	258	26	66
*BD7LQM	“	41,958	392	22	52
*BGØATE	“	25,800	198	19	56
*BA3AX	“	21,600	292	18	32
*BH3DAX	“	14,628	169	20	33
*BH4AHC	“	10,175	95	15	40
*BH3DXB	“	5,200	76	17	35
*BH4TIH	“	495	53	6	5
*BI8CCJ	“	364	10	5	8
*BH4LFG	“	285	15	7	8
*BH1APZ	14	16,074	203	18	39
*BH4EEL	“	3,478	60	13	24
*BH1IZQ	“	952	53	8	9
*BG8PC	7	69,030	297	23	67
*BD3MV	“	1,056	40	11	22
*BD7JJQ	“	60	4	3	3
*BA4II	3.5	11,550	215	14	36

Cyprus

C4W	A	5,985,396	4559	114	363
		(OP: 5B4WN)			
5B4AOF	21	81,627	449	20	49
P35A	7	756,069	2148	30	99
		(OP: 5B4AQN)			

Georgia

4L2M	14	586,432	1688	34	102
4L/LY4ZZ	3.5	520,498	1615	28	90
		(OP: LY2BMX)			
4L9M	1.8	153,738	708	16	65
*4L6QL	A	531,852	688	72	210

Hong Kong

VR2CO	A	739,926	1300	90	213
*VR2JM	A	1,995	28	14	21
*VR2VRC	28	10,044	70	15	39

India

VU2TMP	A	167,825	361	45	130
VU2IVV	“	9,576	72	25	47
VU2VTI	7	6,572	103	18	44
*VU3GDS	A	231,175	534	46	129
*VU2JXN	“	52,854	176	41	97
*VU2BQN	“	36,934	112	40	78
*VU3IZJ	“	730	70	28	45
*VU2RS	28	253	11	4	7
*VU2JOS	14	4,674	56	13	28

Israel

4Z5ML	A	247,338	618	43	108
*4Z5MU	28	37,200	180	22	53

Japan

District 1

JQ1ABC	A	1,327,668	1439	128	244
JA1PNA	“	1,037,504	1107	128	249
JH1QDB	“	1,030,770	1054	131	259
JR1IJV	“	770,518	929	114	215
JE1BMJ	“	391,526	487	113	213
JJ1VFE	“	344,793	541	96	167
JH1HIC	“	316,940	502	90	175
JA1QOW	“	259,126	410	78	145
7K4GUR	“	175,266	294	76	158
JH1OLB	“	168,875	392	71	122
JH1FNU	“	135,872	304	66	127
JH1JNJ	“	134,865	291	65	120
JI1CNA	“	123,000	273	77	123
JR1GSE	“	107,756	367	50	74
7K1III	“	107,485	265	68	117
JQ1CIV	“	103,722	225	55	122
JA1CRJ	“	96,701	267	57	92
JE1QHP	“	92,592	243	54	90
JJ1QLT	“	90,636	241	47	109
JG1LHB	“	76,432	224	48	88
JH1LEM	“	75,843	195	61	98
JK1FNL	“	71,052	217	55	69
JH1NXU	“	64,944	219	60	84
JS1NDM	“	57,204	186	57	69
JR1JCB	“	50,750	192	61	84
JI1HNC	“	37,260	126	54	61
JK1HIY	“	33,408	120	32	64
JH1DGJ	“	31,625	103	47	68
7K1JFM	“	25,017	127	39	54
JA1EPJ	“	14,250	94	24	51
JS1DEH	“	12,137	107	26	27
JL1LNC	“	8,379	65	24	33
JL1JJD	“	5,640	46	28	32
JR1WYW	“	3,135	39	16	17
JK1UVL	“	1,482	23	10	16
JL1IVG	“	273	7	6	7
JF1KQI	“	200	10	10	10
JH1HDT	“	195	7	6	7
JR1CAD	“	8	2	2	2
JA1FFB	28	25,438	140	30	49
JF1KML	21	105,092	424	29	65
JR1NHD	“	38,808	195	30	47
JA1CJL	“	26,962	176	22	39
JF1DMY	“	12,060	81	24	36
JE1JNJ	“	11,544	106	17	35
JM1PIH	“	3,180	44	15	15
JG1SRO	“	1,925	29	6	19
JA1MJN	14	1,045	21	6	13
JI1JPJ	7	5,292	48	15	27
JA1FGB	“	2,464	38	13	15
JH1BBT	3.5	15,984	121	24	48
JA1BBC	“	3,404	55	14	23
*JA1BJI	A	1,839,410	1690	145	294
*JI1RXQ	“	1,816,920	1591	145	296
*JS1OYN	“	1,277,815	1294	124	261
*JK1OLT	“	1,203,499	1182	135	272
*JS1KKY	“	638,928	808	102	204
*JM1MTE	“	256,802	407	87	151
*JA1CXC	“	203,700	394	70	140
*JL1EUP	“	156,216	365	77	107
*JJ2JQF/1	“	154,530	314	70	132
*JE1RRK	“	148,420	372	64	117
*JL1QDO	“	121,720	266	67	103
*JF1WNT	“	121,440	290	64	112
*JA1DDZ	“	121,324	301	73	123
*JM1VNJ	“	116,103	257	69	100
*JA1SCE	“	107,184	292	64	104
*JJ1KZZ	“	96,473	213	67	114
*JA1HNW	“	96,446	260	62	104
*JO1VVT	“	91,584	254	55	104
*JA8KSW/1	“	86,036	266	58	99
*JK1BVN	“	84,952	236	64	100
*JK1JAS	“	79,695	193	61	104
*JJ1JVC	“	76,440	200	50	80
*JL1QQA	“	75,768	232	58	96
*JH1DJD	“	75,509	220	64	97
*JE1GWO	“	67,626	172	60	93
*JR1AQI	“	65,988	228	50	67
*JJ1GXY	“	63,492	193	69	87
*JK1EVU	“	57,200	224	53	90
*7M3LDC	“	50,546	167	54	73
*7L3KJV	“	46,928	163	47	65
*JR1LEV	“	46,116	229	39	69
*JK1VMC	“	41,055	149	43	72
*JH1UES	“	40,832	154	43	73
*JH1GNU	“	37,674	139	37	80
*JF1HAJ	“	34,650	160	43	56
*JH1HMC	“	32,076	156	42	57
*JK1JCE	“	31,560	139	54	66
*JJ1XTG	“	30,090	133	37	65
*JM1KNI	“	29,680	132	50	56
*JA1IE	“	27,552	134	42	70
*JJ1XNF	“	24,795	122	40	47
*JL1FAR	“	20,925	89	35	58
*JA1WQX	“	20,839	107	37	54
*JS1BXH	“	20,739	107	38	55
*JO1PZR	“	19,635	91	32	53
*JQ1GLJ	“	19,095	101	43	52
*JL1GPG	“	18,260	94	33	50
*JP1LRT	“	18,177	99	26	47
*JA1UOA	“	17,550	91	38	52
*JK1FNN	“	17,064	96	32	47
*JJ1NRL	“	16,168	92	35	51
*JL1EUF	“	13,600	122	34	46
*JG1SWV	“	13,454	85	19	43
*JN1KMI	“	13,167	81	27	36
*JH1TJH	“	12,638	76	33	38
*JL1LOF	“	8,120	69	24	32
*JA1EMQ	“	8,094	67	23	34
*JQ1PCT	“	7,644	59	23	29
*JN1FAO	“	7,125	73	26	31
*JM1BNF	“	6,466	48	23	30
*JA3GZE/1	“	6,174	58	21	28
*7K1PYG	“	5,888	64	23	23
*JK1AZD	“	4,482	39	23	31
*JA1WHG	“	4,480	52	26	30
*JJ1IVX	“	4,403	41	16	21
*JP1JZR	“	4,002	39	23	23
*JG1UQD	“	3,795	60	26	29
*JF1OPO	“	3,515	37	16	21
*JH1GTU	“	3,150	37	19	23
*JH1NLF	“	3,115	47	16	19
*JK1BGV	“	3,030	35	16	14
*JK1DVP	“	2,926	49	11	11
*JI1XKH	“	2,550	35	17	17
*JI1LAI	“	1,682	23	12	17
*JA1AGH	“	1,624	32	12	17
JM1TAL	*“*	*1,400*	*26*	*11*	*14*
*JN1KWR	“	1,375	25	13	12
*JAØIND/1	“	1,224	21	11	13
*JH1SAR	“	1,134	28	11	10
*JJ1FWH	“	500	17	10	10
*JG1LMT	“	450	25	14	16
*JE1WBA	“	224	8	7	7
*JI1BHO	“	171	7	5	4
*JN1VFV	“	39	10	6	7
*JE1HXZ	“	24	2	2	2
*JG1CRM	“	16	2	2	2
*JJ1LBJ	28	92,928	394	32	64
*JG1TVK	“	41,029	182	32	57
*JM1SMY	“	29,068	151	31	55
*JJ1CBY	“	24,388	154	24	43
*JI1BBN	“	22,572	153	25	41
*JK1CNL	“	6,776	113	21	35
*JH1HLC	“	6,540	57	26	34
*JR1AKD	“	5,808	53	20	28
*7N2JZT	“	816	17	8	9
*JA1AVI/1	“	90	16	2	1
*7K4XNN	21	169,566	577	34	84
*JJ1ENZ	“	57,715	243	32	65
*JH1KYA	“	38,720	205	26	54
*JG1UKW	“	38,720	201	26	54
*JK1NSR	“	23,940	158	27	49
*JE1JAC	“	14,700	109	20	40
*JH1JJV	“	10,384	96	17	27
*JH1VIX	“	10,011	79	17	30
*JO1KTD	“	8,977	93	18	29
*JO1WIZ	“	4,935	45	16	31
*JJ1BDX	“	2,700	45	11	14
*JA1RYC	“	2,212	48	11	17
*JA1DBG	“	1,425	30	11	14
*JA1LKY	“	936	28	9	9
*JQ1VDJ	“	828	14	10	13
*JK1XAY	“	714	12	9	12
*7K3OZQ	“	680	26	8	9
*JP1EHC	“	672	12	9	12
*7N2CQS	“	448	12	7	7
*7K4TKB	“	242	8	4	7
*JH1OJV	“	150	5	5	5
*JH1BCS	“	56	6	2	2
*JO1JKH	“	4	2	1	1
*JF1TEU	14	28,397	152	24	49
*JA1BFN	“	20,727	143	22	41
*JF1CKO	“	9,790	66	19	36
*7K1EQG	“	4,640	54	12	28
*7K3CZU	“	1,404	22	8	18
*JR1DVB	“	629	15	5	12
*JN1ECL	“	209	7	4	7
*JE1GZB	“	180	14	5	5
*JH1CFV	“	120	5	3	5
*JM1LFA	7	10,404	90	16	35
*JF1VVR	“	1,420	25	5	15
*JF1GZZ	“	154	8	5	6
*JK1VGN	“	133	7	4	3
*JK1EAQ	“	4	2	1	1
*JA1RXC	“	4	2	1	1
*JP1GUW	3.5	5,796	72	18	24

*JA1SKE	“	4,200	52	15	25
***JE1SPY**	1.8	924	41	10	12

District 2

JF2QNM	A	2,183,103	2060	142	281
JA2AXB	“	718,984	846	117	230
JR2PMT	“	545,566	708	94	199
JE2BOM	“	284,580	426	88	167
JA2VHO	“	222,500	498	64	114
JR2UBS	“	81,216	173	73	119
JS2IMR	“	57,216	187	48	80
JF2FIU	“	45,195	190	52	63
JE2GUV	“	30,591	119	40	63
JA2DHF	“	28,496	124	40	64
JA2JWH	“	18,232	88	41	45
JR2PAU	“	10,736	78	29	32
JF2CTS	“	5,035	43	24	29
JA2VQF	*“*	*736*	*16*	*12*	*11*
JH2KKW	28	21,045	138	24	45
JR2PZX	“	13,617	117	21	30
		(OP: JR2ADB)			
JR2IOB	21	232,024	883	32	72
		(OP: JA1KFX)			
JE2PCY	“	70,818	348	25	62
JR2SCJ	14	343,560	946	34	106
JH2GZY	“	54	3	3	3
JE2OTM	3.5	4,700	61	15	32
***7K1MAG/2**	A	327,294	526	89	172
*JA2FXV	“	288,288	477	94	158
*JG2RFJ	“	235,872	413	75	149
*JA2GHP	“	159,600	351	65	125
*JR2NMJ	“	116,928	250	64	110
*JA2KPW	“	109,880	294	63	101
*JH2RIH	“	86,240	208	57	103
*JM2LEI	“	83,898	206	56	102
*JF2SKV	“	83,752	252	62	90
*JP2XYT	“	69,641	197	54	89
*JA2QVP	“	54,280	172	47	71
*JH2MYN	“	39,728	144	47	57
*JS2BGJ	“	18,130	101	27	47
*JE2DOD	“	7,155	65	19	26
*JS2AZO	“	5,880	60	21	28
*JA2IFW	“	4,700	40	21	26
*JS2ITI	“	3,182	32	16	27
*JI2IWN	“	2,808	56	23	29
*JI2IXA	“	1,612	30	13	13
*JR2UQU	“	1,458	28	11	16
*JJ2JCM	“	800	18	11	14
*JO2XYK	“	391	15	9	8
*JA2YBG	“	96	11	7	9
		(OP: JS2IHX)			
*JL2TAW	“	42	3	3	3
***JA2KKA**	28	22,382	146	26	36
*JE2HCJ	“	19,516	114	24	44
*JA2HZA	“	13,452	101	24	33
*JR2TRC	“	1,624	36	14	15
*JL2XMW	“	1,239	23	7	14
***JF2KWM**	21	15,624	99	19	43
*JA2OZM	“	10,400	104	17	33
*JR2NTC	“	2,870	43	13	22
*JF2NLH	“	2,190	29	11	19
*JQ2XVY	“	6	1	1	1
***JF2WXS**	7	2,479	31	12	25
***JG2VSF**	1.8	3	2	1	2

District 3

JH3CUL	A	1,422,834	1456	119	280
JQ3ALW	“	597,849	721	115	228
		(OP: JH1TXG)			
JG3LGD	“	339,824	491	96	172
JR3NZC	“	322,991	719	66	107
JA3IBU	“	280,592	490	78	169
JR3BOT	*“*	*228,660*	*394*	*78*	*144*
JR3KQJ	“	203,400	395	81	119
JA3AVO	“	192,465	383	69	126
JF3KCH	“	77,625	279	51	84
JO3OEF	“	77,028	227	53	94
JA3KKE	“	74,543	207	56	105
JR3XUH	“	27,700	109	39	61
JA3LIL	“	11,712	89	22	42
JR3UIC	“	5,841	59	28	31
JG3KMT	“	4,732	41	21	31
JA3XOG	28	43,152	195	30	57
JA3BXF	“	29,410	164	30	55
JA3EGE	“	9,660	94	23	37
JL3DQX	21	12	2	1	1
JA3GOJ	14	500	12	9	11
JH3FUK	7	78,624	251	35	82
JA3IKG	“	30,342	141	24	54
JE3VRJ	“	8,820	88	18	31
***JL3MCM**	A	535,534	642	105	218
*JA3JM	“	211,560	421	74	141
*JJ3TBB	“	191,135	375	76	139
*JA3NUT	“	95,748	264	57	101
*JS3EOE	“	79,056	224	55	107
*JJ3QJI	“	78,966	248	49	74
*JA3VQW	“	71,685	213	49	86
*JQ3BAV	“	45,195	167	43	72
*JO3QVT	“	15,840	76	31	49
*JJ3IUS	“	12,627	71	31	38
*JO3JYE	“	7,740	87	18	18
*JF3RLV	“	6,240	46	25	35
*JA3PFY	“	4,416	46	20	26
*JE3OUU	“	2,728	44	19	25
*JK3OTH	“	2,242	47	18	20
*JG3EHD	“	420	10	5	9
***JE3EDJ**	28	62,192	221	33	71
*JA3RAZ	“	3,672	62	19	32
***JR3EOI**	21	231,894	786	33	84
*JF3IYW	“	81,189	341	31	66
*JF3PLF	“	50,406	301	20	42
*JA3JRI	“	21,450	143	23	43
*JH3RGD	“	12,446	110	18	31
*JR3XEX	“	10,150	104	20	30
*JA3MQY	“	8,064	66	14	34
*JA3DAY	“	5,040	62	12	23
*JG2CNS/3	“	2,208	39	13	19
*JF3QJR	“	325	13	5	8
***JG3XDR**	14	7,544	66	15	31
*JE3EVI	“	3,300	42	13	20
*JH3FTZ	“	2,146	36	9	20
***JR3OYH**	7	741	19	9	10
*JQ3BVC	“	336	15	7	7
*JF3ROH	“	168	7	4	4

Japan - District 4

JH4UYB	A	4,296,240	3154	152	368
JH4MTE	“	123,750	257	70	128
JA4VNE	“	42,837	167	42	67
JA4EZP	“	8,976	50	26	42
JA4BEV	“	728	18	12	14
JE4JPQ	7	4,727	59	10	19
JL4DJM	1.8	1,071	28	8	13
***JE4MHL**	A	1,049,522	1073	127	262
*JI4WHS	“	177,576	380	68	128
*JH1MTR/4	“	170,560	328	72	133
*JA4JLT	“	70,680	287	56	99
*JA4YPE	“	53,856	162	58	86
		(OP: JM1QPR)			
*JA4LCI	“	30,281	120	43	64
*JR4DTG	“	29,648	118	50	59
*JE4FNC	“	17,172	92	32	49
*JA4VPS	“	12,159	91	30	33
*JA4GQD	“	8,260	79	33	37
*JK4HNN	“	1,856	34	14	18
***JO4JFH**	21	1,650	25	4	18
*JH4PUS	“	1,525	23	10	15
***JH4FUF**	7	230	9	5	5
***JE4URN**	3.5	48	4	3	3

District 5

JA5RB	A	13,650	110	27	38
JA5OXV	“	1,947	27	15	18
JA5JGV	28	7,638	63	23	34
JA5DQH	21	572,040	1507	34	106
***JG5DHX**	A	352,716	556	74	173
*JE5HTN	“	100,170	276	57	102
*JA5CBU	“	47,300	189	33	67
*JA5SUD	“	29,380	117	42	71
*JJ5NFT	“	16,512	152	35	61
*JJ5RAX	“	12,000	86	24	36
*JJ5QLV	“	182	8	7	6
***JA5CDL**	14	45,675	250	28	59

District 6

JA6BZI	A	1,408,008	1124	145	331
JA6FFK	“	332,241	497	92	181
JE6WGT	“	245,456	449	77	155
JR6CSY	“	157,368	363	56	110
JA6BWH	“	80,828	221	64	103
JH6WDG	“	75,396	263	28	75
JA6FFO	“	42,693	153	46	87
JA6HZN	“	13,248	73	23	41
JH6TNH	“	12,879	63	33	48
JA6CRP	“	9,306	63	28	38
JS6TSE	28	495,992	1386	36	100
		(OP: JM1UWB)			
JA6LCJ	14	255,084	841	30	86
JA6SHL	7	406,575	1299	33	84
JH6QFJ	1.8	544	20	8	9
***JE6LZN**	A	101,188	237	60	104
*JA6CVR	“	89,760	238	65	100
*JO6NZN	“	80,712	209	60	92
*JH6EXF	“	26,663	109	25	66
*JE6TUP	“	21,736	103	33	55
*JA6IQG	“	16,849	81	31	52
*JF6KKC	“	14,790	107	23	35
*JE6JZP	“	7,701	60	21	30
*JH6JBQ	“	3,504	45	17	31
*JR6QXL	“	1,829	23	16	15
*JK6JAB	“	77	11	5	6
***JH6WHN**	28	131,328	481	31	77
*JA6CDC	“	192	6	6	6
***JA6WFM**	21	237,060	831	31	77
*JF6ABL	“	55,752	247	26	66
*JR6KBF	“	18,216	119	22	44
*JA6BCV	“	15,930	98	19	40
*JA6HMO	“	2,190	29	9	21
***JG1FGL/6**	14	270	14	5	10
***JA6ELV**	7	29,850	156	22	53
***JH6NBW**	3.5	946	27	9	13

District 7

JA7NVF	A	834,240	1116	107	213
JA7UES	“	214,404	404	75	129
JA7AUM	“	126,075	251	76	129
JM7SKE	“	124,080	342	67	121
JM7OLW	“	97,277	412	46	43
JP7SOZ	“	27,145	123	39	50
JJ7PMS	“	7,440	58	28	32
JA7IC	“	1,368	34	9	9
JA7MAD	21	99,789	368	33	78
JA7FTR	14	458,234	1267	37	105
JA7MYQ	“	108,870	354	28	86
JA7KQC	1.8	1,932	37	11	17
JH7BDS	“	28	5	2	2
***JH7QXJ**	A	817,491	1189	91	178
*JA7BEW	“	234,014	430	89	153
*JR7HAN	“	168,468	340	76	126
*JH7IXX	“	123,176	334	67	111
*JK7UST	“	27,285	127	29	56
*JF7GDF	“	19,656	117	31	32
*JR7ASO	“	11,050	76	27	38
*JE7SRK	“	10,764	60	31	38
*JM7GTK	“	1,596	22	17	21
*JR7BVQ	“	1,484	23	14	14
*JK7BEJ	“	920	19	10	10
***JE7KJG**	21	24,633	145	22	47
*JA7RPC	“	11,130	94	18	35
*JF7VVL	“	3,648	43	15	17
*JI7OED/7	“	2,816	52	11	11
*JP7GRU	“	28	3	2	2
*JP7BCL	“	18	2	2	1
***JH7IQQ**	14	32,560	181	26	54
*JA7LLL	“	26,754	148	25	53
*JR7ANB	“	15,930	101	18	41
*JL7LUI	“	372	11	4	8
***JA7KPI**	1.8	1,518	58	10	13

District 8

JA8RUZ	A	79,200	195	75	105
JA8NRS	“	31,296	144	39	57
JG8TDZ	28	12,060	88	24	43
JA8DNV	3.5	16,240	130	27	53
***JA8RWU**	A	427,750	627	108	187
*JR8NOD	“	385,944	561	114	198
*JM8LND	“	353,100	547	91	184
*JA8CXY	“	229,278	451	80	126
*JK8PBO	“	75,175	216	62	93
*JM8PSY	“	34,944	164	46	58
*JM8RWJ	“	8,957	72	23	30
*JE8UHY	“	5,334	67	16	26
*JR8WOW	“	1,372	20	13	15
*JM8ONP	“	1,173	19	9	14
***JE8IAS**	28	15,750	134	25	45
***JH8RXM**	21	28,656	182	25	47
*JH8DHV	“	23,430	150	23	43
*JR8QFG	“	19,976	164	16	28
*JM8SMO	“	15,903	117	23	34
*JH8DBI	“	5,712	52	15	27
***JG8NKJ**	14	12,958	90	19	43
*JA8HBO	“	9,612	94	19	35
***JK8NIP**	7	2,322	35	13	14

District 9

JA9CWJ	A	815,594	956	107	231
JA9CCG	“	35,175	158	43	62
JH9FCP	“	4,386	52	19	24
JA9LNZ	28	1,281	27	11	10
JH9CEN	7	5,986	64	17	24
JF9QCK	“	5,332	55	17	26
		(OP: JH7UJR)			
JA9FAI	3.5	7,020	72	21	31
JA9FHB	1.8	140	8	5	5
***JA9ILH**	A	238,750	375	85	165
*JA9LX	“	111,012	278	62	112
*JA9VOK	“	35,728	137	46	66
*JA9EJG	“	11,760	79	28	32
*JA9DOF	“	99	5	4	5
***JA9FFS**	28	31,833	159	30	51
*JA9XAT	“	180	10	4	5

District Ø

JIØVWL	A	1,666,132	1910	124	234
JHØILL	“	368,300	661	87	167
JJØPJD	“	266,915	405	93	160
JAØIOF	“	160,550	364	71	119
JJØUIF	“	20,250	102	26	49
JJØVNR	7	566,568	1606	34	95
JHØNOS	3.5	6,785	93	23	36
***JAØMOQ**	A	77,356	246	60	106
*JRØECQ	“	64,801	223	53	84
*JAØBJY	“	47,300	170	45	65
*JAØBZY	“	27,720	106	35	64
*JJØTWX	“	13,050	95	22	36
*JAØRCK	“	7,236	44	27	40
*JHØCCK	“	4,142	39	14	24
*JJØTIY	“	2,850	31	18	20
*JFØIUN	“	621	13	12	11
***JHØDAY**	28	10,382	69	25	33
***JHØEPI**	14	112,700	444	30	68
*JIØWVQ	“	5,635	66	12	23
***JRØBQD**	7	69,445	293	30	65

Kazakhstan

UN7ZW	3.5	518	31	7	7
***UN7CAW**	A	111,518	328	35	102
*UN7QF	“	15,738	107	18	43
*UN1EAU	“	9,048	60	31	47
***UN7GF**	28	55,200	418	17	52
*UN7ZZ	“	35,872	205	16	60
*UNØC	“	12,600	68	17	58
***UN7CN**	21	62,190	294	24	66

Kyrgyzstan

*EXØM	28	56,562	343	14	52

Mongolia

*JT5DX	A	123,255	336	51	114
		(OP: JT1CO)			
*JT1CD	“	42,312	345	27	59

Nepal

9N7AA	A	2,500,592	2788	94	279
		(OP: S53R)			

Republic of Korea

DS4EOI	A	1,969,034	2495	104	249
HL2BQG	“	1,156,848	1987	93	220
HL2WA	“	1,115,850	1226	127	303
HL2ZN	“	177,246	375	95	163
HL5BCH	“	33,376	132	40	72
HL4CEL	“	26,244	365	34	47
HL2EIZ	“	14,235	75	30	43
HL2KV	“	7,728	73	20	28
HL2AHL	“	2,704	50	25	27
HL5IVL	1.8	24,360	253	16	42
DS2JJV	“	1,400	105	6	8
***HL2CFY**	A	245,700	457	88	164
*HL2IDT	“	94,705	280	55	100
*DS5VTG	“	84,322	246	46	87
*HL5FEI	“	31,892	132	55	79
*HL1IWD	“	14,539	100	21	46
*HL2ASZ	“	837	23	14	17
***HL1VAU**	21	106,808	446	27	77
***6K2EGQ**	14	1,360	144	5	5
***HL3AMO**	3.5	9,168	132	17	31

Saudi Arabia

*HZ7C	28	213,226	566	34	105
		(OP: 7Z1SJ)			

Taiwan

***BU2EO**	A	343,958	1046	76	153
***BU2GA**	21	98,118	734	26	53

Tajikistan

*EY7BJ	A	492,352	1024	47	149

Thailand

HSØZNV	A	41,440	184	36	76
HSØZME	“	40,744	271	29	59
		(OP: SM6NT)			
***E2ØWUE**	A	70,022	207	55	102
*E2ØMWE	“	25,312	124	44	69
*HS8KGG	“	7,336	75	22	34
*HS5SOV	“	2,310	40	14	19
*HSØZOK	“	2,072	55	17	20
***E25CRF**	28	78,925	610	20	57
*HS5TXB	“	6,392	58	14	33
*HS5ZLD	“	195	11	6	7
***HS8JYX**	21	13,048	125	17	39
***HS5AES**	14	13,000	124	17	35
***E22HBS**	7	1,890	41	14	21

United Arab Emirates

*A65DF	A	127,374	268	58	155

Uzbekistan

UK7AL	A	428,910	677	65	190
***UK8IQ**	A	426,404	777	58	184

Vietnam

3W3B	A	24,244	98	42	74
***XV9NPS**	A	246,164	689	42	116

West Malaysia

***9M2CIF**	A	1,632	47	15	17
***9M2HUS**	7	224	12	7	9

EUROPE

Aland Islands

OHØZ	A	3,143,880	3455	138	430
		(OP: OH6EI)			

Albania

***ZA1ME**	A	108,353	526	32	129
*ZA1EM	“	66,444	635	22	91
*ZA1F	“	51,072	300	30	84
***ZA1AK**	14	968	30	7	15

Austria

OE3BKC	A	27,552	150	42	70
OE6V	3.5	71,040	829	12	62
		(OP: OE6JXA)			
***OE1CIW**	A	406,890	928	73	224
*OE5CYL	“	289,926	668	66	207
*OE5FDM	“	82,832	229	59	108
*OE3NHW	“	46,650	171	47	103
*OE5HIL	“	13,860	67	39	45
*OE5WEO	“	2,080	56	9	31
*OE1VMC	“	216	14	6	12
***OE2UKL**	28	25,392	142	25	44
*OE9WLJ	“	4,929	71	12	19
***OE1OPW**	21	16,448	119	20	44
***OE7AFT**	7	27,436	202	16	60
*OE7MOP	“	10,088	100	13	39

Azores

CU9AB	A	11,346	95	25	37
***CU2ZG**	A	5,103	59	25	38

Balearic Islands

EF6T	A	9,008,166	8382	150	439
		(OP: EA3M)			
EA6NB	“	219,120	690	40	136
***EA6ZS**	A	29,232	169	28	84
***EA6A**	14	5,760	64	13	35

Belarus

EU4E	A	2,421,108	2265	148	469
EW1I	“	1,594,695	1364	141	474
EU4CK	“	311,976	805	70	182
EW3LN	“	143,220	393	67	153
EU1ST	“	134,190	454	55	158
*EV6Z	A	406,355	755	83	252
*EU8N	“	266,552	608	75	211
*EW1NM	“	71,991	298	44	127
*EW1AFM	28	288	15	5	11
*EU8U	21	369,895	1296	33	112
*EW8AX	“	153,794	595	32	99
*EW1TO	“	57,970	351	23	62
*EW1TZ	14	174,432	717	33	105
*EW1EA	7	21,868	226	16	55
*EW1FM	“	3,854	74	6	35

Belgium

*ON4CT	A	1,082,760	1512	111	309
*ON6LO	“	63,940	385	29	110
*ON4CBA	“	29,312	159	38	90
*ON8WR	“	28,125	164	26	49
*ON4LY	“	18,445	112	28	57
*ON3UN	“	8,346	68	26	52
***ON4ABW**	28	6,110	85	18	29
***ON3PAT**	14	130,416	606	28	86
*ON3ND	“	4,418	64	11	36
***ON5IA**	7	588	28	4	17
***ON5WL**	3.5	12,549	252	9	38

Bosnia-Herzegovina

E74FRS	14	253,658	1116	28	78
		(OP: E71A)			
***E72U**	A	331,296	723	59	173
*E7/Z35M	“	234,192	867	50	188
*E77CFG	“	20,825	217	22	63
*E78CB	“	2,886	32	19	20
***E73AK**	21	6,426	73	13	29
***E77O**	7	27,621	208	18	63
***E77BW**	3.5	50,504	719	9	50

Bulgaria

LZ7J	A	940,005	1531	97	308
		(OP: LZ1CI)			
LZ1HW	“	443,051	691	91	288
LZ1RW	“	162,792	594	42	110
LZ1KIS	“	132,260	544	43	127
LZ1GE	“	101,074	372	46	148
LZ7M	7	93,960	589	22	68
		(OP: LZ5VK)			
LZ3V	“	1,881	50	8	25
LZ5XQ	3.5	70,200	736	15	60
***LZ3QE**	A	658,080	1257	91	269
*LZ1VKD	“	480,036	941	74	253
*LZ5Y	“	211,060	616	60	184
*LZ1IQ	“	141,980	395	67	162
*LZ2CH	“	122,760	504	37	128
*LZ3AW	“	91,932	351	42	121
*LZ1WF	“	66,220	242	51	121
*LZ3ZQ	“	43,990	157	45	121
*LZ5PL	“	37,506	243	35	106
*LZ1KZ	“	33,939	135	37	94
*LZ1NYK	“	18,142	126	31	63
*LZ1BY	“	4,617	75	18	39
*LZ2JE	“	4,459	58	13	36
*LZ5GM	“	2,135	28	16	19
*LZ7VM	“	42	3	3	3
***LZ4TX**	28	236,880	789	31	113
*LZ6T	“	44,912	176	32	80
		(OP: LZ2JA)			
*LZ2GS	“	14,539	122	20	47
*LZ1DQ	“	10,260	104	18	39
*LZ1IA	“	9,400	103	20	30
***LZ2PS**	14	51,200	320	26	74
***LZ1BP**	7	103,014	527	29	89
*LZ2SQ	“	1,000	29	10	15
***LZ3SF**	3.5	6	1	1	1

Croatia

9A2AJ	A	3,342,054	2824	151	502
9A3EZ	“	61,341	295	30	97
9A1VV	7	33,535	174	25	70
***9A1AA**	A	1,748,028	1997	121	387
*9A3SM	“	516,750	689	97	293
*9A6RT	“	235,554	531	62	187
*9A3NC	“	47,558	218	43	115
*9A2M	“	23,229	127	26	61
*9A3BCW	“	6,132	102	25	59
***9A3TU**	28	21,120	138	23	41
*9A2VX	“	1,127	18	9	14
***9A9XX**	14	28,950	242	16	59
*9A5ST	“	26,036	173	24	68
*9A2IK	“	1,247	25	11	18
***9A2MF**	7	22,288	278	11	45
***9A9CW**	1.8	6,235	157	5	38

Czech Republic

OK2EA	A	882,112	1617	81	277
OK1EP	“	436,847	652	95	294
OK1OA	“	387,144	806	66	217
OK2ZDL	“	345,886	591	81	245
OK1KTI	“	182,528	411	80	176
		(OP: OK1ATQ)			
OK1AWC	“	179,765	401	63	166
OK1FU	“	63,450	230	46	95
OK1XC	28	80,156	360	31	85
OK1FZM	“	7,350	55	20	29
OK2FQZ	21	3,366	55	15	19
OK1AMF	14	109,109	382	35	108
OK1Z	7	791,700	2601	34	111
OK1TN	3.5	118,141	966	20	83
OK4U	1.8	36,167	700	12	47
		(OP: OK1TP)			
OK1DWF	“	14,450	294	9	41
OK1DW	“	1,053	17	10	17
***OK2MBP**	A	1,324,008	1841	100	344
*OK1MDK	“	606,498	1025	84	289
*OK1DKR	“	538,020	824	90	276
*OK2QX	“	455,794	966	88	261
*OK1NS	“	408,003	964	76	231
*OL2A	“	342,360	702	69	201
		(OP: OK2PEM)			
*OK2EC	“	298,287	682	64	189
*OK1MKH	“	286,688	570	82	207
*OK1HCG	“	285,978	1055	49	182
*OK1HEH	“	277,535	827	51	184
*OK2ABU	“	243,270	691	58	197
*OK2HBY	“	230,994	616	63	183
*OK1AGE	“	225,616	723	58	181
*OK1DVA	“	205,686	545	62	172
*OK1FRO	“	202,884	673	41	171
*OK1DKU	“	201,488	763	39	157
*OK2BLD	“	116,594	395	49	145
*OK5Y	“	110,160	587	33	137
		(OP: OK1RH)			
*OK2BJ	“	104,448	228	77	115
*OK1UKY	“	100,620	401	41	131
*OK2GU	“	98,085	428	40	155
*OK5SA	“	87,669	298	50	141
*OK2PDK	“	81,968	336	56	132
*OK1ES	“	68,544	208	55	89
*OK1DKE	“	65,871	313	39	78
*OK1AUO	“	63,474	217	46	96
*OK2SGY	“	52,955	251	37	82
*OK2BRV	“	51,678	265	40	122
*OK1PFM	“	39,285	180	39	96
*OK2DIK	“	36,540	170	35	49
*OK2BRS	“	35,392	204	29	83
*OK2IW	“	30,210	274	23	91
*OK2VK	“	29,274	162	34	68
*OK1FCA	“	22,560	160	27	67
*OK1MAW	“	17,160	96	28	32
*OK8KM	“	16,377	143	24	79
*OK1GS	“	15,850	119	22	28
*OK2CDR	“	15,580	144	24	71
*OK2BND	“	14,359	144	16	67
*OK2BRQ	“	13,585	166	21	74
*OK1WSL	“	8,712	116	19	53
*OK1DSX	“	6,231	45	31	36
*OK1TVL	“	4,399	65	15	38
*OK2WX	“	3,280	45	16	25
**OK2PIP*	*“*	*2,352*	*38*	*17*	*25*
*OK2SWD	“	1,147	35	11	20
*OK1MKD	“	420	91	20	40
***OK1FHD**	21	15,180	132	16	39
***OK1FUK**	14	17,334	188	11	43
*OK1JDJ	“	8,614	102	12	47
*OK1FIA	“	2,665	41	12	29
***OK2HBR**	7	92,926	663	23	74
*OK6N	“	44,239	300	18	65
		(OP: OK2PTS)			
*OK2DN	“	32,526	303	17	61
*OK1DRX	“	23,380	170	19	51
*OK1MZB	“	14,079	215	11	46
*OK1MMN	“	12,626	115	13	46
***OK5D**	3.5	135,072	1165	18	78
		(OP: OK1DTP)			
*OL5J	“	77,120	883	14	66
		(OP: OK1RZ)			
*OK7T	“	11,086	223	8	38
		(OP: OK1FHI)			
*OK1GSB	“	9,570	151	9	46
*OK1FOG	“	7,072	84	9	43
***OK1MNW**	1.8	19,719	287	10	53

Denmark

OZ7YL	A	18,700	160	27	73
***OZ8AE**	A	772,800	1098	101	319
*OZ5UR	“	236,872	647	59	173
*OZ1TJ	“	101,388	373	52	161
*OZ6AGX	“	93,215	331	47	134
*OZ1DAE	“	31,980	184	36	94
*OZ5DX	“	4,032	42	14	18
*OZ1THC	“	432	20	7	17
*OZ2JI	“	128	8	8	8
***OZ6TL**	7	36,288	411	17	55
*OZ7AEI	“	6,300	131	7	38

England

G9W	A	6,439,264	5026	152	446
		(OP: MØDXR)			
M5DX	“	2,333,096	2663	115	357
		(OP: G4FAL)			
G3RWF	“	799,141	1264	86	261
G2E	“	602,992	1109	84	254
G4FKA	“	431,244	848	64	178
G3ZGC	“	343,392	728	70	222
G1SCT	“	329,640	718	64	204
G3T	“	178,596	524	47	151
		(OP: G3VGZ)			
G4DBI	“	19,635	199	32	87
G4HZV	28	30,368	164	22	51
G4DYC	“	14,464	98	22	42
M1B	“	3,959	48	14	23
G9D	21	15,158	131	14	39
		(OP: G6NHU)			
G4FNL	3.5	258,520	1610	23	92
GØHVQ	“	26,466	310	14	52
M6N	1.8	3,655	80	7	36
		(OP: MØNPK)			
***MØXUU**	A	495,320	1023	68	237
*2EØCVN	“	493,770	1135	73	229
*G4DDL	“	450,561	934	70	233
*MØRYB	“	323,904	860	56	185
*MØURL	“	244,200	670	56	166
*G3VYI	“	192,474	522	55	167
*G4EBK	“	180,404	514	55	183
*M4X	“	93,982	302	42	95
		(OP: G3SZU)			
*G4POF	“	92,916	311	42	136
*G4FEV	“	82,998	307	46	128
*G4CXQ	“	81,750	334	34	91
*G3SVK	“	63,680	229	57	103
*MØMQV	“	60,634	246	34	108
*G5C	“	59,364	301	34	119
		(OP: G4OGB)			
*MØSDB	“	46,400	251	38	107
*MØCVO	“	46,011	303	34	113
*G4SDX	“	42,108	200	32	84

*M3X	“	36,654	205	32	91
			(OP: MØIHT)		
*G3SQU	“	35,360	161	33	52
*G4NKT	“	34,874	192	29	77
*G5DXC	“	30,260	161	31	58
			(OP: MØCTP)		
*G3NKS	“	27,120	173	28	85
*G4BEE	“	26,676	156	31	83
*G3XTZ	“	25,970	144	34	64
*GØJOS	“	21,756	146	32	66
*G4EBY	“	21,364	168	22	87
*G3WRR	“	17,864	105	32	56
*GØATG	“	14,416	106	20	48
*2EØOBO	“	7,560	99	13	50
*MØMUI	“	1,920	58	6	24
*MØIDL	“	1,488	37	7	9
*G4YRF	“	703	41	8	11
***GØORY**	**28**	**35,490**	**216**	**21**	**49**
*G3MOT	“	23,142	167	17	41
*GØOOR	“	5,076	52	18	29
***G4C**	**14**	**42,480**	**353**	**19**	**53**
			(OP: GØIBN)		
*GØTKZ	“	29,580	213	21	66
*G4WGE	“	27,654	294	14	52
*M2U	“	26,730	287	14	52
			(OP: MØDHP)		
*MØPLA	“	3,400	75	8	32
*M5P	“	644	22	7	16
			(OP: M5BIR)		
*MØKNG	“	72	6	4	5
***G4RMV**	**7**	**6,030**	**90**	**11**	**34**
***G3TJE**	**3.5**	**3,080**	**68**	**6**	**34**
***MØNDZ**	**1.8**	**17,700**	**275**	**11**	**49**

Estonia

***ES1OX**	**3.5**	**15,939**	**309**	**10**	**53**

European Russia

District 1

RT1L	A	103,550	294	63	155
RU1QD	“	69,795	397	35	130
RW1AI	“	399	13	8	11
*R1QE	A	84,303	441	36	135
*R1ZM	“	50,920	246	38	114
*UC1A	“	27,625	184	31	94
*RT1I	“	20,301	146	36	65
*RN1AO	“	14,784	90	32	64
*R1IV	“	6,760	101	14	51
*RN1CW	“	3,780	30	25	29
*RV1AQ	“	3,600	36	19	29
*R1LN	“	3,431	43	16	31
*UA1D	“	3,294	44	25	36
*R1BC	“	1,650	20	14	19
*RK1F	“	529	14	11	12
*R1AT	14	5,104	92	10	34

District 3

RM2U	A	1,453,056	1665	124	392
			(OP: RU3UR)		
RT2H	“	225,720	694	51	213
RA3NC	“	170,660	429	64	201
UA3UBT	“	145,485	285	79	226
RA3FY	“	24,276	164	22	29
RV3TG	“	10,428	108	20	59
RV3FT	“	90	5	2	4
RA3XM	28	161,840	661	33	103
RG5Z	“	21,406	129	19	58
RA5BI	“	0	4	2	3
RC3U	21	77,770	411	28	82
*RV3ZN	A	502,999	842	102	295
*RW3X	“	434,920	1052	82	250
*UA9QCP/3	“	122,820	405	60	170
*RD3FT	“	109,823	349	52	151
*R2UZ	“	65,010	207	65	132
*R2PT	“	50,024	177	43	126
*RV3AJ	“	42,336	295	24	102
*RM2R	“	36,716	172	41	93
*RM3TO	“	32,568	209	35	83
*RA3XCZ	“	17,010	122	29	76
*RA3VE	“	15,840	136	27	72
*RA3V	“	13,900	195	20	80
*R2RZ	“	12,408	76	38	56
*UA3QR	“	12,126	117	22	72
*RN3DN	“	11,224	74	37	55
*UA3UAD	“	10,005	102	22	65
*RZ3DZ	“	8,140	49	29	45
*RT3LA	“	3,382	35	17	21
*RW3QJ	“	3,008	28	20	27
*UA3GDU	“	2,508	33	21	23
*R2AKM	“	1,548	66	8	28
*RX3AAA	“	1,160	32	7	22
**RT3K*	*“*	*240*	*8*	*6*	*6*
*RO5K	28	31,390	246	24	62
*RV3VR	“	22,041	217	22	57
*RU5X	“	17,780	143	20	50
*R3PIQ	“	17,000	159	19	49
*RW3WX	“	6,164	62	16	30
*UB5MBA	“	4,446	90	8	31
*R3AQ	14	108,480	478	27	93
*RV3YR	“	8,000	110	11	39
*UA3SDN	“	3,198	67	8	33
*RZ3AMW	7	49,231	430	21	70
*UA3YDI	“	21,240	250	17	55
*R5FQ	“	17,748	226	14	54
*R5AV	“	2,622	49	12	34
*RA3UAG	1.8	11,825	217	8	47
*UF5A	“	10,545	174	9	48
*RZ3MM	“	7,400	141	10	40

District 4

R4RT	A	195,529	686	57	194
UA4WW	“	55,132	207	43	111
UA4PAQ	“	41,275	229	31	96
RW4HD	“	26,768	91	47	65
RQ4F	“	5,559	43	20	31
R4SA	7	194,292	885	30	96
*RA4ACX	A	285,769	642	78	235
*RN4ZT	“	194,271	526	71	248
*UA4LCC	“	154,358	495	55	171
*RA4CL	“	130,275	415	60	165
*RK4S	“	122,892	393	50	178
*R4WZ	“	103,986	287	57	161
*UA4FDL	“	103,472	400	55	177
*R4PFL	“	86,975	399	41	134
*UI4F	“	75,449	174	55	154
*UA4WJ	“	74,753	285	46	135
*RK4NB	“	43,605	222	38	97
*UA4HBM	“	36,680	156	42	98
*UA4PKA	“	29,736	130	39	129
*RD4AQ	“	16,954	77	38	60
*RW4HM	“	6,380	68	19	36
*R4DI	“	3,520	34	20	24
*R4AJ	“	2,544	55	12	36
*RA4CCK	“	1,947	72	14	45
*UC4P	28	20,724	168	19	47
*R4AC	“	2,415	48	10	25
*UA4QK	21	16,576	159	18	56
*RA4HMT	“	14,570	177	14	48
*UB4FFB	14	28	7	3	4

District 6

UI6D	A	257,202	649	79	218
			(OP: R6DJM)		
R6CA	“	115,080	271	69	141
RU6CO	“	89,646	251	63	160
UA6AK	28	62,415	578	22	73
*UA6GO	A	1,495,458	1966	117	385
**RL6C*	*“*	*819,221*	*693*	*121*	*412*
*R7KX	“	460,964	915	81	245
*RM7C	“	374,390	1002	58	232
*R6KX	“	331,224	586	77	219
*RA7R	“	184,630	595	48	137
*UA6AUA	“	121,912	242	71	125
*R6KY	“	71,977	302	41	126
*R7KO	“	70,446	304	39	138
*UC6Y	“	50,927	252	33	94
*RA6MQ	“	13,464	130	23	45
*RA6WF	“	11,495	91	26	69
*R7KA	“	10,449	65	33	48
*R7AY	“	5,546	38	25	34
*UA6J	“	2,250	37	17	28
*R6NN	“	2,106	22	17	22
*RN6DR	“	1,258	38	8	26
*UA6HLP	“	40	6	5	5
*RC7B	28	41,454	226	26	68
*RV6ARZ	7	630	24	6	15
*RC7LS	1.8	195	10	5	10

District 9

UA9FGJ	21	51,150	253	25	85
*R9XS	A	145,432	488	47	149
*RA9XSL	“	5,586	50	24	33
*UA9XK	“	4,565	77	14	41
*RQ9F	“	2,970	59	15	39

