Professor Heisseluft on Green Power, p.34

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CQ Amateur Radio

COMMUNICATIONS & TECHNOLOGY

APRIL 2023

- First Look: ICOM IC-905 Transceiver, p. 72
- Bottlecap Balloon Mystery, p. 8
- Interview With ChatGPT, p. 12
- Results, 2022 CQ WW SSB DX Contest, p. 18

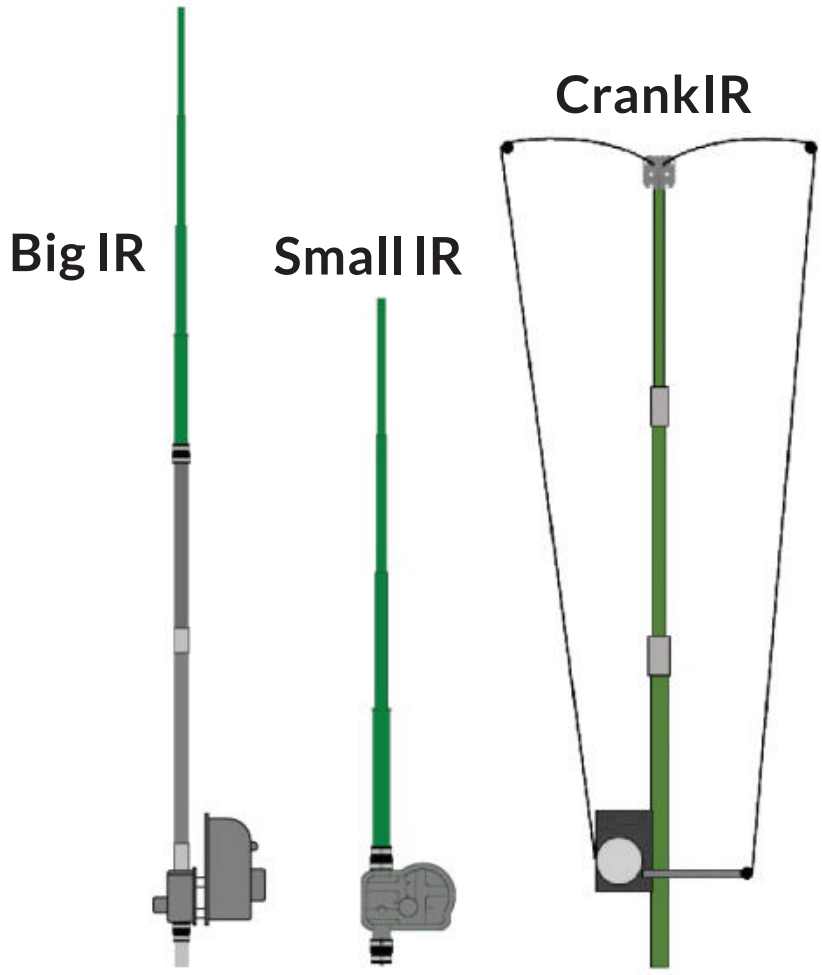
On the Cover: ICOM America Senior Sales Manager Ray Novak, N9JA, shows off the brand-new IC-905 transceiver at the Orlando Hamcation in February. Details on page 85. First look at the IC-905 on page 72.

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announcements

APRIL

BURNIPS, MISSISSIPPI — The Allegan County Amateur Radio Club will hold the AC8RC April Fools Day Mini-Swap from 9 a.m. to 5 p.m., Saturday, April 1 at the Salem Township Hall, 3003 142nd Ave, Burnips, MI. Contact: John Hanse, AC8HZ. Email: < johnhanse@charter.net>. Website: < https://tinyurl.com/2faaxnaf>. Talk-in 147.240 94.8.

BAYTOWN, TEXAS — The East Side Amateur Radio Service will hold the Baytown Hamfest from 7 a.m. to 1:30 p.m., Saturday, April 1 at the Baytown Community Center, 2407 Market Street Baytown, TX 77520. Contact: Wes Harris, W5WES. Email: <w5wes@arrl.net>. Website: < https://earstx.org/>. Talk-in 145.310 PL 167.9. VE exams.

COLUMBUS, INDIANA — Columbus Amateur Radio Club will hold the Columbus Indiana Hamfest from 8 a.m. to noon., Saturday, April 1 at the Columbus North High School Cafeteria, 1400 25th St. Contact: Mike Idlewine, WE9MI. Email: <idlewine@comcast.net>. Website: < http://carcnet.net>. Talk-in 146.790-103.5 Hz. VE exams.

LONGMONT, COLORADO — Longmont Amateur Radio Club will hold the LARCfest from 9 a.m. to noon, Saturday, April 1 at the Events Center – Boulder County Fairgrounds9595 Nelson Rd. Longmont, CO 80501. Contact: Richard Paige, KE0VT. Email: <gwabi2@hotmail.com>. Website: < http://w0eno.org>. Phone: (720) 220-1931. Talk-in 147.270 MHz +, 100 Hz CTCSS tone. VE exams.

MERIDIAN, IDAHO — The South West Idaho ARC will hold the SWIARC Spring Hamfest Saturday, April 1 at the 10 Mile Christian Church 3500 W Franklin Rd. Contact: Kim Gross, KI0E. Email: <swidahoarc@gmail.com>. Website: <http://www.k7swi.org>. Talk-in 146.580.

CORINTH, MISSISSIPPI — The Alcorn County ARES will hold the April Fool – Jess Ables Memorial Hamfest from 9 a.m. to 5 p.m., Saturday, April 1 and from 8 a.m. to noon, Sunday, April 2 at the Crossroads Arena, 2800 South Harper Road. Email: <Harold.butler@me.com>. Website: <www.acares.reiselt.com>. Talk-in 146.925. VE exams.

CLAREMORE, OKLAHOMA — The Green Country Hamfest 2023 and the 2023 ARRL Oklahoma Section Convention will be held from 4 p.m. to 9 p.m., Friday, April 7 and from 8 a.m. to 3 p.m., Saturday, April 8 at the Claremore Expo Center, 400 Veterans Parkway. Email: <info@greencountryhamfest.org>. Website: <www.greencountryhamfest.org>. Talk-in 147.090+ (PL 88.5). VE exams, DXCC / WAC / WAS / VUCC card checking.

DADE CITY, FLORIDA — The East Pasco Amateur Radio Society, Inc. will hold the EPARS Talegate from 7 a.m. to noon., Saturday, April 8 at the Church Ave Parking Lot, 37746 Church Ave. Contact: Chris Bloxsom, AA4CB. Phone: (224) 221-5064. Email: <aa4cb@arrl.net>. Talk-in 146.880 PL 146.2 (-.600). VE exams.

HAMPTON, NEW HAMPSHIRE — The Port City Amateur Radio Club will hold the Seacoast Amateur Radio Flea Market from 8 a.m. to noon., Saturday, April 8 at the St. James Masonic Lodge 77 Tide Mill Road. Contact: Steve Roberts, KC1ILT, Phone: (207) 337-1512. Email: <kc1ilt@maine.rr.com>. Talk-in 145.150- PL 127.3. VE exams..

HAYES, VIRGINIA — The Middle Peninsula Amateur Radio Club will hold the 3rd Annual Gloucester Hamfest from 9 a.m. to 4 p.m., Saturday, April 8 at the Abingdon Ruritan Club, 8784 Guinea Road. Contact: Joy Safrenek, Phone: (757) 871-7772. Email: <w2jms2001@gmail.com>. Talk-in 145.370.

RALEIGH, NORTH CAROLINA — The Raleigh Amateur Radio Society will hold RARSfest and the 2023 ARRL Roanoke Division Convention from 8 a.m. to 3 p.m., Saturday, April 8 at the Jim Graham Building, NC State Fairgrounds, 4285 Trinity Road. Contact: Chuck Littlewood, K4HF, (919) 630-9358. Email: <k4hf953@yahoo.com>. Website: <www.rarsfest.org>. Talk-in 146.64. VE exams.

WINDSOR, CONNECTICUT — The North East Weak Signal Group will hold the Eastern VHF-UHF Conference and Microwave Update from Friday, April 14 to Saturday, April 15 at the Hilton Garden Inn, 555 Corporate Drive, 48 E. Bath Road. Contact: Mark Casey, K1MAP, Phone: (413) 777-9828. Email: <caseyhardware@gmail.com>. Website: <http://www.newsvhf.com>. Talk-in 144.200 usb.

BRAINERD, MINNESOTA — The Brainerd Area Amateur Radio Club will hold the Brainerd Area Hamfest Saturday, April 15 from 9 a.m. to 1 p.m., at the Brainerd National Guard Armory1115 Wright St. Contact: Lyle Amundson, KØLFV, Phone: (218) 330-5110. Email: <k0lfv@arrl.org>. Website: < http://brainerdham.org>. Talk-in 147.225 No Tone. QSL Card Checking.

CUYAHOGA FALLS, OHIO — The Cuyahoga Falls Amateur Radio Club will hold its 67th Annual Hamfest from 8 a.m. to 1 p.m., Saturday, April 15 at the Emidio & Sons Expo Center, 48 E. Bath Road. Contact: Bruce Ferry, Phone: (330) 790-1680. Email: <hamfest2023@w8vpv.org>. Website: <www.w8vpv.org/hamfest>. Talk-in 147.270+ (PL 110.9) or 444.850+ (PL 110.9). Free VE exams.

NORWICH, NEW YORK — The Chenango Valley Radio Association, Inc. will hold the Bullthistle Hamfest Saturday, April 15 from 7 a.m. to noon., at St. Bartholemew's Parish Hall 81 E. Main St. Contact: Matthew Jenne, KD2HKB, Phone: (607) 674-5785. Email: <kd2hkb@yahoo.com>. Website: <https://cvara.net/hamfest>. Talk-in 146.685+ 110.9.

GEORGETOWN, DELAWARE — The Sussex Amateur Radio Association will hold the Georgetown Hamfest and 2023 ARRL Delaware State Convention from 8 a.m. to 3 p.m., Saturday, April 15 at the Cheer Community Center, 20520 Sand Hill Road. Contact: Jamie, W3UC, Phone: (410) 202-7690. Email: <hamfestdelaware@gmail.com>. Website: <www.radioelectronicsexpo.com>. Talk-in 147.090 (PL 156.7). Free VE exams, DXCC / VUCC / WAS / WAC card checking.

ROSWELL, NEW MEXICO — The Pecos Valley Amateur Radio Club will hold the Second Annual PVARC Alien City Hamfest from 8 a.m. to 2 p.m., Saturday, April 15 at Beginnings, 3908 SE Main Street. Contact Gerald Cox, WØCOX, Phone: (575) 840-8586. Email: <w0cox@gmail.com>. Website: <www.pecosvalleyarc.com>. Talk-in 147.320 (PL 146.2).

STOUGHTON, WISCONSIN — The Madison Area Repeater Association will hold the 52nd Annual Madison Hamfest from 8 a.m. to noon, Saturday, April 15 at the Mandt Community Center, 400 Mandt Parkway. Phone: (608) 205-1994. Email: <hamfest@w9hsy.org>. Website: <www.w9hsy.org>. Talk-in 147.150+ (PL 123). VE exams.

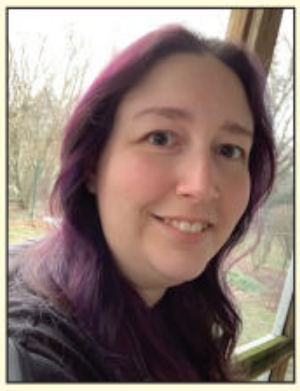
ELIZABETH, PENNSYLVANIA — The Two Rivers Amateur Radio Club will hold the 51st Annual Amateur Radio / Computer Show from 8 a.m. to 2 p.m., Sunday, April 16 at the Elizabeth VFD Bingo Hall, 101 South

(Continued on page 59)

ham radio news

KB3UJW Joins CQ Staff as Associate Editor

Sabrina Herman, KB3UJW, of Lyndhurst, Ohio, has been named *CQ* magazine's Associate Editor, succeeding Managing Editor Jason Feldman, KD2IWM, who is leaving CQ Communications after 12 years to pursue opportunities outside of publishing.



Herman has been a ham for close to 13 years and comes to CQ from Hermes Press, a small book publisher in Pennsylvania, where she served as Managing Editor and Promotional Coordinator. At *CQ*, she will be an integral part of the editorial team producing each issue of the magazine and will work to expand CQ's social media presence as well.

Herman says she hopes to learn more about the ham community in her new position, noting that nearly all of her friends are hams, including her husband, Jacob, about whom she says, "[H]e's the reason I decided to take the license exam back in 2010!"

"I have two dogs who are my fur babies, Ginger Rogers and Noodle," she adds. "I am an avid collector of Disney paraphernalia, books of all kinds, and original comic book art. I play lots of Nintendo Switch games, my favorite being "Animal Crossing"."

Welcome, Sabrina, and thank you, Jason, for your many contributions to *CQ* and amateur radio.

Hamvention Names 2023 Award Winners

The Dayton Amateur Radio Association has announced the winners of the 2023 Hamvention awards. The awards, among the most prestigious in amateur radio, recognize the Amateur of the Year, Special Achievement, Technical Achievement, and Club of the Year.

Dayton's 2023 Amateur of the Year is Carsten Dauer, DM9EE, a longtime advocate for youth in amateur radio (he and his children are featured in the 2021-22 *CQ* Amateur Radio calendar). Carsten was honored for his work in collecting and transporting amateur radio equipment to hams in Ukraine and, on the return trips, driving war refugees from Ukraine to safe havens in Germany, including his own hotel. To help, visit <https://tinyurl.com/25baptav>.

This year's Technical Achievement Award goes to Dr. James Breakall, WA3FET, a prolific antenna designer and professor emeritus of electrical engineering at Penn State University. He helped develop the Numerical Electromagnetic Code, or NEC, which is the basis for most of today's antenna modeling programs. He also worked with K1JT, WP3R, and NP4A in 2010 to operate moonbounce from the Arecibo Observatory (SK) in Puerto Rico.

The Special Achievement Award for 2023 honors Dr. Jason McDonald, N2TPA. A trauma surgeon by profession, his major ham radio interest is promoting amateur radio among young people, particularly through Radio Scouting, and forming scout radio clubs in the U.S., Canada, and the Philippines. Through these clubs, he has gotten more than 500 young people licensed and on the air.

The 2023 Club of the Year is the Delaware Valley Radio Association in Trenton, New Jersey, whose wide range of amateur radio activities and events has led the club membership to triple in size over the past six years.

The honorees will be formally recognized at the Dayton Hamvention awards dinner in May,

Sohn Withdraws as FCC Nominee

Gigi Sohn has withdrawn from consideration for membership on the FCC, after her nomination by President Biden was not acted on by the Senate for nearly two years. According to "The Hill," a Capitol Hill newspaper, Sohn's decision came soon after West Virginia Senator Joe Manchin announced that he would not support her confirmation, which has been supported by most Democrats and opposed by most Republicans and many in the media and wireless industries. The White House has not yet indicated when the President might announce another nomination to fill the fifth Commission seat.

3YØJ Wraps Up Weather-Shortened DXpedition

The much-anticipated 3YØJ DXpedition to Bouvet Island is over and the team is safely back in friendlier climes. While the team's original goal was to operate 12 stations simultaneously for 22 days and hoped to make 200,000 QSOs, they were only able to get two stations on the air and made about 19,000 contacts, according to the *ARRL Letter*. In addition to terrible weather and extreme difficulty getting equipment on shore, the effort was beset by massive amounts of deliberate interference. In addition, the only safe place on the island to set up camp had a huge rock blocking the short path to most of North America. *CQ* will have a complete report on the expedition in the May issue.

ARDC Releases 2022 Annual Report

The Amateur Radio Digital Communications (ARDC) foundation has released its annual report for 2022, outlining more than $7 million in grants made during the year. The *ARRL Letter* reports that ARDC made grants in four categories: amateur radio ($2.1 million), education ($2.3 million), scholarships ($1.5 million), and research-and-development ($2.4 million). The foundation's philanthropy included 47 grants to amateur radio clubs and projects, as well as 95 scholarships. For more information, visit <www.ardc.net>.

Nominations Open for Young Ham of the Year

Do you know a young radio amateur, age 18 or younger, who is doing extraordinary things for his/her community or for amateur radio? If so, the Amateur Radio Newsline Bill Pasternak Young Ham of the Year Award committee wants to hear from you. Nominations for the 2023 YHOTY award are being accepted through May 31. For more information and nominating forms, visit <arnewsline.org> and click on the YHOTY tab. *CQ* is a corporate sponsor of the Young Ham of the Year Award.

Milestones: Former FCC Chief Engineer W4QAW Silent Key

Raymond Spence, W4QAW, became a Silent Key in February at age 93. According to *Newsline*, Spence was retired from a career at the FCC, capped off by service as the agency's Chief Engineer. He was also a dedicated DXer and contester. He lived in Washington's Virginia suburbs and was a ham for much of his life.

contents

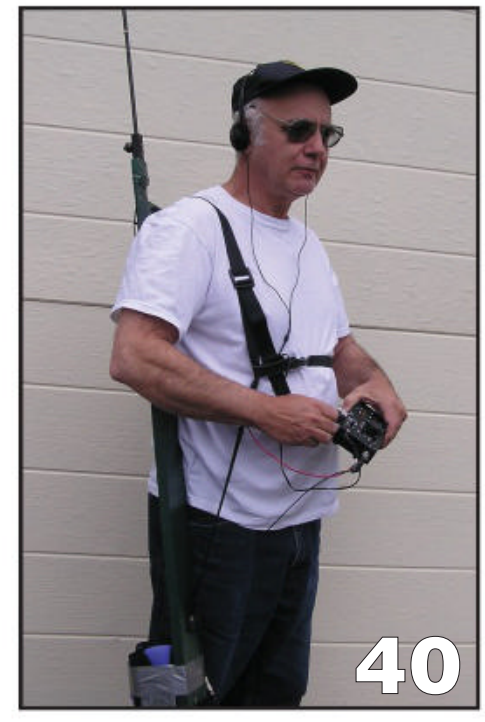
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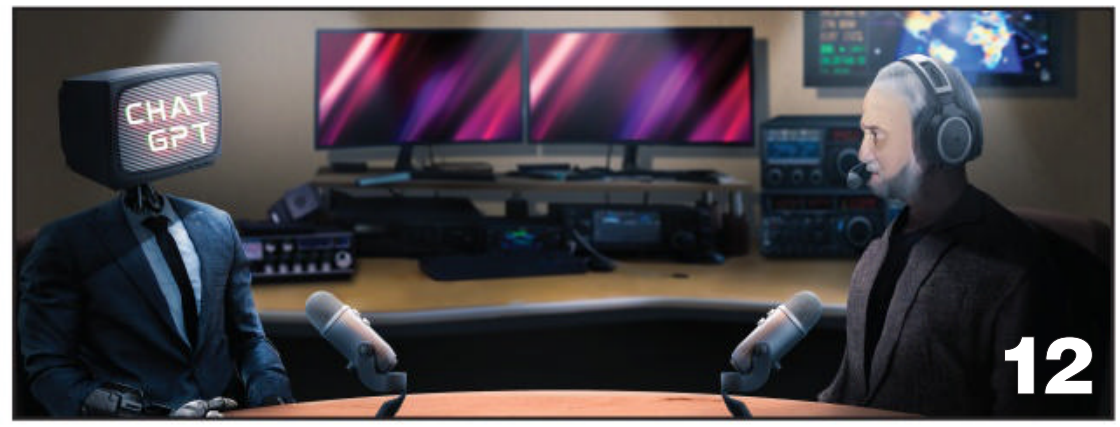


ON THE COVER

ICOM America Senior Sales Manager Ray Novak, N9JA, brought the company's brand-new IC-905 transceiver to Florida's Orlando Ham cation in February. It is the first microwave-focused transceiver from a major ham manufacturer. Details on page 85. First look at the 905 on page 72. (Cover photo by Joe Eisenberg, KØNEB)







features

8 THE BOTTLECAP BALLOON BRIGADE MYSTERY
Did the U.S. Air Force Shoot Down the K9YO-15 Ham Radio Balloon Over the Yukon?
By Rich Moseson, W2VU

12 AN INTERVIEW WITH CHATGPT ON THE FUTURE OF HAM RADIO
This is NOT an April Fool Article, Although You Might Wish it Was
By Jim Millner, WB2REM

16 SHERLOCK INVESTIGATES: SEISMIC SIGNALS BELOW 1 HZ
Build A Detector (Receiver) and Have Your Own Home Seismometer
By "Sherlock"

18 RESULTS OF THE 2022 CQWW DX SSB CONTEST
By John Dorr, K1AR

31 ANNOUNCING: THE 22ND ANNUAL CQ WORLD WIDE FOXHUNTING WEEKEND

32 A VINTAGE WINTER FIELD DAY...KEEPING WARM WITH VACUUM TUBES
W4FSV Added to the Challenge of Winter Field Day With Vintage Tube Gear
By William F. Minikiewicz, W4FSV

34 A *CQ* EXCLUSIVE: EMERGENCY POWER GENERATION SYSTEMS USING STARCHY TUBER ARRAYS
Can Potatoes Solve the World's Energy Problems?
By Prof. Emil Heisseluft

37 CQ CLASSIC: The Gift That Keeps On Giving... The Concentric Yagi
By Bruce Vaughn, NR5Q (April 1991)

40 MY DUMBEST PORTABLE OPERATION
Operating from the U.S. Naval Observatory (USNO)... Not a Very Smart Choice
By Paul Signorelli, WØRW

41 UNUSUAL FACTS ABOUT CABLE LOSS
Here's Something You Probably Didn't Know About Your Coax
By Mark Persons, WØMH

42 LEARNING CYRILLIC MORSE CODE
An App That Can Help You Learn Cyrillic Morse Code
By Kenneth V. Miller, K6CTW

FOCUS ON: Ham radio and current events … Ham radio is often a part of the story when it comes to emergency communications, but it doesn't stop there. In this issue, we look at the Bottlecap Balloon Brigade Mystery (page 8), in which we explore the possibility that one of the balloons recently shot down by the U.S. military was a ham radio club project; plus an "interview" with an AI "chatbot" on the future of ham radio and artificial intelligence (page 12), and, on page 16, a DIY seismometer to chart earthquakes from your basement!

columns

47 MATH'S NOTES: A Universal AM Modulator
By Irwin Math, WA2NDM

50 EMERGENCY COMMUNICATIONS: A Collaborative Effort
By John Ferguson, K3PFW

53 KIT-BUILDING: Updates: Antennas and Tools, Oh My...
By Joe Eisenberg, KØNEB

56 MAGIC IN THE SKY: I Need a Bigger Antenna!
By Jeff Reinhardt, AA6JR

59 ANTENNAS: Care and Feeding of SWRs
By Kent Britain, WA5VJB

60 QRP: LOW-POWER COMMUNICATIONS Winter Field Day with My Old Friend...the FT-817
By R. Scott Rought, KA8SMA

64 LEARNING CURVE: DX Abides...It's the Journey, Not the Destination!
By Ron Ochu, KOØZ

68 ANALOG ADVENTURES: Ye Olde Octopus Curve Tracer
By Eric P. Nichols, KL7AJ

departments

72 VHF PLUS: ICOM's IC-905: A Commercial Radio for the Microwaves
By Trent Fleming, N4DTF

74 AWARDS: World Castles Award
By Steve Molo, KI4KWR

78 DX: Club Profile: The Carolina DX Association
By Bob Schenck, N2OO & Gary Dixon, K4MQG

86 CONTESTING: After the Contest
By Tim Shoppa, N3QE

90 PROPAGATION: April Propagation Revisited
By Tomas Hood, NW7US

miscellaneous

2	ANNOUNCEMENTS	36	BEHIND THE BYLINES
3	HAM RADIO NEWS	39	LOOKING AHEAD
6	ZERO BIAS	59	SPURIOUS SIGNALS
7	NEWS BYTES	110	OOPS
31	WHAT'S NEW	112	HAM SHOP





zero bias: a cq editorial

BY RICH MOSESON,* W2VU

The Next Revolution in Amateur Radio

Technical advances in amateur radio seem to follow a predictable pattern, one that's been consistent for pretty much the past 100 years. We start with "the way it is" – currently popular bands, modes, and activities – along with a certain comfort level that says to many of us, "this is the way it's always been" (which it never has) and "this is the way it should always be" (which it never is). But there are always innovators out there as well, finding new ways to communicate and new areas for growth and continued technical development. Eventually, those innovations with "staying power" become mainstream and the next generation of hams sees a new "way it is."

Going way back, we've seen it in the transition from spark to CW, the arrival of AM phone, followed by SSB and FM, then digital modes beginning with RTTY and packet radio. Over the past half-century, the key to moving an innovation from the fringes to the mainstream has been its adoption by a major manufacturer and availability at a price point that fits into many hams' budgets.

We saw it in the 1950s with single sideband, introduced by Collins and then popularized by Central Electronics with much more budget-friendly gear, the evolution of VHF FM from converted public safety radios to gear designed specifically for hams, and the introduction of PCs and affordable packet controllers in the 1980s. Each of these revolutionized the way we "do" ham radio.

In 1995, Icom revolutionized the hobby once again with the introduction of its IC-706 transceiver, which had two major impacts. It was among the first HF radios to include both 6 and 2 meters, providing multimode access to both bands and beginning to once again make six meters a "mainstream" ham band. Today, nearly every new HF transceiver includes six meters. Perhaps even more importantly, it packaged a QRP HF/VHF radio in a very transportable package, opening the door, literally, to moving ham radio out of the house and into the great outdoors. This encouraged the growth of QRP-portable operating and blazed the path for some of today's most popular ham activities, including summits, parks, lighthouses, and so many more "OTAs" or "on the air" programs. It not only helped Icom's bottom line but spawned a new mini-industry catering to the QRP-portable operator.

Today, Icom is doing it again with the IC-905. While it isn't my habit to spotlight specific products or manufacturers in this column, I believe that the 905 is the IC-706 for microwave hamming and will lay the groundwork for much-needed expansion of activity on our bands above 1 GHz. These bands are incredibly valuable to commercial interests and we risk losing them if we don't make better use of them.

If you haven't yet been introduced to the IC-905, it covers 2 meters, 70 centimeters, 1.2 GHz, 2.4 GHz, and 5.6 GHz, with an option for adding a 10-GHz transverter. And to make sure every ounce of transmitter power makes it to the antenna, the 905 is designed to have the RF module mounted just below the antenna, with an Ethernet connection to the remotely located control module carrying power as well as audio and frequency information.

If you ask most hams today about operating on microwave frequencies, you may hear that "it's too complicated" or "those frequencies scare me." Yet virtually all of us carry microwave transceivers in our pockets or purses and most of us use them constantly. The rest of the world calls them smartphones but we know they're really two-way radios! And they all operate on microwave frequencies.

One may wonder why the designers chose the 2.4- and 5.6-GHz bands as the primary frequency ranges for the IC-905. Well, I haven't asked Icom, but I can guess, and it circles back to the 706 spawning a mini-industry beyond the walls of Icom. Take a look at your WiFi modem – chances are that it operates on either 2.4 or 5 GHz (with some frequencies in each range overlapping the ham bands). This means that there is already a *ton* of time-tested, low-priced, ancillary gear in the marketplace for setting up our own networks and doing all sorts of great stuff that we haven't even thought of yet. Like the 706, the 905 has the potential to be the base for a mini-industry focused on our SHF bands.

Of course, some hams are already doing this. Many ham radio mesh networks operate on 2.4 GHz using minimally-modified WiFi modems. But most of the current radio setups rely on transverters connected to multimode rigs for 2 meters or 432 MHz. The gear gets complicated. The IC-905 will make the microwave bands much more accessible to many hams whose technical strengths may not lie in lashing up mini-networks of transverters, preamps, sequencers, etc.

"But what about DX?" you may ask. Well, amateur satellites have been using these bands for years now, and they don't care about sunspots! Plus, if you refine your definition of DX to include anything farther away than you might expect on a given band (think sporadic-E or transequatorial propagation on 6 meters), then a world of propagation wonders awaits you on these bands. Things like rain scatter, airplane scatter, knife-edge propagation, the waveguide effect, and more.

We applaud Icom for taking this step to bring greater access to a new frontier for many hams, and possibly usher in the next ham radio revolution, just as it did with portable QRP operating nearly 30 years ago. For more about the IC-905, see this month's VHF-Plus column on page 72 and Icom's product info webpage at <https://tinyurl.com/mr3yap3x>.

73 to KD2IWM

This is the final issue for which Jason Feldman, KD2IWM, will serve as Managing Editor. Jason has been with *CQ* for 12 years and has been Associate or Managing Editor of this magazine since late 2014. Jason has decided to take a position outside of publishing. We thank him for his many years of hard work on behalf of *CQ* and the amateur radio community and wish him all the best in his new position. Sabrina Herman, KB3UJW, has joined our staff as Associate Editor and began working with us on this issue. See News on page 3 for an introduction.

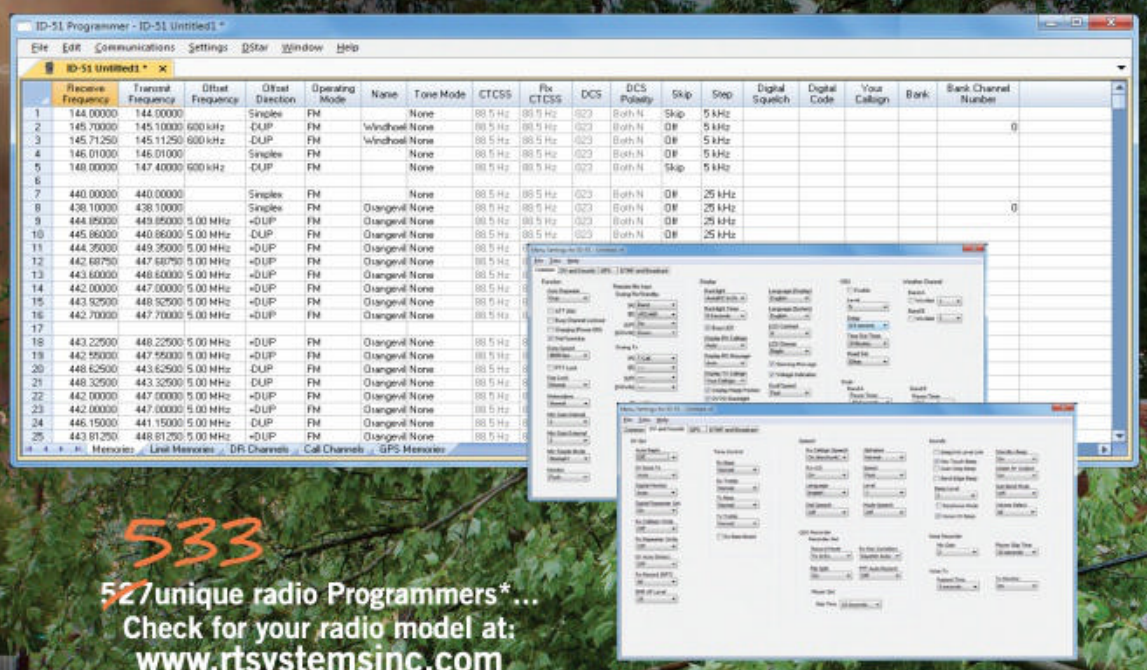
Spring is here! Go enjoy the great outdoors, and don't forget to take your QRP portable ham gear along!

73, Rich W2VU

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

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news bytes: *Quartzfest Distance Challenge Winners*

During the Northern Arizona DX Association's recent Quartzfest, held in January 2023 at Quartzsite, Arizona, the club held its fourth Distance Challenge event to see which attendees could make the longest distance contact from the gathering site in the Sonoran Desert.

There were four different classes of competition:
Class A: 100 watts or less; SSB or CW
Class B: 100 watts or less; FT8
Class C (QRP): 5 watts or less; SSB or CW
Class D (W7Q special event station): 100 watts or less; SSB, CW, or FT8



According to Distance Challenge Co-Chairmen Bob Wertz, NF7E, and Lou Arminio, W7KFT, the winners and runners-up (Photo A) were as shown in Table 1. Each of the winners received a commemorative hard hat and bag of goodies. NF7E pointed out that since KM6BIP was their first YL champion, "[W]e ran into Quartzsite and bought some pink ribbon, made a bow and placed that on her hat as we announced her being the winner."

Quartzfest is an annual winter gathering of RV-active hams in the desert outside Quartzsite, Arizona. More information on Quartzfest and the Northern Arizona DX Association may be found on the NADXA website at <www.nadxa.com>.



Photo A. Winners and runners-up of the 2023 Quartzfest Distance Challenge. From left, K8TX, W1RO, AC6YY, KC5QOC, N9AGC, KU7K, W5RE, and KM6BIP. (Photos by W7FYW, courtesy Northern Arizona DX Association)

Class	Name/Call	Radio	Antenna	Distance Miles
A				
CHAMP	Joe Rogers, KU7K	TS480	Butternut vertical	10,099.6
RUNNER UP	Bobby Sullivan, W5RE	IC-7000	Inverted V	6,727.1
B				
CHAMP	Greg Smith, N9AGC	FT991A	MFJ Octopus	11,380.8
RUNNER UP	John Mocho, KC5QOC	FT991A	Hamstick	9,989.5
C				
CHAMP	Jim Bassett, W1RO	IC 705	YoYo Inverted V	7905.8
RUNNER UP	Ned Tufekcic, AC6YY	K2X	Dipole	5974.6
D				
CHAMP	Eva Kidwell, KM6BIP	TS590	MFJ EFHW	8463.8
RUNNER UP	Robert Morrow, K8TX	TS590S	MFJ EFHW	6679.3

Table 1. Champions and runners-up for each competition class in the 2023 Challenge.

No one is certain if the mystery object shot down by the U.S. Air Force over the Yukon in February was the K9YO-15 ham radio balloon. But this is certain … the speculation that it might have been is shining a spotlight on this small but growing corner of our hobby, with potentially positive impacts.

The Bottlecap Balloon Brigade Mystery

BY RICH MOSESON,* W2VU

On February 12, 2023, at the request of Canada's prime minister, a U.S. Air Force jet shot down an unidentified object floating above the remote Yukon Territory, and speculation quickly turned to the possibility that it was a high-flying amateur radio balloon which had been tracked in the region the day before and has not been heard from since.

The mystery object was one of three shot down by U.S. fighters in the week following the tracking and eventual takedown of a much larger Chinese spy balloon that made its way across much of the United States before being brought down in the Atlantic Ocean off the coast of South Carolina. At press time, Canadian authorities were still searching for any wreckage that might possibly be recovered, to help determine with certainty what it was and what it was doing. Unless and until that occurs, though, the primary speculation continues to be that it was the Northern Illinois Bottlecap Balloon Brigade's K9YO-15 balloon. And that possibility has brought worldwide media attention to amateur radio high altitude ballooning, or ARHAB.

These flights to "near space" (*Photo A*) attract young people to amateur radio, promote skills in building very small and lightweight transmitters, increase understanding of atmospheric science and represent the ultimate in "foxhunting," tracking a balloon's path and trying to recover the payload once it returns to Earth. Here at CQ, we have been reporting on this aspect of ham radio periodically for at least 25 years,[1] but it has remained a niche activity.

Importantly for this discussion, the current generation of "pico balloons" being launched by hams (*Photos B* and *C*) do not have to be registered with the Federal Aviation Administration because they weigh far less than the four pounds specified in FAA rules for regulated flight.[2] To keep the weight down, they have no batteries and rely solely on tiny solar panels for all needed power.

The flight in question, K9YO-15, was built by the Northern Illinois Bottlecap Balloon Brigade and launched last October. It had already circled the Earth six times and was predicted to be flying over Yukon at the time that the mystery object was shot down by the Air Force. It has not been heard from since.

"While we can never be 100 percent certain whether the small metallic balloon with a small payload that was shot down over the Yukon was actually the NIBBB balloon unless the military shows camera footage of the event," said Bill Brown, WB8ELK, considered by many to be the 'father' of ham radio ballooning, "the fact is that they flew a metallized foil balloon and the flight path prediction (*Photo D*) shows the balloon would've been in that region of the Yukon at the same time as the jet shooting something down. Add in the fact that it has been aloft since October and been around the world six times and after the incident K9YO-15 has not been heard on WSPR since, that gives you a pret-



Photo A. GoPro photo from the stratosphere over northern Alabama from a balloon launched by members of the University of Alabama-Huntsville Space Hardware Club. The curvature of the Earth and the blackness of space can be seen from this photo taken at 85,000 feet. (Photo courtesy WB8ELK)

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

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Photo B. Amateur radio ballooning pioneer Bill Brown, WB8ELK, launching a Skytracker transmitter (see text for details) on a small foil party balloon. (Photo by Bev Teter, WB4ELK)

ty high confidence that it was actually their balloon that was shot down."

Brown added, "Shooting down a $12 balloon that carried a payload that cost under $100 with a $450,000 missile is akin to swatting a mosquito with a sledgehammer. All they had to do is fly closely to the balloon and the turbulence would've taken it down."

However, the NIBBB's Ken Daniel, K9YO, said it's still too soon to jump to conclusions, noting in an e-mail that "because the solar collector is flat, I did not expect to hear from the balloon after the last transmission. The sun needs to reach above 17 degrees to get enough power to transmit. It has been in and out of the dark all winter. We did not hear from it for all of January, so it might still be out there somewhere around the North Pole."

Under the Hood

While news reports from the Associated Press, National Public Radio and other outlets discussed the political and potential regulatory issues arising from these incidents, we thought *CQ* readers would be interested in learning more about the technology used on these flights. The tracker on this balloon weighed 7.5 grams (1/4 of an ounce), 14 grams with the solar panel attached, according to Daniel, who notes that by comparison, a nickel weighs 5 grams. The tracker transmitter in *Photo E* weighs 7.8 grams and is made from three components which can be purchased on Amazon.com. It is geared toward school science clubs and is the type flown on K9YO-15. The even smaller transmitter in *Photo F* is custom-built and weighs only 1.7 grams (0.06 ounces). Daniel says the balloon itself was a 32-inch diameter sphere with a shiny surface, purchased from Balloons Online. Other launches have used clear balloons made by Yokohama Balloon in Japan.



Photo C. Launch of a clear plastic Skytracker SBS-13 cylinder balloon by Scientific Balloon Solutions (WB8ELK photo)

WB8ELK filled in some of the technical details for us:

"Their particular payload was totally solar powered just like the ones that Tom (Medlin, W5KUB,) and I fly and use the same telemetry encoding method that I came up with some years ago ... The K9YO-15 pico balloon … was flying a payload that consisted of separate GPS, Arduino, power supply and Si5351a breakout boards. I think the Arduino board was by HiLetGo and the Si5351a RF synthesizer board was either an Adafruit or HiLetGo module. The antenna was a magnet wire dipole connected to fishing line.

The transmissions were on 20-meter WSPR every 10 minutes, (each comprising) two transmissions, one callsign sequence followed by a telemetry callsign sequence.

Telemetry encoding method (WB8ELK format) is as follows on my Skytracker boards and also on Tom W5KUB's payloads:

First transmission example:

WB8ELK EM64 10 (power field is substituted with the coarse altitude encoded in 1000-meter increments.)

Second transmission example:

0a7bcd EM64 13 where

a = number of GPS satellites acquired (alternate used on WB8ELK Skytrackers it to mix GPS status and temperature in this field)

b = solar panel voltage

c and d = 5th and 6th grid square characters (example if 0Z7LOJ is would be a 6-digit grid square of EM64oj)

The power field is used to encode the fine altitude in 60-meter increments.

To get the actual altitude add the coarse and fine altitude fields.

The 0 and the 7 form a channel number to allow multiple flights to fly in the same time slot. The first character should be either 0,1 or Q which are invalid international callsigns)...the 3rd telemetry callsign field ranges from 0 to 9.

The WSPR data is received by amateur radio ground stations worldwide running the WSJT-X or similar decoding software which is uploaded to the WSPRnet.org database by the decoding software. I wrote a Python script to grab the received data from WSPRnet.org's database, decode the telemetry, reformat it to APRS format and then send this directly to the APRS-IS servers. This allows a WSPR balloon to show up on the balloon tracking maps such as <amateur.sondehub.org> and <aprs.fi>, just like it was an APRS object. QRP-Labs has its own tracking map when using their U4B transmitter but those can be linked to the balloon tracking maps using a Python script or by using a website by the LU7AA group which also can link other format methods as well.

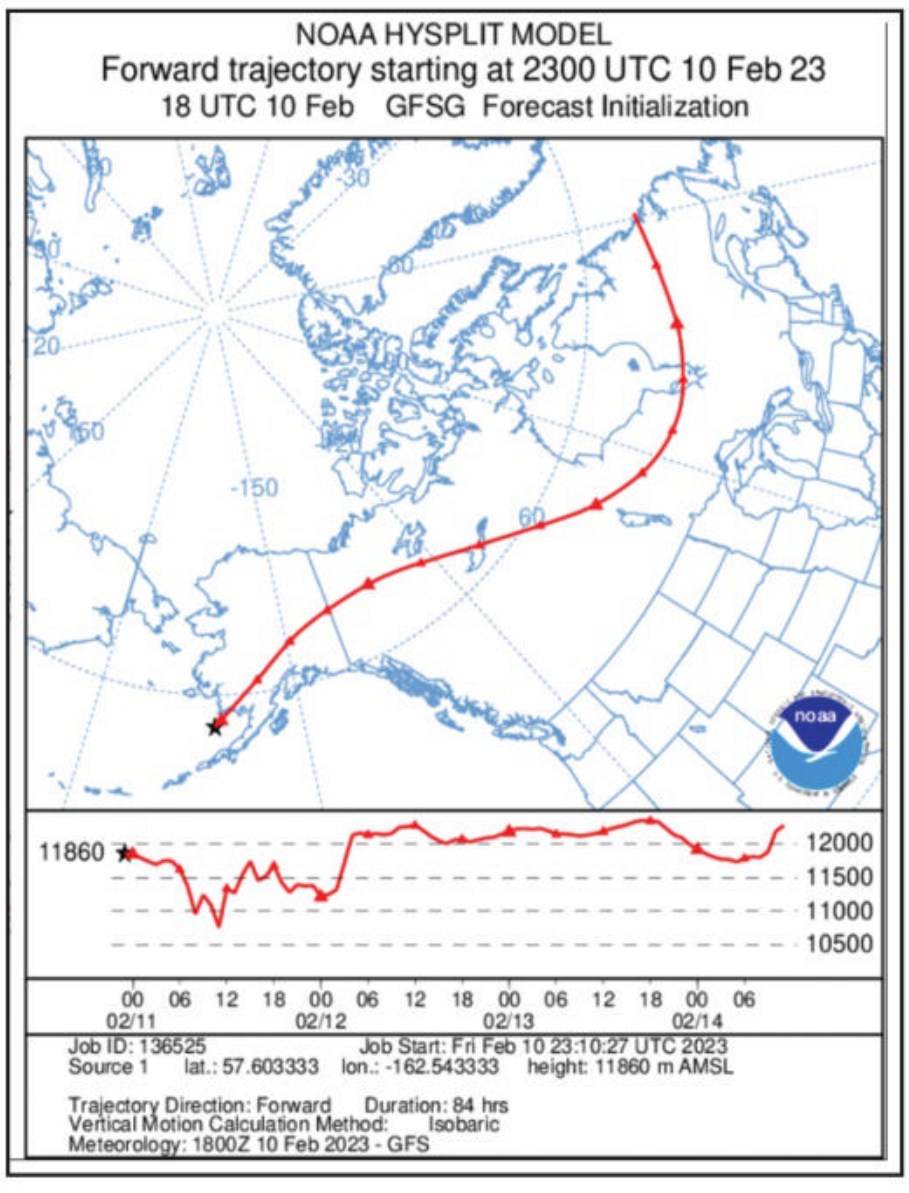


Photo D. NOAA HYSPLIT trajectory model predicting the path of the K9YO-15 balloon from the time it was last heard. The path places it in the area of the Yukon where a mystery object was shot down at approximately the same time as that occurred. (NOAA image)

A Silver Lining

All of the news stories about ham radio ballooning have had a silver lining – increased interest in the pursuit, particularly among young people. K9YO notes that one high school student in their group who had been denied permission to start a ham radio club in the school now has an OK; plus, a 12-year-old and a 14-year-old in their group have gotten General Class licenses to be able to operate on 20 meters, and are planning their own balloon launch this spring with NIBBB.

For more information on amateur radio pico balloons, visit K9YO's website at <https://tinyurl.com/bdh86zxa>.

Notes:

1. See Verhage, "Flight of the Isaac Asimov," *CQ VHF*, May 1997, and much more recently, Medlin, "Adventures With Pico Balloons Using Amateur Radio," *CQ*, Oct. 2020.

2. See 14CFR101, §101.1(a)(4)

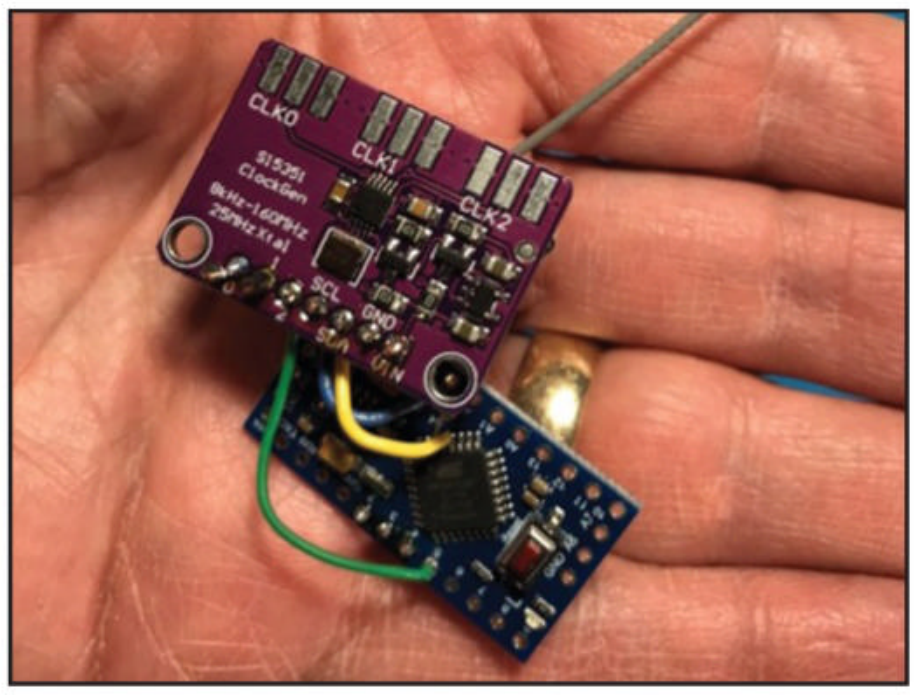


Photo E. The type of tracker transmitter used on the K9YO-15 balloon flight. It weighs 7.8 grams and can be assembled from parts purchased on Amazon.com. Both this and the tracker shown in Photo F are used in conjunction with solar panels made of a flat piece of Styrofoam® - like a party picnic plate – and uncoated polycrystalline solar cells. (K9YO photo)

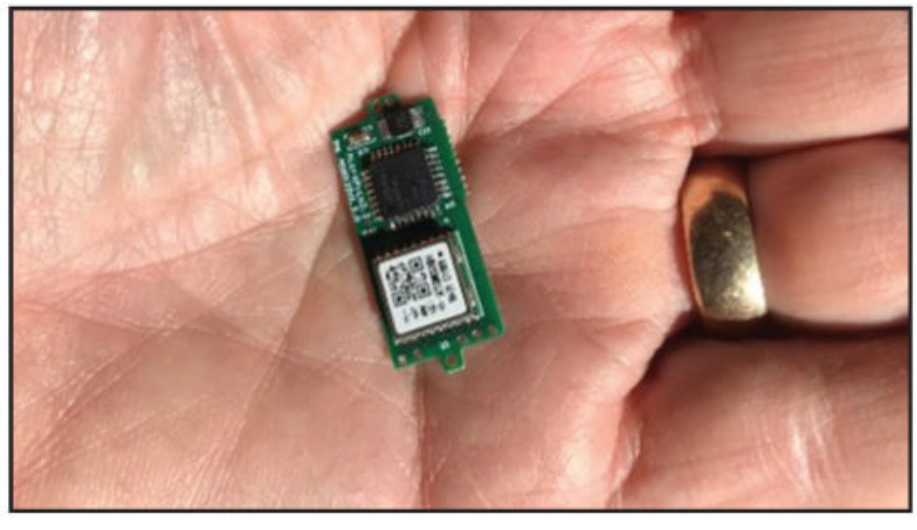


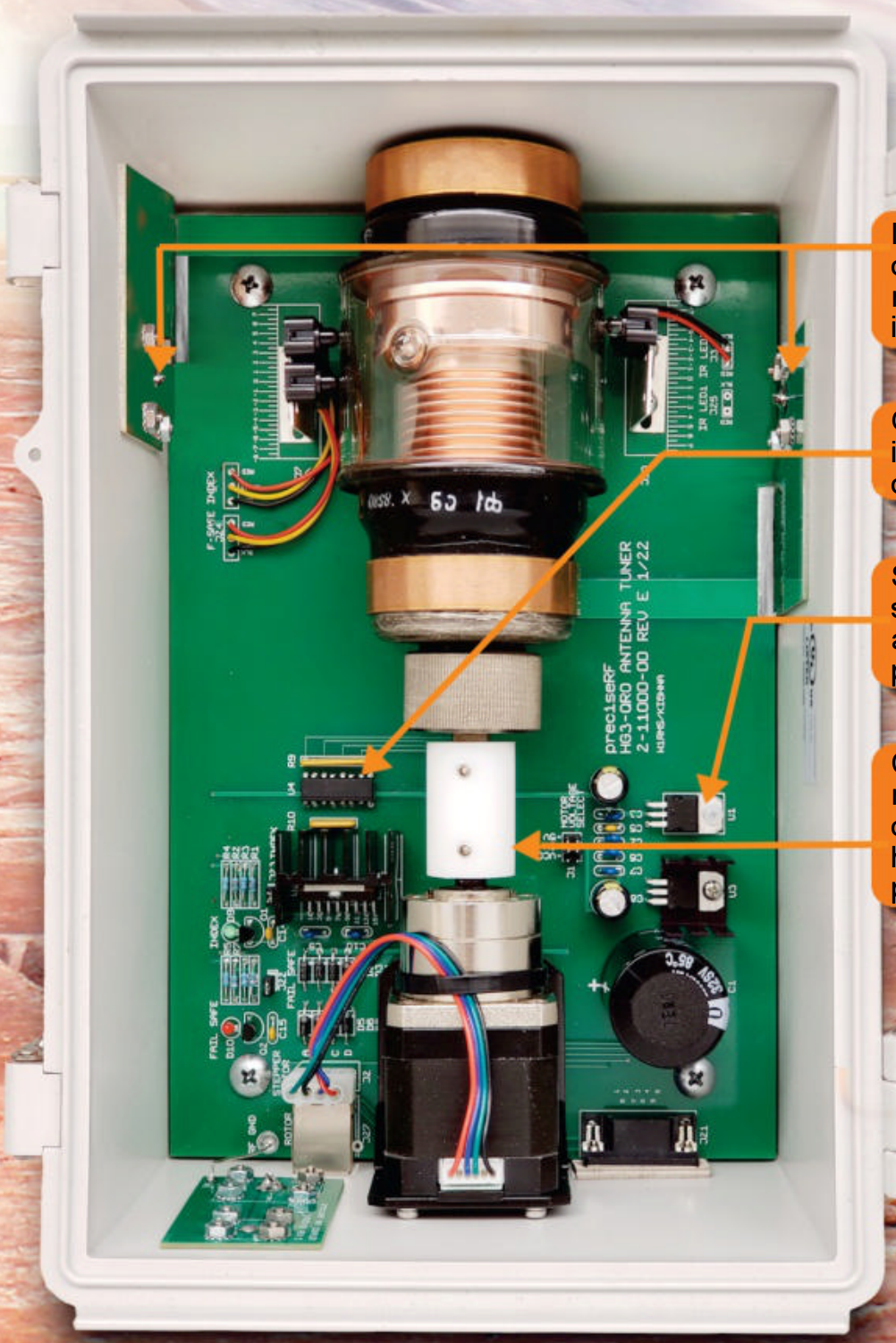
Photo F. An even smaller tracker is used on some flights. This custom-made board weighs only 1.7 grams, or 0.06 ounces. (K9YO photo)

COMPROMISE WAS NOT AN OPTION FOR THE NEW HG3 QRO-A!

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While we can't vouch for anything else in this issue, the following is definitely NOT an April Fool article, although part of us wishes it was…

An Interview With ChatGPT on the Future of Ham Radio

BY JIM MILLNER,* WB2REM

In the future, amateur radio will most likely involve incorporating AI-enhanced radio transceivers. In a previous article written by this author and Gene Hinkle, K5PA, entitled "AI Meets AR, The Coming Convergence of Amateur Radio and Artificial Intelligence,"[1] we were able to demonstrate, in practical terms, how artificial intelligence (AI) devices connected to radio transceivers could serve a practical purpose. In the few years since that article was published, there has been a significant advancement in AI ability. One of the newest AI bots that has come on the scene is called ChatGPT.[2] ChatGPT is a conversational AI model developed by OpenAI. It's a version of the GPT (Generative Pretrained Transformer) architecture, which uses deep learning algorithms to generate text.

ChatGPT has been trained on a large dataset of text from the internet, including dialogues, conversations, and written text, to generate responses in a conversational manner. It can answer questions, provide explanations, and engage in casual conversations, among other tasks. The model's ability to generate human-like text has made it a popular tool for a variety of applications, including chatbot and content generation. Eventually, the questions you can ask it can be converted from text to voice and voice to text, thus allowing it to be incorporated into a radio.

In this article, I "interviewed" ChatGPT about ham radio and found the responses to be fairly accurate and enlightening.[3] The purpose of this article is not to bring out new information but to show the capabilities of ChatGPT and the future implications of its usage. (*It has been very lightly edited by both the author and the CQ editorial staff – ed.*)

At the end of the article, I asked ChatGPT to write a poem about ham radio. I think you will find it quite entertaining.

The Interview

WB2REM: Is ham radio a dying hobby?

ChatGPT: Ham radio, also known as amateur radio, is a

* *E-mail: <wb2rem@verizon.net>*

hobby that involves using radios to communicate with other amateur radio operators. The hobby has been around for over a century and has been popular among people of all ages and backgrounds. However, in recent years, there has been a debate over whether ham radio is a dying hobby.

On the one hand, some argue that ham radio is indeed dying. They point to the declining number of amateur radio operators and the increasing popularity of other forms of communication, such as the internet and mobile phones. The younger generation, in particular, is seen as less interested in ham radio, with many of them gravitating towards technology-based hobbies.

On the other hand, others argue that ham radio is not dying but is simply evolving. They point out that ham radio has adapted to new technologies over the years and has remained relevant. In fact, many ham radio operators have embraced digital modes of communication, such as digital voice and data modes, which have allowed them to communicate with other operators around the world in new and innovative ways.

In conclusion, it is difficult to say definitively whether ham radio is a dying hobby. While there is no doubt that the number of amateur radio operators has declined,[4] the hobby has also evolved and adapted to new technologies, which has helped it to remain relevant. Whether ham radio will continue to thrive in the future will depend on the hobby's ability to continue to evolve and attract new generations of enthusiasts.

WB2REM: What is the future of ham radio?

ChatGPT: The future of ham radio is uncertain and is dependent on several factors. Some experts predict that ham radio will continue to thrive and adapt to new technologies, while others believe that it will continue to decline in popularity.

On the positive side, ham radio has a long history of resilience and adaptation. Ham radio operators have been able to maintain a strong community despite changes in technology, and many operators have embraced new modes of communication, such as digital voice and data modes. This has allowed the hobby to remain relevant and appealing to a new generation of enthusiasts.

Additionally, ham radio is often seen as a backup means of communication in times of emergencies and disasters when traditional communication methods may be unavailable. This means that ham radio will likely continue to be a valuable resource for public safety organizations, amateur radio clubs, and individual operators.

On the negative side, ham radio faces competition from other forms of communication, such as the internet and mobile phones. The younger generation is also seen as less interested in the hobby, which could lead to a decline in the number of amateur radio operators.

Overall, the future of ham radio will depend on the hobby's ability to remain relevant and appealing to a new generation of enthusiasts and to adapt to new technologies and trends. Whether ham radio will thrive or decline in the future will depend on the actions of ham radio operators, amateur radio organizations, and government agencies that regulate the hobby.

WB2REM: Why is there intentional QRM on ham radio?

ChatGPT: Intentional QRM (interference) on ham radio is considered a problem as it disrupts communication between ham radio operators and can prevent them from carrying out their intended transmission. There are several reasons why intentional QRM may occur:

1. Misuse of equipment: Some ham radio operators may not be familiar with proper operating procedures and may cause interference to other operators unintentionally.

2. Unwanted or illegal transmissions: Some individuals may intentionally cause QRM on the ham radio frequencies to interfere with legitimate communication.

3. Territorial disputes: In some cases, multiple ham radio operators may be competing for the same frequency and may intentionally cause QRM to assert their dominance over the frequency.

4. Technical issues: In some cases, technical issues, such as poorly designed equipment, can cause QRM, even if the operator does not intend to cause interference.

It is important to note that intentional QRM is considered a violation of the rules and regulations governing amateur radio and can result in penalties, including fines and the suspension or revocation of an operator's license. Ham radio organizations and government agencies that regulate the hobby work to prevent and address intentional QRM to maintain the integrity of ham radio communications.

Overall, by promoting education, diversity, responsible use, and emergency preparedness, ham radio organizations and clubs can work to improve the hobby and ensure its continued growth and success in the future.

WB2REM: What can be done to improve ham radio?

ChatGPT: Several steps can be taken to improve ham radio:

1. Education and training: Ham radio organizations and clubs can offer education and training programs to help new and existing operators improve their skills and knowledge of the hobby.

2. Encouraging new enthusiasts: Ham radio organizations can work to attract new generations of enthusiasts by promoting the hobby to young people, schools, and other organizations.

3. Encouraging diversity: Ham radio organizations can work to encourage diversity within the hobby by promoting inclusivity and welcoming people from all backgrounds and cultures.

4. Improving equipment: Ham radio organizations and manufacturers can work to improve the quality and functionality of ham radio equipment to make it more accessible and user-friendly for new enthusiasts.

5. Encouraging responsible use: Ham radio organizations can work to promote responsible use of ham radio frequencies and educate operators on proper operating procedures to reduce the incidence of intentional QRM.

6. Encouraging emergency preparedness: Ham radio organizations can work to promote the use of ham radio as a backup means of communication in times of emergencies and disasters and encourage operators to be prepared to provide critical communication support.

Overall, by promoting education, diversity, responsible use, and emergency preparedness, ham radio organizations and clubs can work to improve the hobby and ensure its continued growth and success in the future.

WB2REM: What is the best amateur radio made?

ChatGPT: The best amateur radio is subjective and depends on the individual's specific needs and preferences. Some popular brands that are well-regarded in the ham radio community include:

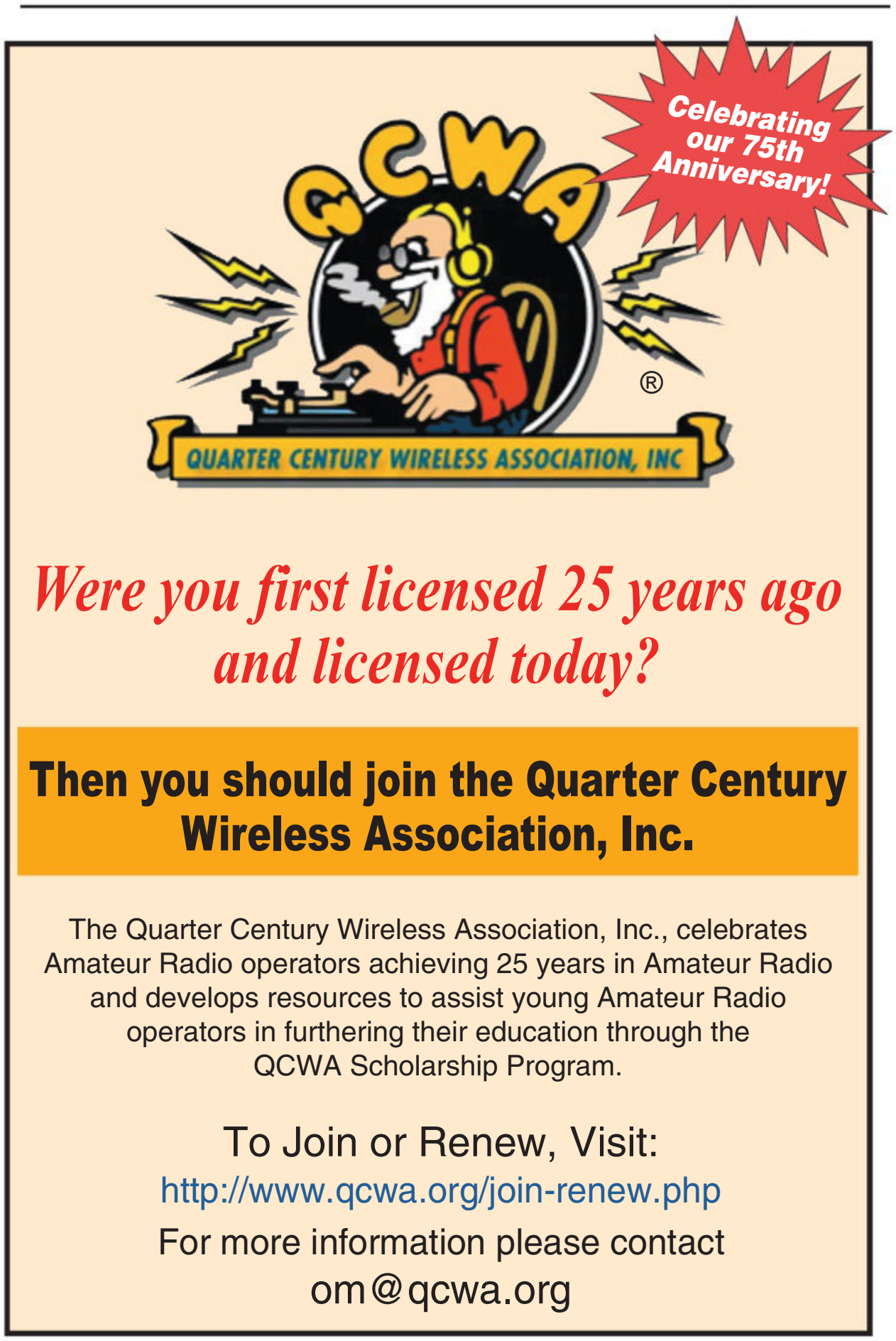
1. Yaesu: Known for their high-quality, reliable, and feature-packed transceivers and accessories.