European Turkey

***TA1NAI**	**A**	**404,826**	**836**	**76**	**251**
*TA1NCT	“	306	16	5	12
*TA1AQW	“	180	10	9	9

Fed. Rep. of Germany

DL2CC	**A**	**3,121,938**	**2551**	**126**	**376**
DC4A	“	2,654,000	2420	133	367
			(OP: DL4NAC)		
DLØRUS	“	1,259,145	1589	94	311
			(OP: DJ2QV)		
DL4ZA	“	395,514	898	65	236
DL3AO	“	317,700	484	92	208
DJ2IA	“	299,886	492	88	214
DL1ASP	“	242,608	672	61	196
DL5YL	“	215,718	580	55	174
DL1YCF	“	213,520	534	66	206
DL9NDV	“	201,620	306	91	249
DL7VMM	“	161,356	563	44	170
DL5DXS	“	150,240	382	58	102
DJ7OQ	“	143,715	378	55	146
DF1XC	“	142,825	507	41	156
DK3AX	“	124,845	419	51	152
DL4ABR	“	120,927	470	44	129
DL6DVU	“	114,848	315	54	140
DGØKS	“	87,696	322	50	124
DL2DSA	“	86,757	210	72	167
DF5BX	“	84,840	351	42	126
DJ4KW	“	73,968	293	48	136
DL7LX	“	69,394	246	46	111
DK5PF	“	67,072	236	42	89
DL6NAV	“	34,239	165	37	64
DK5SF	“	28,372	130	24	58
DL3BCR	“	26,487	120	34	75
DL5BCF	“	19,404	192	21	77
DG2BAR	“	5,632	48	25	39
DF6QE	“	5,472	57	18	30
DJ2SL	“	1,067	35	6	5
DL4LBK	**28**	**127,484**	**482**	**31**	**85**
DL2OM	“	69,834	372	29	74
DF5DK	“	2,912	49	12	16
DK2AI	“	1,015	23	14	21
DJ8ES	“	216	6	6	6
DMØA	**14**	**764,005**	**2556**	**33**	**112**
			(OP: DK3DM)		
DL9LM	“	92,760	440	29	91
DK5GB	“	73,692	467	22	70
DK2CF	**3.5**	**79,776**	**727**	**21**	**75**
***DL2NBU**	**A**	**1,545,726**	**1678**	**120**	**374**
*DK3YD	“	744,255	1364	76	257
*DL8ULF	“	503,979	1121	68	241
*DL5KUD	“	432,485	724	76	259
*DL1SAN	“	380,760	801	64	221
*DL1USB	“	343,886	693	77	201
*DJ9CN	“	329,208	639	77	242
*DF6QC	“	325,755	784	63	222
*DM3AZ	“	321,024	556	77	187
*DJ3RA	“	291,957	650	69	238
*DLØF	“	271,400	1196	54	176
			(OP: DL2FDL)		
*DM5MA	“	252,250	635	58	192
*DM6WAN	“	231,978	592	60	186
*DL8RBR	“	225,760	482	74	198
*DJ7UC	“	221,885	469	58	141
*DL2NEA	“	218,514	606	61	176
*DL7USW/P	“	210,375	389	85	190
*DL3DRN	“	202,070	452	58	184
*DL7PIA	“	180,400	335	84	191
*DL8HK	“	179,231	632	46	175
*DLØRD	“	169,726	456	64	162
			(OP: DL3CQ)		
*DL4XU	“	169,488	548	47	151
*DL7YAD	“	167,640	369	62	158
*DL4JU	“	167,328	351	59	165
*DM3XI	“	164,338	333	78	176
*DL9MFY	“	158,144	448	59	165
*DK7GH	“	157,845	332	60	195
*DK2TX	“	149,058	446	49	133
*DL1VJL	“	142,486	278	72	119
*DG9MDM	“	119,856	289	69	158
*DL1BWU	“	113,832	238	84	164
*DF3IS	“	109,931	293	63	148
*DC8YZ	“	107,358	430	44	130
*DJ8QP	“	102,720	366	53	161
*DL4HBF	“	100,200	296	51	149
*DL2GPK	“	99,372	368	45	151
*DL9DBZ	“	93,058	364	42	119
			(OP: XX9XX)		
*DL1DVN	“	92,661	246	62	139
*DJ7PR	“	89,994	304	44	115
*DL7VHP	“	88,825	249	58	129
*DL2IAN	“	84,203	315	45	116
*DL1RTS	“	78,912	396	44	148
*DH2URF	“	72,930	304	40	147
*DF7CP	“	72,540	298	34	122
*DH6RS	“	70,875	305	40	135
*DL2ZA	“	69,736	308	43	141
*DL1YEG	“	65,703	238	49	132
*DF3CE	“	63,651	212	43	104
*DL5UR	“	60,564	286	33	114
*DL1EHG	“	59,774	268	39	104
*DAØA	“	56,610	182	54	99
			(OP: DK5JI)		
*DD2EG	“	56,304	321	35	109
*DL1HSI	“	52,281	227	47	110
*DF1DX	“	51,600	243	34	86
*DL8SDC	“	51,072	203	40	88
*DL1SL	“	50,887	218	43	108
*DK5ZX	“	49,861	296	29	90
*DL8ULO	“	47,829	226	44	105
*DK9OY	“	46,816	210	44	89
*DH7TS	“	46,375	224	36	89
*DL2FAG	“	45,080	167	40	75
*DF8IU	“	41,760	202	39	105
*DM5WGL	“	39,942	220	34	92
*DLØNG	“	39,102	186	34	80
			(OP: DK8NC)		
*DL3YEE	“	39,026	145	54	104
*DK6OR	“	37,560	143	42	78
*DG5CW	“	36,974	193	39	94
*DH7RG	“	35,510	153	36	70
*DM2ORI	“	34,713	141	44	89
*DO5HCS	“	33,408	184	37	79
*DL2NY	“	33,360	167	34	86
*DF2IY	“	31,824	136	43	74
*DF7AT	“	31,047	139	31	100
*DL9GMC	“	30,738	202	30	79
*DL3MB	“	29,766	183	22	60
*DJ1KW	“	28,272	118	36	57
*DL9AAA	“	26,964	134	32	52
*DL5CC	“	26,280	134	41	105
*DK1TX	“	26,037	144	33	66
*DL3EL	“	25,755	129	32	53
*DF1GRA	“	25,641	170	31	80
*DL9YCS	“	25,441	123	34	69
*DL3ARM	“	25,419	139	36	75
*DJ3CS	“	25,404	117	38	78
*DL2AXM	“	21,716	128	37	85
*DL1YAB	“	21,620	140	28	66
*DF7OA	“	21,500	125	31	69
*DL8UKE	“	21,131	117	36	77
*DK3PM	“	19,665	109	30	85
*DL7NY	“	19,475	109	34	61
*DO1AYJ	“	19,096	206	25	63
*DL9DWR	“	18,693	111	32	61
*DL5ZR	“	17,394	111	31	47
*DJ6PC	“	15,470	77	31	39
*DL4JWU	“	15,308	127	21	65
*DL2AWA	“	15,120	112	29	61
*DL2GMI	“	15,104	94	26	38
*DL2DBH	“	14,608	97	29	59
*DK6AC	“	13,590	142	20	70
*DL1RLB	“	12,524	90	21	41
*DL8CO	“	10,126	70	25	36
*DJ5QE	“	9,717	107	24	55
*DJ3GE	“	9,310	59	30	40
*DL1GWS	“	9,090	107	23	67
*DL9WO	“	9,028	131	16	58
*DM3XB	“	8,550	78	27	48
*DL7UFR	“	7,869	61	21	40
*DL8CKL	“	7,747	69	20	41
*DB4LL	“	7,680	90	20	44
*DL9SUD	“	7,458	98	16	50
*DL5QS	“	6,016	54	21	26
*DH4GB	“	5,915	64	22	43
*DHØVA	“	5,304	109	17	51
*DB2OW	“	4,884	88	17	49
*DL7VRG	“	4,312	49	19	30
*DL1BJO	“	4,214	72	11	38
*DG5DH	“	4,140	38	18	27
*DK9ZE	“	3,572	42	18	29
*DG1YBN	“	2,688	47	12	30
*DJØMA	“	2,560	68	8	32
*DL1AWC	“	2,288	50	11	33
*DL2BUM	“	1,806	28	20	23
*DL2VN	“	1,599	42	9	30
*DF4WO	“	1,485	33	9	24
*DL9ZWG	“	1,290	32	14	29
*DL3SC	“	1,260	34	11	25
*DL6OAA	“	1,160	28	7	13
*DJ6MK	“	1,134	28	9	18
*DL7DAZ	“	1,092	28	11	15
*DK5KF	“	962	26	10	16
*DK4IO	“	860	29	6	14
*DL6RG	“	756	28	11	16
*DL1SBF	“	475	15	7	12
*DK7MCX	“	360	17	6	12
*DL3AWI	“	350	23	7	18
*DB8SM	“	126	13	8	13
***DL9GK**	**28**	**50,904**	**252**	**26**	**58**
*DK1KW	“	26,418	158	25	49
*DL5MEL	“	22,976	151	23	41
*DL5WB	“	14,204	104	19	34
*DL2SBY	“	12,017	86	22	39
*DJ9KH	“	9,558	86	19	35
*DK9TF	“	3,472	43	13	18
*DK9ZQ	“	3,266	80	18	28
*DJ9SN	“	1,159	23	7	12
*DL1NUX	“	740	15	10	10
*DK1FY	“	663	19	6	7
*DL4XT	“	165	6	5	6
***DM3CW**	**21**	**79,213**	**318**	**30**	**83**
*DHØGDS	“	38,325	238	20	55
*DL5ZL	“	30,102	174	25	62
*DO2XU	“	8,364	95	11	23
*DO2MOG	“	429	15	5	6
***DL9ZP**	**14**	**191,565**	**797**	**32**	**97**
*DL4AAE	“	175,336	727	33	91
*DG4UF	“	28,124	221	18	61
*DLØGEO	“	17,520	206	11	49
			(OP: DL2YAK)		
*DL1DWL	“	3,393	81	10	29
*DB3MI	“	2,880	68	6	26
*DL4HCF	“	2,343	56	7	26
*DB8AH	“	1,175	45	6	19
*DL5LWM	“	144	12	4	8
***DK4LX**	**7**	**81,002**	**497**	**24**	**77**
*DL1AIW	“	36,366	249	20	67
*DF5BM	“	24,220	209	13	57
*DK4RM	“	23,100	136	20	64
*DL1THB	“	16,510	200	15	50
*DG3BZ	“	8,375	94	13	54
*DL4FDM	“	3,400	58	10	24
*DL2RZG	“	1,161	44	5	22
*DL8UKW	“	493	20	7	10
*DC1RW	“	9	7	3	6
***DL6KWN**	**3.5**	**42,490**	**520**	**12**	**58**
*DL2RUG	“	14,880	227	9	51
*DL1XW	“	12,383	139	12	49
*DF9ZV	“	8,268	150	8	45
*DL7VFM	“	2,904	58	8	36
**DL7ET*	*“*	*1,710*	*62*	*3*	*27*
***DLØMCM**	**1.8**	**12,255**	**225**	**10**	**47**
			(OP: DL6KWN)		
*DL1KVN	“	2,701	87	5	32
*DM2BPG	“	2,074	84	4	30

Finland

OH1VR	**A**	**1,128,318**	**1493**	**114**	**377**
OH2N	“	55,796	198	49	99
OG5G	“	42,560	170	39	113
OH1XY	“	17,711	84	33	56
OH3PE	“	4,484	55	21	38
OH2BBT	“	3,712	47	17	15
OH6AC	**28**	**167,367**	**717**	**31**	**110**
			(OP: OH6CS)		
OG6B	“	5,856	76	14	34
			(OP: OH1ZAA)		
OH8Z	**21**	**535,650**	**1878**	**37**	**113**
			(OP: OH8PF)		
OG2X	“	97,578	473	28	89
			(OP: OH2RM)		
OH5ZA	“	1,170	30	6	20
			(OP: OH1ZAA)		
OH8X	**14**	**846,612**	**2697**	**38**	**124**
			(OP: OH6UM)		
OH1QX	“	522	19	6	12
			(OP: OH1ZAA)		
OH5AG	“	120	5	5	5
			(OP: OH5CW)		
OH9COG	**7**	**22,630**	**225**	**15**	**58**
			(OP: OH1ZAA)		
OH4BCS	**3.5**	**2,170**	**56**	**6**	**29**
			(OP: OH1ZAA)		
***OH2BMH**	**A**	**115,328**	**329**	**49**	**163**
*OH1TS	“	74,375	301	45	130
*OH3MZ	“	25,875	187	27	88
*OH8SE	“	12,467	101	30	61
*OH2LU	“	9,384	128	15	54
*OH3HZ	“	5,166	50	21	42
*OH9GIT	“	899	27	8	21
***OH3MC**	**21**	**39,900**	**249**	**25**	**75**
***OH3HS**	**14**	**23,925**	**152**	**21**	**66**
**OH5TS*	*“*	*22,338*	*175*	*18*	*55*
*OH2BN	“	8,600	190	6	37
***OH9SE**	**7**	**104,412**	**773**	**30**	**83**
			(OP: OH9HDH)		
*OH5UQ	“	31,752	213	25	73

France

TM5T	**A**	**1,563,744**	**2284**	**87**	**249**
			(OP: F5VKT)		
F5PCV	“	347,984	694	72	167
F4ARU	“	196,392	680	45	122
F6BLP	“	153,827	283	68	131
F5MWA	“	31,920	149	32	73
F1RHS	“	18,156	133	31	58
F6LIA	“	4,070	44	18	37
F5PHY	**28**	**123,776**	**432**	**32**	**96**
F8AAN	“	59,660	424	22	54
TM6X	**21**	**584,982**	**1615**	**37**	**125**
			(OP: F5VHY)		
F6ARC	“	436,893	1294	35	102
F4VSD	“	8,788	133	13	39
***F6FTB**	**A**	**957,849**	**1180**	**102**	**315**
*F5SGI	“	801,781	1202	83	278
*F5ICC	“	545,694	851	72	237
*F5JU	“	265,212	494	73	205
*F5JBR	“	228,260	687	44	182
*F6BQG	“	175,134	434	56	146
*F6JOE	“	163,072	565	45	137
*F5VV	“	127,500	364	54	150
*F5KLE	“	122,400	428	47	153
*F4DXX	“	118,464	394	43	149
*F5TFW	“	109,824	346	65	143
*F5OZC	“	99,684	477	35	121
*F8NUH	“	81,466	253	48	106
*F6GCI	“	65,190	232	51	108
*F5IAE	“	59,584	192	45	88
*F6BUL	“	59,128	198	51	101
*F8DCZ	“	54,085	203	48	97
*F5GGL	“	42,240	121	53	112
*F5LVR	“	41,615	245	39	106
*F5OKB	“	37,922	240	34	100
*F4HYY	“	35,088	249	25	77
*F6API	“	31,808	163	39	73
*F6FNA	“	28,060	121	45	77
*F5PP	“	24,318	216	29	97
*F5MMB	“	23,760	118	28	44
*F6FET	“	22,363	129	31	76
*F4FRC	“	21,408	177	27	69
*F4HAB	“	20,664	162	30	96
*F6KBN/P	“	17,628	131	36	77
			(OP: F5IBV)		
*F6ICA	“	17,476	139	21	47
*F5JOT	“	15,540	117	26	44
*F1MLN	“	9,009	96	15	48
*F4GFT	“	8,748	89	20	61
*F8FQJ	“	8,128	68	21	43
*F2AI	“	6,552	78	23	49
*F4WCY	“	5,192	79	14	45
*F4HUW	“	3,660	46	23	38
*F5MGD	“	3,312	61	14	32
*F4ILK	“	3,080	40	21	34
*F5FKY	“	1,560	29	13	17
*F8EBY	“	1,121	27	10	9
***F5DM**	**28**	**33,596**	**189**	**22**	**52**
*F4HQO	“	108	6	3	3
***F8FPW**	**14**	**3,150**	**48**	**8**	**37**
***F4ICZ**	**7**	**15**	**3**	**2**	**3**

Gibraltar

***ZB2/PA5JF**	**14**	**27,495**	**265**	**14**	**51**

Greece

SV2DSJ	**A**	**491,598**	**1171**	**71**	**208**
***SV1CKZ**	**A**	**435,006**	**849**	**72**	**266**
*SV8OVJ	“	359,295	976	64	191
*SV8DAW	“	151,768	443	66	178
*SV1IU	“	63,828	236	54	108
*SV2HUD	“	50,560	282	42	118
*SV2SKD	“	49,155	314	35	110
*SV1CEI	“	47,082	161	47	67
*SV1NZB	“	22,413	107	35	58
*SV1SXV	“	22,168	263	36	100
*SV1XG	“	21,411	143	37	80
*SV7CUD	“	15,840	116	28	62
*SV1JFL	“	14,652	111	26	73
*SV8PMM	“	759	22	6	17

Guernsey

GU4CHY	**28**	**60,598**	**341**	**21**	**61**
***MUØFAL**	**21**	**43,092**	**276**	**16**	**47**

Hungary

HA8DU	**A**	**1,529,136**	**1661**	**124**	**368**
HA8MD	“	143,792	499	41	111
HA7P	“	130,832	491	42	166
			(OP: HA7PL)		
HA7SQ	**14**	**240**	**20**	**2**	**2**
HA8IH	**7**	**73,467**	**391**	**23**	**58**
***HA5PP**	**A**	**1,171,698**	**1376**	**110**	**341**
*HA2W	“	750,720	1147	91	293
			(OP: HA2EOU)		
*HA8WZ	“	486,324	993	72	244
*HA5BMS	“	394,625	1009	69	206
*HA1TV	“	278,108	696	53	198
*HA4YF	“	182,756	479	60	184
*HA3HK	“	161,837	449	55	156
*HA8AT	“	122,385	360	51	148
*HA7PO	“	81,144	223	62	106
*HA5G	“	36,504	187	31	77
***HA2MI**	**28**	**21,584**	**129**	**24**	**52**
*HAØLZ	“	6,450	60	21	29
***HA6IAM**	**14**	**87,812**	**486**	**32**	**84**
*HA8EN	“	51,798	368	24	73
***HA9RP**	**7**	**89,712**	**326**	**32**	**94**
*HA8KM	“	80	6	4	6
***HA4N**	**1.8**	**19,656**	**397**	**9**	**45**

Iceland

TF3SG	**A**	**1,870,281**	**2366**	**103**	**338**
***TF3VS**	**A**	**150,348**	**501**	**37**	**150**
*TF8KY	“	8,413	99	13	34

Ireland

EI5KF	**A**	**2,325,180**	**3071**	**89**	**301**
EI6FR	“	403,200	1179	49	176
***EI8KV**	**A**	**65**	**9**	**5**	**8**
***EI2KU**	**14**	**6**	**3**	**1**	**1**

Isle of Man

***GDØAMD**	**A**	**74,889**	**334**	**38**	**121**
***GD5F**	**14**	**108,847**	**794**	**19**	**70**
			(OP: GD4RFZ)		

Italy

IKØYUT	**A**	**1,638,819**	**2414**	**90**	**261**
I1NVU	“	946,746	1254	127	320
IZ2MGN	“	581,436	909	108	264
IK7NXU	“	430,326	653	87	264
IK2AHB	“	305,539	531	70	177
IZ5EKV	“	233,634	749	42	96
IZ3DVU	“	227,810	515	77	132
IK3DVY	“	122,040	308	61	165
IZ3QHA	“	85,057	341	48	155
IK5EKB	“	70,380	388	27	42
I4JED	“	61,194	149	73	113
IK5FKF	“	41,866	189	36	85
IKØTUJ	“	34,710	226	36	94
IZ4DZD	“	26,132	156	26	68
IZØCKJ	“	21,054	83	42	79
IK1EQE	“	16,465	95	35	54
IK2IKW	“	14,440	96	32	63
IK6BAK	“	11,880	136	13	42
IQ8OJ	**28**	**25,920**	**209**	**21**	**33**
			(OP: IC8OZM)		
IZ4TOA	“	15,066	113	18	36
IK1YFE	“	11,457	79	21	36
IU3LYJ	“	5,320	54	16	24
IK3UNA	**14**	**39,088**	**297**	**15**	**41**
IKØLNN	**7**	**7,776**	**78**	**16**	**20**
IR2R	**3.5**	**71,682**	**725**	**14**	**64**
			(OP: IZ2EWR)		
IV3RYP	“	7,280	148	10	46
IR8W	“	3,397	106	7	36
			(OP: I8YGZ)		
***IY3A**	**A**	**5,079,492**	**4028**	**147**	**459**
			(OP: IZ3EYZ)		
*IK1JJM	“	1,163,864	1661	91	270
*IK8UND	“	1,116,402	1675	94	305
*IUØHMB	“	511,632	988	80	224
*IV3UHL	“	253,800	582	71	211
*IUØLJD	“	220,884	501	63	174
*IK7XJA	“	213,024	593	65	159
*IK6GPZ	“	195,020	479	61	184
*IK2UEX	“	192,863	659	45	152
*IZ4OSH	“	170,986	553	61	153
*I6FDJ	“	161,394	610	53	169
*IQ2GM	“	153,034	359	76	162
			(OP: IK2WXQ)		
*IK1AYT	“	149,810	405	55	156
*IN3MNS	“	147,550	541	50	177
*IZ6BXQ	“	121,875	326	56	139
*IN3ZWF	“	103,530	508	33	141
*IK2SAR	“	79,651	255	43	100
*IV3YNB	“	73,528	286	47	135
*I2TFJ	“	65,100	242	42	108
*IK1BPL	“	63,474	286	37	105
*I5YKQ	“	62,730	298	35	118
*IK5BDG	“	55,580	200	51	89
*IK2AUK	“	49,880	226	36	109
*IKØISD	“	49,140	200	47	93
*IK8ARF	“	45,980	192	46	75
*IK2QIK	“	44,485	237	39	116
*IK2CMI	“	43,470	204	32	106
*IZ5HQB	“	43,197	192	38	83
*I1BPU	“	42,228	214	38	100
*I8IEQ	“	38,304	195	43	101
*IKØPXD	“	31,560	222	30	90
*IU6FUB	“	30,300	184	41	109
*IK4XQT	“	29,866	194	27	82
*IK1RAG	“	24,409	132	33	44
*IZ3ZOO	“	23,575	181	24	91
*IK6OIN	“	23,004	100	44	64
*IK1YRA	“	22,842	108	30	51
*IK5OJB	“	20,553	171	26	67
*IK8RJS	“	19,936	147	36	76
*IN3OWY	“	19,824	245	12	72
*IK2AIT	“	19,474	115	30	61
*IK2UJF	“	19,158	138	23	70
*IK2CYC	“	18,732	135	25	59
*IZ5BBS	“	18,308	123	26	66
*IU6AIG	“	18,231	138	28	75
*IU4CSS	“	18,042	121	28	65
*I1OOQ	“	16,560	118	27	65
*IWØGYC	“	16,368	112	30	58
*IKØTUM	“	15,708	104	24	53
*IZ5IPA	“	15,390	92	40	55
*IKØVVP	“	12,496	95	24	47

*IK6XEJ	“	11,316	62	30	39
*IU6DVS	“	9,576	56	28	35
*IK7YTT	“	9,548	48	34	43
*I4JEE	“	8,056	72	24	52
*IZ8QPA	“	7,920	119	19	61
*IZ8FPK	“	7,776	75	16	38
*IW5ELA	“	7,750	46	26	36
*IZ2BVC	“	7,347	95	22	57
*IU6MQO	“	6,324	54	23	39
*IK2NUX	“	5,876	47	21	31
*IZ2ABZ	“	5,694	51	30	48
*II6A	“	5,670	56	21	33
(OP: IK6IHU)					
*IUØMVD	“	3,913	43	17	26
*I1OQI	“	3,900	39	19	33
*IU3BPW	“	3,441	53	14	23
*IW5CWC	“	3,182	45	16	27
*IZ4GRP	“	2,300	38	18	28
*I2XYI	“	2,160	44	13	32
*IZ8CLM	“	2,130	25	14	16
*IZ3GGR	“	1,360	18	17	17
*I7CSB	“	1,134	20	11	10
*IK3MLF	“	984	20	9	15
*I5CDF	“	378	16	4	5
*IW2OGY	“	225	20	7	18
*IR4P	“	88	6	5	6
(OP: IZ4FTG)					
*IR4Q	28	39,425	206	29	54
(OP: IU4MRU)					
*IK5AMB	“	13,862	97	19	39
*IK8IOO	“	6,256	69	18	28
*IZ5FDD	“	4,095	53	17	28
*IW2ENA	21	1,404	23	12	15
*IK4MTF	14	140,049	666	31	86
*IV3ZNK	“	16,555	148	16	61
*IW2MXY	“	14,280	158	17	53
*IV3EAD	7	118,762	518	28	91
*IK2AOO	“	27,602	264	18	56
*I3LGP	“	27,375	214	14	61
*IZ2LTW	“	9,504	98	16	50
*IZ3ZBP	“	6,000	72	14	34
*IK8YFU	“	4,387	102	7	34
*IU2JFG	“	2,457	58	6	33
*IN3EMI	“	1,100	54	4	21
*IK2ULV	3.5	34,386	482	9	57
*IW5ECP	“	5,700	100	8	42
*IQ7YU	“	1,215	45	6	21
*I1MMN	1.8	2,656	94	4	28
*II1R	“	378	39	4	17
(OP: IW1CBG)					

Jersey

MJØX	A	1,556,964	2671	83	283
(OP: MØRTI)					
*GJ2A	14	93,104	757	21	67
(OP: MJØASP)					

Kaliningrad

RN2FQ	A	79,534	277	49	133
*RA2FO	A	33,536	202	34	94

Latvia

YL2VW	A	1,747,122	2120	126	381
YL3JD	“	94,605	509	38	121
YL7A	3.5	77,995	658	20	75
*YL3FW	A	255,201	808	53	204
*YL3GQ	“	164,203	577	49	172
*YL2NK	“	108,186	397	53	166
*YL5W	21	136,206	604	31	95
(OP: YL2GN)					
*YL2QV	“	33,768	139	31	95
*YL2LW	“	22,330	195	20	50
*YL2PP	1.8	1,890	49	6	29

Lithuania

LY2NK	28	107,316	413	31	101
LY1N	14	12,261	106	17	50
LY1M	7	66,516	448	22	70
*LY2SQ	A	884	30	7	19
*LY5I	21	77,272	364	27	77

Luxembourg

*LX2KD	A	37,338	192	32	95
*LX1TSF	“	4,959	73	15	42

Netherlands

PAØCT	A	970,992	1587	94	302
PA5FN	“	337,820	806	66	200
PA1X	“	98,475	301	57	138
PA4B	“	76,496	271	40	72
PA3CJP	“	75,682	407	40	118
PAØJNH	“	71,001	243	41	106
PA2CHM	“	51,152	251	37	102
PA4VHF	28	240,543	759	36	115
PAØMIR	7	22,308	206	19	59
*PA3ARM	A	547,316	1162	67	241
*PA2W	“	270,500	705	54	196
*PA7KY	“	194,098	577	45	169
*PA3DBS	“	140,614	721	39	128
*PA3MET	“	95,200	425	48	152
*PAØRBA	“	74,358	280	47	115
*PDØLFJ	“	61,732	351	30	92
*PA4DN	“	61,306	250	41	110
*PA3ADU	“	59,660	219	39	118
*PAØTCA	“	59,598	222	41	88
*PA7F	“	47,586	422	22	81
*PAØRDY	“	45,552	167	47	109
*PA3GUO	“	41,808	191	36	98
*PA3CXB	“	40,905	207	37	98
*PA3EEG	“	40,299	195	39	94
*PA5GU	“	33,276	162	33	61
*PA1FP	“	32,868	235	27	56
*PD7JVW	“	24,750	125	41	84
*PAØPIW	“	17,072	124	27	70
*PA7RW	“	12,464	122	20	56
*PD7RF	“	12,375	83	39	60
*PD6Z	“	10,836	100	18	45
*PD7CJT	“	10,582	105	21	53
*PA3DVA	“	8,910	110	16	39
*PAØKBN	“	8,296	118	13	55
*PD1B	“	8,050	47	31	39
*PI4FL	“	7,668	92	22	49
*PA3GEO	“	4,664	52	18	35
*PA3EPO	“	4,331	87	14	47
*PA3JB	“	1,848	117	23	65
*PAØKGB	“	1,426	25	14	17
*PA3GCH	28	612	14	8	9
*PE4I	7	1,566	49	6	23

North Macedonia

Z35Y	A	82,500	514	26	74
Z32ID	“	1,980	55	10	10
Z35U	7	139,136	825	30	98
*Z35W	A	297,245	682	67	202
*Z32ZZZ	“	15,540	144	29	76
*Z35F	28	43,795	248	28	67

Northern Ireland

GI4FUE	3.5	35,342	345	15	67

Norway

LN3C	A	1,202,380	2206	95	300
(OP: LB8DC)					
LA7AK	“	326,215	1008	51	214
LA7SI	“	60,375	296	37	124
LA3MHA	“	21,804	129	33	59
LA6YIA	28	12,208	101	17	39
LAØGE	21	179,820	887	28	83
LA7NFA	14	35,190	233	22	68
LA5HE	7	37,260	170	28	80
*LA2HFA	A	331,868	721	75	251
*LA1XFA	“	148,720	435	55	153
*LA6DW	“	62,336	314	34	94
*LB2WD	“	56,672	275	43	111
*LA6GX	“	18,204	186	29	82
*LA6PB	“	1,140	30	11	19
*LA3RK	3.5	10,740	175	9	51
*LC9X	1.8	20,124	381	8	44
(OP: LA9XGA)					

Poland

SP5AUC	A	990,462	1741	85	264
SP2FAP	“	583,324	1139	82	250
SP6A	“	366,786	702	93	276
SP9ENV	“	305,226	612	69	210
SQ9DXN	“	272,181	475	80	193
SQ3WW	“	194,425	493	71	204
SN6A	“	189,306	617	64	170
(OP: SP6CES)					
SP5ICS	“	123,624	363	46	158
SQ3HTX	“	91,598	394	37	132
SN8V	“	73,260	280	50	115
(OP: SP8HPW)					
SP1JQJ	“	70,125	285	32	93
SP7HOA	“	25,192	92	40	54
SP7IFM	“	22,092	157	25	59
SP9ATE	“	10,058	103	13	81
SP5Z	“	1,840	58	9	31
SP7IIT	28	70,495	271	30	85
SP9JBE	“	3,696	45	16	32
SP9EML	21	31,284	145	32	67
SO7M	14	204,400	814	33	107
(OP: SP7JLH)					
SQ8LUU	7	75,690	576	21	69
SP7MU	“	2,080	45	9	23
SP9TPZ	1.8	3,762	97	6	32
*SP1AEN	A	1,294,425	1522	109	386
*SP2GMA	“	563,521	1069	79	282
*SP2AYC	“	434,496	1110	71	221
*SP2GCE	“	279,206	688	64	210
*SP5GDY	“	206,190	352	83	207
*SQ1PSA	“	205,751	650	59	188
*SP7FCX	“	120,620	442	56	129
*SQ7LQJ	“	113,344	391	47	137
*SP7JDI	“	98,384	352	48	124
*SP6BEN	“	98,090	217	67	103
*SP9IHP	“	94,464	262	53	70
*SP8CGU	“	88,596	346	40	98
*SP8IOV	“	68,370	391	34	95
*SP3LGF	“	49,840	247	38	102
*SP2JFY	“	47,476	255	46	120
*SP7BCA	“	43,071	196	44	103
*SQ5CZP	“	41,952	186	30	62
*SQ9JYK	“	41,860	173	39	91
*SP3BES	“	36,176	137	41	71
*HF95PRK	“	33,660	266	16	69
(OP: SP6OJE)					
*SP1DMD	“	31,482	143	37	69
*SQ3YOTA	“	28,405	275	18	77
(OP: SQ3JPV)					
*SP9KJU	“	26,215	127	42	65
(OP: SP9MDY)					
*SP7JOA	“	26,091	135	39	78
*SP5TM	“	15,700	129	29	71
*SP9ICU	“	15,150	132	19	56
*SP5BYC	“	14,784	93	24	40
*SP3SLU	“	13,083	120	29	60
*SP3AMO	“	11,397	101	24	63
*SP2QCW	“	6,960	50	26	34
*SO7NA	“	6,365	79	20	47
*SP9WTN	“	3,984	61	15	33
*SP9Z	“	3,444	43	14	14
*SQ9DEO	“	2,691	44	14	25
*SP2GVN	“	2,365	50	14	29
*SP2JJD	“	1,134	49	19	44
*SO5C	“	1,054	25	13	21
*SP3FSM	“	798	20	9	12
*SP2BRZ	“	480	12	9	11
*SQ7M	“	345	25	7	16
*SP3LWP	28	65,076	251	31	85
*SP2FWC	“	120	6	5	5
*SP9R	21	62,865	281	26	73
(OP: SP9BRP)					
*SP2FOV	“	45,864	225	26	65
*SP5EPP	“	43,431	246	28	65
*SP5CJQ	“	41,764	179	28	78
*SP8AR	“	24,485	120	23	60
(OP: SQ8BGR)					
*SP7CVW	“	20,060	106	25	60
*SP3FPF	“	19,126	120	23	50
*SP2FVN	“	16,188	96	22	54
*SP6DHH	“	14,746	137	21	52
*SP4LO	“	9,996	131	15	36
*SP2GTJ	“	8,190	90	16	29
SP9GNM	*“*	*3,180*	*70*	*12*	*18*
*SP6NIK	“	2,436	45	10	18
*SP5ENG	14	57,812	387	25	72
*SQ9FQY	“	7,950	112	12	41
*SOØA	“	6,149	101	8	35
*SP6DMI	“	5,375	95	10	33
*SP2EPV	“	1,276	70	11	33
*SP5SZE	“	240	25	4	12
*SP9GMI	7	57,031	288	27	80
*SP9BCH	“	31,126	322	17	62
*SP9OUV	“	29,058	221	19	68
*SP3JUN	3.5	62,694	657	14	72
*SP2BRI	“	28,084	445	10	49
*SP3MEP	“	22,860	429	9	51
*SP9ODM	“	256	20	4	12
*SO6OO	1.8	3,410	117	4	27
*SP6LUV	“	11	7	4	7

Portugal

CR6K	A	12,835,488	9553	161	520
(OP: CT1ILT)					
CT7AIX	28	39,093	201	23	60
CT7ANO	1.8	2,370	52	8	22
*CR5O	A	2,394,132	2879	101	346
(OP: CT7AJL)					
*CT1ELZ	“	157,197	495	46	137
*CT1FAC	“	17,108	138	23	68
*CS2C	28	308,826	1079	30	96
(OP: OK1RF)					
*CR5BWW	21	30,225	211	27	66
*CT1FOQ	14	26,864	141	23	69

Republic of Kosovo

Z61DX	A	108,018	428	42	111
*Z68EE	A	980,514	1693	84	282
(OP: OZ2I)					

Romania

YR8D	A	6,494,840	5906	144	436
(OP: YO8TTT)					
YO8SBQ	“	499,681	1058	85	238
YO2LDU	“	16,269	147	20	67
YR8I	28	127,568	547	30	89
(OP: YO8BIG)					
YO3APJ	1.8	27,880	340	13	55
*YR2X	A	986,870	1211	108	307
(OP: YO2LEA)					
*YO4CAH	“	612,306	1056	93	298
*YO7SR	“	523,875	862	94	287
*YO7ARZ	“	440,504	797	77	251
*YO8/LZ4UU	“	406,252	938	72	236
*YO5DAS	“	273,600	571	74	214
*YO4AAC	“	230,786	551	66	191
*YO8BDW	“	191,874	643	44	182
*YO2BLX	“	170,430	485	55	175
*YO6HSU	“	127,908	347	57	141
*YO8RFS	“	125,600	425	48	152
*YO4SI	“	85,358	283	52	130
*YO5YM	“	62,010	269	40	119
*YO4RIW	“	48,444	273	29	103
*YO6DMR	“	38,961	212	32	85
*YO2MJZ	“	33,900	196	25	88
*YO8OLY	“	11,220	84	29	56
*YO4CSL	“	10,611	85	20	61
*YO9IUP	“	7,125	83	25	50
*YO7MPI	“	1,840	48	9	37
*YO2OXD	“	675	15	10	15
*YO4FZX	28	37,890	246	24	66
*YO5OAC	“	2,523	43	12	17
*YO2IS	21	65,250	379	23	64
*YO3ND	“	44,710	252	26	59
*YO4TL	“	494	16	6	7
*YO5AXF	14	49,984	402	20	68
*YO4BEW	“	33,516	312	19	65
*YO4AJ	“	31,320	253	24	66
*YO5BTZ	“	28,640	252	16	64
*YO9CWY	“	20,502	234	14	53
*YO9GR	“	19,206	247	14	52
*YO9HG	“	1,586	52	6	20
*YO4MM	“	702	22	9	17
*YO8PUF	“	288	18	4	12
*YO8THR	“	56	5	3	5
*YO8NTD	“	15	3	2	3
*YO5ODT	7	86,016	644	20	76
*YO3JW	“	57,240	420	25	81
*YO2NWW	“	31,262	270	19	58
*YO3JOS	“	16,380	169	13	52
*YO6MT	“	2,673	53	8	25
*YO7NSP	3.5	5,408	124	8	44

San Marino

*T77CX	14	70,464	503	16	48

Sardinia

ISØJXO	A	284,115	925	54	181
ISØ/OM2TW	3.5	429,282	2177	29	97
(OP: OK8WW)					
*ISØLYN	A	75,690	285	42	103
ISØILP	*“*	*576*	*18*	*8*	*10*
*ISØANT	7	12,870	185	10	45

Scotland

GM5X	A	5,227,544	4809	142	412
(OP: GM4YXI)					
GM2V	“	2,501,488	2807	119	369
(OP: GM3WOJ)					
MM3T	“	1,262,250	2385	84	290
GM3NHQ	21	8,640	94	14	40
GM3X	1.8	24,318	341	12	51
(OP: GM3POI)					
*GM3W	A	141,493	483	52	157
(OP: GM3JKS)					
*GMØHKS	“	122,430	453	42	123
*GMØTKB	“	6,726	86	14	43
*GM3A	21	58,167	585	17	52
(OP: MMØJOM)					
*GM3ZDH	14	27,840	319	12	48

Serbia

YT3D	A	3,085,780	2543	147	410
YT7X	“	1,317,504	2032	103	281
(OP: YU7CF)					
YT6T	“	625,974	1197	77	246
(OP: YU7CM)					
YT5R	“	69,008	372	22	130
YUØT	28	397,578	1363	34	104
(OP: YU1WS)					
YU7EE	“	310,365	1130	33	102
YT7B	14	322,344	1470	32	89
*YT6M	A	771,930	1168	99	306
*YU5T	“	477,085	1167	70	231
*YU1GU	“	97,555	310	45	134
*YU1JF	“	69,432	249	42	90
*YU7D	“	14,706	162	17	69
*YT9W	21	330,625	1240	32	93
*YU4MVP	“	4,508	62	18	31
*YU1ML	14	2,376	54	10	26
*YU4BAH	7	5,490	108	9	36
*YU1RM	“	5,320	114	9	31

Sicily

*IT9MRM	A	216,505	481	62	153
*IT9AJP	“	154,780	364	60	158
*IT9CKA	“	29,640	158	30	84
*IT9VJO	“	29,312	119	49	79
*IT9NVA	“	176	9	7	9
*IT9VCE	28	7,320	68	19	42

Slovak Republic

OM7K	A	3,716,190	3450	140	386
(OP: OM7RU)					
OM3CPF	“	627,990	1236	82	264
OM8AA	“	416,527	1137	69	202
OM6AL	“	382,543	1233	53	206
OM3CFR	“	247,380	699	50	178
OM5VS	“	98,952	323	48	138
OM3CM	28	32,215	167	28	57
OM8LA	21	49,995	233	28	71
OM2XW	7	701,415	2536	33	110
OM5R	“	633,984	2544	31	97
(OP: OM5WW)					
OMØAS	3.5	34,176	500	10	54
*OM3ZU	A	338,873	789	68	249
*OM2DT	“	337,365	589	99	258
*OM8ON	“	332,655	473	93	242
*OM7AG	“	247,860	886	52	191
*OM4DU	“	143,208	442	61	173
*OM7SR	“	94,500	388	47	163
*OM3TBG	“	89,964	346	37	116
*OM4AY	“	52,650	246	37	98
*OM7AT	“	21,090	146	29	82
*OMØMM	“	8,904	70	21	32
*OM5MX	28	31,195	157	26	59
*OM3CDN	21	16,065	147	18	45
*OM5TX	14	65,508	399	26	77
*OM2AGN	“	3,476	41	13	31
*OM3ZWA	7	172,500	859	30	95
*OM8AQ	“	48,934	350	20	66
*OM5NA	“	37,926	236	18	68
*OM6TX	3.5	4,662	100	7	35
*OM5NL	1.8	57,304	734	13	63

Slovenia

S52AU	A	695,763	932	95	258
S52C	“	210,528	664	49	155
(OP: S52F)					
S5ØR	21	629,788	1770	36	122
S53X	3.5	252,700	1779	21	79
S52F	1.8	7,849	167	8	39
*S57NAW	A	692,918	935	94	304
*S52WD	“	317,476	599	67	211
*S52ZD	“	152,660	667	43	127
*S57T	“	140,304	395	56	166
*S58RU	“	91,575	396	57	168
*S57WW	“	34,417	197	29	98
*S53DT	“	19,910	77	50	60
*S51SL	“	16,335	158	29	92
*S5ØA	21	375,804	1145	34	112
*S52EZ	“	1,890	35	8	22
*S52GO	14	102,934	570	27	80
*S52FT	7	36,849	418	14	57
*S5ØQ	“	10,746	83	16	38
*S57X	3.5	35,280	447	14	58

Spain

EB7A	A	6,719,692	6432	130	402
EA3OH	“	434,156	798	74	237
EA7R	“	334,917	1065	38	115
EA1ND	“	78,120	330	36	54
EA2DDE	“	2,214	28	11	16
EA5EL	28	203,676	733	33	99
EA4FL	21	79,180	432	27	80
EA3X	14	319,662	1542	30	88
*EA3FZT	A	1,322,799	1750	106	331
*EA4KD	“	1,166,241	1547	90	291
*EA4HKF	“	596,755	1056	82	273
*EA7/G4BJM	“	407,235	1141	50	205
*EA5JJN	“	286,632	862	49	167
*EA5ITT	“	232,842	726	53	204
*EA4IL	“	188,680	507	55	157
*EA1NP	“	185,180	452	59	176
*EA1JO	“	179,280	429	59	181
*EA3DA	“	140,833	427	54	163
*ED3Z	“	119,970	465	32	97
*EA3KE	“	99,540	381	40	118
*EA5DO	“	99,450	305	50	145
*EA2PA	“	85,260	359	33	83
*EA4FIT	“	83,961	293	48	123
*EA3PP	“	83,125	311	38	95
*EA7IZ	“	76,544	321	40	144
*EA3BRL	“	76,028	304	43	123
*EA4Z	“	75,145	298	41	92
*EA5D	“	63,840	243	37	59
*EA3BOW	“	58,400	287	47	113
*EA4W	“	54,272	324	27	79
*EA5DD	“	46,716	235	33	69
*EA1JCE	“	44,758	240	31	108
*EA3WX	“	39,300	190	47	103
*EA1RN	“	29,696	204	32	84
*EF3R	“	23,165	153	34	79
(OP: EA3EYO)					
*EA5CP	“	20,592	146	27	45
*EA7KOL	“	16,688	102	36	76
*EA4JM	“	11,340	92	26	58
*EA5JA	“	10,437	103	19	52
*EA4OA	“	3,750	46	20	30
*EA7BWA	“	3,657	45	20	33
*EB5BRZ	“	1,333	32	15	28
*EA7JTT	“	943	29	7	16
*EA3NO	28	182,000	673	31	94
*EC7R	“	152,488	875	25	73
*EA7VJ	“	18,156	93	25	64
*EA4EJR	“	1,560	29	12	18
*EA3DMN	14	1,920	44	8	22
*EE5X	7	66,066	482	15	63
(OP: EA5KO)					
*EA2BNU	“	39,121	392	14	57
*EA1DD	“	16,002	146	14	49
*EA3DNC	“	3,325	60	8	27
*EA4BW	“	2,625	50	9	26
*EA5PL	“	55	7	4	7
*EA1FBU	3.5	192	12	4	12
*EA4IE	1.8	14,310	280	8	45

Sweden

SM2CEW	A	906,888	1595	79	269
SD6M	“	430,531	1076	64	199
(OP: SA6BGR)					
SMØHRP	“	343,068	837	74	202
SD1A	“	338,846	1066	51	190
SM5Q	“	241,832	475	95	249
SA5CDO	“	87,318	308	48	150
SM5AOG	*“*	*50,274*	*258*	*28*	*105*
SM6EAN	7	34,880	243	20	60
SM6CMU	3.5	31,850	201	19	72
*SM5CSS	A	660,376	1124	87	301
*SM7CIL	“	286,824	578	57	171
*SM5ACQ	“	259,055	791	58	205
*SM5DXR	“	233,681	856	54	197
*SM5LW	“	130,200	396	49	168
*SEØB	“	77,448	405	32	136
(OP: SAØBXV)					
*SJ7M	“	71,604	314	40	122
*SM7FDO	“	63,210	387	23	106
*SM2OTU	“	57,934	271	40	126
*SF6W	“	40,040	345	24	80
(OP: SM6EWB)					
*SE6K	“	38,500	276	31	109
(OP: SM6FZO)					
*SD5M	“	20,544	98	32	64
(OP: SM5DFM)					
*SGØM	“	12,800	82	26	54
(OP: SAØAQT)					
*SM5MX	“	10,780	99	28	70
*SF7X	“	9,768	75	32	56
*SM6TOL	“	3,182	66	12	25
*SM5KQS	“	2,440	28	18	22
*SMØNEJ	“	480	16	9	11
*SG3O	28	675	17	9	16
(OP: SM3AGO)					
*SM2CVH	14	10,857	90	17	60
*SM6VWG	“	2,376	64	6	27
*SM6CWP	“	54	3	3	3
*SM7ATL	7	3,663	79	7	30
*SM6CNN	1.8	51,675	657	14	61

Switzerland

HB9AFZ	A	35,937	149	36	63
HB9CQL	“	15,960	94	30	40
HB9FBG	14	340	10	7	10
*HB9ARF	A	988,160	1602	90	296
*HB9DCM	“	506,141	808	79	244
*HB9HQX	“	125,028	495	41	166
*HB9FMJ	“	76,459	307	38	119
*HB9BGF	“	11,703	103	21	62
*HB9DDZ	“	11,340	57	38	43
*HB9TWU	“	11,286	96	37	62
*HB9MIR	“	8,103	90	21	52
*HB9HEI	“	3,240	41	15	25
*HB9GKM	“	870	23	11	19
*HB9CEY	28	19,832	120	22	45
*HB9AFH	“	1,647	22	12	15
*HB9DDE	21	32,208	224	17	49
*HB9IRF	7	9,231	127	12	39
HB9HFM	*“*	*828*	*36*	*5*	*18*
*HB9CPS	3.5	33,924	436	11	55

Ukraine

UT5EL	A	2,079,126	2070	129	393
UT5ECZ	“	1,306,706	1243	115	387
UT6EE	“	256,608	444	78	219
UR7R	“	101,673	633	28	89
(OP: UX1RX)					
UY5OO	“	18,300	75	40	60
UT3QZ	14	25,585	201	23	62
UZ1U	7	30,266	284	18	56
(OP: US7UU)					
UWØU	3.5	2	1	1	1
(OP: UT7UT)					
*UT7EZ	A	447,468	1076	68	226
*UT3SO	“	333,324	907	61	221
*US7UK	“	230,476	471	72	242
*UW3WF	“	212,268	466	70	196
*UW1WU	“	206,184	629	57	185
*UR5UJ	“	192,832	529	65	197
*UT5UIA	“	169,092	333	66	186
*US5WBJ	“	146,780	510	46	159
*UT5NR	“	118,950	509	41	142
*UR7VA	“	112,634	412	43	156
*UX2HB	“	77,350	330	41	134
*UT6UH	“	67,466	403	36	122
*US7IA	“	65,860	282	40	138
*UXØLL	“	39,325	154	44	77
*UR5EJ	“	26,631	121	39	60
*UT7MR	“	18,643	151	21	82
*UR4LIN	“	18,375	183	24	81
*UT3WX	“	12,948	98	22	56
*UT8EU	“	9,200	56	31	49
*UR8IF	“	3,713	31	20	27
*UT7UT	“	280	8	6	8
*UT2UB	28	55,822	239	28	85
*UT4WA	“	12,932	95	22	39
*UY5QJ	14	54,600	249	27	77
*UX1CL	“	34,629	210	24	73
*UY7RR	3.5	9,592	228	6	38

Wales

GW4MM	A	86,488	273	44	108
(OP: GW4VXE)					
GW4J	28	117,110	497	26	72
(OP: GWØETF)					
MWØIDX	7	7,650	114	10	35
*GW4HBK	A	73,048	281	44	140
*GW4TSG	28	2,670	37	13	17

OCEANIA

Australia

VK6N	A	5,555,174	4053	133	358
(OP: N5ZO)					
VK6T	“	4,459,950	3277	126	351
(OP: VK6LW)					
VL2A	“	3,341,952	3066	119	265
VL2G	“	1,637,766	1666	109	242
(OP: VK2GR)					
VJ3A	“	1,117,540	1421	87	197
VL2B	“	571,824	583	117	244
(OP: VK2BJ)					
VL3E	“	272,272	424	82	156
(OP: VK3TZ)					
VK4JU	“	219,780	683	58	107
VK6AP	“	82,060	170	71	149
(OP: VK6APK)					
VK4AFU	“	60,800	199	58	94
VL2N	“	58,315	214	41	68
(OP: VK2PN)					
VK5T	“	51,304	206	43	63
VK7GN	“	37,800	259	31	29
VL3Q	“	21,021	96	36	55
VK2PW	“	9,306	78	26	40
VK6RZ	“	7,345	41	30	35
VK7BO	“	1,829	26	14	17
VL6T	28	59,429	341	18	49
(OP: VK6VZ)					
VK3IO	7	82,164	384	23	59
VJ4K	3.5	2,106	29	13	14
(OP: VK4BAA)					
*VK5X	A	191,148	403	64	140
(OP: VK5XDX)					
*VK6HG	“	78,736	209	55	93
*VK8NSB	“	65,175	362	23	52
*VJ3U	“	52,578	196	49	78
(OP: VK3IU)					
*VK5LJ	“	30,199	116	33	68
*VK6W	“	8,968	66	25	34
*VJ4O	“	8,037	66	18	29
*VK5WU	“	3,675	51	21	28
*VK2PAA	“	1,617	35	13	20
*VK2BM	“	280	15	10	10
*VK4DRK	“	198	7	4	7

*VL6K	14	1,480	35	11	26
(OP: VK6WX)					

Brunei Darussalam

V85RH	A	3,901,500	3031	133	317
(OP: JO1RUR)					
*V85T	A	342	10	9	9

East Malaysia

9M6NA	A	5,679,882	3824	149	373
(OP: JE1JKL)					
*9M6W	A	82,069	271	37	70
(OP: 9M6ZAE)					
*9M6RTV	"	952	27	12	16

Guam

WH2JA	21	244,394	1010	27	62
(OP: JR3RIU)					

Hawaii

WH7T	A	1,733,420	2285	109	151
(OP: WH7W)					
AH6T	"	3,600	59	24	26
KH7M	28	433,596	1667	33	59
(OP: KH6ZM)					
KH7U	"	276,199	1275	29	48
KH7Q	21	859,856	2524	37	85
(OP: N6TJ @KH6YY)					
*KH6CJJ	28	112,728	629	24	37

Indonesia

YB2MM	A	258,430	429	63	152
YB3BLJ	21	51,543	221	22	61
YF2UFA	"	3,744	49	18	30
YB7KE	14	3,872	48	10	22
YB1RQX	7	8,364	60	18	33
*YB1AYO	A	499,956	876	78	166
*YC3GEM	"	105,042	317	43	80
*YB8RW	"	73,576	416	31	37
*YB1IUQ	"	61,045	186	53	92
*YB3KM	"	51,788	156	36	85
*YB1KK	"	51,336	154	42	82
*YCØRNC/1	"	43,268	224	42	74
*YB1MIG	"	38,220	128	39	66
*YB9GDP	"	27,720	158	40	48
*YC1RYX	"	20,296	90	28	58
*YB9AOS	"	11,200	79	21	43
*YC1TCA	"	10,530	69	20	34
*YC1CAR	"	5,928	42	25	32
*YF7UFT	"	5,796	55	21	25
*YC1CBY	"	4,158	46	23	31
*YDØBCG	"	3,080	38	18	22
*YB7GRN	"	2,774	28	19	19
*YF3AWZ	"	2,450	38	14	21
*YD3BWK	"	1,820	32	14	21
*YD1REA	"	1,568	25	15	17
*YCØSPC	"	1,435	38	20	21
*YB8SB	"	192	10	5	7
*YB3BOA	28	17,240	173	17	23
*YB7SKM	"	1,352	32	11	15
*YC7UDD	"	1,320	37	10	14
*YB1HDR	"	18	7	3	3
*YC9FAR	21	175,539	683	28	63
*YB1LUE	"	66,215	256	24	71
*7C3C	"	32,339	215	23	50
(OP: YG3AKE)					
*YB3BGM	"	26,134	134	20	53
*YB1LZ	"	23,937	143	25	54
*YB8CMT	"	880	27	7	9
*YC2MPF	"	28	3	2	2
*YE4IJ	14	32,224	156	22	54
*YB9GV	"	2,548	37	9	17
*YB7MP	"	264	10	5	6
*YD9UW	7	10,032	75	20	37
*YDØAW	"	56	4	3	4
*YBØOHG	1.8	0	1	1	1

New Caledonia

FK8IK	A	2,284,535	2319	125	240

New Zealand

ZL2RX	A	86,268	236	52	106
ZL2AIM	"	1,300	21	13	13
ZL2AGY	28	34,935	240	22	29
ZL1BBW	14	31,737	156	24	47
*ZL1IF	A	19,050	101	31	44

Norfolk Island

VK9DX	7	1,005,471	2529	35	106

Palau

T88PB	A	1,637,623	1959	102	197

Philippines

DU1EV	28	70,290	380	24	47
4E1AGW	21	44,154	269	23	43
4F2KWT	1.8	2,926	56	8	11
*DX8H	A	596,878	850	82	169
(OP: KH7EA)					
*4E1A	"	229,140	498	66	105
(OP: DU1KG)					
*DV1ZBX	28	77,894	501	19	39

Rotuma Island

3D2AG/P	A	38,544	216	31	35

Samoa

5W1SA	21	537,824	1978	32	66

SOUTH AMERICA

Argentina

LW1F	28	934,362	2747	30	91
(OP: LU5FC)					
LU2D	"	394,130	1250	28	82
(OP: LU2DX)					
LT5A	"	7,802	80	16	31
LU6UO	21	73,194	411	17	49
LU7DW	7	1,372	29	13	15
*LU5YF	A	367,854	619	73	149
*LU4XAP	"	214,134	467	59	119
*LU5HCB	"	160,248	508	42	90
*LU7GFH	"	4,806	46	24	30
*LU2AXF	"	1,625	39	12	13
*LW8ECA	"	770	17	11	11
*L5ØDY	28	185,031	781	24	65
(OP: LW3DG)					
*LU1WUD	"	119,121	759	15	44
*LU4HK	"	116,886	637	20	46
*LU1II	21	13,328	88	20	36
*LW8DRU	"	7,335	80	18	27
*LU1WI	"	1,596	34	10	11
*LU9OZA	14	2,380	41	15	20

Brazil

PP5AX	A	507,864	1093	57	111
PY2EU	"	9,313	69	31	36
PY2MC	28	273,234	1042	26	67
PY2EX	"	98,348	396	28	64
PY5AKW	"	72,600	364	21	54
PV8DX	"	8,365	89	10	25
PY2KJ	21	592,644	1315	34	122
PY3LX	"	9,686	86	19	39
PY3TD	14	33,189	196	25	44
PY9MP	7	8,788	85	15	37
*PY2XL	A	269,390	656	47	108
*PY4ARS	"	165,851	332	71	132
*PY2LPM	"	97,173	221	63	120
*PY2MIA	"	91,008	243	61	97
*PP8ZAC	"	89,440	274	45	85
*PY2RE	"	55,552	205	51	77
*PY2BOA	"	49,600	278	24	56
*PY5CV	"	39,303	170	38	61
*PP5TG	"	34,980	159	32	78
*PY1NP	"	29,601	114	34	65
*PY2TEY	"	18,080	109	27	53
*PY2AXH	"	17,765	114	36	49
*PP5RB	"	11,850	97	30	45
*PY2VCP	"	10,230	68	29	37
*ZV2F	"	9,984	79	31	47
(OP: PY2SFA)					
*PY3AU	"	9,860	77	24	34
*PY7OJ	"	4,056	52	23	29
*PY1CH	"	1,833	27	17	22
*PR7KSA	"	1,260	32	12	16
*PY2OM	"	40	14	9	11
*PR1T	28	295,390	1069	26	83
(OP: PY1ZV)					
*PY1OX	"	11,137	142	12	25
*PQ8RS	"	10,648	94	10	34
*PP2AR	"	6,006	85	18	21
*PP7LP	"	5,280	81	11	19
*PY1NSC	"	3,330	87	14	31
*PU3VON	"	943	31	10	13
*PS7BL	"	209	33	5	6
*PY3DCV	"	190	9	5	5
*PY2WMW	21	78,213	323	22	71
*PR7GY	"	63,963	376	17	52
*PY4DX	"	54,202	485	15	26
*PY2ARY	"	18,722	169	15	31
*ZZ4WTT	"	8,470	87	11	24
(OP: PU4MMZ)					
*ZZ7ZZ	"	7,616	100	9	23
(OP: PR7AR)					
*PU2TNT	"	7,579	63	14	39
*PY2NY	14	403,902	1275	32	82
*PY3XX	7	13,980	112	16	44

Chile

*CE6VMO	A	28,684	267	41	60
*CE4WT	7	2,272	40	12	20

Colombia

*HK3ZD	21	3,538	56	12	17

Ecuador

*HC2AO	A	4,572,040	3618	110	330
*HC5AI	"	37,808	214	26	42

Peru

OA4SS	A	1,428,350	2028	79	166
OA4O	28	913,790	2325	31	106
(OP: EA7TN)					
*OA4DX	21	207,466	818	25	73

Suriname

PZ5MA	A	15,244	75	25	49
(OP: RN5M)					

Trinidad & Tobago

*9Z4A	21	12,150	106	12	33

Uruguay

*CX1CAN	A	21,141	109	33	54
*CX2AQ	28	439,161	1397	26	83

Venezuela

*YV6BXN	A	351,864	625	58	158
*4M5MAG	28	17,391	146	17	34
(OP: YV1DIG)					
*YV5IUA	21	480	17	10	14

ASSISTED
NORTH AMERICA
United States
District 1

K5ZD	AA	11,150,100	4995	166	614
K1ZZ	"	8,631,612	3819	164	617
K1AR	"	6,214,725	3044	154	575
NN1SS	"	5,401,223	3024	136	493
W1GD	"	5,313,231	2657	151	546
AA1ON	"	4,535,720	2420	147	521
K1ESE	"	3,751,220	2047	140	509
KB1W	"	2,406,720	1782	104	376
W1TC	"	2,366,385	1292	144	507
W1FJ	"	2,319,852	1436	128	454
K1TZQ	"	2,156,076	1695	97	371
WX1S	"	2,084,530	1094	150	529
KA1IOR	"	1,872,022	1184	119	443
N3ER	"	1,568,320	1194	106	358
AJ1AJ	"	1,529,275	1370	90	325
W1RM	"	1,506,646	867	139	480
W1NG	"	1,462,600	938	129	439
W1TJL	"	1,390,465	1140	125	440
K2RB	"	1,300,605	1075	111	354
AK1MD	"	1,291,090	1063	123	347
W1NT	"	1,179,642	998	93	328
W1UK	"	1,066,896	702	125	433
W1ARY	"	1,062,048	924	88	328
W1EQ	"	1,028,565	917	93	308
N1IBM	"	1,017,401	722	106	405
K1DJ	"	1,009,888	877	103	315
W1ZT	"	1,003,200	754	112	368
W1DX	"	988,582	789	119	363
(OP: W1AN)					
K1SM	"	940,000	943	92	284
K1RV	"	907,300	770	97	333
W1NK	"	892,525	666	108	367
NF1O	"	877,346	719	102	347
K1EO	"	852,390	764	98	312
WK1J	"	835,142	862	86	288
W3SM	"	776,745	664	98	323
AE1T	"	769,270	650	99	331
W8HAP	"	695,001	622	93	318
W1HNZ	"	653,744	688	88	276
NE1B	"	653,200	539	108	352
N1KM	"	625,968	604	93	285
NR1X	"	610,894	775	66	215
K1TH	"	447,560	515	75	259
NJ1T	"	389,232	490	79	227
W1UJ	"	337,960	434	70	210
WA2BOT	"	311,657	348	91	258
K1BZ	"	305,732	335	94	264
WA3OFR	"	258,412	310	83	225
K1QX	"	255,750	310	83	227
KV1J	"	252,175	340	80	195
N1MGO	"	188,136	352	54	162
KB1NO	"	154,294	284	59	147
W1JR	"	127,759	204	86	165
N1KWF	"	118,664	292	48	115
K1VR	"	88,924	173	51	137
W5HVV	"	75,463	140	66	127
KM3T	"	68,076	143	59	127
KE1VT	"	64,148	162	50	108
WA1ZYX	"	45,136	147	27	85
AB1XB	"	23,520	106	26	58
KK1W	"	14,062	62	27	62
N1MM	"	13,552	63	27	50
WJ1R	"	11,725	65	21	46
K2KA	"	9,282	49	37	41
NF1A	"	6,048	41	21	35
W1MU	"	4,300	34	20	23
N1PGA	28A	75	5	2	3
NC1CC	21A	290,440	770	29	108
K1JB	"	25,620	119	26	58
KA1IS	7A	757,044	1806	35	118
WK1O	"	399,355	1103	30	107
W1FQ	"	47,640	199	29	91
*KS1J	AA	3,393,390	2122	121	444
*W1QK	"	1,957,005	1482	103	368
*N1EN	"	1,946,819	1475	104	365
*WO1N	"	1,540,962	1064	123	408
*KA1YQC	"	976,472	935	85	291
*K1MD	"	615,825	650	81	264
*N1DID	"	554,910	598	83	266
*N1API	"	534,336	533	80	283
*W1DYJ	"	471,744	547	84	267
*K1DW	"	440,545	519	66	241
*KG1V	"	372,391	464	79	228
*NA2AA	"	323,544	340	85	281
*W2TT	"	264,880	339	80	228
*K1ECU	"	159,997	295	49	144
*W1NSK	"	157,024	306	61	163
*KA2KON	"	148,599	267	51	158
*NM1J	"	93,492	224	34	125
*K1XS	"	85,170	202	45	125
*N1SEP	"	64,357	188	34	105
*W1DAD	"	40,334	129	50	84
*N1DM	"	35,844	126	28	75
*AA1NK	"	29,318	128	32	75
*W1VKE	"	22,752	105	24	55
*WV1M	"	17,360	75	21	59
*KM1D	"	16,110	76	27	63
*AA1SU	"	9,685	64	25	40
*KK1L	"	8,580	61	16	39
*K1LHO	"	8,540	125	46	94
*KX1X	"	7,686	49	19	42
*KW1DX	"	2,016	23	13	23
W1MI	*"*	*558*	*14*	*9*	*9*
*N1DG	28A	138,861	351	29	110
*K1IG	14A	33,250	131	22	73
*K9JY	7A	55,120	227	24	82
*K1IM	"	44,270	208	24	71

District 2

AB3CX	AA	6,593,694	3348	143	551
N2SR	"	5,889,646	3097	150	529
N2RC	"	5,865,255	2989	150	547
N2BA	"	3,901,266	2141	140	517
N2NT	"	3,791,642	2318	127	466
(OP: WW2Y)					
AB2E	"	2,591,862	1545	134	477
WA2CP	"	2,334,548	1459	125	437
(OP: KC2GOW)					
KA2K	"	2,286,270	1445	126	444
WØAAE	"	2,272,125	2151	89	286
K4RUM	"	2,040,619	1569	106	363
K3TS	"	1,903,872	1295	118	418
KF2O	"	1,836,900	1027	147	503
WA2OAX	"	1,829,880	1289	124	396
N2NI	"	1,562,724	1149	115	383
N2HMM	"	1,363,767	997	114	385
N2SQW	"	1,341,368	1042	111	365
K2RET	"	1,334,403	909	114	417
W2MV	"	1,289,113	1049	99	328
WT2J	"	1,043,442	1072	63	276
N2JJ	"	1,021,984	855	104	332
K2CJ	"	1,021,318	710	115	399
W2LCQ	"	969,748	812	114	328
W2RD	"	967,550	683	125	398
AG2J	"	852,240	778	96	306
WR2G	"	731,538	644	93	321
WB2WPM	"	636,633	742	76	247
W2NTN	"	615,225	686	75	250
WB2NFL	"	613,824	666	92	276
WO2T	"	586,929	630	95	304
K2EP	"	576,084	548	89	277
KM2L	"	542,030	575	80	255
K2TER	"	499,786	449	101	305
KC2LSD	"	472,872	575	78	245
N1JP	"	388,800	462	71	249
WB2NVR	"	365,700	501	64	201
AB2ZY	"	316,512	478	68	184
K2QB	"	290,924	433	58	199
K2SE	"	260,134	443	58	180
N2KHH	"	257,040	421	57	181
N2SO	"	218,277	355	72	165
K2QPN	"	211,754	321	66	173
NU2Q	"	159,111	292	57	156
NG2P	"	157,215	252	60	175
WK2H	"	146,949	296	43	140
N2MM	"	143,910	252	55	179
N2ADC	*"*	*137,268*	*294*	*51*	*135*
N2CG	"	128,928	226	60	144
KE1IH	"	119,739	259	45	122
WB2PJH	"	96,849	230	38	115
WA2T	"	82,841	172	55	132
WA2UBK	"	81,483	182	45	128
WO2Y	"	76,960	221	36	112
WA3AFS	"	71,318	138	74	137
KD2A	"	64,092	157	40	107
KF2TI	"	61,778	152	48	110
KE2D	"	56,938	135	36	130
W2PA	*"*	*51,397*	*174*	*19*	*84*
NM2O	"	49,842	138	45	97
WA2MCR	"	40,698	132	34	85
K2BX	"	40,040	123	48	82
WO2X	"	31,527	115	37	76
K2YR	"	10,205	54	25	40
AI2N	"	9,120	42	38	42
NJ2DX	"	5,980	45	25	40
KB2MN	"	5,280	34	27	33
WB2LBQ	"	3,248	36	26	32
WF2B	"	1,320	20	15	18
KV2K	28A	478,950	1145	29	121
(OP: K2NG)					
N2OO	"	113,088	326	25	99
W2AW	21A	253,614	691	29	100
(OP: N2GM)					
AA2EQ	14A	8,424	80	8	28
WC2L	7A	26,400	130	15	60
*WB2AA	AA	1,055,669	887	103	340
*N2CU	"	909,221	858	86	293
*NC1A	"	547,680	615	78	248
*K3MTT	"	438,048	513	68	244
*K2PJC	"	418,200	578	53	202
*K2AL	"	418,068	497	73	243
*W2GDJ	"	416,636	410	102	272
*W2AAB	"	411,384	537	74	207
*N1NQD	"	305,916	362	85	233
*W2FDJ	"	303,150	408	73	209
*KC2WUF	"	284,850	385	63	207
*W2VM	"	253,764	396	60	168
*N2UU	"	211,890	357	54	156
*WA2QAU	"	203,604	327	62	166
*WW2P	"	199,906	326	56	162
*K2DFC	"	195,146	284	72	191
*NK1N	"	191,620	333	57	163
*NE2V	"	156,674	273	59	158
*KS2G	"	100,880	199	58	150
*W2MSA	"	72,864	172	49	127
*KM2O	"	71,118	157	41	121
*KY2T	"	69,384	210	47	121
*KA2IRQ	"	62,152	182	39	97
*W2DXE	"	52,096	149	49	99
*KI2D	"	26,106	86	33	81
*AE2TT	"	20,384	119	30	61
*WA2CHV	"	15,030	65	35	55
*AA2TH	"	9,782	53	22	45
*N2GSL	"	7,738	66	22	51
*KD2SGM	"	5,922	59	15	32
*KB2URI	"	3,321	32	14	27
*N2WPT	"	1,560	20	14	16
*N4KHZ	"	690	17	10	13
*K1NY	28A	16,920	97	21	51
*N2BEG	21A	8,100	58	17	37
*N2EIM	14A	38,064	196	16	62
*NR1K	3.5A	90	7	4	6

District 3

K3WW	AA	8,659,726	4407	152	557
N3RS	"	6,928,620	3296	161	579
W8FJ	"	6,698,250	3172	162	588
AA1K	"	6,379,416	3105	159	594
WY3A	"	4,780,359	2692	137	502
W3MA	"	4,449,858	2348	154	553
NA3M	"	3,995,358	2440	128	478
N3AD	"	3,985,072	2440	135	463
NN3Q	"	3,590,370	2033	134	496
K3MD	"	3,579,238	2117	133	478
K3WJV	"	3,506,554	2042	142	472
KU2C	"	2,955,996	1731	139	489
K3ZA	"	2,942,496	1951	114	430
N3AM	"	2,925,020	1755	125	470
NW3Y	"	2,857,842	1680	139	482
K3SW	"	2,656,420	1583	133	468
NF3R	"	2,645,380	1776	131	449
W3FIZ	"	2,475,966	1549	130	457
K3WU	"	2,457,255	1669	123	412
W3FV	"	2,414,262	2036	90	332
K3TEJ	"	2,190,188	1371	125	447
NT2DR	"	2,105,796	1602	109	364
WA3AAN	"	1,880,282	1449	110	372
K3CY	"	1,794,188	1410	119	365
N3NR	"	1,556,880	1112	120	379
K2LNS	"	1,546,776	1199	103	359
N3FJP	"	1,515,036	1063	123	380
AA3R	"	1,413,669	1040	125	398
K3TN	"	1,407,435	999	121	384
K3CCR	"	1,226,470	901	111	379
(OP: N3UM)					
KB3Z	"	1,162,608	1004	93	331
K3ZU	"	1,103,705	754	120	415
N3ZA	"	986,206	796	112	345
WC3N	"	969,012	878	89	307
WA3AER	"	920,564	869	81	292
W3JX	"	911,232	691	113	391
K3PP	"	872,850	629	118	388
KD3TB	"	815,424	720	94	317
K3ATO	"	807,747	871	100	283
KA3D	"	758,163	604	107	350
N3RJ	"	725,382	779	74	268
W3OU	"	715,652	612	103	324
K3RL	"	670,194	529	115	371
K3FMQ	"	663,421	552	104	347
KW3Z	"	647,454	643	93	273
W3UL	"	598,688	616	87	266
K3BHX	"	514,225	587	76	259
NG3J	"	512,798	659	56	230
NX3Z	"	496,278	515	87	262
WW3S	"	433,405	377	112	315
W3RE	"	413,042	463	94	232
W3ICM	"	400,014	454	113	313
AK3B	"	370,575	476	77	228
NN3RP	"	301,040	442	59	206
W3YR	"	300,498	356	79	235
KC3NNO	"	285,842	447	63	199
K3AK	"	266,485	419	58	181
NY3C	"	259,120	307	86	230
N3ZP	"	231,660	408	57	163
W3EA	"	223,258	323	62	197
K3QIA	"	213,816	341	63	173
KG4USN	"	204,730	267	69	226
NT3U	"	191,316	244	74	224
N8WXQ	"	181,332	328	57	150
KC3M	"	140,936	234	68	155
WX3B	"	139,308	234	71	157
WK2G	"	124,236	292	32	121
W3SQ	"	103,408	205	48	136
N4QQ	*"*	*95,956*	*223*	*47*	*114*
K3CWF	"	95,770	232	29	128
K3FH	"	86,592	192	45	119
N2IW	"	65,205	142	56	105
K3WGR	"	59,566	179	43	115
W3NRJ	"	57,279	173	51	132
K3RMB	"	46,343	150	38	83
KG5TA	"	36,442	130	51	82
K2EJ	"	28,994	101	24	85
K3NM	"	27,120	86	40	80
K3OQ	"	11,628	60	22	46
K3FT	"	11,297	173	40	103
KZ3W	"	9,536	60	26	38
W3MAM	"	5,429	50	23	38
N3RM	"	4,888	49	13	34
W3MF	"	2,940	27	15	27
N4ZR	28A	222,080	598	27	101
N3XF	"	16,214	89	22	45
W3NO	3.5A	132,374	397	28	93
K3MM	"	80,928	315	17	79
*NY3A	AA	4,856,628	2666	138	508
*W3KB	"	2,286,526	1398	126	457
*NS3T	"	1,549,776	1150	114	384
*NJ3K	"	1,265,850	1070	102	333
*NR3Z	"	1,188,048	1005	103	321
*W3RGA	"	926,772	882	90	284
*AC5XK	"	670,026	791	76	242
*NU3A	"	628,430	756	73	246
*AG3I	"	516,516	626	76	232
*KB3AAY	"	494,118	624	67	216
*WB8YYY	"	454,310	470	85	277
*N2MA	"	414,854	455	84	262
*WM3O	"	278,205	411	61	194
*WB3FAE	"	208,500	326	71	179
*NE3I	"	144,336	282	53	141
*KB3NSK	"	120,726	277	44	127
*K3MAW	"	100,093	236	52	129
*W3KN	"	98,430	214	46	124
*AC3RA	"	93,264	203	47	127
*W3WHK	"	92,022	253	40	107
*K3QF	"	58,598	140	50	116
*KC3SVR	"	48,094	148	41	98
*KB3RC	"	26,145	97	29	76
(OP: K3JWI)					
*AJ3M	"	19,899	90	33	66
*K4IEY	"	15,652	102	24	67
*N3WT	"	13,440	79	21	49
*W3TAS	"	13,132	77	23	44
*N3HRO	"	11,730	62	20	49
*WD3H	"	4,900	42	19	30
*AB3KP	"	2,752	36	13	19
*N8HM	"	522	12	7	11
*K3STX	28A	9,536	53	15	49
*W3IDT	21A	14,000	90	16	54
*N3TTT	"	1,000	17	6	14
*W1FIF	7A	35,520	170	18	62

District 4

N2YO	AA	6,471,840	3460	149	546
N1LN	"	4,980,800	2534	155	549
K4AB	"	4,572,450	2492	152	523
KØZR	"	4,334,850	2687	128	457
NO9E	"	3,656,790	2160	143	472
K4PI	"	3,356,342	1809	158	513
WO4O	"	3,301,621	1882	142	487
W4RM	"	3,231,351	1928	137	494
N4UU	"	3,041,745	2370	107	384
N3JT	"	2,727,060	1632	133	471
N6AR	"	2,688,160	1546	146	488
N4BP	"	2,658,936	1764	121	411
N2NL	"	2,589,253	1369	149	534
K2SG	"	2,538,179	1902	120	377
K5EK	"	2,457,594	1390	140	501
K3IE	"	2,381,013	1587	128	421
NU4E	"	2,301,825	1287	149	504
K9OM	"	2,163,348	1332	134	460
K2SX	"	2,101,680	1402	128	432
N1TO	"	1,985,145	1633	109	336
AA5JF	"	1,776,015	1193	123	426
N4IQ	"	1,412,808	1029	115	401
K2WK	"	1,402,632	1059	109	374
W3IP	"	1,386,685	838	133	466
W4PM	"	1,370,432	1130	103	345
KX4TT	"	1,325,212	941	132	400
KG4W	"	1,291,314	947	118	380
K8AC	"	1,150,261	847	123	388
N4ZZ	"	1,125,930	1011	90	300
K4WMS	*"*	*1,087,176*	*696*	*133*	*449*
NN4NN	"	1,081,350	811	118	368
(OP: K3SV)					
K1GU	"	1,042,002	858	99	339
N8KH	"	1,000,153	919	104	315
NN4X	"	969,178	686	136	382
N4KH	"	951,356	834	106	321
W4PG	"	883,584	809	98	286
N3MN	"	860,928	691	115	341
K5JR	"	820,393	649	131	372
W3TB	"	732,360	688	103	305
WV4P	"	708,696	469	133	446
AA4R	"	691,548	702	88	284
WA4JUK	"	689,850	712	96	269
N1RM	"	684,450	611	89	316
WE5P	"	663,750	750	95	280
WS6X	"	646,016	608	100	292
NZ4N	"	622,454	658	91	255
N3CW	"	574,820	526	101	309
KC4D	"	562,419	687	66	233
K3WT	"	543,600	691	74	228
K2TE	"	537,610	536	85	285
W3GQ	"	537,480	534	98	262
N4RV	"	522,518	703	66	208
NS4X	"	461,580	535	90	224
N4PD	"	440,700	409	89	301
KE4KY	"	402,675	518	61	212
N4NA	"	390,486	498	85	217
(OP: NB4M)					
N3KN	"	365,264	447	73	223
W2XYZ	"	342,891	494	76	203
N2TU	"	335,885	367	85	256
AB4PP	"	327,600	466	89	223
K8KI	"	323,308	452	67	195
K2SD	"	294,522	463	72	185
N4CWZ	"	287,718	463	61	176
W3US	"	286,356	361	90	204
W8KRZ	"	262,728	368	65	202
AA4DD	"	252,810	345	87	178
N3MM	"	244,019	381	70	169
K4XL	"	242,296	352	61	187
N4FP	"	237,568	346	83	173
KEØL	"	229,834	264	109	232
W3OA	"	222,600	300	66	199
W4ZXT	"	222,040	338	70	190
NA4J	"	207,794	363	54	160
K4HA	"	188,848	299	67	165
W4CU	"	185,900	258	87	199
AA4GA	"	183,200	289	67	162
W4GHV	"	173,978	289	74	164
W4SSF	"	172,660	327	47	147
AF4T	"	164,797	284	63	160
WØLL	"	143,264	293	41	135
(OP: K8FC)					
W4VIC	"	138,150	246	66	159
AB4SF	"	132,756	348	37	111
N4TL	"	125,396	251	56	132
KM4HI	"	122,931	189	79	182
KK4R	"	118,413	200	79	144

KG3V	“	104,574	217	49	125
AC2AC	“	100,672	219	45	131
N6DW	“	96,408	179	71	135
K3ZGA	“	88,722	213	48	111
N4OI	“	77,810	184	44	111
N4DE	“	74,340	198	64	116
K4OV	“	74,298	151	55	128
W4PF	“	74,261	174	47	110
N3PV	“	66,882	157	67	146
AE4ED	“	63,080	138	48	118
KX4X	“	59,532	135	48	116
NU4Y	“	48,230	136	32	98
W6UB	“	43,065	143	50	85
K4EES	“	34,542	120	38	76
KT4O	“	34,138	118	28	73
AD4IE	“	30,926	120	20	74
N4LZ	“	28,611	108	36	63
NØSMX	“	22,230	86	21	69
WB3D	“	21,450	81	39	71
W4/4Z5LA	“	21,170	110	18	55
K4MWB	“	20,806	81	35	66
KT4Q	“	17,784	80	23	55
K4KZ	“	13,572	69	31	47
W4NPX	“	9,724	62	24	44
KB4FB	“	8,946	49	25	46
ND4G	“	8,875	49	26	45
K4AEN	“	8,051	66	26	57
N4ES	“	2,304	22	16	20
KS4X	“	1,960	20	15	20
N3ND	“	1,702	25	7	16
K5KG	28A	218,694	631	27	100
K4WI	“	204,378	568	28	110
NE8P	“	148,953	427	27	96
W4DD	“	92,628	262	29	95
K4NMR	“	59,150	237	24	67
NN4K	“	567	14	9	12
KE4S	21A	150,930	422	27	103
K3DNE	“	34,425	160	24	57
NN3W	14A	10,800	56	21	54
K4MQM	“	1,400	20	9	19
KE4KDY	“	756	16	5	13
AD8J	7A	69,984	271	20	76
W3CL	“	0	1	1	1
W4PK	3.5A	27,335	144	16	55
K2KW	1.8A	11,387	136	15	44
*N4XL	AA	1,504,956	1120	121	377
*K4OAQ	“	1,215,149	988	111	332
*WN4AFP	“	796,860	820	94	286
*KY4ID	“	710,973	670	100	301
*K4FT	“	696,764	682	92	281
*AAØO	“	695,640	671	92	280
*N4PSE	“	656,036	592	105	304
*KW4YA	“	622,909	694	92	279
*KY4GS	“	573,016	654	83	245
*K2MK	“	550,800	667	77	223
*N4DW	“	433,411	472	83	258
*WB4IT	“	402,210	450	73	254
*K3ZV	“	346,290	491	59	196
*WA4PGM	“	260,184	336	80	213
*N3HEE	“	259,549	347	69	208
*WA2LMC	“	250,635	424	64	181
*N4NTO	“	235,770	341	72	199
*W4EE	“	232,960	337	79	177
*W5VS	“	211,296	321	65	183
*K5VG	“	193,492	298	62	182
*NG2J	“	186,960	345	58	147
*W4TM	“	179,157	261	84	183
*W4RKU	“	175,032	274	79	185
*KG4IGC	“	171,696	293	66	153
*N3CKI	“	161,928	348	41	132
*K4GM	“	147,498	298	54	132
*W2BJN	“	145,524	276	59	142
*W4CMG	“	143,678	293	67	132
*KT3T	“	134,784	230	71	145
*N4QI	“	111,723	252	46	121
*N4WO	“	108,928	228	54	130
*KE4Q	“	108,780	226	54	142
*NC2Y	“	102,830	303	55	127
*K4MI	“	102,672	188	62	145
*KS4S	“	98,952	226	56	130
*K4DR	“	89,739	202	49	120
*NG2O	“	71,336	171	37	111
*N2YF	“	68,400	172	46	106
*NE5W	“	64,824	159	41	107
*WD4FMG	“	62,640	142	60	120
*KR4AE	“	51,183	144	49	92
*N4DPM	“	47,925	133	38	97
*KC4LZN	“	47,813	133	52	85
*NA4C	“	44,840	138	55	97
*WS4C	“	40,880	104	42	104
*NJ4Q	“	40,590	152	29	81
*N3GTG	“	37,120	143	33	83
*N1KX	“	35,778	102	45	89
*K4RFK	“	35,280	113	39	81
*W4RIN	“	30,576	112	24	74
*WD4OHD	“	28,674	97	42	76
*K8PO	“	26,460	102	30	68
*K4LW	“	25,440	97	31	65
*NT4W	“	24,860	87	31	79
*KN4ZXG	“	23,760	118	34	65
*K4EAK	“	22,880	94	37	67
*W4NNF	“	17,538	97	21	53
*KA4GFY	“	15,390	67	33	62
*N8RW	“	15,364	75	36	56
*W4SDX	“	14,884	97	49	73
*KB4DE	“	13,224	64	25	51
*K2AOE	“	12,876	61	23	51
*NA4MM	“	8,520	46	30	41
*K4WK	“	8,446	67	34	48
*KM5AT	“	7,749	54	21	42
*W8WZ	“	6,215	51	15	40
*KO4AWC	“	4,816	39	11	32
*K4RSA	“	3,698	36	14	29
*NG4L	“	3,150	28	17	25
*AD4YQ	“	2,967	33	17	26
*N4GL	“	2,340	23	13	23
*KO4OL	“	1,591	21	16	21
*K4VBM	“	1,584	19	15	18
*WJØJ	“	546	14	13	13
*N4AAJ	“	252	7	5	7
*N3UA	28A	101,673	303	27	90
*AA4LS	“	62,062	258	20	71
*WA1FCN	21A	178,553	500	28	103
*W1ZZ	14A	64,414	213	25	82
*AA4NP	7A	112,980	400	23	82
*K3ORC	“	19,604	126	12	46
*NS4T	“	15,246	94	18	45
*NN4RB	“	6,040	54	11	29
*N4ELC	“	1,247	25	10	19
*N4IJ	3.5A	54,238	225	19	75
*K7LU	“	5,125	45	7	34

District 5

N5RZ	AA	4,442,592	2441	159	513
KM5G	“	1,977,448	1439	125	381
KT5C	“	1,412,073	1246	115	332
W5GN	“	1,250,074	1183	104	302
K5TU	“	1,221,204	1023	114	333
N5EE	“	1,176,630	1013	117	314
K5NZ	“	1,089,900	791	134	391
K5KLA	“	1,038,510	765	115	380
K5UV	“	849,960	871	102	258
WØVX	“	746,102	703	103	286
N5XZ	“	734,022	705	103	291
N5KD	“	725,308	745	99	259
W9DCT	“	723,976	643	109	309
AC4CA	“	654,282	740	92	234
W5TM	“	632,502	554	129	330
K5TIA	“	446,823	517	100	251
WBØTEV	“	371,090	330	116	314
K1JD	“	325,414	432	93	196
K5LJ	“	290,377	329	89	234
W2GS	“	281,775	403	78	177
N5XJ	“	255,635	442	62	153
K5TS	“	245,178	299	89	229
K5DU	“	243,076	345	83	185
K5MXG	“	238,272	300	91	201
K5LY	“	196,602	354	61	156
N5JJ	“	192,241	371	70	133
K5FP	“	187,078	398	45	133
K7IA	“	184,704	316	70	152
W2IY	“	175,310	284	82	153
NE5A	“	163,542	335	58	136
AF5J	“	157,296	257	73	159
W5LE	“	141,680	254	71	149
K5DB	“	132,088	373	44	108
N5WNG	“	130,806	209	80	154
K5MV	“	113,032	215	58	141
WD5DBV	“	109,178	309	40	118
K5JTH	“	103,284	183	84	144
K5WA	“	99,900	242	56	124
K5NA	“	98,468	180	77	129
K5KJ	“	72,668	193	59	89
AI5EG	“	69,345	143	66	135
WF3H/5	“	67,039	174	49	108
KA5M	“	53,482	138	36	107
K6ZB	“	52,220	162	49	91
NØVRP	“	49,911	140	39	92
WA5LXS	“	44,525	129	52	85
K5AX	“	44,523	121	60	93
WA5LHM	“	40,479	179	47	84
N5UI	“	27,440	128	37	61
K5CI	“	14,525	68	34	49
KG5VK	“	10,934	59	24	47
N5KAE	“	9,664	62	19	45
NA5M	“	9,263	60	23	36
N5NEN	“	5,015	43	24	35
KJ5Y	“	2,272	24	10	22
W5GAI	“	1,274	23	9	17
K5LG	28A	13,608	95	18	45
WA5YOM	14A	39,144	188	21	63
K3KEK	“	3,420	54	16	29
NI2M	7A	60,495	226	28	83
W5SJ	“	59,511	305	22	61
W5JMW	3.5A	7,008	90	13	35
K5UR	1.8A	12,749	98	16	45
*WB5N	AA	273,776	423	89	195
*W5TMT	“	207,558	406	76	158
*K5MR	“	123,414	233	66	135
*N5IF	“	113,050	250	52	118
*WA5LFD	“	109,440	271	66	126
*AG5AY	“	107,115	238	55	130
*KØYA	“	86,000	196	60	112
*WBØRUR	“	74,688	152	61	131
*NU5DE	“	60,630	178	43	86
					(OP: N5KF)
*W5LA	“	59,296	163	37	99
*KC6ZBE	“	33,375	102	44	81
*W7JKC	“	25,172	88	42	82
*N5JGE	“	14,863	75	37	52
*AF5CC	“	13,440	63	34	46
*N5DIT	“	8,880	87	44	76
*K5KXJ	“	6,248	83	29	42
*W5ZA	“	527	11	8	9
*K5JM	“	486	10	9	9
*KD5YS	“	10	5	5	5
*N5JR	21A	148,626	397	30	108
*NS5S	7A	405	11	6	9

District 6

N6RV	AA	2,382,120	1799	140	369
K6OK	“	1,396,766	1196	126	287
N6ZFO	“	1,363,230	1349	122	252
K6KM	“	1,293,414	1087	128	310
					(OP: @W6SRR)
K9YC	“	1,026,928	1041	110	261
AA6PW	“	796,704	905	97	247
K6MMM	“	700,574	830	94	213
					(OP: KE1B)
W6YI	“	642,200	491	144	350
N6CW	“	527,787	565	104	243
N6XI	“	434,396	597	85	177
NT6V	“	417,060	505	104	211
N6US	“	404,231	634	100	163
					(OP: KH7Y)
WE6Z	“	387,520	480	110	210
WA6KHK	“	345,774	489	97	189
K6RIM	“	335,818	438	92	197
WC6H	“	297,840	383	93	199
N6JV	“	229,179	340	74	163
N6IE	“	210,105	317	92	169
N6TQ	“	193,004	305	94	150
K6RC	“	170,568	353	69	115
AF6DR	“	170,544	315	75	134
WA7G	“	162,628	325	82	136
W7QM	“	154,424	303	74	120
					(OP: W6SX)
K5OA	“	143,902	298	82	129
K6MM	“	115,236	227	67	127
W8GJK	“	110,075	240	66	109
W6IA	“	99,648	192	69	123
K6EFA	“	93,060	251	45	96
K6AR	“	90,449	211	52	99
NE6I	“	71,142	196	53	89
W6GRV	“	64,224	179	62	82
W6KC	“	58,088	160	41	96
W6SC	“	57,564	174	49	74
KG6AO	“	57,156	166	57	75
N6KI	“	54,900	141	65	85
K6NV	“	50,337	166	47	72
K6RWM	“	39,603	135	55	74
K6GFJ	“	37,856	151	36	55
WD6DBM	“	36,449	125	52	75
KF6I	“	35,867	170	40	49
WI6X	“	35,650	125	50	65
N6WT	“	35,190	121	39	63
AF6SA	“	33,439	102	40	79
N6QQ	“	32,242	122	38	60
W6TMD	“	30,226	114	44	75
N6VOH	“	26,487	129	51	58
K6MI	“	25,991	127	29	50
N6VH	“	25,740	107	42	48
K6XV	“	22,568	92	41	50
AJ6TL	“	12,474	81	34	43
W6EO	“	11,685	127	42	53
KB6CA	“	4,284	51	22	29
WD6T	“	3,870	39	17	28
N6PM	“	1,540	21	13	15
K6PO	28A	19,364	142	17	30
KD6X	21A	78,330	268	28	77
NK6A	“	53,406	228	28	58
N6RA	“	8,550	154	3	16
					(OP: N6LRA)
*KW6AA	AA	210,663	337	90	173
*AA2IL	“	162,996	305	74	130
*NC6RJ	“	86,424	207	64	92
*AA6XA	“	42,003	148	49	68
*KØDTJ	“	37,570	113	46	84
*W6RQ	“	37,070	126	41	69
*KN6IPE	“	26,280	163	45	45
*KA5WSS	“	24,424	108	40	46
*KI6OY	“	23,184	130	37	35
*NU6T	“	23,140	103	42	47
*AB6BR	“	21,670	95	51	59
*N6NO	“	20,094	72	44	58
*WU6X	“	9,656	56	29	42
*KX6A	“	9,088	57	36	35
*K6ST	“	8,533	73	25	28
*AE6PL	“	2,480	28	20	20
*KN6Y	“	460	36	22	24
*K6EI	“	352	8	8	8
*K5CAO	“	24	2	2	2
*K6AAM	28A	29,388	194	21	41
*W6JPL	“	540	39	14	16
					(OP: K6ICS)

District 7

N7XU	AA	1,632,848	1214	141	347
					(OP: K4XU)
K7QA	“	1,478,840	1280	131	309
AA7V	“	1,420,848	978	138	390
K6LL	“	1,326,312	1020	127	341
K7WP	“	1,212,332	976	131	336
WS7L	“	1,103,946	995	128	283
N7EPD	“	1,077,678	1027	118	260
W6OAT	“	1,036,816	815	139	334
W7ZR	“	1,027,540	955	125	290
KN7K	“	1,018,654	1057	116	261
K7ZQ	“	1,014,307	1169	104	225
KC7V	“	818,958	860	109	248
KØSN	“	745,059	780	98	259
W7CXX	“	627,120	705	112	248
W7GES	“	598,092	580	117	277
KH7X/W7	“	572,232	729	125	297
					(OP: KH6ND)
W7VO	“	510,447	591	108	219
K7UT	“	456,015	575	88	213
N3AIU	“	422,184	556	99	195
KI7Y	“	417,219	563	100	169
K7GS	“	377,917	445	95	212
N7IP	“	377,085	434	108	237
NW7M	“	348,064	420	97	201
N7RVD	“	330,820	548	90	148
KT7E	“	323,169	494	73	158
					(OP: NK7U)
KN7Y	“	276,150	420	99	164
K7RF	“	244,662	383	82	160
K7HP	“	244,110	393	86	151
K7LFY	“	218,685	377	78	161
K7GA	“	198,640	439	89	171
WU9B	“	186,633	312	79	154
NQ7R	“	181,745	293	72	151
N6MZ	“	179,760	308	66	148
WA7CPA	“	161,838	270	84	159
WØVQ	“	160,962	333	75	118
K6VHF	“	159,430	295	73	141
N9NA	“	130,476	300	64	102
W2VJN	“	125,976	262	67	107
K7VIT	“	94,752	245	62	79
WR7T	“	93,024	234	63	108
K7EG	“	89,380	214	52	112
W7BP	“	83,620	268	68	117
WØNF	“	63,992	166	55	97
WA7DUH	“	60,214	165	62	99
K9PY	“	57,000	160	65	87
K6KR	“	55,328	155	47	86
WB6JJJ	“	51,554	192	62	87
AC7DC	“	44,635	154	46	67
W7VXS	“	38,064	121	47	75
KI6QDH	“	36,461	136	30	71
K7BTW	“	36,449	112	41	86
N6BT	“	35,217	103	50	79
KR7D	“	30,294	113	40	59
N7DSX	“	26,924	137	49	57
KØIP	“	14,994	70	45	57
N6RC	“	8,280	49	26	43
W7CO	“	6,426	52	29	25
K7ACZ	“	5,376	37	22	34
KR7X	“	4,410	39	20	22
KF7ZN	“	3,870	33	18	27
AB7YQ	“	3,655	30	20	23
N6SS	28A	252,453	763	32	97
KK7L	“	6,550	49	19	31
AA7A	21A	490,889	1134	33	128
N7AT	“	459,669	1083	34	125
					(OP: K8IA)
N7DD	“	427,040	1027	35	122
W7RN	“	383,396	1022	34	112
					(OP: K5RC)
K7SS	“	231,750	724	33	92
N7TU	14A	116,348	381	31	87
K7PI	“	56,854	170	32	99
KA6BIM	“	26,574	112	30	56
AG6V	“	6	1	1	1
K7NJ	7A	423,500	1029	35	119
N7KU	“	261,513	690	34	113
					(OP: NJ6D)
N7WA	“	146,520	491	29	81
W6XI	1.8A	966	45	9	12
W7RH	“	740	21	8	12
*K7TQ	AA	670,628	844	101	200
*K6WSC	“	586,560	525	123	293
*W7OM	“	315,904	494	98	158
*WAØWWW	“	271,440	398	94	166
*WN6W	“	183,106	331	77	126
*KK7RR	“	150,243	325	68	115
*NU7F	“	131,192	259	69	115
*WZ8T	“	69,224	190	53	83
*W7KK	“	53,067	151	54	79
*N7MU	“	43,428	141	61	80
*K7HV	“	34,424	135	33	71
*N7UJJ	“	30,225	118	38	55
*KI7VEM	“	28,213	197	43	46
*NA6JD	“	25,916	148	56	68
*KD7LEE	“	23,766	189	47	55
*KK7A	“	15,552	83	31	41
*W2XX	“	12,665	68	37	48
*NW7E	“	11,682	64	24	42
*KT7G	“	10,877	58	31	42
*KB7HDX	“	8,385	48	25	40
*W4IDX	“	7,350	53	21	28
*K5HDU	“	6,084	65	21	18
*NN7M	“	5,977	51	19	24
*WA7YXY	“	5,635	48	24	25
*K7NXL	“	5,187	38	22	35
*WB7QMR	“	2,278	26	12	22
*KJ7MEB	“	812	19	15	13
*N2WLG	28A	6,808	66	17	29
*WV7S	21A	21,574	128	23	44
*WØBF	“	11,375	78	21	44
*N7ESU	14A	5,311	54	18	29
*KTØP	3.5A	434	19	8	6