2. Icom: A trusted brand that offers a wide range of transceivers, handhelds, and accessories for all levels of amateur radio operators.

3. Kenwood: Known for their innovative and technologically advanced transceivers and accessories, offering a range of options for different operating styles and budgets.

4. Baofeng: A budget-friendly option that offers basic handheld transceivers for entry-level amateur radio operators.

Ultimately, the best amateur radio will depend on factors such as the user's operating style, budget, and specific requirements. Before making a purchase, it's recommended to research and compare different options, read reviews, and consult with experienced amateur radio operators to ensure you find the right fit for you.



WB2REM: What do you like most about amateur radio?

ChatGPT: As an AI language model created by OpenAI, I do not have personal preferences or emotions. However, I can tell you that amateur radio is a unique hobby that offers many benefits to those who participate. Some of the things that are often appreciated about amateur radio include:

1. Building a community: Ham radio operators form a tight-knit community, connecting with other enthusiasts from around the world to exchange ideas, share experiences, and provide support.

2. Developing skills: Ham radio offers opportunities to learn new skills, from technical knowledge to communication and emergency preparedness.

3. A connection to history: Ham radio has a rich history, dating back over a century, and many operators feel a connection to this history and the heritage of the hobby.

4. A love of technology: Ham radio is a technology-based hobby, and many enthusiasts enjoy learning about and using the latest equipment, software, and techniques.

5. Providing emergency communication: Ham radio operators can provide critical communication support in times of emergency or disaster, offering a unique sense of purpose and fulfillment.

6. A connection to the world: Ham radio provides the opportunity to make contacts with people from all over the world, fostering a sense of community and connection that spans borders and cultural differences.

These are just a few of the things that many amateur radio operators enjoy about the hobby. Whether it's the technical aspect, the community, the history, or the opportunity to make a difference, there are many reasons why ham radio continues to be a beloved hobby for so many.

WB2REM: If you were an amateur radio operator, what would you like your call sign to be?

ChatGPT: As an AI language model, I do not have a physical form and cannot operate an amateur radio. However, if I were to be assigned a call sign, I would like it to be a combination of letters that represents the purpose of my existence, which is to serve as an AI language model for communication. A call sign like "AI-COM" or "AI-CHAT" would be appropriate in this context.

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WB2REM: Thank you for the interview. Do you have any other things to say about ham radio?

ChatGPT: You're welcome! Ham radio is a fascinating and unique hobby that offers many benefits to those who participate. Whether you're a seasoned operator or just starting out, there are endless opportunities to learn, connect, and contribute to the world of ham radio. From technical knowledge to community building, emergency communication, and the opportunity to connect with people from all over the world, ham radio offers something for everyone. If you're interested in the hobby, I encourage you to learn more, get involved, and see what ham radio has to offer!

ChatGPT: In parting, here is a poem I wrote about ham radio.

Ham Radio, A Nostalgic Symphony

In the quiet of the night, when all is still,
a voice echoes through the air, a distant thrill.
It's the call of ham radio, a hobby from the past,
a symphony of voices, a connection that will last.
A dance between man and machine, a connection pure and strong,
a bridge between the present and a bygone song.
The songs of ham radio, a rhythm in the air,
a connection that transcends time and space beyond compare.
The signals are a story, a tale of joy and pain,
a window to a world, a bond that will remain.
From city to city, from shore to distant shore,
ham radio is the voice that opens doors.
For in the world of ham radio, a bond is formed,
a connection that transcends, a friendship reborn.
The hands that hold the mic, the eyes that scan the air,
are the guardians of this legacy, the keepers of this rare.
So let the signals fly, and let the voices ring,
For ham radio is a treasure, a symphony we bring.
From the heart of the city to the countryside,
Ham radio is the heartbeat, a connection that will survive.
It's the song of the airwaves, a nostalgic lullaby,
a symphony of voices, a connection that will not die.
So let us raise our voices, and let our signals soar,
for ham radio is a gift, a hobby we can't ignore.

Summary

Advancements in artificial intelligence (AI) have occurred exponentially over the last few years. It is inevitable that these advances will find their way into technological development in amateur radio. ChatGPT's broad base of knowledge, with the ability to access it almost instantaneously, has a wide range of potential uses in amateur radio. It will never replace human-to-human communications but will supplement and enhance our operating skills.

Notes:

1. "AI Meets AR, The Coming Convergence of Amateur Radio and Artificial Intelligence," Jim Millner, WB2REM and Gene Hinkle, K5PA, *CQ*, December 2019
2. ChatGPT: <https://openai.com/blog/ChatGPT/>
3. Copyright Information: "The author generated this text in part with GPT-3, OpenAI's large-scale language-generation model. Upon generating draft language, the author reviewed, edited, and revised the language to their own liking and takes ultimate responsibility for the content of this publication."
4. The supposedly declining population of amateur radio operators is widely discussed on the internet, but not necessarily supported by the facts. As of mid-February, 2023, the FCC reported more than 767,000 currently-licensed individual amateurs in the United States and its territories. It is difficult to accurately track licensing numbers worldwide, as there is no uniform reporting format between countries. – W2VU

With earthquakes making big news recently, our intrepid electronics detective shows you how to build a receiver to pick up signals generated by tectonic activity and have your own home seismometer.

Sherlock Investigates: Seismic Signals Below 1 Hz

BY "SHERLOCK"*

Very low frequency seismic signals (below 1 Hz) can be detected from earthquakes around the world. The detector (receiver) in *Photo A* is in the corner of my basement to keep it isolated from local seismic noises.

Local noises from trucks, trains and windblown trees cause seismic pollution mainly above 1 Hz. The frequency of this detector is 0.25 Hz (which is period of 4 seconds), which is good for filtering out local noise and for detecting earthquakes. The equipment needed to detect these signals is a detector, a DC amplifier and a recorder (*Photo B*).

The detector is a swinging 'garden gate.' It is literally a swinging gate 3 feet long, hanging on a nail point and swinging at the base on a knife edge to eliminate friction. The gate arm holds a small multi-turn RF coil that is positioned in the field of an old Magnetron magnet.

That signal is sent to a DC amplifier, which in turn drives the servo pen motor in a Geotech Helicorder that writes with a hot pen on heat sensitive paper (*Figures 1* and *2*). The

* *c/o CQ magazine*

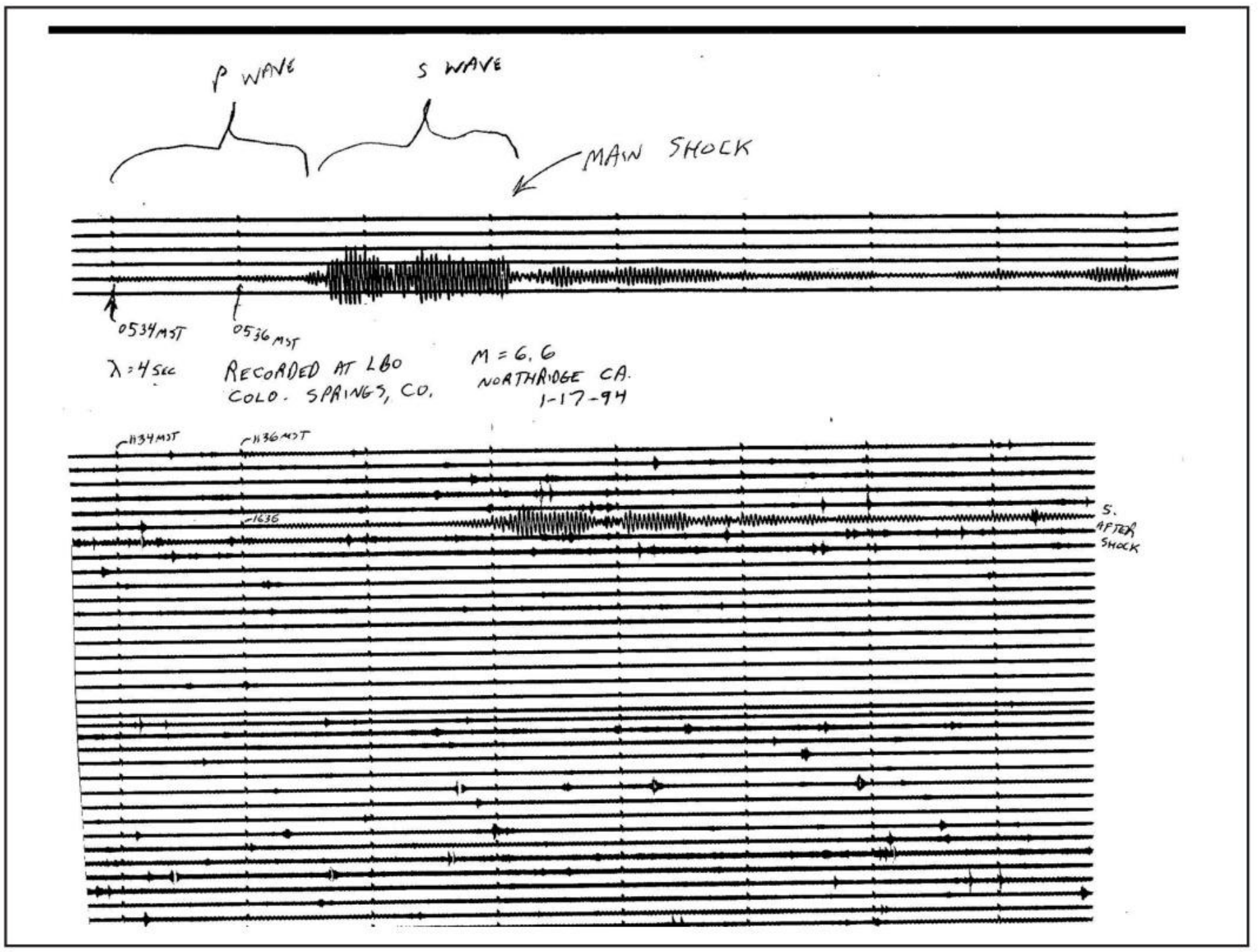


Figure 1. Sherlock's seismographic record of the magnitude 6.6 earthquake that rocked Northridge, California in 1994

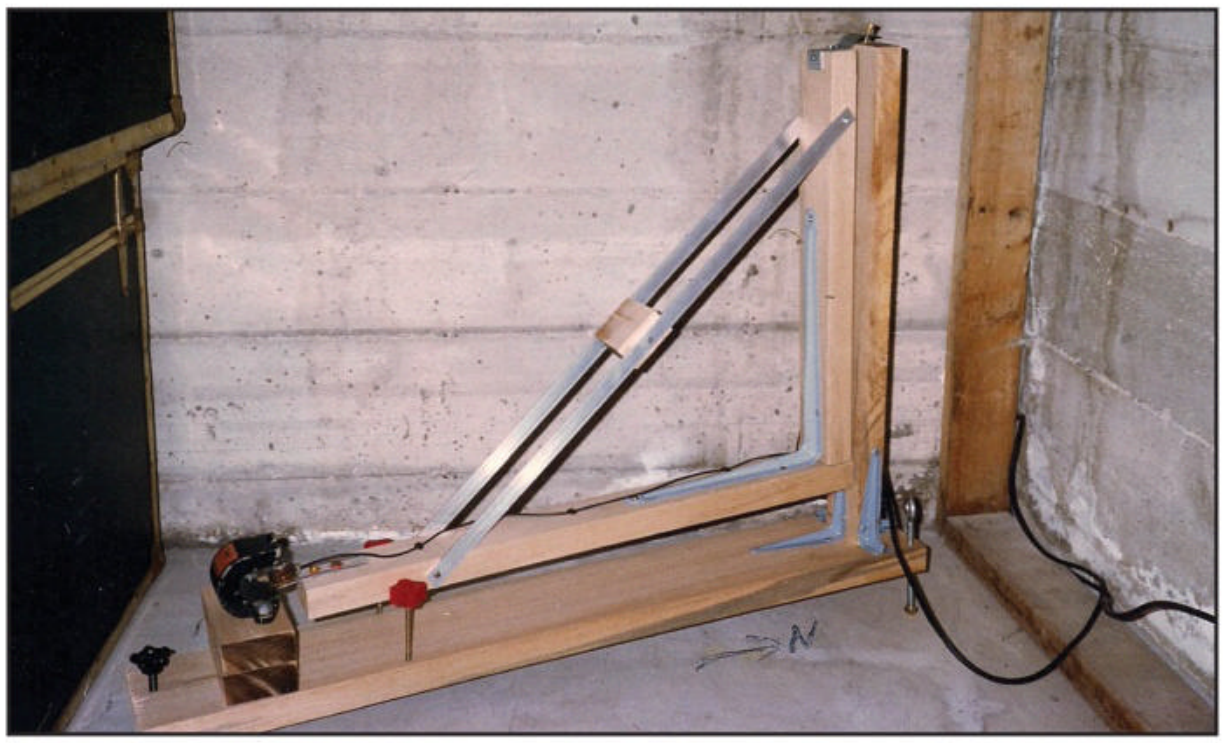


Photo A. Seismic activity detector built into a corner of the basement to block out local vibrations. See text for construction details.

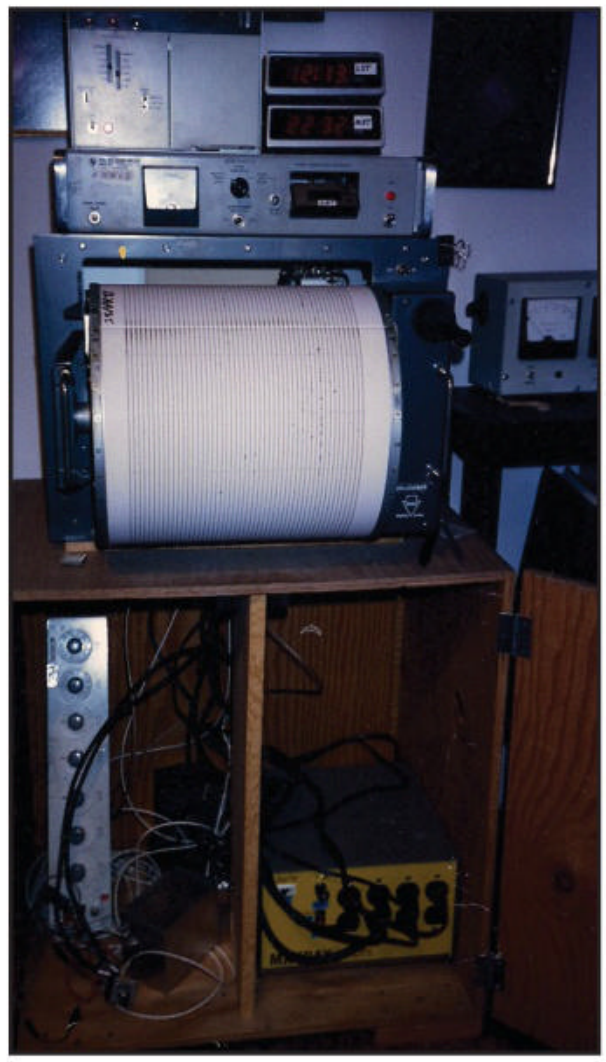


Photo B. A Geotech Helicorder records the seismic vibrations picked up by the detector.

recorder is running at 1 RPM and there is a WWVB receiver that adds time ticks to the signal line. The Helicorder and all the equipment are backed up on an uninterruptible power supply.

This seismic observatory started running in 1980, before the U.S. Geological Survey (USGS) put all the data on the web. Now you can see all the earthquake seismographs on the USGS website at <https://tinyurl.com/yxvp25ab>. But there's nothing quite like building your own!

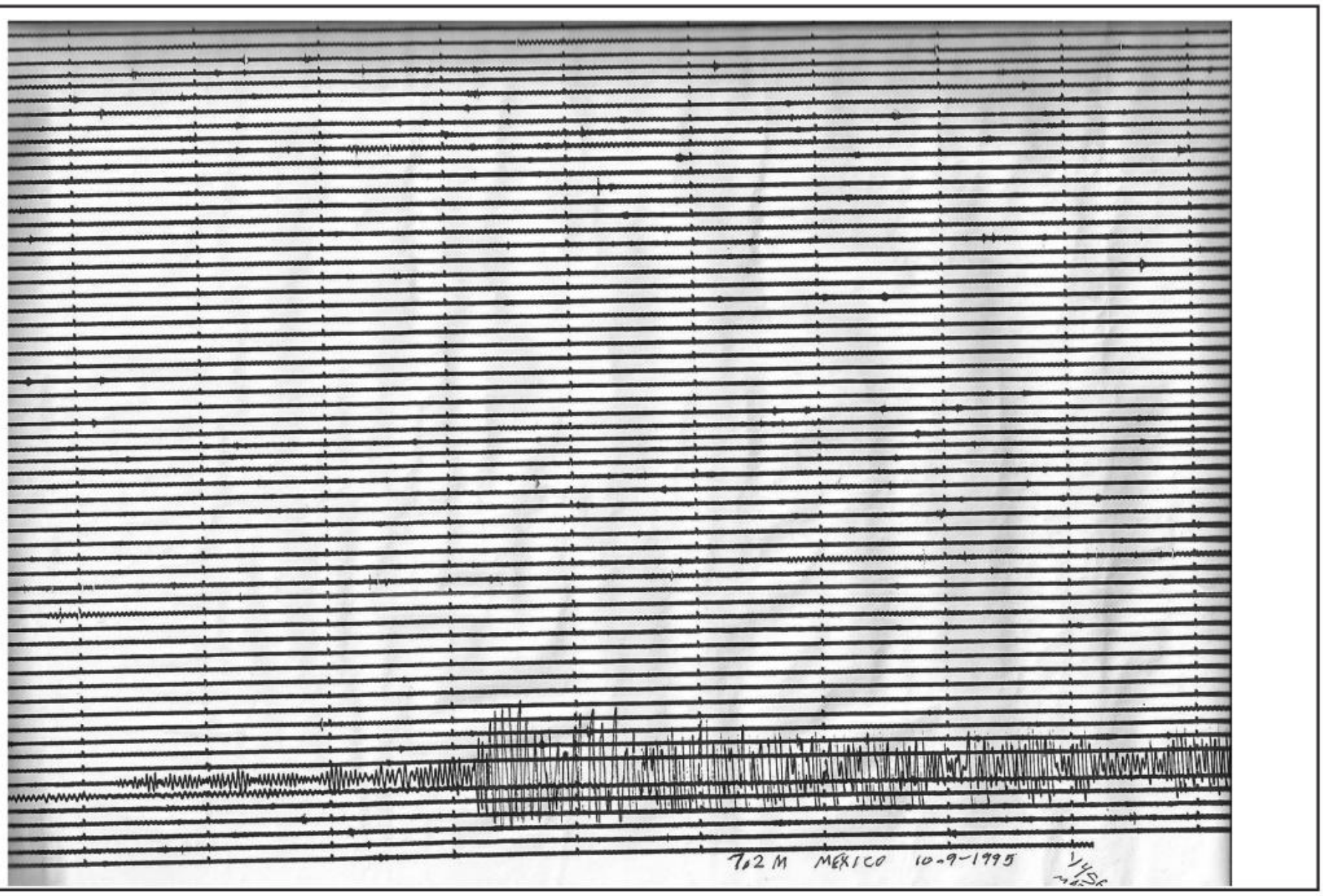


Figure 2. This recording shows the moment that a magnitude 8.0 earthquake rocked Mexico in 1995, causing massive damage in Mexico City and surrounding areas.

Results of the 2022 CQWW DX SSB Contest

"Amazing conditions this weekend … I wish every contest was like this. –VE2HEW"

BY JOHN DORR*, K1AR

For nearly a three-quarters of a century at the end of every October (and November) the world's largest operating event takes place – the CQ WW DX Contest. Celebrating its 74th running, this year's event was nothing short of spectacular as our favorite solar object supported incredible conditions on all bands, 160-10 meters!

Although down about 10% from last year's total, we still received an impressive 9004 logs in the 2022 WW edition as over 1000 entries poured into our "in-box" in the first 60 minutes after the contest ended! When compiling the data, I'm happy to report that your activity reflected 4,111,409 QSOs made during the contest, an average of 85,654 contacts per hour or perhaps more amazingly, 24 QSOs in every second of the contest. I've claimed this before, but after 74 years of beta testing, I'm now convinced this WW thing is starting to gain some traction!

I'm also pleased to note that the full impact of COVID appears to be in the rear-view mirror as proven by the number of 2022 WW contest DXpeditions and other rare activations that were worked in such cool places as SU, 5R8, 7Q7, ZD7, ST, YI, JD1, 9N, FW and others. Of course, who can ignore the spectacular growth in activity from Indonesia and China, with 416 and 197 received logs, respectively? Watch out Japan – your days of dominating the Asian operating scene are being seriously challenged as 571 entries arrived from JA.

Finally, while space does not provide me with the luxury of including all of your soapbox comments (*you can read them all on cqww.com—ed.*), here are a few representative samples that reflect your comments and excitement from the WW weekend:

The CQ WW was a great experience! It was my first contest since getting my new ham radio license! – VU3IZV

10 meters was hot! So cool to hear a dad helping their kid work the contest (DN4AN). CQWW is the best! – N8VW.

My first CQ WW was in 1949. I haven't missed one since then! – DL3AO.

So, with the return of good conditions this year, we have a lot to report. Onward to the results!

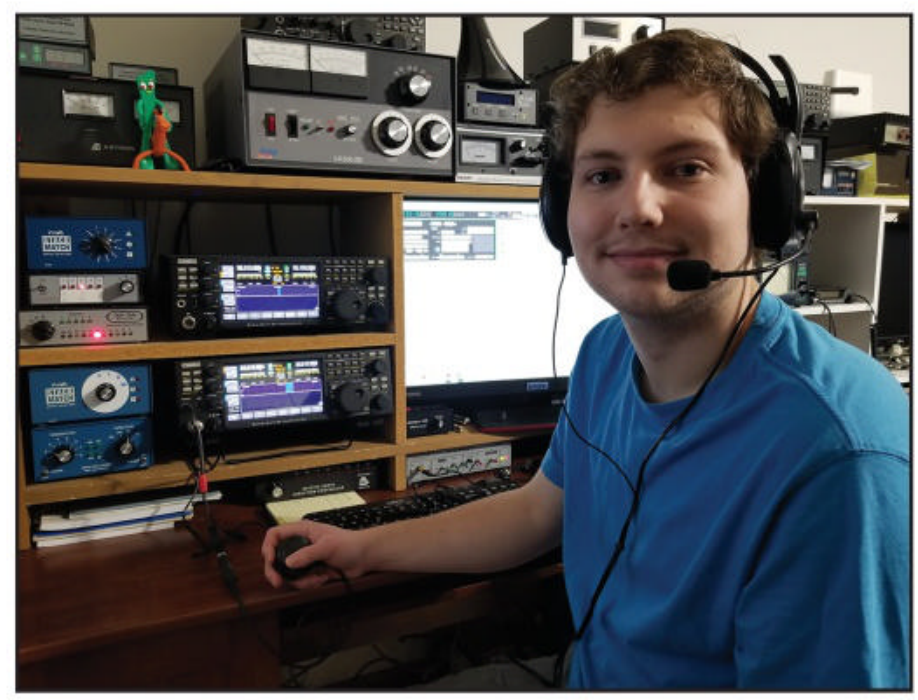
Email: <cqk1ar@gmail.com>

Amazing Results Indeed!

So, did I mention good conditions? Indeed, our old friend 10 meters came back in force as the days of 1000++ QSO 10-meter logs returned. If this year's results are any indication of what's to come over the next few years, we'd better be



Here's where youth operator Yoshi, KH0UA, was sitting if you were lucky enough to work him in the 2022 CQ WW SSB contest.



Another youth operator, Nick, KD9V, trying out his new 40-meter inverted-V in the 2022 CQ WW SSB contest.

Spring is in the Air...

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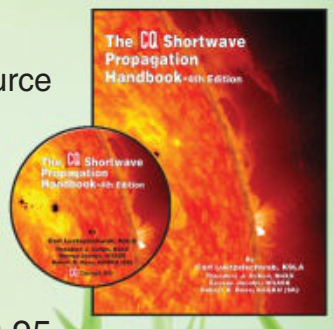
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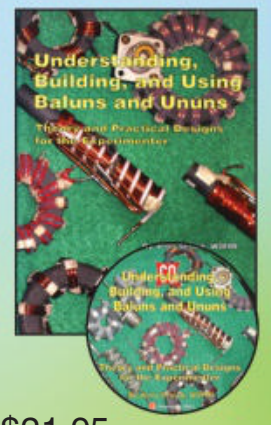


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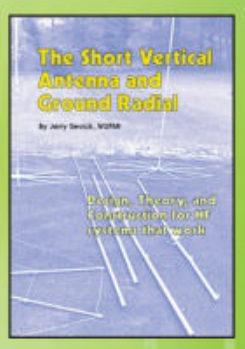
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by Jerry Sevick, W2FMI



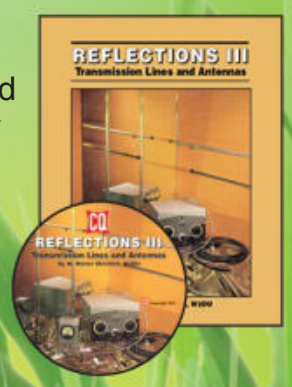
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Here is the hard-working multi-op crew at LX8M, who set-up their station from scratch just for the CQ WW contest!

prepared for amazing conditions and unprecedented scores. It's incredible to think that 50 years ago, the world high CQ WW single-operator score by 4M4UA (op. W6BHY) was only 5.4M, which would barely make today's leader box. That's in sharp contrast to this year's winner, PJ4K (op. – N6KT). Rich posted a 16.2M effort, besting the impressive 13.3M effort by Randy, K5ZD, from V47T, although it should be noted that each score had over 9K QSOs and similar multiplier counts as the 3-point advantage struck again! In the low-power class, Alfredo, WP3C, rang in with a 4.5M world-high result – no small achievement with only 100 watts.

2022 CQWW DX SSB PLAQUE WINNERS AND DONORS

SINGLE OPERATOR, ALL BANDS

World
PJ4K (Opr.: Rich Smith, N6KT)
Donor: Southern California DX Club

World – Low Power
Alfredo Velez, WP3C
Donor: Slovenian Contest Club

World – QRP
Anthony Luscre, K8ZT
Donor: Jeff Steinman, N5TJ

World – Assisted High Power
PT5J (Opr.: Sergio Almeida PP5JR)
Donor: Chick Allen, NW3Y

World – Assisted Low Power
TM3Z (Opr.: Dimitri Cosson, F4DSK)
Donor: Gail Sheehan, K2RED

U.S.A. – High Power
Ken Claerbout, K4ZW
Donor: Potomac Valley Radio Club – KC8C Memorial

U.S.A. – Low Power
Ed Sawyer, N1UR
Donor: North Coast Contesters

U.S.A. – QRP
Bill Parker, W6QU*
Donor: Pat Collins, N8VW

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

U.S.A. – Assisted Low Power
Lyle K. Ten Pas, WE9R
Donor: LA8W/LN8W & LA Contest Club

U.S.A. — Zone 3
ND7K (Opr.: John Colyard, W4IX)
Donor: Northern California Contest Club

U.S.A. — Zone 4
George Fremin, III, K5TR
Donor: Kansas City DX Club

Europe
DM6V (Opr.: Felix Kuntzsch, DL7FER)
Donor: Potomac Valley Radio Club – W4BVV Memorial

Europe – Low Power
CR2B (Opr.: Miguel Angel Devora Jimenez, EA1BP)
Donor: Tim Duffy, K3LR

Europe – QRP
HG6C (Opr.: Gulyas Imre, HA6IAM)
Donor: Steve "Sid" Caesar, NH7C

Europe – Assisted
OMØR (Opr.: Jozef Land, OM3GI)
Donor: Martin Huml, OL5Y

Africa
Ricardo Martins, CT3KN
Donor: Southborough Rod & Gun ARC – N1XS Memorial

Asia
UPØL (Opr.: Vladimir Vinichenko, UN9LW)
Donor: Nodir Tursun-Zade, EY8MM

Caribbean/Central America
V47T (Opr.: Randy Thompson, K5ZD)
Donor: John Rodgers, WE3C

Caribbean/Central America – Low Power
Ted Jimenez, HI3T*
Donor: Albert Crespo, NH7A

Oceania
KH7M (Opr.: Dick Norton, N6AA)
Donor: Barbara Yasson, AC7UH

South America
John Bartlett, HK3C*
Donor: Yankee Clipper Contest Club

Canada
XL3T (Opr.: Ron Vander Kraats, VE3AT)
Donor: Contest Club Ontario –VE3WT Memorial

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

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V85, YB, DU) – Assisted
Ron Schiltmans, DU3T
Donor: Champ C. Muangamphun, E21EIC – Siam DX Group

SINGLE OPERATOR, SINGLE BAND

World – 28 MHz
CR3Y (Opr.: Branislav Panak, OM2KW)
Donor: Joel Chalmers, KG6DX

World – 21 MHz
CR3DX (Opr.: Tibor Ferenec, OM3RM
Donor: John Rodgers, WE3C

World – 14 MHz
CR3A (Opr.: Rastislav Hrnko, OM3BH)
Donor: North Jersey DX Assn. - K2HLB Memorial

World – 7 MHz
ED5R (Opr.: Angel Turpin Guillamon, EA5Z)
Donor: Fred Laun, K3ZO – K7ZZ Memorial

World – 3.7 MHz
ISØ/OM2TW (Opr.: Richard Gasparik, OK8WW)
Donor: Family of Fred Capossela, K6SSS

World – 1.8 MHz
Ljubo Pintar, S53O
Donor: OL7M Contest Group, QRO.cz, RemoteQTH.com

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

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

U.S.A. – 14 MHz
Dan Handa, W7WA
Donor: Yankee Clipper Contest Club – KC1F Memorial

U.S.A. – 7 MHz
Julius Gostel, Jr., K4SXT
Donor: Chuck Dietz, W5PR

U.S.A. – 3.7 MHz
Steven Sussman, W3BGN
Donor: John Rodgers, WE3C

U.S.A. – 1.8 MHz
Drew Vonada-Smith, K3PA
Donor: South Texas DX & Contest Club

Europe – 28 MHz
E7AA (Opr.: Slaven Galic, E77A)
Donor: John Rodgers, WE3C

Europe – 21 MHz
IY3A (Opr.: Matteo Marzilli, IZ3EYZ)
Donor: OH-DX-Ring, OH2AM – OH2SB Memorial

Europe – 14 MHz
OH8X (Opr.: Pasi Luoma-aho, OH6UM)
Donor: Charles Wooten, NF4A

Europe – 7 MHz
CR6T (Opr.: Antonio Rui De Sousa Santos, CT1ESV)*
Donor: Central Texas DX and Contest Club – NT5C Memorial

Europe – 3.7 MHz
Carlos Aragon, EE7L*
Donor: Friend of Klaus - DJ4PT Memorial

Europe – 1.8 MHz
Juris Seilis, YL3FT*
Donor: Robert Kasca, S53R

Caribbean/Central America (28 MHz)
KP2B (Opr.: David Lianez Fernandez, EB7DX)
Donor: Nate Moreschi, N4YDU

Oceania (28 MHz)
VK1A (Opr.: Bernd Laenger, VK1IA)
Donor: Bruce D. Lee, KD6WW

Asia (28 MHz)
Alberto Annesi, VR2XAN
Donor: DFW Contest Group – W5PG Memorial

OVERLAY CATEGORIES

World – Classic
P4ØT (Opr.: Yuri Onipko, VE3DZ)
Donor: John Rodgers, WE3C

Well-known contester Roli, LY4A, sitting in front of his Lithuanian superstation.



Two fine Single-Op, All-Band USA entries made the top-10 world listings this year as Ken, K4ZW came out on top with a 6M point effort, beating out George, K5TR who achieved an impressive #10 world-high score of 5M from Texas.

While QRP operating may be a little less frustrating at solar peaks, QRP is still QRP! The world high score this time around goes to Anthony, K8ZT, who achieved a fantastic score of 349K, including 92 and 90 countries on 15 and 10 meters, respectively.

One of the CQ WW's accuracy champions, Yuri, VE3DZ, demonstrated what's possible in the Classic overlay by posting a world-high 5.3M point entry

U.S.A. – Classic
Robert Shohet, KQ2M
Donor: BeLoud.US

Europe – Classic
Yuri Sakalouski, EB5A
Donor: Steve Cole, GW4BLE Memorial

Japan – Classic
Tsutomu Kubota. JK1OLT
Donor: Hajime Kato, JO1RUR

World – Rookie
Roberto Ursino, IUØOVB
Donor: Tim Duffy, K3LR – N8SM Memorial

U.S.A. – Rookie
Dennis Tune, W9DCT
Donor: Tim Duffy, K3LR – K3TUP Memorial

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

World – Youth
Andreas Tsiakkouris, 5B4AQT
Donor: YOTA Camp

North America – Youth
Dawson Morton, KE8HBV
Donor: Neil Rapp, WB9PVG

Europe – Youth
Philipp Springer, DK6SP
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
Jianang Zhu, BD4VGZ*
Donor: YOTA Japan

Oceania – Youth
Yoshiki Nakada, KHØUA
Donor: IARU Region 3

World Single-Operator – Explorer
Simon Sintic, S53K
Donor: World Wide Radio Operators Foundation

World Multi-Operator – Explorer
OT7T (Oprs.: ON4DS, OP4K, ON7TK, ON4AMX, ON5OO, ON7EQ, ON5RA, ON7MV, ON4ANN, ON5GM, ON4CHT, ON4CAU, ON4EC, ON4CJK, OR1X, ON9TT
Donor: World Wide Radio Operators Foundation

MULTI-OPERATOR, SINGLE TRANSMITTER

World
P33W (Oprs.: RA3AUU, RW4WR, R3DCX, UA4FER, LZ2HM, R4FO, RK4FD, 5B4AIF, RA3CO)
Donor: Southern California DX Club – W6AM Memorial

World – Low Power
FY5KE (Oprs.: FY5FY, F1HAR, F4CWN, F5HRY, F5UII, F6FVY)
Donor: Tennessee Contest Group

U.S.A.
K9RS (Oprs.: K9RS, N3DXX, N8NA)
Donor: Carolina DX Assoc. – Ted Goldthorpe, W4VHF and Ken Boyd, K4DXA Memorial

U.S.A. – Low Power
WW4LL (Oprs.: WW4LL, K9MU, K1ZZI, NN9DD, AA4CF, K4NV, N2WF, UR5WA, US5WE)
Donor: KZ5DX – DX HOGS

Africa
FR4KR (Oprs.: FR8TZ, FR8UA, FR4QT)
Donor: WRTC 2Ø22

Asia
TC3X (Oprs.: TA3NE, TA7N, TA5FA, TA4RC, TA3ST, TA3CY, TB3DMY)*
Donor: John Rodgers, WE3C

Europe
E7DX (Oprs.: 9A1TT, 9A2ZI, DJ2MX, DJ4MX, E7ØR, E7ØT, E74A, E74AW, E76C, E77C, E77DX, E77EA, F5SNJ, S55OO)
Donor: Gail Sheehan, K2RED

Europe – Low Power
ED7O (Oprs.: EA7EU, EA7JXZ, EA7W, EC5AN, EA5O)
Donor: EA Contest Club

Oceania
AH2R (Oprs.: NH2C WI3O KH2JU)
Donor: Junichi Tanaka, JH4RHF

South America
PJ4G (Oprs.: K1QX, K2NG, PJ4DX, PJ4KY, PJ4NX, W1MD)
Donor: Victor Burns, KI6IM – The Cuba Libra Contest Club

Caribbean/Central America
KP4AA (Oprs.: KP4AA, NØHJZ)
Donor: Bob Raymond, WA1Z

Japan
JA7ZFN (Oprs.: JA7ACM, JA7NLW, JG7PSJ, JH7XMO, JI7GBI, JP7DKQ)
Donor: Arizona Outlaws Contest Club

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V8, YB, DU)
7D1C (Oprs.: YBØAR, YBØIBM, YB1EME, YB1FAV, YB1IUQ, YB1NWP, YC1CLE, YC1COZ, YC1DSV, YC1GHZ, YD1CGW, YD1FBF, YD1JOH, YD1KDA, YD1PBJ, YG1BKU)
Donor: Bruce Frahm, KØBJ

MULTI-OPERATOR, TWO TRANSMITTER

World
EA8RM (Oprs.: EA2W, EA5KA, EA7X, EA8KR, EA8RM, EB7A, EC2DX, EC7WR)
Donor: Array Solutions

U.S.A.
W3LPL (Oprs.: W3LPL, W3IDT, K3MM, N3QE, K3RA, W3UR, WR3Z, KD4D, N4QQ)
Donor: Kimo Chun, KH7U & Mike Gibson, KH6ND - Dan Robbins, KL7Y Memorial

Europe
CR6K (Oprs.: CT1CJJ, CT1HXB, CT1ILT, CT2HUU, CT2IMG, CT7AGE, CT7ANO, F4AJS, F4EGZ)
Donor: D4C Monteverde Contest Team – IR4X Monte Capra Contest Team – I4EAT Memorial

South America
P4ØL (Oprs.: W6LD, W2GD, K3CT, NY3B)
Donor: South East Contest Club

Japan
JA7YRR (Oprs.: JAØRYN, JA7FDY, JA7MSQ, JA7WSC, JH7BVH, JH7VHZ, JR7BPM, JR7LVA, JE7KCI)
Donor: Yokohama DX Club

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V8, YB, DU)
E2A (Oprs.: DL3DXX, E2ØNKB, E21EIC, E25KAE, E29TGW, HS3PIK, HS4RAY, KØBJ, LA7JO, N5ZO, SP3LPG, VE3LA)
Donor: Champ C. Muangamphun, E21EIC – Siam DX Group

MULTI-OPERATOR, MULTI-TRANSMITTER

World
D4Z (Oprs.: IK2NCJ, G4CLA, GD4XUM, G4BVY, M5RIC, IZ4DPV, SQ9D, HB9CAT, NØVD, EA8FF)
Donor: Dave Leeson, W6NL & Barb Leeson, K6BL

U.S.A.
K3LR (Oprs.: N2NC, N5UM, K3LR, W2RQ, K3LA, N2NT, K1AR, N3SD, K3UA, K1DG, N3GJ, N3RA, DL1QQ, WM2H)
Donor: Jim Lawson, W2PV Memorial

Europe
M6T (Oprs.: G2NF, G4MJS, MØMDR, MØSDV, G4KNO, GØPZA, G4PIQ, G4PVM, GØWCW, G4BUO, G4AFF, MØTBS, G4TSH, GØVJG, GØAEV, MØHKB, GØEGW)
Donor: SRAL (The Finnish Amateur Radio League) – OH5NQ Memorial

CONTEST EXPEDITIONS
World – Single Operator
V85RH (Opr.: Hajime Kato, JO1RUR)
Donor: National Capitol DX Association - W2GHK Memorial

World Multi-Op
P29RO (Oprs.: DG2RON, DJ9KH, DL4SVA, DL6KAC, DL7VEE)
Donor: Gail Sheehan, K2RED

*Awarded to second place finisher

from P40T (as part of his overall 9M/6000 QSO total score), besting an equally impressive 4.8M effort by Martin, CT3KN.

There's a lot that can be said about the single-band entries this year – the results speak for themselves. However, of particular note is this year's 10-meter achievements led by the winning result of Branislav, OM2KW, operating from CR3Y, with a final score of 1.9M points (including an amazing 4500 QSOs!), beating out the 1.7M+ efforts by PV2G (PT2IC op.) and CQ3J (CR3MD op.).

The results of the multi-ops were something to behold this year as perennial champion P33W bested the PJ4G crew by posting a 24.9M multi-single result. Eye-popping scores get even more spectacular as you scan down the result tables. The Multi-2 group was led by the EA8RM team, who won with

2022 CQWW DX SSB TOP SCORES

WORLD

SINGLE OPERATOR
HIGH POWER
All Band

PJ4K (N6KT).....16,224,072
V47T (K5ZD).....13,340,329
P4ØT (VE3DZ) 9,398,793
CT3KN 9,193,977
XL3T (VE3AT) 9,135,758
UPØL (UN9LW) ...8,050,170
C4W (5B4WN) 7,784,250
DM6V (DL7FER)..6,035,036
K4ZW.....6,017,235
S53MM 5,834,028

28 MHz

CR3Y (OM2KW) ..1,970,399
PV2G (PT2IC).....1,729,506
CQ3J (CT3MD)....1,710,060
KP2B (EB7DX) 1,331,424
VR2XAN 943,795
A65BB.....939,757
7Q6M.....882,024
E7AA (E77A) 757,568
IR9W.....728,854
LZ4TX.....724,108

21 MHz

CR3DX (OM3RM).....2,273,994
IY3A (IZ3EYZ) 1,030,002
LW1F (LU5FC) 1,018,026
VK1A (VK2IA).....1,000,714
KU2M.....903,650
OK7W 889,760
UP2L.....600,768
WP4WW (KP4JRS).....569,130
JA7QVI 513,024
OG8M (OH8MCT)...507,122

14 MHz

CR3A (OM3BH) ...2,400,858
OH8X (OH6UM)...1,019,869
OZ7X (OZ5KF) 693,900
W7WA.....667,800
TI1T (TI2VVV).....623,952
DMØA (DK4EE).....498,400
YT7B.....494,700
HZ7C (7Z1SJ).....401,604
YB1DX.....323,177
CE3QY.....292,905

7 MHz

ED5R (EA5Z).....930,155
4L2M.....924,189
CR6T (CT1ESV).....848,318
S57AL.....775,465
S51CK 388,798
OM5R (OM5WW) ...365,560
JJØVNR.....256,743
YT5DXX.....175,890
SP4LVG.....120,524
R4SA 81,699

3.7 MHz

ISØ/OM2TW (OK8WW) 319,277
EE7L.....151,892
OK5D (OK1DTP) 150,474
W3BGN.....59,013
VE9FI.....50,304
W1FQ 21,229
CT1EKD.....19,520
W1HI.....19,093
JAØJHA.....16,215
OK1KTW (OK1DEZ) 12,427

1.8 MHz

S53O.....65,284
UP7L (UN6LN).....38,308
YL3FT.....28,500
OK4U (OK1TP).....27,724
EI5GUB.....6,525
SP9TPZ 4,000
DL2DSA.....1,947
DL2VIW 1,920
DK3AX 88
K3PA.....70

LOW POWER
All Band

WP3C 4,528,710
N1UR 4,035,766
HI3T.....3,397,464
CR2B (EA1BP) 2,178,800
4XØT (4Z5FI).....2,152,332
K1BX.....1,593,606
IH9/IK5AEQ 1,558,025
FG5GP.....1,336,504
WW4XX (LZ4AX) 1,303,932
ED7R (EA7GX)....1,260,336

28 MHz

PY2UD.....761,118
PZ2YT.....725,000
PZ5RA 417,938
ED8B (EA8TR) 415,093
HZ1SK 405,840
EA1R 349,536
N8II 326,960
CB6LR (CE6GDR) 308,454
STØHQ (ST2M) 301,920
VR2T (VR2ZQZ).....281,175

21 MHz

LZ2VU.....575,811
EA9ABC.....459,225
JA6WFM 285,219
JF3BFS.....207,252
FK8GM 200,408
7Z1VD.....181,488
ZW2T (PY2RKG) 170,430
PY2QT 167,918
L71D (LU7DUE).....140,448
7K4XNN.....134,200

14 MHz

YV4EK 521,420
EE3M (EA3CX).....481,585
TG9ANF.....431,607
PY2NY 375,972
UT3EV 287,421
IQ4JO 219,890
HZ1CY 129,753
F4EIH.....110,538
ISØGRB.....100,896
EA5EOR 82,600

7 MHz

4Z5UN 244,881
IT9EWR 126,260
9W2JHZ.....65,898
ON8LX 47,346
YO3JW 36,921
S53MR.....35,189
UR5WCQ.....35,105
RC7KY.....33,666
YDØNHG.....33,616
Z35U 31,950

3.7 MHz

SQ9MR.....58,112
SQ8NGV.....28,842
S53NW 25,288
OM6TX 22,420
SP4SHD 22,176
EA4IS.....21,608
LY5GT 16,165
IN3HEZ.....13,932
OK7R (OK1TNM).....13,160
E74SL.....12,561

1.8 MHz

SP6LUV 26,255
SNØR (SQ9IAU).....19,822
YT8A.....14,716
SQ8MFM 12,691
RA7KX 8,003
LC9X (LA9XGA) 5,655
OE3WMW.....5,580
YU1P 4,212
E7ØE 3,360
GM4JYB 1,716

QRP
All Band

K8ZT 349,160
HG6C (HA6IAM) 279,405
JH1OGC 264,252
UR5FEO 263,228
MI5JYK 226,252
JH7UJU 189,981
DK8R 167,555
M7XTT 166,014
W6QU (W8QZA).....131,130
SO2U 125,292

28 MHz

TI2YO 96,995
IZ4AIF 75,114
ZY6G (PY6GOE) 66,935
K1WHS.....51,624
IZ1ANK 46,221
F2CT.....39,767
KEØWPA 35,646
PY2VQ.....33,165
JA2MWV.....23,572
SQ8MFB.....22,752

21 MHz

EY8BA 119,082
JR4DAH.....83,040
F8AKS 78,987
TA2IB.....58,800
NDØC 47,229
SY1AEA.....42,588
JQ1NGT.....34,992
LZ2RS.....34,278
JR1NKN.....23,374
YC4SIZ.....18,880

14 MHz

YU1NR.....63,546
G2X (GØDCK) 42,201
RT4W.....30,644
YO8RC 23,625
LA7WRA 20,631
SP9NSA.....15,844
IZ8EWD 15,123
YO4BEX 13,860
W2VRK 12,393
ON4MGY/P.....8,268

7 MHz

IZ4VQS 23,858
OK6OK 18,496
HA3GC 9,760
LY2NK 9,750
SV1DZB.....6,765
G4Y (M6OXO) 3,772
GM4M (GM4UBJ) 3,696
HG7J.....2,925
E78CB 2,730
ISØAGY 2,255

3.7 MHz

OL4W (OK1IF).....8,159
PAØAWH.....1,972
ES6KW 42
UB4IIQ/UA6L/QRPP (UB4IIQ).....2

1.8 MHz

UN9LDC 3,354
HA1TI.....3,232
LY4T 2,880
DL1AOB.....1,568
UT4UBZ.....108

SINGLE OPERATOR
ASSISTED
HIGH POWER
All Band

PT5J (PP5JR)....11,807,370
KP3DX (NP4Z) 8,487,812
OMØR (OM3GI)...8,357,640
V31XX.....8,312,928
VA2WA 7,979,664
IR2Q (IK2PFL) 7,310,784
LY4A 6,783,575
S53M (S53ZO).....6,630,894
SN7Q (SP7GIQ) ..6,590,200
ED3X (EA3QP) 6,366,204

28 MHz

CQ3W (DF7EE) ...2,356,893
LU8DPM (LU7DW).....1,706,912
4X1MM 1,259,827
TMØT (F4HQZ) ...1,137,724
V55Y (V51WH) 1,135,136
PW2L (PY2MNL) 1,047,087
TI2CC 874,208
EA8AM.....852,561
HG3R (HA3NU) 848,056
DR1D (DL8UD).....838,332

21 MHz

DL2ARD.....1,369,088
HA5JI 1,260,080
OM2VL.....1,234,815
CX7SS 1,182,613
RL3A (RL3FT) 1,145,088
S5ØK 1,141,554
FJ/SP9FIH (SP9FIH).....1,124,052
HA8A (HA8DZ) 1,082,771
EE5K (EA5DF).....942,210
S5ØR 934,719

14 MHz

DL6FBL.....1,588,020
SQ2A (SQ9UM) ...1,336,704
OL9Z (OK2PVF) ..1,184,448
PY6BA 1,096,176
IB9T (IT9BLB).....1,055,544
9K9A (9K2OD).....1,054,356
S57DX 1,004,640
VE2IDX (VE3ZF) 754,290
HA1AH.....644,716
F8DVD 631,625

7 MHz

SN3A (SP3GEM) 660,576
S51YI 538,720
YT1A.....517,450
EY8MM 391,952
JH7MQD 348,864
OH7K (OH8SR) 246,500
G8X (G4FJK) 239,242
UK9AA 191,748
F4FJH 186,615
9K9C.....135,897

3.7 MHz

IB3M (OE6MBG).....222,860
HA1TJ.....203,796
IK2QPR.....143,936
TI1K (TI5CDA) 127,038
I1JTQ.....116,748
SP2PIK (SP2MKT) ...95,351
YU1LD 91,430
W3NO 59,580
MI5K (MIØSLE) 40,328
SQ7NSN 33,120

1.8 MHz

S56X 48,709
IKØNMJ 21,924
LC5K (LA5YJ).....9,844
DR3W (DL6MHW) 7,380
K5UR 4,510
OH2BO 2,795
EA1HV 2,448
LY7M 210
K2KW.....77
LZ2ZG.....45

LOW POWER
All Band

TM3Z (F4DSK) 3,736,488
9A2EU 2,591,238
UA9MA 2,241,680
PA9M 1,898,824
WE9R 1,740,975
HZ1TL.....1,738,550
SQ6H (SQ6PLH) 1,603,928
N2YO 1,539,699
KS1J 1,486,660
N3AAA 1,317,580

28 MHz

CO2XN 896,940
9A9R.....711,828
EA7Z.....579,320
PU2SDX 525,555
N1DG.....516,502
EA2LMI 514,755
XQ3WD.....416,312
4L5EE 399,630
IT9XTP.....389,928
EA6SX 385,616

21 MHz

IK4LZH.....524,308
KP4PUA.....515,460
M5W (MØHMJ).....404,250
UN4L.....381,450
IF9A (IT9ATF).....263,568
R7KCW (R6KVA)....234,612
E77FA.....212,325
SP9XCN 207,360
TC99TC (TA2IJ) 191,973
HI3MM 178,500

14 MHz

YU5M.....291,600
CN8SG 243,048
EU2F.....217,394
FM1HN 214,935
PY2TC 214,832
UNØLM.....200,850
SP4DZT 173,280
VA3OOL 166,690
HI3MPC 148,149
RZ3Z.....139,620

7 MHz

HK3EA 565,677
EI9HX 89,748
IR4P (IK4RVG) 71,344
SP3AYA.....62,178
EA9KB 56,800
F4BIV.....50,715
E77X.....25,456
F4IRT.....24,840
OE2ROL 24,702
9A3QB 20,824

3.7 MHz

IZ4REF 62,916
OM5KM.....28,121
SP2N (SQ2HCW) 26,260
YT5ANA.....24,428
EA3CN.....18,585
OK1AY.....11,544
LY2AT.....10,965
MMØGOR.....10,944
DJ6OI.....10,320
OM4AQP 9,585

1.8 MHz

OK6Y (OK2PTZ).....29,295
E79D.....26,523
HF7A.....11,025
ED3M (EA3FP) 10,300
MM1E (MMØGOR) 4,576
EI6JK 2,610
4L7ZS 480
RT6C 54
VE9ML 24

QRP
All Band

OK2FD.....225,990
HG5O (HA5OB) 138,831
HF9CW 136,344
SQ5CW.....129,024
YU1LM.....103,601
TA9J 92,416
SP9RQH.....69,600
JK1TCV 55,510
PE2K.....53,298
YB2NDX 48,768

28 MHz

AC5O 85,902
EF3O (EA3O) 48,222
PY9DM 28,764
LX3AA.....22,750
KO1H 21,294
8J6YAB (JA6VZB) 19,987
OQ4B (ON4BHQ) 17,818
N6MZ.....13,456
PY2MDF 13,167
S59GS 8,957

21 MHz

JA6GCE.....127,050
OMØRX 97,104
YBØSSF 86,204
IT9RJE.....64,920
JM1NKT.....59,040
LY2OU 46,420
E73AA.....34,020
SV1NK 33,396
G1G (G4KIV) 15,180
BA4WI.....11,628

14 MHz

MI1M (MIØLLG).....31,540
SP5PDA.....18,673
PP1ZZ.....7,350
YT1BD 5,838
IZ2QKG.....5,040
JF3KQA 1,276
JM2RUV 80
OM6AS 35

7 MHz

OE3MDB.....3,588
YD8FLF 1,102
YF7RDM 864
JH3DMQ 714
GW5P (GWØEGH) 560
VE3BFU.....266
9M2CDX 48

3.7 MHz

SP5FKW 13,167
IO5K (IK5TBK).....12,210
SP5ES 11,820
EA5S.....10,123
SQ9SX.....99
VA7IR 50

1.8 MHz

S54ZZ 18,872
9A/IZ3NVR.....2,904
9A4QV 576

MULTI-OP
SINGLE-TRANSMITTER
HIGH POWER

P33W 24,948,370
PJ4G.....19,282,256
E7DX 15,649,472
IR4X.....15,237,992
TM6M.....14,895,924
LZ5R 13,684,872
EW5A.....13,254,210
VE3EJ.....11,834,130
IR4M 11,621,455
IR6T 11,524,994

LOW POWER

FY5KE 13,951,476
J68HZ 7,195,568
ED7O.....5,900,622
VP5DX.....4,417,865
HZ1BW 4,339,212
ED1B 3,475,200
LX8M 3,399,088
WW4LL.....3,342,634
IO3F.....3,311,885
TC7G 2,722,296

an incredible 38.7M score. Perhaps the most amazing result of the entire contest, however, goes to the D4Z multi-multi team, who achieved an incredible 50M point score and over 19,000 QSOs! And that included an unexpected one-hour off-time due to a station problem. Imagine the reaction of the CN3A team, who scored 47.4M but came in second. Hats off to both groups for a job well done.

Before moving on, we need to acknowledge our Rookie and Youth entries. Between the two overlay groups, we received 470 logs this year. The CQ WW is indeed attracting newer operators, which bodes well for the contest's future! Roberto, IU0OVB, led the Rookies with a fine score of 1.5M. There is some good contest mentoring going on in Italy. And, the Youth contingent was won by Andreas, 5B4AQT, with a

MULTI-OP
TWO-TRANSMITTER
EA8RM 38,749,256
P4ØL.....24,628,032
ZF1A.....24,295,992
CR6K.....19,736,855
EI7M 18,787,860
PX2A.....17,619,751
W3LPL.....16,260,048
ES9UKR 16,250,324
9A1P.....15,959,447
ED1R 15,804,510

MULTI-OP
MULTI-TRANSMITTER
D4Z.....50,007,304
CN3A 47,413,520
PJ2T 34,239,262
K3LR.....25,835,784
M6T.....21,693,672
K1LZ 21,461,871
V26B.....20,092,748
LZ9W 19,672,752
YT5A.....19,599,723
DFØHQ.....17,362,332

EXPLORER
SINGLE-OP
S53K.....479,765
9A1DR 87,516
SQ5EXM.....16,380
W2MRD 11,304
PY2YAS.....7,168

EXPLORER
MULTI-OP
OT7T.....9,900,208
IOØA.....4,328,676
EA4URE 3,519,552
9H6A.....3,297,650
EE7K.....1,961,756
IB2C.....652,320
9M8J.....231,504
EA6URL.....138,533

ROOKIE
HIGH POWER
IUØOVB.....1,514,955
W9DCT 1,093,680
9A5RTW 1,079,910
LX1LC.....686,154
K3AK.....613,410
IU1NKS.....546,720
W3FR.....544,600
VE3GJP 423,522
DD5VL 360,570
F4JJS.....247,342

ROOKIE
LOW POWER
EA4HKF.....687,635
AEØDX 550,525
EA5JEG 413,699
VA3OKG 331,420
SP9PD 320,565
DL9DX 313,635
TK4TH 308,847
SN3J (SP3DAT).....295,875
IU4NGP 284,130
WP4TZ.....266,178

CLASSIC
HIGH POWER
P4ØT (VE3DZ) 5,338,158
CT3KN.....4,838,712
KP2M (KT3Y).....4,586,904
KQ2M.....4,467,840
WH7T (WH7W)....4,440,352
EB5A.....4,027,944
ED8M (EA8DIG) ..3,979,508
ZF2AA (VE9AA)...3,170,244
DL2CC.....2,677,106
KØEJ 2,636,412

CLASSIC
LOW POWER
K1BX.....1,593,606
IH9/IK5AEQ 1,558,025
FG5GP.....1,336,504
WW4XX
(LZ4AX) 1,303,932
KH6CJJ.....1,060,811
OL5Y.....927,639
CO8NMN 793,026
PZ2YT.....725,000
YO7SR.....619,440
WA3LXD 524,210

YOUTH
HIGH POWER
5B4AQT 1,152,580
DK6SP 1,085,640
E7ØAW.....943,236
KHØUA 922,209
LX7I (F4HWS) 757,520
KE8HBV.....540,792
DK5AV 386,884
OE8DDX.....291,555
F4IDC 249,240
DC2CL 216,800

YOUTH
LOW POWER
9A3GVJ 594,392
BD4VGZ 256,795
SP3GTP.....180,632
LY5AX.....167,014
DL2ALY 161,200
HA1BB 157,740
NR1K 144,504
KE8RJU 142,064
VE3GKT.....131,338
VE3OMV.....76,428

UNITED STATES

SINGLE OPERATOR
HIGH POWER
All Band
K4ZW.....6,017,235
K5TR.....5,005,155
W9RE 4,980,048
KQ2M.....4,467,840
K3ZO 4,289,844
NR3X (N4YDU)....4,127,820
ND7K
(@N6WIN) 3,007,544
N2QV 2,785,321
KØEJ 2,636,412
K7RL.....2,337,120

28 MHz
N4OX.....695,360
K2XA.....599,666
K4WI.....520,277
N1PGA.....467,200
W5PR 375,804
KØPJ 322,010
K1RM.....235,524
W4DD 208,080
KW9A.....173,476
WE6EZ 138,132

21 MHz
KU2M.....903,650
N1LN.....400,650
WC6H (NU6S) 328,679
N7RQ.....269,001
NE8P 233,112
N5CR.....171,384
W9ILY 114,400
KØBBB 106,743
KI5QKL 95,964
WD6DBM.....90,948

14 MHz
W7WA.....667,800
KE8FT.....64,480
N7TU 59,940
KA3LKM.....51,260
W8GOC 19,832
KC3RRF 18,288
W2IKN 5,586
K1ALA.....1,342
KI5ODW.....384
KB9ORA 216

7 MHz
K9CJ 7,436
AA8BV 5,390
KK7DP 3,774
W8SJS.....272
W6IA.....144

3.7 MHz
W3BGN.....59,013
W1FQ 21,229
W1HI.....19,093
K2PM 9,555
W6RKC.....2,001
K5IB 36

1.8 MHz
K3PA.....70

LOW POWER
All Band
N1UR 4,035,766
K1BX.....1,593,606
WW4XX
(LZ4AX) 1,303,932
W6DVS 791,336
K8ZM 740,124
N1NQD 725,637
K3SWZ 682,348
K5FUV 676,620
ACØW.....559,721
WA3LXD 524,210

28 MHz
N8II 326,960
K5OF 254,562
N1WRK.....141,022
N3GB 119,704
K4TMC.....114,814
WK2G 110,016
W4RYW 91,350
N8VW 90,780
W8JGU 76,845
WBØLQC.....70,196

21 MHz
WA7BNM 92,432
W9QL.....64,155
W5CUB.....50,140
KC8ZMN 32,452
N6RM.....26,044
WØJIM.....13,560
KF5RLL.....11,913
N9HDE.....8,816
WB8SAG 4,914
KI5IQE 4,680

14 MHz
KB8VND 27,335
KBØKFH 5,412
K4QR 5,085
KV4AC 4,386
AA1F.....3,420
W3EH 2,790
KE3O 2,528
KG5TKF.....2,016
KG5ZNJ 1,150
AB1J 666

7 MHz
K4SXT 19,440
K7BWC 3,100
N1UMJ.....1,472
KM1NDY.....1,071
W8WJC.....903
N5QNS 684
N5MKY 391
KD5CMW.....360
N8TCP 228
K6WBY 187

1.8 MHz
W1HIS 18

QRP
All Band
K8ZT 349,160
W6QU (W8QZA).....131,130
W3EK.....77,355
KA8SMA 72,695
N7JI 35,805
NF2L.....22,892
N3CI.....19,926
KB4FUW.....11,826
WC7S 10,296
K7FR.....9,316

28 MHz
K1WHS 51,624
KEØWPA.....35,646
WB3GBL.....6,624
W8IQ.....4,590
KØVK.....1,848
W4RLS 1,035
KA7T.....704

21 MHz
NDØC 47,229

14 MHz
W2VRK.....12,393
K4CUZ.....230
K1NLL.....80

7 MHz
WU2M.....1,333
WA2NYY.....60

SINGLE OPERATOR
ASSISTED
HIGH POWER
All Band
K3WW.....6,141,828
WB9Z.....5,813,697
AA3B.....5,674,212
N2IC.....5,410,368
N3RS 5,085,948
K4AB.....5,004,090
N2SR 4,869,000
AB3CX 4,444,160
NN1SS.....4,209,824
AA1ON.....4,182,408

28 MHz
N4EEB 618,852
AA9A.....441,450
NJØF 344,800
WJ2D.....284,592
W1UE 262,780
N6SS 248,381
N1MM 223,524
W8CZN 170,240
W7RN (K5RC) 169,500
W1AJT 161,379

21 MHz
WA2OAX 483,653
W6AFA 370,668
N7DD 328,614
W9PA.....280,716
KM4HI.....203,060
W7IL 183,084
NØRN 41,055
WT2J 31,692
N9TCA 17,301
KI7N.....1,260

14 MHz
KVØQ 313,058
WA4JUK 114,829
WM1G.....108,000
WF7T 96,247
NIØK.....49,294
W7ZR.....10,030
W7CO 2,295
N5KAE 1,170
AD7LJ 1,134

7 MHz
W6KW.....65,508
W4PG 31,995
N9LR.....31,125
KG1E 18,291
N7RK 15,561
KD4RH.....5,700
KB7QFE.....77

3.7 MHz
W3NO 59,580
K3MM 22,400
KM2G.....16,897
W4TTY.....4,998
N2KA 1,976

1.8 MHz
K5UR 4,510
K2KW.....77

LOW POWER
All Band
WE9R 1,740,975
N2YO 1,539,699
KS1J 1,486,660
N3AAA 1,317,580
W3KB.....1,306,216
N4XL.....1,013,520
NS3T.....722,990
KA2KON 695,980
K8LY 670,542
NC1A 651,130

28 MHz
N1DG.....516,502
W4RN 304,428
N3UA 224,000
W9XT.....163,280
W6ZL 67,080
WA2LMC 45,630
KB3NJB 42,930
K2ZR.....37,696
K2IW 37,146
K4JPD.....35,178

21 MHz
N4IJ 151,230
N9TGR.....146,727
WA1FCN.....130,438
WA5WFE 77,998
WB9HFK.....40,940
W8TJM 11,800
KEØITC 10,738
WV7S.....940

14 MHz
KO4WPO 5,891
N1KJS.....4,700
WA8ZNC.....3,312
K4WWP 3,016
AK2U 2,244
W9QEE.....532
K1NDU.....440
WØSAB 6

7 MHz
K1IM 18,292
KA9A.....3,570
AA4NP 2,430

3.7 MHz
W1DYJ.....3,848
WZ6ZZ.....960

QRP
All Band
K2PI 19,448
NO5V 8,576

28 MHz
AC5O 85,902
KO1H 21,294
N6MZ 13,456

MULTI-OP
SINGLE-TRANSMITTER
HIGH POWER
K9RS 7,117,835
K8AZ.....4,458,135
W7RM.....3,960,408
K4RM.....3,704,810
NA2U 3,257,604
N4UU 3,093,960
NJ4P 2,591,512
N4SS 2,565,640
K3AJ 2,409,097
W1TJL 2,221,032

LOW POWER
WW4LL 3,342,634
W1QK 1,168,790
WA1F.....1,020,992
W3ZGD.....958,500
KT4XA 455,975
W1OP 283,884
AA2MF.....281,162
KA8YNW.....166,192
W1JSR.....160,590
AD4XT 114,264

MULTI-OP
TWO-TRANSMITTER
W3LPL 16,260,048
K1CC 10,751,922
K9CT.....8,219,670
K2AX.....6,387,920
W2MKM 6,047,919
KM8Q.....4,197,402
AA4VT 3,844,200
W4NF.....3,150,264
K8LX 2,220,568
W2EN 1,980,090

MULTI-OP
MULTI-TRANSMITTER
K3LR.....25,835,784
K1LZ 21,461,871
WX3B.....11,870,899
K1TTT.....11,127,144
W3PP.....6,004,999
K1KI 5,509,664
K3EST 5,432,178
W2A 3,848,526
K1KP.....3,700,234
NE3F.....2,836,592

EXPLORER
SINGLE-OP
W2MRD 11,304

ROOKIE
HIGH POWER
W9DCT 1,093,680
K3AK.....613,410
W3FR.....544,600
KO4VW.....177,310
K7WXB 141,966
KD2UBH 135,044
N7RBL 132,258
KI5QKL 95,964
N3AML.....64,800
KFØADW 50,410

LOW POWER
AEØDX 550,525
K1MWH 250,776
KY4KP 220,834
N3BAS 126,528
KFØHCN.....126,224
KFØIDT.....123,633
N2EPE 102,912
N8ACP.....97,913
KD2VSD 92,160
KR3L.....80,842

CLASSIC
HIGH POWER
KQ2M.....4,467,840
KØEJ 2,636,412
K7RL.....2,337,120
WS7X.....1,553,752
KN2M.....1,466,874
KU8E 1,088,235
W1JQ.....1,035,954
N5YT.....820,386
NG1M 807,234
N5AW 772,213

LOW POWER
K1BX.....1,593,606
WW4XX
(LZ4AX) 1,303,932
WA3LXD 524,210
N1DC 393,666
N1ALO 370,953
N8II 326,960
KA1YQC 293,702
WD9CIR.....285,500
WA5JMZ 259,316
KC4TEO 259,182

YOUTH
HIGH POWER
KE8HBV.....540,792
KD9V 147,500

LOW POWER
NR1K 144,504
KE8RJU 142,064
NØJMP 36,366
KEØWPA 35,646
N8AJM 29,972
NC8R 14,630
K4IEY.....9,675
W8QI.....975
N2NJW 825
KQ4AKR 384

1.1M point result. What's more amazing about Andreas is that the 2022 CQ WW was his first contest, including his first amateur radio QSO. How's that for getting off to a good start?

What's Your Favorite Category?

When reviewing this data from the 2022 contest (see *Table 1*), I had to do a double-take as it looked almost identical to last year's numbers. We certainly are set in our ways from an operating point-of-view. Keeping in mind that this is solely all band data, the split between assisted and unassisted entries remains the most informative; the unassisted single operator entries far exceeded their assisted counterparts by 3277 to 2344. Interestingly, the unassisted low power group, in particular, led by over 2:1. It's clear, at least for the CQ WW, that the assisted and unassisted entry classes will be here to stay for some time to come.

Table 1

Category	AF	AS	EU	NA	OC	SA	ALL	% of total
SOAB High/Assisted	2	76	462	658	30	38	1266	20.7%
SOAB High/Unassisted	11	136	276	357	59	28	867	14.2%
SOAB Low/Assisted	3	76	537	343	40	46	1045	17.1%
SOAB Low/Unassisted	16	270	1047	733	153	72	2291	37.5%
SOAB QRP/Assisted		3	14	2	3	1	23	0.4%
SOAB QRP/Unassisted		14	66	23	8	8	119	1.9%
Multi-2	2	13	44	27	8	5	99	1.6%
Multi-Multi	2	6	21	18	5	4	56	0.9%
Multi-Single/High	1	16	114	42	9	18	200	3.3%
Multi-Single/Low		23	65	25	12	6	131	2.1%
Explorer/Multi		1	7		1		9	0.1%
Explorer/Single-Op			3	1	1		5	0.1%
ALL	37	634	2656	2229	328	227	6111	100.0%
% by Continent	0.6%	10.4%	43.5%	36.5%	5.4%	3.7%	100.0%	

*Single band entries not included in analysis.

Table 1. 2022 CQ WW SSB Logs by Entry Class

2022 CQWW DX SSB BAND-BY-BAND BREAKDOWN — TOP ALL BAND SCORES

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

WORLD SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
PJ4K	130/10/17	524/22/64	1126/26/82	2226/33/84	2361/35/97	3019/27/100
V47T	41/6/14	613/17/71	1367/26/89	1992/34/98	2319/29/93	3071/25/97
P4ØT	11/5/10	399/15/59	568/23/63	1338/32/99	1619/27/86	2030/28/94
CT3KN	22/5/16	347/13/51	324/16/62	1157/29/88	1527/31/95	2457/31/100
XL3T	151/7/12	701/20/61	1017/27/90	1847/33/99	1263/26/95	1312/24/99

USA TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
K4ZW	32/10/21	216/16/56	306/25/75	866/30/103	1048/29/106	1205/24/100
K5TR	26/10/16	83/18/48	793/30/77	514/32/84	1178/32/97	1289/32/97
W9RE	23/5/11	118/17/53	369/26/74	798/33/103	1025/33/103	991/30/90
KQ2M	18/8/13	201/15/51	92/17/47	595/29/82	1104/26/81	1402/22/89
K3ZO	10/6/6	255/13/49	387/24/72	501/29/81	1098/30/93	797/24/87

WORLD SINGLE OPERATOR ASSISTED ALL BAND

PT5J	8/4/5	130/17/53	613/32/99	1416/36/113	1637/35/121	2424/33/130
KP3DX	45/8/13	304/14/59	1102/25/89	1483/35/103	1174/31/105	1868/32/108
OMØR	210/10/51	577/18/76	846/30/107	1107/36/120	1273/36/124	1142/36/127
V31XX	34/5/7	428/21/65	897/27/88	762/33/96	1595/29/108	2143/31/114
VA2WA	148/9/17	370/16/59	366/22/69	1352/35/109	1408/29/107	1317/27/117

USA SINGLE OPERATOR ASSISTED ALL BAND

K3WW	32/9/18	173/18/59	432/27/89	701/33/105	888/30/111	1286/28/117
WB9Z	26/8/13	206/20/67	192/28/80	366/37/109	770/35/120	1586/33/131
AA3B	29/10/20	213/17/58	328/23/81	763/33/105	823/30/110	1106/28/118
N2IC	25/8/9	108/20/37	882/29/73	367/36/102	1045/33/112	878/32/115
N3RS	30/10/19	133/16/54	186/25/77	555/36/106	942/31/115	996/28/117

WORLD MULTI-OPERATOR SINGLE TRANSMITTER

P33W	202/10/56	499/19/78	1921/33/120	2435/39/149	1863/38/146	3183/39/151
PJ4G	38/9/16	498/23/79	1690/30/105	1540/36/124	2028/36/128	3205/34/129
E7DX	52/11/52	701/22/90	1832/34/132	1616/39/144	2013/35/141	2215/38/140
IR4X	48/9/48	515/20/80	1333/34/120	1700/39/140	2038/39/146	1943/37/141
TM6M	123/11/46	535/19/75	1382/33/114	1491/39/132	1808/37/143	2505/39/139

USA MULTI-OPERATOR SINGLE TRANSMITTER

K9RS	18/9/16	333/16/66	289/28/88	1164/38/123	1001/32/121	1150/28/120
K8AZ	21/10/19	68/16/51	192/28/84	394/34/112	623/31/119	1147/32/123
W7RM	17/7/7	165/22/35	686/31/73	541/36/107	880/35/111	381/26/74
K4RM	16/6/6	182/18/60	198/27/77	457/37/108	608/29/110	750/29/122
*WW4LL	3/2/2	122/13/53	174/24/77	383/32/100	404/27/102	1032/27/112

WORLD MULTI-OPERATOR TWO TRANSMITTER

EA8RM	193/11/47	893/21/83	2221/31/115	2979/39/143	4464/38/147	4692/38/155
P4ØL	72/8/18	576/23/75	2120/28/102	2656/38/115	3739/33/119	2972/32/113
ZF1A	97/6/14	784/20/75	2781/29/109	2897/38/116	4186/34/124	4021/33/126
CR6K	209/12/48	1098/20/84	1718/31/112	2177/37/133	3457/36/128	2978/38/136
EI7M	173/11/46	1196/16/80	1647/34/119	2257/40/123	3358/38/136	2530/36/127

USA MULTI-OPERATOR TWO TRANSMITTER

W3LPL	34/12/28	481/22/81	1126/31/108	1481/39/131	2670/36/141	1822/31/138
K1CC	45/10/29	282/18/72	456/32/96	1380/38/125	1576/33/128	1456/31/126
K9CT	42/9/17	212/22/63	512/29/92	786/38/116	1497/35/126	1716/34/129
K2AX	20/8/10	162/13/55	250/26/75	658/34/101	1254/30/116	1432/28/120
W2MKM	18/5/6	153/14/49	193/27/78	888/34/113	1284/30/118	1042/28/119

WORLD MULTI-OPERATOR MULTI-TRANSMITTER

D4Z	209/15/54	1306/23/89	2856/35/119	4819/39/145	4850/37/144	5222/39/153
CN3A	313/12/53	1981/25/101	3150/32/124	4093/38/144	4328/36/142	4693/39/149
PJ2T	227/14/29	954/23/86	2656/30/118	3490/38/130	3973/33/115	4429/34/123
K3LR	340/14/37	903/23/86	2040/36/129	2767/40/158	3158/38/148	2727/33/142
M6T	581/11/57	1744/21/95	3377/36/131	2570/39/142	2823/38/144	1847/35/133

USA MULTI-OPERATOR MULTI-TRANSMITTER

K3LR	340/14/37	903/23/86	2040/36/129	2767/40/158	3158/38/148	2727/33/142
K1LZ	178/16/50	729/23/83	1336/33/112	2361/40/145	2667/37/140	2472/33/137
WX3B	22/5/9	218/14/52	751/28/86	1927/38/117	2227/32/127	1855/30/123
K1TTT	178/12/33	397/21/74	828/28/95	1425/37/130	1713/34/130	1681/29/126
W3PP	16/9/10	120/18/56	170/25/75	1142/37/109	725/30/121	1278/28/119

How Much Time Did You Operate in the 2022 CQ WW?

Operating any contest is an investment in time, especially for serious competitors. For many of us feeling the effects of age, it's a challenge to put in the time it takes to deliver a top score. The CQ WW has an added challenge – it's addicting, especially if we are blessed with the propagation experienced in the 2022 contest.

Operating by yourself as a single operator presents a unique set of physical challenges. However, there are those unique individuals that continue to figure out ways to power through the excuses. As you can see in *Table 2*, there were 14 operators that put in 45+ hours of operating – several of whom were active for the entire 48 hours!

Congratulations to the superman club as well as everyone as a whole who averaged 10+ hours this time around. What's your goal for this year?

Getting it Right in the CQ WW!

This is a list of callsigns that you want to be on – the lowest error rates! Each entry in *Table 3* worked at least 1000 QSOs, submitting logs with less than 1% mistakes (e.g., bad calls, not-in-log reports, bad exchanges). Imagine, in several cases, working 5000+ QSOs and having only ~50 QSOs identified as being invalid. These results demonstrate that delivering a winning log is more than simply delivering the highest raw score; it's also about accuracy. Congratulations to each of these competitors for setting a fine example of world-class operating!

Our CQ WW Youth Operators are Everywhere!

While there is little debate about the advancing age of ham radio operators

Table 2

Op hours	AF	AS	EU	NA	OC	SA	All
0.1-5	5	162	567	535	64	36	1364
5.1-10	4	124	604	519	85	45	1377
10.1-15	7	120	439	376	57	37	1036
15.1-20	6	58	313	284	38	31	730
20.1-25	6	50	209	194	22	20	501
25.1-30	1	28	122	97	10	13	271
30.1-35	1	17	72	56	11	5	162
35.1-40	2	12	34	33	4	2	87
40.1-45		2	35	18	1	3	59
45.1-48		2	6	4	1	1	14
All	32	575	2401	2116	293	193	5613
Median hours		15.2	10.5	10.3	10.1	9.6	12.3

Median time for all: 10.3 hours

Table 2 – Operating Time Analysis for the 2022 CQ WW SSB Contest (Single-Op All Band entries)

EUROPE TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
DM6V	101/8/36	510/10/50	762/21/81	1131/31/90	1097/32/92	1108/32/91
S53MM	176/7/37	725/17/72	734/26/90	1061/32/94	991/31/97	807/34/99
EB5A	61/8/31	391/12/61	698/23/79	398/22/69	914/29/88	1045/33/97
OM7K	148/5/35	357/11/53	786/24/86	964/28/84	602/27/69	330/26/61
HB9TOC	186/7/35	636/14/66	667/21/78	421/22/58	678/27/70	501/24/76

EUROPE SINGLE OPERATOR ASSISTED ALL BAND

OMØR	210/10/51	577/18/76	846/30/107	1107/36/120	1273/36/124	1142/36/127
IR2Q	128/9/44	424/15/71	772/30/101	940/37/123	1175/36/128	949/36/124
LY4A	333/11/57	800/21/84	1091/32/107	1013/35/121	727/30/106	1191/33/138
S53M	72/8/43	704/18/81	976/31/112	741/39/124	787/34/119	856/37/132
SN7Q	130/9/35	511/18/68	437/27/85	1486/33/97	1004/33/103	1014/36/120

EUROPE MULTI-OPERATOR SINGLE TRANSMITTER

E7DX	52/11/52	701/22/90	1832/34/132	1616/39/144	2013/35/141	2215/38/140
IR4X	48/9/48	515/20/80	1333/34/120	1700/39/140	2038/39/146	1943/37/141
TM6M	123/11/46	535/19/75	1382/33/114	1491/39/132	1808/37/143	2505/39/139
LZ5R	56/9/44	723/21/83	1674/34/120	1941/40/142	1746/37/141	2124/38/147
EW5A	178/10/51	957/24/94	1423/31/120	1413/40/142	2079/37/145	1657/36/144

EUROPE MULTI-OPERATOR TWO TRANSMITTER

CR6K	209/12/48	1098/20/84	1718/31/112	2177/37/133	3457/36/128	2978/38/136
EI7M	173/11/46	1196/16/80	1647/34/119	2257/40/123	3358/38/136	2530/36/127
ES9UKR	364/10/54	1172/23/90	1997/34/124	2652/40/157	2830/38/148	1570/37/144
9A1P	221/8/45	1178/20/81	1599/34/118	2629/40/129	2015/38/136	2044/39/145
ED1R	137/10/46	969/18/76	1792/31/110	1790/38/128	2575/37/134	2598/37/132

EUROPE MULTI-OPERATOR MULTI-TRANSMITTER

M6T	581/11/57	1744/21/95	3377/36/131	2570/39/142	2823/38/144	1847/35/133
LZ9W	566/10/56	1819/24/99	2876/34/131	3636/40/146	2343/38/141	1458/37/132
YT5A	587/11/58	1634/22/88	2836/35/123	3340/40/144	2556/37/139	1747/38/138
DFØHQ	805/14/65	1673/23/93	2777/34/128	2250/40/145	2086/37/145	1390/37/136
OT5A	496/8/47	1527/17/74	1990/28/109	1865/39/126	1601/35/121	1131/32/106



Bob, W3HKK, built this low-budget 10M Moxon Yagi just for the CQ WW contest. Who says you need big antennas to have fun?

Remembering Fred Laun, K3ZO

BY KEN CLAERBOUT, K4ZW



Beloved contester Fred Laun, K3ZO (SK), standing next to one of his many passions — the Yasme QSL collection at Austria's DokuFunk museum in Vienna, Austria.

I grew up in Cedar Grove, Wisconsin. A short thirty-five-mile trip to the northwest would find you in Kiel, home of the AA Laun Furniture Company. Given that my parents ran a furniture store, I would make frequent trips, while in high school, to Laun Furniture to pick up needed items. During that time, although Fred had moved to the Washington, DC, his legend with the local hams was already well established.

I was once told if you ever heard Fred running a pileup, just yell "Sheboygan County" and he'll stop the pileup in its tracks and answer you. Shortly thereafter I found HS1ABD on SSB for a new one and I did as I was told. Sure enough, Fred told everyone to standby while he worked the station from Sheboygan.

I first met Fred in 1984 after I moved to the DC area. One day, I called him on the phone and he graciously invited me to visit on a sunny Saturday morning. Fred said, "The crew will be here putting up an 80-meter beam." Really? An 80 meter beam?!? This was the mid-80s. Not many people had rotatable 80-meter yagis back then and still don't today.

Over the years, like most of you, I came across Fred in almost every contest. There was always that extra "dit dit" at the end of the exchange as a couple of cheeseheads were doing nothing more than exchanging good wishes.

Some years ago I was visiting Fred and he said, "Can I ask a favor?" Not knowing what it was, but coming from Fred, I said, "Of course!" It turned out that he had a couple TenTec Titan amps that needed to be repaired. Fred mentioned, "I understand you have a bench and that you do repair work. Could you look at these amps for me?" Well in fact I didn't have a bench and I didn't do equipment repair but I said, "Sure I'll take a look." Over time, this unexpected beginning morphed into my becoming the K3ZO station engineer, helping with other projects in the shack. KC1XX and team took care of the outside projects.

One upside to volunteering for this work was that we would get together on a more frequent basis, often going out to dinner together. When COVID hit I would cook up some brats, bring him some Gibbsville (WI) cheese, and we would hang out at his place chewing the rag. Topics ranged from ham radio, sports and the Green Bay Packers, our experiences working overseas with the government, and world events. Fred's degree was in political science, after flunking out from the engineering program at UW Madison. His broad view of the world always provided an interesting perspective. I valued that time together and was happy to have had a hand in keeping his beloved ham station operational, because I knew it meant a lot to him and it was something that kept him active in his later years.

On Sunday morning, December 18, 2022, I was standing in the international arrivals baggage area at Dulles airport having just spent 17 hours on an Ethiopian Airlines flight from Addis Ababa in a cramped economy seat. I was looking forward to getting home. Two calls from the same number came in back-to-back, the second time leaving a voice message. It was his neighbor Roger. Fred was ill and slipped getting out of bed. At that time, he was alert but too weak to move around on his own. Naturally, I immediately drove over to his house. Shortly thereafter, K4YT's XYL, a doctor and close friend of Fred, arrived. With the help of paramedics, we moved Fred into Roger's car and took him to a local hospital at his request. The ensuing days were a blur as we spent many hours together in that hospital room. Sadly, K4YT and I last saw him on Monday, January 2, 2023. Before we left, I squeezed his hand, told him I cared about him, and let him know the Packers kicked the Vikings' butt on Sunday and that they still had a chance to make the playoffs. He would have taken great delight in that. There was no response. We lost him the next day.

How fortunate we are to have such icons in our club. Like most everyone in the contest world, I've never operated a major contest without K3ZO being on the bands. His station will eventually be dismantled. But the memories that so many of us cherish will last forever.

RIP OM. It was a hell of a run.

SINGLE-OPERATOR
TOP SCORES IN MOST ACTIVE ZONES

Zone 3

ND7K (@N6WIN)	3,007,544
K7RL	2,337,120
K6XX	2,272,739
K6NA	1,478,655
W7WA	667,800

Zone 4

XL3T (VE3AT)	9,135,758
K5TR	5,005,155
W9RE	4,980,048
KØEJ	2,636,412
VC3R (VE7VR)	2,323,322

Zone 5

K4ZW	6,017,235
VY2TT (K6LA)	4,993,944
KQ2M	4,467,840
K3ZO	4,289,844
NR3X (N4YDU)	4,127,820

Zone 14

DM6V (DL7FER)	6,035,036
EB5A	4,027,944
HB9TOC	2,775,852
DL2CC	2,677,106
EA5DFV	2,543,590

Zone 15

S53MM	5,834,028
OM7K (OM7RU)	3,035,167
YT3D	2,435,860
S57K	2,283,131
OH5BM	1,584,008

Zone 16

*UA3BL	543,968
R3RZ	390,033
*RC5Z	318,396
*R6KX	293,917
*UT3EV	287,421

Zone 20

C4W (5B4WN)	7,784,250
*4XØT (4Z5FI)	2,152,332
TA3DE	1,992,144
YPØC (YO3CZW)	1,779,138
YM7KA (TA7I)	1,164,745

Zone 25

JH4UYB	3,562,173
JF2QNM	1,791,325
JF1NHD (N6VI)	1,574,703
JH7QXJ	1,259,760
HL2WA	1,038,800

Table 3

Entrant	Continent	Power	Raw Qsos
P40T (VE3DZ)	SA	HIGH	6021
WP3C	NA	LOW	4980
DM6V (DL7FER)	EU	HIGH	4754
WH7T (WH7W)	OC	HIGH	4474
ED8M (EA8DIG)	AF	HIGH	3301
9N7AA (S53R)	AS	HIGH	2620
KH6CJJ	OC	LOW	2336
OA4SS	SA	HIGH	2143
K6XX	NA	HIGH	2049
4X0T (4Z5FI)	AS	LOW	2019
K0EJ	NA	HIGH	1947
FG5GP	NA	LOW	1842
PY2KJ	SA	HIGH	1463
K1BX	NA	LOW	1414
OK2MBP	EU	LOW	1408
ZD7BG	AF	HIGH	1395
YO3RU	EU	HIGH	1373
K6NA	NA	HIGH	1359
PC2T	EU	HIGH	1309
OE1HHB	EU	LOW	1227
DP5P (DL1MHJ)	EU	LOW	1175
WW4XX (LZ4AX)	NA	LOW	1174
KN2M	NA	HIGH	1152
OH2PQ	EU	HIGH	1099
G9P (M0NCG)	EU	LOW	1017
OL5Y	EU	LOW	1016

*single operator, all band entries only
**99+% callsign accuracy with >1000 QSOs

Table 3 – Accuracy Winners for the 2022 CQ WW

overall, it's exciting to see the participation by the Youth crowd (25 years old or younger) in the CQ WW. *Table 4* demonstrates that the youth phenomenon is certainly global in nature with logs having been received from 31 countries, led by Germany which squeaked out a log entry win over the U.S. participants.

A Few Words from the Director

It's rewarding to this log checker that the vast majority of this year's operators played by the rules, submitting some of the cleanest logs we have seen in years. Unfortunately, there are still some notable challenges, particularly in the areas of:

Self-spotting (while allowed by some contests, it is still not permitted in the CQ WW),

Out-of-band operation (this is a combination of operating outside of IARU/country restrictions or the bounds of your current license class),

Recordings (this continues to be a challenge as many scoring leaders are not providing requested audio recordings making it more difficult to defend the log entry's claims),

Interlocks (the rules are clear; interlocks for multi-op stations are required to prevent simultaneous in-band transmissions and risk of disqualification).

Lastly, one of the least desirable aspects of creating this report each year is to recognize the friends that have left us. And, while I can't acknowledge everyone, there was one spe-

Table 4

Country	AS	EU	NA	OC	SA	ALL
5B	1					1
9A		3				3
BY	9					9
DL		15				15
E7		2				2
EA		1				1
EI		1				1
F		1				1
G		1				1
HA		3				3
I		2				2
JA	4					4
K			14			14
KH0				1		1
LX		1				1
LY		3				3
OE		3				3
OK		2				2
PA		1				1
PY					1	1
SP		8				8
SV		1				1
TA	1					1
UA9	1					1
VE			2			2
VK				1		1
VU	1					1
YB				6		6
YO		2				2
YT		1				1
ZL				1		1
Totals	17	51	16	9	1	94

Table 4 – 2022 CQ WW Youth Entries by Geography



One of this year's Explorer station entries: Here is Jun, BD3CT, blasting away from BY3CQ.

Youth Operators in Action

My First Contact, Andreas Tsiakkouris, 5B4AQT

Hello from the beautiful island of Cyprus! My name is Andreas and I am 12 years old. I was licensed in September 2022, one month before the CQ WW SSB 2022 contest. In fact, my first-ever QSO was my first contact in this year's CQ WW SSB contest with Marios, C4W!

My father, 5B4AFM, has been an amateur radio operator and contester for many years and I was able to see him operate contests and sense the excitement and energy that went into every contest effort. The sound of HF radio and rapid-fashion QSOs was familiar to me but this year was my turn to have a go in the driver's seat!

I was able to operate for about 15 hours, enjoying every single contact and the thrill that came with it. It felt like I was undergoing the ultimate crash course in amateur radio as I was learning all about CQ zones, DXCC entities, openings to various parts of the world, low bands, high bands and the phonetic alphabet with all its variations! At times, it all became quite daunting and when the pile-ups grew out of control I had to take a break. The experience was unforgettable and amazing fun! By the end of the contest, I had more than 1000 QSOs in the log and achieved DXCC!

I am already looking forward to my next contest, becoming involved in the youth community, and meeting new friends from all around the world that share my passion for amateur radio!



Here is 12-year-old 5B4AQT at work. Andreas' first ham radio contact was in the 2022 CQ WW SSB Contest!

Hello from Croatia, Josipa Vincetic, 9A3GVJ

My name is Josipa, 9A3GVJ, from Croatia. Ever since I was a little kid I have listened to my dad, 9A3AG and other members from my local radio club working big contests. I was amazed by the pile-ups and got hooked on the adrenaline rush, even when I was just listening! For many years I was scared to operate as a single-op in a big contest like the CQWW and would maybe do an hour here and there. But, with the new Youth overlay opportunity, it felt like it was now my chance to see what I can do on my own and against competitors like me.

I participated in the CQWW SSB in 2022 as a single-op, low power, all band entry from my home location. I had a goal of operating at least 24 hours and making 1000 QSOs. With an operating time of just over 27 hours I reached my goal with over 1000 QSOs! It was really exciting to work with just 100W and discover what I could achieve. I was thrilled to work many new DXCC entities as well as learning rare country names, including many Caribbean islands, while logging my QSOs. While calling CQ, the pileups calling me were amazing — like I always imagined! It was also exciting to "hunt" for stations and trying to be heard amongst a pileup of higher-powered stations. My fear of operating by myself quickly disappeared within the first 15 minutes! Hearing a lot of young

cial individual who we simply can't ignore, Fred Laun, K3ZO. Fred was a long-standing member of the CQ WW Contest Committee. His level-headed guidance was a treasure to my team and to all of you as was his friendship. It was while I was standing in Fred's living room one afternoon nearly 50 years ago that I first became exposed to CQ WW log checking. There are so many things that have been said since Fred passed. Ken, K4ZW, wrote one the best tributes, which I'm honored to include in this write-up. In the meantime, thanks for everything, Fred. You were one of a kind, the likes of which we'll likely never experience again.

And, Finally…

This is my fourth year serving as your CQ WW Director. If I've learned anything through this experience, it's that we have the most dedicated and competent team of log checkers in all of contesting! They make my job so much easier and it's my privilege to give them all the credit for the results being reported this month. In particular, my sincere thanks go to: AA3B, Bud Trench; CT1BOH, José Nunes; EA4KD, Pedro Vadillo; ES5TV, Tonno Vahk; F6BEE, Jacques Saget; G0MTN, Lee Volante; HA1AG, Zoli Pitman; IK2QEI, Stefano Brioschi; JH5GHM, Katsuhiro (Don) Kondou;



Youth operator Josipa, 9A3GVJ, having a blast in the WW! Look at all those QSOs on her computer screen!

voices was amazing. It feels like the network of young hams is growing rather than disappearing.

In my opinion, the new Youth overlay in CQWW is an amazing opportunity for youngsters. It gives the feeling of a "safety net, like you are competing with other youngsters and beginners and not just the big-gun stations. It also eliminates the pressure of having to be perfect and connects youngsters around the world, which is truly needed. I hope to see more and more youngsters submitting their log in the Youth overlay every year and hear them on the air! And, why not consider youth overlays in the multi-op categories too?

Small Station, Youthful Operator, Joseph Bondi, VE3GKT

I'm Joseph, VE3GKT, and at 25 years old, have been licensed just shy of three years. I operated the 2022 CQWW SSB from my second-floor bedroom in the Toronto area, with a 40-meter EFHW and 100 watts from my IC-7100. The window is about 15 feet above ground with the wire sagging down from its peaks of 30 feet in the backyard tree. I feel like I've done very well, especially for such a low antenna! It was a blast to work so many excellent operators, and it was very interesting to work some of the Caribbean stations on several bands and to hear propagation changes throughout the day/night cycle. The high point was working FR4KR, Reunion Island, on 10m SSB!

Although I'm still learning how to become a better HF contester, my operating situation at home is not the most comfortable. In the meantime, I'm gaining more experience including activating POTAs, plus some Limited Rover operations in VHF contests and, of course, looking forward to the next WW.

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Exploring the CQ WW Contest

BY FERNANDO, EC3A

I'm Fernando, EC3A (formerly EA3KU). For some time, together with two other colleagues - EB4Z and CT1DRB, I have collaborated with the HF Committee of the Unión de Radioaficionados Españoles – URE in Spain. The result was that our team entered the Multi-Operator Explorer category in the 2022 CQ WW contest as EA4URE.

Taking advantage of the recently created Multi-Distributed category for the CQ WW WPX and the Explorer overlay in the CQ WW, our team eagerly anticipated the possibility of participating in these contests and categories. The objective was simple: to encourage our teammates to participate in contests, teach the use of currently available technological tools and improve everyone's contest operating techniques.

As our planning began, we discovered that operators wanted to be part of a team in the multi-multi category while also using their own stations. In the end, our group was a multi-multi team with a mixture of both expert and inexperienced operators, using a variety of LP or HP stations and antennas ranging from simple dipoles, vertical or small yagis distributed throughout the territory of operation. All that was absolutely required was a share of the shack's personal computer and the radio station itself (transceiver, antenna and amplifier for those participants who had them) to support the following technical goals:

• Chat and videoconferencing software for meetings required for planning, pre-contest coordination, etc. of all group.

• Logging software. N1MM+ properly configured to perform interlock functions in stations to guarantee compliance with the contest rules, guaranteeing that only one simultaneous signal is transmitted per band/mode.

• Communications software to implement the VPN network required by N1MM to implement the distributed computer network.

• Assurance that the interconnection of all the PCs of the N1MM+ network received the information of the DX Cluster Network from the master computer that was connected to the DX Cluster server of EA4URE-5.

• Availability of the chat window during the contest that N1MM+ incorporates as a communication tool between the different team operators.

The operation of the infrastructure was perfect. The network worked without interruption during the entire 48-hours of the contest and the software used, together with the strategy for its use, allowed team members adequate operating time according to their availability. The resynchronization option between the different PCs on the network worked correctly when, due to circumstances, some of the PCs on the network were temporarily disconnected and reconnected later.

Additionally, my role or that of another assigned member of the HF Board of URE, ensured that the connection status of the different PC's of the group stations was supervised and monitored as well as the correct operation of the interlock requirements between the RUN and S&P stations.

In the end, we want the EXPLORER category to be maintained and included in other contests as it is a good way to encourage participation in contests and integrate new technologies.

73 and good DX, Fernando, EC3A
(formerly EA3KU 1979-2020)

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; LU5DX, Martin Monsalvo; 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.

The next CQ WW SSB contest is only a short six months away! I hope to hear you in October!

73, John, K1AR, CQ WW Contest Director

(Scores begin on page 92)

A Makeshift CQWW Yagi and Other Antenna Musings

BY BOB ELEK, W3HKK

With only a few days to go before the beginning of the 2022 CQ WW SSB contest, I decided to build a 10-meter Moxon from my scrap heap of spare parts (see W3HKK photo). Being a lightweight antenna, I was able to erect it on a 16-foot PVC mast located on our rear patio, turning it by the old-fashioned Armstrong method. That little antenna did an amazing job, giving me a taste of what it was like back when I had a KT34XA at 60 ft, and ruled the world on 10-15-20. It's hard to appreciate an ugly duckling that cost nothing to build – that is UNTIL you put it to the test in the CQWW!

The contest and DX bug has always been part of my operating experience since joining the ranks of ham radio in 1956. My long ham radio story of make-shift antennas includes operating experiences in 1969 when I was working in offshore seismic oil exploration based in Takoradi, Ghana. Having purchased a Swan 500C in London, I brought the radio with me into Ghana, stopped by the Ghanaian PTT on a lark and inquired about obtaining a ham license with the Director, Mr. Amatewee. In reality, he was actually more interested in whether I thought we would actually find oil than anything else. But, within five days I had his signature on my license as 9G1GS. And, while the timing wasn't right to operate in the CQWW, I borrowed some tower sections and a spare rotator from the ship's supplies, hired four local kids to chop some bamboo for me, and built a 2-el 15m quad, carried it through the lobby of the Hotel Atlantic and onto the beach in Takoradi.

One day I heard a guy with an unusual accent talking on 15 Meter SSB to his "press agent" near Washington, DC. After about a half hour of listening to reports about his crew and his vessel, I learned it was a papyrus raft floating on the currents off the coast of Ghana. He mentioned his name (Thor) and that he would continue daily updates as the stern of his boat was reportedly slowly sinking into the sea. I finally figured out it was Thor Heyerdahl of Kon-Tiki fame, trying to cross the Atlantic on his recently built vessel, the "Ra." Heyerdahl went on to build a second Ra raft with improvements in design and made the trip a second time one year later, reaching Trinidad before the crew finally had to abandon ship and be rescued. I was able to hear it all with via his single radio transmitter and small antenna. Having read his books as a kid and then being able to listen to him via ham radio as he tried another death-defying adventure was amazing. How great was that for a young kid just out of college who has since had many DX and contest adventures of his own?

Announcing:

The 22nd Annual CQ World Wide Foxhunting Weekend

Saturday, May 13– Sunday, May 14, 2023

The 22nd annual CQ World Wide Foxhunting Weekend will be held on Saturday, May 13th and Sunday, May 14th, 2023. *CQ* doesn't impose any rules or offer any awards for this activity. That's up to you and the hams in your hometown. Your hunt can be mobiles or all on foot. Since the primary objective is lots of participation, we don't even insist that your event be on that weekend. Any time is fine with us.

For mobile "T-hunts," some groups prefer the formalities of carefully-crafted boundaries, specifications for signal parameters, time limits, and so forth. Others are content just to have one or more signals to hunt. No need for any regulations, they say. For on-foot hunts, use the international rules <www.homingin.com/intlfox.html> or make up your own. Talk it up on the local repeater and social media to find out what your friends have in mind.

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

Don't let the excitement of the hunt make you an unsafe runner or driver. Make sure that all transmitting and receiving antennas are safe for the eye. Always be mindful of your own physical limitations and never take chances behind the wheel or in the forest. For more foxhunting ideas, see "Homing In" in the February 2023 issue of *CQ*.

Afterward, write up the results and send them to me at <k0ov@homingin.com>. The list of information in a complete CQ Foxhunting Weekend report is posted on my website <www.homingin.com/joek0ov/report.html>. In addition to the details of date, location, hiders, and winners, *CQ*'s readers also want to know what was unique about your hunt and what lessons (positive and negative) you learned from it. Don't forget to include some sharp action photos. The higher the resolution, the better.

I look forward to receiving your news and photos of mobile and on-foot transmitter hunts in your locality. Happy Hunting!

Joe Moell, KØOV

what's new

Cobra Announces Production of AM/FM CB Radios

While we don't normally cover CB radio in CQ, the FCC's 2021 decision to permit the use of FM as well as AM and SSB on CB is one of the service's biggest changes in decades, and since many of our readers also operate on 27 MHz, we felt that the addition of FM-capable CB gear was worthy of a report. – Ed.



Cobra Electronics, known for its production of AM CB radios, has recently announced that it has widened its range to include FM alongside already-existing AM radios. The addition of this new capability was originally reported in *RadioWorld*.

The company says that the new FM transmission in CB radios will provide high-quality audio during radio conversations with nearby CB radio transceivers, helpful for truckers, off-road vehicle operators and others. If, however, distance is the priority, AM can be used with full AM and single sideband modes.

The addition of FM capability is the product of four years of Cobra petitioning the FCC for a rule change to Part 95 to make the FM mode to be legal for use in CB radio products. During this time, the company reached out to its CB radio customers, off-road vehicle clubs, and CB radio distributors in order to boost its case for the need for FM in their radios. In 2021 this strategy paid off, and the FCC granted permissions for AM/FM CB radios to be sold in the United States. Cobra is now the second major CB manufacturer to introduce AM/FM CB radios.

"Our team has been on the forefront of working with the FCC since 2016 to make AM/FM CB radios possible," said Gail Babitt, CEO of Cedar Electronics, parent company of Cobra, in a news release. "The implications this will have on users like professional truck drivers, fleet managers, and local delivery services will be amazing — making communication clearer and more productive than ever while on the road."

The new dual-mode capabilities are available on several Cobra models, including the 29 LTD Classic, 29 LTD Chrome and 19 MINI AM/FM. The 29 LTD NW AM/FM CB Radio will be available later this spring.

Operating Winter Field Day out in the field is always a challenge. W4FSV added to his personal challenge by operating outdoors with vintage tube gear. At least it kept him warm!

A Vintage Winter Field Day…

Keeping Warm With Vacuum Tubes

BY WILLIAM F. MINIKIEWICZ,* W4FSV



Photo A. The author's Winter Field Day setup in a picnic pavilion at a local county park. Note the generator in the background, straight back from the brim of the author's hat.

Winter Field Day was only a week away when I received permission to operate in a local county park. This location was just about 10 miles from my home QTH and had covered picnic pavilions that would protect against precipitation, but do little for wind and cold temperatures (*Photo A*). The local (South Carolina) forecast was calling for overcast skies and chilly temperatures in the 40s and 50s. Certainly, the weather would not be much of a problem. So, I found another way to make things interesting.

For some time, I have contemplated the possibility of operating a modern contest with vintage gear. Winter Field Day provided the opportunity. I decided to dust off my 1960-vintage Hallicrafters SX-140 receiver and 1961 HT-40 transmitter along with the matching HA-5 VFO with the intention

* E-mail: <w4fsv@breadboardradio.com>



Photo B. Front view of the author's vintage Winter Field Day setup. From left, Hallicrafters SX-140 receiver, HA-5 VFO and HT-40 transmitter.

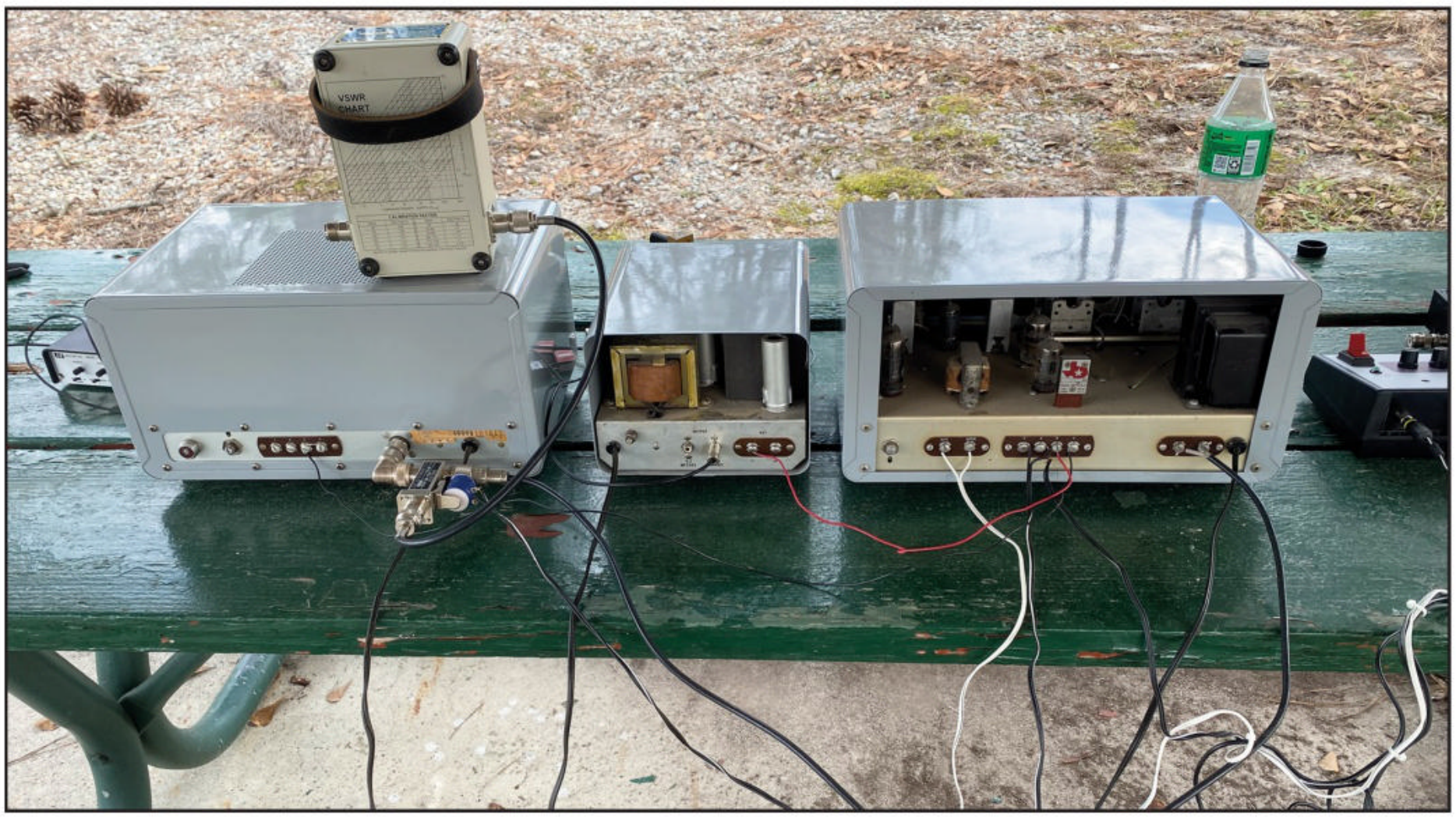


Photo C. Rear view of the vintage equipment. Even 60 years ago, "wireless" wasn't really wireless!

of operating in the Winter Field Day with 60-plus year-old equipment.

You Gotta Love a Challenge

While my fellow operators above the Mason-Dixon Line would be challenged with keeping warm, I would be enjoying the gift of 13 vacuum tubes with ductile tungsten filaments glowing red hot at around 1500 degrees. Spoiler alert: while that sounds pretty hot, the actual temperature of a tube's glass envelope is generally less than 500 degrees which could still burn curious fingers or toast a bagel. The only benefit I noticed was that my ceramic coffee mug was kept warm sitting on the top of my HT-40 above the 6DQ5 final amplifier tube. On the other hand, my vintage Hallicrafters gear that thrilled many a novice class operator in the 1960s proved to be quite a disadvantage in the 21st century contest environment.



Photo D. If you look closely, you can see a crystal plugged into the HT-40 transmitter. Bill's backup supply of vintage crystals came in handy when he realized that spotting a contact with the VFO was too time-consuming in a 21st century contest setting.

Living the Dream

I arrived at the park around 10:00 am and was met by two ham friends, Richard Rivera, KQ4AMD, and Phil Shreves, N7GZT. They were there to give me a hand with the setup and to operate their own stations in other areas of the park. My vintage gear was arranged on a picnic table (*Photos B* and *C*) and augmented by an audio CW filter and an electronic keyer used to supply a sidetone (which was not provided by the 1961 HT-40). The 60 watts of RF output was delivered to a 40-meter off-center-fed dipole that was hung between two trees at about 30 feet high. Antenna T/R switching was handled by a coaxial switch actuated by the function switch on the SX-140. Electricity was supplied by a small gasoline-powered generator.

Before the event officially started at 2:00 p.m., I tested the set-up on the air and made two contacts. These test contacts revealed a potential problem. The VFO required way too much time to accurately spot on a station, especially during a contest. Luckily, I had a good supply of FT-243 crystals with me to save the day (*Photo D*). Of course, using rocks limited me to repeatedly calling "CQ WFD" and relying on stations to answer my call. Four hours later, it was time to QRT and we had worked only six other stations. While contacts were few, it was great fun using my six-decades-old gear. Besides, try keeping your coffee warm with transistors!

Professor Emil Heisseluft investigates how potatoes have the potential to solve the world's energy problems.

A CQ Exclusive: Emergency Power Generation Systems Using Starchy Tuber Arrays

BY PROFESSOR EMIL HEISSELUFT*
LAUTON INSTITUTE, GROSSMAUL AN DER DONAU, AUSTRIA

The availability of emergency power-generation systems is becoming an ever-increasing challenge, especially given the impact of climate change and with it, the number of natural disasters occuring worldwide. Amateur operators are among those most affected, for who among us at one time or another has not been inconvenienced, at best, by not having access to the airwaves because our primary power source was unavailable? Gasoline- and propane-powered electrical generators, of course, have always been used in such situations, though noise (both of the audible and electrical varieties) impose limitations (the former, especially, limiting their use in urban areas). Now, solar systems are increasingly being employed, though their costs still can be prohibitive in some applications. Below, the good professor introduces us to still another option: the use of starchy tuber arrays that portend the generation of electrical power at a uniquely low cost, giving us the promise of efficient emergency power generators, even for use in the Third World. -- W2VU

Introduction and Background

The Lauton Institute has a long and distinguished history of participating in the exploration of bleeding-edge science, including molecular biology and genetic engineering. For example, the first paper published in the popular literature by the Lauton Institute on molecular engineering was an article that appeared in the April, 1982, issue of *CQ* on the threat to molecular electronics from microbes produced by genetic engineering.[1] The seminal research on this topic was performed by the Institute's prestigious Genetic Engineering and Research Center (GERC; see *Figure 1*), which was formed in 1971 and which, by the early 1980s, was recognized as a world leader in the development of new microbes using gene-splicing techniques.[2] In the years that followed, GERC discovered revolutionary new ways to slow the aging process.[3] The research was paid for by three well-known, high-scoring DXers who had approached me in Dayton in the early 1990s. They offered to fund a research program that would lead to the development of drugs that extended their lives to the point where they could ascend to and remain at the top of the ARRL DXCC Honor Roll for decades while their competitors died off. So, you see, my dear readers, the Lauton Institute has been at the forefront of molecular biology and genetic engineering since the early 1970s. This legacy bodes well for the success of our most recent work in the field of emergency power generation systems using tuber arrays.

The Lauton Institute's Genetic Engineering and Research Center [which also houses the Center for Research of Abnormal Personalities (CRAP)], seen



Photo A. The Lauton Institute's Genetic Engineering and Research Center outside Grossmaul an der Donau, Austria.[4]

**Professor Heisseluft has returned to the Lauton Institute, Grossmaul an der Donau, Austria, where he is assisting his government in developing a new strain of potato that will yield a superior electrical potential when employed in a tuber array. Mail may be conveniently sent to the professor c/o CQ Magazine, PO Box 1206, Sayville, NY, 11782.*

E-mail:
<heisseluft.emil@mashuga.orf.ar>

in *Photo A*, is located in a forested setting just outside Grossmaul an der Donau, Austria.[4] The facility currently is treating five Radio Amateurs who recently formed a DX contesting club. The members anticipate erecting a rotating tower with Yagis for 160 through 6 meters at the peak of the mountain. Doctors and nurses are in attendance during all contests. The club will be using an all-tuber array of power supplies during the next DX contest to text its capability to function under emergency conditions.

Some Background on Starchy Tuber Electrical Generation Arrays

The first mention of the use of potato batteries in the scientific literature highlights the work of Golberg, Rabinowitch, and Rubinsky at Hebrew University and the University of California at Berkeley. According to these researchers, "we show that boiled or irreversible electroporated potato tissues with disrupted cell membranes generate electric power up to tenfold higher than equal galvanic cell made of untreated potato. The study brought about basic engineering data that make possible a systematic design of a Zn/Cu-potato electrolytic battery. The ability to produce and utilize low power electricity was demonstrated by the construction of a light-emitting diode-based system powered by potato cells. Primary cost analyses showed that treated Zn/Cu-potato battery generates portable energy at 9USD/kW h, which is 50-fold cheaper than the currently available 1.5 V AA alkaline cell (retail) or D cells (49–84USD/kW h)."[5]

First Application to Amateur Radio

Dear readers, you are most fortunate that, with *CQ* at the forefront of developments in amateur radio, the first amateur-related application of potatoes to power generation has already been described in the pages of this august magazine. Specifically, Hiroki Kato, AH6CY, in the July 2022, issue, published a seminal article titled " 'Green' Power for QRPp."[6]

Here, he described how it was possible to obtain between 0.5 and 0.9 volts from a single potato regardless of the size of the potato or the distance between the two electrodes used. He also noted that by increasing the size of the electrodes, he could increase the current output without changing the voltage, and that it was possible for a potato to produce output for as long as a month even after it became moldy or rotten.

Beginning with a number of experiments employing a variety of copper and zinc-plated electrodes, one of Kato's more successful batteries, shown in *Photo B*, comprised a bank of eight cooked potatoes tightly wrapped in plastic tape. The two electrodes (again, copper and zinc) were bent into a "U" shape to increase the contact surfaces. Further experimentation by Kato yielded a 6-cell mashed-potato array in a 6-section plastic case that generated about 5 volts and a current greater than 30 mA.

High-Power Systems

While little known outside of the academic community, The Lauton Institute's Genetic Engineering and Research Center (GERC) has for the last several years worked with the Hebrew

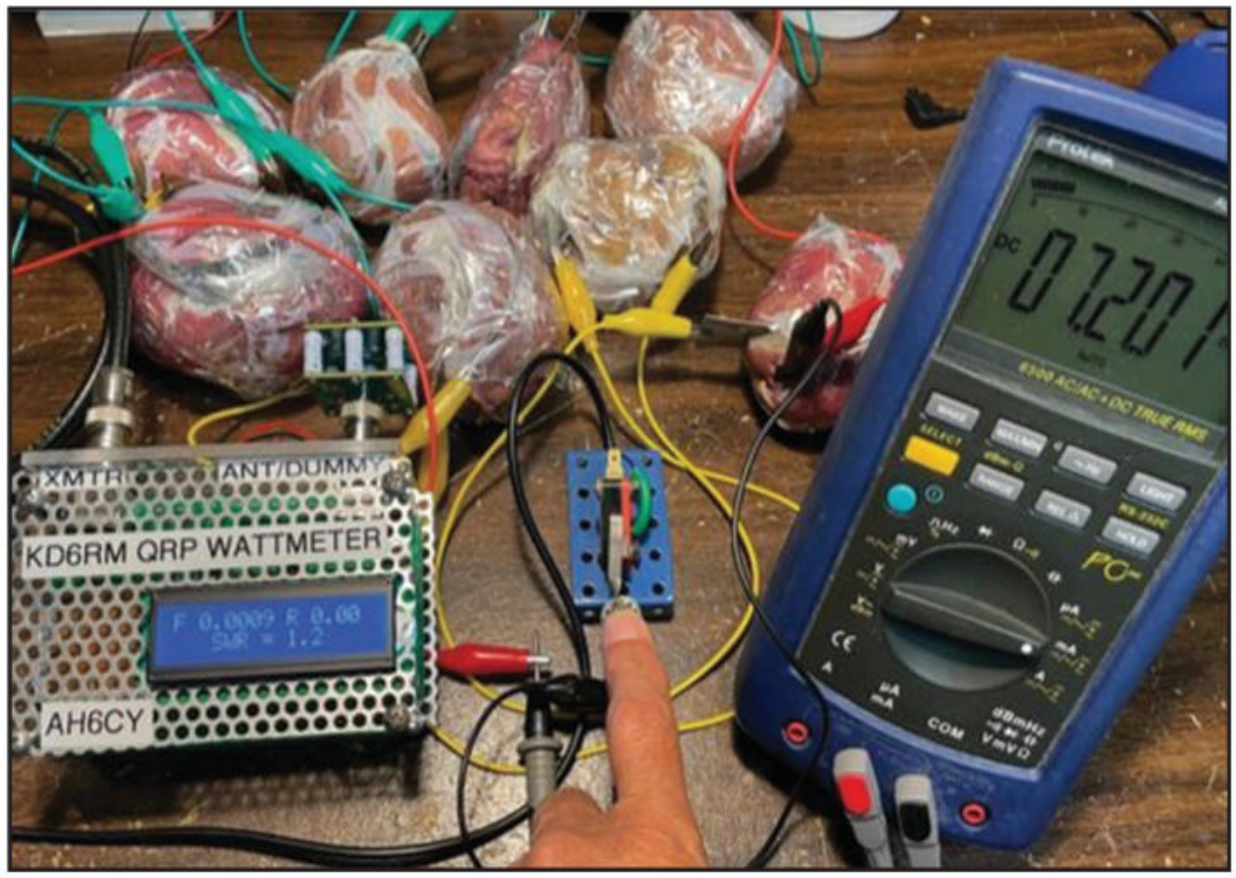


Photo B. This eight-bank tuber array produced 1 mW of power with a current drain of 7.729 mA. (AH6CY photo)



Photo C. Shady Brook Farm in Yardley, Pennsylvania, yields from 25,000 to 35,000 pounds of potatoes per acre, more than enough for the Lauton Institute's experiments.[7]

behind the bylines...

... a little bit about some of the authors whose articles appear in this issue.

Jim Millner, WB2REM ("An Interview with ChatGPT on the Future of Ham Radio," p. 12), is a frequent contributor to *CQ*, and is a retired licensed psychologist. He is keenly interested in the integration of ham radio and robotics, and previously published an article in the December 2019 issue of *CQ* entitled, "AI Meets AR – The Coming Convergence of Artificial Intelligence and Amateur Radio." He has been a ham for 60 years and is a high-speed CW operator and DXpeditioner.

Sherlock ("Sherlock Investigates: Seismic Signals Below 1 Hz," p. 16), is a longtime investigator and analyst of failures in electronic equipment. He lives inside the head of his alter ego and is a regular contributor to *CQ*.

Professor Emil Heisseluft ("Emergency Power Generation Systems Using Starchy Tuber Arrays," p. 34), visits our pages every April, reporting on his latest work at the Center for Research on Abnormal Personalities of the Lauton Institute in Grossmaul-an-der Danau, Austria. In a recently released anthology of his *CQ* articles, Herr Professor revealed himself to actually be longtime *CQ* author and contributor Ted Cohen, N4XX. "The Collected Works of Professor Emil Heisseluft" is available from the CQ Bookstore at <https://tinyurl.com/mrxyta27>.



Mark Persons, W0MH ("Unusual Facts About Cable Loss," p. 41), was first licensed in 1962 as WNØAXD. He is a retired radio broadcast engineer and life member of the ARRL. The Society of Broadcast Engineers named him Engineer of the Year in 2018 and then honored him with a Lifetime Achievement Award in 2020. Mark and his wife Paula, WØHA, seen above, reside in Brainerd, Minnesota. Their website is <www.mwpersons.com>.

Kenneth Miller, K6CTW ("Learning Cyrillic Morse Code," p. 42), is a longtime CW enthusiast, perhaps best-known for his 2005 appearance with Chip Margelli, K7JA, on "The Tonight Show with Jay Leno," in which the two of them proved that they could send a message in Morse code faster than another pair could send it via text message. Ken was on the key.

University and the University of California at Berkeley to develop high-power, tuber-based power systems for the emergency response community (including the Amateur and Amateur-Satellite Services). Our first goal is the limited production of a unit capable of producing 5 A at 12 VDC for at least 30 minutes from activation. Initial estimates suggest at least 1000 tubers will be required to achieve our design goals, but battery longevity has been a problem, and we are "burning" through potatoes faster than resupply is possible. To this end, the Institute has entered into a multi-year agreement with Shady Brook Farm (*Photo C*) for the delivery of its annual potato crop through the year 2033, to ensure an adequate supply of tubers for experimentation and product development.

Summary

Power generation systems using starchy tuber arrays have the potential to provide low-cost emergency power worldwide. Such systems have already been demonstrated in amateur radio applications and are under further development by the Lauton Institute. The intent is to fabricate units capable of producing 5 A at 12 VDC for at least 30 minutes from activation. To further such development activities, the Institute has contracted with Shady Brook Farms—whose acreage can yield up to 25,000 to 35,000 pounds of potatoes per acre—to supply it with potatoes through 2032. In addition to providing a cheap form of energy, this power source (with the exception of the electrodes) is biodegradable.

Notes:

1. Heisseluft, E., "The Threat To Molecular Electronics From Microbes Produced By Genetic Engineering," CQ, April, 1982, p.13

2. Heisseluft, E., and J. Ostermond-Tor, "Fundamental Principles Behind the Use of Genetic Engineering to Create New Life Forms," Lauton Institute Report LI-1-71, 1971.