District 8

WA3C	AA	3,392,356	1862	141	511
W8MJ	“	3,129,950	1993	138	452
K1LT	“	2,100,054	1157	149	528
N4RA	“	2,055,674	1266	133	454
WA8Y	“	1,602,717	1259	120	367
N8TR	“	1,186,911	704	144	487
KI6DY	“	1,111,215	981	94	305
NW8U	“	900,720	749	100	332
K8MM	“	617,312	604	106	276
KI8R	“	549,185	556	91	264
NO8C	“	543,744	607	90	264
W8MK	“	496,059	543	76	251
KB8KMH	“	447,120	475	97	263
W3HKK	“	368,562	480	89	229
N4EL	“	287,595	411	63	186
KA8G	“	282,569	414	59	200
NR8Z	“	273,831	360	79	212
WB8AKW	“	273,304	373	75	194
K8TS	“	232,408	376	85	193
N4LSJ	“	221,343	306	73	194
W8EH	“	177,723	302	66	151
N8BE	“	114,912	254	53	118
N9RC	“	111,690	193	69	150
WA8LRW	“	107,198	232	59	123
KV8O	“	103,950	216	56	133
					(OP: K8PGJ)
WB2RPW	“	100,620	256	60	200
WA8KAN	“	95,375	220	58	117
W8AJS	“	94,454	244	40	126
K8JQ	“	70,375	209	35	90
NR5N	“	59,580	153	66	114
N8HO	“	55,719	145	40	111
KD8SAV	“	50,715	140	39	108
W8YV	“	47,854	128	45	97
W8JWN	“	36,312	104	41	95
K8ESQ	“	30,736	98	33	80
W8PI	“	27,104	86	43	78
AA5TA	“	16,104	65	35	53
KF8MZ	“	2,232	28	14	22
KD8VMM	“	546	13	8	13
W8AV	28A	135,346	415	27	91
KO8Z	21A	45,978	173	24	73
WZ8P	“	31,122	109	27	87
K8CX	14A	854,712	1912	36	126
W8BI	7A	30,690	130	21	69
					(OP: KB8UEY)
*K8LY	AA	651,058	687	96	271
*KE3K	“	501,160	566	107	233
*KE8PX	“	337,272	455	77	205
*KC8R	“	238,420	341	68	192
*W8AN	“	220,119	352	73	166
*N8VV	“	150,516	248	58	164
*W8ASA	“	89,694	173	60	138
*W8TOM	“	78,489	193	46	107
*W8PU	“	77,525	205	51	124
*N8LR	“	75,658	167	60	121
*N8KOM	“	72,432	212	64	80
*W8IQ	“	68,838	170	53	101
*AB8OU	“	63,520	159	60	100
*AK2U	“	45,540	128	44	88
*K8GT	“	37,638	118	49	74
*W8EWH	“	28,768	97	46	78
*K8WWS	“	21,770	106	17	53
*KD8EDC	“	11,622	60	26	52
*WB8ASI	“	7,728	59	31	38
*KB8ZYE	“	6,302	62	13	33
*N8OH	“	4,558	36	24	29
*W5DT	“	3,182	35	10	27
*N8HRZ	“	1,176	19	10	14
*KG8CW	“	594	13	10	12

District 9

K9NW	AA	4,555,265	2300	164	551
K9IMM	“	3,217,254	1907	144	462
N9TTK	“	2,770,979	1846	138	413
KK9V	“	2,296,220	1500	140	440
N2BJ	“	1,784,064	1224	131	421
NF9V	“	1,694,420	1155	139	393
K9YY	“	1,496,052	1065	127	395
AJ9C	“	1,405,404	1030	127	380
K9WO	“	1,252,080	961	124	346
N9CK	“	1,207,360	884	121	369
WI9WI	“	1,069,984	863	114	350
W9MR	“	821,792	713	107	314
AI9T	“	815,833	686	107	342
AC9S	“	691,352	703	97	259
KW9E	“	664,309	670	99	292
WT9U	“	612,130	568	100	310
K9NO	“	467,250	496	102	248
KA9FOX	“	274,518	351	98	204
K9MMS	“	269,988	351	90	208
W9YK	“	248,496	375	70	178
KØTQ	“	244,065	382	71	194
WØELT	“	223,728	355	82	155
WB8BZK	“	211,932	310	76	185
KB9S	“	199,448	333	69	164
WN9O	“	190,954	236	106	201
N9GUN	“	190,422	326	59	154
W9MS	“	143,262	301	56	133
KU9S	“	135,606	244	68	165
WB9VGO	“	110,544	243	51	117
W9KXQ	“	99,800	261	64	136
KB8RY	“	81,965	172	51	118
AB9CD	“	67,332	145	69	117
WB9TFF	“	54,568	138	54	98
W9FFA	“	46,417	178	42	91
WS9W	“	43,066	134	36	86
W9OA/9	“	42,560	117	53	87
KC9EOQ	“	40,950	146	45	81
AA9L	“	38,060	138	33	77
W9NZ	“	36,830	111	42	85
KC9EE	“	35,417	124	38	69
W9DGI	“	16,610	70	46	64
N7MB	“	9,452	53	26	42
KØPG	“	7,480	59	36	52
K9EL	“	3,036	24	23	23
AG9S	28A	59,202	227	23	76
WB9Z	21A	571,704	1248	34	130
N9CO	“	438,353	1036	31	120
K9LA	“	33,669	107	29	100
W9PA	7A	340,650	811	34	116
N9AU	“	149,467	430	32	105
W9RN	“	103,936	314	31	97
N9LR	“	45,217	210	27	76
KM9M	“	1,664	24	10	16
K9GS	3.5A	225,375	670	28	97
N9AW	1.8A	3,040	39	12	28
*KG9X	AA	1,949,480	1389	136	384
*WE9R	“	1,794,654	1233	129	408
*K9PW	“	626,133	677	89	250
*KYØQ	“	351,036	433	74	220
*AB9YC	“	340,118	367	90	256
*W9KM	“	290,985	391	88	197
*N9XX	“	262,454	346	76	205
*WT9Q	“	259,116	347	83	203
*N5RP	“	224,058	381	56	158
*KD9CLH	“	200,725	328	52	165
*WA9LEY	“	190,530	338	63	156
*K9QC	“	158,400	266	64	156
*W9JA	“	152,274	276	73	173
*W9VQ	“	117,810	210	63	147
*AG9A	“	107,040	192	82	141
*KC9YL	“	81,450	212	48	102
*N9SB	“	66,504	178	40	96
*K9CPO	“	57,420	152	48	97
*K7CS	“	48,000	143	42	86
*WB9TFH	“	34,680	132	47	89
*KC9IL	“	30,495	103	32	75
*KD9OIN	“	27,423	108	35	64
*KZ9V	“	20,064	92	38	58
*KX9RT	“	11,934	54	30	48
*WO9U	“	8,880	50	29	45
*W9LW	“	8,120	51	19	39
*AA9RK	“	7,280	53	23	33
*KF9VV	“	7,257	53	22	37
*KJ9X	“	6,678	47	16	37
*N9VPV	“	5,358	41	16	31
*N8HWV	“	4,914	37	22	32
*K9PG	“	3,102	25	23	24
*K9EI	“	1,848	25	14	19
*K9DRS	“	1,696	21	15	17
*NQ9A	“	836	15	10	12
*W9ILY	28A	63,852	227	26	76
*W9XT	21A	256,452	635	30	112
*K9MCK	7A	2,414	30	10	24

District Ø

NØAV	AA	2,610,387	1557	148	455
KØEU	“	2,424,936	1686	143	386
KØAP	“	1,598,919	1128	133	378
KTØA	“	1,483,959	1213	124	337
KØIR	“	1,428,742	1139	128	350
ABØRX	“	1,296,256	976	117	377
WAØMHJ	“	1,206,864	844	144	378
NØKV	“	1,165,248	1100	123	285
WØBV	“	890,332	764	118	294
KEØUI	“	839,790	882	115	272
NXØI	“	751,036	722	116	288
K9DU	“	687,216	626	108	304
K2VV	“	660,325	768	83	222
KØYR	“	618,813	668	114	255
KØAD	“	594,638	635	101	257
NG7A	“	545,110	618	101	260
NØBUI	“	533,687	616	86	233
KØCN	“	490,533	538	93	246
KØVBU	“	484,696	543	99	245
WØZA	“	481,193	493	107	282
W7II	“	439,227	503	91	242
NØTA	“	426,979	523	97	240
WØBM	“	406,644	452	83	246
AE5E	“	396,000	431	102	250
WØGJ	“	385,682	454	113	260
KØPC	“	367,715	476	89	204
KBØEO	“	355,500	366	120	255
KIØF	“	352,974	491	70	197
WBØN	“	345,488	418	92	210
KMØO	“	315,504	474	70	182
NØKK	“	313,320	418	80	200
NØAT	“	279,538	355	87	200
WØPSY	“	278,988	382	86	182
WØPR	“	273,312	409	86	202
WØUY	“	248,920	387	78	176
NØKQ	“	240,570	357	89	181
NØRN	“	233,766	354	76	167
NWØM	“	221,364	401	57	141
KØGD	“	207,888	378	77	136
KØHB	“	191,394	277	94	185
W7RF	“	189,224	327	70	147
K1KD	“	182,646	311	69	150
KØTRL	“	149,640	262	60	155
KØMD	“	147,828	277	59	135
N7IV	“	144,320	277	71	149
WØAD	“	131,937	235	76	145
KS9W	“	100,940	206	58	138
KØARY	“	98,975	208	51	134
KØTG	“	88,872	193	60	124
WØGAS	“	77,328	175	63	116
ADØRW	“	76,950	189	45	105
KØDS	“	75,504	196	44	112
					(OP: KJ5Y)
NFØN	“	54,210	151	42	88
NOØL	“	37,290	141	37	76
ADØAB	“	29,184	124	42	72
WØGXA	“	27,192	110	36	52
WØPMO	“	23,449	80	62	69
K5ZG	“	22,968	100	43	56
KØTLG	“	10,062	61	30	48
ACØE	“	2,752	32	18	25
K7TD	28A	27,962	124	26	56
K3PA	“	26,950	91	26	84
KFØIQ	21A	6,962	43	18	41
WØMI	7A	3,344	44	12	26
					(OP: ACØE)
*KØRC	AA	1,025,999	814	126	341
*AD1C	“	798,174	786	105	274
*ACØW	“	759,708	691	116	307
*KØKX	“	635,704	685	100	247
*AEØDX	“	443,368	511	105	248
*KØXF	“	408,576	525	98	206
*AAØAW	“	386,872	522	91	205
*AI6O	“	334,080	479	87	203
*WØUC	“	213,640	318	82	198
*NØHR	“	180,960	313	75	157
*NNØG	“	151,755	293	65	136
*AAØAI	“	142,317	224	73	178
*KØIL	“	121,690	225	71	144

*AKØM	"	104,594	191	73	144
*KØMPH	"	84,108	191	61	111
*KEØEK	"	80,772	201	62	97
*AFØE	"	71,400	176	55	115
*K9OR	"	62,700	143	55	110
*WØYJT	"	53,400	165	53	97
*WO7U	"	48,008	140	48	88
*NØGM	"	32,504	145	44	92
*KØWOI	"	30,140	111	40	70
*KNØL	"	26,700	118	28	61
*K4EQ	"	26,334	99	41	73
*KØWRY	"	25,725	97	35	70
*WBØWIV	"	8,493	64	17	40
*KIØD	"	6,417	48	31	38
*WI9P	"	6,174	42	29	34
*W6GMT	"	5,304	44	23	28
*KB9LLD	"	4,644	33	26	28
*W5GA	"	2,940	42	10	25
*KØSV	"	2,849	32	15	22
*KJØP	"	1,836	25	18	18
*KEØQKF	"	1,050	17	7	14
*WB9NMN	"	468	12	6	7
*WØJOP	"	408	10	7	10
*K7BG	"	48	3	3	3
***KKØU**	28A	60,096	233	25	71
***W2UP**	21A	123,625	386	29	86
***NNØJS**	14A	20	6	3	2
***KØKT**	3.5A	14,012	101	13	49

NORTH AMERICA

Alaska

NL7V	AA	85,094	241	57	100
AL2F	"	38,352	150	48	54
NL7S	21A	14,014	119	20	29

Belize

V31CQ	21A	942,704	2632	34	118
(OP: K5PS)					

Canada

District 1

VO1HP	AA	1,069,086	1149	84	297
VE9HF	"	887,250	1099	80	258
VE1ANU	"	526,500	695	83	242
VA1CC	"	154,971	294	45	156
VO1CH	"	24,130	75	55	72
VE9OA	"	7,128	53	20	34
VO2AC	28A	95,040	350	21	87
VA1RST	7A	172,250	674	24	82
***VE9VIC**	AA	757,701	779	94	305
*VO2NS	"	2,494	33	19	24
*VE9WH	"	1,392	17	13	16
***VE9BK**	7A	236,680	791	25	97

District 2

VA2WA	AA	9,157,896	4843	159	585
VA2EBI	"	1,798,712	1154	137	467
VA2AM	"	1,589,980	1098	122	452
VA2CZ	"	1,458,500	1147	111	389
VE2XAA	"	1,065,413	1686	62	201
(OP: VE2FK)					
VE2EZD	"	398,708	598	63	200
VE2EBK	"	58,032	144	45	111
VE2SG	28A	9,486	72	15	36
***VA2OT**	AA	725,121	1147	68	211
*VA2VT	"	647,190	1157	66	189
*VE2OWL	"	85,345	183	50	119
*VE2HEW	"	68,561	296	39	70
*VE2ZDR	"	8,730	93	18	27
*VA2YZX	"	4,350	32	20	30
***VE2GT**	28A	6	1	1	1
***VE2HLS**	14A	89,270	297	23	90

District 3

VE3NZ	AA	2,890,800	2754	87	353
VE3CT	"	2,237,118	1554	125	434
(OP: VE3UTT)					
VE3YT	"	1,013,816	1261	89	264
VE3NRT	"	963,090	957	97	338
VA3TNM	"	948,330	1031	94	275
VA3CW	"	808,656	781	99	309
VE3TW	"	555,237	676	88	235
VE3KI	"	489,945	720	86	181
VA3FH	"	246,512	479	60	157
VE3TMK	"	196,245	277	64	203
VE3ZZ	"	161,952	258	67	174
VA3IK	"	147,504	341	47	121
VE3NR	"	2,016	23	15	17
VE3KG	28A	292,380	905	29	103
VE3VN	7A	896,124	2208	37	122
VE3NNT	"	632,745	1837	30	105
VE3NE	"	222,972	950	22	80
***VE3MGY**	AA	1,379,057	1619	97	294
*VE3MV	"	736,932	764	92	280
*VE3SMA	"	318,159	472	73	188
*VE3FP	"	252,464	407	68	180
*VE3XD	"	99,663	295	38	101
*VE3HG	"	81,212	198	44	114
*VA3PAF	"	76,033	223	41	98
*VE3FZ	"	44,480	123	55	105
*VE3CWU	"	38,300	135	23	77
*VA3YV	"	30,728	134	33	59
*VE3QN	"	18,232	85	26	60
*VE3CV	"	13,650	73	28	47
*VA3SK	"	12,931	80	23	44
*VE3KTB	"	12,320	82	28	49
*VE3OU	"	7,350	54	16	33
*VA3TMV	"	4,140	39	17	28

District 4

VE4VT	AA	919,103	839	121	328

District 5

***VE5SF**	AA	773,415	1376	76	179

District 6

VE6TN	AA	883,870	1121	112	226
VE6KC	"	370,980	720	73	156
VE6WQ	21A	96,390	367	26	79
***VA6TI**	AA	31,284	246	33	33
*VA6BGE	"	16,343	117	32	27

District 7

VE7NY	AA	1,823,148	1678	131	328
VA7KO	"	1,235,304	1549	112	232
VA7OM	"	628,046	1146	81	160
VE7XF	"	320,877	419	106	197
VA7UI	"	25,480	97	36	68
VE7IO	"	20,833	110	39	44
VE7NZ	"	*8,190*	*151*	*16*	*10*
***VA7CRZ**	AA	359,382	553	99	168
*VE7AX	"	206,829	431	75	126
*VE7CV	"	89,679	212	60	107
*VE7ZX	"	81,000	345	52	56
*VA7OO	"	65,807	403	37	42
*VA7RY	"	64,660	210	54	68
***VE7TK**	28A	6,345	57	17	28
***VE7BC**	7A	868	28	7	7

Cayman Islands

ZF2SS	AA	6,297,366	4281	149	505
(OP: KO7SS)					

Costa Rica

TI7W	AA	137,940	513	27	87
(OP: N3KS)					
***TI5JON**	AA	67,355	324	30	65

Cuba

***CO8ZZ**	7A	276,471	1052	26	91

Dominican Republic

***HI3MM**	AA	145,071	464	64	135
*HI3K	"	100,655	207	58	147
*HI8RD	"	2,607	44	17	16

El Salvador

***YS1MS**	AA	46,287	186	32	79

Greenland

OX7AM	AA	3,269,034	3447	90	296
(OP: OZ7AM)					

Guatemala

***TG9ADM**	14A	9,211	60	17	44

Mexico

XE1KK	7A	42,020	152	33	77
***XE1EE**	28A	18,760	247	17	23

Panama

HO2T	28A	55,651	227	27	74
(OP: K2GO)					

Puerto Rico

KP3DX	AA	7,212,387	5350	144	465
(OP: NP4Z)					
KP4AA	"	1,262,090	841	142	468
***KP3N**	AA	720,940	1552	57	163

US Virgin Islands

KP2B	AA	2,820,129	3051	118	315
(OP: LU8EOT)					

AFRICA

African Italy

***IH9YMC**	1.8A	9,360	98	5	31

Canary Islands

EA8KR	AA	128,856	257	57	125
EA8DED	"	3,864	77	19	37
(OP: OH2BP)					
EA8DO	"	1,125	16	12	13
EA8DIG	1.8A	6,327	65	8	29
***EA8AJW**	AA	84,060	233	50	130
*EA8DHH	"	26,880	105	31	74
***EA8TR**	28A	3,636	48	15	21

Madeira Islands

CT3KN	AA	6,784,680	3974	132	459

Morocco

***CN8WW**	AA	26,650	136	19	63

Namibia

***V55Y**	21A	400,320	1148	29	91
(OP: V51WH)					

Reunion Island

***FR8TZ**	28A	284,513	973	25	82

South Africa

ZS1C	AA	100,695	282	51	86
ZS4TX	"	*25,856*	*145*	*31*	*33*
***ZS6JBZ**	AA	690	16	8	15
***ZR2X**	21A	760	22	4	15
(OP: ZS2G)					

ASIA

Asiatic Russia

District 9

RW9DX	AA	2,602,295	1959	116	399
UA9CDC	"	1,550,840	1023	126	440
RL9Y	"	1,020,539	989	89	288
RK9AX	"	*410,500*	*681*	*60*	*190*
RL9O	"	*395,456*	*561*	*77*	*219*
UA9AX	"	253,500	327	93	207
RY9C	"	3,871	28	22	27
UA9LAO	28A	241,048	958	25	91
RK8I	"	134,970	578	24	86
RW9QA	"	88,543	559	24	67
R8OM	21A	539,784	1610	34	119
R9MM	"	450,805	1439	32	113
R8LA	"	238,680	783	30	105
R8TT	14A	587,006	1469	38	123
UA9CTT	7A	592,373	1524	37	114
R9PS	1.8A	126,522	616	16	65
*RU9TN	AA	725,450	1024	61	214
*RA9MX	"	410,154	405	92	302
*R9SS	"	322,786	493	65	186
*RA9JM	"	238,522	426	62	177
*UA9OQM	"	111,428	245	47	131
*RG8U	"	87,711	209	51	122
*UA9YE	28A	50,573	198	25	78
*RA9AP	14A	403,106	1014	33	113
*UG8C	"	89,187	359	21	72
*UA8L	7A	429	11	5	8
(OP: R9LM)					
*R9LM	1.8A	8,976	86	9	39

District Ø

UCØA	AA	1,369,253	1318	90	307
RØWC	"	995,200	1105	101	299
RN1B/Ø	"	937,380	1347	111	229
RDØA	"	205,175	301	64	219
UAØSU	"	176,386	255	79	214
UAØSR	"	82,400	172	77	123
RMØW	21A	55,264	293	21	67
UDØW	7A	11,304	66	19	53
*RØSBI	AA	721,056	876	87	261
*RØUT	"	51,375	181	46	91
*UAØAV	1.8A	180	9	4	5

Asiatic Turkey

TA2SE/3	AA	772,096	1156	60	196
***TA7I**	AA	2,423,494	2262	85	309
*TA4RC	"	105,495	232	71	124
*TA4CS	"	15,450	92	21	54
***TA2DA**	21A	250,070	1047	22	63
***TA2IJ**	14A	60,480	353	14	50
*YM4KU	"	264	10	3	8

China

BA3WW	AA	854,619	1120	98	241
BA4DL	"	787,508	1325	97	216
BA3OM	"	772,260	1322	93	212
BG3IAY	"	745,767	1257	105	236
BH1NGG	"	406,116	925	87	174
BY4SZ	"	56,916	282	34	68
(OP: BI4XDT)					
BA4AEO	"	*50,184*	*195*	*53*	*83*
BH1HWF	"	18,648	123	34	50
BD7MM	28A	393,080	1433	33	91
(OP: BD7LMD)					
BA7JS	"	304,997	1213	30	89
BG5TOX	"	78,020	420	28	66
BD7MQ	21A	260,848	1144	29	83
BA7QT	"	231,800	911	29	93
BI4SDT	3.5A	4,674	116	16	22
BA5DX	"	1,980	98	10	12
***BØA**	AA	1,775,922	1741	97	294
(OP: BA7NQ)					
*BY6BB	"	889,243	1261	104	255
(OP: BG6GQE)					
*BH4TQX	"	780,224	1263	105	229
*BG2AUE	"	623,934	872	93	213
*BA4TB	"	380,160	596	77	179
*BH7QP	"	364,151	912	77	164
*BH4AYG	"	273,260	572	86	174
*BI6LFJ	"	180,549	439	74	169
*BD7JZC	"	161,538	317	71	147
*BG3ILY	"	153,874	453	77	126
*BH3PLA	"	124,092	458	50	112
*BG6SZD	"	120,484	341	61	121
*BD8CS	"	112,998	403	29	82
*BG2DVL	"	105,194	437	46	103
*BG3HFS	"	101,192	296	57	125
*BG3GRU	"	96,696	291	48	110
*BH6ODC	"	74,606	301	51	95
*BH2VBK	"	58,960	267	48	86
*BD3QT	"	57,682	247	51	100
*BG7XVX	"	51,712	173	41	87
*BG9OF	"	45,630	161	49	86
*BG3GBZ	"	43,946	208	64	82
*BI1JPC	"	43,010	163	38	77
*BI4MPH	"	39,697	202	37	70
*BH2UBD	"	36,134	297	34	55
*BG6HOK	"	30,734	125	47	74
*BG5JND	"	29,328	153	38	66
*BH4FCD	"	25,864	137	37	69
*BG4FQD	"	17,936	141	35	41
*BA5AD	"	16,065	67	28	57
*BG3HMQ	"	14,720	121	34	46
*BG6QLL	"	13,832	95	39	52
*BD7ODG	"	13,800	78	51	69
*BD3GIP	"	8,502	118	30	48
*BH3EMV	"	7,800	70	22	30
*BG3IYX	"	6,480	71	27	33
*BG3IPT	"	5,624	96	31	45
*BD3CB	"	1,118	15	13	13
*BH1AQA	"	943	30	9	14
*BG8KYI	"	182	19	11	15
***BG8SRK**	28A	80,736	433	25	71
*BG5UZW	"	6,160	93	13	27
***BA5CW**	21A	300,989	1042	34	103
*BH7JUO	"	199,650	793	29	81
*BD4UNT	"	161,364	684	29	84
(OP: BH4RRG)					
*BA5AB	"	119,728	496	30	82
*BH7LSW	"	54,150	260	25	70
*BD1RCR	"	54,033	363	23	60
*BH4TVU	"	30,888	303	17	37
*BG7IWZ	"	5,244	78	17	29
*BH1JHC	"	3,813	68	15	26
***BH4BIN**	14A	1,350	115	6	12
**BH4CAC*	"	*663*	*15*	*6*	*11*
*BD2TBJ	"	136	23	4	4
***BH6JFR**	7A	980	30	8	12
*BA4SCP	"	64	4	4	4
***BD4UJ**	3.5A	192	25	6	6
*BG8PM	"	20	6	2	3
***BD2RJ**	1.8A	12	6	1	2

Cyprus

C44C	28A	25,517	132	21	58
(OP: 5B4AHJ)					
**P3AA*	*21A*	*254,835*	*904*	*24*	*81*
(OP: RN3QO)					

Georgia

4L8A	28A	628,269	1897	29	98
***4L5P**	21A	107,010	442	20	67
***4L4NW**	14A	43,452	254	15	56

Hong Kong

VR2XMT	AA	42,795	157	50	85
VR2XAN	28A	229,628	785	35	104
VR2XYL	21A	27,370	150	25	60
VR2KW	7A	140,389	724	28	75
***VR2NC**	28A	16,366	247	18	31

India

VU2CDP	AA	2,578,945	2321	99	320
VU2YYF	"	763,374	1022	67	215
VU2IBI	"	67,040	185	50	110
VU2ZMK	21A	54	3	3	3
***VU2XE**	AA	1,512,352	1750	81	253
*VU2DED	"	259,506	426	61	173
*VU2PTT	"	167,328	253	73	176
*VU2GRM	"	40,469	133	55	88
*VU2DCC	"	31,065	122	36	73
***VU2FGQ**	21A	62,034	268	24	74

Israel

4Z5LY	AA	1,441,066	1617	79	262
4Z1DZ	"	280,900	486	51	161
4X1IM	"	55,245	193	37	90
4X1MM	21A	919,181	2262	34	115
4Z4AK	"	591,408	1587	33	111
***4X6FR**	AA	7,837,438	4153	151	507
*4X1ST	"	583,740	778	63	207
*4X6FB	"	170,841	416	41	126
*4X1EL	"	62,225	181	39	92
***4XØA**	28A	228,872	773	29	93
*4Z5TK	"	14,719	133	10	31
***4Z5LU**	14A	38,160	252	18	62
***4Z4KX**	3.5A	147,760	697	14	66

Japan

District 1

JE1LFX	AA	3,382,236	2167	162	432
JE1NVD	"	1,720,895	1492	142	325
JL1CNY	"	1,034,978	1185	118	240
JA1RPK	"	1,001,517	1094	116	247
JM1XCW	"	974,810	859	128	302
JN1THL	"	974,529	1059	117	252
7L1FFH	"	879,794	920	124	277
JK1HIX	"	865,190	978	128	231
JK1LSE	"	826,440	1028	119	236
JA1IAZ	"	689,402	863	101	221
7K4VPV	"	609,224	720	102	220
JJ1XBQ	"	579,462	640	106	217
JH1FSF	"	513,925	605	113	224
JH1CTV	"	469,395	696	95	190
JN1ILK	"	420,856	706	77	171
JH1SJN	"	338,169	449	106	193
JF1LMB	"	262,944	444	87	162
JI1LET	"	231,467	411	78	133
JG1FML	"	176,341	371	63	124
JQ1TIV	"	159,264	377	63	95
JA1CJP	"	141,000	282	69	119
JI1FOE	"	129,516	381	55	74
JI1PBK	"	123,150	299	41	109
JA1XRA	"	114,536	226	70	136
JA1WWO	"	108,680	204	78	142
JA1KZP	"	94,482	234	73	108
JA1PTJ	"	70,528	235	51	77
JS1KQQ	"	67,398	184	47	94
JI1LNR	"	54,054	169	42	84
JJ1PFC	"	30,276	110	49	67
JA1DKT	"	23,147	111	35	44
JG1OGM	"	11,786	70	30	41
JH1KLE	"	10,434	59	32	42
JR1BAS	"	7,800	46	29	31
JH1XEF	"	6,324	53	28	40
JK1AKA	"	4,277	37	21	26
JA1GHR	"	2,418	22	17	22
JA1KXT	"	1,656	26	14	22
JA1ILA	"	1,225	25	12	13
JK1BAB	"	238	7	7	7
JH1ERJ	"	224	8	8	8
JE1CKA	28A	188,377	643	33	86
JF1SQC	"	110,682	406	32	67
JH1BNC	"	81,302	304	34	72
JH1BMX	"	42,930	201	29	52
7N3IJT	"	169	7	6	7
JM1NKT	21A	258,535	693	35	110
JK1WSH	"	105,774	335	33	89
7N4GIB	"	378	14	9	12
JA1TBA	7A	71,100	273	29	71
JH1APK	3.5A	7,661	76	20	27
***JH1EAQ**	AA	1,634,424	1404	145	306
*JG1LFR	"	913,332	966	127	266
*JH1RNI	"	580,272	750	103	205
*JG1XIO	"	264,192	422	89	169
*JI1HFJ	"	227,796	358	87	159
*JA1UXV	"	211,844	368	77	134
*JN1MSO	"	201,394	423	73	129
*7J1ADJ	"	174,900	266	103	197
*JR1NWV	"	84,378	234	57	90
*JA1GFD	"	75,924	221	53	95
*JF1JDG	"	75,072	240	57	81
*7K1VKU	"	73,432	243	48	86
*JM1EKM	"	68,385	189	52	89
*JA1PTO	"	52,326	189	42	60
*JHØUUY/1	"	50,173	141	53	78
*JK1HWU	"	47,744	162	54	74
*JA1CTZ	"	47,368	148	44	80
*JJ1MBU	"	46,728	177	51	81
*JI1HSV	"	42,799	192	50	77
*JF1EPL	"	34,210	132	45	65
*JJ1ONK	"	33,925	119	46	69
*JQ1EPD	"	21,576	100	39	48
*JH1USR	"	21,140	132	28	42
*JA1OHP	"	20,303	109	33	46
*7M2ALZ	"	19,256	101	35	48
*JN1GNL	"	9,796	80	24	38
*JH1EYM	"	9,112	48	26	41
*JA1BJT	"	8,544	70	18	30
*JJ1UBX	"	7,645	64	19	36
*JI1RSF	"	3,042	28	16	23
*JH8KYU/1	"	2,328	39	11	13
*JA1CUF	"	1,846	29	12	14
*JM1VDM	"	1,560	20	10	16
*JH1GBO	"	432	14	9	9
*JA1UII	"	240	11	8	8
*JG1LBN	"	54	3	3	3
***JH1RFM**	28A	32,311	185	28	51
*JA1CHY	"	25,560	156	26	46
*JF1OVA	"	23,660	156	23	42
*JL1EEI	"	19,920	101	29	51
*JE1UPB	"	12,597	109	20	31
*JK1AUY	"	12,064	95	24	28
***7L1ETP/1**	21A	93,660	364	31	74
*JR1CBC	"	63,600	266	31	69
*JH1SBE	"	39,771	194	28	53
*JH2EUV/1	"	20,790	147	24	42
*JA1AKL	"	10,764	94	21	31
*JK1FUP	"	4,292	51	13	24
***JI1BDQ**	14A	21,845	107	30	55
*7N4XTA	"	17,490	114	22	44
*JA1QIF	"	14,763	95	19	38
***JJ1AEB**	7A	48,060	203	29	61

District 2

JR2GRX	AA	4,508,335	3112	171	388
JN2AMD	"	1,479,888	1631	129	258
JH2FXK	"	927,463	895	128	293
JJ2CJB	"	535,444	593	115	249
JA2XCR	"	417,012	484	122	232
JA2HYD	"	367,908	546	90	186
JH2XQY	"	191,268	306	79	152
JF2RVJ	"	189,196	384	83	150
JS2KWL	"	85,249	213	56	107
JR2AWS	"	10,880	87	29	35
JE2FJI	"	1,037	21	9	8
JA2KQE	28A	15,795	105	23	42
JA2PFO	"	3,456	44	11	16
JE2DJC	"	1,536	24	10	14
JH2JNU	"	1,050	20	10	15
8N2YOTA	21A	124,292	551	32	60
(OP: JR2KHB)					
JR2WLQ	"	45	3	2	3
JJ2YRE	14A	603,100	1403	37	126
(OP: JH2QXG)					
JA2GTW	7A	34,592	146	30	64
JH2PWY	"	135	5	4	5
JE2LPC	3.5A	6,240	57	21	31
***JF2VAX**	AA	1,298,772	1263	117	270
*JA2KVB	"	708,797	701	141	268
*JF2OZH	"	597,960	720	107	223
*JG2TSL	"	366,705	525	95	186
*JA2VZL	"	162,588	336	74	130
*JR2ATZ	"	132,804	237	74	130
*JA2HJA	"	21,879	91	36	63
***JE2CPI**	28A	14,756	114	24	38
***JR2MIO**	21A	131,784	472	33	81
*JS2MKU	"	101,152	364	31	85
*JG2AIG	"	41,810	233	25	49
***JE2VYM**	14A	1,674	24	10	17
***JR2ALA**	7A	53,738	230	31	66
***JF2MBF**	3.5A	10,521	80	24	39

District 3

JF3IPR	AA	2,221,704	1708	159	364
JN3TMW	"	793,084	731	138	298
(OP: JF1RPZ)					
JN3SAC	"	762,157	825	112	247
JM3UGA	"	368,781	399	125	232
JA3VOV	"	196,386	383	79	134
JR3RIY	"	133,940	294	63	122
JF3LGC	"	13,013	72	32	45
JG3RPL	"	1,372	17	11	17
JF3LOP	28A	110,212	392	34	84
JA3RAR	"	17,664	99	21	48
JS3CTQ	21A	418,770	1172	34	101
JH3AIU	14A	574,452	1310	38	124
JF3NDW	"	11,856	95	15	37
JF3KNW	7A	10,899	63	20	43
***JG3FEA**	AA	772,200	714	119	271
*JP3WEL	"	510,205	633	100	235
(OP: JG1EIQ)					
*JF3EIG	"	192,582	316	82	152
*JM3FUW	"	65,934	199	73	89
*JH4PUL/3	"	40,584	161	34	55
*JF3GFH	"	28,141	105	47	60
*JR3KAH	"	3,255	43	15	20
***JR3RWB**	28A	94,608	345	33	75
*JI3KDH	"	36,960	197	25	52
*JK3DGX	"	20,230	124	22	48
*JA3EJG	"	1,628	20	19	18
***JF3BFS**	21A	276,479	833	33	94
*JN3DSH	"	135,542	446	33	89
*JH3QFY	"	58,562	242	32	62
***JA3YVI**	14A	2	1	1	1

District 4

JR4OZR	AA	3,928,837	2502	163	420
JH4UTP	"	2,830,289	2094	150	389
JH4CPC	"	68,544	147	80	112
JA4RED	"	28,500	112	39	56
JA4CZM	"	2,660	24	14	24
JR4PUR	"	1,530	23	10	20
JA4PXC	"	60	5	5	5
JN4MMO	28A	67,184	264	33	71
JM4WUZ	"	66,928	289	28	66
JR4VEV	"	16	2	2	2
JA4OPW	1.8A	629	25	7	10
***JH4ADK**	AA	391,414	603	86	168
*JA4MRL	"	864	24	6	6

District 5

JH5MXB	AA	67,156	164	55	108
JF5SIM	"	6,222	38	27	34
JA5FDJ	28A	273,920	850	35	93
JA5NSR	7A	51,390	226	28	62
JA5THU	"	33,460	194	26	44
JJ5GSY	"	5,733	58	13	26
JA5CBO	1.8A	377	11	6	7
***JR5CAG**	AA	83,616	256	50	84
*JA5IVG	"	1,824	25	14	18
***JH5FTY**	28A	14,288	73	27	49
*JH5OJH/5	"	8,624	78	18	26
***JA5EXN/5**	7A	7,176	60	18	28
***JH5HDA**	3.5A	72	10	4	4

District 6

JA6MWW	AA	157,290	309	89	156
JA6GMC	"	101,556	254	72	110
JE6QQN	"	43,798	137	50	72
JG6OZC	"	27,336	146	26	42
JA6ZPR	21A	261,590	1025	31	70
(OP: JH6JSR)					
JE6WOQ	"	59,613	247	28	65
JK6DXD	7A	40,936	174	26	60
***JH6OPP**	AA	476,451	606	111	206
*JG6JAV	"	438,561	518	113	220
*JH6QIL	"	177,970	354	61	124
*JS6RRR	"	164,265	280	83	150
*JG6XYS	"	141,750	292	66	123
*JE6PJP	"	11,310	76	28	37
***8J6YAB**	28A	49,224	315	27	57
(OP: JA6VZB)					
***JR6QFV**	7A	180	6	5	5

District 7

JF7PHE	AA	1,619,928	1460	142	311
JO7KMB	"	449,064	594	127	197
JH7CUO	"	234,302	454	70	123
JH7RTQ	"	231,594	386	82	160
JA7GYP	"	30,528	114	39	67
JI7VNJ	"	28,320	120	28	52
JA7ZP	"	28,034	117	44	63
JA7OWD	28A	135,600	487	35	78
JG7PSJ	"	87,418	314	33	76
JH7XGN	21A	382,641	1078	34	99
JA7QVI	"	113,183	337	34	99
JR7IWC	"	39,120	203	25	55
JH7VHZ	14A	333,504	868	36	108
JH7MQD	7A	16,732	97	27	67
JN7FAH	3.5A	3,690	45	18	23
JA7MSQ	"	851	16	11	12
***JH7VTE**	AA	136,656	271	89	119
*JE7LHT	"	109,848	224	70	114
*JA7SUR	"	83,331	248	50	91
*JAØVTK/7	"	33,660	142	35	55
*JA7SSP	"	14,880	72	32	48
*JL7GGH	"	6,633	77	28	39
***JA7RQK**	28A	189	9	4	3
***JP7SJI**	21A	5,332	50	18	25

District 8

JH8XVT	AA	172,608	323	97	151
JH8SLS	"	125,373	207	96	141
JR8ORC	21A	21,735	133	23	46
JH8GEU	14A	59,678	239	33	73
***JK8CEE**	AA	175,370	305	92	155
*JH8CXW	"	130,472	290	75	113
*JM8FEI	"	104,115	278	67	98

District 9

JR9GMS	AA	9,600	64	16	34
***JE9PFD**	AA	41,148	159	40	68
***JF9JTS**	21A	38,000	193	26	50
(OP: JAØTEA)					
***JH9DRL**	3.5A	9,576	91	20	37

District Ø
JJØJML AA 1,619,072 1522 136 280
JAØFVU “ 1,463,648 1346 144 280
JHØGHZ “ 76,500 166 67 103
JHØKHR “ 51,660 155 50 73
JAØGCI 28A 12,160 92 27 37
JAØGCY 21A 44,239 222 26 57
JRØRBY 3.5A 7,728 73 19 37
*JHØNEC AA 930,552 910 134 272
*JHØMUC “ 504,094 672 97 210
*JJØTHX “ 255,398 469 81 166
*JHØDUG “ 159,885 349 65 122
*JJØVXN “ 63,240 197 53 83
*JRØELG “ 1,000 14 12 13
*JAØDOW 21A 1,800 28 14 16

Kazakhstan
UPØL AA 5,003,240 2983 146 518
(OP: UN9LW)
UP5B “ 1,360,153 1521 63 260
(OP: UN7ZO)
UN7FW “ 599,508 677 95 269
UN3G 28A 42,292 174 24 73
*UN4Q AA 4,261,446 3036 125 433
(OP: UA4Z)
*UN7JX “ 176,928 433 49 145
*UN7LV “ 138,943 354 37 124
*UN3M 28A 105,096 418 18 69
*UN2E “ 101,296 474 25 79
*UN4PG “ 82,071 421 23 76
*UN4L 21A 423,913 1086 35 126
*UN4PD 14A 84,958 303 28 79

Kuwait
9K2HN 28A 1,710 34 5 14

Lebanon
*OD5ZF 28A 3,150 48 6 19

Qatar
A71BX AA 4,550,956 3778 107 359

Republic of Korea
DS5DNO AA 222,904 721 71 116
HL2VXK “ 139,104 520 55 106
DS5TOS “ 10,500 67 39 45
*DS3EXT AA 104,949 294 64 105
*HL5YI “ 81,011 248 61 102

Singapore
9V1ZV AA 142,340 297 75 145

Taiwan
BV2LA AA 78,228 200 55 104
BV4VQ 28A 6,109 85 14 27
*BU2EV AA 700 21 9 11
*BU2EP 28A 882 20 9 12

Thailand
E21YDP 21A 48,282 379 26 52
HS3NBR 14A 16,576 126 15 41
*HSØZLN AA 586,440 897 90 234
*HS8NKB “ 327,669 567 65 174
*E29AHU “ 60,755 189 50 95
*HS4MLV “ 4,560 50 25 32
*E2ØXMG 28A 37,376 264 20 53
*E2ØHHK “ 21,900 144 19 54
*HS8JWH “ 15,745 163 11 36
*E27EK “ 40 5 5 5
*HS8HEX 14A 30,810 196 21 57

United Arab Emirates
*A65/
DL2RMC AA 688,288 900 72 202

Uzbekistan
UK9AA 7A 427,893 1321 33 96

Vietnam
XV9DL AA 63,130 408 41 77

West Malaysia
9M2TO AA 412,104 913 61 162

EUROPE

Aland Islands
*OHØV AA 3,256,152 3128 143 490
(OP: OH6LI)

Austria
OE5OHO AA 3,135,400 2740 120 368
OE5TXF “ 2,098,270 3019 121 414
(OP: G3TXF)
OE3G “ 1,923,933 2005 124 395
(OP: OE3KAB)
OE1TKW “ 184,860 436 65 169
OE2LCM “ 111,034 261 66 140
OE6GC “ 1,188 36 22 32
OE6VIE 1.8A 7,380 163 8 37
OE1SGU “ 3,680 100 6 34
*OE8TED AA 1,836,860 1828 132 448
*OE2E “ 550,818 625 108 318
(OP: OE2GEN)
*OE4EIE “ 310,750 614 67 208
*OE3MCS “ 32,809 161 36 73
*OE5CSP 7A 66,768 350 26 81

Balearic Islands
EA6BF AA 364,581 1195 52 137
*EA6SX 28A 263,755 765 33 112

Belarus
EW5A AA 4,658,743 3539 159 524
(OP: EW2M)
EU1A “ 4,642,288 3395 165 559
EW4A “ 1,337,639 1812 104 353
EU3A “ 1,221,858 1046 141 453
EW8OM “ 998,580 1752 88 286
EU7X “ 632,045 1031 95 320
EU4T “ 193,765 302 93 178
EV1R 28A 212,706 627 34 128
EW2A 21A 399,340 1094 35 129
EU4U “ 303,576 999 35 121
EU6AF 14A 347,622 1334 33 105
EU1DX “ 181,116 633 36 120
EW1M 3.5A 51,057 446 20 73
*EW1P AA 1,194,623 1309 120 389
*EW6EW “ 593,328 1083 89 287
*EW4C “ 110,032 321 58 126
*EU1DC “ 42,500 256 37 88
*EU1VA “ 27,213 108 47 94
*EW8R “ 25,506 144 35 82
*EU2F 7A 336,746 1497 32 105
*EW4GL “ 20,976 196 15 61
*EU6RO 3.5A 4,329 108 6 33

Belgium
OP7T AA 634,068 971 79 245
(OP: ON4IT)
ON6MR “ 204,612 483 61 175
OR1Z “ 183,352 747 36 128
OO7P “ *58,710 139 71 119*
ON6LR “ 56,388 149 60 88
OR5T “ 34,726 230 22 75
ON4LDP 14A 161,188 701 30 88
OT1A 1.8A 66,994 757 17 65
*ON3DI AA 681,360 1184 86 248
*ON7XN “ 83,398 301 47 114
*ON5ZZ “ 48,396 223 35 76
*ON5GM “ 46,276 191 34 58

Bosnia-Herzegovina
*E74SL AA 114,202 389 51 128
*E77D 28A 19,880 114 25 45
*E7AA 14A 185,328 1207 27 90
(OP: E73AA)
*E7ØX 7A 100,800 673 25 80
*E7AR “ 40,400 222 25 76
(OP: E77AR)
*E79D 3.5A 130,707 855 21 82

Bulgaria
LZ6E AA 2,165,904 1938 148 476
(OP: LZ1GU)
LZ1ZJ “ 459,284 846 79 250
LZ1UK “ 116,620 434 55 141
LZ1NT “ 48,280 219 32 104
LZ8R 28A 187,440 585 33 99
LZ1MS “ 175,518 589 33 114
LZ4W “ 71,868 291 29 84
LZ5K 21A 282,976 972 34 114
(OP: LZ1QZ)
LZ6W “ 229,086 842 34 109
LZ1QN 14A 412,412 1711 37 117
LZ4T “ 357,420 1405 33 105
(OP: LZ4TL)
LZ1AQ “ 196,686 935 31 95
LZ4R “ 48,506 529 21 58
LZ3BB “ 8,732 176 9 28
LZ5M 7A 117,488 723 24 88
LZ6F “ 106,836 908 22 65
LZ6Y 3.5A 421,448 1843 32 107
(OP: LZ1MC)
LZ7U “ 25,063 368 14 57
(OP: LZ2WP)
LZ2ZG 1.8A 1,014 35 5 21
*LZ6O AA 882,182 1115 109 318
*LZ1QV “ 726,752 1099 103 313
*LZ1FH “ 404,680 781 75 260
*LZ3RM “ 343,920 643 70 170
*LZ7O “ 289,044 737 62 197
(OP: LZ1ONK)
*LZ1QB “ 232,059 361 97 212
*LZ7DL “ 127,002 482 44 139
*LZ5B “ 56,704 351 27 101
(OP: LZ7DP)
*LZ2JU “ 13,600 99 31 49
*LZ1ZP 28A 89,472 300 32 96
*LZ3DJ 21A 1,716 57 8 18
*LZ2MP 14A 53,053 414 20 71
*LZ7R 1.8A 7,938 135 9 45
**LZ6C* “ *2,945 87 6 25*
(OP: LZ2UW)

Croatia
9A3YT AA 1,593,515 1985 98 287
9A5RTW “ 1,051,050 984 148 402
9A5AET “ 816,462 1056 115 287
(OP: W2HUV)
9A4BA “ 225,412 584 50 168
9A1KDE “ 112,572 250 64 95
(OP: 9A2VR)
9A5Y 28A 648,200 1758 37 138
(OP: 9A7DX)
9A5D “ 517,820 1484 37 133
(OP: 9A5DU)
9A2U “ 265,760 846 34 117
(OP: 9A2R)
9A3K 7A 220,593 775 32 107
9A1CFR “ 60,888 303 29 89
9A8M 3.5A 267,159 1341 28 101
(OP: 9A3XU)
*9A7T AA 982,820 733 153 475
(OP: 9A5MR)
*9A1DR “ 335,588 741 59 204
*9A2KI “ 243,040 605 57 191
*9A3MA “ 128,081 317 62 201
*9A4W “ 109,048 323 59 113
*9A7Y “ 6,120 38 26 34
*9A6D “ 2,772 25 19 25
*9A4BT 28A 60,704 240 30 82
*9A3LG 7A 13,623 198 13 44
*9A7ZZ “ 10,553 146 14 47