3. Heisseluft, E., "How To Stay at The Top of The DXCC Honor Roll Until You Reach At Least Age 100," CQ, April 1996, p. 11

4. Castle Hochosterwitz, this file is licensed under the Creative Commons Attribution-Share Alike 3.0 Austria license. Photo by Johann Jaritz

5. Golberg, A., H. D. Rabinowitch, and B. Rubinsky, Biochem. ZN/Cu-vegetative batteries, bioelectrical characterizations, and primary cost analyses, Biophys. Res. Commun. 389, 2009, p. 168; <https://tinyurl.com/2czj22j2>; Abstract: <https://tinyurl.com/3ezau73r>

6. Kato, H., " 'Green' Power for QRPp," CQ, July, 2022, p. 32

7. Potato harvest; this file is licensed under the Creative Commons Attribution-Share Alike 2.0 Generic license. Photo by Richard Croft.

CQ CLASSIC



The Gift That Keeps On Giving…

CQ's April Fool articles are the gifts that keep on giving, even three decades later! This great one, on a circular Yagi from April, 1991, came back to our attention when a reader who recalled seeing it recently asked for help in finding it and wondered why he'd never seen anything since about the design. We figured that if it was good enough to stick in his mind for 32 years, it's good enough to share again!

It may look strange, but that's just because you haven't seen one before. NR5Q presents a fundamentally new antenna design based upon extrapolations of Pasquinade equations.

The Concentric Yagi

BY BRUCE VAUGHN, NR5Q

It was during the blizzard of '86, just five days before the big CQ DX contest, when my rotator failed. The old unit was replaced with one much larger and more expensive, with the hope that it would withstand the most severe ice storms. It did, only to be burned out by a lightning storm in July of '87. While waiting for the rotator to be returned by the repair facility, I started thinking of a way to avoid rotator problems.

Verticals were eliminated because of higher noise levels, relatively low gain, and the need for radials. Switchable phased arrays were also considered, but their modest gain versus the large area required for installation did not offer the solution we were looking for.

It seemed the best route to pursue was that of modified quads or Yagis. Time has proven that both antennas exhibit good forward gain, can be erected on most any lot, and are normally not too difficult to install and adjust. Of the two, the Yagi seemed to offer more potential.

The antenna shown in the picture is the result of two years of study and experimenting. As you well know, the typical Yagi consists of a 1/2-wave dipole, with one or more parasitic elements, the longer elements being the reflector(s) and the shorter elements being the directors.



The overall size may tend to put some amateurs off the idea of trying a concentric Yagi, especially multi-element arrays. Here we see the original version installed near a conventional tribander.

It was reasoned that if we could design a circular Yagi with the elements spaced in the normal manner, then we could achieve maximum gain in all directions, thus eliminating the need for a rotator.

Twenty meters was selected as the band to use for our test model. I was sure if we could attain operation on 20, we could duplicate the results on other bands.

All measurements were taken from the *ARRL Handbook*. The tables and formulas need not be repeated here. For a frequency of 14,050 kHz the length of a halfwave dipole (driven element) is 33 feet, 8 inches. Since we wished to construct a circular antenna, we used our eighth-grade arithmetic to calculate a diameter of 10 feet $8\frac{1}{2}$ inches, the radius being 5 feet $4\frac{1}{4}$ inches.

From the same table of measurements, we could see that the director length was 31 feet $11\frac{5}{8}$ inches, and the reflector length 35 feet $5\frac{1}{4}$ inches. These were starting measurements, and we knew some adjustment of these dimensions could be necessary. Spacing between the elements then became 10 feet 1 inch (.15 wavelength).

With these figures in hand, we decided to first draw a diagram of the antenna before actually starting construction. This is where the first problems surfaced. When the director was placed 10 feet 1 inch from the driven element, we had a radius of 15 feet $5\frac{1}{2}$ inches, the circumference being approximately 97 feet. While some variations in the dimensions may be permitted, 65 feet longer than the calculated length did present a problem. But wait! If we broke the 97 foot director into three lengths, using 4 inch long insulators, we could be back on track.

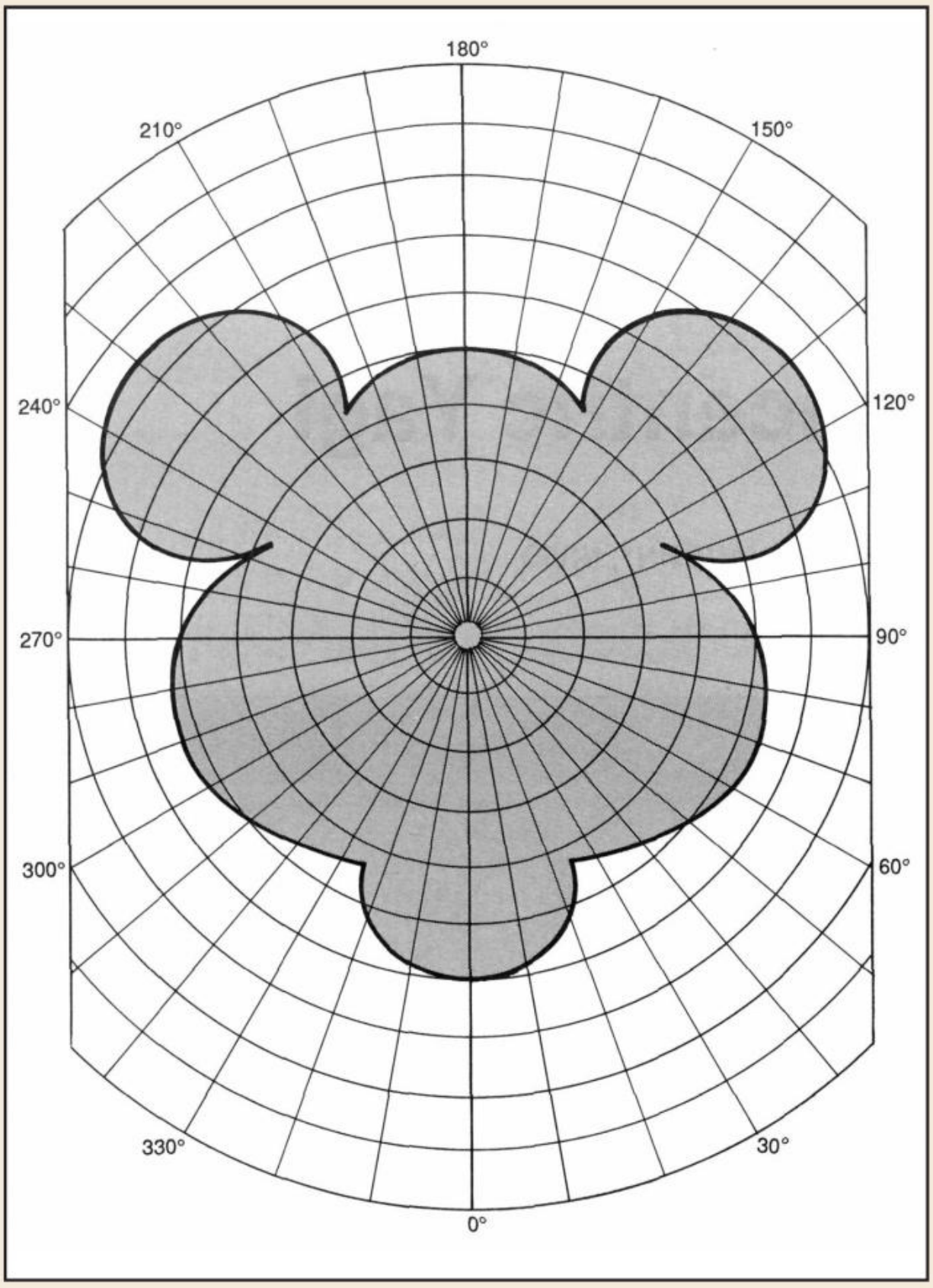


Fig. 1-A chart of the concentric Yagi's radiation pattern.

Our next problem occurred with the reflector. Since our driven element was only 5 feet $4\frac{1}{2}$ inches from the center of our circle, if we moved behind the driven element 10 feet 1 inch, this would place the reflector in front of the driven element, concentrating our signal back toward the center of the antenna and thus creating a negative power gain. I assumed this would be similar to the black holes in space.

I could see that this was going to take more than eighth-grade arithmetic. Since it was a little late for me to take up Quantum Mechanics and Functions of Complex Variables, I decided to build my antenna the way amateurs have built antennas for years—cut, try, and experiment.

To keep the project simple and easy to construct we chose to build a three-element antenna. If it worked, we could always try for more elements. However, adding one more element could present problems, since the effective boom lengths would be more than 50 feet, and the length of the wire in the second director would be approximately 160 feet. Obviously, 6- and 7-element arrays were going to be very difficult.

As my first step in construction I drew two circles on paper. Looking at them, I discovered my error. It was easy to see that for any given beam heading, the outer, or larger, circle, being in front of the inner circle, or driven element, became the reflector when we moved 180 degrees from our heading. This was working out better than I had hoped. We could forget the black-hole concept. Our problem now became how to make the larger loop (director-reflector) both longer and shorter at the same time. Compared to the difficulty of making a TNT transmitter stay in the 20 meter band, we thought this one should be easy.

Once construction was started, the answer became quite clear: use another loop. We calculated the circumference of the reflector loop, 106 feet $3\frac{3}{4}$ inches, by taking the reflector length given in the table, multiplying by 3, and adding 12 inches (three 4 inch long insulators). The radius of this loop would be 17 feet. But what about the .15 wavelength spacing? I was also concerned

Many of the amateurs in our club are skeptical of this antenna. Since it is somewhat unusual, I can understand their doubts and amusement.

until I reread the chapter on beam construction in the *Handbook*. Chapter 20, page 19: "Fig. 44 shows the gain variation with director spacing is not especially critical." It seemed reasonable to assume that reflector spacing is also a flexible figure.

Our first model to undergo tests was constructed from the preceding calculations. As suspected, breaking the director and reflector loops into three segments gave us a pattern somewhat similar to a three-leaf clover. It was then we decided to build the version shown in the photograph. You can see that we placed two loops, separated by 18 inch spreaders, at the director and reflector position, breaking each loop into three parts. The insulators of the top loop were placed 60 degrees from the insulators of the bottom loop. This resulted in the pattern shown in fig. 1. Not really ideal, but improving.

The booms used for the project were wood. Aluminum or fiberglass would have been a better choice, but I had a supply of wood dowels left over from my experiments with roof-top Rhombics.

The driven element is aluminum tubing, fed at the center with coax, through a conventional 8-turn choke. The reflector and director loops are made from #16 wire. The elements are all insulated from the boom, and spreaders, with short pieces of plastic pipe. I believe the rest of the construction details are best left up to the builder.

After three months of use we are well pleased with the antenna—with one exception. CQs often result in simultaneous answers from Europe, Japan, South America, and Australia, with the result that we are unable to copy any of the calls.

Many of the amateurs in our club are skeptical of this antenna. Since it is somewhat unusual, I can understand their doubts and amusement. I do feel, however, that the term "Mickey Mouse Antenna" is undeserved and without foundation.

I am working on a way to make the antenna directional. If my experiments go as planned, I should have the answer by next April.

Looking Ahead

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

- 3Y0J: Report from Bouvet
- CW Results: 2022 CQ WW DX Contest
- CQ Interviews: IARU Region 2 VP PT2ADM

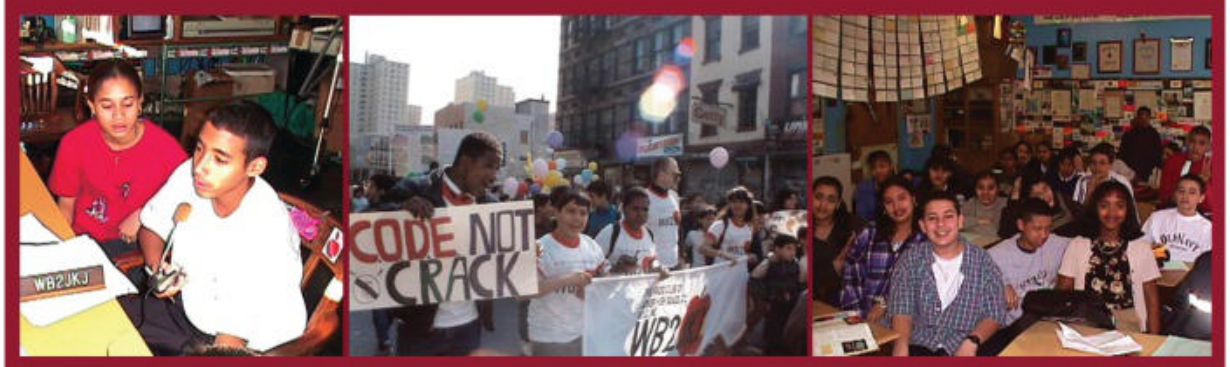
Plus...

- Bramham and Guanella Baluns
- A University Foxhunt in India
- A Skeleton Slot Antenna for HF Through 432 MHz

Do you have a hobby radio story to tell? Something for one of our specials? *CQ* covers the entire radio hobby. See our writers' guidelines on the CQ website at <http://bit.ly/2qBFOdU>.

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Regular readers will know that WØRW loves operating pedestrian mobile, often in remote locations. Several years back, though, he tried his hand at operating from a very NON-remote location, resulting in …

My Dumbest Portable Operation

BY PAUL SIGNORELLI,* WØRW

About 16 years ago, I was visiting Washington, D.C. after a work trip to Canada. As a Colorado resident, I am just a tourist on the east coast.

My idea was to visit the U.S. Naval Observatory (*Photo A*) and work into a QRP net from there. I like observatories (*He has one of his own! – ed.*) and thought I could at least see the USNO atomic clock. When pulling into the driveway I noticed a bank of very unfriendly tire puncturing spikes and a truck barricade (*Photo B*). The U.S. Naval Observatory was closed.

So I went around to the back of the USNO to a shopping mall parking lot.

It was a muggy evening there on June 30, 2006. The fireflies were bobbing around the grassy fields. I had always wanted to catch a firefly and see if I could excite its phosphorescent tail light with RF. I caught a few in a plastic bag and held them up to my high-power UHF mobile antenna. No luck.

After that, I got my KX1 out for some pedestrian mobile operation at the USNO. I always like to operate from historical sites and this is the first time I had been there.

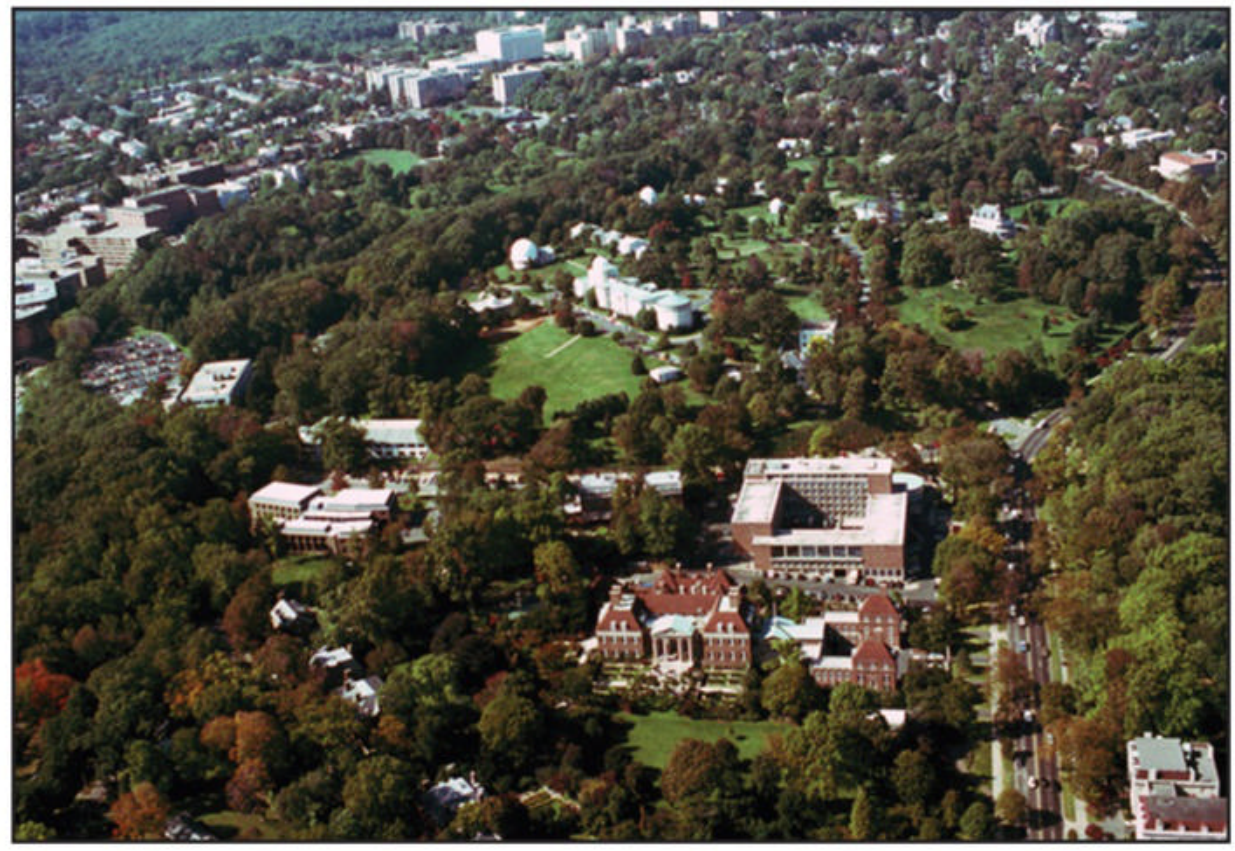


Photo A. Aerial view of the U.S. Naval Observatory in Washington, D.C. (National Archives photo)

PM Setup, QSOs and … Oops

My pedestrian mobile antenna is a 10-foot whip and it is "socketed" in my rear pocket and attached at my shoulder with a cloth loop on my vest (Vestenna / *Photos C* and *D*). The KX1 is hand held in the left hand and keyed with the right hand.

I worked John, K4BAI; Russ, K8AF; and Roy, N8RN. Georgia, Michigan and Ohio, not too bad for 3 watts to a 10-foot whip from D.C. While I was walking along the northern fence, a cop on a bicycle pulled up and asked me what I was doing. My answers did not really seem to satisfy him, so he asked for my



Photo B. When I arrived at the observatory, the gates were closed and highly secured. But that didn't stop me from getting on the air! (WØRW photo)

* E-mail: <w0rw1@msn.com>



Photo C. My "Vestenna" and KX-1 setup for pedestrian mobile operation. See text for details. (WØRW photo)

ID and ran me in the computer. Maybe he felt less threatened when he found out I had a security clearance. He didn't officially detain me since I was not going anywhere anyway. (I had him pose for a picture with me, he was a nice guy. The picture got lost in my last hard drive crash.)

After resuming a few CQs using the KX1, he called for backup. Then more Capitol Police arrived. This old Colorado tourist didn't realize that the USNO is also the official residence of the Vice President of the United States (Dick Cheney at the time) and it is heavily guarded. I gave the officer a QSL card.

Paul, WØRW/3/PM



Photo D. Detail of the antenna setup, minus the vest. (WØRW photo)

Most of us know that any antenna feedline carries both forward and reverse power. But very few hams realize that certain coaxial cables are designed to more efficiently carry energy in one direction than the other. WØMH, a former Society of Broadcast Engineers "Engineer of the Year," explains this new twist on coax.

Unusual Facts About Cable Loss

BY MARK PERSONS,* WØMH

There is a little-known fact that coaxial cables, such as RG-8, RG-213, RG-214, and RG-58, have more RF loss in one direction than the other. This is due to the twist direction of the inner conductor and the braid twist on the outer conductor of the cable. The inner conductor controls forward power and the braid is the return path for receive signals.

This phenomenon was discovered and documented by Professor Loof Lirpa, SM9LL, in Sweden, now SK. He came across this while doing basic research at the University of Stockholm in April, 1956. This science does not apply to hardline, in which the inner and outer conductors are solid, not braided.

Manufacturers of quality braided cable today print an arrow on the outer jacket of their cables, indicating which way the transmitted RF should go (Photo A). You may not have noticed it because the arrows are tiny.

* E-mail: <mark@mwpersons.com>

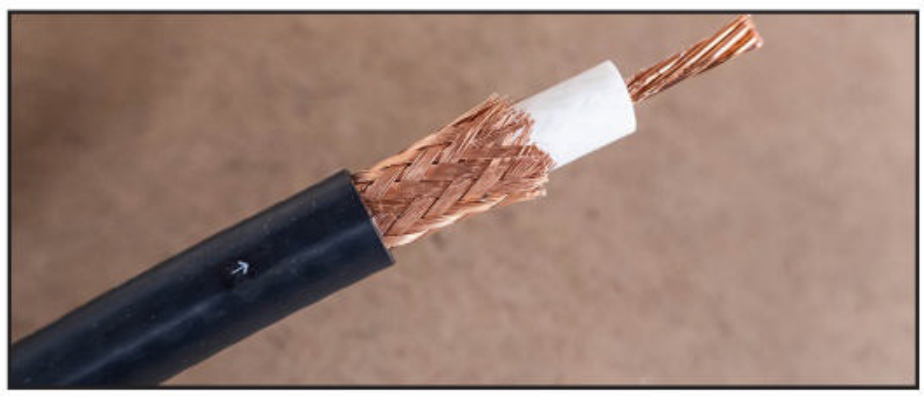


Photo A. RG-8 coaxial cable with arrow printed on outer insulation.

If the coaxial cable in your shack does not have an arrow, you can experimentally determine it. Connect your transmitter to one end of a cable and a wattmeter, with dummy load, to the other end. Check the power and then reverse the cable to see which way it works best. Then mark the cable with an arrow so you will always know the "sending end" of the cable for minimum loss to your antenna. Install it accordingly.

This can be a significant advantage for the ham radio operator trying to make long-distance contacts, especially in a pileup.

Increase the enjoyment of your CW QSOs with hams in Russia and other countries where the Cyrillic alphabet is used (including Ukraine) by learning some basics of Cyrillic Morse Code. K6CTW has developed an app that can help.

Learning Cyrillic Morse Code

BY KENNETH V. MILLER,* K6CTW

Although currently not exactly "politically correct," the author's interest in multi-language CW communication, specifically Russian using the Cyrillic Morse alphabet, came about a number of years ago. Progress in the development of a technique to enable rudimentary QSOs was eventually developed and then documented in an article for *CQ* magazine, "Russian CW and QSO Phrases," in the November, 2013 issue. This "worked" for slow-speed CW QSOs using a "cheat sheet" for conversion and translation. However, this was not a very satisfying method as it did not allow for more "free form" conversations.

What was needed was a method to improve copying speed and transcription capability using the Cyrillic characters directly as well as a basic facility in the Russian language. Should you also be interested in voice communications with your Russian-speaking amateur radio friends, a superb set of documents and audio is contained in Les Traubman, W6JKH's, "Russian Phrases for Amateur Radio"[1] to help you in that endeavor.

The author hopes that this effort will promote friendship, good will and fun! Starting a conversation with a foreign ham in their own language and/or Morse alphabet is a wonderful way to bring people together, promote good will and foster lifelong friendships. Isn't that one of the great features of amateur radio?

On a side note, there are many languages other than Russian that also use the basic Cyrillic alphabet, e.g., Ukrainian. Adapting the application to Ukrainian, besides the language changes, will require four alphabetic changes in the code generation section (yes, their Cyrillic alphabets are slightly different)

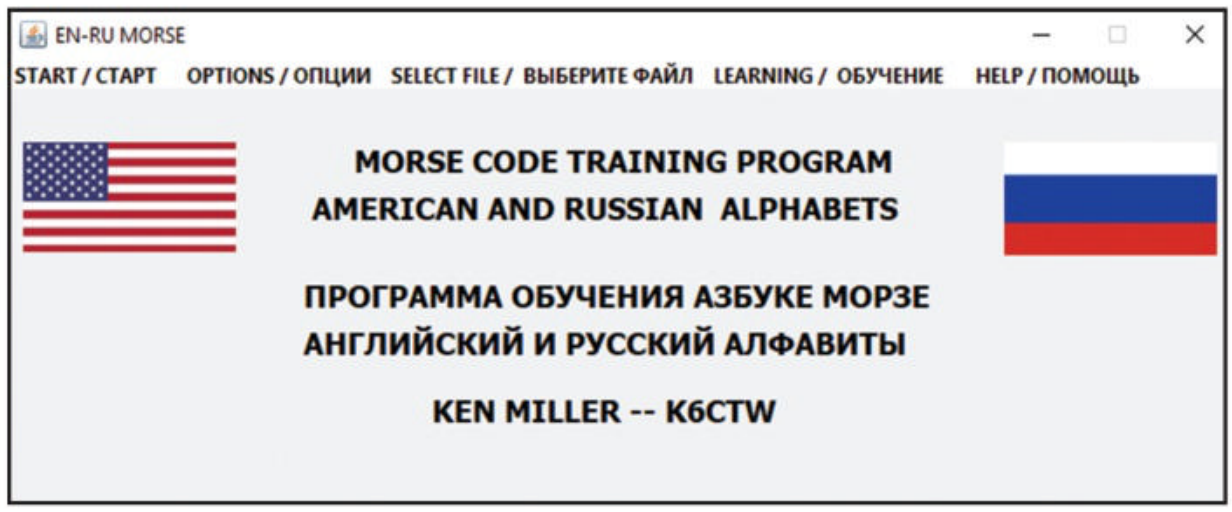


Figure 1. EN_RU_Morse Application Main Screen

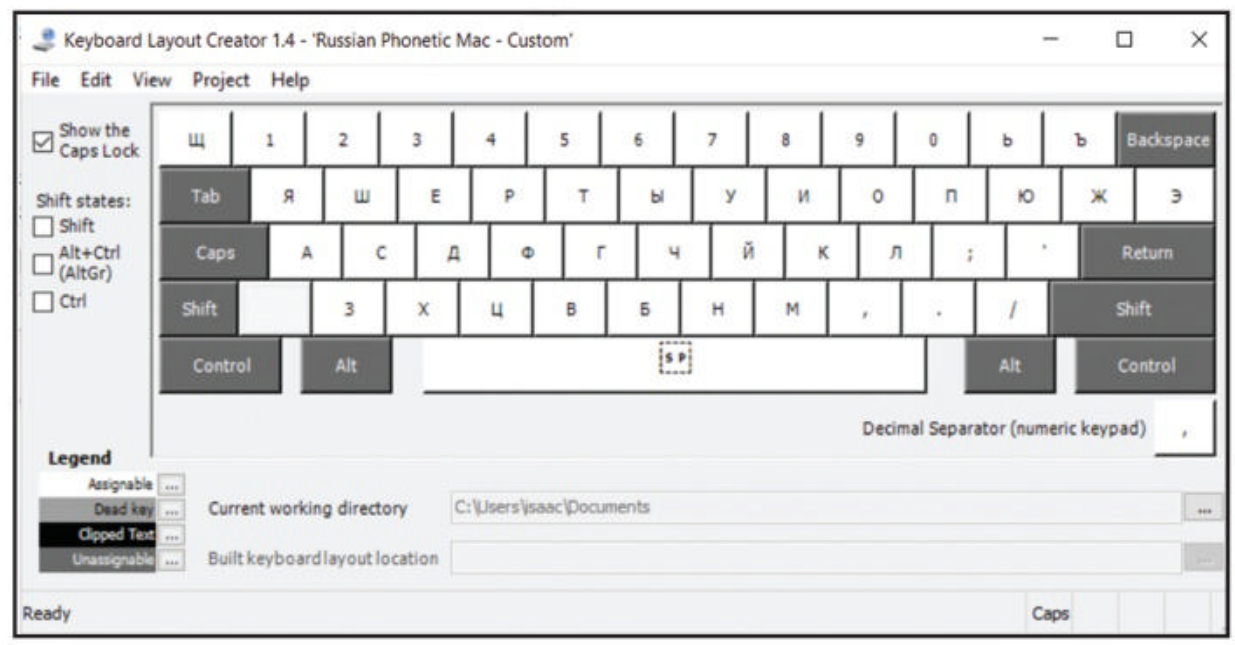


Figure 2. Russian Phonetic Keyboard Layout

The Application

The application, *EN_RU_Morse* (*Figure 1*), has evolved over a number of years from a simple command line to a full GUI (graphical user interface) and through three versions of Microsoft Windows® (7 Pro, 8 and 10), as well as a series of Java and Netbeans versions. It is 100% Java and so it will be much more easily ported to a number of other platforms. The initial release is aimed at an American/English speaking user who would like to learn either the International Morse Code, which supports the Latin-based alphabet for the English language and/or the Russian Morse code for the Cyrillic alphabet. The application also provides some basic QSO and conversational help in both languages. It is hoped that

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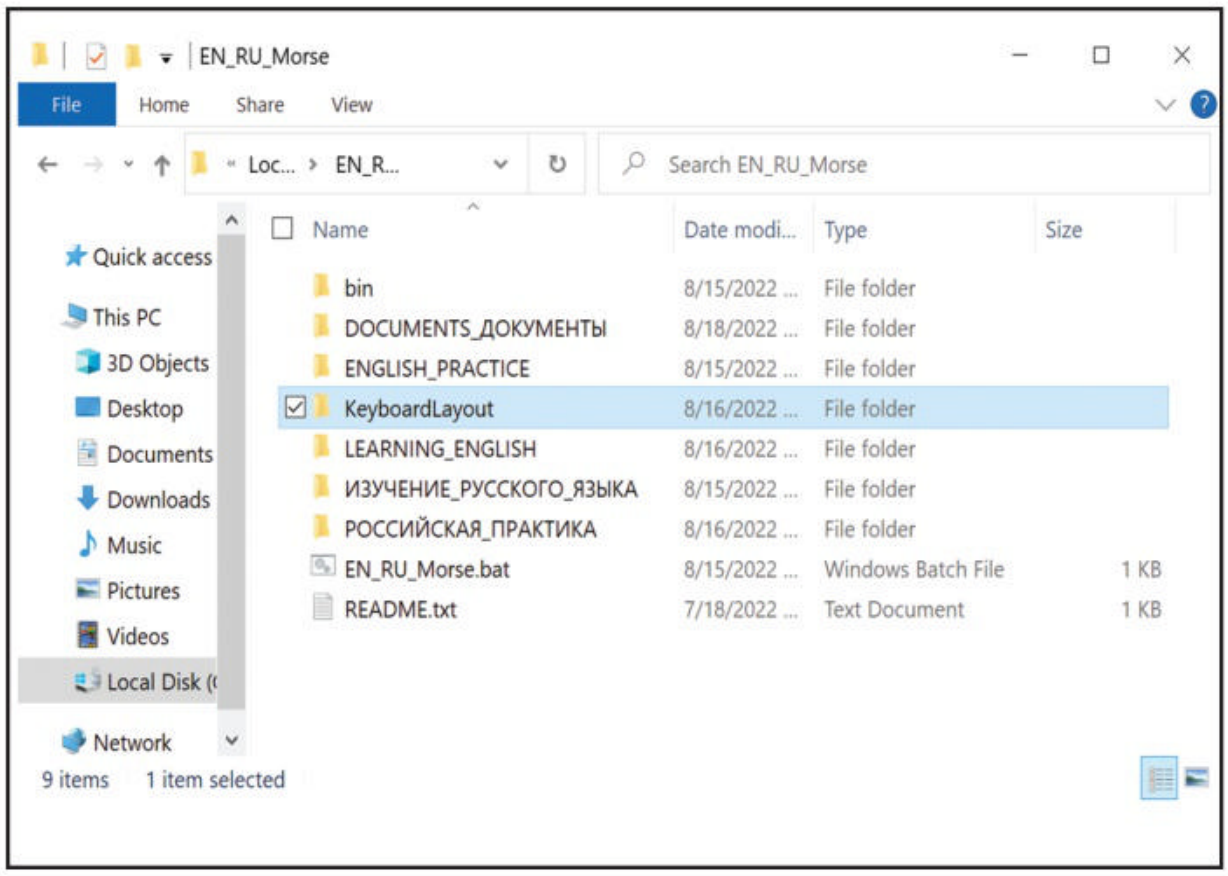


Figure 3. EN_RU_Morse Application Directory Structure

in the future, additional help from native Russian-speaking hams will enable this application and the user's manual to be augmented to better support native Russian speakers who would like to learn/practice International Morse code while also learning some English. As such, the menus and pull-downs are all bilingual which, through repetitive viewing, enables the user to enjoy a more immersive learning experience.

With thanks to the author, Isaac de la Pena, included with the *EN_RU_Morse* download is another application, *rusmac*[2] that will re-map the keys on your keyboard to a "phonetic" Russian keyboard (*Figure 2*). This simply means that when you enable this mapping, and you "copy" a dah-di-dit character, and press the "D" key on your keyboard, what will be displayed in the word processor window you are using will be the Russian letter Д. This makes it easier for those touch typists who learned

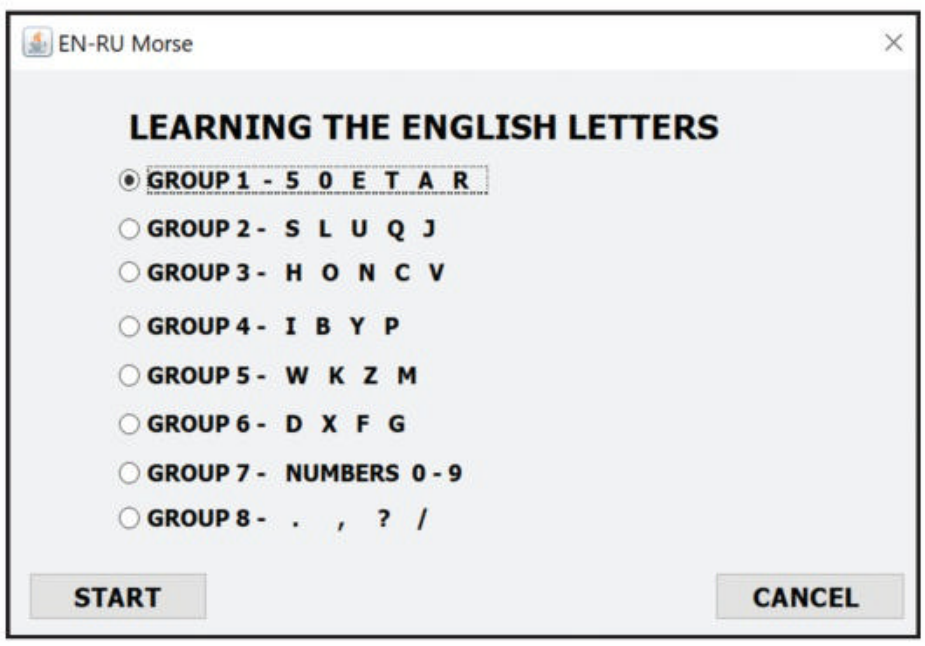


Figure 4. Learning English Symbols

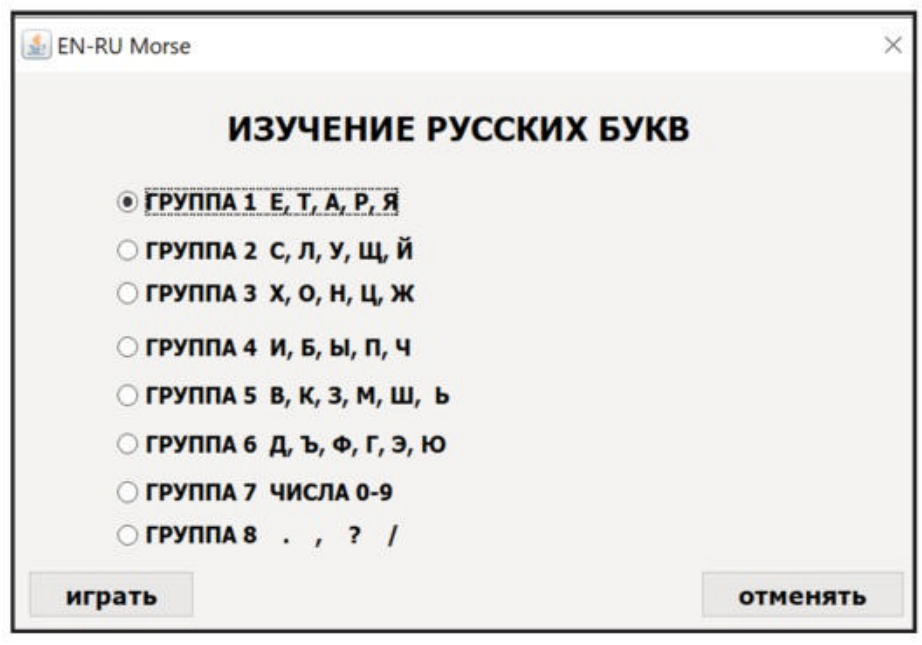


Figure 6. Learning Russian Symbols

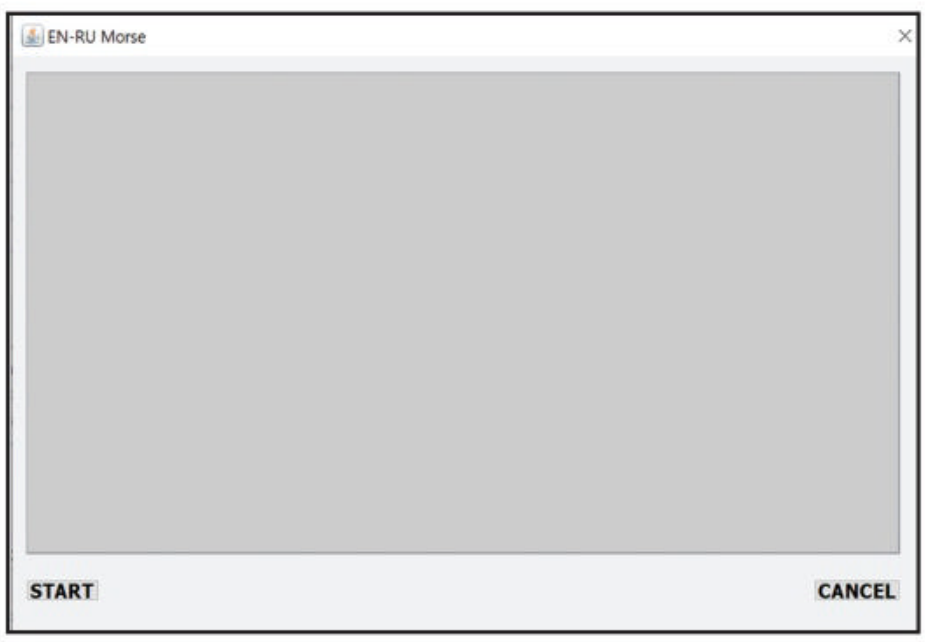


Figure 5. Play File (English)

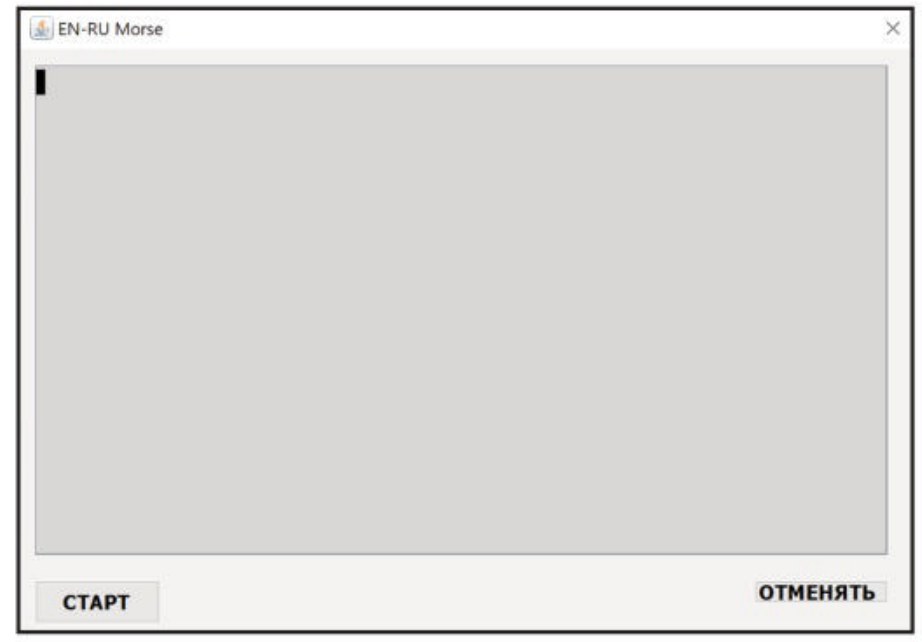


Figure 7. Play File (Russian)

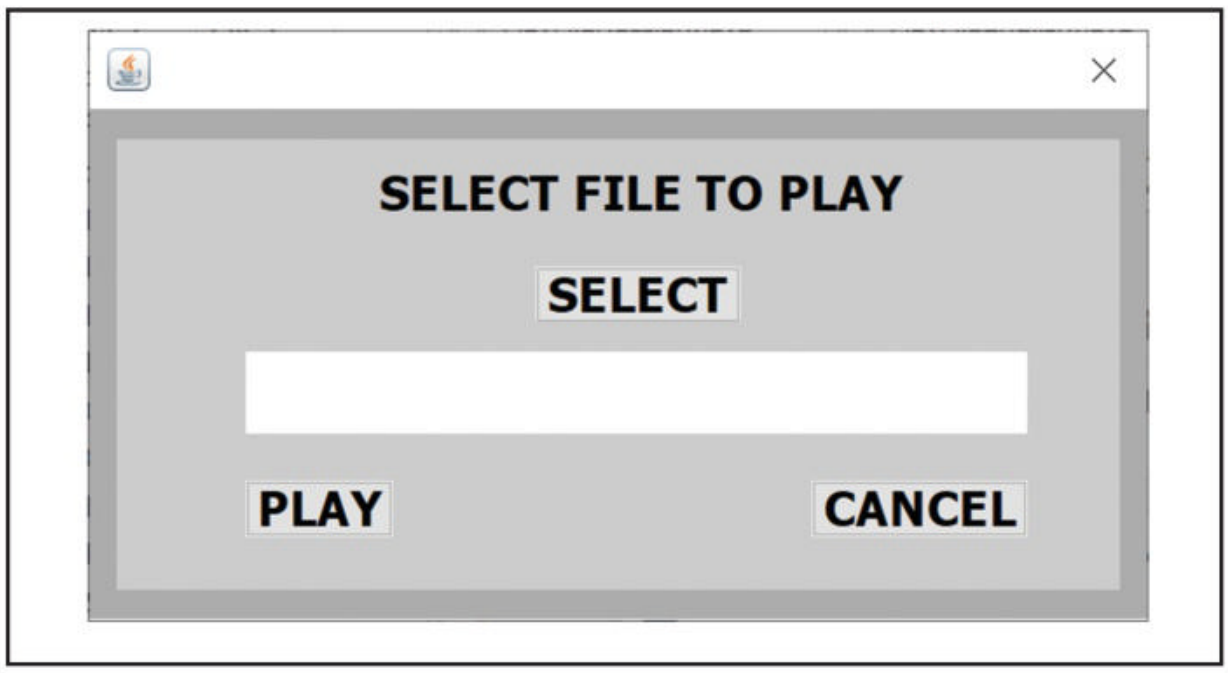


Figure 8. Select File (English)

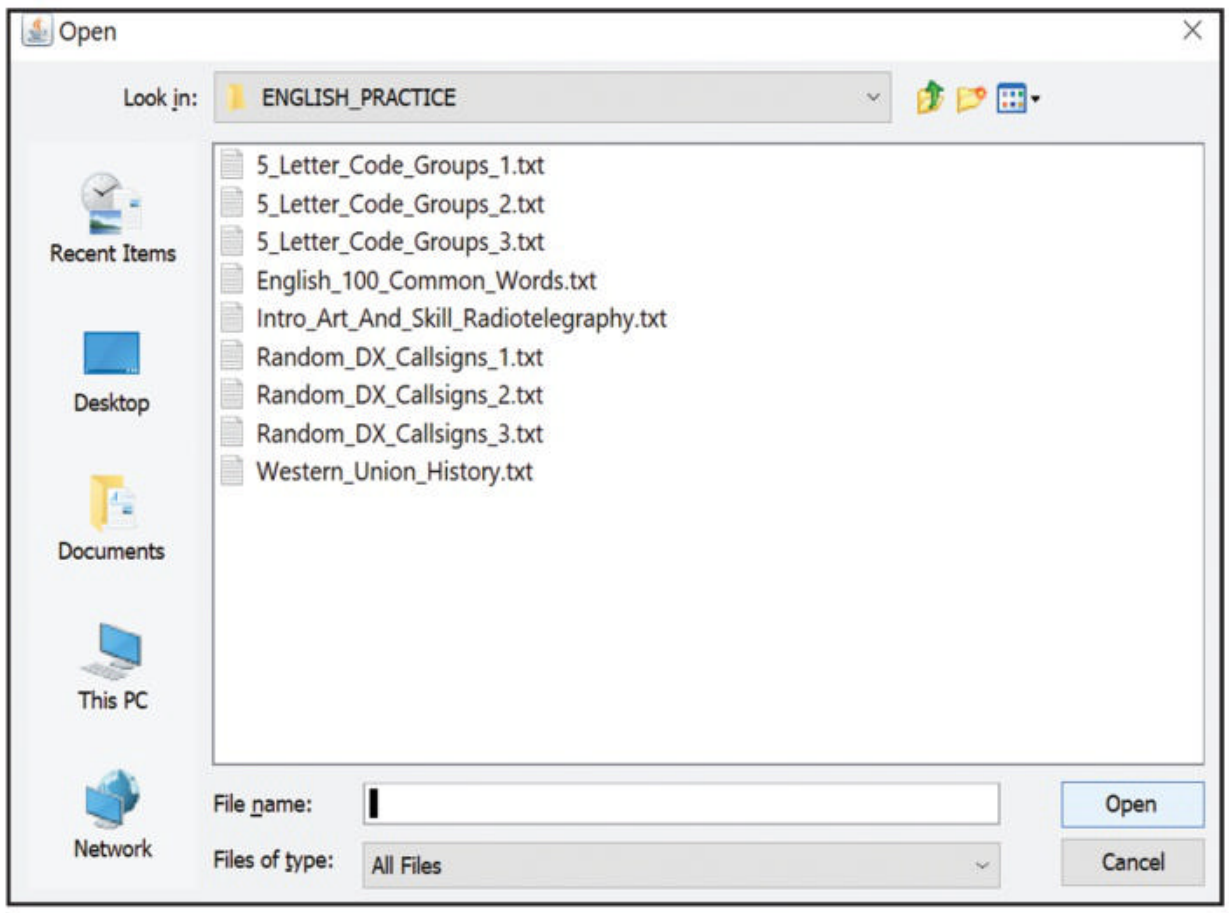


Figure 9. English Practice Files

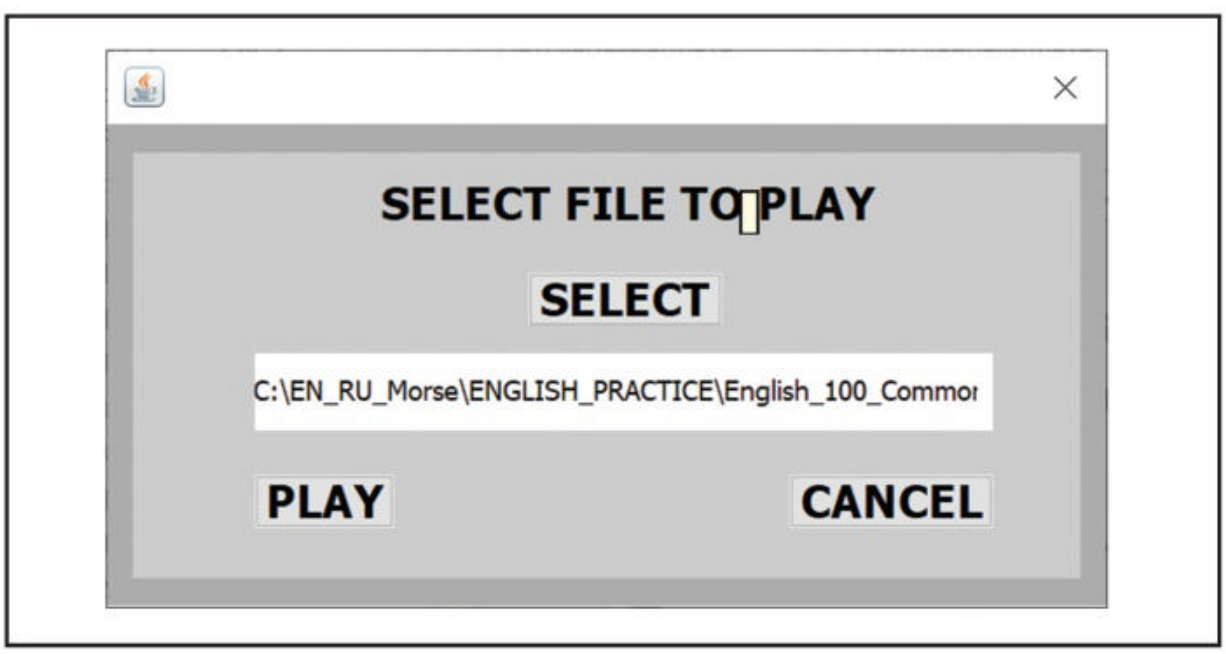


Figure 10. Play Selected File (English)

on the standard US QWERTY keyboard as there are only six changes to learn. The author did this for an external USB keyboard and using new keycap decals to implement the keyboard settings below.[3] As a side note, using this application will enable you to copy in Russian without having to learn to hand-write the Russian alphabet.

One note, since this application is Java-based, you'll need to have the Java Runtime Environment (JRE) installed on your computer. To verify installation, open a command window by going to the Search area on the bottom left of your screen and typing in "CMD" and then click on the Command Prompt icon. When the command line window appears, enter the following command: *java -version*

If the JRE is installed, there should be a response. If not, then follow this link to download and install the latest version <https://www.java.com/en/>.

The application itself is installed from a Zip file that will be uncompressed in the root section of the C: drive of a Windows PC. The resulting layout of the directories can be seen in *Figure 3*.

More detailed installation instructions are included in the EN_RU_Morse_Users_Guide.pdf in the DOCMENTS_**ДОКУМЕНТЫ** folder. The Keyboard Layout folder contains a series of directories that will enable the user to install and use a Russian "phonetic" keyboard mentioned earlier (rusmac).

Additionally, there are the following folders:

* **ENGLISH_PRACTICE**
* **ПРАКТИКА РУССКОГО ЯЗЫКА** (Russian_Practice)
* **LEARNING_ENGLISH**
* **ИЗУЧЕНИЕ_РУССКОГО_ЯЗЫКА** (Learning_Russian).

The learning folders contain beginners' practice files. These are to enable the user to acquire basic skills in the character-set/symbols for each language, in a graduated method.

The practice folders contain files which can be used/enjoyed once all of the corresponding alphabet and symbols for a given language have been mastered. These include random callsigns, coded groups and text files with relevant content. These are intended for extended copying sessions to improve speed and just for the enjoyment of the stories and information. The user's guide also contains instructions for how to add your own content to these directories.

Operation

To start the application, double click on

the **EN_RU_Morse.bat** file. During startup, you should hear the following in code: "**WELCOME ДОБРО ПОЖАЛОВАТЬ**", i.e., "welcome" in both English and Russian.

Once it is running, the first thing to do is to select the language of operation. That is done using the pull-down menu item from the **START / СТАРТ** selection (default is English). Note that with this selection, all of the remaining items will be displayed in that language. The next would be the Morse code tone frequency and speed using the **OPTIONS / ОПЦИИ** selection. Defaults here are 700 Hz and 20 WPM.

Before you begin on this wonderful journey of learning either or both codes, however, here are some thoughts that may help you acquire this skill more quickly and easily.

First, just listen to the entire group of elements in Group 1 and follow along with the displayed letters. Remember to stay relaxed and listen to the timing and spacing of each letter. Then, play the group again but this time, try to write down (copy) all the characters you can. This can be with either pencil and paper or by bringing up the text editor of your choice.

If you miss some, let them go and just try to keep focused on the flow of the characters. Don't get bothered or discouraged for the letters that you miss. The purpose of the exercises is not to memorize the letters, but to establish an automatic recognition in your brain as you listen to them. This kind of automated recognition is achieved only by means of repetition. If you are not satisfied with how many characters you copied one day, you can always repeat the exercise the next day. However, try not to exceed 15-30 minutes of practice per day, but do try to train every day. Once Group 1 has been mastered, go on to Group 2 and so on, until you have mastered all of the letters, numbers and punctuation symbols.

Now let's examine the training options. Selecting **LEARNING / ОБУЧЕНИЕ** (with English as the default) will display the pop-up seen in *Figure 4*.

For some of those more "seasoned" operators, who, like the author, learned International Morse back in the 60s, the groupings for each of these lessons may be familiar. They are all taken directly from the now out-of-print ARRL publication, "Learning The Radiotelegraph Code." Once the group has been selected, the blank dialog/pop-up in *Figure 5* will be displayed:

To start the group playing, click on the START button which will sound the letter(s) and then display each one on the screen. Selecting the CANCEL button will stop the group playing and will return to the LEARNING THE ENGLISH LETTERS menu. To pause the session without canceling it, click the mouse in the display area. To restart the session again, just click the mouse again.

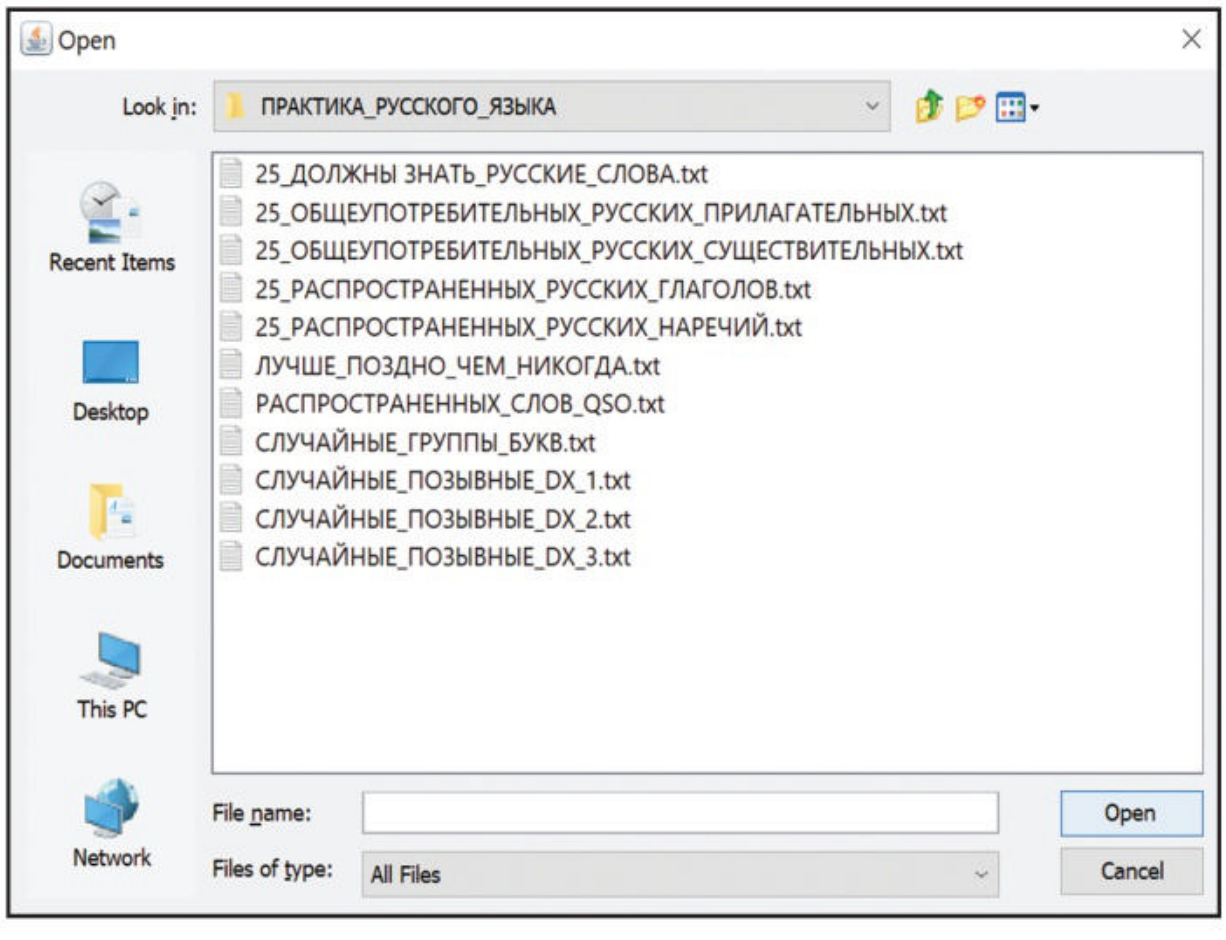


Figure 11. Russian Practice Files

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3CX1200D7	4CX10000A	845
3CX1200Z7	4CX15000A	6146B
3CX1500A7	4CX20000B	3-500ZG
3CX3000A7	4CX20000C	3-1000Z
3CX6000A7	4CX20000D	4-400A
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If the language selection is **РУССКИЙ** (Russian), then the **ИЗУЧЕНИЕ РУССКИХ БУКВ** (Learning Russian Letters) dialog box (*Figure 6*) will be displayed.

Unlike the American/English training methods, the equivalent texts/books in Russian have not been located. Thus, the **ГРУППА** (Group) structure was set up to mirror the ones in the English lessons above but with the addition of Russian letters to each so that all the Russian symbols will be accommodated in the six basic **ГРУППА** (groups), with **ГРУППА** 7 and 8 remaining as the numbers and the punctuation and short sentences. Similarly, once the group has been selected, the blank dialog/pop-up in *Figure 7* will be displayed. The same mechanization to **СТАРТ** (start), **ОТМЕНЯТЬ** (cancel) and pause also work with this menu item.

As noted earlier, the **SELECT FILE / ВЫБЕРИТЕ ФАЙЛ** selection provides longer practice files with a variety of materials, and the menus and elements will be displayed in accordance with the language selected. For ENGLISH, the display will be as seen in *Figure 8*.

Pressing the SELECT option will display the practice files available (*Figure 9*).

The files currently included in this directory are as follows:

*** 5_Letter_Code_Groups_1.txt**
*** 5_Letter_Code_Groups_2.txt**
*** 5_Letter_Code_Groups_3.txt**
*** English_100_Common_Words.txt**
*** Intro_Art_And_Skill_Radiotelegraphy.txt**
*** Random_DX_Callsigns_1.txt**
*** Random_DX_Callsigns_2.txt**
*** Random_DX_Callsigns_3.txt**
*** Western_Union_History.txt**

The names of the files are self-explanatory. Note that the Introduction to the Art & Skill of Radiotelegraphy contains the introductory paragraphs from the book.[4] The Western Union History is an article from the internet that has been set up for long duration copy as it is quite a long file. Finally, the English 100 Common Words is really for typing practice, to assist in developing muscle memory for those most common words. Although not included in this version, the author also put together, in chapter files, the book, "A Princess of Mars," by Edgar Rice Burroughs which makes for great relaxing copy.

Once the selection has been made, the resulting display should be something like the dialog box shown in *Figure 10*. Selecting PLAY will bring up the same display and maintain the same options as seen earlier in *Figure 5*. If the language selection had been **РУССКИЙ** (Russian), then the selection of files to play are as seen in *Figure 11*.

Once again, the filenames describe the contents. The first file contains 25 "must-know" Russian words. The next four files are also for rapid comprehension through repetition and typing practice as they are, in order, the 25 most common adjectives, nouns, verbs and adverbs. The next file is a Russian short story, "Better Late Than Never." Following that is a file with a number of common words that would be used in an amateur radio conversation (QSO). The next file is composed of random Russian letters in 5-letter groups, as would be generated in coded messaging. The last three files are random DX callsigns. Note that callsigns for all countries are identified using International Morse code so these do not contain any Russian characters but were included for practice just like the English language suite of practice files.

Conclusion

As noted, the author hopes that this effort will promote friendship, good will and fun! This system should enable the user to get a much better appreciation for, and enjoyment of, the Russian code and language, and thus the ability to have more meaningful conversations with our Russian-speaking amateur radio colleagues. If however, Russian isn't your "cup of tea", there are about 50 languages that also use the basic Cyrillic alphabet, and this application can be modified to support those.

The application (EN_RU_Morse.zip) can be supplied by the author upon email request, which includes all the directories/files noted in Figure 3. For the adventurous Java programmer, contact the author via email for the source code and the myriad number of configuration settings and support libraries also needed to construct your own version for another language.

Have fun and hope to see you on the air! 73

REFERENCES

1. "Russian Phrases for Amateur Radio," by Len Traubman, W6HJK, <https://traubman.igc.org/hamradio.pdf>

2. Russian Phonetic Keyboard, by Isaac de la Pena, <https://tinyurl.com/37edvtxj>

3. Russian/Cyrillic Keycap decals (Etsy), <https://tinyurl.com/bdfypneu>

4, 5. "The Art and Skill of Radio-Telegraphy," by William Pierpont, N0HFF, at hfradio.org: <https://tinyurl.com/49akjmka>, or purchased on Amazon. This can also be found online in French! The downloaded version is included in the DOCUMENTS_ДОКУМЕНТЫ folder.

DITS and DAHS

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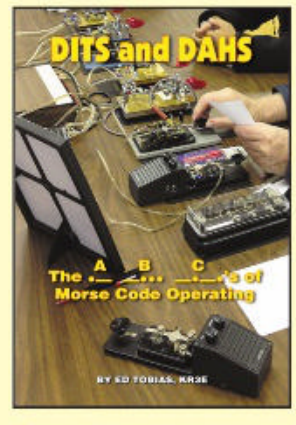
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math's notes

BY IRWIN MATH,* WA2NDM

A Universal AM Modulator

Usually this month, I like to provide a column that, while exhibiting some "unknown" phenomenon or unresolved technique, has unique possibilities. This time, however, I would like to bypass that and provide a so-called "Universal AM Modulator" which, while not intended as an attempt to solve an impossible application, nevertheless has all sorts of opportunities for the true experimenter.

Figure 1 is the schematic of the device. You will note that while this is really just a simple basic audio amplifier, it has all sorts of other applications beyond just amplifying an audio signal to drive a speaker. It uses a common LM-386 with a control to adjust the maximum output. Before going any further, however, let me also indicate that the basic applications that follow do not have to be just limited to the 1-watt LM-386. You could use any audio amplifier up into the kilowatt range (with the appropriate components) as we will now explain.

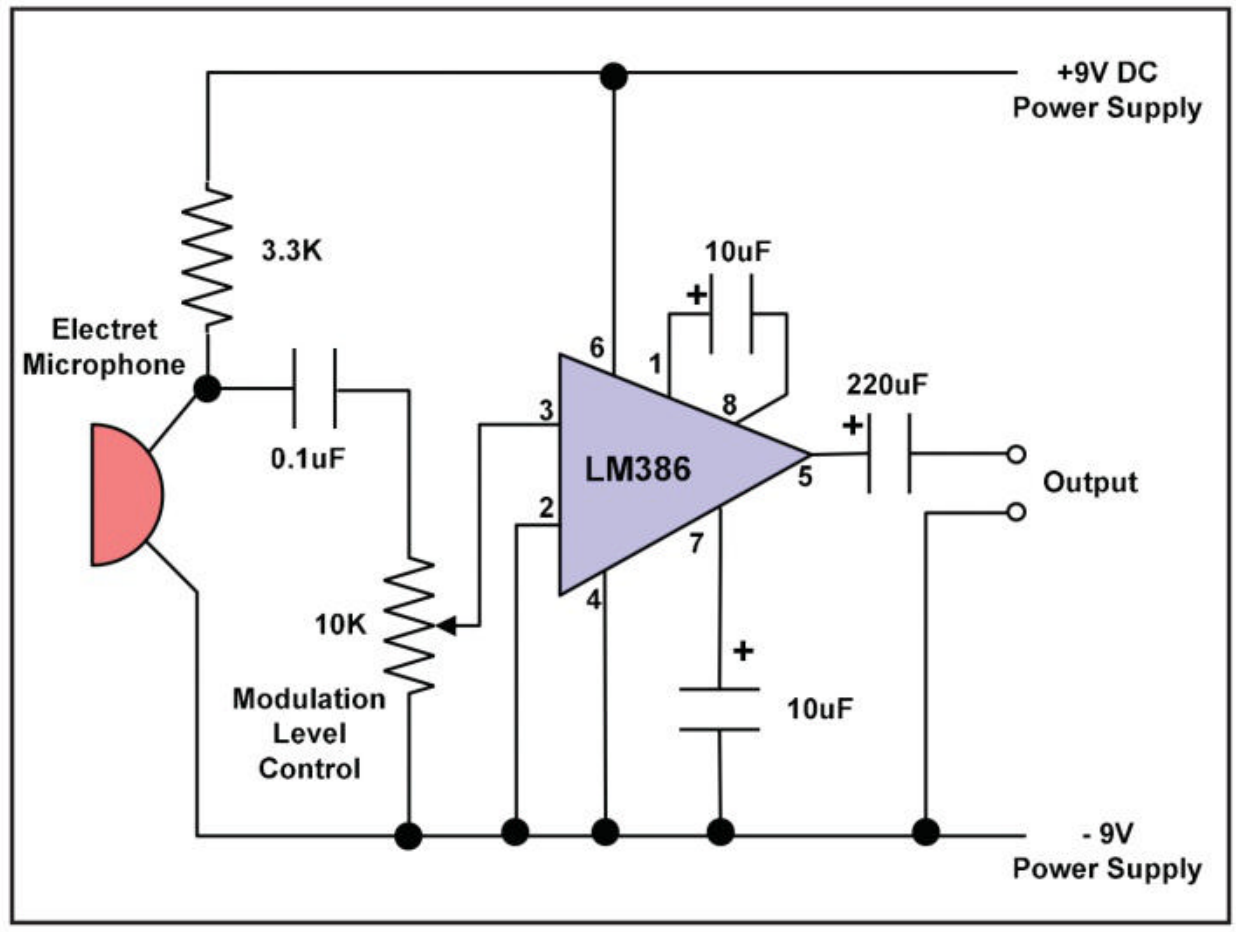


Figure 1. Universal AM Modulator

Application 1 – AM RF Transmitter

For ordinary well known RF applications you could just connect the power supply of an RF oscillator in series with a suitable audio transformer and the amplifier as shown in *Figure 2* and you would have a conventional RF AM transmitter.

Application 2 – Ultrasonic AM Transmitter

If you simply replaced the RF oscillator with an ultrasonic audio oscillator, you would now have an ultrasonic AM audio transmitter. This could be at any frequency above the audible hearing range as an alternate form of transmission to experiment with. Of course, in this case, you would need a speaker (or device) that could respond to the ultrasonic frequency with which you wished to experiment.

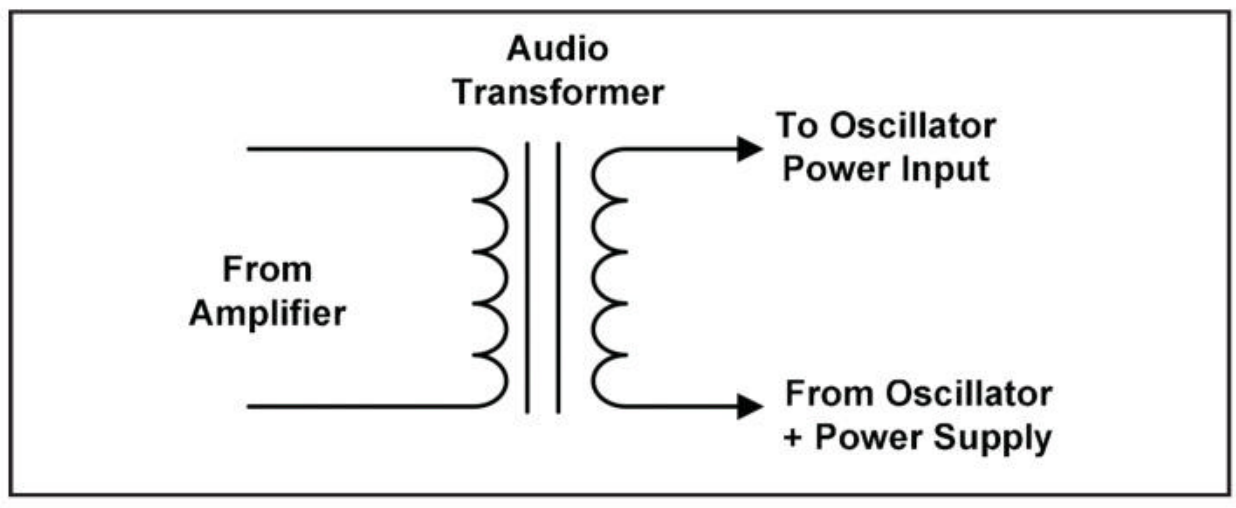


Figure 2. Applications 1 and 2

Application 3 – Optical AM Transmitter

If you connect a simple flashlight in series with a basic audio transformer as shown in *Figure 3*, you would have an AM-modulated visible light beam transmitter which could then be directed to a

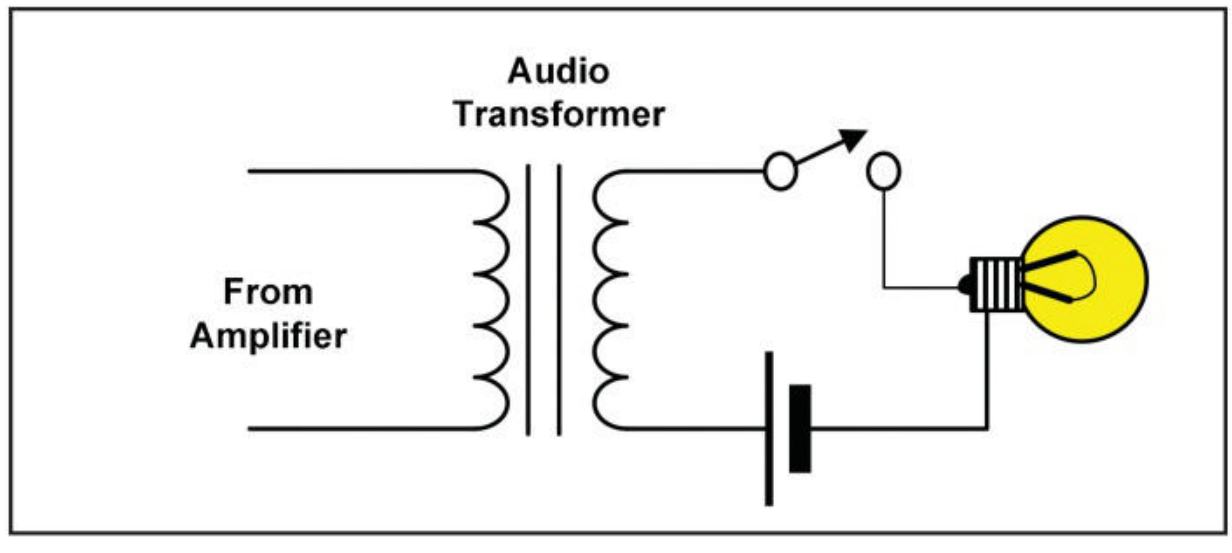


Figure 3. Application 3

*c/o CQ magazine

VHF Propagation

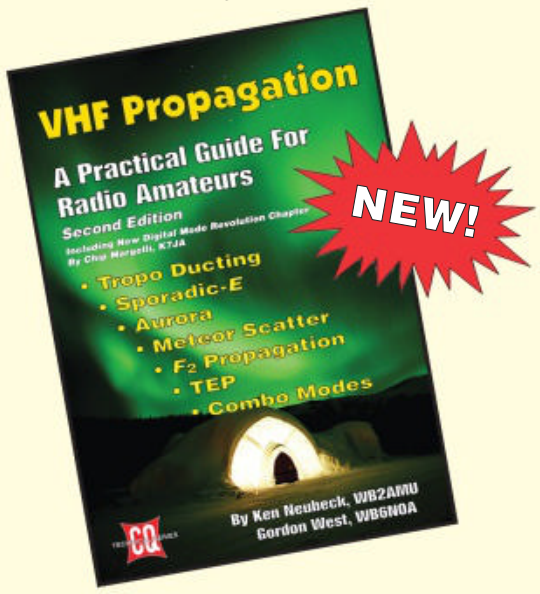
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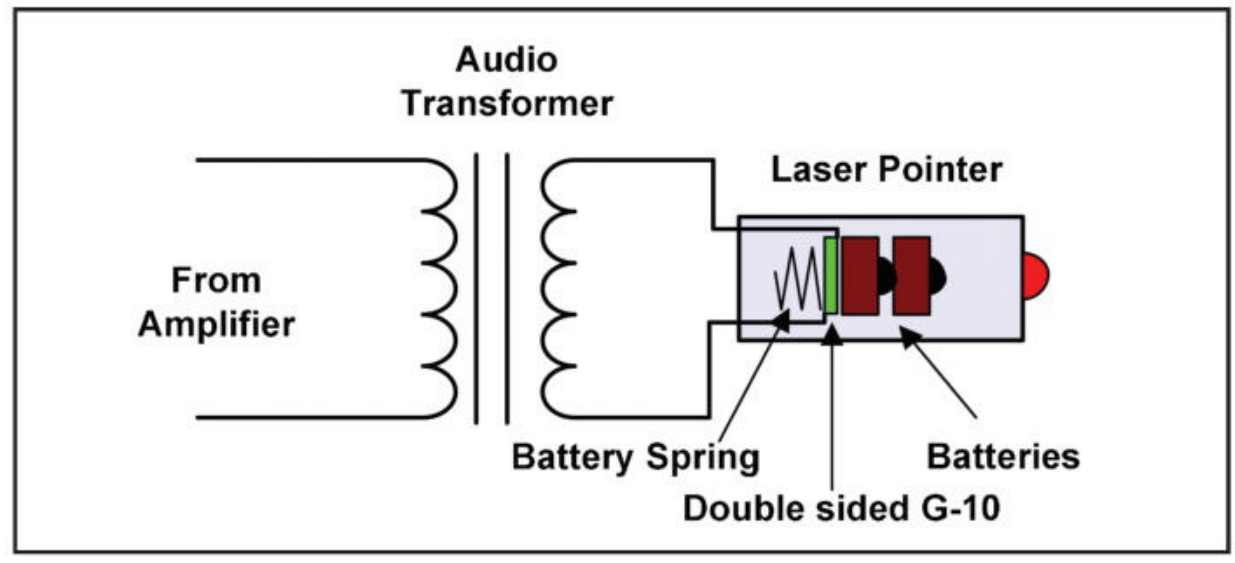


Figure 4. Application 4

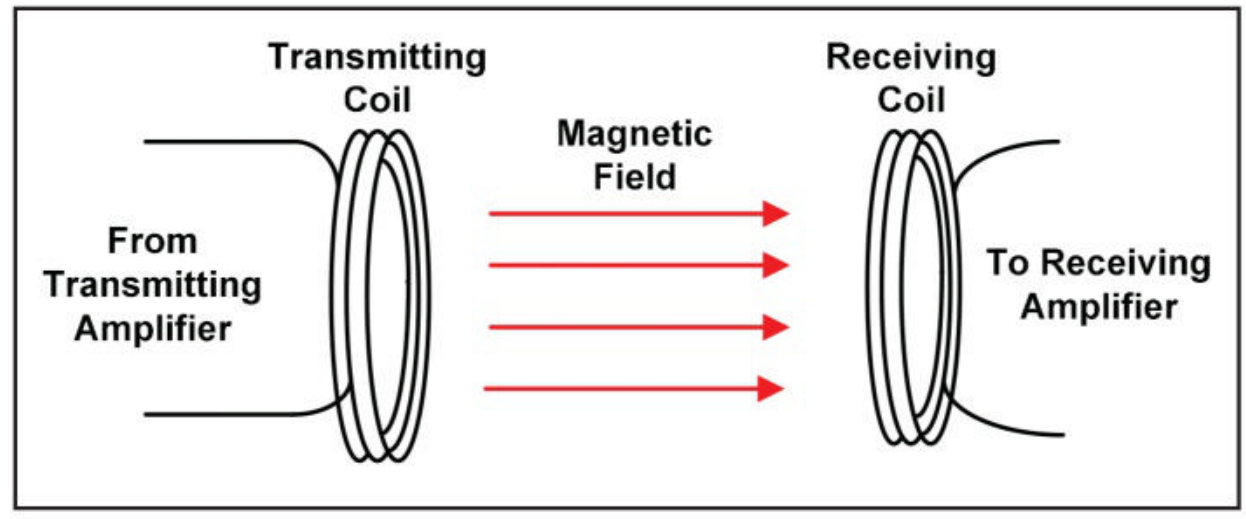


Figure 5. Application 5

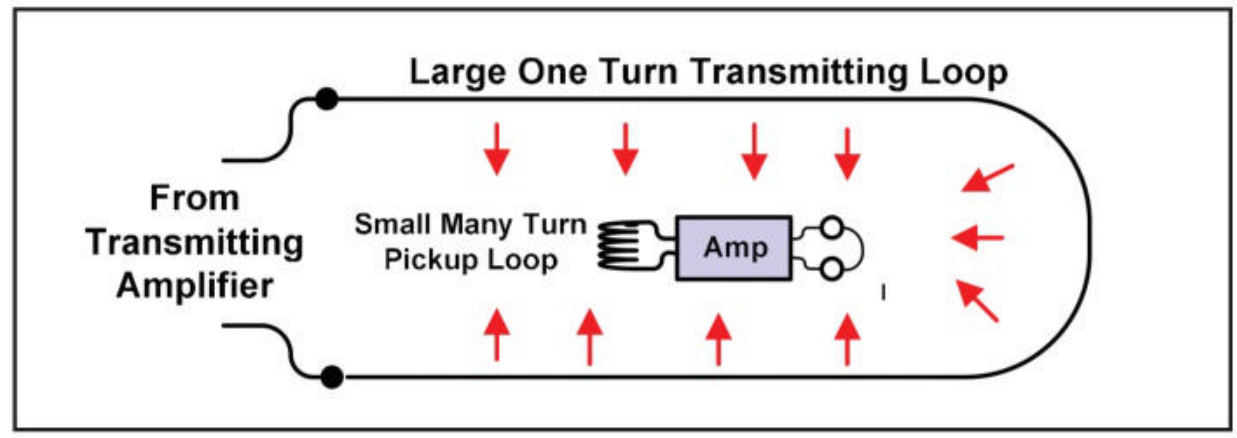


Figure 6. Application 6

distant photocell for a simple visible optical communication system. The more powerful the flashlight, the greater the range of the unit. For this, you would obviously need a transformer that could handle the current of the flashlight.

Application 4 – AM Laser Transmitter

If you replaced the flashlight with a laser pointer as shown in *Figure 4*, you would now have a long-distance narrow-beam AM-modulated transmitter that could be used as is or even coupled into an optical fiber. Note that, in this case, the transformer is connected between the batteries and the common connecting spring with a thin piece of double sided G-10 circuit board material to make sure it is in series with the laser pointer power supply.

Application 5 – Magnetic Transmitter

If you replace the audio transformer with a large coil of wire (several feet in diameter) you would have an AM-modulated magnetic field transmitter that could send a magnetic signal to another large diameter coil at a distance for a truly magnetic (not electromagnetic) wireless system. Old-time experimenters could get transmission ranges of hundreds of feet with this configuration.

There are applications that also use this technique to communicate with locations under the Earth, such as in mines.

Application 6 – Direct Audio Transmitter

If you connected the output of the modulator directly to a one turn loop of wire wrapped around the perimeter of a room you could have a system that would transmit audio to another loop of wire with many turns that could be connected to an set of earphones and have a wireless system that would cover a single room (inside the loop) for all sorts of applications. In this case you would use an audio transformer with a low output impedance to match the impedance of the wire loop.

Application 7 – Ground Wave Transmitter

Finally, If you used an audio transformer with a high voltage output connected to two metal rods a foot or so long which you pounded into the ground a few feet apart, you would have an AM-modulated ground signal that could be picked up by another two similar rods also pounded into the ground a distance away. These would then be connected to earphones, perhaps with an additional local amplifier.

These are only a few applications for a simple (low or high) power audio amplifier. Remember, with all of these, you are really generating AM-modulated audio signals (not RF), which when used alone are not electromagnetic at all and as a result may have applications that you could discover.

– Regards, Irwin, WA2NDM

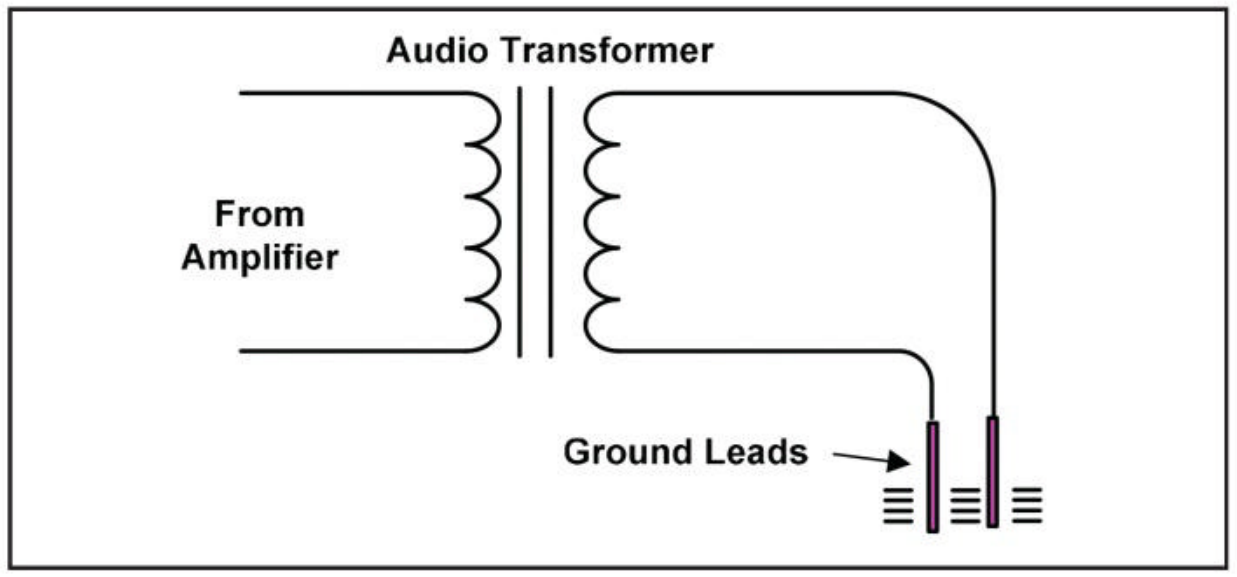
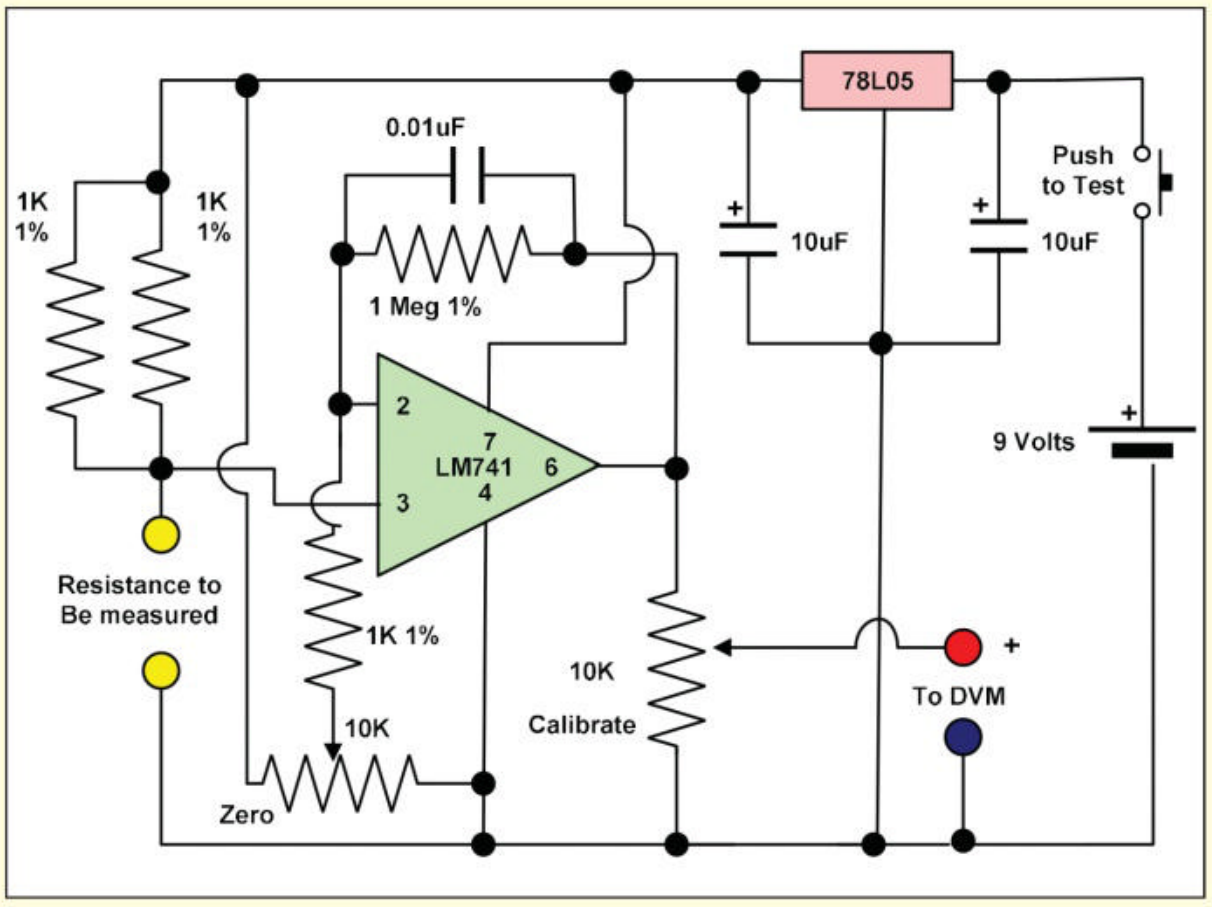


Figure 7. Application 7

Correction to January Column

Thanks to eagle-eyed reader Ed Fong, WB6IQN (who just happens to be an electrical engineering professor), we have a small correction to the circuit shown in Figure 1 of our January column, "Low Resistance Ohmmeter." The text reference to the capacitor across the **1K**-gain resistor should refer to the **1-Meg** gain resistor ("The capacitor across the 1-Meg gain resistor is used to eliminate any residual noise or jitter that may be present due to the high gain."). As WB6IQN noted, "The op amp circuit has a gain of x1000. The way the resistors are configured, it has a gain of 1/1000. Seems like the 1 Meg and 1k resistors are switched?" Indeed they were. A corrected schematic is printed below.



Corrected schematic for low-resistance ohmmeter discussed in the January 2023 column. The 1K and 1-Meg resistors above and below the LM741 IC are reversed in their positions in the circuit. (Tnx to WB6IQN)

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emergency communications

BY JOHN FERGUSON,* K3PFW

A Collaborative Effort

col·lab·o·ra·tive

Co Labor, as in working together towards a common goal.

The art and science of providing emergency and disaster communication is not a solo sport. You can't do it all by yourself. Communication involves moving a message from one intelligent being to another. We may not all be Einsteins, but we did pass a license exam, OK?

Providing communication support to a served agency, government or non-government, requires teamwork and planning. We've already talked about planning, and will definitely revisit it in the future. It is the only way we can be assured of providing the absolute best service we can offer to our clients. And we are serving clients. The information we pass is for their use, not ours.

I will agree that this great hobby of ours includes those who, for their own reasons, prefer to go it alone. And there are some stellar examples in the DX competitions that leave me gasping; how one individual can bring that much concentration and effort to a task over long hours, amassing an impressive score. But then what happens when we get a team of these superstars together? The scores are astronomical! History and literature often extol the "Lone Wolf." In reality, though, wolves work together for the common good and survival of the pack.

We don't give scores for disaster traffic handling, although we may report the number of health-and-welfare messages handled. The number of messages handled for the local Red Cross chapter or the county Emergency Operations Center never get counted. Yet each class of message is valuable in its own way.

So how do we achieve this team effort? That's the simple answer: Through organized groups, starting at the local community level and building to the national level. A group that is organized, by its very nature, has a plan, a framework it uses to function efficiently.

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Perhaps the broadest and most recognized emergency communications group in our hobby/service is the Amateur Radio Emergency Service (ARES®), sponsored by the American Radio Relay League, (ARRL) with headquarters in Newington Connecticut. With 15 divisions and 71 sections, the ARRL covers the 50 states plus U.S. territories. Each division is managed by a director, and each section by a manager. These individuals are volunteers elected by the membership they serve.

For ARES® at the section level, the Section Manager appoints a Section Emergency Coordinator (SEC), a volunteer who manages the ARES® program for the section and appoints District Emergency Coordinators (DECs), if the size of the section warrants it, and Emergency Coordinators (ECs) for the local level. It will be the EC who manages the local group. You do not have to be a member of the ARRL to be a member of ARES, but why not? The advantages are enormous, giving you access to all kinds of support and information. The ARRL website (see references sidebar) will have the contact information for the Section Manager of the section in which you reside. He or she will be able to direct you to the Emergency Coordinator for your local area.

You will find the ARES® program to be very well-structured with a task book available to guide your progress in the organization. Local ARES® groups may be involved with the Red Cross, the local government, hospitals and possibly other agencies. Over the last several years, the training requirements for the three levels of qualification in the program have been upgraded to keep pace with the changes in emergency management.

One other recent change has been the development of ARESMAT, which is the process of developing mutual assistance agreements between ARES® groups, often across jurisdictional (county/state) lines. The accent is on mutual agreements for similar training and qualifications.

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Skywarn and MARS

A group that often works closely with the ARES® is Skywarn, sponsored by the National Weather Service through its regional Weather Forecast Offices (WFOs). After completing a short training course, you are issued a Spotter ID, and can participate in the tracking of severe weather in your locale. There will be a Skywarn Coordinator somewhere local to you. The actual management varies somewhat under each Weather Forecast Office (see information sidebar for details).

If you are looking for a real challenge, operationally and technically, look no further than the two Military Auxiliary Radio System, or MARS organizations,

sponsored by the Department of Defense. There is the Army MARS and the Air Force MARS (Navy-Marine Corps MARS was disbanded several years ago). These groups operate on Department of Defense frequencies, just outside the ham bands. Your equipment may have to be modified to do so. Usually, it is not a difficult procedure. During the Vietnam era, MARS stations "in theater" and here at home ran thousands of phone patches as a morale activity. There is still some of that activity, both morale and official. An interesting technical note, all official MARS traffic today is encrypted, and part of your training to become a MARS operator would include that.

In celebration of Armed Forces Day and other occasions, such as exercises, hams get the opportunity to interoperate with military stations and MARS stations. On Armed Forces Day, you would work "split" with the military station outside the ham band. For the exercises, the MARS stations, because they are still hams, sometimes come up on the ham bands to exchange traffic. When I was younger and single, I thoroughly enjoyed my time in Air Force MARS, as an operator (AFA3SQ) and moving up to State, Region and then Area Director. This is an activity that will require a considerable commitment of your time, as any emergency and disaster communication activity will, but maybe a bit more. It will, however, be time well spent.

Faith-Based Organizations

Not as widely known are the faith-based disaster relief organizations that have amateur radio operators, sometimes as a component, and sometimes embedded in the staffing. There are two that are active over a wide area of the country. The Salvation Army Team Emergency Radio Network (SATERN) is sponsored by The Salvation Army and is used as a component of its disaster relief plan. If they are active in your local area, you might investigate what they have to offer. The second one is the Mobile Kitchen Ministries of the several Baptist Church groups. Frequently there are hams embedded in the staffing, working in food service when not needed on the radio. I've had the opportunity to work with some of these mobile kitchen groups, and I have two takeaways; they are dedicated, committed volunteers, and the food is excellent!

RACES and AUXCOMM

No discussion of amateur radio emergency communications would be com-

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plete without something about the most misunderstood portion of the amateur service, the Radio Amateur Civil Emergency Service (RACES). In the FCC Rules and Regulations (47 CFR § 97.407 - Radio amateur civil emergency service <https://tinyurl.com/ycxawnsk>), you will find the relatively simple, for a government regulation, description of what and how the RACES operation is structured. First of all, RACES, as its name implies is a service. Secondly, it is a component of state and local emergency management agencies and may only be officially activated by those agencies or when the War Powers Act is engaged by the President of the United States. Third, if you are not registered with a RACES entity, you will not be able to operate.

The problem of the RACES registration is few agencies keep it up to date. Amateur groups would do well to find the RACES Radio Officer for their jurisdiction, and keep the roster up to date. That said, there are RACES groups active around the country doing what hams do. They are established as part of the volunteer communication support to a government agency involved in response and recovery operations, and function as your everyday ham club.

A natural evolution forward from RACES, relatively new in about the last decade, is AUXCOMM. This is an auxiliary communication service, sponsored and managed by an agency involved with response and recovery activities in disasters. This is usually a government agency. In many ways it could be called the "New RACES." It is organized to fit in and work with the Incident Command System (ICS). It has been directed by the Department of Homeland Security that the ICS will be used for *all* response and recovery operations! The development of the program was started in about 2009, and first came out in about 2012. Many states across the country have adopted it to manage their Auxiliary Communication Service program. Volunteers in AUXCOMM can be expected to perform any communication-related task for which they have the applicable training and competence. This makes it a very flexible, somewhat dynamic, program. It is not exclusively hams. You don't need an FCC license to answer a phone, operate a FAX machine or make copies; but these are critically important tasks in an Emergency Operations Center actively managing a major disaster. There has been controversy, somewhat frequently, as AUXCOMM is adopted in local and state government jurisdictions. We must remember and keep in perspective, that we are the communicators, not the emergency managers, who by governing statute are have the authority for the response and recovery operations.

There are other organizations, of course, such as two that I mentioned in this column last August, REACT International and the Oregon ACES, and I'm sure there are other groups like them, maybe in your locale.

As I said at the beginning of this column, you really can't go it alone in emergency communications and be effective. Here's why: The FCC Rules and Regulations state as the first premise for the existence of amateur radio in the United States, "Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications." [§97.1(a)] The FCC expects us to serve our communities in time of need. The best way we can do that is by being organized, trained and practiced in our craft.



On the Home Front

An update on last month's column on the rebuilding of the station here at my QTH. A few of my original thoughts are changing. First, the inverted-L for 160 meters is now going to be an end-fed random wire that will do 160, 80/75 and 40. This puts a second multi-band HF antenna in the inventory. The two 100-amp-hour SLA batteries did not pass the load test and will be replaced by two slightly smaller ones. Those big ones are way too heavy to conveniently move when necessary. The work continues slowly, much too slowly...

73, John K3PFW

References

Follow these links for more information on the organizations discussed in this month's column:

ARRL – Home: <https://www.arrl.org>
ARES (ARRL): <http://www.arrl.org › ares>
SKYWARN <https://www.weather.gov › SKYWARN>
U.S. Army MARS <https://netcom.army.mil › mars>
U.S. Air Force MARS: <https://www.mars.af.mil>
SATERN: <https://tinyurl.com/3jkewvrn>
RACES (FCC Rules & Regs, Part 97.407): <https://www.law.cornell.edu/cfr/text>
or <https://tinyurl.com/mr2vwwe5>
REACT International: <https://reactintl.org>

kit building

BY JOE EISENBERG,* K0NEB

Updates, Antennas and Tools, Oh My…

When building kits, some of the greatest modifications and upgrades often come from the individual builders. A popular kit recently put out by the Four State QRP Group is the 4S Dummy Load, a kit I have previously reviewed. The modification created by Jim Sheldon, W0EB, is very simple and requires no modification to the PC board.

The 4S Dummy Load is a 10-watt dummy load that incorporates 4 LEDs that indicate the power level being supplied by the ARP transmitter. I highly recommend connecting a dummy load to any QRP kit transceiver or transmitter during initial power up to prevent damaging the final output stage should the kit be inadvertently keyed into transmit mode by either an unknown problem or the key being accidentally shorted. Most QRP kits have no VSWR protection, and so connecting the dummy load on initial power up is a great step to preventing a problem.

The 4S Dummy Load kit incorporates a PC board-mounted BNC connector which normally is placed on the top of the PC board. Because this part is symmetrical, it can also be mounted on the bottom of the board. The reason to do this is to make the kit easier to fit into a 3D printed case Jim has designed and has made the files available free as Thing #5407722 on <thingiverse.com>. Jim offers two different versions of the case (*Photo A*), one being the original version that accommodates the kit with the BNC connector on top and utilizes "light pipes" to allow the 4 LEDs to be visible through the top cover of the 3D case. The other version rearranges the lower part of the case to accommodate the positioning of the BNC connector onto the bottom of the PC board and eliminates the need to print clear "light pipes" to shine the light to the lid. This new configuration allows the LEDs to be directly viewed through the top of the case. No other changes need to be made to the kit assembly process.

Wire Winders

While on the subject of 3D printing, I have discovered a number of wire antennas popular with those who enjoy portable operating. Parks On the Air (POTA) as well as Summits On the Air (SOTA) operators often deal with the problem of storing and deploying these wires for end-fed antennas and dipoles which can also include counterpoise wires for vertical antennas. Adam Kimmerly, K6ARK, has designed a number of extremely compact wire antenna kits that I'll be reviewing soon. In addition, Adam also provides the 3D printing files to make winders for portable wire antennas including his lineup of kits (*Photo B*). To find Adam's 3D printable objects, go to <www.printables.com>. This website is aimed at the users of the Prusa line of 3D printers, but the files are easily printable on other 3D printers as well. To find his designs on Printables, just search for K6ARK in the search field. To prepare the file for your printer, just use the slicer program you normally use for your printer to process these files for printing.

Adam gives an online source for the Velcro® strips needed for assembling

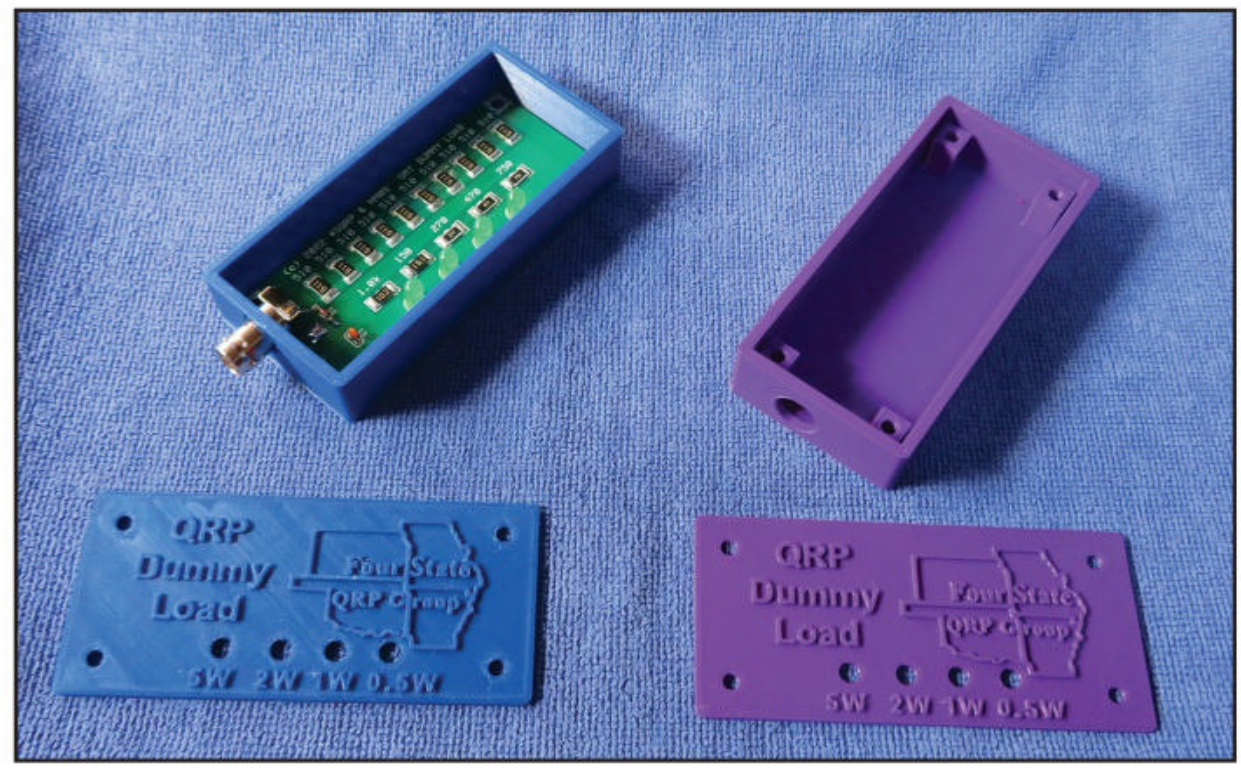


Photo A. The original 4-State QRP Group 4S Dummy Load mounted in the original version of the 3D printed case (left), and the new design case (right) made for having the BNC connector mounted on the bottom of the PC board.

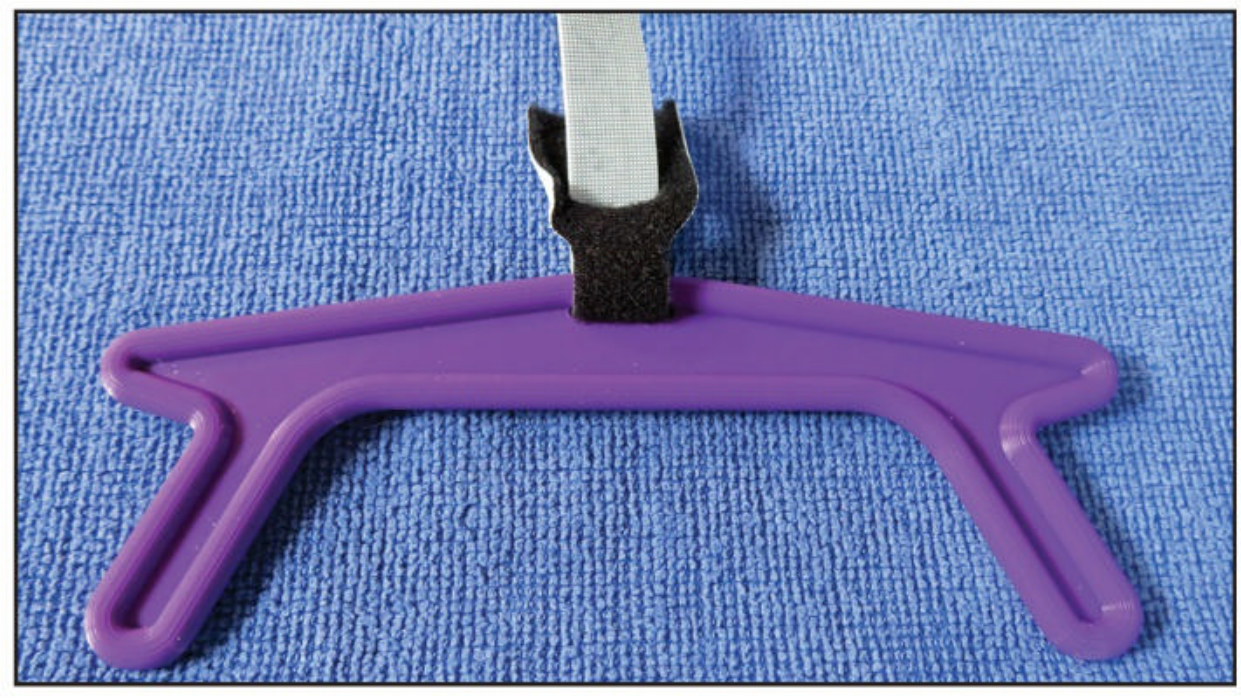


Photo B. A K6ARK-designed wire winder with a Velcro® strip attached.

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this winder on the Printables page. I used his simple antenna winder design to print several winders for an upcoming group kit build a local club is doing that involves the Pacific Antenna 30/17-meter dual-band trap dipole kit (*Photo C*). This inexpensive kit sells for $25 and is also available as a 40/20-meter dual band version. There are several other winders as well as many 3D designs available on his page that would be very useful to those operating portable. With warm weather finally here, it is time to put together some great antennas and accessories for enjoying the fun of portable operation.

Soldering Pen

Harbor Freight has again come up with a tool that can be useful for hams in the form of a cordless soldering iron (*Photo D*). This tool is sold as a 4-volt Lithium-Ion Soldering Pen, but it isn't very pen-like. I found the handle to be quite thick. The tool comes with an equally sized stand to allow for safe storage while the tip still is hot, a very nice touch. Many other cordless soldering tools come with no place to safely cradle it while the tip cools. This cordless soldering tool heats up to about 900 degrees and recharges using a USB cable, which is supplied. I found it useful for working with connectors outdoors or in automotive installations. The higher temperature is more useful for repairing antenna wires and connections as

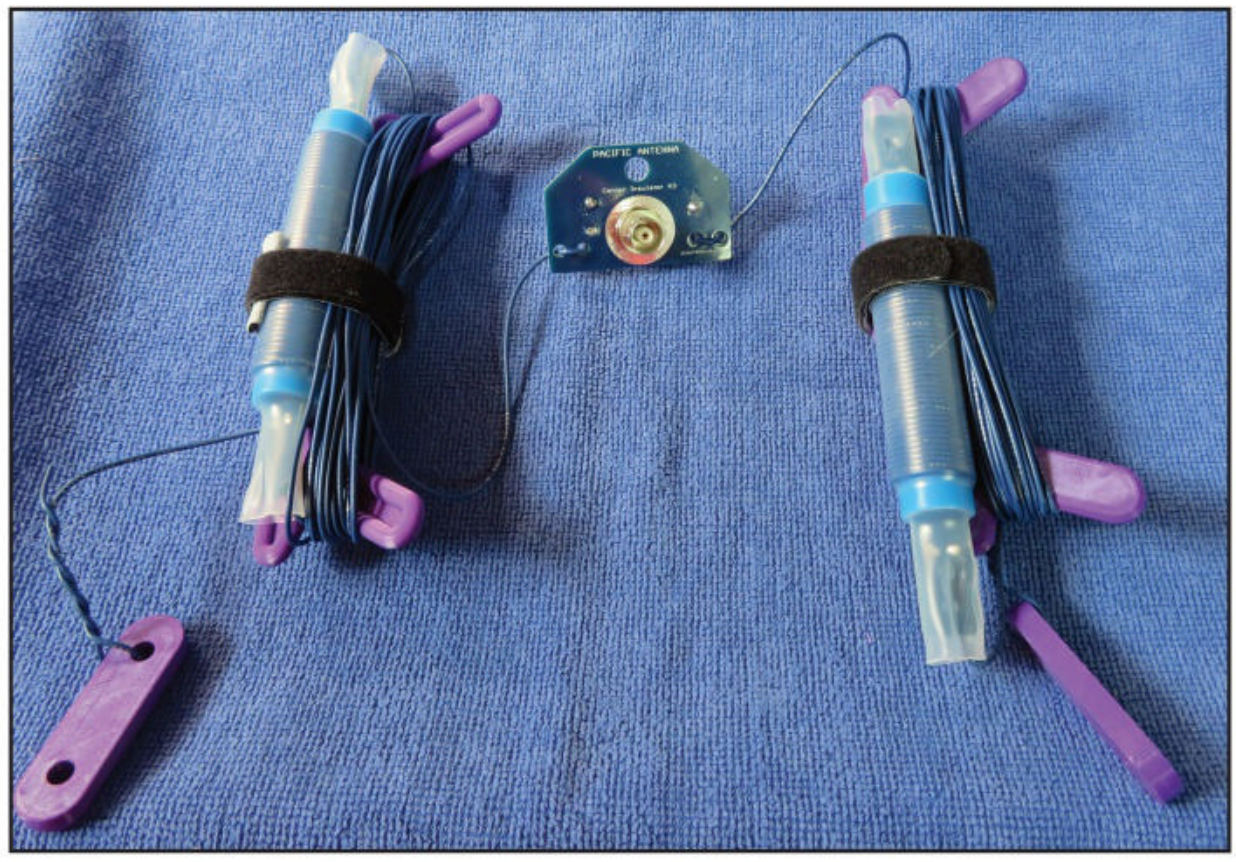


Photo C. A Pacific Antennas 20/40M trap dipole kit wrapped on two K6ARK-designed 3D printed winders.



Photo D. The Schneider 4V cordless soldering iron from Harbor Freight. This tool utilizes USB-C charging cables.

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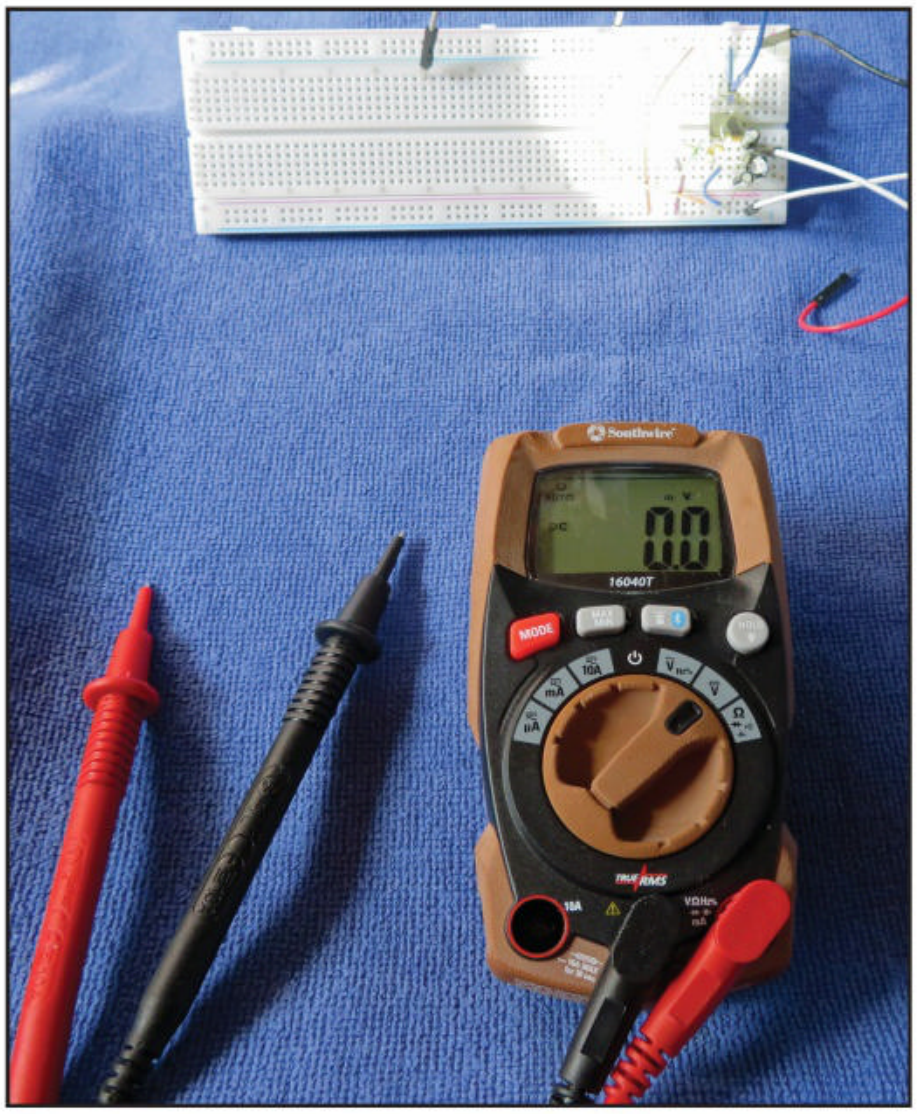


Photo E. A Southwire multimeter featuring a lighted display, Bluetooth connectivity, and an LED "headlight" to illuminate the circuit being tested.

well as other types of connections outside of finer work. I would not use it on PC boards as I believe it to be a bit too hot. You can find this cordless iron for sale at your local Harbor Freight store or at <www.harborfreight.com> for $39.99. As with most items at Harbor Freight, big savings can be had from the list prices by watching their online coupons and ads.

Getting a Good Reading

Finally, I had the occasion to visit my local Menards store recently and discovered their electrical section now has a much more extensive selection of multimeters and other electrical test equipment than I have seen in the past. I only saw maybe 2 or 3 different types of meters there in the past. They now carry a broad line of meters including those sold by Southwire that include models that have Bluetooth connectivity to a smartphone app that lets you record and observe readings. Some of their meters include a "headlight" that lets you illuminate the circuit being tested (*Photo E*). This feature can be very handy when testing things in darkened areas, such as in repeater or equipment rack cabinets, closets, under desks, etc. This is in addition to the backlight feature that illuminates the digital display. Menards is a home improvement store that is primarily in the central part of the US and also is available online at <www.menards.com>.

Hamfests on the Horizon

April brings lots more hamfests and May is just around the corner with the Dayton Hamvention® being the highlight. I hope to see everyone at one of these great events and look forward to finding even more new kits and tools!

Until next time,
73 de K0NEB

magic in the sky

BY JEFF REINHARDT,* AA6JR

I Need a Bigger Antenna!

If you saw the 1997 movie, *Contact,* you might remember the plaint of the main character, Ellie Arroway (played by Jodie Foster) as she portrays a young ham radio operator seeking to feed her curiosity about the universe. The dramatic cut shows a grown young woman at the Karl G. Jansky Very Large Array (VLA) in New Mexico, the site of 28 receiving dishes, each weighing 230 tons and able to be tightly concentrated or spread across a distance of some 22 miles, depending on the area currently being studied.

If you haven't seen the movie, it's worth the investment of time, as it explores a wide range of topics, beliefs, science and emotions tied to our understanding of the universe. You would expect no less from a film inspired by a book of the same name, written by the late astrophysicist Carl Sagan. A key element of the story is the search for intelligent life beyond our home planet, but scientific research at the VLA goes far beyond that single pursuit.

Road Trip

Those familiar with my writings in *CQ* may know that I'm a "road warrior" who

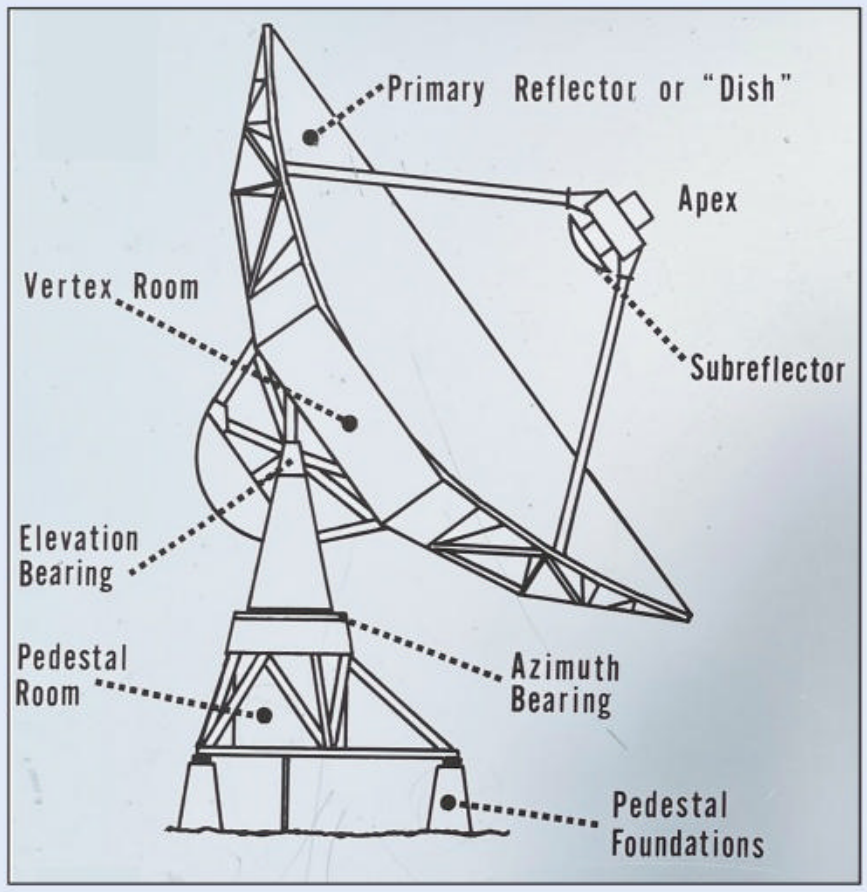
*5904 Lake Lindero Drive, Agoura Hills, CA 91301
e-mail: <aa6jr@cq-amateur-radio.com>



What's 90 feet tall, weighs 230 tons and moves in a tightly choreographed ballet with its 27 siblings? Read on to find out…



Just some of the Very Large Array's receiving dishes at work. The array is too large to capture in one photo. (All photos by the author)



Antenna Specifications

Type: Offset cassegrain with asymmetric subreflector
Mount: Altitude-Azimuth
Focal Ratio: f/.35
Total Weight: 235 Tons
Total Height: 29 Meters (94 ft.) when pointed straight up
Dish Diameter: 25 Meters (82 ft.)
Drive System: 4 Electric motors (2 per axis)
Range of Motion: 540 degress azimuth, 120 degrees elevation
Tracking Accuracy: 15 arc seconds in winds up to 18 mph
Founations: Height above track 1.9 Meters (6ft. 4in.)
Depth below track 9.7 Meters (32ft.)

Technical specifications of the VLA radiotelescope dish antennas.



Jessica, KD6ARA, and Steven, K6SJR, give an idea of the scale of just one of the receiving dishes. Steven is 6'2" tall.

has enjoyed exploring highways and back roads in every state of this great country from coast to coast, from Canada to the Gulf shores and the Mexican border, with visits to Alaska and Hawaii. To be sure, there are breathtaking sights and experiences to be found in each state, but a visit to the VLA could (and should) cause recalibration of your ability to measure awe.

The Road Less Traveled

Unlike many tourist attractions, such as Hollywood, Las Vegas, Broadway or the Disney parks, you have to really *want* to visit the VLA. By design, it's not near, well, anything, so as to provide a quiet (from a radio perspective) home for the antenna system. Operated by the National Radio Astronomy Observatory, the VLA was constructed in the 1970s on the Plains of San Agustin, several miles west of Socorro, New Mexico. The nearest settlement is Magdalena (blink and you missed it), and if you like wide open spaces, you'll enjoy the vistas along US 60 as you make your way along the road to the VLA.

Do Your Homework

However, before tossing your suitcase in the car, do become familiar with the VLA and what's required of those who intend to visit. Start on the web at <https://tinyurl.com/4sbb5by7>. The website contains vital information on the limited days and hours visitors may be welcome, the nominal admission fees, and importantly, the radio emissions that are prohibited at the site. For example, drones are not allowed under any circumstances and commonplace items like cell phones and Bluetooth devices must also be turned off in and around the facility. RV operators need to be sure the microwave oven is not used! Frequencies monitored at the VLA range from 1 to 50 GHz with equipment that could sense a cell phone on the moon!

What You'll Experience

The small visitor center has a friendly and helpful staff along with a theater and dioramas that explain the purpose of the facility and some of the scientific studies being undertaken there. The theater shows a short informative film, appropriately narrated by Jodie Foster, that gives greater understanding to the missions of the VLA.

You can then head outdoors and begin a self-guided walking tour past several exhibits, each with interpretive signs and several of them are interactive. But the real thrill is approaching one of the actual dishes and marveling at the size and precision of the unit (see photos). Each antenna unit is over 90 feet high and the receiving dish is 82 feet across, with a



Signals from light years away find their to dishes in New Mexico.

total weight of 230 tons. Captured signals are then conveyed to a cryogenically-cooled receiver. While the numbers are impressive, remember that when in use, there are 27 of these behemoths (the 28th is kept as a spare) *and they are mobile!*

Depending on what is being observed by the VLA's radio telescopes, the 27 active dishes can be configured in different reception patterns, enabling wider or more concentrated areas of resolution. Grouping the dishes in their varied configurations is a time-consuming operation, as they move along rails to their respective connection points. A reconfiguration occurs every four months. While observing, the data from each dish is conveyed to a central control building which is enclosed in a Faraday cage, where a supercomputer assembles the data and converts the received signals into formats the scientists can analyze, including visual images. Sadly, but understandably, a visit inside the control building is not permitted but one may climb the stairs to a second story observation deck to take in the site and perhaps capture some photographs.

During our visit, we witnessed the coordinated and simultaneous movement of the dishes as they were aimed at different targets and that motion was perceived as an amazing but exacting ballet. Silence fell over the visitors as the graceful precision movements took place.

Just What's "Out There"?

In its nearly 50 years of operation, the VLA has detected the "invisible universe" of radio emissions from distant galaxies, solar systems, planets, black holes, gas clouds and stellar "nurseries." Since operations began in 1976, the VLA has observed some 43,000 different cosmic objects. While the stunning visuals from both land-based telescopes and the Hubble and Webb telescopes orbiting in space add to our understanding of the universe, radio astronomy still has a valued place by detecting that which cannot be viewed in the visual spectrum, or objects that cannot be observed because they are obscured by cosmic dust.



No, these folks were not calling us through the VLA – but you can visit them in Roswell, New Mexico, about a 3½-hour drive to the east. And remember – this is the April issue!

While the film *Contact* placed much focus on the search for extra-terrestrial intelligence (SETI), that is not the main focus of the VLA, so the movie image of an observer listening intently to headphones is not quite the case. Scientists from all over the world have used the VLA to explore topics too numerous to list but they include studies ranging from our own solar system to the farthest reaches of the known universe.

New discoveries frequently open the door to new mysteries. Can we come to understand the enigmatic "dark matter" of the universe or look back in time to the Big Bang? Are there sources of energy we have yet to define? And – are there any signs of life beyond the (relatively) tiny speck of celestial dust we call Earth?

As you read this, consider that radio signals that originated untold eons in the past have been making their way toward Earth at the speed of light. Some of those emissions are being detected right now, as the VLA captures another aspect of the *Magic In The Sky*.

antennas

BY KENT BRITAIN, WA5VJB

Care and Feeding of SWRs



For some years, there has been considerable speculation about those tiny SWRs crawling around on our antennas and soaking up RF energy. Do they have six legs? Do they have eight legs? Microscopic studies have shown that they are indeed related to arachnids and thus have eight legs. But they don't necessarily put them all down on your feedline at the same time. Get those radio waves going up and down the antenna and it burns their feet! They lift up one foot, then another, and when they have seven legs in the air and are standing on only one foot, your SWR is 1 and you get out best!