Czech Republic
OLØW AA 4,275,822 3003 165 558
(OP: OK1DSZ)
OL7D “ 2,593,570 2810 129 424
(OP: OK1DG)
OK1VK “ 2,276,520 1883 151 471
OK2QA “ 1,185,121 1487 105 328
OL6P “ 983,240 1184 108 362
(OP: OK2PP)
OK1PI “ 967,587 1159 110 269
OK2SG “ 404,082 589 91 287
OK1ALX “ 170,925 311 81 184
OK2RU “ 154,440 286 77 183
OK1DX “ 78,840 175 51 165
OK1FPG “ 72,982 309 31 60
OK1DO “ 39,160 160 31 79
OK7NV 28A 61,182 238 29 74
OK4X “ 41,382 196 26 73
(OP: OK1UXH)
OL9Z 14A 834,716 2550 38 134
(OP: OK2PVF)
OK2BPU “ 157,560 620 32 98
OK6W 7A 1,069,752 3173 38 136
(OP: OK1MU)
OL3A 3.5A 361,383 1699 31 110
(OP: OK1DX)
OK1UXH “ 12,932 212 10 51
OK5ET 1.8A 27,648 415 9 55
OL1T “ 13,020 205 10 52
(OP: OK6DJ)
*OL5Y AA 3,390,340 2739 145 454
*OL9R “ 3,357,746 2684 157 486
(OP: OK6RA)
*OK5OK “ 872,830 1391 83 287
*OK2YZ “ 356,269 708 79 244
*OK3DM “ 337,552 640 73 219
*OK1TRJ “ 328,489 703 67 214
*OK4DZ “ 266,085 451 84 159
*OK1BR “ 262,570 715 55 162
*OK5MAX “ 166,500 601 46 176
*OK1TDX “ 98,368 293 61 151
*OK2DM “ 54,442 284 38 125
*OK1DLX “ 26,220 101 37 55
*OK7N “ 22,655 115 38 77
*OK1DXK “ 20,274 129 31 62
*OK2RO “ 16,432 98 23 56
*OK2PGY “ 15,824 125 25 67
*OK1DOY “ 13,013 73 32 59
*OK1FMJ “ 6,693 43 31 38
*OK2CLL “ 4,050 42 17 28
*OK1TD 28A 115,050 396 31 99
*OK1CLD “ 27,436 147 26 50
*OL3R 14A 318,164 1089 35 119
(OP: OK1VWK)
*OK1FGD “ 37,209 329 18 61
*OK1DZR “ 28,272 206 22 54
**OK8SMS 7A 6,118 100 9 37*
**OK7SE “ 475 11 8 11*
*OK1AY 3.5A 79,887 700 18 75
*OK1USP “ 65,700 798 12 61
*OK2VV “ 35,287 418 12 59
*OK6Y 1.8A 53,058 676 12 62
(OP: OK2PTZ)
*OL6B “ 5,920 178 4 33
(OP: OK6AB)

Denmark
OZ3SM AA 1,267,680 1837 108 372
OZ8SW “ 1,142,708 1148 123 395
OU4N “ 768,362 898 117 380
(OP: OZ4KG)
OZ2TF “ 285,140 611 58 207
OZ1KZX “ 170,765 400 68 177
OZ8PG “ 122,010 307 58 152
OZ4O “ 87,660 277 46 134
OZ1KIH “ 20,905 165 29 84
OZ5ØDDXG “ 16,274 198 19 60
(OP: OZ1AXG)
OZ8ABA “ 13,340 55 38 54
OZ1AXG “ 3,800 36 19 21
OZ8AGB “ 2,356 30 17 21
OZ1IKY 21A 332,304 975 36 125
OZ5E 3.5A 226,464 1559 22 90
(OP: DL8UD)
*OZ1AAR AA 387,091 968 62 207
*OZ7DK “ 35,535 197 33 82
*OZ6TM “ 18,304 146 23 81
*OZ4CG “ 14,651 108 23 68
**OZ2ABI “ 675 21 10 17*
*OZ7BQ 21A 79,970 331 26 84

Dodecanese
*SV5/
SV9COL AA 81,579 297 53 160

England
G4IIY AA 3,179,736 2538 145 503
G6T “ 2,691,234 2109 151 500
(OP: G4MKP)
M7W “ 2,290,484 1519 168 548
(OP: G3TBK)
M1X “ 1,368,459 1757 93 304
(OP: GØCKP)
G3VMW “ 817,036 1185 78 263
G4AMT “ 703,716 1014 80 258
GØBNR “ 650,925 654 119 376
MØWLF “ 565,153 676 100 253
G4IZZ “ 550,466 1003 60 227
G3SWH “ 400,002 466 89 320
G4OWT “ 393,840 553 105 255
MØTDW “ 391,935 822 65 200
MØDSL “ 353,890 812 53 162
M2A “ 348,975 595 62 173
(OP: G3ORY)
MØWJE “ 341,880 595 87 177
G4WFQ “ 240,198 582 69 189
G4RKO “ 119,727 511 44 115
G3YXX “ 69,222 359 43 123
G4SND “ 67,996 200 52 139
MØNGN “ 65,296 207 53 123
GØB “ 54,168 194 38 84
(OP: MØBUL)
G4CTY “ 27,234 143 28 74
GØEFO “ 23,940 153 27 57
MØEAS “ 11,648 93 28 76
MØRNR “ 3,312 49 17 31
G6AD “ 3,174 37 20 26
MØXAC “ 3,080 45 15 41
G8X 28A 331,499 975 35 126
(OP: G4FJK)
G6AY “ 121,275 321 34 113
G4KNO “ 32,038 140 26 57
G4LPD “ 14,100 108 18 29
M2G 21A 562,485 1560 36 129
(OP: G4RCG)
M7O “ 151,522 578 35 123
(OP: MØVKY)
M8A “ 140,875 497 32 93
(OP: MØHDF)
G3PJT “ 95,200 361 30 82
G1GEY “ 92,988 359 30 93
G3YJQ 14A 14,690 151 14 51
M5W 7A 350,840 1549 31 109
M5D “ 178,227 923 29 94
(OP: G4WQI)
MØHOM “ 81,661 330 32 95
MØUNN “ 36,240 139 30 90
GØKPE 1.8A 10,505 181 9 46
*G4PVM AA 2,036,949 2148 131 426
*M2J “ 858,390 1019 106 297
(OP: G4NBS)
*G3RLE “ 621,560 804 101 309
*GØOOD “ 546,674 956 78 236
*G4P “ 540,274 1083 67 231
(OP: G3YPP)
*M9N “ 281,995 804 52 193
(OP: G7WHI)
*M5M “ 187,480 522 55 160
(OP: G4BRK)
*M4M “ 177,480 457 59 145
(OP: MØPNN)
*G9F “ 150,282 323 58 149
(OP: G4BVY)
*GØFGI “ 141,224 298 61 193
*G4ENZ “ 114,816 197 88 188
*G4RWD “ 111,389 445 38 129
*MØVVC “ 109,224 329 44 120
*GØRXA “ 86,720 326 39 121
*G3WGE “ 85,310 305 46 144
*G3RTU “ 75,492 316 33 129
*GØMFR “ 66,068 221 47 119
*G4LPP “ 62,010 200 52 107
*G3PHO “ 57,216 172 36 113
*MØNNQ “ 29,283 165 34 95
*MØNIE “ 22,581 145 31 86
*GØVJG “ 12,561 69 30 49
*MØMDR “ 11,792 120 20 68
*MØNJW “ 11,730 106 21 81
*G4ZZL “ 11,316 127 21 61
*MØJSB “ 10,519 102 18 49
*G2W “ 9,088 86 15 56
(OP: G4DBW)
*G8AJM “ 7,560 42 30 42
*G4AWA “ 7,076 48 24 34
*M5NCW “ 5,226 46 25 42
*2EØEBM “ 4,324 40 20 27
*G4PDF “ 2,640 48 13 42
*GØVSS “ 1,950 35 9 17
*G4NXG/M “ 1,650 29 10 12
*M7X 28A 107,750 361 34 91
(OP: GØTSM)
*G4RGK “ 106,140 418 30 86
*G4DBW “ 15,785 135 15 26
*GØBVD “ 10,030 80 21 38
*G8P 21A 154,536 439 32 109
(OP: G4CLA)
*G4RQI “ 101,106 322 32 91
*G3MXH “ 90,062 413 25 73
*M3M “ 40,764 317 17 62
(OP: G3PLE)
*G7C “ 21,170 134 19 54
(OP: MØCKE)
*M6W 14A 323,856 1274 34 110
(OP: G3WW)
*G4ERW “ 232,224 1055 29 89
*G6A “ 184,560 854 29 91
(OP: G3VDB)
*GØWAT “ 32,580 243 20 70
*MØHWT “ 2,788 58 7 27
*G4FJW 7A 33,968 239 20 68
*G1HWY “ 2,052 37 11 25
*G4BVY 3.5A 38,844 391 13 65
*GØW “ 9,860 147 10 48
(OP: GØVDZ)
*G5Q 1.8A 28,182 401 12 54
(OP: G3SVL)

Estonia
ES3TI AA 1,494,375 1295 155 470
ES4RD 21A 96,480 459 32 102
ES1CN “ 44,191 228 26 81
ES2DF 7A 62,212 393 25 78
*ES7A AA 5,379,230 3823 188 642
(OP: ES7GM)
*ES1BH “ 199,432 642 56 201
*ES3RF “ 159,616 505 55 177
*ES2GW “ 8,556 85 17 45
(OP: ES7GW)
*ES2TT “ 6,960 48 25 35
*ES3BH “ 945 32 10 25
*ES7GN 7A 325,304 1410 36 121
*ES2DJ “ 11,830 115 16 49

European Russia
District 1
RA1OHX AA 522,466 673 105 364
RT1A “ 7,995 55 24 41
RV1CC 7A 93,532 397 35 99
R1DX “ 53,360 241 30 85
RA1M 3.5A 57,974 502 21 80
UA1OMS 1.8A 14,320 127 17 63
*R1MJ AA 95,931 293 52 135
*RV1OO “ 19,107 107 31 68
*R1CAA “ 4,876 100 12 41
*UA1F 14A 13,568 139 16 48
*UA1A 1.8A 2,240 58 9 26

District 3
RL5A AA 3,444,220 3310 152 524
RM5F “ 3,061,762 3444 145 493
RN3BL “ 1,534,456 1454 140 443
RA3DNC “ 1,070,172 1392 107 379
RY3D “ 997,568 1085 138 434
RM3DA “ 331,008 527 88 296
RC2A “ 313,966 502 99 259
RX3AEX “ 293,196 596 77 241
RA3UT “ 188,370 425 80 235
RU5A “ 179,280 368 73 197
R5GR “ 179,080 451 63 179
RM2E “ 144,102 274 85 197
RT5T “ 106,898 292 62 164
RA3BQ “ 103,411 242 67 120
R3CW “ 66,951 265 45 128
RQ3A “ 46,320 204 35 85
RA3S “ 42,772 123 58 90
R3QF “ 40,870 123 52 70
UA3AB “ 29,866 94 41 68
RU3SD “ 3,525 27 20 27
R2AOQ “ 2,808 24 18 21
R3TE “ 1,940 283 48 146
R2DA “ 575 13 12 13
RD3K “ 195 7 6 7
RW5C “ 24 2 2 2
RK3ER 28A 169,260 569 35 121
RC3W “ 154,364 492 33 116
(OP: RA5W)
RX3N “ 35,765 202 28 87
(OP: RX4W)
RL3A 21A 675,078 1810 37 140
(OP: RL3FT)
RC3FL 14A 135 5 4 5
R3ZZ 7A 729,570 2421 38 128
RV3FF 3.5A 23,048 227 15 52
RD3AW “ 6 1 1 1
RX3APM 1.8A 113,565 761 26 87
RG2A “ 76,077 549 26 81
R3ZJ “ 12,212 160 14 57
UA3QGT “ 6,384 98 8 48
*RU3DNN AA 415,160 576 102 326
*RL2Y “ 365,310 700 78 219
*RK2M “ 245,700 542 80 245
*RK2A “ 170,587 420 56 123
*RA3GAA “ 118,349 368 55 148
*UA3DSS “ 110,700 238 76 149
*RA3RLJ “ 105,040 376 54 148
*UA3YCX “ 78,754 369 40 129
*RW5CW “ 71,487 199 39 130
*R3VL “ 62,988 276 36 138
*RX3Q “ 62,100 302 41 109
*UA3X “ 57,152 185 56 132
*R2AT “ 52,545 239 41 114
*RN5M “ 49,933 180 42 125
*RU3DM “ 44,162 135 50 92
*RX3MM “ 20,880 118 32 84
*RX3ACO “ 13,020 62 41 52
*R2HB “ 11,931 69 34 63
*RT2X “ 5,720 57 21 44
*UA5R “ 1,428 19 12 16
*R3QX “ 1,302 33 9 22
*RX3AFE “ 1,060 31 10 10
*UA3LEO 28A 5,508 54 18 36
*UA3MCH “ 3,397 35 16 27
*RZ3Z 14A 87,120 493 30 91
*UA3UCD “ 18,542 198 16 57
*UA3PI 7A 82,200 602 22 78
*R5DF “ 14,946 110 16 31
*RN3QN 3.5A 6 1 1 1

District 4
RA4Y AA 784,896 1277 101 337
RG4A “ 541,025 591 115 360
RU4PU “ 350,207 579 95 308
RA4PBE “ 272,538 727 68 241
R4KO “ 254,856 436 85 211
R4BZ “ 253,914 512 74 229
RD4A “ 251,034 552 69 209
UA4CC 28A 48,510 306 26 73
R4MM “ 46,428 251 26 80
UA4C 14A 126 11 5 9
RA4W 7A 2,068 60 12 35
*R4YT AA 556,659 772 116 361
*UA4CNJ “ 170,500 349 73 177
*RN4SN “ 163,898 308 90 232
*RN4HAB “ 130,529 591 46 157
*RW4O “ 99,408 214 73 145
*R4RM “ 93,740 327 55 163
*R4PBF “ 75,658 337 41 140
*RU4LM “ 28,680 135 38 82
*RZ4NWB “ 1,575 31 12 23
*UB4NAL “ 1,216 28 9 23
*RW4NW “ 192 10 6 6
*RU4SO 21A 177,274 704 34 117
*UB4WBQ “ 15,480 181 14 46
*R4HA 14A 54 6 3 6
*RW4CLF 7A 17,238 184 17 61

District 6
RX6AM AA 241,200 473 80 188
R7AT “ 210,672 497 49 160
RX6LRU “ 209,304 363 83 145
R6KA “ 144,099 383 69 174
R7FF “ 107,100 291 59 179
UA6G “ 28,200 186 31 89
RU6B “ 459 9 8 9
RC6U 28A 20,672 131 19 49
RW7K 21A 601,380 1583 37 143
UB7K 14A 890,928 2580 38 146
UC7A 7A 110,654 519 32 90
*UD6M AA 505,161 1135 77 256
*UA6HFI “ 98,136 350 46 142
*RA6L “ 76,608 304 43 125
*RV6AJJ “ 68,020 149 69 110
*UA6LCJ “ 67,596 182 55 76
**RJ6K “ 34,584 103 57 75*
*RN6AT “ 26,880 135 31 53
*RA6DT “ 1,891 23 16 15
*RK6HG 14A 25,645 125 31 84

District 9
RG8G AA 25,883 109 47 96
R9GM 7A 77,868 578 24 79
UA9FAR 3.5A 22,050 289 14 61
*RM8G AA 308,798 698 73 249
*UA9XX “ 86,784 455 41 151
*RC9X “ 22,575 191 30 99
*UA9XL “ 22,072 146 28 96

European Turkey
*TA1L AA 64,024 130 92 120
*TA1MK 21A 2,418 46 13 26
*TA1UT 3.5A 2,146 70 6 31

Faroe Islands
OY1CT 28A 100,842 817 20 78

Fed. Rep. of Germany
DM4X AA 5,508,594 3602 165 537
(OP: DD2ML)
DK3QZ “ 4,790,916 2818 155 551
DL3UB “ 3,919,095 2680 177 588
DK9IP “ 3,153,880 1817 169 571
DM5GG “ 3,026,432 2066 166 570
DL6NDW “ 2,820,436 1617 159 544
DL5XJ “ 2,386,800 1624 128 457
DF6QV “ 2,337,996 1983 132 459
DL1NKS “ 2,303,192 2240 133 403
DHØGHU “ 2,284,698 1464 154 509
DF3VM “ 2,109,376 1228 171 565
DL5GAC “ 2,048,898 1547 145 481
DL1BUG “ 2,005,488 1415 156 528
DL1QW “ 1,893,552 1414 147 471
DJ9MH “ 1,777,816 1334 149 483
DK4SR “ 1,600,070 1586 127 403
DL8WEM “ 1,588,260 1571 128 387
DL7QU “ 1,391,824 1570 109 367
DL5JS “ 1,294,440 1295 118 351
DL5YM “ 1,270,692 1632 105 318
DQ5T “ 1,253,259 999 128 385
(OP: DL4LAM)
DF2LH “ 1,125,033 960 125 382
DK2CX “ 1,058,940 1068 112 365
DF9LJ “ 1,053,630 1245 119 295
DL1ATZ “ 1,029,345 1020 121 368
DJ5AN “ 1,001,096 800 161 417
DL1NEO “ 988,972 765 138 433
DJ8RS “ 853,876 768 119 314
DL5JQ “ 823,116 956 118 374
DH7KU “ 816,816 917 116 292
DK8ZZ “ 732,095 810 109 346
DF5EG “ 715,860 1010 99 311
DF8XC “ 710,190 811 95 295
DK8AX “ 687,309 724 132 351
DJ8EW “ 637,776 634 119 397
DJ9RR “ 635,758 667 112 370
DL4JLM “ 623,809 782 94 219
DL6AG “ 621,565 722 109 304
DK3GI “ 605,600 687 111 289
DL1VDL “ 604,041 769 113 280
DL6NCY “ 591,668 926 89 285
DL5ST “ 569,646 792 101 310
DL8SCG “ 563,079 528 138 315

DF2RG	“	542,430	605	116	325
DG9SEH	“	533,197	742	99	262
DJ4WT	“	493,304	734	94	228
DK1TW	“	484,137	614	96	291
DL4YAO	“	474,903	606	97	254
DJ5IW	“	453,180	583	104	286
DF7TV	“	420,492	518	113	289
DL5DTG	“	412,848	544	101	322
DH1TST	“	390,910	512	99	304
DM5DM	“	389,418	805	62	184
DK7ZT	“	379,566	443	110	376
DL8RDL	“	371,050	508	104	258
DK2AT	“	367,471	656	73	226
DK5XG	“	356,820	736	72	213
DM5TI	“	354,981	472	105	242
DF8V	“	312,965	616	68	197
(OP: DF8VO)					
DL1YM	“	303,030	507	63	159
DK2LO	“	294,144	419	104	279
DL1LOD	“	279,216	432	99	237
DF1HF	“	254,514	433	77	261
DL7VOG	“	246,818	582	72	214
DF6RI	“	227,700	485	65	210
DL3FCG	“	221,400	425	63	183
DL7CX	“	220,528	323	100	258
DL8KX	“	206,668	489	72	170
DF9XV	“	197,276	352	82	216
DK5JM	“	181,248	358	67	110
DK2CC	“	169,708	339	82	237
DL2OE	“	164,838	254	102	229
DL9NDW	“	160,380	357	57	141
DL1SVA	“	153,065	300	77	176
DL6UAA	“	139,612	490	61	148
DK1AX	“	136,575	324	62	163
DL2DX	“	95,904	275	55	93
DG7NFX	“	93,177	247	56	133
DL2NFC	“	90,432	200	65	92
DF4PD	“	85,352	208	60	167
DL1STG	“	84,346	220	60	121
DH6BH	“	81,968	285	53	135
DL9GCG	“	77,280	211	56	105
DJ2AX	“	64,680	291	45	120
DL8CA	“	55,432	196	42	62
DK2BJ	“	54,416	272	37	115
DL3IAE	“	53,956	125	68	96
DF9VJ	“	51,456	180	43	85
DL7LAM	“	50,554	209	47	114
DL1SWT	“	49,270	188	43	87
DK1FW	“	46,176	151	44	112
DJ1TO	“	43,361	150	43	88
DF3CB	“	43,218	139	52	74
DL7AUO	“	40,425	177	49	116
DK4QT	“	31,408	164	32	72
DK7MD	“	30,366	93	51	75
DH1NBE	“	28,923	166	26	67
DD2NU	“	25,792	156	22	82
DF3QG	“	23,088	99	41	63
DL5NAM	“	21,715	89	40	61
DM6DX	“	17,574	85	39	48
DO4DAN	“	11,413	87	17	84
DL8UI	“	8,568	48	28	35
DF2TT	“	8,190	52	29	36
DH6DAO	“	7,874	55	29	33
DF5SI	“	7,383	56	24	45
DL8BFV	“	6,077	39	24	35
DB7BN	“	6,032	74	14	38
DK4US	“	3,154	45	15	23
DL9BU	“	2,970	60	11	34
DL3ZZA	“	2,920	31	18	22
DM5JBN	“	1,107	17	12	15
DF6PB	“	594	13	9	13
DL2ARD	28A	468,165	1156	36	141
DL3ANK	“	407,750	987	37	138
DH8BQA	“	345,189	1078	34	125
DK2GZ	“	290,832	726	36	130
DKØMM	“	148,282	456	35	116
(OP: DJ7IK)					
DJ3CQ	“	116,229	415	31	98
DJ9AO	“	110,448	336	35	109
DL9NEI	“	35,840	183	27	53
DL7VEE	“	30,380	111	33	91
DL7DZ	“	14,448	95	18	38
DJ6TB	“	7,524	77	16	22
DL6HCC	“	7,105	59	16	33
DL8WX	“	4,104	59	11	13
DL2AMD	“	24	2	2	2
DH8VV	21A	395,010	1072	35	119
DL1DTL	“	208,351	762	34	109
DF4WC	“	4,884	54	13	24
DL6FBL	14A	1,002,840	2465	38	145
DL7ON	“	607,221	1684	38	133
DL6RDE	7A	301,176	1360	35	106
DL4ME	“	121,520	648	29	95
DL2LDE	“	69,680	247	34	100
DK7A	“	47,816	247	23	63
(OP: DJ8VH)					
DK1WU	“	26,110	307	16	54
DR1A	“	15,120	140	15	30
(OP: JG7AMD)					
DL2NBW	“	3,600	48	14	26
DL4LAM	“	2,268	35	10	26
DJØMDR	3.5A	307,051	1494	32	107
DL6DH	“	1,980	32	9	24
DL9SCO	“	1,638	31	12	30
DL7URH	“	6	1	1	1
DM7C	1.8A	75,650	805	17	72
(OP: DL6CX)					
DL6MHW	“	59,682	625	17	70
DL6JZ	“	26,400	382	11	55
DL5KVV	“	11,716	255	9	49
DM2RM	“	2,926	76	6	32
DL6MFK	“	1,519	40	7	24
*DJ5MO	AA	3,457,212	2254	169	557
*DL4FN	“	2,577,960	2118	130	428
*DF7EE	“	1,999,998	1221	160	542
*DM7W	“	1,824,843	1674	117	382
(OP: DL8MAS)					
*DR7T	“	1,637,454	1643	128	418
(OP: DF1DN)					
*DK5DQ	“	1,534,568	1425	124	412
*DD5M	“	1,500,883	1196	140	453
(OP: DJØZY)					
*DL4SDW	“	1,371,240	1255	113	355
*DK1KC	“	1,367,384	1619	105	367
*DF1MM	“	1,324,927	1466	125	384
*DL1GME	“	1,143,648	1548	93	325
*DL1MGB	“	1,036,422	1319	103	356
*DL8TG	“	986,264	1291	101	351
*DF2SD	“	936,828	804	115	376
*DL1TS	“	819,762	1032	106	325
*DJ4MH	“	758,056	995	95	299
*DL7YS	“	728,916	949	98	319
*DL5ARM	“	624,096	1098	79	273
*DAØBCC	“	607,240	1174	72	268
(OP: DL8DXL)					
*DK3DUA	“	580,371	703	111	298
*DJ1SL	“	498,492	656	88	278
*DL4MFM	“	498,370	1048	70	235
*DK8NT	“	497,746	804	88	294
*DK1IP	“	468,756	490	121	328
*DK3WN	“	419,728	839	73	223
*DL3JAN	“	395,256	425	122	394
*DK7TX	“	367,200	614	93	267
*DL1AQU	“	346,473	770	59	222
*DF1DT	“	345,644	695	64	235
*DF2CH	“	336,996	531	89	244
*DK5WO	“	287,985	690	59	204
*DL2LRT	“	276,255	586	77	238
*DP5P	“	271,560	511	68	180
(OP: DL1MHJ)					
*DL5MFF	“	270,471	551	73	194
*DL3IAS	“	269,370	351	101	337
*DL8DWW	“	207,825	420	54	201
*DK5TA	“	202,119	528	67	200
*DC8SG	“	201,228	419	67	179
*DF2AJ	“	188,616	309	86	185
*DLØCK	“	178,649	473	59	168
(OP: DL1EAL)					
*DF1OE	“	176,337	488	49	140
*DF7CB	“	175,582	510	53	200
*DL3RDM	“	172,898	423	59	212
*DL4DTL	“	163,840	409	64	192
*DJ3XA	“	158,340	410	53	150
*DL7ALM	“	157,879	401	60	191
*DG9OAY	“	156,137	508	47	146
*DF1LON	“	152,139	326	59	190
*DJ2FL	“	147,420	372	61	173
*DL1SO	“	129,744	391	51	153
*DF7TS	“	124,407	392	42	165
*DJØIF	“	124,352	258	72	196
*DJ5KW	“	122,672	373	45	131
*DL1DQW	“	121,828	324	57	172
*DJ3WE	“	121,800	251	66	214
*DK2FG	“	114,264	426	46	138
*DL4DRW	“	110,517	305	57	130
*DL6RDR	“	108,768	249	61	115
*DJ3NJ	“	106,765	305	45	118
*DL9SEV	“	106,577	345	51	146
*DK7TY	“	105,885	308	48	147
*DK7XX	“	104,838	325	50	123
*DL4FDI	“	102,672	351	47	139
*DL1GRC	“	93,625	314	45	130
*DF2DR	“	85,329	240	50	121
*DL4KUG	“	83,824	265	46	123
*DF4XF	“	81,162	327	45	117
*DL4WG	“	78,402	328	44	135
*DL2SWR	“	77,415	158	71	124
*DL6DCX	“	77,244	317	34	89
*DM3M	“	74,592	289	42	126
(OP: DM3XRF)					
*DD5KG	“	72,874	305	36	130
*DM2RN	“	69,020	262	40	100
*DL7UN	“	65,637	254	39	114
*DL3LJ	“	57,456	214	43	83
*DL8ZAJ	“	55,924	198	46	118
*DL8FMA	“	52,290	211	44	122
*DK6QW	“	41,208	154	42	60
*DL1EJD	“	41,055	215	28	91
*DL3SBD	“	39,680	133	51	104
*DO4OD	“	39,501	205	35	98
*DD5VL	“	37,125	151	43	82
*DL3CB	“	36,972	198	33	84
*DK1YH	“	36,372	195	27	57
*DL6TK	“	33,274	163	38	89
*DH1VY	“	29,748	149	39	72
*DL9FBF	“	29,318	124	28	79
*DL7ED	“	29,141	146	50	131
*DJ1MM	“	26,950	157	24	86
*DL7ULM	“	26,909	131	31	40
*DL6RBH	“	22,848	185	25	94
*DF1LX	“	22,464	123	28	80
*DF9JL	“	22,042	159	29	78
*DL7UPN	“	21,804	137	26	66
*DL7URB	“	21,476	94	43	75
*DL1NOD	“	20,064	119	33	63
*DL3CX	“	19,950	130	22	53
*DL1NKB	“	19,620	155	24	66
*DMØE	“	18,841	119	29	54
(OP: DG1HXJ)					
*DL1QS	“	16,212	97	28	56
*DHØAAC	“	15,936	91	31	65
*DL1FY	“	15,600	118	18	32
*DF8AN	“	15,554	108	28	49
*DL3SFB	“	14,544	103	21	51
*DF2AP	“	13,284	100	25	57
*DL9NCR	“	11,934	79	28	50
*DJ3XM	“	11,644	88	24	58
*DG9VH	“	10,850	119	15	55
*DL3GJ	“	10,823	134	18	61
*DK9DA	“	10,374	84	17	40
*DL7CO	“	9,798	150	37	101
*DK5WN	“	9,266	92	24	58
*DL8JDX	“	9,261	58	25	38
*DL9DAN	“	8,763	57	23	46
*DH9SB	“	7,128	60	20	24
*DF7RG	“	5,335	51	20	35
*DL4DRG	“	5,046	125	29	58
*DF9GH	“	5,040	38	21	24
*DK4RR	“	3,686	57	11	27
*DH5YM	“	3,652	57	14	30
*DL1ARK	“	3,444	32	18	23
*DC6RI	“	2,448	58	14	37
*DL1JHW	“	1,860	40	10	21
*DF8LY	“	1,612	18	16	15
*DO1PE	“	1,426	34	13	18
*DL1ONI	“	1,410	17	14	16
*DK7SM	“	1,050	36	9	26
*DL4ROB	“	736	22	7	16
*DL8WJM	“	585	15	6	7
*DL2OO	“	196	10	6	8
*DK5UA	“	135	11	5	10
*DC2CL	“	99	5	5	4
*DJ3HW	28A	148,260	440	34	106
*DL7AU	“	128,772	361	34	112
*DF8AE	“	103,983	305	33	104
*DL7JV	“	20,164	108	27	44
*DF5EN	“	10,620	88	16	29
*DF3OL	“	9,594	90	14	27
*DL6UM	“	3,060	37	14	22
*DO2MS	“	2,324	35	12	16
*DM3F	21A	72,120	272	31	89
(OP: DH5FS)					
*DK2KT	“	39,732	235	21	63
*DO4DXA	“	35,784	129	29	97
*DL4YR	14A	66,057	342	25	72
*DF4ZL	7A	114,114	683	26	88
*DL8WAA	“	110,484	527	30	94
*DJ5TT	“	25,500	153	19	66
*DM2TO	“	20,910	169	18	64
*DL1RNW	“	10,547	89	16	37
*DL7ND	“	24	4	3	3
*DM7CW	3.5A	20,069	316	8	53
*DJ6OI	“	10,500	102	12	58
*DL5NO	“	3,555	79	8	37
*DF7GG	1.8A	25,740	365	10	56
*DL5ANS	“	10,123	213	9	44

Finland

OG7F	AA	2,698,290	2577	143	487
OG6N	“	2,697,290	1909	156	554
(OP: OH6NIO)					
OH8L	“	1,723,781	2275	120	383
(OP: OH8LQ)					
OH3FM	“	846,976	1478	93	323
OH6OS	“	795,880	897	122	383
OH1EB	“	494,852	754	94	292
OG2P	“	398,008	1290	42	136
(OP: OH2PM)					
OH3NAQ	“	365,600	500	104	296
OH7KD	“	278,444	536	69	233
OH8CW	“	275,184	614	79	233
OH3NDH	“	204,290	347	82	228
OG1D	“	159,088	475	50	113
(OP: OH1JD)					
OH6DX	“	142,352	224	88	160
OH3JR	“	141,440	232	93	227
OH5BE	“	125,160	224	76	134
OH2BJ	“	115,543	292	64	163
OH7KBF	“	103,576	321	58	156
OH2ID	“	92,685	244	54	113
OH5VT	“	86,028	225	61	153
OH1MM	“	56,823	159	51	90
OH2EA	“	50,512	179	44	110
OH2CI	“	43,358	166	43	90
OH2KI	“	38,500	139	64	90
OH6TN	“	31,920	130	37	47
OH2BAI	“	7,991	87	17	44
OH3EX	“	5,100	59	13	47
OH2MAS	“	1,452	26	11	11
OG7A	28A	223,074	687	35	127
(OP: OH6MW)					
OG3B	“	153,700	656	32	113
OH7MA	“	149,112	568	34	118
OH8WW	21A	566,692	1984	35	113
OG8N	“	49,875	247	27	68
OH2IPA	14A	216,372	1071	28	86
(OP: OH4MDY)					
OH6RE	“	104,256	323	35	109
OH7K	7A	530,400	2020	38	122
(OP: OH8SR)					
OH1HB	“	14,880	122	19	61
OH1X	3.5A	24,479	200	19	72
OG5O	1.8A	33,624	536	14	58
(OP: OG55W)					
OG4T	“	22,720	327	12	52
(OP: OH4MFA)					
OH1XX	“	15,548	97	18	74
*OH7GGX	AA	316,484	601	79	277
*OH6JUM	“	240,300	613	62	208
*OH7KC	“	108,344	374	50	182
(OP: OH7MFO)					
*OH8MJ	“	76,235	211	53	140
*OH3KAV	“	55,632	199	44	139
*OH7L	“	11,088	122	21	63
(OP: OH8TV)					
*OH8KA	“	2,378	48	17	41
*OH2CBD	“	961	30	8	23
*OH3Ø77F	“	550	17	10	15
*OH1TD	14A	2,088	39	10	26
*OH3JF	7A	46,620	508	20	64

France

TM9C	AA	2,855,968	2934	125	371
F5CBQ	“	1,401,057	1347	115	326
F6EZV	“	1,056,440	1349	111	379
F6AUS	“	828,480	798	122	358
TM5A	“	792,792	938	111	351
(OP: F5VHJ)					
F6GCP	“	348,950	429	86	264
F8DFP	“	302,064	975	63	185
F5UQE	“	285,840	391	101	296
F5RDS	“	171,801	426	62	181
F5PAL	“	160,717	480	53	120
TMØT	“	154,488	395	58	106
(OP: F4HQZ)					
TM4T	“	141,510	339	50	128
F4IEH	“	127,006	323	74	179
F4HPX	“	120,020	396	45	125
F4KLW	“	119,790	353	55	143
(OP: F5RQQ)					
F8EFU	“	116,160	344	57	119
F5TVG	“	95,841	198	58	149
F6GPT	“	66,576	330	29	85
F1ADG	“	27,804	152	29	55
F5JRC	“	22,532	138	23	63
F6GOE	“	3,276	50	12	30
F6ETI	“	420	11	9	11
F5NBX	28A	324,810	843	36	126
F4GXX	“	20,295	84	29	70
F4HRM	21A	14,938	96	25	52
F5VIF	7A	3,784	49	12	31
TM1CY	“	2,380	44	8	27
*F8DGY	AA	1,828,505	1562	139	484
*F8CRS	“	1,726,673	1296	146	455
*F6DCQ	“	684,664	802	112	376
*F5PLC	“	271,806	559	69	198
*F5OWL	“	213,380	456	62	165
*F4FHV	“	175,950	455	61	164
*F6DZD	“	136,915	404	52	145
*F4EJL	“	106,140	300	53	121
*F5BMI	“	87,135	325	42	115
*F4CVQ	“	86,464	201	60	133
*F4FFH	“	76,741	297	44	89
*F1IKA	“	70,720	305	34	96
*F5ILS	“	61,740	268	36	90
*F4JIK	“	58,028	234	42	121
*F5TYY	“	37,932	208	32	84
*F4EEI	“	35,207	161	33	76
*F6CEL	“	32,301	149	36	75
*F4BHK	“	28,665	104	61	86
*F5MQU	“	25,296	144	23	79
*F4HJO	“	23,100	94	40	70
*F1HMR	“	18,928	185	25	79
*F6CZV	“	18,648	120	31	53
*F8CPA	“	12,851	97	23	48
*F1TRE	“	10,660	72	29	36
*F6KBF	“	7,210	89	20	50
*F5FRM	“	2,976	30	21	27
*F4FRF	“	2,009	37	18	31
*F4GYM	“	1,564	20	15	19
*F3WT	“	375	14	7	8
*F4FLO	“	299	12	6	7
*F5TGR	28A	41,280	197	26	54
*F5OIH	“	20,591	145	19	40
*F5DRD	“	10,400	103	18	32
*TM5DX	21A	156,672	502	35	93
(OP: F4HAU)					
*F4IXM	“	364	14	5	9
*F5UGQ	14A	7,964	120	8	36

Greece

SX1T	AA	1,878,765	2625	106	329
(OP: SV1ENG)					
SV1RK	“	286,572	594	70	216
SV2BXA	“	249,010	348	98	272
SV1ABB	“	11,375	125	21	70
SV3AQT	“	728	14	14	14
SV3IRG	“	475	22	9	16
J42C	14A	222,615	1212	33	102
(OP: SV2HXX)					
SX2I	7A	502,800	1854	36	114
(OP: SV2JAO)					
SV1JG	“	121,344	645	29	99
SV8BHN	1.8A	1,221	33	7	26
*SV1AJO	AA	222,748	644	52	181
*SV2EVS	“	83,640	344	38	132
*SVØSYH	“	46,610	173	47	111
(OP: OK1CDJ)					
*SV2SIF	“	19,729	125	33	76
*SV1PMQ	“	7,857	77	25	56
*SV2BOH	28A	74,000	433	24	76
*SV1ME	14A	123,264	743	28	79
*SV1SYY	“	9,086	158	18	59
*SV2AEL	7A	105,840	517	28	92

Hungary

HG8R	AA	6,911,991	4267	173	574
(OP: HA8JV)					
HG1A	“	2,569,652	2903	126	401
HG1W	“	2,402,040	2621	131	424
(OP: HA1YA)					
HA6P	“	1,198,539	1387	105	282
(OP: HA6PX)					
HA3OU	“	1,058,596	1082	133	406
HA5UX	“	756,863	1049	103	276
HG8W	“	697,570	900	109	286
(OP: HA8ZO)					
HA5OM	“	429,319	544	96	245
HG22TISZA	“	425,040	963	85	223
(OP: HA7VK)					
HA8VV	“	244,314	360	88	206
(OP: DH8VV)					
HA5YG	“	218,218	757	51	167
HA3IC	“	169,250	538	56	194
HAØDR	“	149,682	500	59	143
HA2NA	“	147,490	259	84	161
HA5MIG	“	143,312	436	49	159
HA3JO	“	71,820	213	51	129
HA2VR	“	53,960	183	43	109
HA2UF	“	34,344	146	38	70
HA5AQ	“	22,995	109	31	42
HA3MAR	“	13,132	126	17	50
HA3LN	28A	518,064	1327	37	135
HA8M	“	227,745	771	33	102
HA4A	“	221,529	706	34	113
HA5JI	21A	848,144	2067	36	140
HG1S	“	583,569	1405	36	141
(OP: HA1DAE)					
HA8FK	“	474,912	1345	35	118
HA9A	“	338,390	1132	33	104
HGØY	14A	921,519	2486	36	135
(OP: HA7GN)					
HA8A	“	880,821	2482	37	134
(OP: HA8DZ)					
HA1AH	“	789,960	2147	37	137
HA8IB	“	519,203	1560	36	131
HG4I	“	313,445	1072	34	105
(OP: HA5LN)					
HG5D	7A	669,240	2139	37	132
(OP: HA8QZ)					
HA7A	“	432,943	1988	31	96
HA8LCA	“	218,752	1068	30	98
HA8TP	“	78,795	444	24	79
HA1TJ	3.5A	493,878	2026	35	119
HA2KMR	“	154,900	1281	19	81
HA8BT	“	117,660	902	23	83
HA8BE	1.8A	86,480	857	17	75
*HA7UI	AA	1,744,554	2237	124	387
*HA5PT	“	1,539,279	1823	109	352
*HA7MF	“	1,058,132	1507	106	346
*HA8V	“	437,052	1035	70	238
*HA8EV	“	282,957	685	61	196
*HA5MI	“	241,697	538	68	195
*HA1TNX	“	201,810	408	64	153
*HA1AC	“	191,080	405	76	205
*HA7MS	“	160,416	282	85	203
*HA9TA	“	134,334	424	43	110
*HA8TKS	“	130,988	301	70	216
*HA9MDN	“	127,710	355	61	154
*HA6AK	“	43,788	244	30	93
*HA6NN	“	43,733	213	38	63
*HAØANA	“	1,400	30	6	14
*HGØR	28A	235,445	647	34	121
(OP: HAØNAR)					
*HG3A	21A	87,756	409	27	76
(OP: HA3PW)					
*HA8CQ	14A	30,975	221	20	55
*HA7I	7A	312,002	1344	35	111
(OP: HA7JTR)					
*HG8K	“	109,678	559	30	92
(OP: HA8GY)					
*HA5BVG	“	67,803	512	21	76
*HA1WD	“	22,950	203	19	66
*HA3FMR	“	11,834	106	13	48
*HA5LV	3.5A	9,462	160	7	50
*HA5N	“	4,590	103	6	39
(OP: HA5CQZ)					
*HAØHV	1.8A	70,933	764	16	73

Iceland

TF1AM	AA	486,750	923	77	253
TF3Y	28A	27,825	317	15	60
*TF3DC	AA	283,338	524	63	234
*TF3EO	“	220,572	685	47	151

Ireland

EI6LA	AA	637,096	726	98	290
EI2KC	“	367,026	982	67	182
EI8KW	“	133,575	515	43	152
EI2GLB	“	54,460	204	42	98
EI6HB	“	49,560	198	37	81
EI5IX	28A	143,594	639	30	92
EI5KO	“	5,092	64	13	25
*EI8GP	AA	229,000	608	49	180
*EI9KY	“	48,880	260	32	62
*EI6KW	14A	20,720	130	16	54

Isle of Man

MD2C	AA	876,120	1412	71	209
GD4EIP	“	61,272	360	41	143

Italy

II2S	AA	7,005,284	4000	185	629
(OP: IK2QEI)					
IO6A	“	2,323,150	2773	124	361
(OP: IK6QON)					
I2WIJ	“	2,252,974	2047	146	480
IK3ORD	“	2,077,731	1368	156	525
IZ3NYG	“	1,558,550	1460	141	370
I3FIY	“	788,125	997	120	365
IK2SAI	“	768,904	978	117	314
I8QFK	“	700,416	1067	106	278
I1JTQ	“	693,036	855	101	313
IK2XDE	“	663,936	1305	64	240
IKØYVV	“	557,036	916	78	236
IK3SCB	“	538,074	779	79	255
IR2C	“	476,748	859	69	159
(OP: IK2JUB)					
IKØXBX	“	471,393	615	104	355
IK3SWB	“	351,135	368	127	332
IK2XSL	“	326,400	580	74	166
IZ7ECL	“	299,880	448	85	221
IK1TTD	“	287,550	714	64	206
IK5XLB	“	267,075	592	54	171
IZ3XEF	“	265,320	432	84	180
IK2TDM	“	192,192	360	72	192
IV3IPS	“	188,710	535	63	163
IK7UKF	“	188,210	465	76	214
IZ5NFD	“	186,296	394	68	164
IU4CHE	“	178,383	253	107	184
IZ8VYU	“	135,713	522	35	78
I5MPN	“	115,583	300	66	155
IW2EVH	“	113,472	270	67	125
I3VJW	“	84,575	157	74	125
IR1Q	“	65,720	457	27	97
(OP: IU1JCZ)					
IK4JQQ	“	58,752	208	39	114
IK1LBL	“	47,595	115	67	100
IØWBX	“	23,544	124	34	74
IK3XJP	“	22,244	96	36	47
IW3QTG	“	16,095	79	42	69
IK1BXN	“	12,360	111	18	22
IV3KKW	“	12,096	94	24	39
IK2YXB	“	5,400	40	21	33
IK8UIF	“	1,254	22	9	10
IK3LLS	“	1,035	17	10	13
IW7ED	“	256	15	5	11
IB3N	28A	296,730	886	35	122
(OP: IV3SKB)					
IO2X	“	249,640	709	35	123
IK2SND	“	227,448	668	37	119
IO3X	“	195,508	587	34	114
(OP: IV3JCC)					
I5MXX	“	166,860	626	32	103
IR4B	“	129,645	402	33	96
(OP: IK4AUY)					
II3W	“	93,744	306	32	112
(OP: I3VFJ)					
IB6B	“	25,280	144	27	53
(OP: IZ6FXS)					
IZ5DKG	“	14,499	69	28	53
IR4E	21A	403,095	1051	36	129
(OP: IK4ZHH)					
IKØFUX	“	153,502	449	34	108
IR3L	“	140,940	481	35	100
(OP: I3FDZ)					
IZ8DVD	“	138,233	516	35	102
I3FGX	“	33,180	122	33	107
IZ2EER	14A	271,050	993	33	106
II8M	“	210,056	1129	30	94
IZ8XXE	“	150,192	693	31	95
I2IFT	7A	506,055	1732	39	126
IKØGDG	“	97,092	619	26	82
IK2CLB	“	95,761	373	33	98
IK1MTZ	“	62,408	261	28	88
IK6ZER	“	4,320	34	15	30
IR2D	3.5A	128,700	1129	18	82
IK2QPR	“	91,392	429	30	98
IZ8GCB	“	82,820	670	20	81
IK1PMR	1.8A	54,750	630	15	60
IC8POF	“	3,290	53	10	37
*IZ4JMA	AA	859,840	1496	76	244
*IK1RGK	“	609,760	738	96	274
*IK1ZOF	“	567,464	803	87	269
*IK4RQJ	“	510,384	607	99	273
*IØGOJ	“	378,315	752	88	227
*IUØITX	“	289,845	575	76	209
*IW5EIJ	“	282,150	566	77	193
*IZ2OBS	“	275,693	460	89	264
*IK8TEM	“	242,355	475	79	242
*IZ2OOS	“	226,785	560	57	138
*IK8PGM	“	226,625	525	67	192
*IZ2DII	“	178,038	497	50	139
*IV3TRK	“	167,753	329	74	153
*IZ2GMT	“	162,240	494	39	156
*IU2JWF	“	145,860	349	66	154
*IK2RLS	“	142,065	346	62	143
*I1WXY	“	137,550	275	66	109
*IW2FUT	“	136,500	436	41	134
*IZ5ILK	“	127,248	308	67	174
*IK4ZIF	“	120,536	199	105	142
*IK5MEP	“	120,328	599	38	140
*I4IKW	“	109,568	221	64	150
*IK7RVY	“	107,450	341	38	137
*IK2YGZ	“	104,160	294	58	102
*IUØPJS	“	92,235	278	54	111
*I1RJP	“	90,552	246	62	92
*IZ1DXS	“	75,570	229	49	116
*IK3TCK	“	74,685	290	44	151
*IN3HUU	“	68,970	306	31	90
*I2DJX	“	58,962	228	34	59
*IK1NEG	“	57,710	241	37	108
*IK2GZU	“	49,149	249	34	93
*I2OGV	“	48,285	193	41	104
*IU1GNA	“	48,204	138	52	104
*IW7DMH	“	47,124	222	44	109
*IK7LMX	“	40,424	157	43	81
*I3JUK	“	39,337	217	35	104
*IZ5FSA	“	33,866	131	45	73
*IW8FFH	“	28,638	126	37	74
*IU2ECB	“	27,136	137	39	89
*IZ7GEG	“	25,839	139	28	53
*IK3EDT	“	25,700	110	40	60
*IZ2BHQ	“	22,800	78	52	62
*IW1CHX	“	22,420	171	30	88
*IV3HAX	“	16,652	89	32	60
*IK3OII	“	13,311	57	36	51
*IU3EGK	“	10,032	64	30	36
*IZ4EFN	“	9,780	136	10	20
*IKØALT	“	9,322	81	30	49
*IU3OAR	“	8,100	85	21	39
*IU2OZU	“	6,760	84	19	46
*IU3QEZ	“	3,696	44	25	31
*I2EAY	“	2,288	42	18	26
*IZ4IST	“	1,564	26	12	11