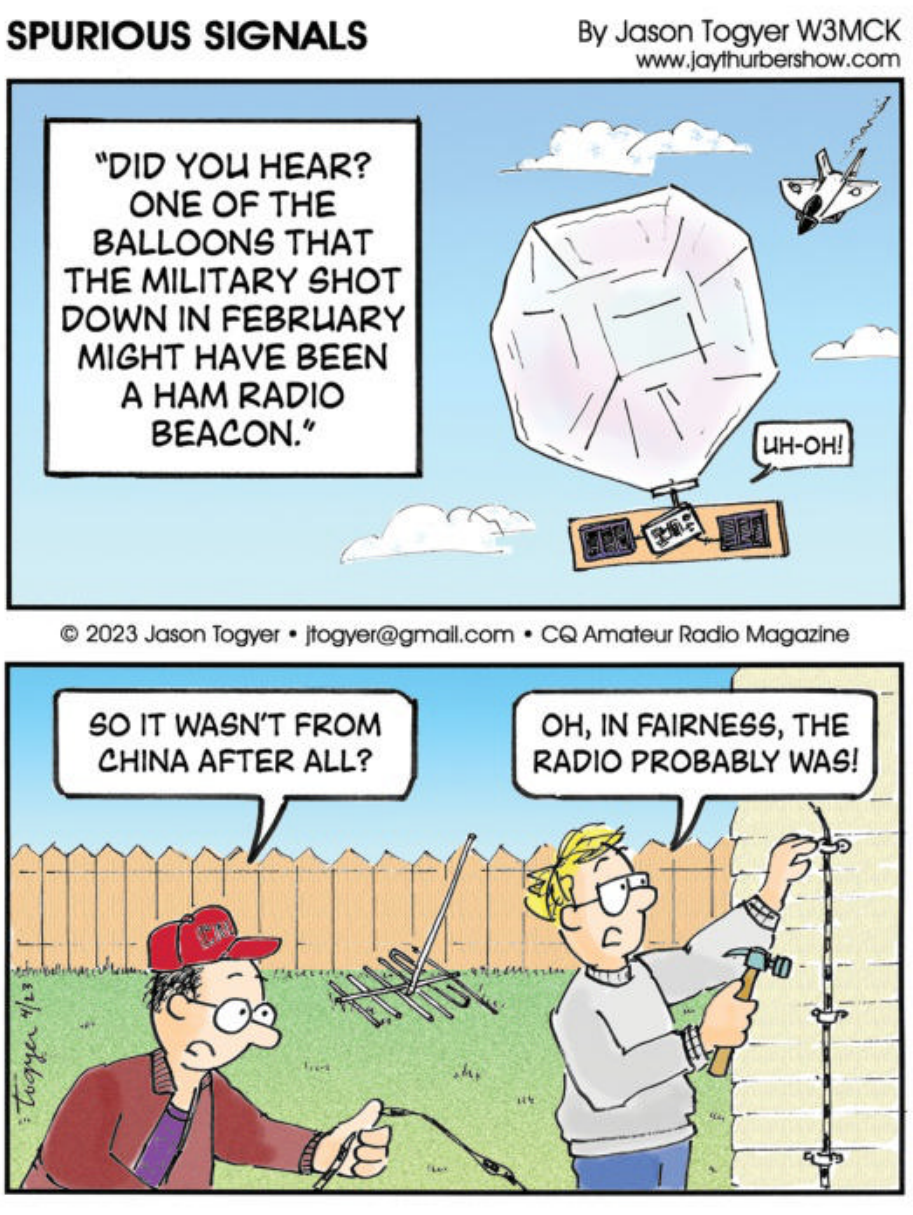
Of course, this brings up the question of with only eight legs, how can you have an SWR higher than 8?

Studies into SWR breeding habits continue. We hope to report on the results of this research in next April's column.

Late News Flash!

The Environmental Protection Agency has declared the SWR an endangered species. As explained by the EPA's Dr. Chart Smith, "It's a classic case of habitat destruction! With all these hams using antenna tuners and getting their SWR counts down to 1, they simply don't have an opportunity to breed." Regulations to ban the use of automatic antenna tuners are planned.

Email: <wa5vjb@cq-amateur-radio.com>



announcements *(from page 2)*

1st Avenue. Contact: Bill Powers, Phone: (412) 260-5699 or Del Peterson, Phone: (412) 974-9695. Email: <hamfestchairman@trarc.net>. Website: <www.trarc.net>. Talk-in 146.73. VE exams.

DOVER, OHIO — The Tusco Amateur Radio Club will hold its 2023 Hamfest, Computer & Electronics Show from 8 a.m. to 1 p.m., Saturday, April 22 at the Tuscarawas County Fairgrounds, 259 S. Tuscarawas Avenue. Contact: Rick Dingman, KE8URA, Phone: (303) 934-0575 or Cindy Gray, KE8JNN, Phone: (330) 340-4946. Email: <w8zx@n8bag.bet>. Website: <www.w8zx.net>. Talk-in 146.730.

LANDING, NEW JERSEY — The Splitrock Amateur Radio Association will hold the 2023 North Jersey Tailgate Hamfest beginning 8 a.m., Saturday, April 22 at the Landing Park Recreation Complex, 165 Landing Road. Email: <hamfest@splitrockara.org>. Website: <www.splitrockara.org>. Talk-in 146.985- (PL 131.8). DXCC card checking.

SONOMA, CALIFORNIA — The Valley of the Moon Amateur Radio Club will hold its Hamfest 2023 from 8 a.m. to noon, Saturday, April 22 at the First Congregational Church of Sonoma, 252 W. Spain Street. Email: <valleyofthemoonarc@gmail.com>. Website: <www.vomarc.org>. Talk-in 145.350 (88.5). VE exams, fox hunt.

ODENTON, MARYLAND — The Maryland Mobileers Amateur Radio Club will hold the MMARC Spring Hamfest from 7:30 a.m. to noon, Sunday, April 23 at the Odenton Volunteer Fire Department, 1425 Annapolis Road (Rt. 175). Contact: Bruce McPherson, AB3AC, Phone: (410) 456-2500. Email: <bmcpherson73@verizon.net>. Website: <https://tinyurl.com/2p935p6k>. Talk-in 146.805- (PL 107.2).

OCALA, FLORIDA — The Marion County Emergency Radio Team will air a special event station KG4NXO from 1200-2359 UTC, Saturday, April 29 to celebrate 20 years of amateur radio support for Marion County Emergency Management. Frequencies include 14.262, 7.262 MHz and D-STAR on 146.790 MHz REF 037. Request further information about Certificate & QSL at the website <www.mert20.org>.

SPRING GROVE, PENNSYLVANIA — The York Hamfest Foundation will hold the 2023 York Hamfest from 8 a.m. to 1 p.m., Saturday, April 29 at Elicker's Grove Park, 511 Roth Church Road. Email: <duane.sternee@yahoo.com>. Website: <www.yorkhamfest.org>. Talk-in 147.330+ (PL 123). Free VE exams, DXCC / VUCC / WAS / WAC card checking.

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).

BOONSBORO, MARYLAND — The Antietam Radio Association will hold The Great Hagerstown Hamfest from 7 a.m. to 1 p.m., Saturday, May 6 at the Washington County Ag Ed Center7313 Sharpsburg Pike, Rte 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.

SANDWICH, ILLINOIS — The Kishwaukee Amateur Radio Club will hold The DeKalb Hamfest from 8 a.m. to 1 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 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 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 a.m. to 1 p.m., Saturday, May 13 at the Stanwood Middle School, 9405 271st Street NW. Email: <scarchamfest@yahoo.com>. Website: <www.scarcwa.org>.

XENIA, OHIO — The Dayton Amateur Radio Association will hold the Dayton Hamvention 2023 from 9 a.m. to 5 p.m., Friday, May 19; 9 a.m. to 5 p.m., Saturday, May 20; and 9 a.m. to 1 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.

qrp: low-power communications

BY R. SCOTT ROUGHT,* KA8SMA

Winter Field Day with My Old Friend … the FT-817

December 28, 2022 was a sad day for the QRP world when Yaesu announced it was discontinuing production of the FT-818 due to parts availability. The FT-818 and its predecessors, the FT-817ND and FT-817, are a solid line of highly portable, rugged, QRP transceivers that introduced many hams to the joy of low-power communication. These "shack in a box" rigs were touted as the world's first self-contained, battery-powered, multi-mode portable QRP transceivers covering the HF, VHF and UHF bands. Soon after the FT-817 was released in 2001, I bit the bullet and purchased one. For nearly 20 years, I used the FT-817 as my primary transceiver until I purchased an Icom IC-7300 (with the output power set at 5 watts, of course). I now use the FT-817 primarily for Parks on the Air (POTA) activations, Winter Field Day (WFD), and general portable operation.

I have contested, rag-chewed, worked DXpeditions, and had memorable QSOs with several notable hams including Sid May, ET3SID (SK), and John Delvodere, ON4UN (SK), and contacted RI1ANC (Russian research station in Antarctica) with the FT-817. Although my FT-817 is in working order and does everything I need, a part of me feels empty knowing that I cannot replace it with a new one in the event it goes kablooey. One reader recently asked me if I would buy an FT-818 on the used market knowing it has been discontinued. I responded with a resounding yes! As part of Yaesu's December 28th announcement, it was indicated that support for the FT-818 and the availability of replacement parts will continue long after production. As long as there are talented radio technicians who like working in tight quarters on small boards (my pudgy fingers do not belong inside these radios) the FT-817/817ND/818 will be around for a long time to come. In fact, I am considering purchasing another just to have on hand. One cannot have too many QRP rigs, right?



Photo A. Last year's ground-mounted Winter Field Day (WFD) shelter.

The big question now is, what does Yaesu have in store to replace this iconic series? Many want to see Yaesu's next QRP transceiver equipped with a built-in sound card for digital operation, a larger display, less current draw for longer battery life, and a built-in antenna tuner. I am sure Yaesu will include all these features and many more on its next go, but what I don't want changed is the stock hand mic and audio output. These items may seem trivial, but I really like the stock mic (MH-31) that came standard with these radios as it fits in my hand comfortably and does not slip out like some of the smaller mics that come with other QRP transceivers. Also, the audio output through the built-in speaker is loud and crisp, just what the doctor ordered for portable operations in noisy environments.

Whether or not you are a fan of the FT-817/817ND/818, I believe the QRP community owes Yaesu a huge thank you for helping introduce thousands of hams to the thrill of low power communications and turning skeptics who believed you cannot work the world with 5 watts or less into believers.

WFD 2023

WFD – Winter Field Day - is one of my favorite events of the year as it provides an escape from the wintertime doldrums and allows me to get outdoors and have fun with my QRP gear. Last year, I visited the Manistee National Forest in northern Michigan where I set up camp off a two-track trail in the middle of nowhere and constructed a makeshift ground shelter in which I spent the night (*Photo A*). I wrote about my experience in last year's April column and soon after it went to print, I received positive feedback from several readers and was petitioned by one of my local ham clubs to discuss my adventure at an upcoming meeting.

For those who may not be aware, the idea behind WFD is to practice setup/operational skills under less-than-ideal conditions. I took this to the next level by using only materials I had on hand to construct my shelter (a tarp, Visqueen® plastic sheeting, rope and binder clips). To stay in line with my "keep it simple" and minimalistic ways (I am a QRPer, after all), I prohibited myself from purchasing any items to construct the shelter.

Since last year's event was a success, I decided to do the same this year and construct a homebrew shelter near the

*<ka8sma@cq-amateur-radio.com>



Photo B. Support posts zip-tied to the truck bed's cargo bars. Note the rope for supporting the tarp roof.



Photo C. Securing the roof and walls with binder clips.



Photo D. Ooh la la! The finished shelter.

same location where I operated last year. The thought of 24 hours with no cell reception, being outdoors with Mother Nature, eating salt bagels and scallion cream cheese (my favorite junk food), and of course, operating QRP in the woods, made me giddy with excitement.

The Makeshift Shelter Revisited

One lesson learned last year was cold air emanating from the frozen ground made for cold feet and legs, so getting off the ground was my number one consideration for this year's shelter. I accomplished this by building the shelter in the bed of my Dodge Ram 1500 pickup truck. The bed (5 feet wide and 7 feet long) provided a solid foundation and the spray-in bedliner made for a non-slippery surface (no melting ice or snow to deal with). I used the same materials as last year (rope, a tarp, Visqueen clear plastic, and binder clips), except I added four wooden 2x2s (to be used as corner support posts) and a handful of zip ties to construct the shelter. Prior to setting out for WFD, I cut the 2x2s to a length of 6.5 feet and pre-drilled holes in each one so I could zip-tie them to the cargo bars inside the bed. I shortened the 2x2s because I did not need an 8-foot ceiling and it made for easier construction. Rope was used to secure the tops of the 2x2s so they would not flop around and to provide support for the roof tarp. *Photo B* shows the structure prior to applying the roof tarp and clear Visqueen for the sides. Binder clips were used to clamp the roof and sides together. To do this, I bunched the tarp and Visqueen together then rolled them over a few times before clamping (*Photo C*). Excess Visqueen was pulled down inside the bed of the truck. This simple shelter (*Photo D*) will not win any prestigious "Better Homes and Gardens" awards, but it gets the job done!

A utility table (4 feet long by 2 feet wide) and folding chair were set up inside the shelter for the operating position.



Photo E. The operating position – a nice view of the woods!

Like last year, I borrowed my brother's Mr. Heater®, a propane radiant heater that is safe for use in indoor environments, for heat. I took along several one-pound propane cylinders that I had on hand which, in total, could supply around 20 hours of heat. I placed the heater beneath the table which not only kept my feet and legs warm but provided a warm tabletop for operating. Within 45 minutes of turning on the heater I was basking in 60-degree temperatures against an outdoor temperature of 33 degrees. When the temperature inside reached 70 degrees, I turned off the heater to conserve propane. In comparison, last year, the warmest I could get the inside of my ground mounted shelter was in the low to mid-50s against an outdoor temperature in the upper 20s. Without question, getting the shelter up off the ground created a much warmer environment.

Fun in the Woods

As you may have already guessed, I took my FT-817 along for this operation. I coupled the FT-817 with my MFJ-971 portable antenna tuner, hand key and a Bioenno 20Ah Lithium Iron Phosphate battery (*Photo E*). I also packed my Buddipole Powermini Solar Charge Controller and Powerfilm foldable solar panel in the event I needed to charge the battery.

I kept my antenna simple and used a slingshot to help string approximately 100 feet of 16-gauge wire high into the trees. When erected, my wire antenna resembled the shape of an inverted V. Total setup time was about an hour to erect the antenna, build the shelter, and set up the equipment.

When I turned on the FT-817, both 20 and 40 meters were a solid wall of stations across the phone portion of each band. CW traffic was high, too. For the first couple of hours I searched and pounced across 20 meters and made a slew of contacts before finding a clear frequency I could hold and call CQ without any neighboring QRM. After a few hours of WFD activity, I decided to operate POTA and activated Manistee National Forest (K-4583). My little QRP rig received



Photo F. Snack time – nothing beats a toasted salt bagel.

a good workout as there was no shortage of hams participating in WFD or POTA hunters who needed K-4583 in their log.

To make the most of this adventure, I spent the night in the woods. I thought about sleeping in the shelter; however, I was concerned that a pesky squirrel that hung around the truck all Saturday afternoon and evening would come for a nighttime visit, so I opted for the truck's back seat instead. Sleeping in the back seat worked out for the better as I was able to stay tucked in my sleeping bag and remote start the truck (with heater on) using my key fob when it got chilly. To satisfy my hunger, I brought a bag of salt bagels and a tub of scallion cream cheese which was Saturday's dinner, breakfast on Sunday, and snacks in between, exactly what was needed to keep me going! Thankfully, I remembered to pack my tongs so I could toast my bagels in front of the heater *(Photo F)*.

Before breaking camp late Sunday morning, I hopped on 15 meters and worked several DX stations. The DX operators were not participating in WFD but were very surprised to hear I was operating QRP from the middle of the woods. After a few exchanges with the DX stations, I packed up and headed for home. The only item left behind was a bagel for the annoying squirrel that hung around Saturday and kept a distant eye on me as I packed up.

Update – The V Stands

I am happy to say that the inverted delta loop antenna (dubbed the "V") I built last fall (see December column) is still standing. The extendable fishing poles I used for support arms have not failed and appear to be in good condition despite several winter storms, including the epic Christmas week blizzard that paralyzed much of the Midwest. I am very impressed with these fishing poles and am making plans to purchase a few more for upcoming antenna projects this spring.

I am also happy with the V's performance. In mid-January, I broke a moderate pileup on 12 meters to work TN8K (DXpedition to the Republic of Congo) with 5 watts SSB and received a 59 signal report. My signal report was no surprise as the magic of a DXpedition always yields a 59 report both ways, even for QRP stations - HI! This spring, I am planning to give the V a permanent home atop the house – my wife will be thrilled.

Until June, 73

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learning curve

BY RON OCHU, KOØZ

DX Abides…

It's the Journey, Not the Destination!

Drat! Darn the luck! I was hoping to work the 3Y0J Bouvet Island DXpedition (ham radio excursion to activate a distant, remote entity; Photo A) into my logbook for an ATNO (all time new one). Unfortunately, Mother Nature, space weather propagation and deliberate QRM (interference) prevailed. At least, it sure seemed so in my neck of the woods in eastern Missouri and with my existing city lot vertical antennas. This DXpedition team made it to Bouvet and encountered tremendous challenges. The island is very remote (*Photo B*), and the hardships associated with freezing temperatures, high winds, rough seas, and pounding surf proved to be unrelentless and daunting. From what I've read, and seen of posted videos, it is an amazing feat that the team was even able to safely get onto the island, much less put it on the air under such harsh conditions. I know I couldn't do it. I admire the 3Y0J team's intrepid spirit and willingness to activate the island. It is a remarkable achievement.



Photo A: The 3Y0J DXpedition took on the challenge of getting to, setting up on and operating from Bouvet Island. To say that it is inhospitable is an understatement! An Arctic-rated ship is required to navigate the rough seas to the island and getting ashore is downright dangerous. It ranked number two on the most needed DX entity list by ham radio operators prior to the 3Y0J DXpedition. North Korea ranks as number one.

Win Some, Lose Some

It's too bad that the 3Y0J team wasn't able to achieve its initial goal of getting more antennas, generators and amplifiers on the island to transmit a robust, louder signal, thereby increasing everyone's chances for an ATNO. Instead, Mother Nature severely hampered their plans. Still, the team found a way to erect some antennas and to put two 100-watt transceivers on the air rather than giving up. "If there is a will, then we will find a way!"

Dedicated ham radio operators are resourceful. Instead of no one getting an ATNO, their efforts gave some of us, worldwide, a chance to put the station in the log. Unfortunately, constant, deliberate QRM by some, combined with the team's low power and shorter stay on the island, hampered the DXpedition's goal of making contacts available to a wider community. I was able to hear their signal weakly on 17 meters and a little better on 30 meters, but the constant QRM interfered with my ability to copy their signal. I didn't even try to make contact. It is sad there were operators displaying selfish, poor behavior by QRMing (interfering) with 3Y0J's transmissions, severely limiting fellow hams from obtaining an ATNO. Sure, I wish I had made a two-way Q (DX ham radio parlance for QSO or contact), but alas and alack, that's part of the thrill of DXing. I am reminded of ABC television network's "Wide World of Sports" announcer Jim McKay's famous phrase, "The thrill of victory, and the agony of defeat." I deeply appreciate all the planning, expenditure of resources, time and effort that went into activating Bouvet and the opportunity to "land an ATNO."

DXpeditions Are Exciting

DXpeditions generate excitement among DXers. DXpeditions to rare places generate tremendous excitement. Maybe it's the thrill of the hunt and chase. Maybe, it's excitement generated from putting up a new antenna or getting a new rig. Maybe it's the allure of working an ATNO. Maybe it's the desire to not only be on the DXCC Honor Roll, but to become a member of "Top of the DXCC Honor Roll!" Maybe, like fishermen, it's the fun of swapping shared experiences associated with working DXpeditions at gatherings and club meetings. I suspect it's all of the above and then some. I enjoy attending the Dayton Hamvention© DX forum to listen to the stories and to see the slides and videos that DXpeditioners bring to the forum. I always learn something new. In a small way, I feel like I am part of a bigger ham radio community picture which reinforces my love and my enthusiasm for our hobby.

All DX is Exciting!

As exciting as DXpeditions are in the ham radio community, I never get bored of the daily thrill of turning on my transceiver and making an unplanned, distant (DX) contact with someone I've not met before. Likewise, I enjoy coming across a DX operator I've worked before to see how he/she and his/her family are doing. They may not be a rare DX entity, but communicating with

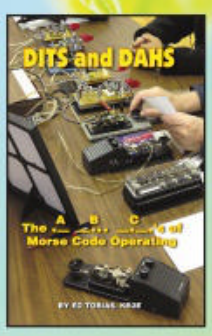
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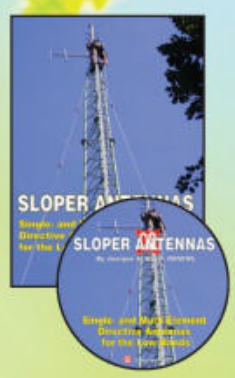
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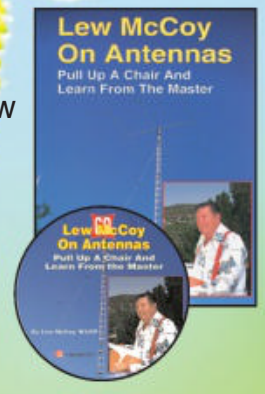
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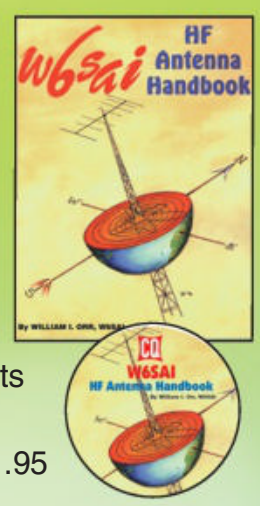
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someone on another continent is always exciting! For the most part, DXpeditions to rare entities tend to be seasonal. They tend to be operated around the months surrounding the fall and spring equinoxes when DX propagation is most favorable. Fortunately for us, "regular" DX contacts still abound all year long. These "casual" DX contacts are the real gist of this month's article. No matter the time of day or the season of the year, I can almost always find someone to chat with.

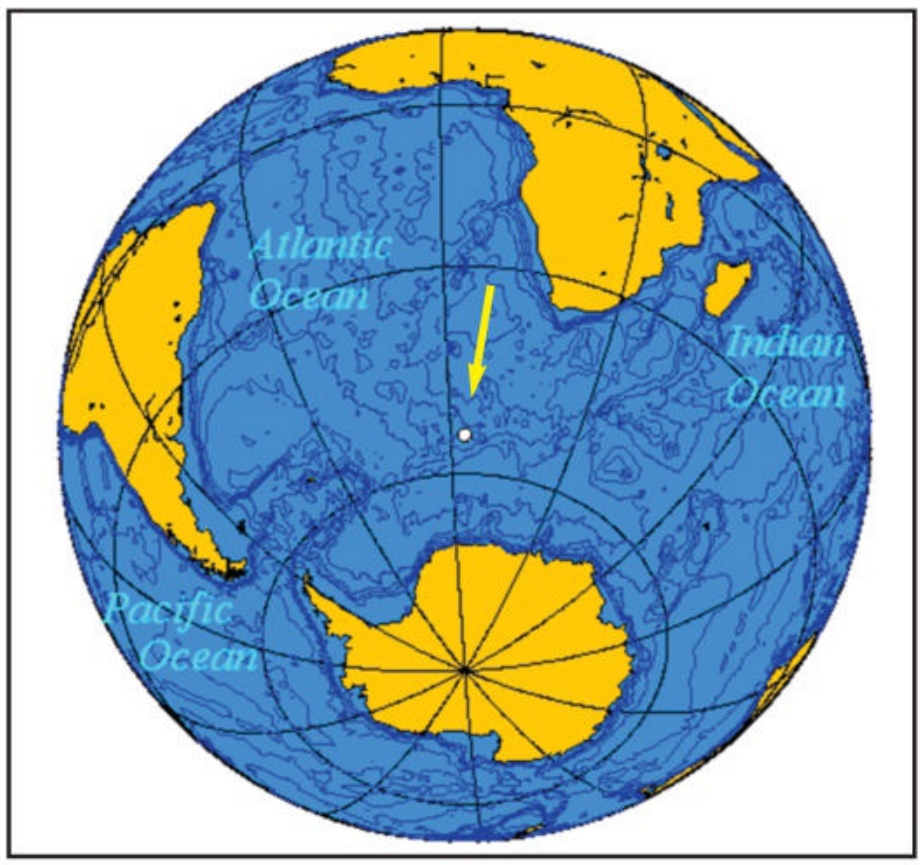


Photo B: Bouvet Island – the white dot on this map - is an extremely remote island in the South Atlantic Ocean between South America, Africa and Antarctica. (Source: Wikimedia Commons)

There are times when a DX station gets on the air and the operator is trying to work (contact) as many hams as possible. These types of contacts are quick and simple. For example, the on-the-air exchange will only consist of call signs, a signal report and a 73 (goodbye and best wishes). Sure, those contacts are fun, but the ones I remember the most are the more relaxed, personal contacts that entail more than call signs and a signal report.

My Typical Radio Day

Now that I am a retired, I have more time to devote to amateur radio. I usually begin my mornings with breakfast and the morning news. Afterwards, I get a piping hot cup coffee from my Keurig, sit down at my operating desk and I begin to scan the HF (high frequency) bands for activity. Sometimes, I call CQ (general call to all stations), but more often than not, I listen for others calling CQ. Recently, I had two very interesting contacts. These ham radio operators don't know me from Adam, or that I am a *CQ* magazine columnist always on the prowl for a future topic to write about. As far as they know, I am just another ham radio operator (which I am), and they have no idea that my QSO with them inspired me to write about them in *CQ*! I hope they will be pleasantly surprised.

Signals Across the Pond

Local mornings are a good time, propagation wise, to listen to Europeans from Midwest U.S.A. As I am beginning my day, hams across the Atlantic are in the middle of their day.

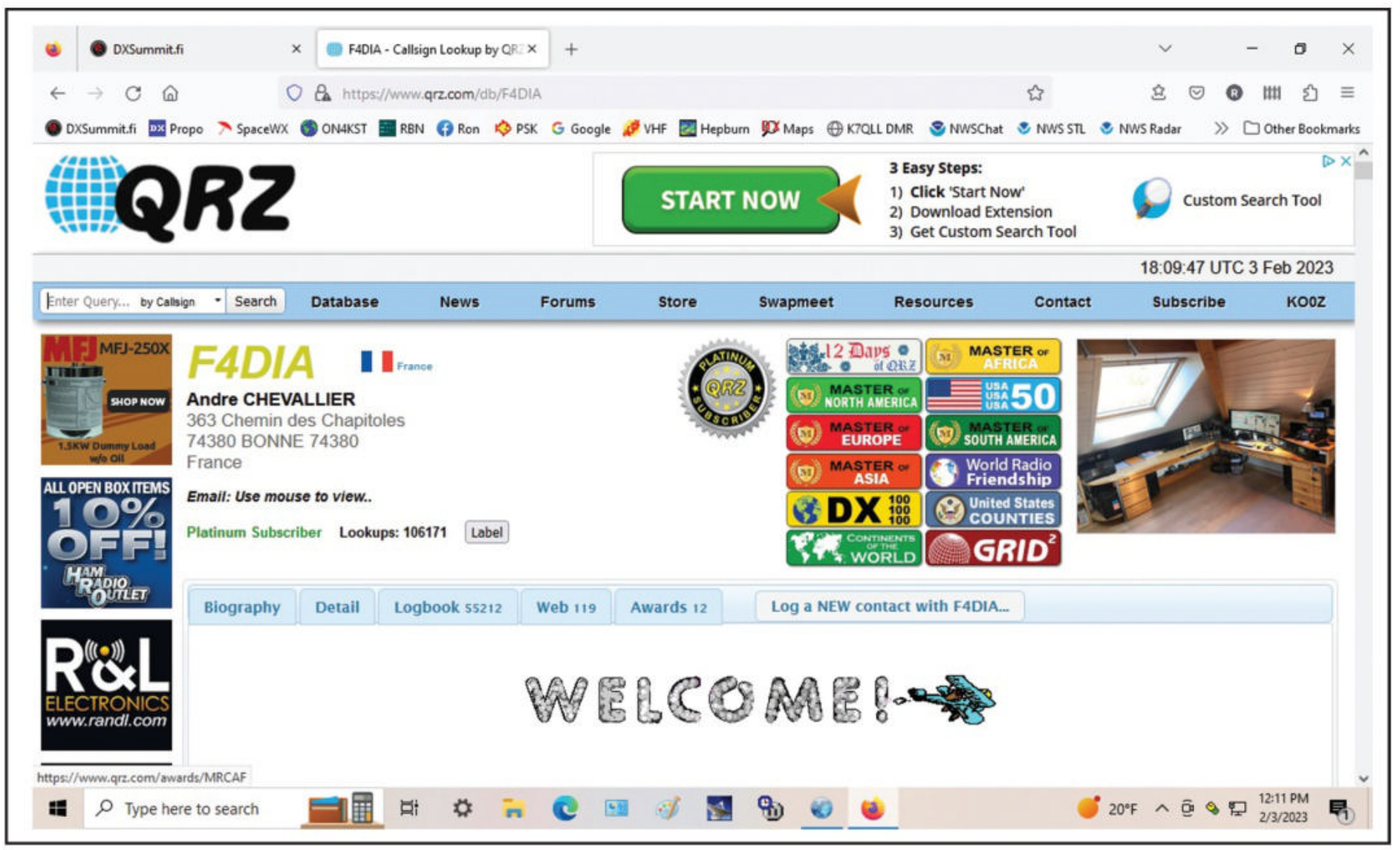


Photo C: Screenshot of Andy Chevallier, F4DIA's, QRZ.com webpage. It was good catching up with Andy since our last QSO three years earlier.

It's their afternoon and HF propagation tends to follow the Sun's path. As my morning becomes early afternoon, Europeans are enjoying evening hours.

Andy Chevallier, F4DIA

The month of February, 2023, inspired me. On February 3around 1804 Z (Zulu time, abbreviation for UTC, or Coordinated Universal Time) on 17 meters CW, I gave a call to Andy, F4DIA. Andy came back to my call and a nice, relaxed CW QSO ensued. Andy lives in Bonne, France (*Photo C*). It had been three years since I first contacted Andy. It was good to catch up with him again, especially since the pandemic, to see (hear) he is alive and well! Andy is an excellent CW operator. I easily copied his CW and band conditions on 17 meters were good. His HF Yagi (beam antenna; *Photo D*) goes a long way towards making his signal easy copy. Andy and I chatted about the weather and our stations. The last time we talked, I was living in Illinois. Back then, I was still using the same transceiver (Elecraft K3S), but I had a rotatable 17-meter dipole up 45 feet. This time, I had the same transceiver, but I was using my MFJ cobweb antenna mounted ten feet off the ground. So my signal this time wasn't quite as strong, but we had good propagation and solid copy between us. Looking at Andy's QRZ page, I noticed that he has a webcam link. He has a camera focused on his CW paddles and you can actually see Andy's fingers move the paddles and send in almost real time (*Photo E*). There is a slight delay between receiving his radio signal and seeing his fingers send CW over the video via the internet. Too cool! I look forward to my next QSO with Andy. Perhaps, one of these days we'll be able to have a face-to-face, in person QSO!

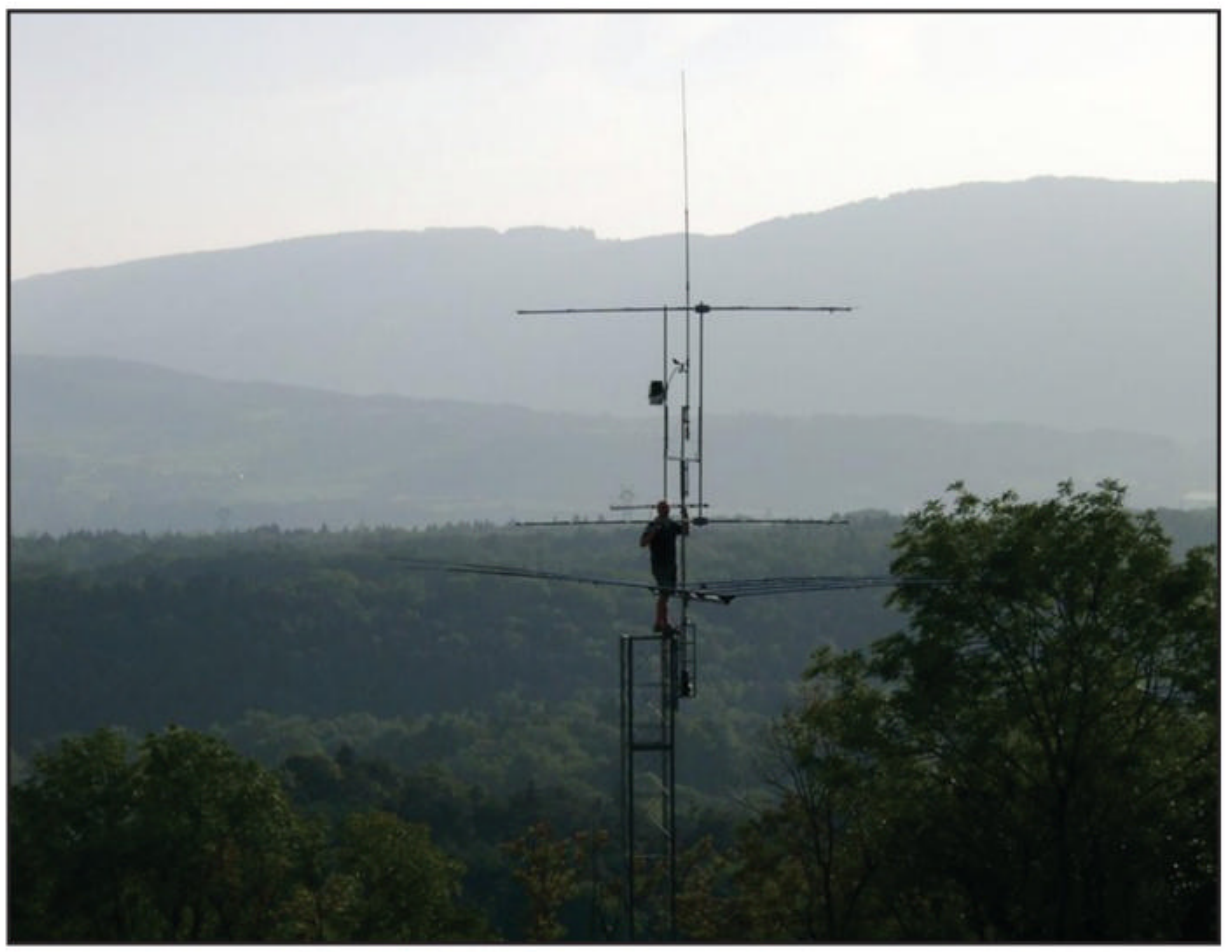


Photo D: Screenshot of Andy's impressive HF Yagi, also from his QRZ page. He has an impressive signal on the bands.

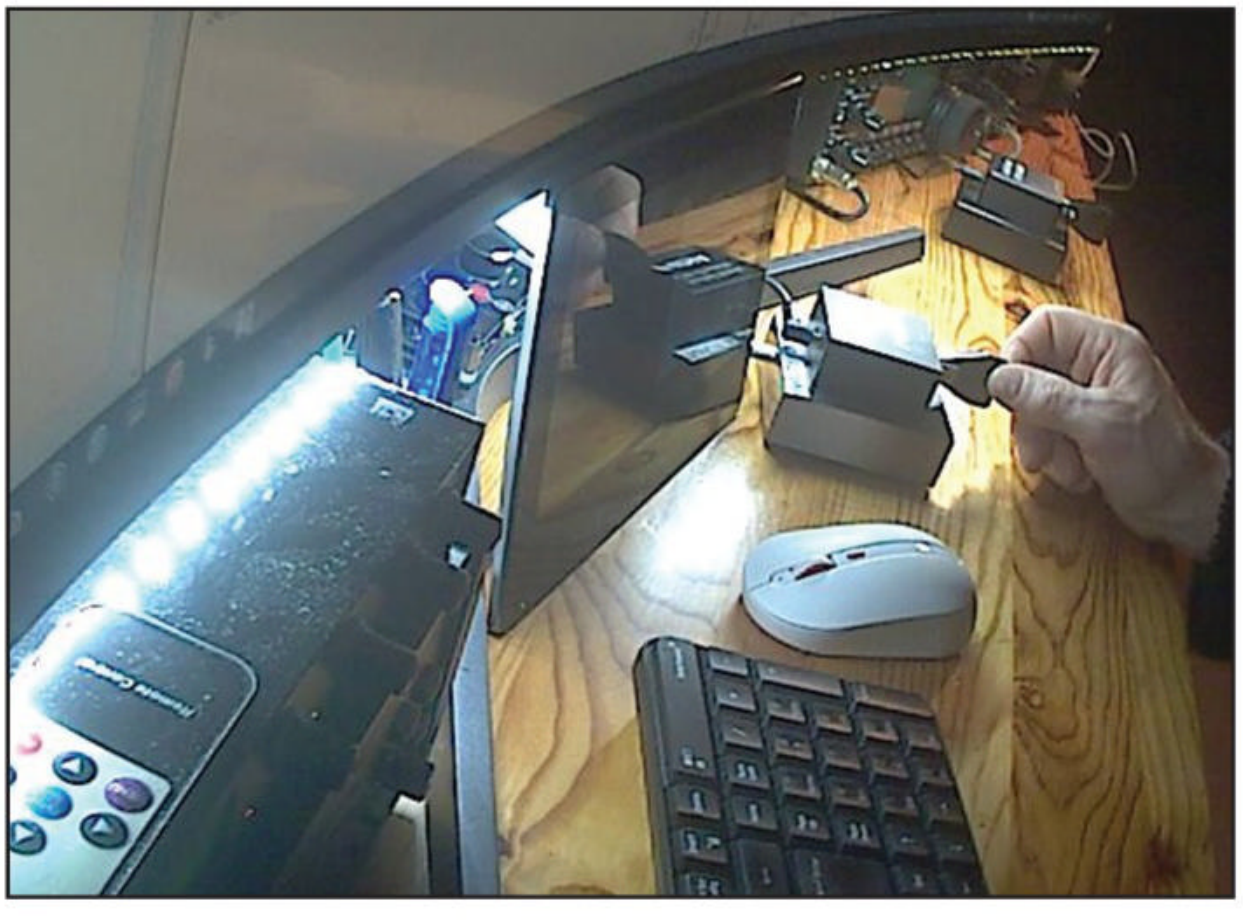


Photo E: When Andy is on the air, he transmits video from his shack. It is fun to listen to his transmitted Morse code and a few seconds later see his fingers working the paddles. BTW, F4DIA sends very copyable code.

Time for Phone

After I completed my enjoyable CW QSO with Andy, I decided to switch it up and to listen to voice (phone). Taking another sip of coffee, I switched my rig to upper sideband and proceeded to tune across the band. Before long, I came across a very interesting QSO with club station M0SNB in England. They had a good signal into the Midwest. What made the QSO particularly interesting to me was one of the operators describing their club station. Their club station (*Photo F*) is located at a former British government nuclear bunker! M0SNB is the call sign for the **S**ecret **N**uclear **B**unker Contest Group (Photo G). The bunker is located about 32 kilometers (20 miles) northeast of London. It secretly operated from 1952 to 1993 according to their website, <https://www.gb0snb.com/>. I highly recommend going to their webpage and reading the fascinating history associated with the bunker and the Cold War. I had the most enjoyable time listening to the QSO and learning more about M0SNB's unique clubhouse.

Time for Lunch

While listening to M0SNB, I checked out their website and before I knew it, lunchtime arrived. I had promised my wife, Debbie, KC9ULA, that we'd go out for lunch. Since discretion is the better part of casual DXing (especially when it comes to lunch with your spouse), I

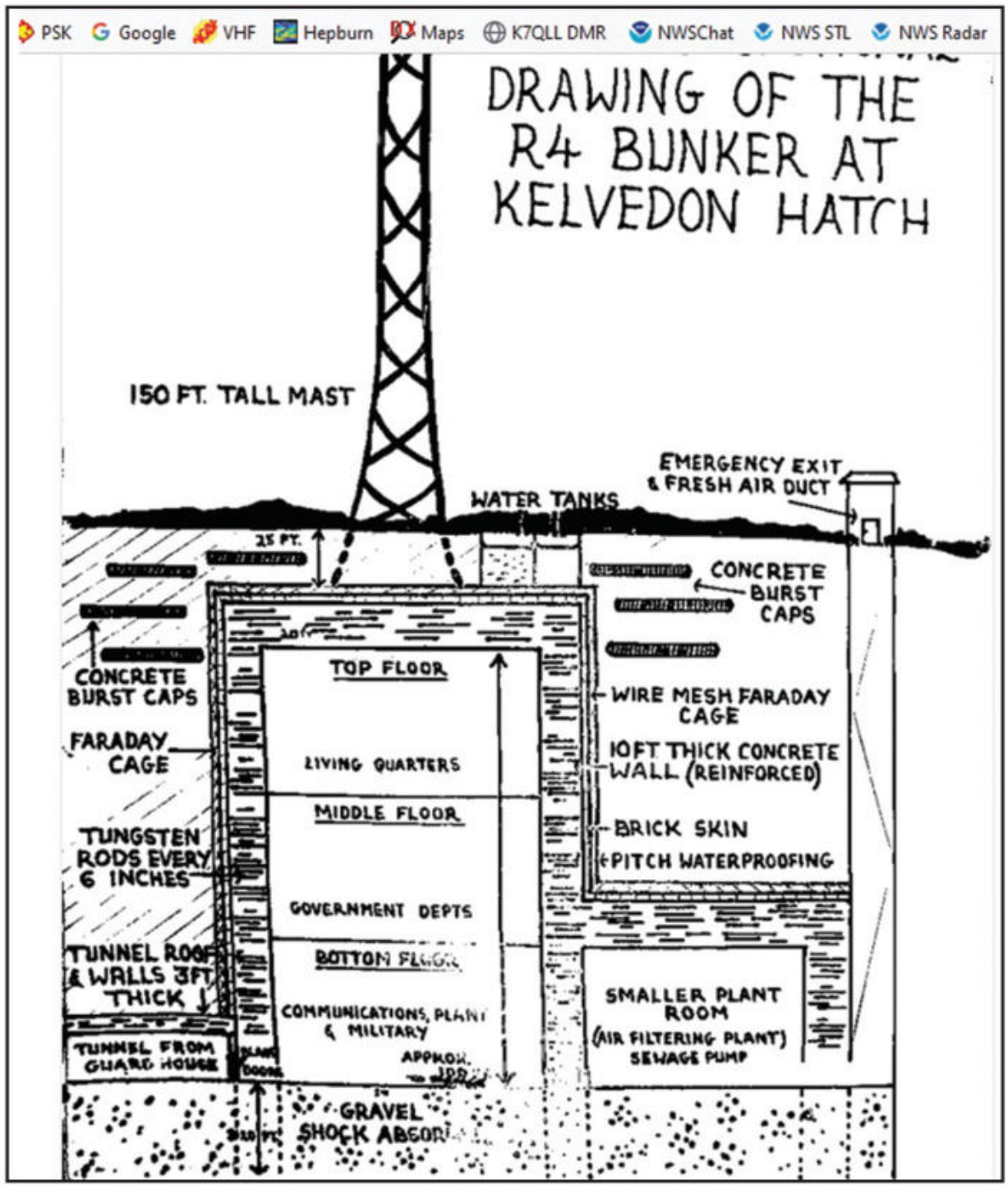


Photo F: Screenshot of England's Kelvedon Hatch Secret Nuclear Bunker and club station for M0SNB. ←

somewhat reluctantly turned off the rig and we made our way to a nearby restaurant. Our lunch was very satisfying, but so, too, was my morning working DX from my radio bench in St. Peters, Missouri! I was happy to reconnect with Andy and to find him well and active on the bands. I'm glad to learn that a former secret nuclear bunker is now a museum and the home for a very active British radio club.

The thing is there are a lot of similar stories to be told every day. Fortunately, I am able to discover some of them and to share these discoveries with you. Luckily, ham radio is filled world-wide with fun, interesting operators who make getting on the air fun. Too bad our ranks also contain a minority of discontented operators, but by far my logbook and my memories are filled with contacts like I've described this month. I've learned that the real reward is not in the destination, but in the journey and the people you meet along the way! Thank you for reading *CQ* and I hope to hear you on the air. *73, Ron KO0Z.*

Photo G: Screenshot of M0SNB's QRZ page. I became fascinated and spent part of a very enjoyable morning listening to a QSO with M0SNB describing their very unique club station! ↓



analog adventures

BY ERIC P. NICHOLS,* KL7AJ

Ye Olde Octopus Curve Tracer

I accumulate stuff. One of my old bosses, who taught me an awful lot about running a business, once said, "If you don't have it, you have to buy it." I took his words of wisdom to heart, sometimes to the XYL's mild chagrin. But there's a difference between having and hoarding. I don't hoard; I have.

My Box du' Junque is impressive even by ham standards. For the past couple of years, I've had some child labor actually going through my vast inventory of electronics components, sorting them all and inserting them into a spreadsheet. Someone else once said, "If you can't find it, you don't really have it." So, not only do I have it, but I know where it is. Which is a good thing.

One of the items which recently acquired have status in my shop is a Tektronix 620 monitor scope (*Photo A*). It doesn't actually qualify as an oscilloscope; it has no time base, no calibrated vertical amplifiers, nor any calibrated horizontal amplifiers. It's essentially nothing more than a CRT, a high voltage supply, and a set of X and Y deflection plates. That's it.

Perhaps some of you are asking, "What conceivable purpose could an oscilloscope with no internal electronics possibly have?"

I'm glad you asked that. This bareboned embryonic facsimile of an oscilloscope is a wonderful adjunct to a device I will describe herein, known as a *curve tracer*. A curve tracer does nothing more than plot current THROUGH a device vs. a voltage ACROSS a device. Couldn't be simpler.

In January 1975 *QST*, David Ludlow, W7QHX, described a profoundly simple curve tracer adapter he dubbed "The Octopus." I had a brief correspondence with Mr. Ludlow a couple of years ago, wherein he assured me that he was indeed the very same David Ludlow who invented the device. Not that I had any doubts, of course; it's just that I don't meet many famous hams. I'm easily impressed. *Figure 1* shows the circuit in all its glory, shamelessly gleaned from that *QST* article.

I only made a couple of small modifications to my particular specimen of the Octopus (*Photo B*). Since the Tektronix XY monitor has no input gain adjust, I added a pair of internal 10-megohm potentiometers in series with the vertical and horizontal input terminals to form a pair of 10:1 voltage dividers with the nominal 1-megohm input impedances of the '620 scope. This allows me to keep the trace fully on-screen, both horizontally and vertically. I also used a 9-volt AC wall wart instead of the center-tapped 6-volt transformer in the



Photo A. Tektronix 620 monitor scope

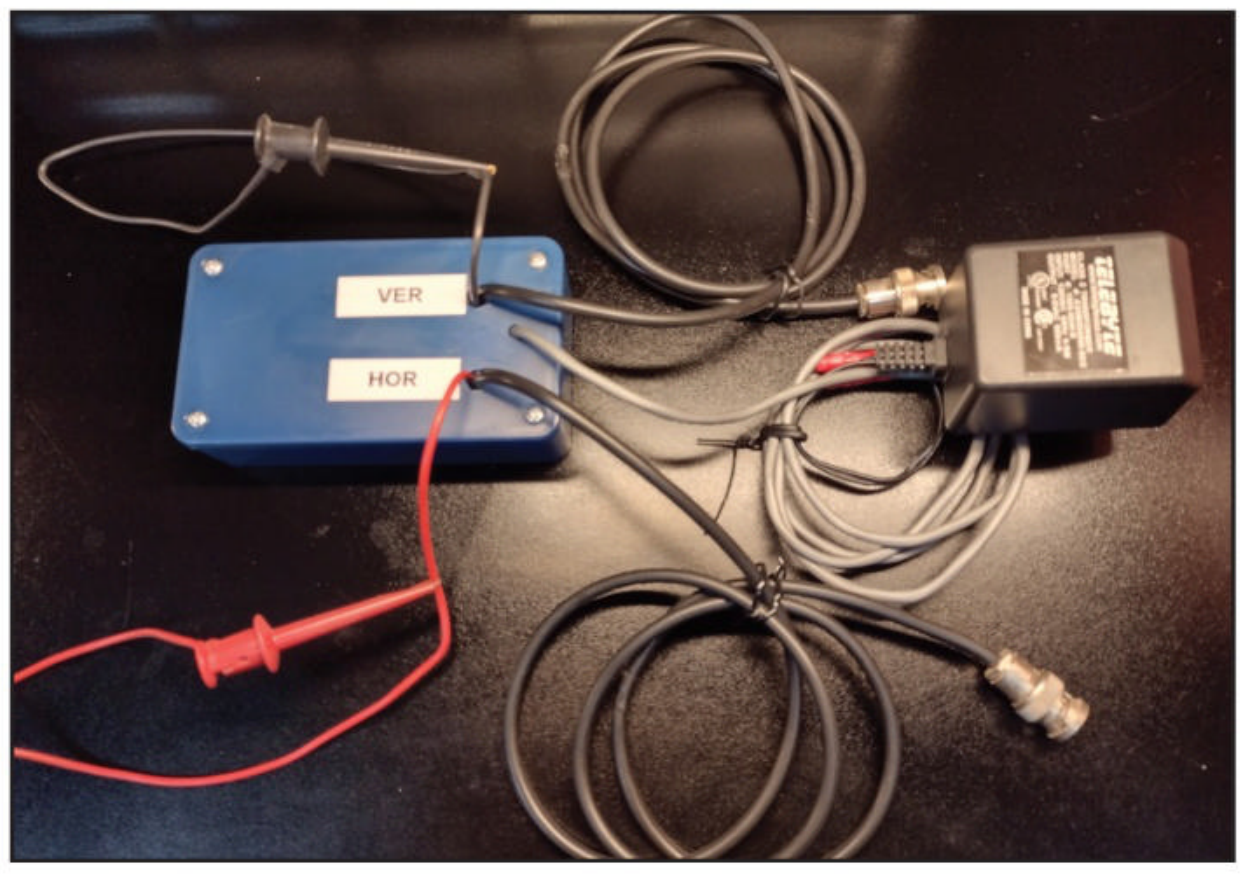


Photo B. KL7AJ Octopus

*3763 Lyle Avenue
North Pole, AK 99705
email: <kl7aj@cq-amateur-radio.com>

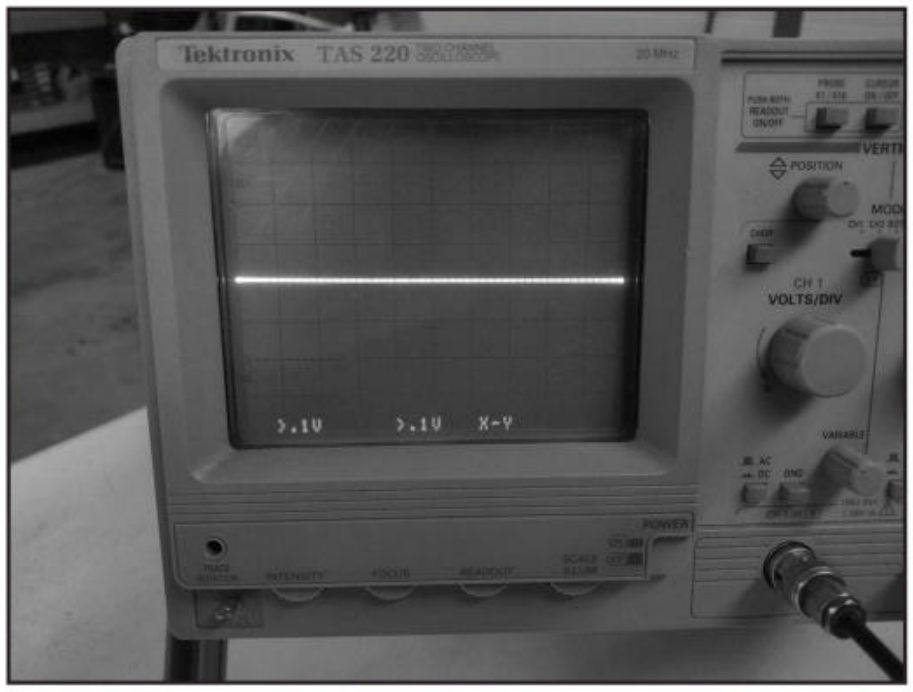


Photo C. Open circuit display

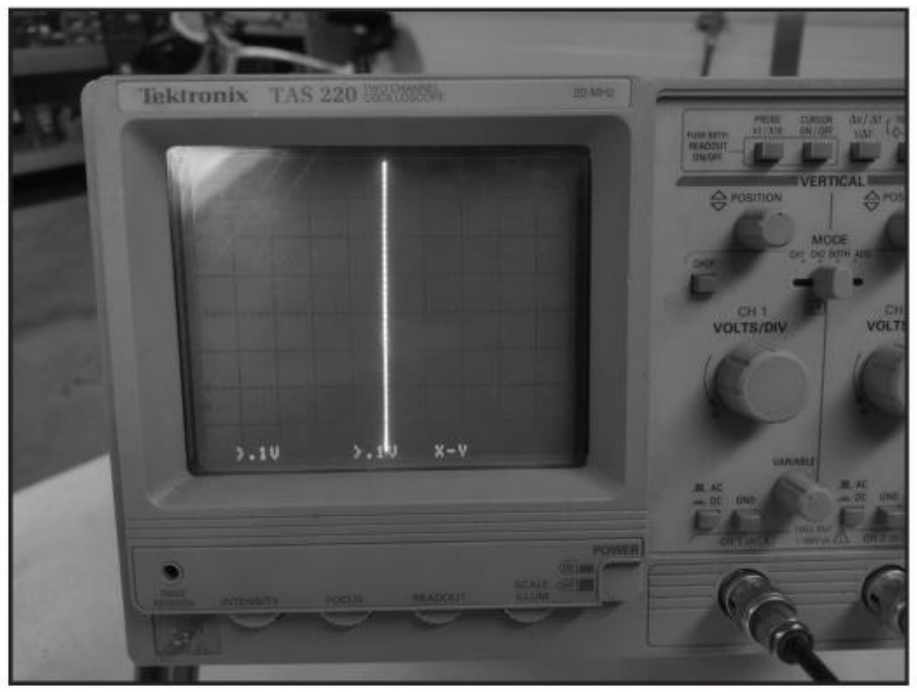


Photo D. Short circuit

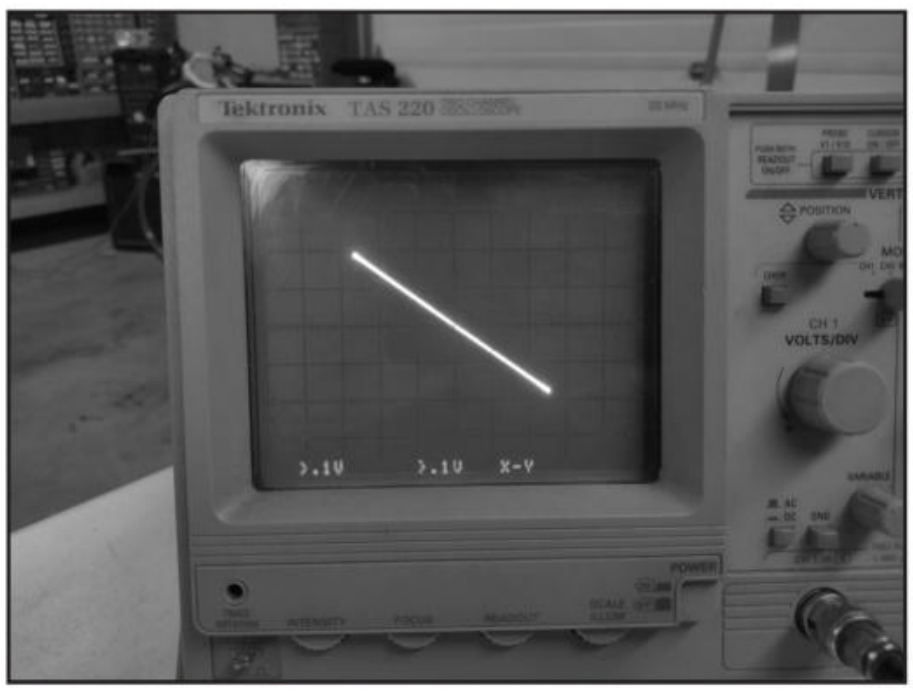


Photo E. Resistor

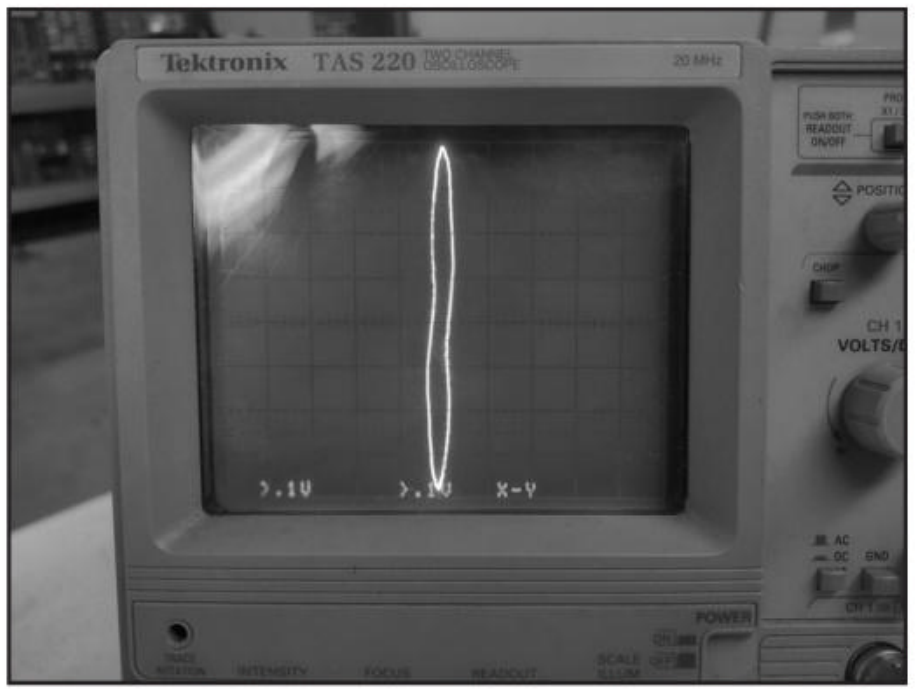


Photo F. Leaky electrolytic capacitor

original, since this allows the testing of slightly higher voltage Zener diodes and such than David's version. (My "haves" include an infinite supply of wall warts, as you have probably suspected).

Aside from being a very handy (and cheap!) universal component tester, the Octopus is quite educational, demonstrating some basic principles of both linear and non-linear components.