*IK5LWE	“	1,080	30	11	19
*IC8FBU	28A	50,685	284	27	66
*IZ8BGY	“	21,888	155	22	54
*IK1SOW	“	20,592	124	25	63
*IKØNOJ	“	17,856	125	24	38
*I1GXV	“	14,840	102	25	45
*IK4IDP	21A	23,572	155	20	51
*IZ1PKV	“	7,176	82	16	23
*IZ8EFD	14A	256,168	1081	34	108
*IZ5IOV	“	30,303	195	20	43
*IZØEHL	“	11,880	114	14	46
*IK4RVG	“	1,140	22	9	21
*IK2WAD	7A	104,980	675	29	87
*IZ4BOY	“	38,493	186	18	73
*IU4OMO	“	48	5	3	5
*IU8LMC	3.5A	5,100	104	9	51

Kaliningrad

UA2FZ	*AA*	*1,773,750*	*1523*	*150*	*475*
RA2F	“	167,417	355	63	188
RN2FA	“	61,633	180	56	87
UA2FW	28A	366,520	1073	35	135
(OP: RA2FA)					
*UD2F	1.8A	4,158	133	4	29

Latvia

YL2SM	AA	5,462,445	3694	186	609
YL2KO	“	4,670,105	3172	183	596
YL2GD	“	1,665,608	1493	149	458
YL9T	“	182,214	367	91	227
YL7X	21A	625,008	1630	36	138
(OP: YL2LY)					
YL2BJ	14A	390,096	1409	35	127
YL9W	3.5A	438,360	1870	35	121
(OP: YL3DW)					
YL5T	“	157,890	1101	24	90
(OP: YL3DQ)					
YL3FT	1.8A	147,402	1023	25	89
*YL1YF	AA	127,699	746	25	118
(OP: YL3GAZ)					
*YL3GX	“	59,595	258	36	101
*YL3JA	21A	119,528	451	32	102
*YL2TD	7A	82,264	619	26	78
*YL2EA	“	24,124	226	16	58

Lithuania

LY2MM	AA	1,544,328	1590	127	407
LY7M	“	828,729	1368	87	276
LY2SA	“	773,604	746	130	421
LY2XW	“	288,981	544	57	174
LY7T	“	287,592	745	66	210
LY3CY	“	258,741	654	56	203
LY2GV	“	144,598	588	46	151
LY2AX	“	48,336	138	54	105
LY2IJ	28A	332,766	977	35	136
LY2LE	“	31,724	127	28	75
LY5O	21A	381,746	1106	34	129
LY3B	7A	103,854	539	30	84
*LY2J	AA	1,059,087	1276	117	374
*LY5W	“	612,549	795	112	329
*LY9W	“	544,896	900	95	292
*LY2N	“	351,869	681	69	232
*LY2X	“	275,361	520	69	194
*LY2F	“	214,896	741	42	180
*LY2MC	“	197,006	506	63	211
*LY4L	“	156,729	295	74	193
*LY7Z	“	120,321	252	72	189
*LY6C	“	25,466	172	30	89
(OP: LY5XX)					
*LY3QN	“	9,272	90	25	51
*LY2PAD	“	3,692	33	22	30
*LY2AT	3.5A	9,261	110	11	52

Luxembourg

*LX1ER	AA	733,720	693	132	388

Malta

9H3TX	AA	1,180,848	1776	103	335
(OP: DL5XAT)					
*9H1CG	AA	36,520	176	32	78
*9H/YT7AW	21A	2,065	33	10	25
*9H/YT4RA	14A	4,656	72	9	39
*9H/IV3CTS	7A	4,995	97	9	28
*9H/SA7DXR	3.5A	5,668	84	10	42

Moldova

ER1KAA	AA	6,367,305	4915	167	568
(OP: UT5UDX)					
*ER3DX	AA	149,520	352	51	159

Netherlands

PA3AAV	AA	3,745,248	3264	148	476
PA5KT	“	2,833,922	2518	146	452
PC3M	“	1,675,366	1711	126	380
PA2A	“	1,257,668	1489	100	358
PA1T	“	856,556	1195	99	295
PC4H	“	731,042	1185	98	305
PA5N	“	687,102	1210	94	289
PA7LV	“	623,124	865	86	256
PA5WT	“	593,460	1194	73	242
PAØJED	“	536,599	785	88	241
PA4EL	“	451,611	505	107	310
PE1RDP	“	384,600	682	78	222
PAØINA	“	382,200	691	71	229
PAØGJV	“	373,750	712	68	182
PA6AA	“	355,014	542	85	241
(OP: PB7Z)					
PAØKDV	“	271,150	660	63	212
PC5C	“	256,486	599	71	186
PA1LEX	“	231,290	886	48	154
PA4T	“	226,107	460	69	190
PA4M	“	180,612	415	57	117
PB5DX	“	179,218	475	58	168
PA3GCU	“	144,324	401	56	155
PA3GDD	“	128,475	343	68	157
PA4WM	“	126,338	323	53	128
PA1BX	“	123,025	417	43	142
PA1H	“	111,709	282	61	108
PE6Q	“	82,544	444	33	121
(OP: PA8AD)					
PA3EZC	“	76,760	215	58	132
PA5KM	“	58,156	197	42	92
PA3DRL	“	46,580	126	52	85
PA3HEN	“	46,151	178	39	94
PA1WX	“	26,077	105	37	52
PA5CT	“	25,530	106	39	76
PA9HR	“	18,880	121	24	40
PA3CWN	“	11,232	70	27	45
PA6Y	“	5,610	94	11	40
PA3DDP	“	1,704	27	10	14
PI4DX	28A	361,200	1077	35	133
(OP: PD1DX)					
PF5X	“	106,656	354	32	100
PI4COM	21A	571,540	1506	36	128
(OP: PA1AW)					
PA1CW	14A	238,005	989	33	102
PA4OES	“	41,310	294	18	63
PA3GVI	7A	18,827	172	13	54
PA1CC	3.5A	284,440	1493	30	100
PA3C	“	29,160	243	20	70
PF6W	“	228	8	5	7
*PA9M	AA	2,851,770	1986	157	533
*PA4O	“	2,694,024	2333	143	469
*PA2PKZ	“	1,327,968	1483	125	352
*PA8MM	“	982,049	1320	100	301
*PAØO	“	920,970	1112	120	285
*PA2TA	“	792,050	1250	81	269
*PA3BUD	“	734,400	838	118	314
*PC1PM	“	627,173	1048	85	274
*PA2DK	“	571,872	1297	68	228
*PG2AA	“	523,752	1097	68	210
*PC4E	“	325,416	694	75	237
*PE1EEC	“	274,248	534	64	170
*PA3EMN	“	263,220	666	50	164
*PG7M	“	183,375	487	52	173
*PA7JWC	“	180,690	517	53	137
*PA8KW	“	169,904	395	75	184
*PA1BD	“	139,988	391	50	108
*PA3DTR	“	129,307	387	48	143
*PA7RA	“	126,856	435	59	143
*PG6F	“	126,672	428	47	156
*PA3GCV	“	114,444	368	50	137
*PA8E	“	97,464	417	41	145
*PA3DUU	“	81,510	257	38	76
*PAØCMF	“	76,424	348	39	125
*PDØME	“	70,980	289	43	113
*PA1FNW	“	67,080	272	34	96
*PE1HWO	“	63,840	279	40	112
*PDØJMH	“	60,166	299	33	101
*PA2RU	“	59,340	282	42	96
*PD2DX	“	57,081	182	42	117
*PE4BAS	“	48,944	146	52	81
*PE1RWL	“	41,920	244	32	99
*PA3HGF	“	38,512	162	36	80
*PC7E	“	36,848	246	26	72
*PE4KH	“	33,136	179	30	79
*PAØB	“	30,100	192	32	68
*PC3T	“	27,960	134	29	91
*PE4A	“	21,945	141	30	75
*PA2VS	“	21,080	206	21	64
*PC8M	“	15,295	160	27	88
*PA2WLE	“	15,106	114	30	61
*PEØCD	“	14,014	105	26	65
*PA3DSB	“	11,859	85	24	43
*PB4PT	“	9,156	90	26	58
*PI4RS	“	2,204	173	22	54
(OP: PD1DBL)					
*PD1BHZ	“	1,369	20	17	20
*PA5MW	28A	17,871	99	21	48
*PA3EVY	7A	21,680	135	25	55
*PD1RP	“	6,076	121	8	41
*PD9DX	“	3,840	80	7	33
*PA3AIN	3.5A	10,672	230	6	40

North Macedonia

Z33B	AA	329,732	1070	58	163
Z35T	28A	477,795	1500	33	126
Z39A	7A	74,778	378	21	82
*Z32U	AA	42,828	188	41	88
*Z32TO	7A	88,191	399	31	92
*Z33F	3.5A	92,430	1028	14	65

Northern Ireland

GI5I	AA	2,057,292	3054	100	343
(OP: GI4DOH)					
MI5K	28A	5,375	55	15	28
(OP: MIØSLE)					
*MI5I	AA	2,034,053	2635	99	370
(OP: GIØRQK)					
*GI4SZW	“	21,424	150	27	76

Norway

LA4C	AA	3,852,500	4280	123	452
(OP: LA8OM)					
LB6KC	“	470,855	819	90	295
LA7GIA	“	424,125	1220	59	202
LA8HGA	“	191,100	607	47	148
LC7X	“	120,536	688	30	92
LA3TK	“	75,350	192	50	87
LA7XK	“	59,330	256	47	123
LB2TB	“	49,392	153	55	89
LA6XI	“	43,646	166	47	110
LC5M	“	5,936	68	19	37
LA6SK	“	1,377	17	10	17
LA2US	“	736	18	9	14
LA6OP	21A	23,712	114	27	87
LA9OI	7A	97,020	623	26	84
LC5K	1.8A	8,460	188	10	50
(OP: LA5YJ)					
*LN7TTT	AA	830,588	1262	96	343
(OP: LA5LJA)					
*LC9A	“	162,140	396	72	196
(OP: LB1TI)					
*LA2XNA	“	136,372	422	46	160
*LA6CF	“	48,970	125	66	100
*LA3ZA	“	17,940	89	37	78
*LA8OKA	“	17,936	148	27	91
*LC1R	“	7,597	106	24	47
(OP: LB5SH)					
*LB6VI	“	3,245	63	16	43
*LA4KQ	“	729	30	7	20
*LC9T	7A	3,916	73	9	35
(OP: LA9VKA)					

Poland

SN7Q	AA	8,641,836	4870	193	635
(OP: SP7GIQ)					
SP4Z	“	5,214,911	3232	184	633
SP1NY	“	2,908,224	2174	161	487
SQ9C	“	1,724,340	2064	109	326
HF1K	“	1,506,285	1729	124	413
(OP: SP1MGM)					
SN5N	“	1,294,176	1779	100	342
(OP: SP5KP)					
SP3HRN	“	1,275,510	1470	119	391
SQ8N	“	1,177,968	909	147	381
SO3O	“	1,120,536	1515	110	364
SP2GWH	“	771,058	1038	106	288
SP7Q	“	665,482	775	102	289
SQ1X	“	528,150	521	114	389
SP9MZH	“	517,452	598	115	313
SN7B	“	412,056	508	96	292
SP6NIF	“	305,280	525	90	228
SP3A	“	297,660	601	67	175
SP2XX	“	170,183	384	66	181
SP5GNI	“	163,800	360	75	185
SP5TT	“	133,551	315	63	146
SN7X	“	93,184	354	42	140
SP5GQX	“	43,585	149	42	73
SQ6LJV	“	27,900	112	42	51
SQ7IQM	“	19,600	110	37	61
SQ7U	“	7,686	118	12	49
SP6ECA	“	6,136	40	24	28
SP3JDZ	“	3,588	31	23	29
SO5E	“	795	48	17	36
(OP: SP5VIH)					
SP3QDM	“	693	11	10	11
SP6MAA	“	368	9	7	9
SNØW	28A	64,034	317	26	75
(OP: SQ9HQ)					
SP3MKS	“	26,980	143	28	67
SP1MWN	“	12,567	99	18	41
SN2M	21A	730,334	1743	36	142
(OP: SP2XF)					
SP2PIK	“	521,850	1525	35	112
(OP: SP2MKT)					
SN5Y	“	324,900	883	32	118
(OP: SP5Y)					
SP3CYY	“	223,146	682	35	119
SP5AUY	“	48,600	195	28	72
SQ2A	14A	791,190	2099	38	139
(OP: SQ9UM)					
SP9RCL	“	244,701	742	36	123
SQ5LNU	“	79,398	415	25	74
SN3A	7A	1,233,900	3385	39	141
(OP: SQ2GXO)					
SP5CNA	“	232,580	996	35	110
SP8PAI	“	205,920	695	35	108
(OP: SP8HZZ)					
SP5GH	“	15,696	87	26	83
SP2HWW	“	13,794	129	19	47
SN2B	3.5A	405,444	1908	30	108
(OP: SP2MKI)					
SP3GTS	“	157,665	999	26	89
SP9LAS	“	157,522	1100	25	88
SP5ELA	“	140,700	1220	18	82
SP9JZU	“	132,209	883	26	93
SN1W	“	83,888	717	22	76
(OP: SQ1DNJ)					
SO4P	“	34,342	359	15	62
(OP: SP4DEU)					
SP3HLM	1.8A	79,900	770	19	75
SP6AEG	“	38,952	526	12	60
SP2LNW	“	33,450	401	13	62
SP9DWT	“	20,223	299	12	51
*SP4JCQ	AA	3,160,080	2394	159	534
*SP2R	“	2,793,099	2537	144	503
*SP9XCN	“	2,389,145	2265	142	463
*SN5J	“	1,574,612	1797	126	440
(OP: SP5JXK)					
*SQ3R	“	1,122,660	1252	112	350
(OP: SQ3HMM)					
*SP9DLY	“	1,037,875	1478	116	359
*SP7CF	“	989,838	1339	97	336
*SN1T	“	698,850	1036	104	346
*SP8ALT	“	424,000	687	79	186
*SP3BBS	“	378,263	702	70	223
*SP2DKI	“	317,322	581	75	214
*SP6CJK	“	266,400	404	95	275
*SP2HHX	“	249,249	516	79	194
*SN4D	“	247,895	938	44	171
(OP: SP4GAP)					
*SP8GNF	“	209,712	535	54	203
*SN95PRK	“	185,535	449	62	155
(OP: SQ9FMU)					
*SP8HWM	“	172,730	574	50	180
*SQ3POS	“	163,761	411	63	158
*SP5DJ	“	109,890	530	35	150
*SN5WD	“	104,040	473	37	143
(OP: SO5WD)					
*SP3FMF	“	92,814	334	43	143
*SP7CXV	“	88,136	207	68	116
*SP9FMP	“	81,446	238	51	160
*SP6NIV	“	65,250	303	44	101
*SP7TEX	“	61,254	201	50	116
*SP6OPC	“	53,790	130	61	102
*SQ9ZAX	“	44,844	169	41	70
*SQ5VCO	“	37,084	205	35	92
*SP3TYI	“	33,180	167	44	96
*SQ9S	“	27,648	141	33	75
*SO6XL	“	24,624	147	34	80
*SP8FB	“	23,808	101	48	80
*SP2HFH	“	22,261	129	33	80
*SQ9MEE	“	19,788	194	27	70
*SP6IHE	“	16,965	69	38	49
*SP2MF	“	12,012	80	25	66
*SP5TAT	“	10,117	65	29	38
*SP2WGB	“	9,718	109	22	64
*SP5TER	“	9,396	106	19	62
*SP2ADY	“	5,247	63	11	22
*SP6MI	“	4,095	63	12	33
*SP5BN	“	2,747	33	14	27
*SP5SSB	“	1,110	42	5	25
*SP9EXE	“	210	17	9	12
*SQ6IUS	“	162	18	10	17
*SP2EWQ	28A	122,388	404	33	108
*3ZØX	“	118,938	444	34	95
(OP: SP5MXZ)					
*SP3CCT	“	55,955	249	25	70
*SQ7NSN	“	32,364	147	30	63
*SOØN	21A	143,309	451	35	104
(OP: SQ9CNN)					
*SP4JFR	“	33,800	142	25	79
*SP2TMT	“	29,058	153	21	66
(OP: SQ2BNM)					
*SP2IKP	14A	21,436	159	25	67
*SQ1WO	“	2,550	65	7	27
*SP7OGP	7A	145,560	738	28	92
*SP6MQO	“	5,610	67	13	42
*SP8BRT	“	2,117	58	7	22
*SP3CW	3.5A	57,354	657	13	66
*SP9JZT	“	52,050	677	13	62
*SN1F	“	50,140	475	15	77
(OP: SP1GZF)					
*SO5UT	“	39,338	416	17	72
*SP8BXL	“	16,131	328	8	49
*SN2S	“	11,040	165	8	52
(OP: SP2MHD)					
*SNØR	1.8A	52,785	773	10	59
(OP: SQ9IAU)					
*SQ9IDE	“	858	41	4	18

Portugal

CT7AUP	AA	432,600	764	75	234
*CT1BOH	AA	444,261	745	84	197
*CT1EHK	“	76,048	371	31	81
*CT1AGS	“	17,394	103	32	46
*CT7ASQ	“	8,940	103	19	41
*CT7AKW	“	1,260	32	9	12
*CT1GFK	28A	12,012	64	21	63
*CT7/DL6IAK	21A	378,099	1621	32	97
*CT1GFQ	14A	42,768	404	18	63

Romania

YO9HP	AA	3,022,672	2668	154	498
YO4NF	“	2,468,016	3085	127	395
YO3GNF	“	751,840	1318	88	282
YO4AR	“	494,158	1120	75	254
YO7CW	“	331,485	791	72	215
YO4FPF	“	242,400	564	68	232
YO9AYN	“	229,620	484	68	199
YO6ZS	“	159,929	592	49	168
YO8BGD	“	153,110	394	65	186
YO6OEV	“	75,276	315	42	111
YO7BM	“	836	20	8	14
YO2LCP	28A	1,232	22	10	18
YO9SW	21A	2,015	37	9	22
YR9F	14A	151,578	722	30	96
(OP: LB3TI)					
YO2MNZ	“	105,120	543	29	91
YQ6A	7A	689,564	2249	37	129
(OP: YO6BHN)					
YP3A	“	149,499	866	27	86
(OP: YO3HA)					
YP5A	“	131,898	725	28	86
(OP: YO5CBX)					
YO3LW	“	58,425	368	24	71
YO2MFC	“	2,952	32	15	26
YO5CUQ	3.5A	15,738	245	8	53
*YO8DOH	AA	1,153,025	1798	100	325
*YO3GCL	“	860,078	1289	102	296
*YO4DG	“	826,308	1489	91	287
*YO3FRI	“	751,076	1005	107	305
*YO7BGA	“	298,782	636	76	221
*YO4RDW	“	273,738	643	60	198
*YO4NA	“	249,091	636	51	172
*YO2DFA	“	223,440	478	78	207
*YO2CEQ	“	132,462	454	54	169
*YR8A	“	113,436	320	51	156
*YO2URS	“	86,553	393	43	134
*YO2MIT	“	64,780	294	42	122
*YO4GO	“	37,994	162	36	85
*YO2ARM	“	29,484	181	27	81
*YO9GDN	“	18,117	101	28	33
*YO6LA	28A	2,945	51	11	20
*YO4DW/P	21A	22,080	164	21	48
*YO8SAO	“	7,439	105	12	31
*YO8TNB	14A	82,917	427	26	85
*YO2MKI	“	55,300	341	29	71
*YO3CVG	“	14,212	132	17	59
*YO6FGZ	7A	183,060	1084	26	87
*YO5AVN	3.5A	136,344	1097	21	83
**YO2NAA*	*“*	*10,912*	*155*	*9*	*53*

Sardinia

ISØAFM	AA	2,515,405	3066	117	388
*ISØBZR	28A	12,566	98	19	42

Scotland

MM2N	AA	1,424,664	1765	102	319
(OP: MMØGPZ)					
GM4Z	“	537,572	736	87	205
(OP: GM4ZUK)					
GMØAZC	“	233,472	580	60	168
GM4V	“	52,305	196	43	122
(OP: MMØCCC)					
GMØVMV	“	45,486	225	33	100
GM4EVS	“	43,491	225	26	83
MM1E	28A	160,347	559	30	99
(OP: MMØGOR)					
GM3YTS	“	146,432	493	31	112
MMØZBH	1.8A	33,069	410	14	59
*MM2T	AA	910,672	1440	86	290
*GM4X	“	306,000	702	74	226
(OP: GM4WZG)					
*GM3ZRT	“	109,394	326	44	122
*GM5TDX	“	57,352	298	34	100
*GM4OSS	“	8,640	54	33	47
*GM4FDM	28A	79,632	338	28	84
*MM4D	“	77,826	372	26	83
(OP: GM4ATA)					
*GM7WCO	21A	27,064	266	16	52
*GM4UYZ	14A	3,588	75	9	37
*GM8DYT	7A	73,500	467	21	77
(OP: GM4ATA)					
*MMØGOR	3.5A	6,223	114	7	42

Serbia

YT7R	AA	4,022,200	3681	144	451
(OP: YU7BW)					
YU7KW	“	3,477,600	2419	162	513
YU7OM	“	30,069	206	36	81
YT1X	28A	405,643	1122	36	131
YU5W	“	176,700	505	34	116
YT5K	“	93,946	389	28	79
(OP: YT2SS)					
YTØZ	21A	755,650	2037	36	134
(OP: YU1ZZ)					
YT9A	“	753,666	1932	38	139
YU5R	“	578,502	1615	36	126
(OP: YO8XXX)					
YT3X	14A	984,725	2753	38	137
YT4W	“	522,348	1835	37	121
(OP: YU1DW)					
YT2ISM	“	159,900	1052	25	75
YT1A	7A	676,512	2410	35	127
YT3K	“	259,576	1115	34	108
(OP: YU1UO)					
YT4T	3.5A	171,490	1284	22	88
YUØU	“	80,665	805	16	69
YU1JW	1.8A	35,425	574	10	55
*YU3TA	AA	1,034,580	1177	119	397
*YT2U	“	318,784	699	74	198
*YU1FG	“	79,790	376	35	123
*YT1XC	“	74,704	306	44	117
*YT5BOS	“	3,500	50	18	32
*YT2RX	28A	84,728	328	31	88
*YT5N	21A	57,600	317	26	74
(OP: YU7AF)					
*YU7ZZ	“	12,716	105	19	49
*YT1TU	“	11,628	130	16	35
*YT1BD	“	3,000	30	16	24
*YU5M	14A	346,560	1289	37	115
*YT2AAA	7A	424,700	1576	37	118
*YU7WW	“	346,527	1459	33	106
*YT2B	“	189,552	910	30	102
*YU1KT	“	72,362	486	20	77
*YU1LA	“	69,760	423	27	82
*YU1ED	3.5A	92,652	949	16	68
*YT1WA	“	85,941	939	13	68

Sicily

IT9QGH	AA	1,010,410	1252	98	297
IT9SSI	“	177,156	401	62	166
IB9A	14A	630,136	2027	38	128
(OP: IT9RBW)					
*IW9GRL	AA	136,114	297	66	187
*IT9KCD	21A	182,272	727	33	95
*IR9R	14A	407,805	1601	36	119
(OP: IT9WDC)					

Slovak Republic

OM7LM	AA	1,085,418	1384	114	309
OM7JG	28A	384,216	1035	35	133
OM8CW	21A	845,920	2159	37	133
OM8DD	“	27,140	150	25	67
OMØM	14A	849,680	2364	38	134
(OP: OM3CGN)					
OM3CW	“	237,625	1033	33	92
OM8FR	“	150,429	710	29	94
OM3DX	“	23,850	180	20	70
OM5CM	3.5A	247,200	1403	27	93
*OM6RM	AA	334,929	699	66	221
*OM4O	“	117,476	305	48	124
(OP: OM3NI)					
*OM5UM	“	95,880	334	46	158
*OM2RA	“	78,225	176	70	105
*OM6MS	“	75,504	379	38	138
*OM5APP	“	34,727	279	26	95
*OM1AKU	“	32,160	224	35	99
*OM8MF	“	4,200	42	17	18
*OM1HMI	“	1,518	44	9	24
*OM5KM	21A	263,702	793	35	123
*OM3TZZ	7A	271,414	1245	36	107
*OM5ALL	“	194,951	939	32	105
*OM8PG	“	2,310	46	8	25
*OM1AVV	“	360	16	5	10
**OM5AW*	*3.5A*	*111,858*	*923*	*21*	*82*

Slovenia

S5ØG	AA	2,158,920	2339	133	407
(OP: S58M)					
S59AA	“	1,101,411	1034	127	386
S53BB	“	935,655	1316	120	349
S54O	“	646,469	861	102	331
S52D	“	616,413	777	110	337
S51NM	“	408,375	655	93	282
S58Y	“	310,642	585	72	182
S58N	“	164,576	354	81	197
S53A	“	102,492	367	41	67
S51RE	“	76,076	184	64	90
S59L	“	72,447	306	28	65
(OP: S51DS)					
S52TW	“	24,360	134	38	46
S51DI	“	3,000	40	18	32
S59DJK	“	240	12	8	12
(OP: S51DD)					
S56AA	28A	387,774	1038	36	131
(OP: S56M)					
S5ØU	“	326,100	1010	36	114
S5ØK	21A	826,920	2008	37	143
S52ZW	“	474,925	1360	35	122
S57Z	14A	819,408	2316	38	134
S57DX	“	818,832	2443	36	132
S53M	7A	1,111,352	3181	38	135
(OP: S51FB)					
S51YI	“	943,428	2780	38	136
S52AW	“	916,994	3033	37	132
S57WJ	“	762,528	2522	35	121
S53Z	“	62,014	415	23	78
S57W	“	25,568	226	16	52
S51ZJ	3.5A	149,130	1287	18	72
S51V	1.8A	164,808	1217	23	86
S53O	“	138,123	1101	20	83
S56X	“	79,650	879	18	72
*S52W	AA	2,392,680	2127	150	485
*S54X	“	2,167,944	1850	147	471
*S56A	“	913,900	975	117	364
*S53FO	“	641,146	1122	85	301
*S56C	“	568,516	1115	81	257
*S51MF	“	231,878	433	74	195
*S52ON	“	173,201	494	55	172
*S55AW	“	37,064	170	32	50
*S5ØL	“	30,016	233	25	87
*S58D	“	24,892	148	30	68
*S52AA	“	14,440	106	28	67
*S55KA	“	12,078	91	29	70
*S51RM	“	4,140	52	22	47
*S53V	28A	76,866	230	32	106
*S59MA	“	14,905	106	21	34
*S51WU	21A	6,954	81	12	26
*S52CC	“	2,025	27	11	16
*S57ZT	7A	99,935	629	26	89
*S57AW	3.5A	169,592	1157	23	93
*S57KM	“	9,169	150	9	44

Spain

EA2W	AA	9,184,725	5284	186	639
EE4Y	“	2,431,704	2010	142	462
(OP: EA4GOY)					
EA2ESB	“	1,796,678	1894	104	390
EA4EM	“	767,807	1461	77	230
EB7KA	“	465,850	1062	58	184
EA2BD	“	416,097	649	79	218
EA2A	“	324,800	494	84	206
EB5F	“	318,045	849	48	147
EA3AKA	“	191,025	634	49	176
EC3AIT	“	189,735	354	81	192
EA4HQV	“	181,300	387	71	188
EA3KAN	“	158,730	294	78	208
EA3PT	“	145,476	273	94	230
EA1B	“	82,995	201	67	98
EA4UV	“	50,880	166	45	115
EA5JDN	“	44,400	209	40	110
EA2GR	“	39,894	273	28	94
EA3B	“	20,246	113	32	74
EA7A	28A	292,435	1077	32	111
ED4T	“	218,120	678	32	101
(OP: EA4R)					
EA7BUU	“	2,555	29	15	20
EA3ATM	“	960	18	13	17
ED1K	21A	312,528	1090	32	104
(OP: EA1NK @EA1NK)					
EA7FPG	14A	44,626	287	29	77
EA5GIE	7A	5,289	105	11	32
EC1R	“	2,784	51	8	24
*EA5M	AA	2,969,890	3207	128	411
*EA7W	“	2,672,024	2209	124	445
*EA2AZ	“	1,173,051	1335	103	348
*EA7TG	“	896,335	1094	90	289
*EA4BAS	“	731,084	970	96	290
*EA2NN	“	592,196	1105	76	237
*EA3NR	“	550,536	743	86	253
*EA3XR	“	533,260	696	95	269
*EA7ZC	“	436,774	707	78	236
*EA1IQM	“	338,040	685	70	200

*EE2A	"	299,148	592	77	214	(OP: EA2SN)
*EA5BM	"	276,552	514	73	203	
*EA4XT	"	208,278	498	66	195	
*EA3AVV	"	207,090	461	64	170	
*EA7K	"	205,860	390	78	214	
*EA5LU	"	202,644	510	61	173	
*EA2GM	"	188,374	675	41	153	
*EF7N	"	181,700	437	56	174	(OP: EA7KHB)
*EC5AGM	"	126,808	304	72	190	
*EA7GVR	"	121,875	406	46	149	
*EA1G	"	85,836	401	28	64	
*EA7MT	"	85,800	241	61	159	
*EA7GZQ	"	57,949	243	43	124	
*EA2EOW	"	56,430	187	48	142	
*EA7RCS	"	56,135	234	37	66	
*EC4TA	"	38,214	198	24	75	
*EA4DLZ	"	34,720	147	40	84	
*EA4HRJ	"	30,012	124	43	79	
*EA3AXM	"	27,816	126	38	76	
*EA1DA	"	25,360	149	28	52	
*EA7KQI	"	22,048	111	41	63	
*EA4AQQ	"	10,830	66	33	62	
*EA3AQ	"	8,211	63	29	40	
*EA1CN	"	6,820	67	23	32	
*EA7BGR	"	3,612	52	18	24	
*EA3CV	28A	18,960	112	21	59	
*EA4CWW	"	12,850	116	16	34	
*EA7J	"	5,696	65	12	20	
*EE5K	21A	329,935	1143	35	116	(OP: EA5DF)
*ED7O	"	310,488	1183	33	103	(OP: EA7EU)
*EA1CS	"	121,873	615	29	78	
*EA3JW	"	76,245	365	33	82	
*EA4FJX	"	14,819	104	19	54	
EA7OR	"	*8,052*	*111*	*13*	*31*	
*EA3IN	14A	250,062	1031	36	106	
*EA4S	"	64,337	443	21	80	
*EA5ET	"	56,459	327	24	77	
*EA1ASG	"	12,730	130	16	51	
*EA1FHQ	7A	1,107	29	8	19	
*EB5CS	"	612	30	5	12	

Svalbard

JW8AJA	AA	549,690	1082	70	149	(OP: LA8AJA)
JW7QIA	"	231,623	605	51	112	

Sweden

SC7DX	AA	2,084,832	1970	139	469	
SF1Z	"	1,408,158	1636	121	413	(OP: SMØHEV)
SM3U	"	1,336,500	1192	136	458	(OP: SMØMPV)
SEØX	"	1,144,678	1450	130	384	(OP: SMØMDG)
SM6BZV	"	848,216	995	112	346	
SM6M	"	827,118	879	129	348	(OP: SM6MCW)
SB7S	"	750,288	1311	103	289	
SM6NET	"	669,811	788	110	311	
SM5EPO	"	583,464	942	80	242	
SM3EVR	"	535,424	1000	90	286	
SM6NZA	"	490,050	533	125	325	
SM5COP	"	357,178	742	63	208	
SM3OMO	"	199,545	361	73	178	
SA6NIA	"	163,780	734	41	149	
SM3PZG	"	124,354	377	53	141	
SM6BGA	"	61,204	223	45	62	
SM5LNE	"	14,104	62	38	44	
SM5ENX	"	2,660	28	16	19	
SK3W	21A	482,288	1304	36	136	(OP: SM3SGP)
SM6F	"	165,714	511	35	107	(OP: SM6CUK)
SE5E	14A	693,063	2024	38	133	(OP: SM5AJV)
SM7PEV	"	158,720	721	30	94	
7S9A	"	121,000	526	28	93	
SE5B	7A	40,200	303	24	76	
*SD6F	AA	751,400	1644	68	272	(OP: SM6JWR)
*SDØN	"	721,536	1229	82	302	(OP: SMØNSJ)
*SM5IMO	"	694,590	1131	76	314	
*SM6FPG	"	341,285	773	70	273	
*SM3EAE	"	206,150	605	52	165	
*SM6IQD	"	117,660	389	54	168	
*SM6S	"	90,117	391	33	120	(OP: SM6OEF)
*SM6Y	"	79,948	342	44	114	(OP: SA6BNV)
*SK5AA	"	65,884	258	50	131	(OP: SM5KRI)
*7S7V	"	58,050	225	45	105	
*SE4E	"	49,928	273	34	124	(OP: SM4DQE)
*SM6MIS	"	29,868	262	24	90	
*SI6T	"	28,459	117	39	110	(OP: SM6LZQ)
*SD3A	"	20,680	137	27	67	(OP: SM3FJF)
*SM7RYR	"	19,176	150	28	66	
*SM6OPM	"	16,830	154	25	77	
*SM4EPR	"	11,583	102	21	60	
*SF5O	"	3,220	29	22	24	(OP: SMØEOS)
*SM6FPC	14A	139,128	556	31	93	

Switzerland

HB9TOC	AA	3,854,540	3124	147	473	
HB9DQL	"	3,015,064	2638	126	421	
HB9ON	"	1,441,033	1768	122	365	(OP: HB9FBM)
HB9IJC	"	1,258,305	1612	118	329	
HB9AWS	"	616,920	1288	86	302	
HB9CVQ	"	519,168	1047	66	190	
HB9AUK	"	471,245	751	80	227	
HB9EHJ	"	366,452	709	79	238	
HB9DVZ	"	331,500	621	83	257	
HB9CZF	"	178,816	342	60	194	
HB9KOG	"	23,871	132	42	67	
HB9EGA	"	11,328	85	25	34	
HB9FAP	21A	509,049	1402	36	127	
*HB9BXE	AA	685,184	929	103	301	
*HB9HTF	"	664,848	1296	64	240	
*HB9TWM	"	320,754	587	70	224	
*HB9IIH	"	115,593	381	45	114	
*HB9HDV	"	113,880	364	55	164	
*HB9DBM	"	62,868	222	51	118	
*HB9CIC	"	45,744	358	23	25	
*HB9GNY	"	27,645	117	37	58	
*HB9LF	"	16,692	99	25	53	(OP: HB9CRV)
*HB9XCL	"	6,438	62	17	20	
*HB9EXR	"	667	17	8	15	
*HB9HMY	14A	77	9	2	9	
*HB9HBY/P	7A	13,330	250	14	48	

Ukraine

UW1M	AA	8,197,727	6644	161	578	(OP: UR5MW)
UTØRM	"	1,050,840	1440	102	276	
UTØRS	"	965,928	1002	125	376	
UY7C	"	608,820	1076	73	219	
UT3UV	"	76,612	331	42	137	
US8QQ	"	46,455	107	68	95	
USØSY	"	7,521	53	26	43	
UR5EDX	"	6,624	52	22	26	
US1CT	"	1,710	23	12	18	
UR7EZ	"	660	13	8	12	
UT7CR	7A	501,254	1748	36	133	
UT5C	"	15,850	195	13	37	(OP: UX7CQ)
US6EX	1.8A	24,747	304	15	58	
UT5UGR	"	23,100	232	15	60	
UYØZG	"	15,732	164	15	54	
UW5ZM	"	4,230	81	9	38	
*UZ1WW	AA	526,110	885	86	304	
*UXØFF	"	316,354	513	97	270	
*UT1US	"	237,445	432	74	207	
*UW5U	"	127,470	444	51	159	(OP: UY2UA)
*UT1UL	"	121,878	306	63	159	
*UR7HN	"	112,840	453	38	117	
UT2O	"	*77,112*	*312*	*41*	*121*	
*UZ1RM	"	54,670	260	31	111	
*UW7CN	"	33,396	149	38	83	
*UR5RP	"	22,176	123	61	93	
*UT5Q	"	2,601	53	14	37	
*UY1HY	28A	98,145	326	33	102	
*UTØEM	21A	4,066	53	12	26	
*UY5ZZ	14A	167,616	705	31	113	
*UT6CW	7A	28,296	150	27	81	
*UT8UU	"	14,144	160	13	55	
*UT7NY	3.5A	62,560	508	20	72	
*UR7MZ	1.8A	27,328	408	10	54	

Vienna Intl Ctr

*4U1A	AA	6,099	37	22	35	(OP: OE1ZZZ)

Wales

MWØSAW	AA	71,940	196	52	80	
MW5B	3.5A	478,682	2097	32	110	(OP: G3WVG)
*GW5L	14A	52,920	343	24	66	(OP: GW4ZAR)

OCEANIA

Australia

VK6DW	AA	40,464	109	51	93	
VK3KE	"	22,145	98	37	66	
VK3X	21A	4,284	43	16	20	(OP: VK3GK)
VK4DX	14A	621,452	1458	35	113	
*VK4FJ	21A	5,184	60	11	21	
*VK3GF	"	1,482	25	12	14	

Guam

NH2DX	21A	665,798	1771	34	99	(OP: KG6DX)

Hawaii

WH6R	AA	281,385	653	76	93	
KH6U	"	61,236	216	45	63	
AH7C	"	4,752	46	14	22	
NH7T	7A	875,550	2015	38	112	(OP: @KH6YY)
*KH6OO	AA	34,706	173	34	40	
*AH6KO	28A	391,482	1478	31	60	

Indonesia

YB1DOL	AA	178,139	330	70	123	
YBØBAC	"	128,590	293	54	113	
YB7YGR	"	122,550	236	70	120	
YB2IQ	"	93,330	222	51	102	
YE1BON	"	77,996	228	56	92	
YBØCOU	"	3,901	35	20	27	
YC1JGE	28A	8,060	113	8	18	
YE3AA	21A	34,444	169	24	55	
YBØSAS	14A	24	2	2	2	
*YC2VOC	AA	1,432,118	1587	96	230	
*YB1RKT	"	280,728	412	81	171	
*YBØNSI	"	132,459	276	75	126	
*YB1BX	"	83,895	264	45	74	
*YD1FRU	"	64,842	250	35	72	
*YCØJOY	"	63,801	179	53	86	
*YB6IUP	"	13,952	88	24	40	
*YBØISE	"	11,122	70	34	49	
*YB1BA	"	10,682	83	37	61	
*YB3VK	"	8,470	80	33	44	
*YG2BDN	"	6,321	54	17	26	
*YBØMZI	"	4,066	47	17	21	
*YB3FTD	"	3,772	39	18	23	
*YE3ESW	"	3,293	41	16	21	
*YC1IFR	"	2,585	52	24	31	
*YC4SMK	"	1,269	18	11	16	
*YE8DWC	"	1,078	18	10	12	
*YB1WCK	"	304	12	8	11	
*YB1HR	28A	36,103	172	25	54	
*YB9DE	"	14,905	98	22	33	
*YD2UWF	"	6,972	115	8	13	
*YF3FBV	"	2,546	57	9	10	
*YB1UUN	"	2,511	34	11	20	
*YD3CZV	"	78	5	3	3	
*YB2VYY	21A	34,124	160	23	53	
*YB1BML	"	23,496	145	19	47	
*YB7OO	"	15,635	117	13	40	
*YD2UTC	"	14,945	97	19	42	
*YF8HYV	"	14,726	167	18	19	
*YC1JEL	"	11,928	126	20	36	
*YB1NWP	"	5,661	61	10	27	
*YD3ASV	"	1,848	40	11	13	
*YD2UFR	"	1,298	25	8	14	
*YC1GDF	"	1,056	58	17	31	
*YD1CHM	"	150	7	5	5	
*YF3FZR	"	80	8	3	5	
*YC2KJC	14A	7,084	57	13	31	
*YB9UA	7A	8,008	62	20	36	
*YB6PEN	"	30	4	2	3	

New Zealand

ZL4NR	AA	82,926	221	52	101	
ZL4TT	21A	245,672	842	32	75	
*ZL1TM	21A	168,402	485	31	96	

Philippines

DU3T	AA	3,468,972	2817	128	316	
DU3JH	21A	47,068	252	25	57	
*4I1FKB	AA	59,328	166	46	98	
*4F3BZ	7A	40,875	218	22	53	

SOUTH AMERICA

Argentina

LU1MA	AA	370,104	799	53	115	(OP: LU3MAM)
LU7HN	"	110,544	432	40	58	
LU8DPM	28A	935,887	2350	34	105	(OP: LW8DQ)
LT6M	"	779,160	2149	26	103	(OP: LU8MHL)
LO5D	"	392,250	1128	27	98	(OP: WP3A)
LU1DZ	"	275,184	1086	24	67	
LT5V	"	23,826	198	18	39	(OP: LU8VCC)
*AZ1A	AA	433,755	673	71	184	(OP: LU1AW)
*LT7F	"	78,996	171	64	110	(OP: LU6FOV)
*LW2DX	"	77,244	364	29	53	
*LU5OM	"	16,620	105	26	34	
*LU7CRA	"	7,811	66	24	49	
*L77D	28A	11,515	100	16	31	(OP: LU6DC)
*LU1ELY	21A	0	4	2	2	

Aruba

P44W	AA	13,457,875	6254	169	586	(OP: W2GD)

Bonaire

PJ4DX	AA	2,958	29	13	21	

Brazil

PY2KC	AA	2,134,176	1768	121	352	
PY5AMF	"	1,679,140	2028	82	213	
PY2KNK	"	787,641	976	71	238	
PT7WM	"	395,963	658	63	178	
PY3DX	"	96,831	229	54	105	
PY2OF	"	38,720	151	36	74	
PY4HO	"	34,400	163	29	51	
PY5DK	"	25,088	84	43	69	
PY2XJ	"	*14,910*	*97*	*44*	*61*	
PY4BZ	28A	527,498	1305	34	112	
PY5ZHP	"	306,935	955	28	87	
PY3TR	"	684	14	7	12	
PS7DX	"	64	7	4	4	
PY6TS	14A	53,766	272	23	64	
PY4ME	7A	59,007	353	21	68	
PP5JR	3.5A	16,110	78	23	67	
PT2AP	1.8A	60	11	5	5	
*PP5BZ	AA	3,670,056	2837	119	349	
*PY2FRQ	"	1,388,361	1350	106	261	
*PY2CX	"	243,219	371	65	186	
*PT7CG	"	218,325	395	60	153	
*PT2AW	"	176,787	535	38	79	
*PY2UDB	"	145,792	388	43	93	
*PP5KR	"	144,650	549	31	79	
*PP2RON	"	123,098	408	42	80	
*PY2WC	"	113,985	318	56	93	
*PY5CC	"	75,735	221	48	87	
*PY2VZ	"	43,904	145	39	89	
*PY2KME	"	39,758	144	41	62	
*PY2BBQ	"	39,216	137	40	74	
*PY5IQ	"	28,024	148	42	82	
*PU2UAF	"	26,864	158	58	126	
*PY2OKB	"	22,155	118	44	61	
*PY2DN	"	17,760	104	34	46	
*PU1LEO	"	13,504	100	24	40	
*PY1FI	"	9,880	61	25	40	
*PY1LV	"	9,648	88	24	43	
*PP5DKM	"	8,418	55	32	37	
*PY1ZB	"	3,220	59	23	23	
*PU8PSF	"	2,805	55	23	32	
*PY2POA	"	540	10	9	9	
*PY2LCD	"	348	11	6	6	
*PY3DCC	"	204	12	9	8	
*PP2DX	"	90	8	5	4	
*PY4XX	28A	256,891	722	29	102	
*PY2RSA	"	220,528	701	28	84	
*PY7RP	"	168,087	530	31	98	
*PY2RH	"	113,049	505	22	57	
*PU1JSV	"	45,920	224	21	59	
*ZZ1M	"	42,550	306	21	53	(OP: PY1SAD)
*PY5II	"	35,910	219	18	45	
*PY1MK	"	31,680	193	21	45	
*PY2RX	"	22,021	159	21	40	
*PY2ATR	"	19,260	189	16	29	
*PY5VE	"	18,480	193	16	26	
*PY1CMT	"	15,456	143	14	32	
*PX5M	"	12,987	136	16	23	(OP: PP5BT)
*PY1KB	"	12,737	118	15	32	
*PU2OGQ	"	12,144	112	16	30	
*PU2VNC	"	7,326	92	13	24	
*PY8WW	"	4,176	76	10	26	
*PU4WTB	"	1,743	53	9	12	
*PU2USK	"	1,475	28	10	15	
*PY1DK	"	286	18	6	5	
*PU7ASP	"	247	9	7	6	
*PY4NF	"	120	11	4	4	
*PY4LH	21A	199,302	643	29	89	
*PY2FSR	"	168,480	613	28	76	
*PY2QT	"	80,948	303	26	72	
*PT9DX	"	75,050	344	25	54	
*PY1XW	"	49,250	358	15	35	
*PY1KO	14A	36,575	198	25	52	
*PR7AB	7A	146,387	758	19	60	
*PY2GTA	1.8A	24	5	3	3	

Chile

XR2K	*28A*	*408,054*	*1671*	*23*	*71*	*(OP: CE2ML)*
XQ1KZ	21A	927,055	2143	37	118	
XQ3OP	7A	3,876	47	15	23	
*XR3W	AA	3,061,155	2536	122	323	(OP: XQ4CW)
*CE1EW	"	100,167	246	70	103	
*CE1RT	"	168	7	6	6	
*XQ3WD	28A	261,600	974	23	73	

Colombia

HK6J	AA	953,984	1302	78	179	
HK3C	"	24,596	115	25	61	
HK1MW	3.5A	142,740	638	20	70	
*HK1N	28A	240,670	1101	19	63	
*HK3UA	21A	220	17	10	10	

Ecuador

*HC1DW	AA	720,714	1136	61	165	

Paraguay

ZP5AA	AA	4,502,880	3530	126	354	(OP: N2TTA)

Trinidad & Tobago

*9Z4Y	14A	599,250	1626	33	108	

Uruguay

CX5UA	AA	957,456	1445	70	174	
CX5FK	"	855,651	1411	65	158	
CX7ACH	"	104	10	7	6	
CX2BR	28A	762,669	1974	31	110	
CX6VM	1.8A	18,144	113	19	44	
*CW3A	AA	1,583,255	1932	85	220	(OP: CX5CBA)
*CX9AU	"	549,640	819	87	173	

Venezuela

YV4ABR	28A	280,395	1094	23	70	
*YV5COR	AA	27,792	198	22	50	
*YV1JGT	28A	14,798	124	13	36	

QRP

PZ5CO	A	6,335,373	4478	116	375	
KR2Q	"	1,375,470	1060	108	357	
LY9A	"	1,078,742	1805	91	315	
DK7HA	"	888,440	1400	87	293	
JH1OGC	"	576,232	715	120	203	
JR4DAH	"	493,344	672	100	188	
DL1MAJ	"	490,560	750	82	254	
HA5BA	"	482,895	983	74	241	
N8AA	"	371,616	486	79	215	
K8MR	"	369,460	514	66	194	
W6JTI	"	357,744	515	88	169	
JH7UJU	"	354,450	536	94	161	
DL1JDQ	"	336,092	695	72	220	
FG/VE3RSA	"	302,614	627	54	152	
YL2PJ	"	292,608	737	69	219	
AC2YD	"	285,056	396	64	208	
9A2EY	"	256,256	837	50	206	
R2PU	"	216,381	654	50	199	
GM4M	"	212,576	597	52	172	(OP: GM4UBJ)
S53AR	"	210,410	623	57	208	
WB2CPU	"	209,520	363	55	161	
JK2VOC	"	187,776	442	74	118	
EA1AER	"	161,460	457	48	132	
W6QU	"	160,461	328	69	120	(OP: W8QZA)
NDØC	"	156,891	281	73	144	
ON9TT	"	153,318	543	47	155	
K4PQC	"	152,342	308	62	149	
OH3KQ	"	149,270	530	50	180	
UT5EOX	"	148,608	414	53	163	
EA1GT	"	141,183	458	48	141	(OP: EA1GT/QRP)
OH3RF	"	134,568	402	56	196	
LY5G	"	132,264	325	59	205	
N7RCS	"	123,402	294	42	115	
W7LG	"	114,767	271	40	117	
SEØI	"	108,741	428	43	158	(OP: SMØHPL)
HB9AYZ	"	108,712	408	51	163	
DS1TUW	"	102,227	389	49	102	
G4FPA	"	99,302	368	40	133	
SMØGNS	"	99,050	405	43	132	
ON7CC	"	98,808	387	38	141	
VE3SIF	"	95,424	303	46	96	
ISØESG	"	92,300	292	46	96	
DL8LR	"	90,552	336	48	120	
K7FR	"	79,192	218	69	83	
EA7AAW	"	77,980	341	36	104	(OP: EA7AAW/QRP)
F4HPZ	"	75,033	259	44	145	
NU4B	"	70,525	172	43	112	
OK1KDN	"	69,412	301	34	100	(OP: OK1NF)
IV3DRP	"	69,003	254	37	86	
W1IG	"	68,949	180	41	100	
IU2OZV	"	67,635	362	36	131	
RZ4AZ	"	64,517	358	34	115	
DL8DXW	"	64,380	262	41	107	
EW8G	"	62,160	367	32	108	
SP9CXN	"	61,908	341	29	125	
N5OE	"	59,321	166	46	91	
DL7UKT	"	56,100	314	36	129	
HG7J	"	55,068	268	41	115	
OP4F	"	*54,470*	*223*	*44*	*86*	
N7JI	"	53,742	193	54	52	
W1UU	"	53,361	136	43	104	
PAØZAV	"	49,068	247	36	105	
DF7XR	"	47,724	253	31	92	
PY2PLL	"	46,920	188	32	70	
RV3DBK	"	46,872	365	22	102	
K2PI	"	43,368	142	45	94	
EA3QC	"	39,895	258	26	75	
DL2DCX	"	39,480	260	26	115	
IK3TZB	"	38,962	140	53	101	
EA1CM	"	37,524	195	35	83	
K2YG	"	36,260	96	44	96	
EA4U	"	35,208	170	35	73	
NQ2W	"	31,970	113	44	71	
EA7HCB	"	31,744	220	34	94	
JE3AKU	"	31,314	141	44	58	
HA7AVU	"	30,820	186	31	84	
IK3BVD	"	30,353	213	28	99	
DG2FDD	"	28,514	196	26	80	
PU2TWZ	"	27,489	206	35	84	
Z33ST	"	26,733	164	33	100	
OK7PZ	"	25,200	193	30	90	
WJ1MK	"	24,800	95	34	66	
K2EKM	"	24,610	89	38	69	
DL6UKL	"	24,066	206	31	95	
AA5KD	"	23,901	201	36	57	
OE8TIR	"	23,688	300	15	57	
YO3FVR	"	21,996	186	17	61	
DL2BIS	"	21,630	146	28	77	
EA1BP	"	20,046	121	22	56	
KQ1P	"	19,135	87	27	62	
7K1CPT	"	19,012	98	45	53	
W7UDH	"	17,577	94	32	49	
EA3ERD	"	16,854	147	31	75	
OM3CUG	"	15,928	101	31	57	
JU1DX	"	15,022	118	27	47	
R4FJ	"	14,766	123	28	79	
DL1KGT	"	14,534	135	20	66	
TA4/MØMPM	"	14,514	94	12	47	
I2BPP	"	14,080	97	24	56	
W6MZ	"	14,000	76	34	36	
DL6MWG	"	13,770	118	25	56	
4I1EBD	"	13,724	108	21	26	
SP9VFX	"	12,880	142	17	63	
HK4KM	"	12,775	91	31	42	
DL1BWM	"	12,236	101	29	63	
F6CWA	"	11,704	98	26	62	
UY7LM	"	11,248	78	22	54	
N6HI	"	10,676	65	32	36	
KB8PGW	"	9,375	54	30	45	
NO2D	"	8,905	61	28	37	
WR4I	"	8,710	57	24	43	
PA1B	"	7,820	109	15	53	
MØZWW	"	7,209	77	23	58	
DU1WBX	"	7,007	53	20	29	
YO4LHR	"	6,887	103	15	56	
YB1NA	"	6,732	54	21	30	
DJ3EI	"	5,888	56	19	27	
EA3TJ	"	5,568	92	20	38	
KNØW	"	5,512	47	26	26	
UAØSBQ	"	5,440	52	12	28	
TA1APD	"	5,130	72	17	40	
PA3HGX	"	4,450	72	12	38	
7L1DST	"	4,418	40	24	23	
KIØG	"	4,324	55	21	26	
DK7OG	"	4,312	78	11	45	
KC3NDU	"	4,048	46	16	28	
F5IQJ	"	3,969	51	17	32	
N3CI	"	3,654	31	14	28	
PA/SQ3OGZ	"	3,564	65	12	32	
YD6ROA	"	3,416	71	25	36	
DL8BEG	"	3,360	80	8	6	
VY2DP	"	3,325	50	16	19	
IW2NOY	"	3,132	48	10	44	
JM1DPL	"	2,870	36	17	18	
GØVCW	"	2,821	38	14	17	
IZ5RAQ	"	2,576	31	20	26	
DL5OE	"	2,520	40	15	27	
BH2TVR	"	2,304	64	14	18	
K9XB	"	1,914	29	10	23	
SP5ETS	"	1,786	48	10	28	
BG3LTM	"	1,680	77	14	16	
BI3VJL	"	1,596	47	13	15	
YC1HBP	"	1,488	51	20	28	
DM3AA	"	1,408	32	8	8	
KE4WKH	"	1,260	32	21	24	
YC9WH	"	1,240	18	14	17	
OH6OG	"	1,152	28	11	25	
KA4RUR	"	891	20	15	18	
JJØSFV	"	864	17	12	12	
BG5OA	"	812	25	14	14	
JG1BGT	"	741	19	9	10	
VA3IIF	"	629	17	7	10	
F4IGG	"	621	20	8	15	
PY6FX	"	465	11	7	8	
UT2HC	"	380	13	10	10	
N9EEE	"	330	17	9	13	
AC9XK	"	280	15	8	12	
JHØKFI	"	247	7	6	7	
VK4UTT	"	160	6	5	5	
9M2SPN	"	156	13	6	6	
YD2NIR	"	88	7	4	4	
UB1AKA	"	66	8	3	8	
IZ3NVR	"	50	6	4	6	
DO1OKE	"	36	12	7	11	
N6ARA	"	18	6	3	3	
BG6TVZ	"	12	3	3	3	
4F3OM	28	101,181	434	26	61	
OM7PY	"	41,031	182	26	71	
US5VX	"	31,450	177	22	63	
F8AKC	"	24,081	141	22	47	
YO6EX	"	20,367	131	23	50	
CO6EC	"	13,158	103	17	34	
HF5WIM	"	12,934	100	22	36	
G3L	"	10,035	102	15	30	(OP: G3LHJ)
W7USA	"	9,947	72	19	30	
GW4W	"	9,752	98	14	32	(OP: GW4EVX)
NH6O	"	9,248	102	17	17	
OK1LV	"	8,650	76	20	30	
K3UT	"	7,800	65	12	38	
N1AIA	"	7,084	62	12	32	
EA4EPY	"	6,708	97	16	36	
JE1CAC	"	6,486	63	20	26	
N3HCN	"	4,625	45	11	26	
WA6FGV	"	3,770	53	13	16	
PU3VRW	"	3,745	45	12	23	
MIØM	"	3,689	47	13	18	
SN5Z	"	2,405	47	13	24	
SQ5W	"	2,310	24	14	21	
JR1UJX	"	1,530	27	15	15	
IW1BCO	"	1,150	28	11	14	
KJ5T	"	1,000	23	9	11	
JK1NWD	"	825	24	8	7	
PY2DSN	"	800	21	10	10	
DK5NAD	"	465	11	6	9	
YO8DHD	"	294	18	4	10	
DM5QZ	"	165	7	5	6	
JT1CO	"	85	17	2	3	
YO8AJG	"	60	5	2	2	
NØJK	"	60	5	2	2	
LZ2RS	21	114,885	469	28	83	
HA3JB	"	92,340	395	28	86	
JQ1NGT	"	54,320	277	26	54	
YV5EN	"	52,850	290	18	52	
JR1NKN	"	50,220	253	30	51	
EA2BO	"	46,720	309	20	60	
M7R	"	43,092	313	21	55	(OP: GØTPH)
JR2EKD	"	26,432	159	21	43	
SP4NKJ	"	25,704	202	20	52	
G3YMC	"	23,973	245	15	46	
KF4AV	"	22,126	120	19	55	
YO3DAC	"	20,592	166	17	49	
JG1RYQ	"	19,024	138	21	37	
WW2G	"	18,711	111	15	48	(OP: WU2M)
JK1VUZ	"	13,608	106	21	33	
KEØTT	"	13,195	82	21	44	
JA1KPF	"	12,850	113	20	30	
WC7S	"	8,601	75	16	31	
YC4SIZ	"	8,413	75	16	31	
SP2FMN	"	8,055	100	14	31	
ZP9MCE	"	6,882	80	9	28	
PA5DX	"	2,728	42	11	20	
AB8DF	"	2,310	37	7	26	
VK4HAT	"	1,863	38	13	14	
SQ2RH	"	1,632	34	8	16	
HB9IQB	"	1,200	28	7	9	
YB1KFQ	"	944	25	7	9	
YC2AUP	"	360	10	6	9	
GØVDZ	"	252	12	4	10	
DO1HFS	"	49	5	3	4	

FS/KØCD	14	124,236	748	21	63
RT4W	"	65,270	392	25	82
JE1RZR	"	65,145	250	31	70
YU1RK	"	50,320	367	22	63
DL2TM	"	39,591	300	19	64
G2X	"	25,593	350	13	44
			(OP: GØDCK)		
YO4BEX	"	18,360	224	12	48
DH1AKY	"	12,818	160	11	47
SP2HMY	"	7,750	143	9	41
EA3BES	"	5,720	142	8	44
GWØVSW	"	5,358	107	7	31
G4GXL	"	5,244	108	8	30
G4ETS	"	5,031	113	7	32
MØORY	"	4,636	92	9	29
DF3SM	"	4,455	133	5	28
EA4GJT	"	3,496	84	7	31
GØUCP	"	3,456	82	7	29
EA2CAR	"	1,880	38	7	13
VE6EX	"	1,804	94	6	5
IU1HCC	"	1,422	35	6	12
JH2DFJ	"	858	34	11	22
UA6ATG	"	598	29	4	19
E77MA	"	405	27	4	11
YCØBAS	"	247	7	6	7
CX2PI	"	169	11	6	7
HAØGK	"	100	8	3	7
JJ8RUN/6	"	54	3	3	3
IW3SOQ	"	49	7	3	4
CN8YR	"	45	3	2	3
7K2VNA	"	42	4	3	3
YTØI	"	32	6	3	5
N5GSG	"	32	10	4	4
JR1USU	"	8	4	2	2
YU1RA	7	104,839	473	30	89
OK6OK	"	70,752	573	22	74
DM2DZM	"	38,511	254	22	77
F5MOG	"	34,444	330	17	62
GM1J	"	30,528	325	13	59
			(OP: MMØBQI)		
HA3GC	"	28,880	277	15	61
M3F	"	28,248	298	13	53
			(OP: G3WZD)		
OK1LO	"	12,862	183	10	49
UT5UUV	"	7,050	125	8	39
IZ5OVP	"	3,864	83	10	36
ON4ANE	"	3,772	109	8	38
JR1ABS	"	3,770	65	12	14
PB7RS	"	3,686	94	6	32
TA3OWL	"	3,465	41	9	24
WA2NYY	"	1,917	25	7	20
SO2U	"	1,750	56	7	28
			(OP: SP2UUU)		
EA6/K9VV	"	728	28	7	19
OH5C	"	247	15	4	9
			(OP: OH5CW)		
4I1EAY	"	228	7	5	7
OK6D	"	210	12	6	9
PY3FF	"	104	5	4	4
JK1ECX	"	98	10	4	3
DK9BM	"	48	8	2	6
JG3DHN	"	28	3	2	2
IZ5LZP	"	20	4	2	3
JJ1SWI	"	6	1	1	1
YT5YTT	3.5	43,736	570	11	60
YO8RAA	"	22,836	318	10	56
SM6DOI	"	18,135	238	13	52
IO5K	"	17,216	266	10	54
			(OP: IK5TBK)		
SP8OOE	"	11,289	225	8	45
YO8RIX	"	9,744	204	8	40
G3YHF	"	7,990	155	8	39
OH1RX	"	7,696	134	10	42
DMØY	"	7,008	147	7	41
			(OP: DH8BQA)		
UT1WW	"	5,236	107	8	36
SP8D	"	2,412	110	5	31
VK2CCC	"	364	30	6	7
JH1APZ	"	200	12	5	5
OH5CW	"	100	10	3	7
GM3YEH	1.8	19,740	311	11	49
LY4T	"	12,432	293	6	36
UR5FEO	"	10,200	206	7	43
DL1AOB	"	8,850	181	8	42
HA1TI	"	7,200	181	5	40
IK1RAC	"	1,408	43	5	27
OU2V	"	1,404	58	4	23
			(OP: OZ1FJB)		
IZØORT	"	660	34	3	19
URØFF	"	342	16	5	13
OH5LAQ	"	40	5	3	5
			(OP: OH5CW)		

QRP ASSISTED

NORTH AMERICA

United States

District 1

K1SX	*AA*	*3,565*	*45*	*8*	*23*
KE1AK	28A	12,036	78	16	43
NV1W	"	88	6	3	5
KO1H	14A	33,580	189	14	59
KC1DVT	"	1,364	25	4	18

District 2

W2VRK	14A	31,980	163	17	61
KQ2RP	7A	5,074	53	13	30

District 3

KW2A	AA	62,088	157	42	114
W3EK	28A	5,633	48	12	31
N8URE	14A	2,241	36	6	21

District 4

KA4RRU	AA	985,226	865	97	321
W4ER	"	55,872	148	53	91
KU4A	"	39,294	121	36	82
KJ4YM	"	8,614	71	28	45
WD4ETU	"	6,664	48	16	40
KN4PHS	"	3,344	33	17	27
K3TW	14A	63,420	224	25	80
W1IE	"	33,535	194	22	73
K9AXT	"	6,975	58	10	35

District 6

WQ6X	AA	15,480	104	33	39
W6SIY	"	8,362	45	33	41
K6JS	21A	80,172	304	28	74
K2GMY	14A	760	20	9	10
K6BBQ	"	195	13	7	6

District 8

K8ZT	AA	538,800	507	99	301

District 9

KB9RPG	AA	89,414	205	58	123

District Ø

W7RY	AA	52,805	115	70	109

NORTH AMERICA

Belize

V31MA	1.8A	592	20	7	9

Canada - District 3

VE3KJQ	AA	15,824	172	15	28

Cuba

CO2WL	*7A*	*11,521*	*173*	*12*	*29*
			(OP: CO2AME)		

AFRICA

Mauritius

3B8X	AA	1,767	36	9	10
			(OP: PFØX)		

ASIA

Asiatic Turkey

TA9J	AA	58,786	165	33	100

China

BD1KV	AA	142,104	238	81	167
BG5JNT	"	12,308	100	30	38
BD3OOX	"	4,240	35	22	31
BG3UFC	"	640	30	10	10
BA4WI	21A	11,648	130	20	32
BH4LLP	"	9,100	95	15	37

Israel

4Z4UO	28A	23,312	142	15	47

Japan

District 1

JK1TCV	AA	71,240	186	55	82
JA1KEB	"	41,710	160	37	60

District 3

JA4XHF/3	AA	222,642	394	77	140

District 4

JH4RUM	1.8A	6	4	1	2

District 6

JA6GCE	AA	1,109,988	1104	119	277

District 7

JK7DWD	14A	46,818	225	25	56

District 8

JK8VPQ	28A	5,760	66	17	19

District 9

JG1GOY/9	21A	2,875	44	11	12

West Malaysia

9M2S	AA	104	6	3	5
			(OP: 9M2CDX)		

EUROPE

Belgium

OQ4B	21A	18,048	128	20	44
			(OP: ON4BHQ)		
ON/S58J	"	16,758	121	18	39

Bosnia-Herzegovina

E7ØAA	28A	5,217	58	16	31

Bulgaria

LZ2AF	AA	110,292	385	54	148

Croatia

9A5YY	AA	1,512	40	13	29
9A6TT	28A	5,332	63	17	26
9A1CRT	21A	8,480	86	17	36
			(OP: 9A7RA)		
9A5MP	"	1,512	55	7	20

Czech Republic

OK1DMP	AA	153,428	262	75	242
OK4AS	"	1,890	24	15	20
OL4W	3.5A	71,467	916	11	62
			(OP: OK1IF)		
OK6DJ	"	11,825	215	8	47

Denmark

OZ6OM	21A	8,742	85	16	31

England

G1G	AA	459,081	887	78	269
			(OP: G4KIV)		
G4OZG	"	171,200	567	50	164
M1U	"	91,430	225	58	147
			(OP: MØUTD)		
GØMTN	"	19,723	86	36	85
G8AFN	"	17,922	112	33	70
M/K9VV	"	11,100	140	16	58
G4MAD	"	4,368	71	15	33
G3NDS	"	2,068	47	14	30
2EØFFT	"	1,683	35	10	23
G4UZE	"	475	26	5	20
G4KRJ	28A	15,435	160	15	34
M3A	21A	220,864	703	34	102
			(OP: MØUKR)		
M3E	"	95,079	364	32	91
			(OP: G4CWH)		
M2F/P	"	500	17	7	13
			(OP: GØOOG)		
G7RDX	14A	425	17	5	12

European Russia

District 4

UA4FCO	AA	339,200	803	67	253
RM4W	1.8A	3,526	61	9	34

District 6

UA7G	AA	367,444	643	83	225
R6FY	28A	2,523	31	12	17

Fed. Rep. of Germany

DM2M	AA	2,312,442	1994	144	450
			(OP: DK3WE)		
DL1YAW	"	223,816	442	66	211
DK3UW	"	169,929	648	48	189
DL1DXA	"	58,842	232	43	83
DL8MF	"	29,591	137	42	85
DDØVS	"	23,520	124	27	78
DM2DS	"	14,600	129	29	71
DL3MFQ	"	8,470	71	26	51
DD7NT	"	4,350	72	15	43
DL1EFW	28A	97,080	339	29	91
DM7AA	14A	109,242	543	27	92
DK1VD	"	31,031	219	18	59
DL2PR	"	3,293	73	7	30
DL4CF	7A	4,816	108	7	36
DO6SR	3.5A	5,546	105	10	49
DL5SFC	1.8A	2,183	62	5	32

France

F/DL8CX	AA	324	14	7	11
TM3W	28A	247	9	6	7
			(OP: F4FDA)		
F5MMX	7A	65,504	457	20	72

Hungary

HG5O	AA	579,018	1093	87	254
			(OP: HA5OB)		
HA2ZB	"	13,167	72	34	65
HA6FQ	21A	209,300	701	33	107
HA8RD	"	124,488	497	34	92
HG3C	"	85,065	372	29	78
			(OP: HA3HX)		
HG5A	14A	222,358	830	34	112
			(OP: HA5IW)		
HA4FY	7A	58,548	537	17	65

Ireland

EI3CTB	7A	546	24	5	16

Italy

IZ8JFL	AA	379,875	572	94	281
IC8TEM	"	192,672	412	62	154
IU3MIK	"	27,552	136	36	60
IK4OMU	28A	20,768	141	22	37
IZ8NWA	14A	100,776	484	30	84
IZ2QKG	"	5,320	131	5	35
IW3ILM	7A	19,032	247	10	51

Latvia

YL3BU	AA	98,820	477	35	145

Lithuania

LY2OU	28A	31,740	168	24	68
LYØNAS	"	2,070	34	12	18
LY4BF	14A	50,869	394	24	67

Netherlands

PC5Q	AA	214,452	594	56	166
PAØRDT	"	177,325	557	48	157
PC5D	"	160,632	508	44	140
PE2K	"	120,414	481	42	141
PA4PA	"	32,340	231	25	73
PA2AM	14A	638	29	5	17
PF5T	3.5A	8,211	160	8	43

Northern Ireland

MIØI	AA	3,481	63	13	46

Poland

SQ2ICX	AA	306,558	464	81	297
SP9RQH	"	109,616	338	59	149
SP9HVV	"	17,922	167	24	79
SP7M	28A	72,358	246	33	110
SP5PDA	14A	20,400	212	16	52
SP5FKW	7A	16,200	174	15	57
SP6EIY	"	5,502	113	8	34
			(OP: SP6EIY/QRP)		
SP5ES	3.5A	40,014	454	14	67
SQ9MR	"	6,624	176	7	41

Romania

YO8BSE	AA	170,366	451	72	211
YP8A	28A	33,934	155	26	68
YO2CMI	21A	6,762	77	15	31
YO8WW	1.8A	8,046	138	9	45

Serbia

YU1LM	AA	409,200	896	73	237
YT8A	3.5A	56,070	536	17	73

Sicily

IT9RJE	AA	9,317	55	32	45

Slovak Republic

OMØRX	AA	880,400	1432	95	305

Slovenia

S59GS	28A	2,856	50	12	22
S58WW	14A	150,060	630	31	92
S58R	7A	54,048	391	23	73
S52CQ	"	16,055	198	14	51
S57XZ	"	342	17	4	14
S5ØXX	3.5A	62,100	716	13	62
S51Z	"	24,857	317	11	56

Spain

EF3O	AA	1,519,600	1173	139	441
			(OP: EA3O)		
EA5ICL	"	90,558	296	44	118
EA3QP	28A	116,928	381	32	94
EC7AKV	"	150	13	4	11
EA5Y	1.8A	2,769	64	6	33

Sweden

SFØA	AA	183,804	668	48	156
			(OP: SMØLPO)		
7S2A	28A	6,240	99	13	39
			(OP: SA2SAA)		

Ukraine

UX9Q	28A	51,040	259	27	89
			(OP: UR9QQ)		
UY5LW	21A	16,697	127	16	43
UW1U	3.5A	3,306	89	5	33
			(OP: UT7UA)		
UT4UBZ	1.8A	1,312	40	5	27

Wales

MW9W	AA	723,247	1117	83	290
			(OP: GWØKRL)		

OCEANIA

Hawaii

AH7RF	AA	1,368	27	11	13

Indonesia

YB2NDX	AA	23,296	105	37	54
YD2BRN	28A	110	7	5	5
YE3WIL	"	36	4	3	3
YC1LJT	21A	22,737	151	16	37
YDØRFS	"	198	8	4	5

SOUTH AMERICA

Argentina

LT7D	28A	142,155	636	18	63

Brazil

PU2MLO	AA	3,600	55	21	24
PU5ALE	28A	3,872	45	8	24
PY2CER	21A	15,246	110	24	53
PP5VX	14A	3,420	35	14	22

Chile

CE4PS	AA	80	7	5	5
3G3O	28A	18,018	187	16	23
			(OP: XQ3OP)		

MULTI-OPERATOR SINGLE-TRANSMITTER

NORTH AMERICA

United States

District 1

K1LZ	16,690,848	6717	188	700
KC1XX	14,063,840	5774	181	685
W3UA	1,500,840	1667	58	272
NE1F	24	2	2	2
***W4KZ**	5,619,065	3036	144	509

District 2

W2FU	10,907,217	4916	171	630
KQ2F	6,754,100	3608	153	532
***K1RQ**	715,176	668	90	306

District 3

K9RS	8,034,042	3808	163	595
KQ3F	3,815,955	2310	129	456
NS3L	14,832	74	19	53
***K3AJ**	2,725,236	1774	124	425
*W3ZGD	1,634,886	1152	119	387

District 4

NX3A	3,305,412	1949	138	474
N4QS	3,245,625	1927	147	478
AC8Y	685,755	628	111	330
***AD4ES**	3,517,458	2120	142	481
*W4TG	732,672	736	93	291
*KT4XA	604,116	573	106	282

District 5

K5TR	7,530,566	3745	176	597
***W5WZ**	144,536	242	76	156

District 6

W1FM/6	29,172	115	46	56
***NX6T**	1,504,413	1227	130	323
*W6DER	17,459	118	37	42

District 7

W7RM	5,193,500	3073	166	445
W7VJ	2,950,344	2050	152	370

District 8

K8AZ	8,472,700	3906	166	606

District 9

W9VW	4,599,000	2702	141	489
AA9A	4,119,580	2135	154	549

District Ø

KØLIR	254,597	429	79	180
KØZX	112,668	409	31	92

NORTH AMERICA

Alaska

KL7RA	6,134,364	5080	148	350

Canada

District 3

VE3EJ	14,156,758	6585	186	668
VC3U	5,648,100	3586	150	520
VE3YAA	1,780,368	1564	116	348

District 6

VE6SV	1,870,992	2006	127	299

District 7

VE7SAR	1,490,534	2303	99	218
VE7JKZ	351,522	972	76	101

Cayman Islands

ZF1A	18,548,608	9389	182	650

Puerto Rico

***WP3C**	9,497,412	5608	163	566

AFRICA

Benin

TY5AF	5,826,414	4358	105	368

ASIA

Asiatic Russia

District 9

UC8Y	3,028,506	2466	120	413
*RW9Y	495,742	669	66	233

District Ø

*RWØS	1,680	32	12	18

Asiatic Turkey

TC3X	3,808,912	3455	93	311

China

B1Z	3,952,362	3135	149	433
B7C	3,474,212	3018	136	372
B4T	2,128,056	2447	125	299
BY4DX	1,045,485	1723	91	224
BA7MT	896,926	1846	82	195
***BYØAB**	895,325	1243	76	219
*BY1TL	8,580	72	22	38

Cyprus

P33W	25,580,949	9613	206	745

Japan

District 1

JQ1YUF	2,195,736	1917	148	331
JS1YLQ	62,738	202	45	82
JF1AMX	8,084	93	17	30

District 2

***JJ2YDV**	2,380	52	13	21

District 3

JL3ZHU	65,631	205	52	79

District 6

JG6YLY	733,656	790	133	264
JA6YLP	35,256	132	40	73

District 8

JH8YOH	4,494,177	2917	174	447

Kazakhstan

UP2L	16,739,261	7453	187	660

Taiwan

***BX2AB**	50,996	539	33	43

Thailand

E2X	3,568,968	2820	138	420
E2E	1,546,716	2112	104	262

Vietnam

***XV9K**	1,050,318	1615	113	274

EUROPE

Austria

OE1XTU	158,844	379	61	183

Belarus

*EU1XX	672,600	1295	93	261

Belgium

OR2M	6,817,284	4209	182	612

Bosnia-Herzegovina

E7DX	14,487,240	7501	199	721
***E7CW**	4,516,272	3324	163	548
*E7GZ	3,556,750	2788	159	535

Bulgaria

LZ5R	17,603,784	8873	208	748
LZ7A	3,784,888	3041	156	512
***LZ8A**	467,857	728	99	278

Croatia

9A7A	13,136,580	6621	202	716
9A1P	7,459,342	4405	183	635
***9A5G**	198,628	463	63	191

Czech Republic

OK5Z	11,103,606	5500	199	728
OK7O	7,620,720	4462	186	657
OL1C	4,200,971	3371	150	497
OL7T	3,050,890	2957	143	447
OK1KKI	553,527	1058	81	270
***OK5SWL**	1,224	34	12	22

Estonia

ES9UKR	12,787,341	7118	207	740

European Russia

District 1

RU1A	11,340,684	6513	200	709

District 3

UC5D	724,318	1410	91	298
*UG5R	3,124	52	13	31

District 4

RT4G	6,785,307	4977	186	657

Fed. Rep. of Germany

DRØW	11,334,592	5525	195	704
DA2X	9,720,720	4668	198	722
DP7D	8,622,403	4614	184	655
DD2D	7,135,782	3908	178	644
DF7A	5,967,849	3537	177	644
DQ2C	5,014,005	3227	171	552
DJ1XT	969,220	1017	104	326
DM1T	824,192	1163	99	277
DFØUK	146,422	356	53	126
***DLØFTL**	263,736	734	60	204
*DLØGMH	96	6	6	6

Finland

OH1F	7,448,253	4549	177	654
OH9W	3,175,464	2863	170	561
OH2BAH	2,462,400	2243	148	460
OH3D	774,507	1077	100	331

France

TM6M	16,218,862	8032	196	706
TM2Y	10,252,032	5182	199	697
F6KRK	1,251,234	1368	108	315
F6KJS	1,032,935	1554	102	313
TM1D	785,070	830	106	323
F8KGW	763,420	974	102	308
F4KJN	701,764	1087	91	193
F5KSE	266,266	545	78	208
***F8KLY**	341,802	643	78	228
*F6KMB	206,712	582	52	164
*F4KLC	188,734	641	54	184
*F6KPW	95,586	317	53	125

Greece

SZ1A	6,000,739	4591	169	588

Hungary

HG6N	11,277,570	6089	193	686
HA3DX	4,523,984	3516	158	495
***HG5C**	2,114,342	2364	131	411
*HG6L	926,432	1356	104	338
*HG6Z	353,430	921	62	208

Ireland

EI9E	3,381,827	2960	136	465
EI2JD	2,762,334	2723	131	460

Italy

IR4M	14,628,636	7064	200	702
IR4X	14,334,728	6885	197	707
IO1T	9,110,685	4953	183	652
II8K	7,022,112	4684	173	599

Q8SN	3,643,368	2275	168	576
IB1D	3,224,340	2820	146	484
IQ3TN	16,728	136	24	44
***IO3F**	**4,884,492**	**3756**	**164**	**544**
*IR6T	3,862,510	2556	163	538
Liechtenstein				
HBØA	**1,086,534**	**1768**	**78**	**275**
Lithuania				
***LY2ZO**	**1,598**	**31**	**13**	**21**
Malta				
***9H6WW**	**4,572,500**	**4043**	**144**	**481**
Netherlands				
PI4CC	**5,507,925**	**3818**	**174**	**601**
PAØAA	496,743	1102	71	200
Poland				
SP8R	**11,334,580**	**5660**	**197**	**704**
SO4M	6,027,654	3857	173	593
***3Z1K**	**3,222,591**	**2721**	**146**	**471**
*SP9YGD	1,404,993	1938	104	367
*SP5KCR	61,178	311	43	126
*SP4KVA	27,840	248	29	87
*SP9PBB	13,608	185	16	68
*SP6ZHP	5,074	68	16	43
Romania				
***YP8T**	**3,108,153**	**2950**	**143**	**446**
*YO4KAK	46,488	215	46	103
Sardinia				
IQØID	**1,342,500**	**2107**	**86**	**272**
Serbia				
***YT7A**	**367,866**	**922**	**54**	**160**
*YU1ANO	24,198	170	30	79
Sicily				
***IB9T**	**6,822,036**	**4554**	**177**	**597**
*IB9O	2,909,672	3059	136	460
Slovak Republic				
OM7M	**16,672,638**	**7963**	**206**	**735**
OM4Q	3,410,675	3182	141	460
Slovenia				
S51DX	**94,672**	**640**	**30**	**92**
Spain				
EA5RS	**10,163,340**	**5472**	**193**	**692**
EA5O	6,724,152	4599	169	563
***EA5KM**	**4,446,064**	**3503**	**164**	**578**
Sweden				
SJ2W	**9,074,274**	**5358**	**188**	**674**
SKØQO	1,461,984	2033	111	360
SK6EI	395,005	977	67	228
SK6DG	278,391	701	64	149
Switzerland				
HB9EP	**2,699,900**	**2614**	**134**	**446**
HB75SG	20,298	138	33	69
Ukraine				
***UT1KWA**	**75,364**	**384**	**37**	**129**

OCEANIA

American Samoa				
K8H	**2,175,348**	**2358**	**120**	**209**
Guam				
AH2R	**7,364,112**	**4298**	**164**	**442**
Indonesia				
7A2A	**3,761,145**	**2764**	**128**	**349**
***7AØD**	**200,018**	**424**	**50**	**132**

SOUTH AMERICA

Argentina				
LP1H	**12,776,826**	**6573**	**165**	**522**
LS2D	4,095,300	3488	120	318
LR3D	849,720	1199	89	203
LT5D	174,995	505	50	105
Bonaire				
PJ4A	**16,826,600**	**7361**	**183**	**625**
Brazil				
PR2E	**9,215,601**	**4585**	**173**	**544**
PT4A	4,120,358	3100	119	387
PR2RP	888,041	1558	70	139
Chile				
CE3CT	**7,315,266**	**4290**	**154**	**464**
French Guiana				
***FY5KE**	**13,695,220**	**6154**	**169**	**601**

MULTI-OPERATOR TWO-TRANSMITTER

UNITED STATES

W3LPL	**19,462,500**	**8113**	**186**	**679**
N4WW	**11,418,402**	**5175**	**176**	**646**
K9CT	**11,255,326**	**5399**	**175**	**603**
N2AA	**10,162,074**	**4889**	**158**	**583**
K2AX	9,029,108	4320	156	592
K2LE	**8,974,852**	**4514**	**158**	**575**
ND7K	**7,923,960**	**4640**	**169**	**527**
W4NF	7,593,597	4433	134	493
K8LX	**7,156,592**	**3959**	**157**	**507**
W2CG	5,944,647	3068	157	560
N7DX	3,933,692	2891	154	364
NØHJZ	**1,230,240**	**1020**	**124**	**356**
W1SRG	860,064	887	80	292
NRØT	697,178	810	95	264

NORTH AMERICA

HQ9X	**16,696,400**	**10214**	**164**	**536**
VP5Y	**7,615,026**	**6178**	**133**	**425**
VC7O	**6,992,960**	**5910**	**154**	**379**
VA2UR	**2,201,031**	**1939**	**106**	**377**

AFRICA

CR3DX	**39,611,468**	**14781**	**198**	**725**

ASIA

E2A	**11,946,744**	**6878**	**181**	**557**
JA1ZGO	**2,307,552**	**2225**	**130**	**286**
BD4QB	**847,260**	**1814**	**85**	**185**
JA1ZGP	292,932	670	73	133
JA2YKA	**2,006**	**39**	**14**	**20**

EUROPE

TKØC	**24,525,288**	**14232**	**199**	**719**
EF2X	**17,979,101**	**9968**	**198**	**701**
ED1R	16,422,876	9767	191	682
OL3Z	**14,245,326**	**7835**	**195**	**679**
II9P	**14,177,150**	**8435**	**195**	**655**
OH5Z	**12,760,956**	**7661**	**194**	**700**
UA4M	12,635,796	8210	194	700
G5W	**11,973,738**	**7350**	**184**	**650**
TM7A	**11,899,274**	**7495**	**187**	**615**
RT4F	11,446,155	7360	198	697
HG7T	**11,276,922**	**7142**	**175**	**627**
DR4A	**10,636,353**	**6114**	**177**	**642**
HB9CA	**10,523,844**	**6547**	**178**	**624**
DP6A	9,836,444	5716	187	651
LY4A	**9,248,412**	**6854**	**182**	**622**
SX9V	**9,045,096**	**7231**	**181**	**608**
DD1A	7,733,110	5103	170	600
OZ5W	**7,526,022**	**5679**	**178**	**599**
DAØT	7,493,508	5192	174	588
UW5Y	**7,149,000**	**5343**	**165**	**585**
RT6A	**6,799,850**	**4486**	**174**	**601**
9H6A	**6,078,996**	**6539**	**135**	**426**
SO4R	**5,664,764**	**5026**	**153**	**506**
SM2U	**5,622,984**	**5142**	**157**	**539**
G5O	2,884,736	2972	118	378
PA6X	**2,153,684**	**2205**	**120**	**379**
HB9BS	173,880	401	61	146

OCEANIA

7D1C	**2,316,280**	**2621**	**82**	**234**
9M8J	**28,016**	**156**	**41**	**62**

SOUTH AMERICA

PJ4K	**31,331,662**	**12973**	**188**	**654**
P44X	**19,119,034**	**8860**	**174**	**584**
PX2A	**12,013,521**	**5617**	**173**	**594**

MULTI-OPERATOR MULTI-TRANSMITTER

UNITED STATES

K3LR	**23,705,156**	**9774**	**192**	**716**
K1TTT	**16,173,416**	**7549**	**174**	**638**
K1RX	14,347,200	6744	166	618
KØRF	**9,555,724**	**5000**	**176**	**575**
N1RR	8,576,325	4393	152	553
N6RO	**6,739,395**	**3997**	**176**	**487**
K1KI	5,149,575	2756	143	532
W2AA	**4,856,334**	**3327**	**131**	**471**
K3PH	4,055,000	2289	136	489
WT3K	3,129,540	1827	144	501
K1KP	3,020,640	2152	111	385
NE3F	2,478,140	1645	132	439

AFRICA

CN3A	**44,014,817**	**16708**	**200**	**713**
CR3W	**41,003,743**	**15290**	**198**	**715**
3B8M	**29,016,903**	**11980**	**191**	**652**
ZS6Z	**4,293,682**	**3647**	**111**	**298**

ASIA

A44A	**20,965,527**	**10000**	**177**	**626**
JA3YBK	**10,121,265**	**5524**	**198**	**561**
JF1NHD	**3,184,510**	**2656**	**150**	**340**
9M2A	**1,305,306**	**2020**	**108**	**273**
BY1AS	**1,207,548**	**2023**	**98**	**226**
JA1YPA	547,485	754	91	194
JS1YDX	8,370	71	25	37
BI1JY	374	29	9	8

EUROPE

9A1A	**25,217,834**	**13098**	**211**	**763**
YT5A	**22,879,624**	**12635**	**208**	**745**
M6T	**22,742,406**	**12739**	**203**	**751**
LZ9W	**20,944,836**	**12437**	**198**	**710**
DFØHQ	**18,156,492**	**10057**	**201**	**750**
LN8W	**17,126,325**	**10381**	**204**	**723**
DP9A	12,682,788	8146	187	657
F6KOP	**10,762,269**	**8140**	**171**	**586**
G3V	1,826,393	2239	122	381
YT5L	229,612	547	72	202
IQ2MI	**79,242**	**487**	**30**	**111**

OCEANIA

KH6LC	**11,945,902**	**7673**	**173**	**381**
7A1A	**1,216,808**	**1558**	**108**	**248**
VK2W	**277,240**	**568**	**85**	**154**
7E3E	324	9	6	6

SOUTH AMERICA

PJ2T	**33,708,798**	**14180**	**186**	**643**

EXPLORER SINGLE-OPERATOR

LU6OA	**1,053,592**	**1566**	**78**	**176**
SP5ATO	**290,920**	**521**	**79**	**201**
C6AZT	**258,336**	**961**	**29**	**88**
S53K	**211,024**	**520**	**56**	**162**
WX8S	**189,666**	**292**	**63**	**194**
OH2XX	**38,872**	**170**	**36**	**50**
NØUJT	**31,824**	**126**	**33**	**71**
K7RB	**18,715**	**75**	**35**	**60**
YO2GL	**15,714**	**270**	**10**	**44**
VU2UUU	*288*	*12*	*7*	*9*
VU2VUV	*132*	*11*	*5*	*6*

EXPLORER MULTI-OPERATOR

OT7T	**16,360,290**	**10333**	**189**	**678**
ZM1A	**14,301,232**	**7627**	**179**	**485**
C6AGU	**12,615,785**	**9081**	**154**	**441**
EA4URE	**9,150,408**	**7123**	**162**	**567**
YPØK	**3,758,307**	**4666**	**131**	**442**
ZL3X	3,533,658	2821	122	324
BY3CQ	**1,232,763**	**2314**	**101**	**228**
EA6URL	**534,567**	**1208**	**68**	**223**

ROOKIE

NORTH AMERICA

United States

District 2				
KD2UBH	**7,107**	**53**	**27**	**42**
***KD2ZEL**	**204,930**	**377**	**68**	**185**
*KI2D	26,106	86	33	81
District 3				
K3AK	**266,485**	**419**	**58**	**181**
***KC3SVR**	**48,094**	**148**	**41**	**98**
*W1FIF	35,520	170	18	62
*W3OY	22,680	81	46	74
*N3HRO	11,730	62	20	49
District 4				
***KY4ID**	**710,973**	**670**	**100**	**301**
*KY4GS	573,016	654	83	245
*KO4AWC	4,816	39	11	32
District 5				
W9DCT	**723,976**	**643**	**109**	**309**
***KI5PED**	**598**	**21**	**12**	**14**
District 9				
N9TTK	**2,770,979**	**1846**	**138**	**413**
***K9BRS**	**972**	**36**	**17**	**19**
District Ø				
***AEØDX**	**443,368**	**511**	**105**	**248**

NORTH AMERICA

Canada

District 3				
***VA3OKG**	**689,913**	**815**	**83**	**246**
*VE3KOT	359,968	693	57	167
*VA3KRJ	30,184	172	35	63
*VE3FNT	646	30	8	9
District 6				
***VA6BGE**	**16,343**	**117**	**32**	**27**
Mexico				
***XE1O**	**7,381**	**48**	**26**	**35**

ASIA

Asiatic Russia - District Ø				
*UBØAZR	201,894	425	61	148
China				
***BI8FRF**	**113,072**	**391**	**68**	**123**
*BH2VBK	58,960	267	48	86
*BG5MWN	56,610	183	63	107
*BG7XVX	51,712	173	41	87
*BI1JPC	43,010	163	38	77
*BH2UBD	36,134	297	34	55
*BG8KVC	26,460	208	14	40
*BH3EMV	7,800	70	22	30
*BA7LCS	3,685	66	22	33
*BH4FNE	1,521	30	18	21
*BH1IZQ	952	53	8	9
*BI8CCJ	364	10	5	8
*BD7JJQ	60	4	3	3
Hong Kong				
***VR2NC**	**16,366**	**247**	**18**	**31**
Israel				
***4X6FB**	**170,841**	**416**	**41**	**126**
Japan				
District 1				
JK1BAB	**238**	**7**	**7**	**7**
***JK1AUY**	**155,220**	**320**	**84**	**111**
*JK1JCE	31,560	139	54	66
*JK1AZD	4,482	39	23	31
*JK1ECX	98	10	4	3
District Ø				
***JJØVXN**	**63,240**	**197**	**53**	**83**
Thailand				
***E25CRF**	**78,925**	**610**	**20**	**57**

EUROPE

Austria				
***OE5WEO**	**2,080**	**56**	**9**	**31**
Croatia				
9A5RTW	**1,051,050**	**984**	**148**	**402**
England				
***M5NCW**	**5,226**	**46**	**25**	**42**
European Turkey				
*TA1AQW	180	10	9	9
***TA1APD**	**5,130**	**72**	**17**	**40**
Fed. Rep. of Germany				
***DD5VL**	**37,125**	**151**	**43**	**82**
*DO2XU	8,364	95	11	23
*DB3MI	2,880	68	6	26
*DJØMA	2,560	68	8	32
*DL2OO	196	10	6	8
*DL7ND	24	4	3	3
*DM2DS	14,600	129	29	71
Finland				
***OH2CBD**	**961**	**30**	**8**	**23**
France				
***F4JIK**	**58,028**	**234**	**42**	**121**
Greece				
***SV1SXV**	**22,168**	**263**	**36**	**100**
*SV1SYY	9,086	158	18	59
Hungary				
HA5MIG	**143,312**	**436**	**49**	**159**
***HA6AK**	**43,788**	**244**	**30**	**93**
*HA8KM	80	6	4	6
Ireland				
EI6LA	**637,096**	**726**	**98**	**290**
Italy				
*IU2OZU	6,760	84	19	46
***IU2OZV**	**67,635**	**362**	**36**	**131**
Netherlands				
***PE4I**	**1,566**	**49**	**6**	**23**
Poland				
***SQ5VCO**	**37,084**	**205**	**35**	**92**
*SO7NA	6,365	79	20	47
*SP5SZE	240	25	4	12
*SQ9MR	14,442	206	18	65
Scotland				
***GM5TDX**	**57,352**	**298**	**34**	**100**
Serbia				
***YU4MVP**	**4,508**	**62**	**18**	**31**
Slovak Republic				
***OM1HMI**	**1,518**	**44**	**9**	**24**
*OM1AVV	360	16	5	10
Spain				
EA4HQV	**181,300**	**387**	**71**	**188**
EA5JDN	44,400	209	40	110
***EA4HKF**	**596,755**	**1056**	**82**	**273**
*EA4HRJ	30,012	124	43	79
Switzerland				
***HB9HMY**	**77**	**9**	**2**	**9**
Ukraine				
***US5WBJ**	**146,780**	**510**	**46**	**159**

OCEANIA

Indonesia				
***YD2UTC**	**14,945**	**97**	**19**	**42**
*YF7UFT	5,796	55	21	25
*YDØBCG	3,080	38	18	22
*YD3BWK	1,820	32	14	21
*YD2UFR	1,298	25	8	14
*YC4SMK	1,269	18	11	16
*YD2BRN	110	7	5	5