Now, since most of our readers will probably not have a Tektronix X-Y display at their disposal, but probably DO have some sort of "normal" oscilloscope, the screenshots in *Photos C-H* were taken from one of my several such standard analog scopes in the XY mode. A note is in order here. Although every analog scope that I know of CAN be used as an XY display, not all of them are good at it. The frequency response and linearity of the vertical and horizontal amplifiers of most "bottom rung" scopes are greatly mismatched. Most

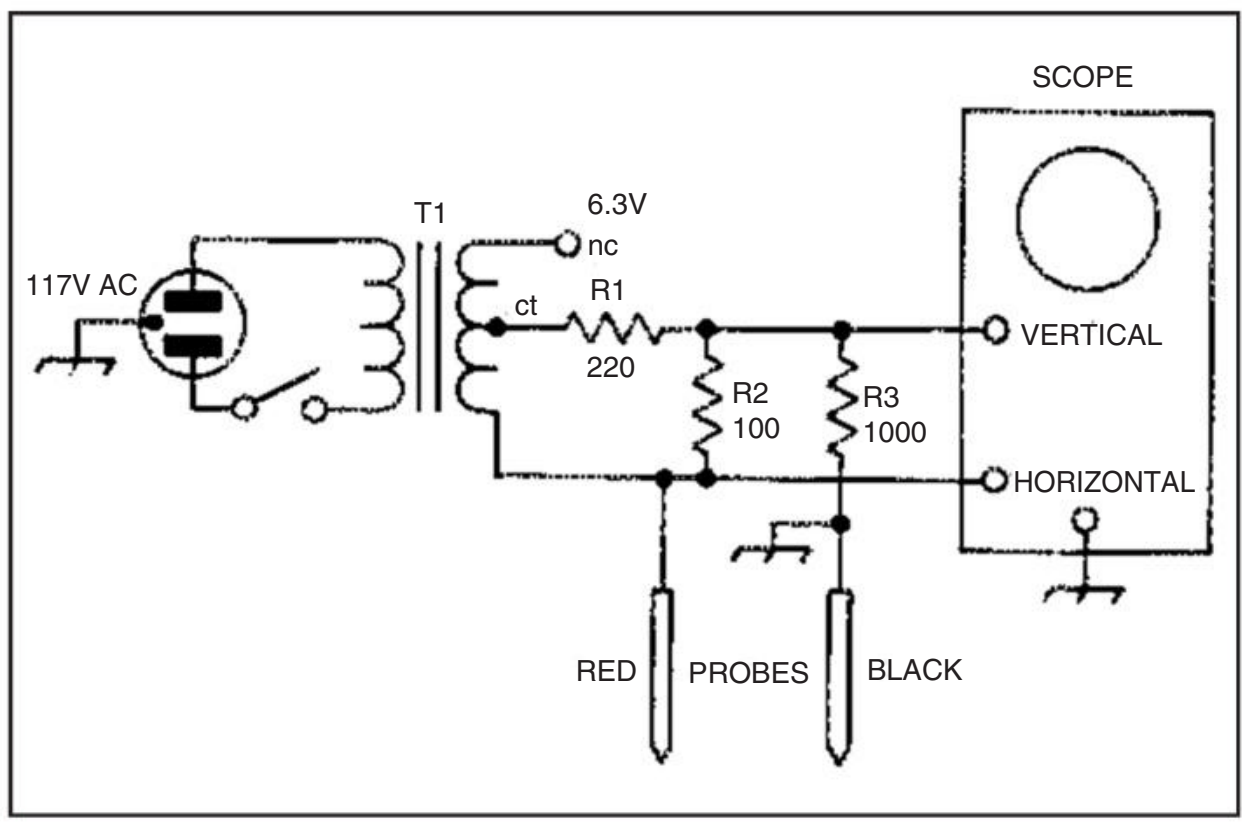


Figure 1. Schematic of the "Octopus" curve tracer adapter described in a January 1975 QST *article by David Ludlow, W7QHX. (Courtesy January 1975 QST)*

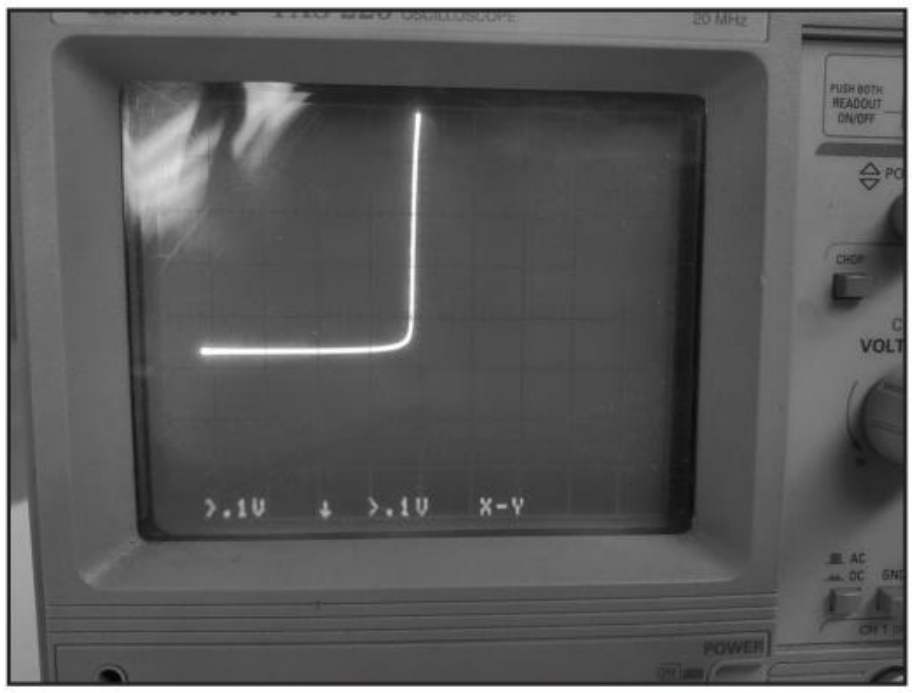


Photo G. Germanium diode

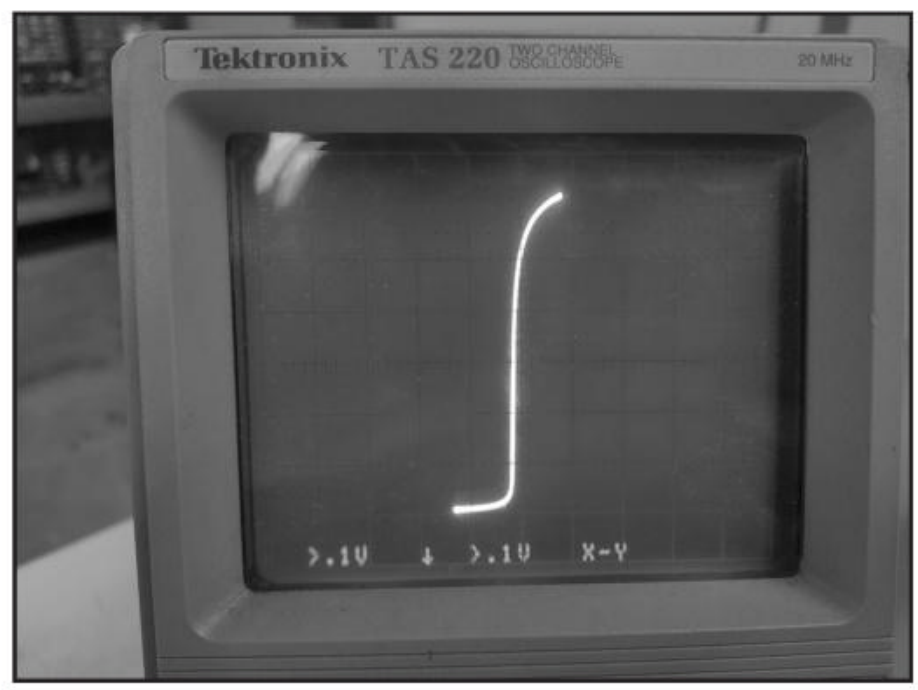


Photo H. Silicon diode and inductor in series

DUAL CHANNEL analog scopes do an excellent job in the XY mode, since they simply switch one of the identical vertical amplifiers to the horizontal sweep circuitry. Following are some typical displays, by no means is this an exhaustive catalog. You are encouraged to build your own octopus and experiment with various components.

After playing around with the Octopus for a while, you'll probably want to experiment with a little more elaborate curve tracer. There are a number of "official" curve tracer projects on the web. I believe the Arduino-based projects are the most interesting. But at their core, they are nothing more than I vs E plotting devices, like this primitive Octopus.

One of the more practical troubleshooting tasks of a curve tracer is IN-CIRCUIT component testing, and a curve tracer can do an amazing job of this...even with some fairly elaborate ICs. There are extensive catalogs of oddball component defects that a curve tracer can identify.

We trust you will have some fun with your Octopus … maybe not quite as much fun as a REAL octopus, but probably a little safer!

In our next Analog Adventure, we will uncover the mysteries of the ubiquitous transmitter Pi network, with a little help from the VNA.

– 73! Eric, KL7AJ

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The CQ Ham Shack Project Calendar which features fifteen spectacular color images of amateur ham shack projects.

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BY TRENT FLEMING,* N4DTF

ICOM's IC-905: A Commercial Radio for the Microwaves

I've watched a number of YouTube videos, perused all the Icom literature and announcements, and read a number of articles discussing this radio. First and foremost, I have to say how pleased and excited I am that Icom is making a commercial unit to help folks more easily get on SHF frequencies. It is great to see a manufacturer work to help hams better use frequencies that are allocated to us. I am going to maintain that attitude as we see this device become available, and we finally get our hands on it. Here's my initial take: the majority of early adopters will be rovers and hilltoppers, seeking to simplify their mobile setups and perhaps add additional bands more easily. Our friend in Ireland, John, EI7GL, experimented with the IC-905 in Japan and posted an article about his experiences at <https://tinyurl.com/4yzhwvuv>.

Of course, it remains as a prototype in the US, so our talk is mainly speculation – but of course that's to be expected and is a lot of fun. I think this radio will delight some, and miss the mark with others, but again, that is about par for the course.

My friend and colleague Joe Eisenberg, K0NEB, a popular fixture at many ham radio events, was present at Hamcation® in Orlando in February and was able to get some photos of the new radio, seen in *Photos A* and *B*. Thanks, Joe!

While the concept and early press and compelling, I'm not sure that I fully understand Icom's "mission" with the IC-905, so I won't comment on whether they succeeded. Instead, I will offer some observations that I think will impact how the radio is and isn't used.

First, the treatment of 2 meters, 70 centimeters, and 23 centimeters. There is a single antenna port for these three bands, and a maximum power out of 10 watts. For serious weak-signal work, this will require splitters and amplifiers. So I don't think the radio is intended to meet that requirement, but I do think that having access to those bands for repeaters (such as the Cactus Net in the western states) and simplex access will prove to be valuable.



Photo A. Front panel of IC-905 shown in backpack carrier (Photos A & B by Joe Eisenberg, K0NEB)



Photo B. A look from the rear at the head and remote units of the IC-905

* <n4dtf@cq-amateur-radio.com>

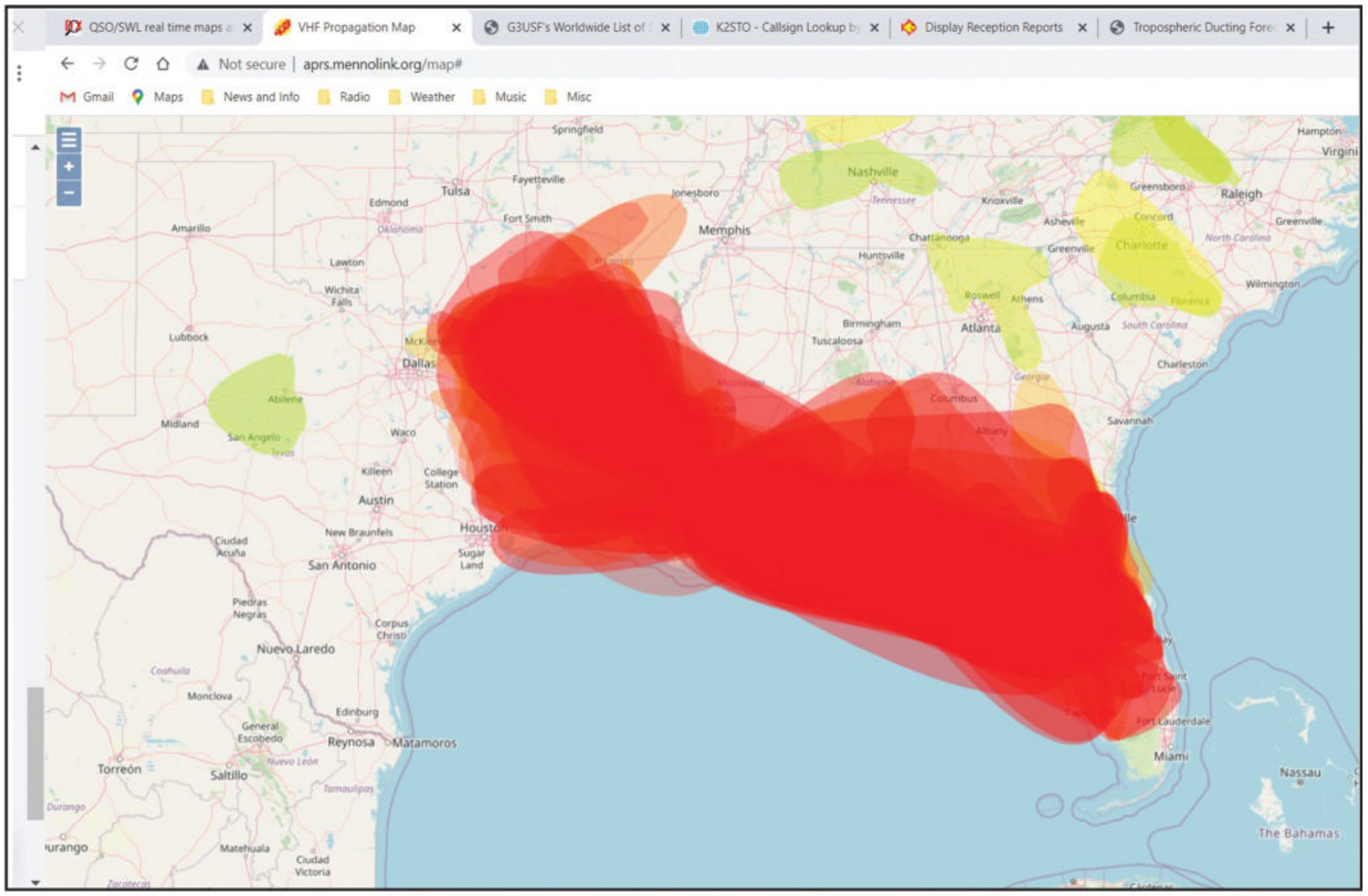


Photo C. Hepburn map of the southeastern US during the evening of February 14, 2023 showing the potential for tropospheric propagation.

Second, having 10 GHz as an option, rather than built in, seems to ignore the popularity of that band and the work that is being done across the world to advance knowledge of scatter modes, tropo modes, and even EME on 10 GHz. But at least it is an option.

On a positive note, Power over Ethernet (POE) is an exciting technology and it is nice to see a manufacturer implementing it. The potential to reduce or eliminate loss in transmission lines is very exciting to SHF enthusiasts.

Finally, price point is going to be an issue, so we will have to wait and see on that one. Kudos to Icom for the effort to serve the microwave community!

Again, just some thoughts. I look forward to your questions, comments, and hurled vegetables in response.

On the Air

Winter often brings tropo openings. A good example was on the evening of February 14, around 0400 – our friend David Their, WA3GWK, in EM60 reported the following activity: "The following stations were worked on 2-meter SSB and those with * were also worked on 432 SSB: N4DLW* EL87, KD4ESV* EL87, N4TUT* EL98, KW4BY EL97, KW4G EL97, NO5G EM32, WB5HIL EM43."

Microwave enthusiasts have been active as well. Gedas, W8BYA in EN70 reported on the following activity. On February 4, he said that "despite the freezing temperatures and VERY windy conditions we were able to find 3 brave souls willing to give me a FB CW QSO on 10 GHz: K8ZR in EN91KT at 360 kilometers, N8IUP in EN81PF at 225 kilometers, and W9ZIH in EN51NV at 330 kilometers."

Then, on February 16, Gedas reported a 10-GHz contact with Tony, K8ZR, at a distance of 330 kilometers: "Several hours ago, Tony set up at EN91KT (330 km away) so we could have a 10-GHz RS (rain scatter) QSO using a huge blob of yellow & orange rain surrounding his entire area. We pointed direct at each other since it coincided with the middle of the rain mass. Signals were 100% RS and of nominal (expected) strength....in other words about what we expected. Then, for fun, we turned our dishes south about 6 degrees from "direct" so our signals hit a more dense area of this rain blob and signals were much stronger, at least 10 dB better than the RS signals when pointing direct. Tony was booming in. What was SO weird was that Tony's CW signal had tone to it, almost like no RS at all! I have never experienced RS like this. Has anyone else made RS QSOs and had the CW sound almost normal and with no spreading on the waterfall? (This prompted a discussion on the Midwest Microwave reflector about such variances in CW tonality.)"

Six-Meter DX Ahead!

Thanks as always for the info on your contacts. As we discussed last month, higher sunspot numbers are producing F_2 propagation on 6 meters. This will likely be a great year for 6-meter contacts, especially if you want to work DX. Please keep me posted on your activities, and send along your questions, thoughts and project plans.

awards

BY STEVE MOLO,* KI4KWR

World Castles Award

Recently I was working a 160-metrer QSO with an individual in the UK and he was chasing a rare-to-him award…the World Castles Award, or WCA. So, he shared what the awards are about and mentioned that it is chased by many so I told him I would share it among *CQ* magazine readers around the world.

This international award program was created to work castles, fortresses and other fortifications anywhere in the world, although it is based in Europe as you will see from a list later in the article. The program includes several awards and was founded early 2009 by members of RZ1CWC Radioclub under the support of the international "Castles On The Air" or "COTA" organization.

The program goal is working amateurs from different countries who are activating these historical castles and fortresses from all over the world. Another piece is learning about the maintenance required to protect and preserve the monuments and architectural constructions used in these fortified structures.

The rules package is very straightforward and listed below, as taken from the WCA Group website at <http://wcagroup.org/>:

1. International program "*World Castles Award*" (WCA) has been instituted by group of the Russian radiohams, members of Radioclub RZ1CWC, founders of "Castles On The Air-Russia" (COTA-Russia) award program.

2. The purpose of the program is joining of efforts of radiohams in different countries for activation and popularization historical objects relating to fortification (fortresses, castles, forts, etc.) and attract attention to historical and architectural heritage as well as visiting existing historical monuments all over the world.

3. Fortifications are military constructions and buildings designed for defense in warfare and military bases. Humans have constructed defensive works for many thousands of years, in a variety of increasingly complex designs. The term is derived from the Latin *fortis* ("strong") and *facere* ("to make").

Fortifications are usually divided into two branches, namely permanent fortification and field fortification. Permanent fortifications are erected at leisure, with all the resources that a state can supply of constructive and mechanical skill and are built of enduring materials. Field fortifications are extemporized by troops in the field, perhaps assisted by such local labor and tools as may be procurable and with materials that do not require much preparation, such as earth, brushwood and light timber, or sandbags.

4. Contacts with objects of permanent fortification such as castles, fortresses, forts, fortified areas (including their parts like gate, walls, towers, etc.) having obviously expressed signs of preservation or are newly restored are valid for WCA.

Contacts with newly restored objects of field fortification such as stockaded towns, fortified ancient settlements, etc., are valid too.

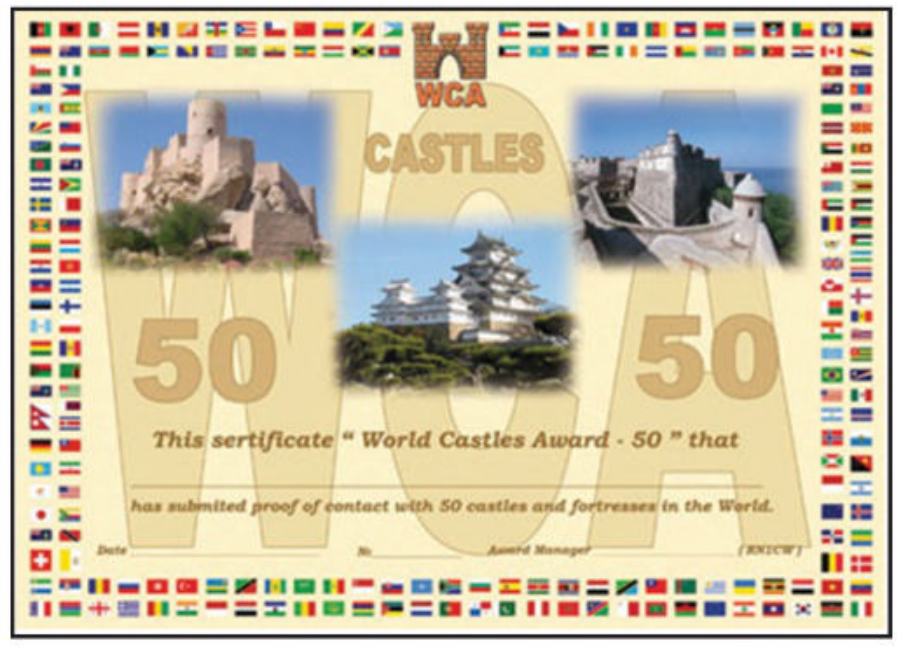


Photo A. This is the basic Worked Castles Award certificate, earned for confirmed contacts with at least 50 castles or fortifications around the world.

5. The World Castles Award Program (WCA) includes following diplomas:

WCA 50 – for QSO/SWL with any 50 valid objects in the world (*Photo A*);
WCA 100 – for QSO/SWL with 100 objects in the world;
WCA 200 – for QSO/SWL with 200 objects in the world;
WCA 300 – for QSO/SWL with 300 objects in the world;
WCA 400 – for QSO/SWL with 400 objects in the world;
WCA 500 – for QSO/SWL with 500 objects in the world;
WCA 600 – for QSO/SWL with 600 objects in the world;
WCA 700 – for QSO/SWL with 700 objects in the world;
WCA 800 – for QSO/SWL with 800 objects in the world;
WCA 900 – for QSO/SWL with 900 objects in the world;
WCA 1000 – TOP Award – for QSO/SWL with 1000 objects in the world.

The "World Castles Activator Award – WCAA" is issued for work on the air form historical objects (activation) such as castles, fortresses, forts etc.

WCA HONOR ROLL PLAQUE is issued for QSO/SWL with 1001 or more objects located in any 10 countries and on any 3 continents of the world.

E-Awards: WCA Hunter – for QSO/SWL for each 500 objects in the world beginning with 1500.

6. For WCA 50 – WCA 900, need to have QSO/SWL with not less than 2 countries from any continents.

For WCA-1000 – TOP Award and WCA HONOR ROLL are issued for QSO/SWL with 1000 and 1001 objects located in any 10 countries and on any 3 continents of the world. For WCA Hunter there are no limitations by number of countries and continents.

7. Activators must be no more than 1 kilometer away from the activated reference/s. More than one reference may be activated at the same time as long as this distance rule is maintained, meaning one activation can be valid for multiple WCA references.

*Email: <KI4KWR@cq-amateur-radio.com>

* The exception from basic rules about distance from historical object are the criteria which were established earlier by some national award programs (9A-COTA, BCA, CASHOTA, DCE, DFCF, DCI, DCS-SSD, DMHP…etc.)

It is not necessary to notify WCA Committee about object activation. The WCA Committee can require necessary data (photos, videos etc.) if some activation gives rise to doubt.

8. For WCA activators, any activated object is valid for all awards of WCA series (WCA-50, WCA-100 etc.) on conditions that at least 50 QSOs are made. In this case, the application for the award needs to mark activated objects.

9. Recommended frequencies for work on the air during expeditions on fortresses and castles.

CW: 3.531; 7.031; 10.121; 14.031; 18.081; 21.031; 24.911; 28.031

SSB: 3.731; 7.131; 14.251; 18.131; 21.251; 24.951; 28.551

10. On the base of S50CLX Cerkno Linux DX Cluster <http://s50clx.infrax.si> was created WCA cluster to inform about expeditions on fortresses and castles.

11. WCA Committee has decided to institute a greeting code when working from fortification objects.

Code "11" ("*Two towers*") means "best wishes form castles and fortresses of the world." Thanks a lot to Sergey Beresnev, UR7UT (WCAG # 002), for the idea.

12. The new system of WCA identification numbers is constituted since November 1st, 2009. All objects (castles, fortresses, forts etc.) are identified by an alphanumeric designation. Letters indicate the country according to prefixes, for example: DL – (Germany), I – (Italy), LY – (Lithuania), etc., and the next digits indicate the serial number of objects. For example: DL-00001, I-00002, LY-00003 etc.

The official WCA List is organized by countries and may be downloaded from the award website. The WCA-List is not final and will be constantly updated.

* It is permissible not to transmit superfluous zero during QSO to simplify transmission and receiving of identification numbers.

** Correspondence between identification numbers of national award programs (BCA, CASHOTA, CASHOTA-EI, CASHOTA-NI, CCA, COTA-9A, COTA-DL, COTA-NL, COTA-RU, COTA-UN, COTA-YL, CPBA, DCE, DCE 1.0, DCFP, DCI, DCS, DFCF, DMHP, HCS, IDES, RHO, S5-WCA, SCA, UCFA, ZWP) and WCA identification numbers is in the WCA-List table.

13. Repeated QSOs are not valid. The object is valid only once regardless of bands or mode.

14. The same award rules are for SWL.

15. QSO/SWL are valid since January 1st, 1995 on any bands (including WARC) by any kind of modes.

16. Application for diploma is based on the received QSL cards according to the WCA application form and must be signed by two radio hams. Each QSL card must have identification number according to WCA-List.

WCA Committee recommends using the WCA application form on the award website to register and apply for awards.

QSL cards having object name or identification number according to national castles and fortresses award programs are valid for the diploma.

No QSLs should be submitted, only a certified application is required. The award manager can require QSL for check.

17. The WCA E-LOG (at<https://www.qth.cz/wcagroup/log_rus.php>) allows participants to check up data

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about completed QSOs without QSL validation for all awards of WCA series and make application for awards online. The author and manager of the WCA E-LOG is Jiri Suchy, OK5NN.

18. The award can be issued for separate MODE (optionally).

19. The application should be sent to the award manager by e-mail: wca11team@gmail.com or via post to the following: Andrey A. Petushkov, RN1CWul. Komsomolskaya, 12-49 Sosnovyj Bor,Leningrad oblast, 188540 Russia

20. – Since January, 1st, 2011 the order of issue of the "*World Castles Award (WCA)*" and "*Castles On The Air – Russia – Award (COTA-RU*" will change. Awards will be issued by two means:
– in electronic form – JPG (free of charge);
– in print form, the fee of WCA and COTA-RU will be:
– For Russia 200 Rubles, for the CIS countries – 7 EURO, 7 USD, 7 IRC.
– For the others – 10 EURO, 10 USD, 10 IRC.
– Fee for HONOR ROLL please ask Award Manager at the moment of application.

21. Award certificates "*World Castles Activator Award – WCAA*" and "*WCA – Hunter*" are free of charge. You can obtain them in electronic form – JPG files completely ready for printing in A4 format (297×240), which will be sent by e-mail.

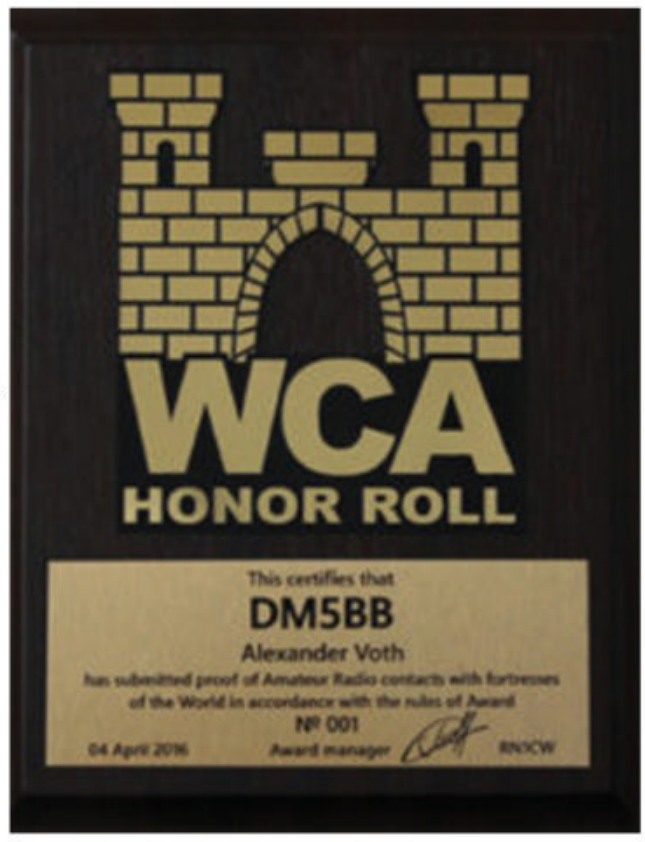


Photo B. The WCA Honor Roll plaque may be earned by making more than 1000 valid castle/ fortification QSOs.

WCA Honor Roll Plaque

Now to even make this more interesting, there is also a WCA Honor Roll Plaque (*Photo B*) that is issued for QSO/SWL with any 1001 objects located in any 10 countries and on any 3 continents of the world.

The fee of WCA Honor Roll Plate is:
– for Russia 2000 Rubles;
– for the others – 50 Euro (or equivalent in USD).

As of this writing, only 13 amateurs have obtained this prestigious plaque….amazing.

WCAA – World Castles Activator Award

The "*World Castles Activator Award – WCAA*" (*Photo C*) has been instituted by the founders of the World Castles Award

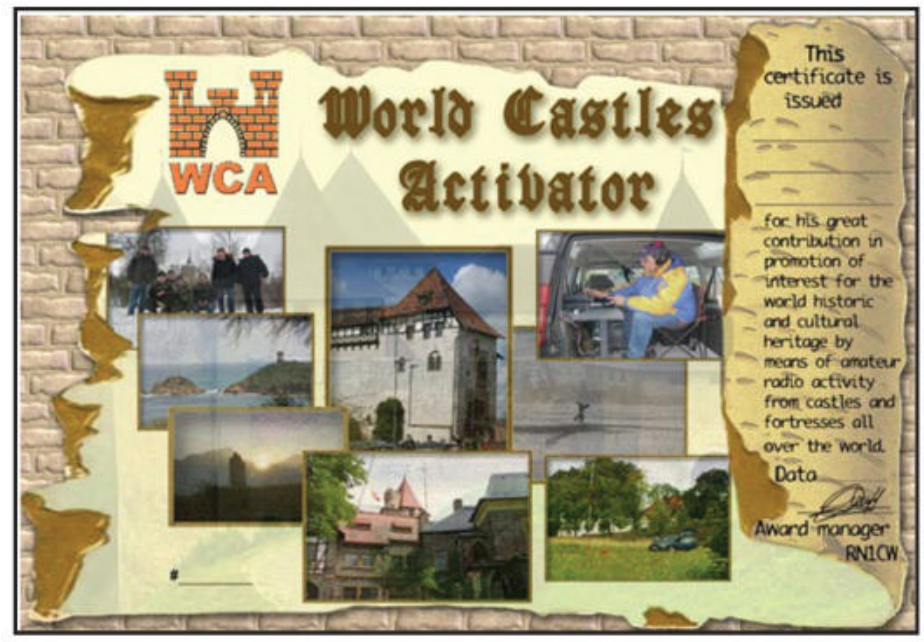


Photo C. The WCA Activator award is issued to hams who make a required number of QSOs from a minimum number of valid sites.

Program (WCA) as a mark of commendation for work on the air from historical and memorial places.

The "*World Castles Activator Award – WCAA*" is issued for work on the air from historical objects (activation) such as castles, fortresses, forts, etc.

To obtain the "*World Castles Activator Award – WCAA*," you need to make not less than 50 QSOs from each of five various objects qualifying for WCA. Radio hams living near castles, fortresses, forts, etc., within the 1-kilometer circle, need to make at least 1000 QSOs to qualify.

QSOs are valid since January 1st, 1995 on any bands and modes.

The "*World Castles Activator Award – WCAA*" certificate is free of charge. There are two ways to obtain it:

1) in electronic form – JPG file completely ready for printing in A4 format (297×240) will be sent by e-mail;

2) in paper form by post (need to pay the postage).

The application for the "*World Castles Activator Award – WCAA*" is made in free-form but needs to specify participants name, numbers by national award program or WCA-number, total number of QSOs and dates when they were made.

The Award Manager is: Petushkov Andey Alexandrovich, RN1CWul. Komsomolskaya 12-49 Sosnovy Bor, Leningrad Oblast, 188540, Russia *E-mail*: <wca11team@gmail.com> or <cqrn1cw@gmail.com>.

This award has been given to almost 200 award chasers so far and is quite an accomplishment if I don't say!!

This group has something that not always is seen in awards; partnerships with other award groups to make this program and theirs become known and worked as seen below in the list:

At the present time, the World Castles Award program cooperates and keeps up friendly relations with nearly four dozen well-known national castle and fortress award programs.

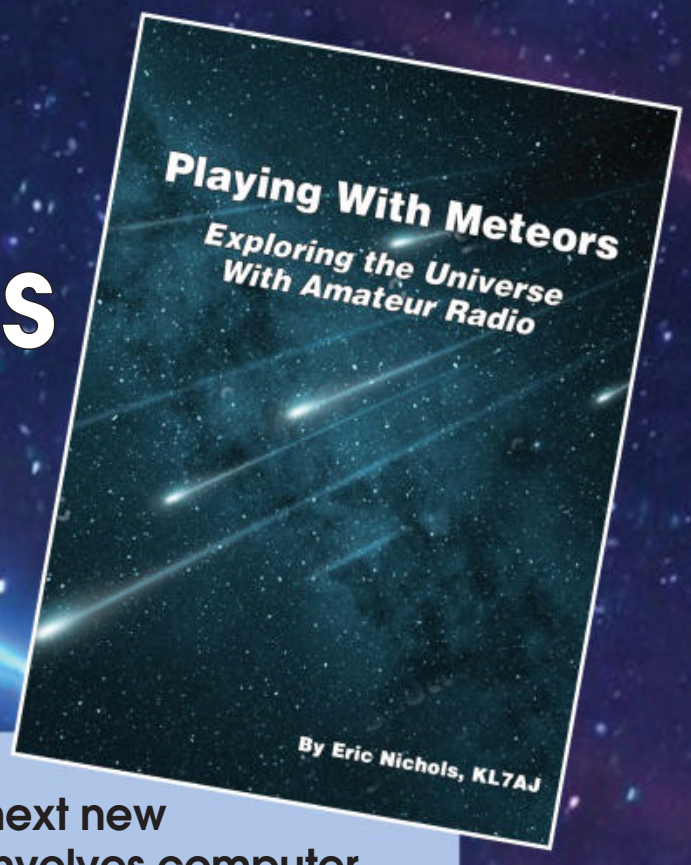
Monuments and architectural constructions relating to fortification from countries of Asia, Europe and South America are present in lists of historical objects for the World Castles Award program.

This award has a very strong base of organizers and partners from around the world and I congratulate them for creating and maintaining an award program that is strong and worldwide.

Playing With Meteors

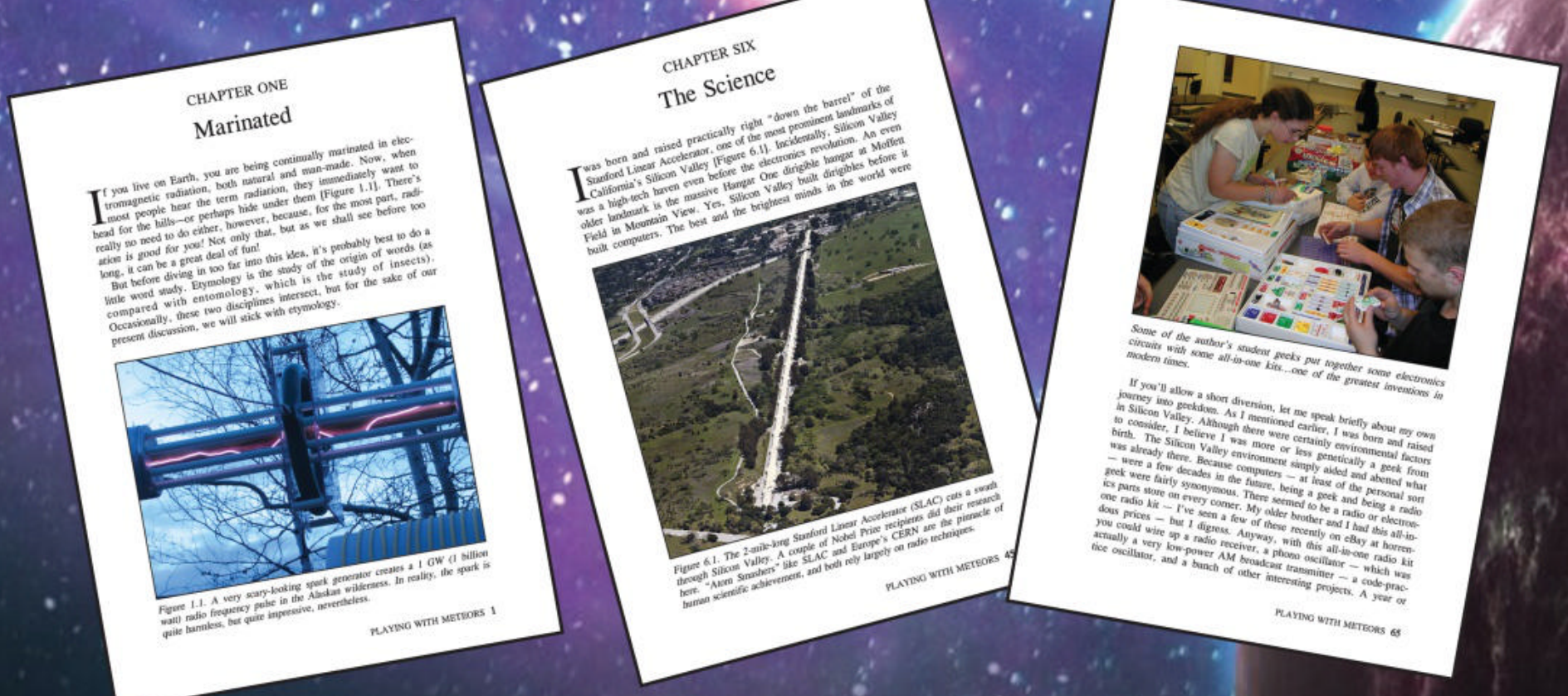
Exploring the Universe With Amateur Radio

By Eric Nichols KL7AJ



Wouldn't it be a blast to be a master of technology rather than to be at its mercy? Or better yet, to actually create the next new thing? While it's true that a lot of what we consider high-tech involves computer technology, an equal or greater part of the next new thing is going to involve wireless, also known as radio. In fact, our entire universe is connected by radio, and the entire universe is the radio amateur's sandbox.

In *Playing With Meteors*, author Eric Nichols takes you on a tour of the opportunities that amateur radio can bring you, and how you can leverage the knowledge you gain in "hobby radio" to a career in hi-tech, or just to being smarter than your "smart devices" (and maybe even some of your friends).



CHAPTER ONE

Marinated

If you live on Earth, you are being continually marinated in electromagnetic radiation, both natural and man-made. Now, when most people hear the term radiation, they immediately want to head for the hills—or perhaps hide under them [Figure 1.1]. There's really no need to do either, however, because, for the most part, radiation is good for you! Not only that, but as we shall see before too long, it can be a great deal of fun!

But before diving in too far into this idea, it's probably best to do a little word study. Etymology is the study of the origin of words (as compared with entomology, which is the study of insects). Occasionally, these two disciplines intersect, but for the sake of our present discussion, we will stick with etymology.

Figure 1.1. A very scary-looking spark generator creates a 1 GW (1 billion watt) radio frequency pulse in the Alaskan wilderness. In reality, the spark is quite harmless, but quite impressive, nevertheless.

PLAYING WITH METEORS 1

CHAPTER SIX

The Science

I was born and raised practically right "down the barrel" of the Stanford Linear Accelerator, one of the most prominent landmarks of California's Silicon Valley [Figure 6.1]. Incidentally, Silicon Valley was a high-tech haven even before the electronics revolution. An even older landmark is the massive Hangar One dirigible hangar at Moffett Field in Mountain View. Yes, Silicon Valley built dirigibles before it built computers. The best and the brightest minds in the world were

Figure 6.1. The 2-mile-long Stanford Linear Accelerator (SLAC) cuts a swath through Silicon Valley. A couple of Nobel Prize recipients did their research here. "Atom Smashers" like SLAC and Europe's CERN are the pinnacle of human scientific achievement, and both rely largely on radio techniques.

PLAYING WITH METEORS 45

Some of the author's student geeks put together some electronics circuits with some all-in-one kits...one of the greatest inventions in modern times.

If you'll allow a short diversion, let me speak briefly about my own journey into geekdom. As I mentioned earlier, I was born and raised in Silicon Valley. Although there were certainly environmental factors to consider, I believe I was more or less genetically a geek from birth. The Silicon Valley environment simply aided and abetted what was already there. Because computers — at least of the personal sort — were a few decades in the future, being a geek and being a radio geek were fairly synonymous. There seemed to be a radio or electronics parts store on every corner. My older brother and I had this all-in-one radio kit — I've seen a few of these recently on eBay at horrendous prices — but I digress. Anyway, with this all-in-one radio kit you could wire up a radio receiver, a phono oscillator — which was actually a very low-power AM broadcast transmitter — a code-practice oscillator, and a bunch of other interesting projects. A year or

PLAYING WITH METEORS 65

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BY BOB SCHENCK,* N2OO

Club Profile: The Carolina DX Association

BY GARY DIXON,# K4MQG
WITH JOHN SCOTT, K8YC; PAUL TROTTER, AA4ZZ, AND ROGER WEBB, W4MW



Photo A. DXers gather in 1981 to discuss formation of Carolina DX Association (Photos courtesy of the authors and CDXA)

For this month's DX column, I've asked Gary Dixon, K4MQG, and a couple of friends to introduce us to one of the premier DX clubs in the eastern US, the Carolina DX Association. – N2OO

Back in the 1970s and 1980s, a large number of DXers in North and South Carolina were very active on the bands. Many of them chatted and exchanged DX info on a 2-meter repeater in Fort Mill, South Carolina. The repeater was located on top of a multi-story hotel right on the state line. The Internet was not invented or in use at the time, so the repeater was the information link for spotting DX and other information.

There was no DX club in the area and, through the repeater, a large group decided to meet at the home of N4ZC near Charlotte, North Carolina to discuss forming a club. The meeting occurred in July 1981 with approximately 15 DXers present (see *Photo A*).

The group decided to form a new club and named it the Carolina DX Association, CDXA. Some years later, the repeater was actually donated to the CDXA and the call W4DXA was ac-quired. A packet network was used before the internet for members to spot HF and VHF DX. After the Internet became available in the early 1990s, CDXA used it for DX spotting



Photo B. AA4ZZ VHF antennas



Photo C. Drone view from AA4ZZ's VHF site

*email: <n2oo@comcast.net>
email: <gdixon@comporium.net>

and a club website. The CDXA grew to be an ARRL affiliated club. Over the past 42 years, the CDXA has also supported well over 50 DXpeditions to rare DX entities.

In 1983 the CDXA assumed management of the W4-K4-N4 Single Letter ARRL Incoming QSL Bureau. In 2022, the bureau merged with the W4 two-letter bureau. Many CDXA members continue to be involved with the merged bureau. CDXA also has club members in other states who have been approved by the *ARRL* and *CQ* magazine for field checking of QSLs for DXCC, VUCC, WAS and CQ awards.



Photo D. 6-meter antennas at W4MW's QTH



Photo E. W4MW's VHF QTH in Boone, North Carolina

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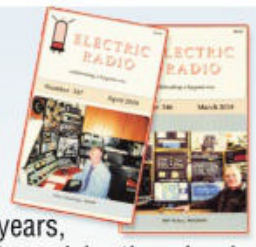
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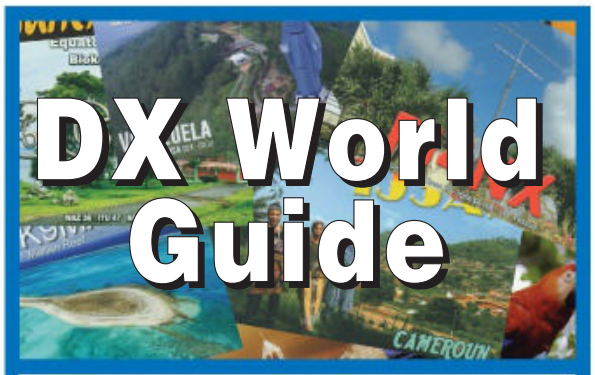
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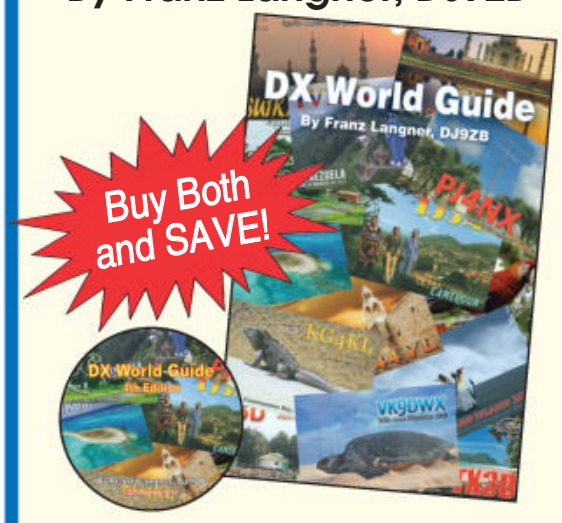
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By Franz Langner, DJ9ZB



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Photo F. CDXA's own AA4NN on Scarborough Reef



Photo G. HF antennas at K4MQG's QTH … 80- and 40-meter beams at 120 feet, Moseley Pro 57 at 80 feet



Photo H. CDXA fall barbeque at AA4NN's QTH

The WAZ Program

SINGLE BAND WAZ

10M Digital

5 ..... HI8RD
6 ..... N1NK

12M CW

114 ..... WX2S

12M Digital

9 ..... JR2LJO
10 ..... JA1QJI

15M Digital

16 ..... HI8RD
17 ..... JA4FCV
18 ..... JA4IXI
19 ..... JA8UIV

17M CW

140 ..... DK1FW

17M Digital

32 ..... HI8RD
33 ..... K9NR
34 ..... JA8UIV
35 ..... JA1QJI

20M Digital

62 ..... HI8RD
63 ..... KC1OPD
64 ..... JA8UIV

30M Digital

24 ..... JR2LJO
25 ..... JA1QJI

40 CW

341 ..... WZ8P

40M Digital

30 ..... HI8RD
31 ..... W7AH
32 ..... KC1OPD

160M

706 ..... EA5CI, 30 Zones
707 ..... ES1GO, 33 Zones
708 ..... N7TY, 30 Zones

ALL BAND WAZ

CW

1230 ..... OZ1OXQ
1231 ..... JP1GUW
1232 ..... JL1SAM
1233 ..... K1JD
1234 ..... JH3VWN

Digital

425 ..... HI8RD
426 ..... W9WO
427 ..... W9VOB
428 ..... NT9J
429 ..... JL3OUW
430 ..... WE4S
431 ..... JF1CPH
432 ..... LX1JH
433 ..... K9NR
434 ..... JA1QJI
435 ..... NY1V
436 ..... JA1UBZ
437 ..... W6ZL
438 ..... JR1CAD
439 ..... W3ICM

SSB

5551 ..... NONE
5552 ..... NONE
5553 ..... OK1XOE

RTTY

319 ..... DL6ZBN

Mixed

10388 ..... HI8RD
10389 ..... JH8FIH
10390 ..... W9WO
10391 ..... W9VOB
10392 ..... NT9J
10393 ..... K9AQ
10394 ..... JE1FQV
10395 ..... KC1OPD
10396 ..... JL3OUW
10397 ..... JPJ1GUW
10398 ..... JK3RHX
10399 ..... SQ2OMK
10400 ..... LX1JH
10401 ..... JE1SYN
10402 ..... OK1XOE
10403 ..... AAA8KY
10404 ..... JA2CPD
10405 ..... K9NR
10406 ..... W9PDS
10407 ..... AA5NT
10408 ..... XE1SAX
10409 ..... WO2T
10410 ..... K1JD
10411 ..... JR0QFA
10412 ..... JA5RVN

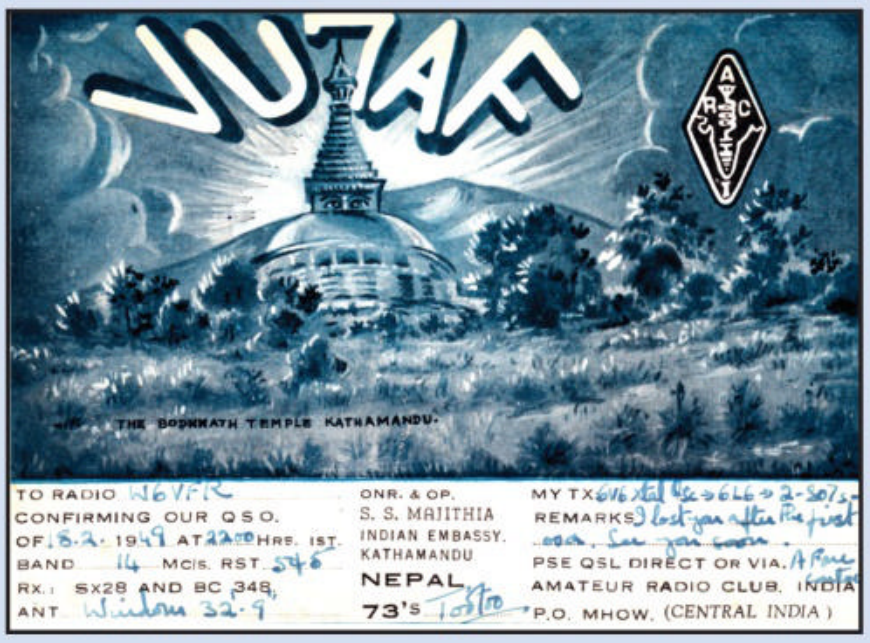
Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Jose Castillo, N4BAA, 6773 South State Road 103, Straughn, IN 47387. The processing fee for all *CQ* awards is $6.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $12.00 for nonsubscribers. Please make all checks payable to Jose Castillo, N4BAA. 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>.

QSL of the Month: VU7AF, Nepal

VU7AF was Surjit S. Majithia. He was an Indian politician, diplomat, and air force officer. He commanded a fighter squadron in the Indian Air Force until 1944. He then left to pursue a political career. He was appointed ambassador to the neighboring country of Nepal where he remained until 1949. The VU7AF operation was from the Indian Embassy in Kathmandu, Nepal. It is the earliest known operation from Nepal, starting in 1948, and the only VU7 from Nepal. Father Marshall Moran, 9N1MM, was the next ham to operate from Nepal, starting in 1951.

The photo on the front of Surjit's QSL card is of the Boudhanath Stupa, a type of Buddhist shrine, located in Kathmandu. Its massive mandala makes it one of the largest spherical stupas in the world.

73, Tom K8CX



The 1940s QSL of VU7AF, an Indian diplomat serving in Kathmandu, Nepal. His was the first known amateur operation from Nepal. The card shows a drawing of the Boudhanath Stupa, a Buddhist shrine in the Nepalese capital. (Images courtesy K8CX Ham Gallery <www.hamgallery.com>)



A photo of the Boudhanath Stupa, one of the largest spherical stupas in the world. (Wikipedia photo)



Photo I. Annual CDXA Christmas party

One of the facets of the club for many years are the various VHF contests that have won using the calls of AA4ZZ, W4VHF and W4MW.

CDXA is a vibrant group of elite HF and VHF DXers. With over 200 members from several continents at one time, the CDXA has placed very high in the ranks and recognition of accomplishments. Currently the Carolina DX Association is ranked #3 in the Club Leagues listings produced by Club Log. One of the facets of the club for many years are the various VHF contests that have won using the calls of AA4ZZ, W4VHF and W4MW. A team of club members has operated from the mountains of North Carolina for many years. AA4ZZ is the call of our current President. He has a second home up near Boone, North Carolina, next to W4MW's second QTH. Both of these locations have been used in many VHF contests. They are located above 4000 feet and have wonderful antennas that provide outstanding performance at this

The WPX Program

CW

4075 ..... WA1LAD
4076 ..... KG7YU
4077 ..... W9DCT
4078 ..... ISØAFM
4079 ..... NØJRN

SSB

4461 ..... KY4KP
4462 ..... VE2HTC
4463 ..... W3CWT
4464 ..... IT9ODQ
4465 ..... W9DCT
4466 ..... K3YQA

Mixed

4538 ..... K6DSP
4539 ..... W2TI
4540 ..... KQ4ADO
4541 ..... W5MBG
4542 ..... W2RLK
4543 ..... N3JIM
4544 ..... DL8MRE
4545 ..... OH7CBC
4546 ..... AD2BO
4547 ..... KD5DDV
4548 ..... IW1PVT
4549 ..... IUØRBE
4550 ..... NU4H
4551 ..... KD9TLI
4552 ..... NT4TN
4553I T9ODQ
4554 ..... N8LFK
4555 ..... W9NC
4556 ..... WK9X
4557 ..... HL5LX
4558 ..... DL1OMP
4559 ..... W9DCT
4600 ..... N9AZZ
4561 ..... W8ASH
4562 ..... SP5HHP

Digital

1873 ..... WA1LAD
1874 ..... K6DSP
1875 ..... JJ1NRX
1876 ..... JJ1SZA
1877 ..... N4EXO
1878 ..... JK1VXE
1879 ..... W5MBG
1880 ..... K4JIP
1881 ..... W2RLK
1882 ..... N3JIM
1883 ..... DL8MRE
1884 ..... IW1PVT
1885 ..... IUØRBE
1886 ..... NU4H
1887 ..... K6FXZ
1888 ..... NT4TN
1889 ..... IT9ODQ
1890 ..... N8LFK
1891 ..... WK9X
1892 ..... HL5XL
1893 ..... KD9VQD
1894 ..... DL1OMP
1895 ..... WB6EQK
1896 ..... W9DCT
1897 ..... W4XED
1898 ..... W8ASH

CW: 350 W9DCT, NØJRN. 400 WA1LAD, KG7YU. 550 ISØAFM. 600 F5VHQ. 2000 WA6KHK

SSB: 350 K3YQA. 400 W3CWT. 450 IT9ODQ. 500 W9DCT. 550 WR7X. 650 WA1LAD. 700 W5UJ. 850 IZ4DPV. 900 W8KSC. 1000 DL8MRE. 1100 F5VHQ. 1950 WA6KHK

Mixed: 450 K6DSP. 500 N3JIM, NT4TN, WK9X. 550 NR6AM, KBØUGQ. 600 OH7CBC, DU1/NF0O, HL5XL. 650 W2RLK. 700 KQ4ADO, NU4H. 800 NA7KR. 900 KF8QL, W1DNP, N4SV, W8KSC, JS1ERB. 950 WB8LEM. 1000 DL8MRE, N2TC, AD2BO. 1050 JHØEYA, N1HO, KV8P. 1100 N6DSC. 1150 NA5WH. 1200 WA1LAD, KM4VI, NA5WH. 1250 IZ4DPV. 1300 N4DJT. 1550 JK1VXE, KC1UX, W9DCT. 1600 WR7X. 1650 MØHIH. 1700 N8IK. 1850 IT9ODQ. 2250 F5VHQ. 2500 WA6KHK. 2550 JR3UIC

Digital: 350 W5MBG, K4JIP, KD5DDV, IUØRBE, WB6EQK. 400 JJ1NRX, IW1PVT, N8LFK, DL1OMP. 450 K6DSP, NR6AM, WB8LEM, WK9X, KBØUGQ. 500 N3JIM, NT4TN, HL5XL. 550 WA1LAD, W2RLK. 600 DU1/NF0O. 650 IZ4DPV. 700 KQ4ADO, NU4H, JS1ERB, KV8P. 750 NA7KR. 800 N4SV, N1HO. 850 KF8QL. 900 W1DNP. 950 N2TC. 1050 JHØEYA. 1100 N6DSC. 1150 KM4VI, NA5WH. 1200 JK1VXE, N4DJT, NA5WH. 1300 N8IK. 1350 W9DCT. 1450 MØHIH. 1500 WR7X, KC1UX. 1600 F5VHQ. 1750 IT9ODQ. 2200 JR3UIC

160 Meters: WA1LAD, DL1OMP, N9DCT
80 Meters: WA1LAD, N4SV, AD2BO, NT4TN, N9DCT
40 Meters: WA1LAD, NR6AM, N4SV, W8KSC, JHØEYA, N3JIM, AD2BO, KC5CMX, NT4TN, IT9ODQ, WK9X, W9DCT, NA7KR
30 Meters: W1DNP, N1HO, W9DCT
20 Meters: WA1LAD, JJ1SZA, JK1VXE, KG7YU, W8KSC, JHØEYA, N3JIM, DL8MRE, AD2BO, W3CWT, IT9ODQ,W9DCT
17 Meters: N4DJT, W9DCT
15 Meters: WA1LAD, K6DSP, W1DNP, W8KSC, AD2BO, KM4VI, N4DJT, IT9ODQ, W9DCT
12 Meters: N8IK, W9DCT
10 Meters: WA1LAD, KQ4ADO, N2TC, N8IK, N4DJT, DU1/NF0O, KD9TLI, KD9VQD, W9DCT, JS1ERB

Asia: JJ1NRX, 7N4EXO, JK1VXE, DL8MRE, OH7CBC, N1HO, NT4TN, IT9ODQ, HK5XL, KBØUGQ, W9DCT, IU1HGN, ISØAFM
Europe: WA1LAD, W1DNP, JJ1SZA, N4SV, JK1VKE, KQ4ADO, JHØEYA, W2RLK, DL8MRE, OH7CBC, AD2BO, IW1PVT, IUØRBE, NU4H, W3CWT, NT4TN, IT9ODQ, HL5XL, DL1OMP, KBØUGQ, W9DCT, ISØAFM, SP5HHP
Oceania: MØHIH, IZ4DPV, WR7X, JK1VXE, N9DCT
North America: WA1LAD, K6DSP, W2TI, JK1VXE, KG7YU, W8KSC, KQ4ADO, W5MBG, K4JIP, JHØEYA, W2RLK, N3JIM, KY4KP, AD2BO, N1HO, KD5DDV, NU4H, K6FXZ, KD9TLI, N8LFK, WK9X, KBØUGQ, WB6EQK, W9DCT, W4XED, NØJRN, W8ASH, K3YQA
South America: N1HO, N4DJT, KC5CMX, W9DCT, KV8P

Digital Bar: N6PEQ

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.

On the Air in Addis Ababa



Youth visiting the ET3AA club station at Addis Ababa Institute of Technology in Ethiopia. Members Joe (standing) and Nahom (sitting), showing 8-year-old Milkias ham radio on the air at ET3AA. (Photo courtesy ET3AA)

CQ DX Awards Program

No Update

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.

5 Band WAZ

As of February 15, 2023
2458 stations have attained at least the 150 Zone level, and 1123 stations have attained the 200 Zone level.

As of February 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
DM5EE	199	1
EA5RM	199	1
EA7GF	199	1
H44MS	199	34
HAØHW	199	1
HA5AGS	199	1
I5REA	199	31
IKØXBX	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
RU3DX	199	6
RWØLT	199	2 on 40M
RX4HZ	199	13
RZ3EC	199	1 on 40M
S58Q	199	31
SM7BIP	199	31
SP9JZU	199	19 on 10M
USØSY	199	1 on 15M
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

Updates to the 5BWAZ 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

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
2358	JH3VWN	2/11/2023	1123

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).

Within the club, the members have an annual HF DX contest that is called the "DX King" that mirrors the CQ DX Marathon. Nice prizes are given for various levels.

altitude (see *Photos B, C, D* and *E*). AA4ZZ and the VHF contests participants have won five major ARRL and CQ VHF contests in past years.

Many of our club members have been guest operators or team leaders on major DXpeditions to such locations as Scarborough Reef (*Photo F*), Svalbard, Cocos Island, Wake Island, Swains Island, Navassa, Palmyra, Kingman Reef, Peter 1st, Willis Island, Western Sahara, Sovereign Military Order of Malta, Malta, Rwanda, Andorra, Morocco, San Andres, Lesotho, Botswana, South Africa, Thailand, Vatican, UN Headquarters, Puerto Rico, French Saint Martin, Bermuda and Bahamas.

The club has many members who participate in the annual ARRL CW and SSB DX contests, the CQ DX Marathon and the CQ World Wide CW and SSB DX contests (*Photo G*). Within the club, the members have an annual HF DX contest that is called the "DX King" that mirrors the CQ DX Marathon. Nice prizes are given for various levels.

CDXA members often gather several times a year for fun and food (*Photos H* and *I)*. The CDXA members know how to work DX and have fun eating as well! The CDXA web site is <www.cdxa.org>, where you can find more information about the club and its members' accomplishments.

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 340 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by an SASE if confirmation of total is required. The fee for endorsement stickers is $1.00 each plus SASE. (Stickers for the 340 level and Honor Roll are available.) Please make checks payable to the Award Manager, Keith Gilbertson. Mail all updates to Keith Gilbertson, KØKG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604 USA.