SOUTH AMERICA

Brazil				
***PU2VNC**	**7,326**	**92**	**13**	**24**
*PU4WTB	1,743	53	9	12

CLASSIC

NORTH AMERICA

United States

District 1				
K1DG	**4,278,254**	**2987**	**104**	**389**
KQ2M	3,935,016	2856	118	374
K1RU	2,115,195	2178	81	264
W1JQ	1,420,510	1158	104	342
K1RM	1,190,350	1184	84	266
W1OHM	47,616	152	38	90
W1/ PY1MX	14,841	94	37	60
W3AKD	12,675	94	18	47
***K1BX**	**2,798,455**	**2147**	**101**	**350**
*N1DC	1,063,474	1009	88	291
*K1HT	894,704	796	95	303
*N1CGP	481,770	565	77	241
*WA1LAD	37,050	113	52	98
*W1UU	53,361	136	43	104
District 2				
K2NV	**2,404,448**	**1827**	**112**	**352**
N2GC	1,399,930	1023	112	378
KN2M	1,395,968	1137	109	339
NS2N	378,508	536	61	190
KE2SD	247,536	447	51	165
WA2BMH	57,670	145	47	99
AF2F	36,210	150	19	66
N2AXX	24,687	88	47	70
W2CN	21,888	90	35	61
***K2ZR**	**521,236**	**643**	**80**	**231**
*WB2FUV	202,016	325	60	176
*W2NTV	113,400	214	56	144
*KD2P	29,308	157	17	51
*W2NPT	18,758	87	28	55
				(OP: NP4H)
*K2SCH	7,259	48	17	44
*NQ2W	31,970	113	44	71
*WW2G	18,711	111	15	48
				(OP: WU2M)
*WA2NYY	1,917	25	7	20
District 3				
W3BGN	**126,400**	**548**	**20**	**80**
K2ACX	64,008	177	36	90
***K3AU**	**1,324,632**	**1254**	**94**	**294**
				(OP: K2YWE)
*K3HW	443,703	522	86	281
*N2EM	326,400	426	90	210
*N2EY	218,496	410	42	150
*KD9QS	190,281	349	59	162
*WB3DPS	53,730	156	36	99
*WA4GUD	46,095	158	28	77
*WD8RYV	15,470	86	25	60
*WA1HEW	10,443	78	18	41
*W7LG	114,767	271	40	117
District 4				
N4AF	**3,195,840**	**2340**	**104**	**376**
K4ZW	1,962,281	1617	103	318
W4CB	1,209,245	1173	89	276
				(OP: W2RU)
W4NZ	833,185	837	100	255
K4WW	562,922	696	71	227
N4CF	507,647	584	85	244
AC4G	452,295	498	100	245
W8FN	451,528	543	73	235
W3SA	269,016	394	71	193
N4KS	165,792	667	20	68
WF3T	143,856	254	70	146
K4FOY	142,992	307	62	154
N9CB	136,128	295	56	136
KQ4R	52,535	148	43	90
K4AVX	51,208	174	49	99
NC4S	15,642	124	17	49
NX4N	7,137	50	26	35
KA3MTT	6,273	100	17	34
***NK4O**	**620,961**	**692**	**89**	**252**
*N4HA	390,728	489	72	217
*WA1S	333,203	497	68	179
*W3DQS	203,616	317	75	177
*N4DJ	201,968	354	58	150
*WZ4M	182,125	296	70	165
*KI3C	171,700	310	53	149
*K4FTO	145,314	292	58	149
*K4FJW	126,256	244	62	146
*N4AO	100,440	342	26	82
				(OP: WC4E)
*AA4SD	98,044	247	57	136
*WA8MDC/4	94,122	226	56	106
*WØNA	62,000	189	44	81
				(OP: W4RN)
*KB3FW	47,047	148	46	97
*K3YDX	44,336	132	49	87
*W4IOD	43,566	130	51	86
*N4ARO	41,180	126	54	91
*N4IU	31,752	115	33	75
*KM4CH	28,616	165	53	93
*K8LBQ	24,393	124	50	91
*K6RM	22,707	153	25	62
*WO8L	8,284	89	31	45
*WB5KFP	7,040	45	27	37
*K2TV	4,760	50	24	32
*KC3O	1,824	36	16	22
*N5SMQ	1,736	24	7	21
*KM4SK	1,302	18	14	17
*KK4Z	780	22	13	17
*K4PQC	152,342	308	62	149
*N3HCN	4,625	45	11	26
*KE4WKH	1,260	32	21	24
District 5				
KZ5D	**1,513,926**	**1271**	**118**	**335**
N4OGW	1,377,103	1223	101	308
WQ5L	784,441	809	92	251
K5QR	155,477	418	31	102
K5RM	38,556	146	32	76
AK5Y	204	25	6	6
***KG5OA**	**420,614**	**622**	**75**	**203**
*NN5T	351,204	497	80	179
*NO5W	231,192	384	63	165
*W8OV	96,906	206	65	121
*KD2KW	69,654	187	56	85
*KC7QY	67,473	173	58	95
*WY6K	23,421	110	48	63
*WB5BHS	17,094	85	30	47
*N3CI	3,654	31	14	28
*N5GSG	32	10	4	4
District 6				
K6NR	**1,099,185**	**1039**	**118**	**263**
AJ6V	880,982	1148	96	182
W6YA	480,240	1001	40	134
K6YK	281,912	412	83	179
KB6A	49,704	159	45	69
WA6URY	48,488	167	44	72
N6NZ	30,870	126	40	58
W6RKC	663	17	9	8
***W6TK**	**533,392**	**726**	**92**	**180**
*N6PN	153,640	330	61	106
*KF6NCX	28,405	125	43	52
*W6JBR	4,017	39	17	22
*W6YOY	1,421	31	14	15
*N6BHX	495	14	8	7
*N6DVS	180	8	5	5
*WA6FGV	3,770	53	13	16
District 7				
K7JQ	**214,467**	**394**	**71**	**130**
W7GF	89,776	211	70	111
K9JF/7	79,323	226	53	84
KE2VB	18,157	100	31	36
WU7W	10,626	73	30	36
N7RK	10,498	71	23	35
K5IB	627	20	9	10
***K7NEW**	**165,822**	**370**	**62**	**112**
*W7MTL	98,854	237	71	90
*K7AZT	60,984	177	55	77
*KE7AUB	29,939	122	38	53
*WK7G	23,816	136	48	56
*K7ROG	20,202	97	29	49
*W7TMT	18,306	128	21	33
*KE7DZ	8,924	81	46	46
*W7RCS	2,414	30	18	16
*K7FR	78,280	216	69	83
*N7JI	53,742	193	54	52
*KNØW	5,512	47	26	26
District 8				
K8MP	**860,520**	**878**	**95**	**260**
KT8Y	304,668	478	57	177
KE8E	18,816	108	34	62
W8EOG	4,628	43	21	31
K8ALM	3,649	36	12	29
***W1NN**	**859,527**	**813**	**103**	**284**
*N8II	503,276	942	48	140
*K8AJS	446,352	593	69	203
*K7DR	120,727	244	55	126
*NU8A	118,854	297	37	105
*AF8A	49,364	208	19	67
*N8ET	30,342	164	22	56
*N8GZ	27,090	101	36	69
*NF8M	21,879	84	41	58
*AA8RV	13,700	92	38	62
*AA8SW	4,350	41	23	35
District 9				
K9MA	**1,523,743**	**1338**	**103**	**300**
W9GT	287,250	441	72	178
AA9JS	125,550	315	67	158
KX9DX	95,840	240	36	124
KØVW	89,544	217	51	117
W9DZ	59,584	189	30	82
W9FL	16,340	94	31	64
***K9WA**	**294,508**	**435**	**73**	**171**
*WD9CIR	267,776	407	77	179
*KE9SA	187,488	325	64	160
*K9UIY	61,812	266	27	75
*W9QL	25,050	133	22	53
*KC9AAP	2,880	29	14	26
*KJ9C	1,742	28	7	19
*WD8DSB	1,704	33	9	15
*NV9X	1,305	21	11	18
District Ø				
NØAX	**1,583,163**	**1249**	**129**	**348**
WØETT	504,030	604	98	220
KØPK	296,750	433	80	170
NGØT	190,610	292	80	165
NØTT	111,320	378	29	86
KJØI	101,010	212	65	130
N7WY	82,218	211	40	102
W7UT	47,430	199	23	70

*NØUR	747,994	810	92	246
*W4IFI	188,044	391	78	134
*AEØEE	123,716	250	71	126
*WØPI	80,542	198	53	101
*KØALT	45,747	148	49	68
*NØZIB	24,823	113	31	72
*NØUI	13,987	90	25	46
*WØZF	12,711	88	15	42
*NØDL	5,529	89	30	27
*ABØCD	3,248	44	26	30
*WXØZ	2,516	28	15	19
*KKØD	551	52	10	9
*WØOP	36	17	7	11
*NDØC	156,891	281	73	144
*KA4RUR	891	20	15	18
*NØJK	60	5	2	2

NORTH AMERICA

Alaska

AL7LO	389,298	928	69	113

Belize

*V31YB	3,055	34	21	26

Canada

District 1

VA1MM	1,154,244	1620	68	226
*VY2LI	70,064	284	35	81
*VE1GVY	35,550	188	21	69

District 2

VA2EW	3,648,886	3081	104	354
*VE2QV	63,838	211	37	81
*VA2LGQ	24	4	2	2

District 3

VE3MDX	104,780	272	51	104
*VA3FF	1,082,048	1391	80	239
*VE3MA	601,086	1072	64	185
*VA3DBT	86,250	261	48	102
*VE3FAC	13,067	78	23	50
*VE3ADQ	7,896	91	14	28
*VA3IIF	629	17	7	10

District 4

*VE4AKF	8,424	93	25	29

District 5

VE5CPU	19,691	118	44	53
*VE5GC	6,984	136	11	13

District 6

VE6UM	89,838	636	26	43
*VE6IV	5,610	68	13	21
*VE6GK	1,872	32	16	20

District 7

*VE7NI	24,990	123	31	54
*VE7GOG	2,400	33	19	13
	(OP: VA7QCE)			

District 8

*VY1KX	17,395	107	33	38

Cuba

*CO8NMN	1,092,481	2068	66	181

Dominican Republic

*HI3Y	351,540	1458	25	83

Mexico

*XE1AQY	12,444	79	22	39

Sint Maarten

*PJ7/G4JEC	458,367	88955		
164				
	(OP: NØUK)			
*PJ7PL	32	4	2	2

Turks & Caicos Islands

*VP5M	2,610,374	3351	83	255
	(OP: K4QPL)			

US Virgin Islands

KP2M	5,145,882	4386	118	365
	(OP: KT3Y)			
NP2J	101,844	609	18	64
	(OP: K8RF)			

United Nations HQ

*4U1UN	1,146,831	1708	71	220
	(OP: KO8SCA)			

AFRICA

Canary Islands

ED8M	4,758,704	3424	116	356
	(OP: EA8DIG)			
*EA8CN	1,180,098	1297	73	245
*EA8BQM	386,966	748	55	136
*EA8OM	321,000	525	55	159
	(OP: DJ1OJ)			
*EA8CYU	3,488	39	10	22

Rodriguez Island

3B9KW	3,386,060	2966	100	291
	(OP: MØCFW)			

ASIA

Asiatic Russia

District 9

*RA9SN	198,440	374	44	161
*RL9L	81,192	303	26	76
*UA9OV	18,012	84	23	56

District Ø

UAØJF	177,792	431	60	132
*RØMZ	1,740	28	14	16

Asiatic Turkey

*TA2L	50,050	145	54	100

China

BI1JNP	18,176	153	22	42
*BG2QMO	410,640	655	95	200
*BI4QKE	115,840	301	67	114
*BG6QAL	88,452	317	58	104
*BD3OD	32,379	183	42	87
*BA4II	11,550	215	14	36
*BD4LB	2,562	27	18	24
*BG3LTM	1,680	77	14	16
*BG6TVZ	12	3	3	3

Hong Kong

*VR2VRC	10,044	70	15	39

India

*VU3GDS	231,175	534	46	129
*VU2JOS	4,674	56	13	28

Israel

4Z5ML	247,338	618	43	108

Japan

District 1

JH1HIC	316,940	502	90	175
JF1KML	297,840	554	74	130
JA1QOW	259,126	410	78	145
7K4GUR	175,266	294	76	158
JR1GSE	107,756	367	50	74
JA1CRJ	96,701	267	57	92
JE1QHP	92,592	243	54	90
JK1FNL	71,052	217	55	69
JR1NHD	38,808	195	30	47
JF1DMY	14,430	88	27	38
JL1LNC	8,379	65	24	33
JK1UVL	1,482	23	10	16
*JK1OLT	655,626	781	113	226
*JS1KKY	638,928	808	102	204
*JJ2JQF/1	154,530	314	70	132
*JJ1KZZ	96,473	213	67	114
*JO1VVT	91,584	254	55	104
*JK1BVN	84,952	236	64	100
*JH1DJD	75,509	220	64	97
*JR1LEV	46,116	229	39	69
*JA1IE	27,552	134	42	70
*JJ1XNF	24,795	122	40	47
*JL1FAR	20,925	89	35	58
*JO1PZR	19,635	91	32	53
*JK1FNN	17,064	96	32	47
*JG1SWV	13,454	85	19	43
*JH1VIX	10,584	80	18	31
*JO1KTD	8,977	93	18	29
*JA1WHG	4,480	52	26	30
*JP1JZR	4,002	39	23	23
*JK1BGV	3,030	35	16	14
*JJ1BDX	2,700	45	11	14
*JA1AGH	1,624	32	12	17
*JE1SPY	924	41	10	12
*JQ1VDJ	828	14	10	13
*JR1DVB	629	15	5	12
*JJ1FWH	500	17	10	10
*JF1GZZ	154	8	5	6
*JH1OJV	150	5	5	5
*JH1CFV	120	5	3	5
*JN1VFV	39	10	6	7
*JA1RXC	4	2	1	1
*7K1CPT	19,012	98	45	53
*JK1VUZ	13,608	106	21	33
*7L1DST	4,418	40	24	23
*JK1NWD	2,349	39	15	14

District 2

JE2BOM	284,580	426	88	167
JA2JWH	18,232	88	41	45
*JA2KKA	249,984	467	73	144
*JG2RFJ	200,880	372	72	144
*JA2GHP	159,600	351	65	125
*JR2NMJ	116,928	250	64	110
*JE2HCJ	25,677	124	29	52
*JF2NLH	2,190	29	11	19
*JR2UQU	1,458	28	11	16
*JH2DFJ	858	34	11	22

District 3

JR3BOT	*228,660*	*394*	*78*	*144*
JO3OEF	77,028	227	53	94
JL3DQX	140	6	5	5
*JL3MCM	435,900	564	97	203
*JJ3TBB	117,107	281	67	114
*JG3XDR	7,544	66	15	31
*JE3OUU	2,728	44	19	25
*JG3EHD	420	10	5	9

District 4

*JH1MTR/4	170,560	328	72	133
*JE4FNC	17,172	92	32	49
*JA4GQD	8,260	79	33	37
*JK4HNN	1,856	34	14	18
*JH4FUF	230	9	5	5

District 5

*JG5DHX	266,084	473	64	157
*JA5CBU	47,300	189	33	67

District 6

JA6BZI	1,408,008	1124	145	331
JA6BWH	80,828	221	64	103
*JA6CVR	89,760	238	65	100
*JR6KBF	37,128	158	38	64
*JA6BCV	15,930	98	19	40

District 7

JA7NVF	834,240	1116	107	213
JA7UES	214,404	404	75	129
JA7KQC	1,932	37	11	17
*JH7QXJ	449,069	793	80	149
*JH7IXX	87,450	272	63	96
*JA7RPC	11,130	94	18	35
*JF7VVL	3,648	43	15	17
*JA7KPI	1,518	58	10	13

District 8

JA8RUZ	79,200	195	75	105
*JA8RWU	424,800	623	108	187
*JK8PBO	75,175	216	62	93
*JR8QFG	19,976	164	16	28
*JM8SMO	15,903	117	23	34
*JG8NKJ	12,958	90	19	43
*JA8HBO	9,612	94	19	35
*JE8UHY	5,334	67	16	26
*JK8NIP	2,322	35	13	14

District 9

*JA9EJG	11,760	79	28	32

District Ø

*JRØECQ	64,801	223	53	84
*JHØDAY	10,382	69	25	33
*JIØWVQ	5,635	66	12	23

Kazakhstan

UN7ZW	518	31	7	7
*UN1EAU	9,048	60	31	47

Nepal

9N7AA	2,500,592	2788	94	279
	(OP: S53R)			

Saudi Arabia

*HZ7C	213,226	566	34	105
	(OP: 7Z1SJ)			

Thailand

*HS8KGG	7,336	75	22	34

Vietnam

3W3B	24,244	98	42	74

EUROPE

Aland Islands

OHØZ	3,143,880	3455	138	430
	(OP: OH6EI)			

Albania

*ZA1EM	66,444	635	22	91
*ZA1F	51,072	300	30	84
*ZA1AK	968	30	7	15

Austria

*OE7AFT	27,436	202	16	60
*OE9WLJ	4,929	71	12	19

Belarus

EW1I	1,594,695	1364	141	474
EU1ST	134,190	454	55	158
*EW1NM	71,991	298	44	127
*EW1FM	7,686	95	12	49
*EW1AFM	288	15	5	11

Belgium

*ON4CT	1,060,500	1489	111	309
*ON4CBA	29,312	159	38	90

Bosnia-Herzegovina

*E7/Z35M	234,192	867	50	188
*E77O	27,621	208	18	63
*E77CFG	20,825	217	22	63

Bulgaria

LZ7J	940,005	1531	97	308
	(OP: LZ1CI)			
LZ1HW	443,051	691	91	288
LZ7M	151,286	663	30	104
	(OP: LZ5VK)			
*LZ3QE	658,080	1257	91	269
*LZ1VKD	480,036	941	74	253
*LZ4TX	236,880	789	31	113
*LZ5Y	211,060	616	60	184
*LZ3AW	91,932	351	42	121

Croatia

*9A1AA	1,748,028	1997	121	387
*9A3NC	47,558	218	43	115
*9A5ST	26,036	173	24	68
*9A2VX	1,431	20	11	16

Czech Republic

OK1OA	387,144	806	66	217
OK2ZDL	345,886	591	81	245
OK1XC	80,156	360	31	85
*OK1HCG	285,978	1055	49	182
*OL2A	282,240	636	63	189
	(OP: OK2PEM)			
*OK1UKY	90,048	374	39	129
*OK1AUO	63,474	217	46	96
*OK2IW	30,210	274	23	91
*OK1FHD	15,180	132	16	39
*OK1JDJ	8,614	102	12	47
*OK1TVL	4,399	65	15	38
*OK2WX	3,280	45	16	25
*OK1LO	12,862	183	10	49
*OK1LV	8,650	76	20	30

Denmark

OZ7YL	18,700	160	27	73
*OZ8AE	772,800	1098	101	319
*OZ5UR	236,872	647	59	173
*OZ1TJ	101,388	373	52	161
*OZ5DX	4,032	42	14	18
*OZ2JI	128	8	8	8

England

G2E	602,992	1109	84	254
G3T	178,596	524	47	151
	(OP: G3VGZ)			
G9D	144,360	468	46	134
	(OP: G6NHU)			
G4HZV	30,368	164	22	51
M6N	29,610	159	32	73
	(OP: MØNPK)			
GØHVQ	26,466	310	14	52
M1B	3,959	48	14	23
*MØXUU	495,320	1023	68	237
*MØRYB	323,904	860	56	185
*MØURL	244,200	670	56	166
*G3VYI	192,474	522	55	167
*M4X	93,982	302	42	95
	(OP: G3SZU)			
*G4POF	92,916	311	42	136
*G4CXQ	81,750	334	34	91
*MØMQV	60,634	246	34	108
*G5C	59,364	301	34	119
	(OP: G4OGB)			
*MØSDB	46,400	251	38	107
*MØCVO	46,011	303	34	113
*G4SDX	42,108	200	32	84
*M3X	36,654	205	32	91
	(OP: MØIHT)			
*GØORY	35,490	216	21	49
*G3NKS	27,120	173	28	85
*M2U	26,730	287	14	52
	(OP: MØDHP)			
*G4BEE	26,676	156	31	83
*G3MOT	23,142	167	17	41
*MØNDZ	17,700	275	11	49
*G3TJE	3,080	68	6	34
*MØIDL	1,488	37	7	9
*M7R	43,092	313	21	55
	(OP: GØTPH)			
*M3F	28,248	298	13	53
	(OP: G3WZD)			
*G3YMC	23,973	245	15	46
*G3YHF	7,990	155	8	39
*G4GXL	5,244	108	8	30
*GØUCP	3,456	82	7	29

Estonia

*ES1OX	15,939	309	10	53

European Russia

District 1

*UC1A	27,625	184	31	94
*R1AT	5,104	92	10	34
*RK1F	529	14	11	12

District 3

RM2U	1,453,056	1665	124	392
	(OP: RU3UR)			
RC3U	550,246	912	88	270
*R3AQ	108,480	478	27	93
*RZ3AMW	38,984	344	21	67
*RU5X	18,504	144	21	51
*R5FQ	17,748	226	14	54
*RA3XCZ	17,010	122	29	76
*RA3V	13,900	195	20	80
*RZ3DZ	8,140	49	29	45
*RT3LA	3,382	35	17	21
*UA3SDN	3,198	67	8	33
*R2AKM	1,548	66	8	28
*R2PU	216,381	654	50	199

District 4

R4RT	195,529	686	57	194
*RA4ACX	285,769	642	78	235
*R4WZ	103,986	287	57	161
*UI4F	75,449	174	55	154
*UA4PKA	29,736	130	39	129
*UA4QK	16,576	159	18	56

District 6

R6CA	115,080	271	69	141
*R7KX	460,964	915	81	245
*RM7C	301,050	874	53	217
*RA7R	184,630	595	48	137
*R7KO	70,446	304	39	138
*UC6Y	50,927	252	33	94
*R7KA	10,449	65	33	48
*UA6J	2,250	37	17	28
*R6NN	2,106	22	17	22
*RC7LS	195	10	5	10
*UA6ATG	598	29	4	19

District 9

UA9FGJ	51,150	253	25	85

Fed. Rep. of Germany

DL2CC	3,121,938	2551	126	376
DC4A	2,654,000	2420	133	367
	(OP: DL4NAC)			
DLØRUS	1,259,145	1589	94	311
	(OP: DJ2QV)			
DL4ABR	120,927	470	44	129
DL6DVU	114,848	315	54	140
DK2CF	79,776	727	21	75
DJ4KW	73,968	293	48	136
DL7LX	69,394	246	46	111
DG2BAR	5,632	48	25	39
*DL2NBU	1,272,866	1396	114	355
*DL8ULF	503,979	1121	68	241
*DL5KUD	432,485	724	76	259
*DJ3RA	291,957	650	69	238
*DLØRD	169,726	456	64	162
	(OP: DL3CQ)			
*DL4JU	167,328	351	59	165
*DK2TX	149,058	446	49	133
*DC8YZ	107,358	430	44	130
*DJ8QP	102,720	366	53	161
*DL9DBZ	93,058	364	42	119
	(OP: XX9XX)			
*DL7VHP	88,825	249	58	129
*DL2IAN	84,203	315	45	116
*DK4LX	81,002	497	24	77
*DH6RS	70,875	305	40	135
*DL2ZA	69,736	308	43	141
*DL1YEG	65,703	238	49	132
*DF3CE	63,651	212	43	104
*DH7TS	46,375	224	36	89
*DL6KWN	42,490	520	12	58
*DF8IU	41,760	202	39	105
*DL3YEE	39,026	145	54	104
*DJ1KW	28,272	118	36	57
*DG4UF	28,124	221	18	61
*DL5CC	26,280	134	41	105
*DK4RM	23,100	136	20	64
*DL4JWU	15,308	127	21	65
*DL2DBH	14,608	97	29	59
*DK6AC	13,590	142	20	70
*DJ5QE	9,717	107	24	55
*DG3BZ	8,375	94	13	54
*DL8CKL	7,747	69	20	41
*DHØVA	5,304	109	17	51
*DB2OW	4,884	88	17	49
*DL1BJO	4,214	72	11	38
*DK9ZE	3,572	42	18	29
*DM2BPG	2,074	84	4	30
*DL2RZG	1,161	44	5	22
*DL8UKW	493	20	7	10
*DL1JDQ	336,092	695	72	220
*DL8LR	90,552	336	48	120
*DL7UKT	44,844	266	33	115
*DG2FDD	28,514	196	26	80
*DL1BWM	12,236	101	29	63
*DMØY	8,046	150	10	44
	(OP: DH8BQA)			
*DK7OG	4,312	78	11	45
*DK9BM	48	8	2	6

Finland

OH1VR	1,128,318	1493	114	377
OG2X	97,578	473	28	89
	(OP: OH2RM)			
OG5G	42,560	170	39	113
OH9COG	22,630	225	15	58
	(OP: OH1ZAA)			
OG6B	5,856	76	14	34
	(OP: OH1ZAA)			
OH4BCS	2,170	56	6	29
	(OP: OH1ZAA)			
OH5ZA	1,170	30	6	20
	(OP: OH1ZAA)			
OH1QX	522	19	6	12
	(OP: OH1ZAA)			
*OH2BMH	115,328	329	49	163
*OH3MZ	25,875	187	27	88
OH5TS	*22,338*	*175*	*18*	*55*
*OH1RX	7,696	134	10	42

France

TM5T	1,563,744	2284	87	249
	(OP: F5VKT)			
F4ARU	196,392	680	45	122
*F5JU	265,212	494	73	205
*F5PP	24,318	216	29	97
*F5MMB	23,760	118	28	44
*F6KBN/P	17,628	131	36	77
	(OP: F5IBV)			
*F8FPW	3,150	48	8	37
*F4ILK	3,080	40	21	34
*F4ICZ	15	3	2	3

Greece

SV2DSJ	491,598	1171	71	208
*SV7CUD	15,840	116	28	62
*SV8PMM	759	22	6	17

Guernsey

GU4CHY	60,598	341	21	61

Hungary

HA8DU	1,428,138	1571	120	357
*HA5PP	1,171,698	1376	110	341
*HA5BMS	290,763	745	67	200
*HA4YF	182,756	479	60	184
*HA7AVU	30,820	186	31	84
*HA1TI	7,200	181	5	40

Ireland

EI5KF	2,325,180	3071	89	301
EI6FR	403,200	1179	49	176

Isle of Man

*GD5F	108,847	794	19	70
	(OP: GD4RFZ)			

Italy

IKØYUT	1,638,819	2414	90	261
I1NVU	946,746	1254	127	320
IZ2MGN	581,436	909	108	264
IK7NXU	306,054	506	78	216
IK2AHB	305,539	531	70	177
IK3DVY	122,040	308	61	165
IZ3QHA	85,057	341	48	155
IK5EKB	70,380	388	27	42
I4JED	61,194	149	73	113
IKØTUJ	34,710	226	36	94
IQ8OJ	25,920	209	21	33
	(OP: IC8OZM)			
IZØCKJ	21,054	83	42	79
IK1EQE	16,465	95	35	54
*IK1JJM	820,179	1317	86	247
*IV3UHL	253,800	582	71	211
*IK2UEX	192,863	659	45	152
*I6FDJ	161,394	610	53	169
*IK1AYT	149,810	405	55	156
*IN3ZWF	103,530	508	33	141
*IV3YNB	73,528	286	47	135
*IK1BPL	63,474	286	37	105
*IK8ARF	45,980	192	46	75
*I1BPU	42,228	214	38	100
*I8IEQ	38,304	195	43	101
*IU6FUB	30,300	184	41	109
*IZ3ZOO	23,575	181	24	91
*IK1YRA	22,842	108	30	51
*IK2AIT	19,474	115	30	61
*IU4CSS	18,042	121	28	65
*IWØGYC	16,368	112	30	58
*IKØTUM	15,708	104	24	53
*IZ5IPA	15,390	92	40	55
*IZ2LTW	9,504	98	16	50
*IZ8QPA	7,920	119	19	61
*IW5ELA	7,750	46	26	36
*IZ2BVC	7,347	95	22	57
*IW5ECP	6,480	102	10	44
*IK2NUX	5,876	47	21	31
*IZ2ABZ	5,694	51	30	48
*IUØMVD	3,913	43	17	26
*I1OQI	3,900	39	19	33
*IU3BPW	3,441	53	14	23
*IU2JFG	2,457	58	6	33
*IZ4GRP	2,300	38	18	28
*I2XYI	2,160	44	13	32
*IZ8CLM	2,130	25	14	16
*IQ7YU	1,215	45	6	21
*I7CSB	1,134	20	11	10
*II1R	437	40	5	18
	(OP: IW1CBG)			
*I5CDF	378	16	4	5
*IW2NOY	3,132	48	10	44
*IK1RAC	1,408	43	5	27
*IZ3NVR	50	6	4	6

Kaliningrad

RN2FQ	79,534	277	49	133
*RA2FO	33,536	202	34	94

Latvia

YL2VW	1,747,122	2120	126	381
*YL2NK	108,186	397	53	166

Lithuania

LY1M	66,516	448	22	70
*LY4T	12,432	293	6	36

Netherlands

PAØJNH	71,001	243	41	106
*PA3DBS	140,614	721	39	128
*PD1B	8,050	47	31	39
*PAØKGB	1,426	25	14	17
*PA1B	7,820	109	15	53

Norway

LN3C	1,202,380	2206	95	300
	(OP: LB8DC)			
LA7AK	326,215	1008	51	214

Poland

SP5AUC	990,113	1738	85	264
SP5ICS	113,032	335	46	153
SQ8LUU	75,690	576	21	69
SP1JQJ	70,125	285	32	93
SP9JBE	4,698	49	18	36
*SP1AEN	787,815	1042	88	339
*SP6BEN	98,090	217	67	103
*SP9R	62,865	281	26	73
	(OP: SP9BRP)			
*SP9GMI	57,031	288	27	80
*SP5EPP	43,431	246	28	65
*SP7BCA	43,071	196	44	103
*HF95PRK	33,660	266	16	69
	(OP: SP6OJE)			
*SP1DMD	31,482	143	37	69
*SQ3YOTA	28,405	275	18	77
	(OP: SQ3JPV)			

*SP9KJU	26,215	127	42	65
		(OP: SP9MDY)		
*SP2FVN	16,188	96	22	54
*SP5TM	15,700	129	29	71
*SP9Z	3,444	43	14	14
*SO5C	1,054	25	13	21
*SP9CXN	61,908	341	29	125
*SP4NKJ	25,704	202	20	52
*SP9VFX	12,880	142	17	63
*SP8OOE	11,289	225	8	45
*SO2U	2,520	67	10	35
		(OP: SP2UUU)		
*SP8D	2,412	110	5	31
*SQ2RH	1,632	34	8	16

Portugal

***CR5O**	**1,189,875**	**1666**	**82**	**293**
		(OP: CT7AJL)		
*CT1FOQ	26,864	141	23	69

Republic of Kosovo

***Z68EE**	**958,576**	**1666**	**83**	**279**
				(OP: OZ2I)

Romania

YR8I	**142,266**	**557**	**33**	**98**
				(OP: YO8BIG)
***YO7SR**	**523,875**	**862**	**94**	**287**
*YO7ARZ	440,504	797	77	251
*YO8/ LZ4UU	406,252	938	72	236
*YO4AAC	230,786	551	66	191
*YO8BDW	126,690	475	41	164
*YO3JW	58,428	421	26	82
*YO5AXF	49,984	402	20	68
*YO5BTZ	28,640	252	16	64
*YO9CWY	20,502	234	14	53
*YO3JOS	16,380	169	13	52
*YO4CSL	10,611	85	20	61
*YO9IUP	7,125	83	25	50
*YO7MPI	1,840	48	9	37
*YO4TL	494	16	6	7
*YO8RAA	22,836	318	10	56
*YO4BEX	18,360	224	12	48
*YO8DHD	294	18	4	10
*YO8AJG	60	5	2	2

Sardinia

ISØJXO	**284,115**	**925**	**54**	**181**

Scotland

GM2V	**2,501,488**	**2807**	**119**	**369**
		(OP: GM3WOJ)		
MM3T	1,262,250	2385	84	290
*GM3ZDH	27,840	319	12	48
***GM1J**	**30,528**	**325**	**13**	**59**
				(OP: MMØBQI)

Serbia

YT3D	**3,085,780**	**2543**	**147**	**410**
YT6T	625,974	1197	77	246
		(OP: YU7CM)		
*YU1RM	5,320	114	9	31
***YU1RA**	**104,839**	**473**	**30**	**89**

Sicily

***IT9CKA**	**29,640**	**158**	**30**	**84**
*IT9VJO	29,312	119	49	79
*IT9VCE	7,623	69	20	43

Slovak Republic

OM5VS	**98,952**	**323**	**48**	**138**
***OM7SR**	**94,500**	**388**	**47**	**163**
*OM5NA	37,926	236	18	68
*OM7AT	21,090	146	29	82
*OM3CDN	16,065	147	18	45
*OM2AGN	3,476	41	13	31

Slovenia

***S57NAW**	**363,000**	**629**	**78**	**252**
*S57T	140,304	395	56	166
*S52FT	36,849	418	14	57
*S57WW	34,417	197	29	98

Spain

EA1ND	**78,120**	**330**	**36**	**54**
***EA4KD**	**1,166,241**	**1547**	**90**	**291**
*EA5ITT	232,842	726	53	204
*EA1NP	185,180	452	59	176
*EA3NO	182,000	673	31	94
*EC7R	152,488	875	25	73
*ED3Z	119,970	465	32	97
*EA4FIT	83,961	293	48	123
*EA7IZ	76,544	321	40	144
*EE5X	68,000	483	16	64
				(OP: EA5KO)
*EA3WX	39,300	190	47	103
*EA2BNU	39,121	392	14	57
*EF3R	23,165	153	34	79
		(OP: EA3EYO)		
*EA4IE	14,310	280	8	45
*EA4JM	11,340	92	26	58
*EA4BW	2,625	50	9	26
*EB5BRZ	1,333	32	15	28
*EA3QC	39,895	258	26	75
*EA4U	35,208	170	35	73
*EA1BP	20,046	121	22	56
*EA3TJ	5,568	92	20	38
*EA4GJT	3,496	84	7	31
*EA2CAR	1,880	38	7	13

Sweden

SM2CEW	**906,888**	**1595**	**79**	**269**
SD1A	338,846	1066	51	190
SM6EAN	34,880	243	20	60
***SM7CIL**	**286,824**	**578**	**57**	**171**
*SM5LW	130,200	396	49	168
*SJ7M	71,604	314	40	122
*SF6W	40,040	345	24	80
		(OP: SM6EWB)		
*SD5M	20,544	98	32	64
		(OP: SM5DFM)		
*SGØM	12,800	82	26	54
		(OP: SAØAQT)		
*SM5MX	10,780	99	28	70
*SM5KQS	2,440	28	18	22

Switzerland

***HB9MIR**	**8,103**	**90**	**21**	**52**

Ukraine

UT5EL	**2,079,126**	**2070**	**129**	**393**
UWØU	2	1	1	1
				(OP: UT7UT)
***UT3SO**	**333,324**	**907**	**61**	**221**
*US7UK	230,476	471	72	242
*UR5UJ	192,832	529	65	197
*UY7RR	9,592	228	6	38
*UT7UT	280	8	6	8
*UT5UUV	7,050	125	8	39

Wales

***GW4HBK**	**73,048**	**281**	**44**	**140**
*GW4W	9,752	98	14	32
				(OP: GW4EVX)

OCEANIA

Australia

VL2G	**1,630,044**	**1658**	**109**	**242**
				(OP: VK2GR)
VL2A	1,601,124	1915	101	193
VL2B	571,824	583	117	244
				(OP: VK2BJ)
VL3E	272,272	424	82	156
				(OP: VK3TZ)
VL6T	59,429	341	18	49
				(OP: VK6VZ)
VJ4K	2,106	29	13	14
				(OP: VK4BAA)
***VL6K**	**1,681**	**37**	**13**	**28**
				(OP: VK6WX)
*VK2CCC	364	30	6	7

Brunei Darussalam

V85RH	**2,112,860**	**2058**	**112**	**244**
				(OP: JO1RUR)

Guam

WH2JA	**244,394**	**1010**	**27**	**62**
				(OP: JR3RIU)

Hawaii

WH7T	**1,733,420**	**2285**	**109**	**151**
				(OP: WH7W)
***NH6O**	**17,888**	**131**	**26**	**26**

Indonesia

YB2MM	**258,430**	**429**	**63**	**152**
YB1RQX	18,792	95	25	47
YB7KE	3,872	48	10	22
***YB8RW**	**73,576**	**416**	**31**	**37**
*YCØRNC/1	35,776	195	38	66
*YD9UW	32,724	126	40	68
*YB3BGM	26,134	134	20	53
*YF3AWZ	2,450	38	14	21
*YB1HDR	18	7	3	3
*YC9WH	1,240	18	14	17
*YC2AUP	360	10	6	9
*YCØBAS	247	7	6	7
*YD2NIR	88	7	4	4

New Zealand

ZL2AGY	**94,452**	**325**	**44**	**58**
ZL2RX	86,268	236	52	106
ZL1BBW	31,737	156	24	47
***ZL1IF**	**19,050**	**101**	**31**	**44**

Philippines

DU1EV	**70,290**	**380**	**24**	**47**
***4E1A**	**229,140**	**498**	**66**	**105**
				(OP: DU1KG)
*4I1EBD	13,724	108	21	26
*4I1EAY	228	7	5	7

SOUTH AMERICA

Argentina

LT5A	**7,802**	**80**	**16**	**31**
LU7DW	1,372	29	13	15
***LU4XAP**	**214,134**	**467**	**59**	**119**
*LW8DRU	16,272	112	30	42
*LU2AXF	1,625	39	12	13

Brazil

PY2KJ	**549,632**	**1252**	**34**	**118**
PP5AX	507,864	1093	57	111
PY2MC	273,234	1042	26	67
***PY2NY**	**394,822**	**1256**	**32**	**81**
*PR1T	295,390	1069	26	83
				(OP: PY1ZV)
*PY2RE	55,552	205	51	77
*PY2ARY	18,722	169	15	31
*ZV2F	9,984	79	31	47
		(OP: PY2SFA)		
*ZZ7ZZ	8,460	102	11	25
		(OP: PR7AR)		
*PU2TNT	7,579	63	14	39
*PY3FF	104	5	4	4

Peru

OA4O	**906,803**	**2308**	**31**	**106**
				(OP: EA7TN)

Uruguay

***CX2AQ**	**439,161**	**1397**	**26**	**83**

Venezuela

***4M5MAG**	**17,391**	**146**	**17**	**34**
				(OP: YV1DIG)

YOUTH

NORTH AMERICA

United States

District 2

WØAAE	**2,272,125**	**2151**	**89**	**286**
***NR1K**	**132**	**8**	**5**	**7**

District 3

***K4IEY**	**15,652**	**102**	**24**	**67**

District 4

***KO4GOF**	**6,550**	**46**	**18**	**32**

NORTH AMERICA

Canada

District 3

***VE3OMV**	**268,641**	**728**	**53**	**118**

ASIA

China

***BD4VGZ**	**571,200**	**996**	**82**	**190**
*BH2SWB	159,274	465	70	124
*BI4MPH	39,697	202	37	70
*BG5UZW	23,782	150	33	61

District 3

***JQ3BVC**	**336**	**15**	**7**	**7**

District 5

***JJ5RAX**	**12,000**	**86**	**24**	**36**

District 8

***JM8PSY**	**34,944**	**164**	**46**	**58**

Republic of Korea

***DS1TUW**	**102,227**	**389**	**49**	**102**

EUROPE

Croatia

*9A3BCW	6,132	102	25	59
***9A1CRT**	**8,800**	**87**	**18**	**37**
				(OP: 9A7RA)

England

MØWJE	**341,880**	**595**	**87**	**177**

Fed. Rep. of Germany

***DL7PIA**	**180,400**	**335**	**84**	**191**
*DK1YH	36,372	195	27	57
*DL4XT	165	6	5	6

Hungary

HA3MAR	**13,132**	**126**	**17**	**50**

Ireland

EI8KW	**133,575**	**515**	**43**	**152**

Italy

***IUØLJD**	**220,884**	**501**	**63**	**174**

Latvia

***YL3JA**	**119,528**	**451**	**32**	**102**

Netherlands

***PI4RS**	**2,204**	**173**	**22**	**54**
		(OP: PD1DBL)		

Poland

***SP8BRT**	**2,117**	**58**	**7**	**22**

Romania

***YO2NWW**	**31,262**	**270**	**19**	**58**
*YO8OLY	11,220	84	29	56
*YO8PUF	288	18	4	12
*YO8THR	56	5	3	5
*YO8NTD	15	3	2	3

Sweden

SA6NIA	**163,780**	**734**	**41**	**149**

OCEANIA

Indonesia

***YD2UWF**	**134,820**	**452**	**34**	**73**
*YD3CZV	78	5	3	3
*YC1LJT	22,737	151	16	37

SOUTH AMERICA

Brazil

***PY2POA**	**540**	**10**	**9**	**9**

Check Logs

3V8SS, 4U1ITU, 4U9A, 4Z4DX, 7I1F, 7N4LNK, 8J1DENPA, 9A1CCY, 9A1CMA, 9A2EU, 9A5FM, 9A9R, AAØAJ, AA8TA, AC1NM, AD4SA, AI9K, BA4VE, BA7IO, BG2WV, BG4NMT, BG7KO, BG7SRM, BH1MCB, BH6KOK, C6AQQ, CM2DAH, CO2CW, CQ3J, CT3HF, DB1SEM, DF2KK, DF7IS, DG1LQX, DJ4CW, DJ6TK, DJ6YX, DK1TBL, DK2AR, DK5OCE, DK6CS, DK9TN, DLØVV, DL2RTJ, DL3FBB, DL3TC, DL3TU, DL4TJ, DL4ZBY, DL5CL, DL5KW, DL6DCD, DL6GV, DL7JOM, DL7UCX, DL9SAS, DL9UO, DM3A, DO5NU, DR1ØØRY, DR5E, E77T, EA1IQ, EA1PJ, EA1W, EA2DSG, EA3D, EA4/K1WE, EA4/KT4RP, EA4KG, EA4OR, EA6EJ, EA7AFD, EA7CJN, EA7HAB, EA7P, EC1A, EC1DD, EC7C, EF4F, EI7CC, ES2AJ, EU1FQ, EU1KY, EU2EU, EY8MM, F4HWS, F5MDB, F5MUX, F5UMP, F5VBU, F6HBR, FM1HN, GØHDV, G3RKF, G3VPW, G3VQO, G4BSW, G4HPY, G4PFZ, G4RRM, GJ3YHU, GMØEGI, GMØHUU, GU4EON, HAØLC, HA1AG, HA1SM, HA3MN, HA7SBQ, HB9DXB, HD1A, HF7A, HS6MYW, I2CZQ, I5OVS, I5WNN, II3R, IK2AVH, IK8SCR, IN3FHE, IO2O, IU8MOA, IV3FPX, IW1QIF, IZ1PMC, IZ2CSX, IZ3GNG, IZ3IBL, IZ8PPJ, J35X, JA1JPM, JA2KVD, JA5FNX, JA5KJD, JA6CNX, JA8AZN, JA9RRH, JE1DXC, JE4XCQ, JG1SXP, JH1WOY, JI1AVY, JJ2QXI, JK1ESR, JN1RVS, JQ6JWL, JS1IFK, JS6RTJ, JT1BV, JT1CS, KØYQ, K3NF, K3WWT, K6ZP, K7GQ, K8RXB, KA2MGE, KD6WW, KH6Y, KJ4QHL, KO4IFG, KU1T, LAØCX, LA1U, LA5FBA, LA7AFA, LA9VPA, LC4C, LU1HLH, LU7DLS, LY1CT, LY2BAA, LY2BNL, LY2DX, LY2K, LY3NX, LY4OO, LZ1JZ, LZ1MC, LZ1ND, LZ1YF, LZ3YY, LZ7DX, NØLMQ, NØNC, N4EFS, N4PL, N5NHJ, N6DNU, N7XR, N8EW, N9QB, NA5LU, NQ5M, NU4M, OH1NDA, OH1NPM, OH2BF, OH2BV, OH2CIP, OH2IS, OH3MF, OH4KA, OH6BA, OH8MBN, OK1AYU, OK1DWC, OK1FRD, OK1ITK, OK1NF, OK1TA, OK2BHD, OK2BOB, OK2CSU, OK2FB, OK2FD, OK2HIJ, OK2LC, OK2NMA, OK2PAY, OK2PYA, OK2TJ, OK2VX, OK4MM, OK7SX, OM3SX, OM3ZAH, OM5CD, OM5XX, ON4PU, ON5BC, ON5XX, PA2RG, PA3DZM, PA3I, PG7V, PJ4NX, PT2NP, PU2MBO, R2AA, R2DFD, R3GM, R4WR, R5AJ, R7NW, R7TJ, R7TW, RA1QD, RA3AL, RA3XDX, RD3R, RD9CX, RK3TD, RK6J, RL3T, RM2A, RM5W, RN2F, RN3OG, RN6LG, RN6MA, RO8U, RT2F, RT6C, RU7J, RW3DKK, RW3LA, RW3PX, RW3VM, RW9AV, RX9WN, S52WW, S53XX, SDØW, SMØQ, SM5GLC, SM5X, SM7N, SN5V, SO5N, SO6K, SP3BP, SP3CMX, SP3JIA, SP3OCC, SP4F, SP4LVG, SP4W, SP5ALV, SP5LXR, SP5NZF, SP5OXJ, SP6CC, SP6FXY, SP6JOE, SP6TRH, SP7P, SP7QO, SP7SQM, SP7Y, SP8HKT, SP9HWY, SP9HZW, SP9KDA, SP9MDY, SQ3F, SQ5NRY, SQ6ILZ, SQ6JNX, SQ8L, SQ8LUV, SQ9MZ, SQ9NFC, SV1DAY, SV1EEM, SV1MO, SV2DCD, SV3RF, SV9FBP, TF3JB, TK5MH, UA1CUR, UA1OSM, UA3AGW, UA3EDQ, UA3P, UA3SKV, UA6EC, UA6JBX, UA6JQ, UC8U, UI3A, UN7PWM, UR5WCW, UR7EC, US1IV, US3EO, US5ETV, UT2SQ, UT3QU, UT4LW, UT6UA, VA2QR, VE2CSM, VE3VSM, VU2LYE, WØCAR, W2ITT, W3JJ, W3QT, W8UE, WA7YAZ, WC6Y, YB1ACN, YB1NIN, YB2CTE, YB3DXG, YL3JI, YO2MKL, YO3IRM, YO5OHY, YO6DDF, YO9CB, YU/YO8XXX, YU7AF, Z3ØA, ZL4TE, ZS5XT

Disqualified: EW8DX (use of spotting as a single-op), **F6KCS** (use of spotting as a single-op), **HG6O** (use of spotting as a single-op), **HK3TU** (use of spotting as a single-op and self-spotting), **IK2FIR** (use of spotting as a single-op), **K3SUK** (use of spotting as a single-op), **ON7HLU** (use of spotting as a single-op), **PA6T** (use of spotting as a single-op), **PU2MST** (use of spotting as a single-op), **RN5AA** (use of spotting as a single-op), **S51J** (use of spotting as a single-op), **SP2HOU** (use of spotting as a single-op), **SP2MHC** (use of spotting as a single-op), **SP4AWE** (use of spotting as a single-op), **SV1AZL** (use of spotting as a single-op), **UT3EV** (use of spotting as a single-op), **UV2IZ** (use of spotting as a single-op), **WØIZ** (use of spotting as a single-op).

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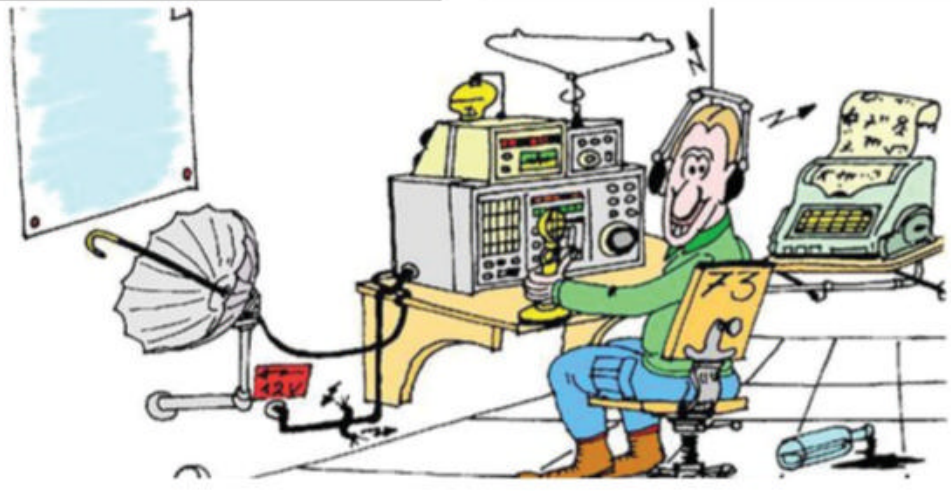

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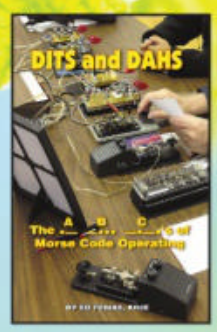

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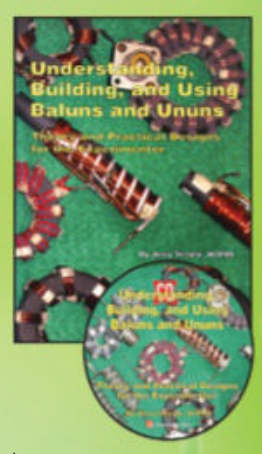

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