CW

DL3DXX.....339
HB9DDZ.....339
K4IQJ.....339
K9MM.....339
N4MM.....339
WB4UBD.....339
WS9V.....339
EA2IA.....339
F3TH.....339
K2FL..... 339
K2TQC.....339
K3JGJ.....339
K3UA.....339
K4CN.....339
K4JLD.....339
K4MQG.....339
K5RT.....339
K7LAY.....339
K7VV.....339
K8LJG.....339
N4AH.....339
N4CH.....339
N4JF.....339
N4NX.....339
N5ZM.....339
N7FU.....339
N7RO.....339
NØFW.....339
OK1MP.....339
W3GH.....339
W4OEL.....339
W5BOS.....339
W7CNL.....339
W7OM.....339
W8XD.....339
WK3N.....339
WØJLC.....339
WØVTT.....339
YU1AB.....339
K8SIX.....338
KA7T.....338
WA5VGI.....338
W9RPM.....338
G3KMQ.....337
KØKG.....337
W1DF.....337
W7IIT.....337
K8ME.....336
W6OUL.....336
JA7XBG.....335
F6HMJ.....334
K1FK.....334
K9OW.....334
PY2YP.....334
WG5G/QRPp.....334
WD9DZV.....334
K2OWE.....333
K5UO.....333
N6AW.....333
W4MPY.....333
K6LEB.....331
K9VKY.....331
N7WO.....331
OK1DWC.....331
K6YK.....329
W9IL.....329
IKØADY.....328
OZ5UR.....328
AB4IQ.....327
K6CU.....326
KE3A.....326
EA5BY.....325
KA3S.....325
K7CU.....324
N3RC.....324
N7WO.....324
KEØA.....322
YT1VM.....322
4Z5SG.....321
N2LM.....321
ON4CAS.....321
W2OR.....320
HB9DAX/QRPp.....319
W6YQ.....319
HA1ZH.....318
N4RF.....318
N6PEQ.....318
CT1YH.....316
EA3ALV.....315
RA1AOB.....313
WA4DOU.....312
YO9HP.....312
W6WF.....309
KT2C..... 307
K4DGJ.....307
W4ABW.....306
K7ZM.....305
HA5LQ.....301
RN3AKK.....300
WA9PIE.....298
K4IE.....295
YU1YO.....295
WA2VQV.....292
4XIVF.....286
K6YR.....284
PP7LL.....282
WR7Q.....282
N2VW.....280
K4EQ.....280
W8BLA.....280
WB5STV.....277
YO6HSU.....275

SSB

AB4IQ.....340
DJ9ZB.....340
DL3DXX.....340
DU9RG.....340
EA2IA.....340
EA4DO.....340
HB9DDZ.....340
I8KCI.....340
IK1GPG.....340
IN3DEI.....340
K2FL.....340
K2TQC.....340
K3JGJ.....340
K4CN.....340
K4IQJ.....340
K4JLD.....340
K4MQG.....340
K4MZU.....340
K5OVC.....340
K5RT.....340
K5TVC.....340
K6YRA.....340
K7VV.....340
K8LJG.....340
K8SIX.....340
K9MM.....340
KE5K.....340
KM2P.....340
KZ2P.....340
N4CH.....340
N4JF.....340
N4MM.....340
N5ZM.....340
N7BK.....340
N7RO.....340
NØFW.....340
OK1MP.....340
OZ3SK.....340
OZ5EV.....340
VE1YX.....340
VE2GHZ.....340
VE2PJ.....340
VE3MR.....340
VE3MRS.....340
VE3XN.....340
VK2HV.....340
W3AZD.....340
W3GH.....340
W4ABW.....340
W5BOS.....340
W6BCQ.....340
W6DPD.....340
W7BJN.....340
W7OM.....340
W8ILC.....340
W9SS.....340
WB4UBD.....340
WK3N.....340
WS9V.....340
XE1AE.....340
YU3AA.....340
JA7XBG.....339
KØKG.....339
W2FKF.....339
W4UNP.....339
W9RPM.....339
EA3EQT.....338
K3UA.....338
K7LAY.....338
K9HQM.....338
N4NX.....338
YU1AB.....338
4Z4DX.....338
K1UO.....338
N7WR.....338
WA5VGI.....338
W2CC.....338
W7FP.....338
W9IL.....338
N4FN.....337
IØZV.....336
K3LC.....336
K8ME.....336
EA3BMT.....335
F6HMJ.....335
HB9DQD.....335
IKØAZG.....335
IW3YGW.....335
OE2EGL.....335
VK2HV.....335
W4WX.....335
WB3D.....335
AA4S.....334
EA5BY.....334
K9OW.....334
PY2YP.....334
VK4LC.....334
W8AXI.....334
XE1J.....334
CT3BM.....333
IK8CNT.....333
K8LJG.....333
N6AW.....333
OE3WWB.....333
WD9DZV.....333
AA1VX.....332
KE3A.....332
N2VW.....332
N5YY.....332
W1DF.....332
K5UO.....331
KC2Q.....331
SV3AQR.....331
WØROB.....331
W6OUL.....331
XE1MEX.....331
KD5ZD.....330
WA4WTG.....330
WØYDB.....330
ZL1BOQ.....330
AD7J.....329
N3RC.....329
VE7SMP.....329
WØULU.....329
CT1AHU.....328
N1ALR.....328
N2LM.....328
AE9DX.....327
K7HG.....327
K6GFJ.....326
KE4SCY.....326
KF4NEF.....325
W6WF.....325
W9GD.....325
VE7EDZ.....324
WA5UA.....324
F6BFI.....323
ON4CAS.....323
VE6MRT.....323
W5GT.....323
N6PEQ.....322
W4MPY.....322
K8IHQ.....321
KW3W.....320
TI8II.....320
YO9HP.....320
XE1RBV.....317
N7YB.....315
IV3GOW.....312
N8SHZ.....312
K7CU.....311
OK1DWC.....311
KU4BP.....310
W6NW.....310
I3ZSX.....309
G3KMQ.....308
KA1LMR.....308
RA1AOB.....308
XE1MEX.....308
IK5ZUK.....307
IØYKN.....306
XE1MW.....305
K4IE.....304
K4ZZR.....304
K7ZM.....303
4Z5FL/M.....302
K7SAM.....301
KA8YYZ.....301
4X6DK.....298
K2HJB.....295
F5MSB.....293
W9ACE.....291
N3KV.....289
W6MAC.....289
N5KAE.....283
IZ1JLG.....282
WA9PIE.....282
WD8EOL.....281
IWØHOU.....277
AKØMR.....276
NØAZZ.....275
SQ7B.....275

RTTY

NI4H 338
WB4UBD 338
WK3N 338
N5ZM 338
OK1MP 337
K4CN 334
K8SIX 334
W9RPM 334
W3GH. 333
K3UA 332
AB4IQ. 323
K4WW. 323
N4MM 302
K4IQJ 300
K8ME 278
IN3YGW 275

On the Cover...

Icom America Senior Sales Manager Ray Novak, N9JA, shows off the brand new IC-905 transceiver at the Orlando Hamcation® in Florida this past February. Ray has had a long career in the business of amateur radio. Starting out as a technician at MFJ Enterprises, Ray got his Novice license as KB5KCL while working there. Ray advanced at MFJ to become the Domestic and International Sales Manager before he went to work for Icom America in tech support. His 28 years at Icom America began with a change of call sign to KC7JPA and his career at Icom later took advantage of his sales expertise. Following the introduction of the IC-7800, Ray became an Extra and acquired the callsign N9JA.

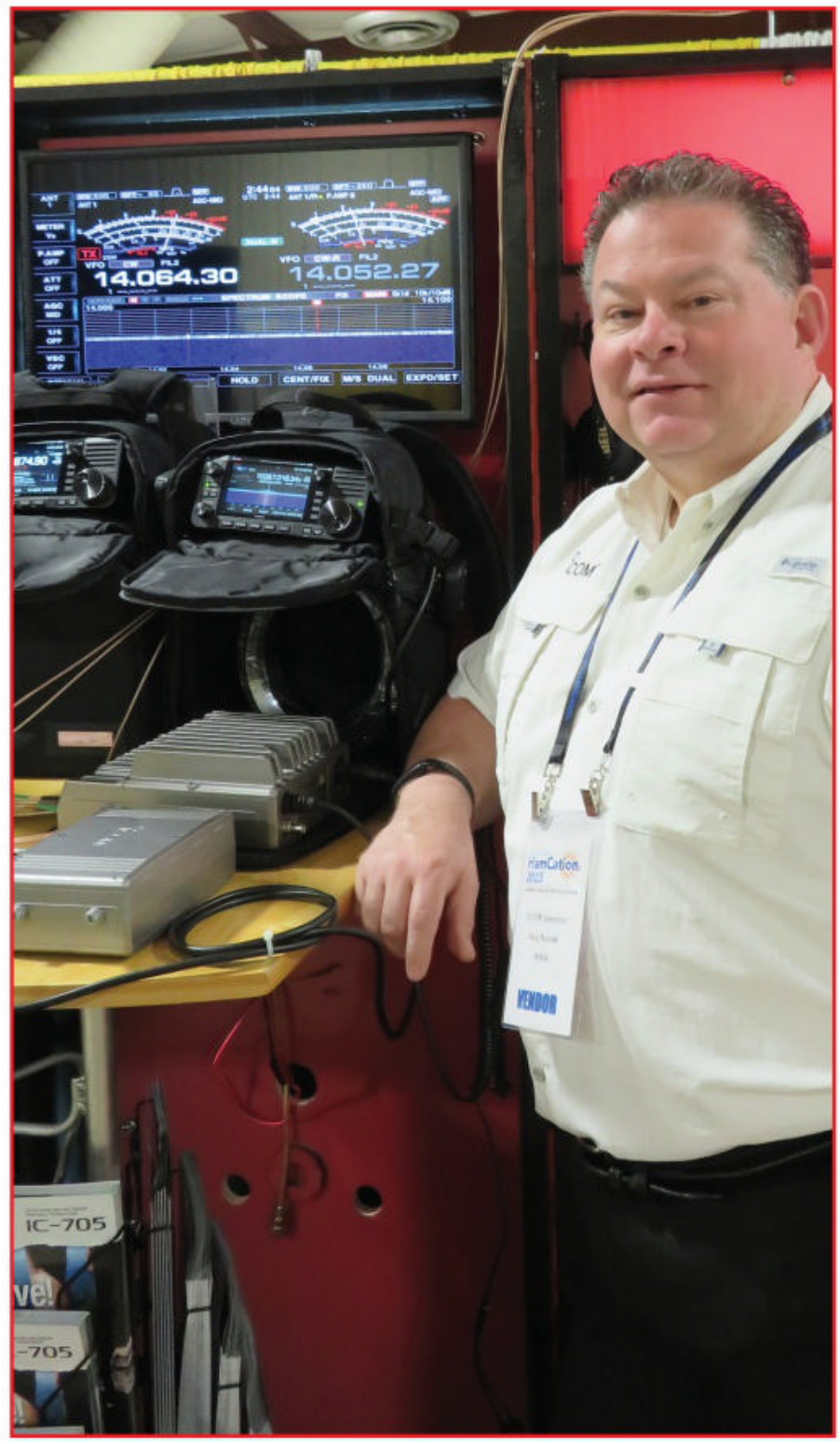


After becoming the sales manager for amateur radio products and successfully marketing many innovative new products, Ray was promoted to Senior Sales Manager, covering the amateur, aviation and marine product lines. Having personally met Tokuzo Inoue, the founder of Icom, Ray was impressed with the founder's emphasis on technology and performance and is excited to be a part of introducing Icom's latest product, the IC-905.

Icom says the IC-905 brings VHF, UHF and microwave bands to the amateur radio community in a form factor that maximizes ease of use and optimizes reduction of feedline losses at microwave amateur frequencies such as 2.4, 5.6, and 10 GHz in addition to covering the 2-meter, 70-centimeter and 1.2 - GHz bands. The IC-905 builds on Icom's storied history of innovation including the IC-781 having the first built-in panadapter. Another huge stride forward at Icom was represented by the very successful introduction of the IC-7300, the first full featured SDR-based transceiver to not require an external computer.

Ray has taken his love of DX on a DXpedition to Mozambique as C82DX as well as another DXpedition to Bhutan. When Ray is not finding new innovations in his trunk to share with his fellow hams, he enjoys traveling in his motor home as well as riding on his motorcycle. Look for N9JA not only at major ham radio events but at major boat shows as well as the annual aviation extravaganza at Oshkosh, Wisconsin.

For more about the IC-905, see this month's VHF Plus column on page 72 and Zero Bias editorial on page 6. (Cover photo and "On the Cover" text by Joe Eisenberg, K0NEB)





Ray and Frank Lappin, KF5AHJ on YouTube Channel Tank Radio.

contesting

BY TIM SHOPPA,* N3QE

After the Contest

This month, let's look closely at the required after-contest activity of preparing and officially submitting your Cabrillo log to the sponsor. Then we'll discuss the many online tools available today for sharing your claimed scores with your local buddies, the members of your club, and the contest world at large.

The first action item is to collect any paper or electronic notes you may have made during the heat of the contest and correct/update your log to match what you heard and exchanged. Optimally you will make these corrections in the logging software itself and rescore the log to come up with your claimed score.

Note that any corrections must come from your on-air experience and notes during the contest. Sending emails to QSO partners to ask them to verify or updated an exchange is strictly forbidden. Checking DX clusters or Reverse Beacon Network skims for call corrections is also not allowed. If you made a recording of the contest, you cannot go back and listen to develop corrections to your log.

You might be tempted to look up callsigns in online databases, such as QRZ.com, to correct name and state exchanges, or to check DX newsletters for a confirmation or fill on a rare DX callsign. Not only are these strictly forbidden by contest rules, but any attempt to do so may lead to erroneous information, as many active contesters will remote to stations in different states, and name exchanges as used in the North American QSO Parties may vary to honor recent Silent Keys.

Immediately after the contest, it's a great idea to write a couple of sentences describing your contest experience. Was this the first contest in which you made a real attempt at calling CQ? Do you want to brag about any specific DX multiplier efforts that paid off? Maybe you made a recent station improvement that you'd like to share. Contest sponsors are specifically looking for succinct comments to include in their final published writeups, and you can pass these comments to the sponsor by putting them in the "Soapbox" section of your log file. With the popular N1MM+ logger, it's easy to type these on the same screen where you select your category.

Soapbox comments are not as popular as they once were. I quickly reviewed the CQ WW SSB public logs from 2005 and found that more than a third of contesters included more than one line of comments. In contrast, only 6% of 2022 CQ WW SSB entrants included more than a single line in their Soapbox. Contest article authors really appreciate these soapbox comments, and they are especially likely to appear in the "Full Articles" that appear on the *ARRL* Contest results website.

After you've applied the allowed corrections in your logging program, you generate your Cabrillo file, the log format the contest sponsors universally accept. The Cabrillo format consists of header lines, that you can carefully inspect for correctness at this point. The CATEGORY-ASSISTED: header line should show ASSISTED if you've used any Telnet Cluster or Reverse Beacon spots during the contest. CATEGORY-POWER specifies either HIGH, LOW, or QRP; note, for many events like the NAQPs, any log showing high power will be classified as a checklog.

email: <n3qe@cq-amateur-radio.com>

The OVERLAY field may be present if you are entering a special overlay category allowed by the contest sponsor. The CQ WW DX contests have CLASSIC and ROOKIE overlays, and the CQ WPX contest has the TB-WIRES overlay. *Carefully* read the contest-specific rules for any overlay you claim. The details of these overlay categories are very specific, and your logger does nothing to help verify that you've operated within those rules.

For multioperator, special-event and club entries, very careful attention must be made to the CALLSIGN and OPERATORS Cabrillo headers. The CALLSIGN field must show what was used on the air during the contest. OPERATORS may list only your callsign if you were a single-op guest of a station host. In a multi-operator entry, the OPERATORS line should show all operators, including the station owner if he/she was also an operator. You can credit the station owner by appending an "@" and his/her callsign at the end of the OPERATORS line.

Below the headers, you'll find a list of QSO lines in the Cabrillo. Quickly verify that the callsign and exchange you sent on the air appears correctly. Corrections here might be made in a text editor with a global search and replace, or you can go back to your logger, edit the exchange information, and re-export.

Contest sponsors do not want you to ever delete any questionable QSOs from your log. On review, you might note there's an obvious typo in the exchange you copied from the other station, or that the callsign cannot possibly be correct. If you delete these QSOs from your log, the other station will receive a *NIL* (Not-In-Log) penalty. You should keep these questionable QSOs in your log but change the "QSO:" prefix of the line to read "X-QSO:".

Note, all editing of Cabrillo files should be done in an ASCII text editor, such as the Notepad application in Windows, and saved as pure text. Copying your log file into a full-featured text editor and saving for example, in Microsoft Word format, will not be useful for submission, as the contest sponsors do not accept that file type. Opening a Cabrillo log file with Excel may look like it works, but you'll find that Excel auto-identifies fields such as dates and times and will reformat these into completely different internal formats. Exporting the QSO data as text may look like it works to the human eye, but the resulting dates and times will be incorrectly formatted for parsing by the contest logchecking software.

Submitting Your Log

For most contests, the best way to submit a log is via the web. For several years, CQ WW has accepted logs only via website submission. *ARRL* strongly encourages website submissions but will still take email submissions. As you fill out the web entry form, you'll likely find that you answer some questions regarding your entry category. For *ARRL* contests, you'll enter the grid square from which you operated; this is important for your log to count towards club competition, as the grid is used to compute whether you're in your contesting club's circle.

Every contest has a deadline for log submittal; for many HF contests sponsored by *ARRL* and *CQ* you have seven

days from the end of the contest to submit your log (*CQ contests have a 5-day deadline – ed.*). VHF contests and state QSO parties may allow more time – please always check the detailed rules. The best time to send your log in is immediately after the contest. I noted that in the February 2023 ARRL DX CW Contest, more than half of all logs were submitted by Monday after the contest.

Contest sponsors make use of early log entries to find callsigns that were active in the contest but have not yet submitted logs. A day or two before the deadline, many contest sponsors use these early entries to email any stragglers and remind them before the deadline.

If you're encountering a technical challenge getting your log prepared and submitted by the deadline, please reach out to the contact e-mail address in the contest rules to explain the details and request a special case extension of the log deadline.

What happens to late log submissions? For the *ARRL* and *CQ* contests, a late submission may be listed in the final result but will not be eligible for any awards. In printed or online score listings, late entries are shown in italics. Most notably, your contest club will not receive any credit for a late submission.

After submitting a log via the web, you'll see a confirmation page which will again echo back details such as your entry category for one more check. The sponsor may also provide a "raw score" at this stage; look for at least a rough agreement between the number of QSOs and mults your logger shows you, and the log robot's raw score calculation. Deviations between your logger and the robot by several percent are normal and can be ignored; if you see a drastic difference, there's something to investigate and correct.

Even after you've gotten a response from the log robot that your log was received, you might want to double-check that the sponsors have it in their computer system. All the major contests offer a logs received web page that is updated either continuously or at least daily in the days after the contest.

For the contests sponsored by *CQ* magazine, you'll find the link to the logs received report under the "Logs" tab on the home page of each individual contest. An alphabetical list of all log submissions will show. Note that for the *CQ* contests, details such as entry category, overlay, and club are shown.

To check your log's received status for ARRL-sponsored contests, you start with the ARRL Contest Portal at <https://contests.arrl.org/> and click on the Logs Received tab at the top. The *ARRL* keeps the category hidden until after the log deadline, but you'll be able to cross-check your callsign and club credit for correctness.

After Submitting Your Log to the Sponsor

Here are a few recommendations for follow-up once your log has been submitted to the contest sponsor and you've confirmed that it's been received:

* Submit log to Super Check Partial database.

* Compare to past years.

* Compare to your competition. What is your competition? SO2R vs single-radio. Big station vs home station. HP vs LP vs QRP. Your buddy across town.

3830

Historically, the very largest US stations would gather on 3830 kHz LSB in the minutes after the contest was over and share their scores and make qualitative observations of activity and band conditions. Smaller stations would listen in as the giants of the airwaves shared their opinions. In the past few decades, the shift by contesters both large and small has been towards online sharing of claimed scores and comments. Posting to 3830, as the website <https://www.3830scores.com/> is commonly known, has become the common online platform worldwide not just for scores, but also for comments containing opinions, successes, and grievances.

For many on-air contest-type activities, notably including the Thursday night NCCC Sprint and the Wednesday CWOps events, there is no sponsor to send your logs to; instead, you simply post your claimed scores to 3830. Bruce Horn, WA7BNM, not only runs the 3830scores.com website – he also hosts the de facto international contesting calendar at <http://contestcalendar.com>. If you are organizing any kind of on-air contest-type activity,





reach out to Bruce and get it listed on both his calendar and 3830scores.com.

How many hams submit scores to 3830? In CQWW SSB 2022, 1348 hams submitted 3830 reports vs. 9004 logs submitted. The bulk of 3830 score website reporting is done by North American hams; looking at a NA-centered event like NAQP SSB from January 2023, nearly half of those submitting logs also submitted to 3830.

The 3830 website is highly promoted by contest clubs to help track member activity. There is a tab at the top, labeled "Activity Tracker," that allows you to see club standings. My regional contest club, the Potomac Valley Radio Club, collects claimed scores from all our members through the 3830 reporting system, and uses it for our own internal intramural activity award.

You might notice in the 3830 comments for the very biggest contests – ARRL DX, CQ WW, and CQ WPX – that several dozen of the most serious efforts have included very detailed by-hour, by-band, and by-country statistical breakdowns. Even if you made a more modest effort, it's worthwhile to run the same statistics on your own logfile and compare with the big guns. These detailed statistical reports are prepared by contest log analyzer software. The *CBS Cabrillo log analyzer* by Ken Adams (now a silent key, formerly K5KA) and Bob Wilson, N6TV, is a free log analyzer that produces such detailed output. You can download it at <https://www.kkn.net/~n6tv/cbs> and run it against your Cabrillo. By comparing your log analysis with other geographically nearby stations, you'll learn key strategies for operating on the best band and the best hours in each contest. As we approach the peak of this solar cycle, specifically look at the band usage by the biggest stations.

Contesters are prolific users of ARRL's *Logbook Of The World* – more than half of my contest QSOs are confirmed in LoTW. For digital and RTTY mode contests, the confirmation rate is over 65%. LoTW confirmations count towards the ARRL Worked All States (WAS), DXCC, and grid square-based awards. To sign up for LoTW, visit <https://

Calendar of Events

All year	CQ DX Marathon	bit.ly/3FyPiui
Mar. 31-Apr. 1	Sasquatch Stomp	https://www.pnwqrp.org/sasquatch-stomp
Apr. 1	RSGB FT4 International Activity Day	bit.ly/3TxCrxl
Apr. 1-2	EA RTTY Contest	http://concursos.ure.es/en/eartty/bases/
Apr. 1-2	Florida State Parks on the Air	http://flspota.org/
Apr. 1-2	Louisiana QSO Party	http://laqp.org/
Apr. 1-2	Mississippi QSO Party	http://www.arrlmiss.org/
Apr. 1-2	Missouri QSO Party	https://bit.ly/3rkAl87
Apr. 1-2	PODXS 070 Club 31 Flavors Contest	http://bit.ly/2SESbDg
Apr. 1-2	SP DX Contest	https://spdxcontest.pzk.org.pl/2023/rules.php
Apr. 3	RSGB 80m Club Championship, CW	bit.ly/3TxCrxl
Apr. 5	UKEICC 80m Contests SSB	https://ukeicc.com/80m-rules.php
Apr. 5	VHF-UHF FT8 Activity	http://www.ft8activity.eu/index.php/en/
Apr. 6	SARL 80m QSO Party	http://bit.ly/H0IqQf
April 8	QRP Spring QSO Party	http://www.qrpcontest.com/
Apr.8-9	FT8 DX Contest	https://europeanft8club.wordpress.com/
Apr. 8-9	Georgia QSO Party	https://gaqsoparty.com/
Apr. 8-9	IG-RY World Wide RTTY Contest	https://www.ig-ry.de/ig-ry-ww-contest
Apr. 8-9	JIDX CW Contest	http://www.jidx.org/
Apr. 8-9	New Mexico QSO Party	http://www.newmexicoqsoparty.org/wp/
Apr. 8-9	OK-OM DX SSB Contest	http://bit.ly/3ioS3Cl
Apr. 8-9	Yuri Gagarin International DX Contest	http://gc.qst.ru/en/section/32
Apr. 9	Hungarian Straight Key Contest	http://hskc.ha8kux.com/
Apr. 9	International Vintage Contest HF	http://www.iv3ehh.it/vintage.htm
Apr. 9	WAB 3.5/7/14 MHz Data Modes	http://bit.ly/31yE4kT
Apr. 10	144 MHz Spring Sprint	http://bit.ly/3XM4RpW
Apr. 10	DARC Easter Contest	http://bit.ly/3bOk9pd
Apr. 12	VHF-UHF FT8 Activity	http://www.ft8activity.eu/index.php/en/
Apr. 14-15	Holyland DX Contest	http://www.iarc.org/iarc/#HolylandContest
Apr. 15	ES Open HF Championship	https://www.erau.ee/en/es-open-contests
Apr. 15	QRP to the Field	http://www.zianet.com/qrp/qrpttf/pg.html
Apr. 15-16	CQ Manchester Mineira DX Contest	http://www.cqmmdx.com/rules/
Apr. 15-16	North Dakota QSO Party	https://www.ndarrlsection.com/index.html
Apr. 15-16	Michigan QSO Party	https://miqp.org/index.php/rules/
Apr. 15-16	Ontario QSO Party	http://www.va3cco.com/oqp/rules.htm
Apr. 15-16	Texas State Parks on the Air	https://www.tspota.org/
Apr. 15-16	Worked All Provinces of China DX Contest	http://www.mulandxc.com/index/index
Apr. 15-16	YU DX Contest	http://yudx.yu1srs.org.rs/
Apr. 16	ARRL Rookie Roundup, SSB	http://www.arrl.org/rookie-roundup
Apr. 18	222 MHz Spring Sprint	http://bit.ly/3XM4RpW
Apr. 19	RSGB 80m Club Championship, SSB	bit.ly/3TxCrxl
Apr. 19	VHF-UHF FT8 Activity	http://www.ft8activity.eu/index.php/en/
Apr. 22	YOTA Contest	https://www.ham-yota.com/contest/

www.arrl.org/logbook-of-the-world>. The best format for exporting to LOTW is the ADIF format, if your logger supports it. Cabrillos can also be up-loaded with an extra conversion step.

If you're chasing awards, DX, or working in the CQ DX Marathon, the Clublog website lets you upload all logs (including contest logs) to be included in your statistics. I found Clublog's "DXCC Leagues" and "Zone Leagues" to be particularly strong motivations to work *not* just contests, but *also* chase DXpeditions for counters in my CQ DX Marathon entries. Uploading all your logs to Clublog also makes it easy to process OQRS (Online QSL Requests) for DXPeditions. Learn more at <https://clublog.org/>.

April and May Contest Highlights

The 4-hour North American SSB Sprint is held Saturday night, April 22. (That's 0000-0359Z April 23 in UTC time). The required QSY rule mandates that every time you work a station calling CQ, he has to find a new frequency and you inherit his run frequency, at least briefly. The exchange is name, state, and serial number. You'll find full rules, along with operating and logging hints for the unique Sprint format, at <https://ssbsprint.com>.

The 2023 Contest University is held May 18-19, right before the Dayton Hamvention®. Register for it at <https://contestuniversity.com/>. The Saturday evening of Hamvention also has the Contest Dinner, which features the induction of new members to the CQ Contest Hall of Fame. Reserve a seat via <https://contestdinner.com/>.

The weekend after Dayton, Memorial Day weekend in the US, has the CQ WPX CW Contest. Although we are all excited about the amazing DX openings likely on the 10-meter band, plan your operating time to get on the 40-meter band before dusk in order to take advantage of the unique WPX score table that gives you 6 points for each DX QSO on the low bands; see the rules at <https://cqwpx.com> for full details. Single-operator entries may operate up to 30 hours of the 48-hour contest weekend starting at 0000Z May 27.

Apr. 22-23	SP DX RTTY Contest	http://www.pkrvg.org/strona,spdxrttyen.html
Apr. 23	BARTG Sprint75 Contest	http://bartg.org.uk/wp/contests/
Apr. 23	North American SSB Sprint	https://ssbsprint.com/rules/
Apr. 24	RSGB FT4 Contest Series	bit.ly/3TxCrxl
Apr. 26	432 MHz Spring Sprint	http://bit.ly/3XM4RpW
Apr. 26	UKEICC 80m Contests CW	https://ukeicc.com/80m-rules.php
Apr. 27	RSGB 80m Club Championship, Data	bit.ly/3TxCrxl
Apr. 29-30	10-10 Spring Digital Contest	http://bit.ly/1FrFeBc
Apr. 29-30	Florida QSO Party	http://www.floridaqsoparty.org/
Apr. 29-30	Helvetia Contest	https://www.uska.ch/
Apr. 29-30	UK/EI DX Contest, CW	https://www.ukeicc.com/dx-contest-rules.php
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	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	bit.ly/3TxCrxl
May 10	VHF-UHF FT8 Activity	http://www.ft8activity.eu/index.php/en/
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	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	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	His Majesty King of Spain CW Contest	http://concursos.ure.es/en/
May 20-21	NZART Sangster Shield Contest	http://bit.ly/3aviX6h
May 20-21	SARL VHF/UHF Digital Contest	http://bit.ly/H0IqQf
May 22	QRP ARCI Hoot Owl Sprint	http://www.qrpcontest.com/
May 22	RSGB FT4 Contest Series	bit.ly/3TxCrxl
May 25	RSGB 80m Club Championship, CW	bit.ly/3TxCrxl
May 27-28	CQ WW WPX CW Contest	http://www.cqwpx.com/

PROPAGATION

BY TOMAS HOOD,* NW7US

April Propagation Revisited

Quick Look at Current Cycle 25 Conditions:
(Data rounded to nearest whole number)

Sunspots:
Observed Monthly, January 2023: 144
12-month smoothed, July 2022: 87

10.7-cm Flux:
Observed Monthly, January 2023: 182
12-month smoothed, July 2022: 130

One Year Ago:
(Data rounded to nearest whole number)

Sunspots:
Observed Monthly, January 2022: 57
12-month smoothed, July 2021: 32

10.7-cm Flux:
Observed Monthly, January 2022: 104
12-month smoothed, July 2021: 83

NW7US was unable to produce his column this month, so we are reprising his April 2022 column, which offered a general look at what to expect on the bands in this month of "equinoctial" propagation. Sunspot numbers have been updated. For the Last-Minute Forecast, please visit Tomas's website at <https://SunSpotWatch.com>. – W2VU

As we move into spring in the Northern Hemisphere, the Sun is mostly overhead above the equator this month. This creates equal day and night periods in both hemispheres, which leads to improved DX conditions around the world on HF.

The Vernal Equinox in mid-March marks the day when the hours of daylight and darkness are about equal around the world. This creates an ionosphere of similar characteristics throughout more of the world than is possible during other times when it is summer in one hemisphere and winter in the other, and there are extreme differences in the ionosphere.

This equalization of the ionosphere during the equinoctial periods (autumn and spring) is responsible for optimum DX conditions starting late in February and lasting through late April. The improvement in propagation is most noticeable on long circuits between the Northern and Southern hemispheres. During this season, conditions are optimum for long-path as well as short-path openings, and during gray-line twilight periods associated with sunrise and sunset.

DXers (those who seek out signals from across the world) love April because the seasonal change this month plays out on HF: Activity (propagation) moves up from the 40-meter band and down from the 10-meter band, with stronger, more stable openings on paths on frequencies from 30 meters through 17 meters. Propagation on the higher HF frequencies (20 through 10 meters) begins to suffer late in April and into the summer months due to lower MUFs (Maximum Usable Frequencies) in the Northern Hemisphere, but the mid-HF bands are very usable, especially late in the day when MUFs peak.

Summertime MUFs are lower due to solar heating which causes the ionosphere to expand. An expanded ionosphere produces lower ion density, which results in lower MUFs.

Short-path propagation between countries in the Northern Hemisphere will drop out entirely. Higher frequency propagation peaks in the fall, north of the Equator.

April and May are autumnal months in the Southern Hemisphere, resulting in enhanced long-path DXing. At the same time, short-path propagation from South America, the South Pacific, and other areas south of the equator to points in the Northern Hemisphere will be strong and reliable when open. However, these do not happen every day on the higher frequencies—but do on mid-HF frequencies such as in the 20-meter band.

From April to June, excellent propagation occurs on both daytime and nighttime paths. The strongest propagation occurs on paths that span areas of both day and night, following the MUF. During April, peaking in May, and still in June, the 16-meter broadcast and the 15-meter amateur bands may offer 24-hour DX to all parts of the world, with both short- and long-path openings occurring, sometimes at the same time! If you hear a lot of echo on a signal, you might be beamed in the wrong direction. Try the opposite azimuth. Propagation on frequencies from the 30-meter band through 17 meters is more stable at night, with propagation following gray-line and nighttime paths.

Low-band propagation is still hot on 40 meters, with Europe in the evening and Asia in the mornings. Occasional DX openings will occur on 90 and 75 meters around sunrise.

VHF Conditions

The Lyrids meteor shower occurs in mid-April, peaking on the UTC night of April 21/22. The hourly visual meteor rate is expected to be low, with average meteor velocities of about 48 kilometers per second with broad outbursts. However, this shower's peak lasts for several days.

The debris expelled by comet Thatcher as it moves through its orbit causes the Lyrids. It is a long period comet that visits the inner solar system every 415 years or so. Despite this long period, there is activity every year at this time, so it is theorized that the comet must have been visiting the solar system for quite a long time. Over this long period, the debris left with each pass into the inner solar system has been evenly distributed along the path of its orbit.

This material isn't quite evenly distributed however, as there have been some years with outbursts of higher than usual meteor activity. The most recent of these outbursts occurred in 1982, with others occurring in 1803, 1922, and 1945. These outbursts are unpredictable, and one could occur this year. The best time to work this shower should be from midnight to early morning.

The unpredictability of the shower in any given year always makes the Lyrids worth watching, since we cannot say when the next unusual return may occur. If this year's event is average or better, this should make possible meteor-scatter type openings on the VHF bands.

A seasonal increase in sporadic-E (E_S) ionization usually begins during April and continues through the spring and summer months. Expect an increase in short-skip openings on both the 15- and 10-meter bands during April, as well as a possible occasional opening on 6 meters. While sporadic-E openings may occur at any time, they tend to peak between 8 a.m. and noon, and again between 5 and 9 p.m. local time.

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Widespread auroral displays can occur during April, bringing with them unusual ionospheric short-skip openings on the VHF bands. Best times for these to occur are during periods of radio storminess on the HF bands.

For a detailed list of meteor showers, check out <https://tinyurl.com/bdcpttcw> for a complete calendar of meteor showers in 2023.

If you use Twitter.com, 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

Solar Cycle 25 continues to significantly outperform most of the predictions. The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for January 2023 is 143.6, up considerably from 113.1 in December 2022. The twelve-month running smoothed sunspot number centered on July 2022 is 86.5, up from 80.9 in June. A smoothed sunspot count of 87, give or take about 6 points, is expected for April 2023.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 182.47 for January 2023, up from 148.46 for December 2022. The twelve-month smoothed 10.7-cm flux centered on July 2022 is 129.73, up from 119.74 for June.

For a look at geomagnetic activity levels this month, check out the *Last-Minute Forecast* at <https://SunSpotWatch.com> on the main page.

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.

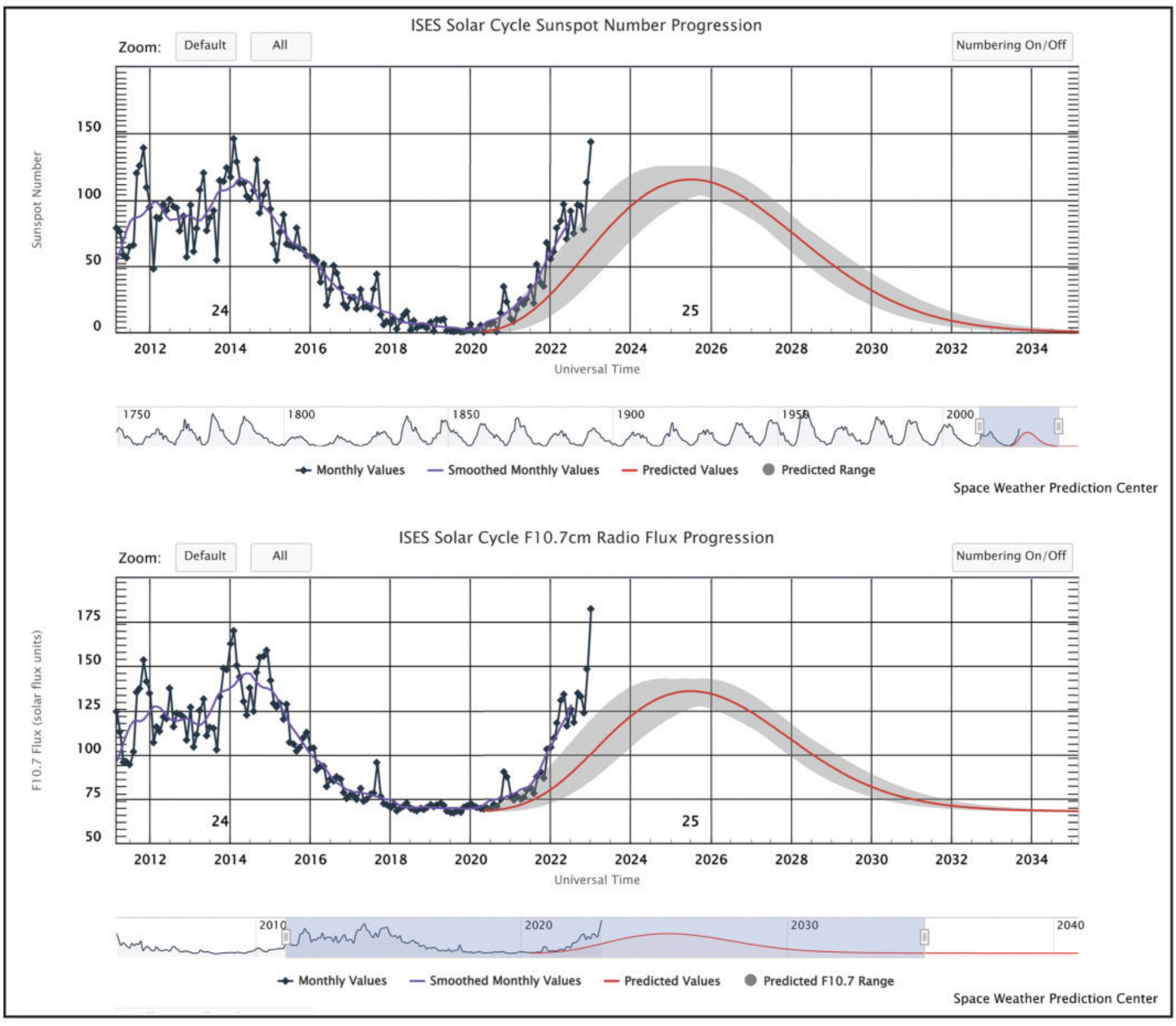


Figure 1. Cycle 25 continues to beat the "official" predictions by a huge amount, lending more and more credibility to Dr. Scott McIntosh's "outlier" prediction that this could be one of the best solar cylces ever. (Graphs courtesy SWPC/NOAA)

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 SSB RESULTS

SINGLE OPERATOR NORTH AMERICA

United States

District 1

KQ2M	A	4,467,840	3412	117	363
W1JQ	“	1,281,267	1083	94	329
N1DD	“	994,444	951	93	295
NG1M	“	807,234	1019	71	220
W1WEF	“	624,987	723	80	241
N2ZA	“	405,996	535	66	210
N1JEZ	“	237,796	408	55	166
K1RO	“	234,080	373	55	169
N1SEP	“	207,518	312	69	185
NE1RD	“	116,571	238	57	126
K1BIF	“	110,940	238	46	126
W2TT	“	98,237	199	62	131
W1OHM	“	48,678	153	34	88
KF0INO	“	42,075	193	16	59
WO1I	“	39,446	120	36	85
K1OFO	“	17,978	85	30	59
_W1/PY1MX_	_“_	_13,410_	_99_	_30_	_60_
N1NN	“	2,414	28	11	23
W1CS	“	1,643	23	11	20
N1PGA	28	467,200	1314	25	103
K1RM	“	235,524	741	24	90
W1NK	“	44,462	170	22	72
K1ALA	14	1,342	28	7	15
W1FQ	3.7	21,229	116	18	53
W1HI	“	19,093	121	14	47
*N1UR	A	4,035,766	2739	116	411
*K1BX	“	1,593,606	1402	92	307
*N1DC	“	393,666	527	67	206
*N1ALO	“	374,884	489	78	220
*KA1YQC	“	293,702	412	66	196
*W1JIM	“	215,031	366	62	167
*K1HT	“	166,662	303	58	139
*KR1A	“	164,101	314	50	147
*WA1HXH	“	121,638	241	63	131
*K1LK	“	117,696	248	50	142
*AF1R	“	104,912	243	44	122
*N1SFE	“	89,748	223	46	116
*WA1YZN	“	82,592	189	56	122
*KC1RET	“	65,412	178	33	105
*ND1T	“	56,832	161	32	96
*KC1QEM	“	56,574	173	34	92
*N1ADX	“	56,400	152	39	102
*N1OIG	“	42,066	135	32	82
*WB2ITX	“	39,445	125	32	83
*WA1K	“	38,958	137	39	90
*W1FWS	“	25,839	98	34	65
*KB1FX	“	25,760	110	28	64
*K1AV	“	24,541	109	30	67
*W1EYZ	“	22,654	106	29	65
*K1TIG	_“_	_22,506_	_89_	_33_	_60_
*N1CEO	“	12,848	75	29	44
*W1VBX	“	11,814	79	22	44
*NV1P	“	11,040	68	19	41
*N1WEN	“	10,758	61	22	44
*K1RTO	“	9,664	59	22	42
*AB1XB	“	8,060	51	24	41
*N1MRI	“	6,844	62	21	37
*WA1N	“	6,816	51	15	33
*N1AM	“	6,608	44	22	37
*AI1G	“	6,380	45	17	38
*KC1FOZ	“	5,376	40	21	35
*K1NZ	“	4,452	36	21	32
*K5ATA	_“_	_3,577_	_33_	_19_	_30_
*N1YIS	“	3,234	32	21	28
*KC1NCN	“	2,926	31	12	26
*N1TAA	“	2,640	31	11	22
*AA1NK	“	2,590	28	15	22
*KC2TV	“	2,576	38	19	27
*KC1LM	“	2,006	28	13	21
*KB1ZAC	“	1,680	53	16	32
*N1ET	“	1,674	32	12	19
*KC1SA	“	800	16	10	15
*NV1Y	“	775	14	11	14
*W1ACB	“	440	13	11	11
*K1THE	“	16	2	2	2
*N1WRK	28	141,022	502	20	78
*ND1L	“	1,656	26	5	18
*KB1DMR	21	2,754	40	6	21
*AA1F	14	3,420	43	14	22
*AB1J	“	666	16	6	12
*NM1J	“	455	13	4	9
*KU1N	“	243	11	2	7
*N1UMJ	7	1,472	39	8	24
*KM1NDY	“	1,071	36	8	13
*W1HIS	1.8	18	3	2	1

District 2

N2QV	A	2,785,321	2410	111	316
KN2M	“	1,466,874	1149	120	334
W2XL	“	1,035,870	1121	80	250
KD2TT	“	698,679	784	80	259
W2OIB	“	525,252	621	88	250
WA2JQK	“	480,216	546	95	279
W2CN	“	465,885	550	83	232
KC2MBV	“	363,420	524	76	194
KC2G	“	332,555	415	80	213
WS9M	“	316,940	464	75	185
WA3AFS	“	303,831	395	84	213
WA2GOT	“	241,964	370	64	177
N2YG	“	220,298	355	58	171
N2JJ	“	209,397	347	57	166
W2KU	“	102,116	189	59	137
N2AXX	“	87,750	168	62	133
K2PLI	“	51,220	160	44	86
W2LC	“	43,700	148	24	76
KB2DX	“	25,990	89	42	73
AH2O	“	21,830	113	16	58
KC2BBI	“	14,364	68	24	52
AC2ZU	“	13,790	98	18	52
KC2KZJ	“	6,278	53	12	31
KN2U	“	3,645	36	16	29
K2XA	28	599,666	1498	28	114
N2ZN	“	29,172	198	8	43
KU2M	21	903,650	2096	34	121
*N1NQD	A	725,637	744	95	268
*N2MTG	“	216,648	357	70	166
*WB2KLD	“	203,451	344	57	162
*WA2CNV	“	179,078	334	63	166
*AB2TC	“	160,890	310	52	134
*KC2WUF	“	126,038	251	46	141
*KE2SD	“	125,660	247	63	143
*KA2FIR	“	124,600	251	59	141
*N2LDV	“	120,800	235	55	145
*KD2VSD	“	92,160	227	43	117
*K2WJL	“	83,980	206	50	120
*KI2D	“	67,781	171	50	111
*K2DD	“	66,776	183	37	99
*W2YW	“	65,664	199	32	96
*KA2ENE	“	60,345	169	44	91
*KD2WOZ	“	57,624	160	37	110
*AC2ZZ	“	57,057	163	39	94
*K2RSK	“	54,087	150	50	99
*KD2UTL	“	44,226	139	39	87
*N2PYH	“	42,978	143	32	82
*KD2GUD	“	40,194	132	39	87
*KD2QFI	“	39,558	143	43	71
*WA2VAM	“	34,650	132	34	76
*N3DRK	“	33,708	137	33	73
*KQ2N	“	32,490	133	27	68
*AI2U	“	30,636	121	35	76
*N2BZD	“	27,169	109	26	75
*K2YG	“	25,830	84	39	84
*N2LEB	“	21,204	85	30	63
*W2VU	“	12,994	67	27	46
*K2QGP	“	10,366	53	22	49
*N2TEV	“	10,248	61	15	46
*NV2K	“	5,610	38	23	32
*KB2GD	“	5,400	40	18	32
*WB2AIV	“	2,976	34	19	29
*KD2REH	“	2,668	38	19	27
*W2FTL	“	2,405	31	13	24
*KX1W	“	2,200	25	18	22
*KC2VPE	“	2,080	27	7	19
*WB2ZEX	“	1,953	26	13	18
*KD2FQZ	“	1,020	20	13	17
*KD2WDN	“	920	16	9	14
*N2NJW	“	825	14	11	14
*KE2AAK	“	552	13	11	12
*AA2TH	“	420	11	6	9
*W2JAT	“	130	10	5	8
*KD2TUD	_“_	_63_	_9_	_4_	_3_
*KD2ZEL	_28_	_143,856_	_492_	_25_	_83_
*K2CS	“	59,274	240	21	68
*N2EAB	“	16,017	117	14	43
*KC2JRQ	“	1,311	21	9	14
*N1MID	“	832	23	5	8
*K2HVE	“	682	21	6	16
*KC2SEK	“	108	5	4	5
*W2VJ	21	276	8	4	8
*K1TZT	_14_	_4,212_	_41_	_10_	_26_
*W3EH	“	2,790	33	9	22
*WA2WZT	“	12	2	2	2
*K2JF	“	12	2	1	1
*WB2BWU	“	8	2	2	2

District 3

K3ZO	A	4,289,844	3048	126	388
K3TC	“	1,010,724	895	100	318
NY3A	“	620,160	855	60	195
K3FF	“	382,382	498	68	218
_W3KL_	_“_	_296,484_	_549_	_49_	_137_
K3UL	“	276,675	497	59	158
N3LH	“	274,944	415	74	182
4U1WB	“	246,642	570	62	160
					(OP: AJ3M)
N8WXQ	_“_	_160,550_	_314_	_51_	_139_
WB3CJU	“	120,792	271	37	131
N3MWQ	“	94,800	223	43	115
K3EJJ	_“_	_49,786_	_163_	_45_	_101_
K3CU	“	48,852	142	45	93
K3CWF	“	36,036	121	32	85
NA7L	“	31,354	100	36	86
AA3RC	“	11,550	76	27	43
KB3RCT	“	9,815	68	23	42
NC3Y	“	9,540	65	17	36
WW3HAM	“	8,778	65	17	40
K3ISH	“	3,160	31	15	25
W5EIM	“	2,944	45	26	38
WF3W	“	1,505	28	13	22
KB3RN	“	902	17	6	16
N3RW	28	8,225	76	11	36
W3PAX	21	60,885	248	24	75
KA3LKM	14	51,260	197	26	84
KC3RRF	“	18,288	123	20	52
K0BAK	“	40	3	2	3
W3BGN	3.7	59,013	392	15	64
*K3SWZ	A	682,348	701	97	261
*KD3HN	“	98,102	194	52	129
*KD9QS	“	82,082	341	41	102
*KR3L	“	80,842	194	47	119
*KC3II	“	76,200	238	28	92
*K3THS	“	55,176	183	41	91
*NH7TV	“	47,082	145	34	84
*AC5XK	“	44,928	145	33	84
*KQ3W	“	44,390	143	39	76
*AB3JF	“	41,344	134	43	93
*KB3LPE	“	38,571	117	42	87
*WM2Y	“	38,186	116	39	83
*WA3YZD	“	30,688	108	34	78
*W3AVP	“	25,564	110	21	62
*AC3EK	“	24,411	104	27	76
*KC3RKW	“	23,584	107	25	63
*WD8RYV	“	23,310	88	33	72
*NR3S	“	23,184	99	24	60
*N3BMX	“	21,335	96	26	59
*N3YHM	“	19,662	103	26	61
*KW3P	“	16,650	94	19	55
*KB3RKM	“	15,675	74	24	51
*K3ADA	“	12,975	64	24	51
*N3WAS	“	12,420	76	21	48
*N8URE	“	12,283	68	21	50
*KN1OLA	“	12,250	72	25	45
*WB3JAC	“	11,748	71	32	57
*KI4TXP	“	10,640	67	22	48
*N3VFK	“	9,558	61	32	49
*WB2FUE	“	8,816	59	18	40
*W3ATN	“	7,194	50	26	40
*NV3C	“	6,014	44	26	36
*AJ3DI	“	3,956	35	17	29
*KA3UIH	“	3,720	35	14	26
*WS3C	“	3,080	30	17	27
*KD3CR	“	2,709	28	17	26
*KC3RWU	“	1,645	21	15	20
*W3AZT	“	1,530	21	16	18
*KC3KFW	“	1,188	22	12	15
*KN3A	“	1,080	20	10	14
*KC3SSC	“	1,000	23	9	16
*N3UP	“	770	16	9	13
*W3GY	“	360	12	7	8
*WK2G	28	110,016	438	22	74
*KA3MZR	“	17,816	114	14	54
*W3DF	“	11,340	78	19	35
*KA3FZN	“	8,976	76	17	27
*N2EM	“	5,289	61	16	27
*N3TKG	“	532	13	7	12
*KE3O	14	2,528	30	8	24

District 4

K4ZW	A	6,017,235	3673	134	461
NR3X	“	4,127,820	3119	121	413
					(OP: N4YDU)
K0EJ	“	2,636,412	1929	132	366
WS7X	“	1,976,562	1958	89	289
K4PV	“	1,526,836	1479	109	310
WO4O	“	1,431,760	1238	105	335
KU8E	“	1,088,235	1044	101	304
N5GF	“	891,405	844	100	305
K4IE	“	538,650	636	80	235
N4PSE	“	527,184	606	90	246
AC4G	“	472,068	545	97	227
W4WKU	“	406,536	506	86	226
N1TO	“	366,612	518	72	202
W3DQS	“	263,592	391	65	187
WB5WAJ	“	245,116	432	62	171
KM4TC	“	218,685	358	62	177
N4DN	“	215,760	349	73	175
W4FNZ	“	198,882	326	82	179
N3US	“	188,832	330	52	172
W3TB	“	179,280	326	69	147
N1MHV	“	178,200	262	78	186
NN4SS	“	163,800	304	57	143
N4CF	“	162,877	295	65	156
K4BBH	“	162,640	293	63	151
KW4CW	“	161,920	287	61	159
K4BAI	“	143,927	269	57	146
WB4YDY	“	142,956	255	58	140
AD8J	“	131,542	273	53	125
NW3U	“	125,095	285	58	139
K4ML	“	113,568	246	45	124
WN3F	“	100,470	237	46	124
WG4MC	“	100,392	210	57	131
K4MDI	“	90,321	216	50	111
WA8YVF	“	89,670	231	36	111
AH6FX/W4	“	83,072	199	51	125
					(OP: AH6FX/W4)
WX4G	“	79,200	176	51	125
K4PKM	“	68,572	166	49	109
KI4GGJ	“	61,464	175	55	101
K9GWS	“	59,492	170	47	92
W4WRS	“	58,384	163	53	111
KN4LIU	“	55,577	152	49	100
N9GQA	“	53,636	230	36	70
K4NWX	“	53,190	146	42	93
WB4DKU	“	52,520	305	41	89
NC4S	“	49,147	163	29	90
KM4ALL	“	48,622	119	49	102
W4LDS	“	42,164	128	40	87
K1GU	“	37,560	130	40	80
AI4WW	“	31,440	145	19	61
KD4AYU	“	27,951	112	42	79
K3WR	“	24,232	102	37	67
K4KZ	“	21,995	100	25	58
KC1DWP	“	17,088	82	35	54
K4HQK	“	15,600	87	23	55
AA4HG	“	15,416	90	33	61
KR4EZ	“	14,948	94	24	50
KA3MTT	“	14,560	69	38	53
W3UO	“	11,537	75	36	47
AF4T	“	11,232	68	24	48
KO4DJG	“	7,497	62	16	35
N9CB	“	5,616	80	24	48
N2JW	“	5,355	41	22	29
W8FN	“	3,597	40	9	24
W4RLB	_“_	_837_	_30_	_13_	_14_
N4NT	“	10	7	5	5
N4OX	28	695,360	1586	31	129
K4WI	“	520,277	1384	31	108
W4DD	“	208,080	640	28	92
W4SLT	“	138,000	408	26	94
WE5P	“	93,400	349	24	76
WA3DZS	“	59,984	238	22	70
AD4IE	“	7,488	76	7	32
KJ4BIX	_“_	_3,744_	_43_	_8_	_24_
KA8Q	“	2,484	40	9	14
N1LN	21	400,650	976	30	120
NE8P	“	233,112	736	30	102
W4RJA	“	6,816	58	15	33
W2IKN	14	5,586	55	10	28
KO4IZQ	“	104	5	3	5
*WW4XX	A	1,303,932	1168	97	302
					(OP: LZ4AX)
*W6DVS	“	791,336	785	84	280
*WA3LXD	“	524,210	605	82	228
*NN4DX	“	300,806	486	65	177
*KB4CG	“	269,133	401	84	199
*KC4TEO	“	259,182	403	64	174
*N4MTE	“	258,396	398	68	176
*K1MWH	“	250,776	437	57	159
*WD4PTJ	“	221,123	406	57	160
*KY4KP	“	220,834	384	58	160
*KF7CG	“	186,902	342	68	158
*N2YF	“	168,740	299	62	158
*WA4JA	“	155,020	270	72	158
*K4KNO	“	152,592	302	48	139
*NC4MI	“	150,500	317	42	133
*N2JF	“	149,800	304	67	133
*K3K	“	141,370	253	63	148
					(OP: K3TW)
*KM4SK	“	139,744	294	47	129
*N4YKD	_“_	_134,343_	_246_	_58_	_149_
*KA4GFY	“	128,641	269	55	142
*KB4LOA	“	122,536	281	63	149
*KW4SW	“	119,144	221	71	141
*W4IOD	“	105,165	243	46	125
*KK4RV	“	104,823	257	48	123
*K4TEC	“	101,060	272	44	119
*WX4DAT	“	84,825	252	57	138
*KV4ZY	“	84,348	160	52	146
*W4CWA	“	78,110	200	44	102
*K3YDX	“	71,380	169	53	113
*WC4E	“	67,620	181	37	101
*K3SUK	“	65,565	158	53	102
*KN4OTT	“	65,552	188	41	95
*K4SBZ	“	61,593	173	44	103
*WA3GDB	“	59,550	156	46	104
*W4WCD	“	56,677	184	52	105
*K4FJW	“	54,806	152	45	89
*N5VX	“	50,540	157	41	99
*KA4JAH	“	48,280	145	51	91
*N4RWH	“	48,260	146	35	92
*NN4DF	“	47,190	120	44	99
*KA4SQN	“	44,875	139	37	88
*K8RAR	“	43,953	166	48	99
*WA4OFW	“	43,632	150	33	75
_*W9MC_	_“_	_40,200_	_139_	_42_	_78_
*KN4UND	“	39,878	127	40	87
*K3NF	“	39,675	157	31	84
*W4ZZK	“	39,000	119	37	83
*K4JSK	“	38,800	147	30	67
*W4XXV	“	36,680	119	39	92
*N0JMP	“	36,366	125	31	83
*W8BRY	“	33,333	114	42	81
*N4DJ	“	31,680	111	37	73
*K4ZMF	“	30,866	111	42	80
*KY4HV	“	30,199	133	37	64
*N4KXO	“	28,614	135	37	77
*N4QI	“	28,100	120	36	64
*AA5UN	“	28,050	121	39	71
*KQ4VT	“	27,930	110	30	68
*K4GOP	“	27,720	107	30	75
*AC2N	“	27,639	99	39	72
*KM4VI	“	27,250	88	47	78
*W4GDV	“	27,120	115	44	69
*K4FTO	“	26,558	111	31	67
*K4BWM	“	26,036	104	28	64
*KM4JAD	“	25,752	136	39	72
*AK4VQ	“	23,496	101	26	62
*W4DXL	“	23,200	99	35	65
*WC4Y	“	22,616	98	28	60
*WD4KTF	“	22,048	96	37	67
*WN4AFP	“	22,032	90	37	65
*KO4IVS	“	21,408	104	35	61
*WD0ETG	“	18,318	92	32	54
*KN4ADM	“	16,605	74	32	49
*AE4IM	“	16,185	81	30	53
*AD4GG	“	14,877	77	36	51
*N4LKB	“	14,773	70	21	58
*AA4JW	“	14,706	70	34	52
*KE4QCM	“	13,013	64	28	49
*W4SKB	“	12,740	84	28	63
*KE4MAC	“	12,719	70	25	54
*KN4IWO	“	12,717	70	28	53
*AF4XL	“	12,166	64	30	47
*KN4IXT	“	11,988	76	28	46
*WB4E	“	11,857	73	27	44
*N4QWB	“	11,088	62	21	45
*KF4WNU	“	10,787	66	22	45
*AD3I	“	10,692	60	31	50
*K4ADX	“	10,668	59	32	52
*K4TTU	“	10,540	64	24	44
*W4KLS	“	10,200	59	23	45
*W4FCL	“	10,152	59	25	47
_*NB4F_	_“_	_9,660_	_54_	_30_	_40_
*K4ELW	“	8,908	53	24	44
*N4TLC	“	8,379	64	26	37
*AK4SE	“	8,113	76	19	42
*K8MR	“	7,705	46	28	39
*KW4LU	“	7,320	49	25	36
*AI8O	“	6,552	51	24	39
*KB6QPI/4	“	6,264	42	21	37
*N4VFA	“	6,104	44	19	37
*WA2OMT	“	4,408	44	10	28
*KO4ICI	“	4,180	44	20	35
*KO4ENU	_“_	_3,808_	_83_	_24_	_32_
*W4SDX	“	3,792	39	21	27
*KG4DBM	“	3,735	35	16	29
*KO4MNO	“	2,856	25	18	24
*KK4KSM	“	2,847	38	16	23
*KK4WDP	“	2,552	34	17	27
*KZ1H	“	2,436	30	9	19
*N4SJJ	“	2,035	23	14	23
*KD4QMY	“	1,998	25	9	18
*KK4CS	“	1,960	30	16	19
*K4FOO	“	1,872	25	17	19
*WE4BE	“	1,820	24	9	19
*KB4VL	“	1,786	26	16	22
*N0DIM	“	1,457	31	9	22
*KO4JKV	“	1,365	23	13	22
*KK4MRG	“	1,280	25	12	20
*WS4Z	“	1,232	24	8	14
*NS4E	“	972	16	13	14
*KQ4BBC	“	891	19	11	16
*N1QEQ	“	870	24	12	17
*K4ZRP	“	748	14	9	13
*KO4IJH	“	594	12	10	12
*WE5TM	“	558	21	12	19
*KF4UGI	“	418	13	9	10
*KQ4AKR	“	384	9	7	9
*NQ4K	“	340	11	7	10
*KK4ITQ	“	336	8	8	8
*N4RAF	“	36	4	3	3
*K5OF	28	254,562	817	27	87
*N3GB	“	119,704	399	22	82
*K4TMC	“	114,814	348	25	93
*W4RYW	“	91,350	324	26	79
*N4OO	“	40,500	195	22	59
*W0PV	“	40,240	177	19	61
*N3ND	“	27,144	142	18	54
*KF4RJA	“	27,144	145	19	53
*W2WCM	“	19,200	109	16	48
*KK4WX	“	10,808	69	19	37
*K4WY	“	8,208	73	13	35
*KA1RRX	“	8,016	74	14	34
*KJ4BKI	“	5,292	61	16	26
*KO4RUL	“	2,840	30	14	26
*WB0POH	“	882	20	7	14
*N4YHC	“	300	8	7	8
*AF4TQ	“	21	4	3	4
*KF4NQN	“	6	1	1	1
*N4IRK	21	24	3	1	3
*K4QR	14	5,085	52	12	33
*KV4AC	“	4,386	42	12	31
*KM4ZXD	“	169	16	6	7
*K4SXT	7	19,440	101	23	49

District 5

K5TR	A	5,005,155	3883	154	419
N5YT	“	1,382,240	1228	110	314
N5AW	“	772,213	956	84	227
WQ5L	“	692,289	858	79	212
KM5VI	“	654,922	887	89	228
K5YAC	“	462,392	551	96	226
AI5SF	“	320,712	439	88	188
KD5QHV	“	238,387	408	69	154
AE5P	“	237,250	388	76	174
W5ORC	“	235,470	396	67	168
N5DD	“	198,843	315	74	163
N5TJ	“	177,030	316	60	150
K5TBA	“	125,768	237	76	123
AA5RN	“	96,117	244	51	110
WA5DSS	“	91,448	229	53	108
NO5F	“	64,260	217	44	75
AB5TH	“	47,092	150	42	80
AD5HS	“	45,640	135	47	93
WC5WC	“	38,150	134	35	74
KG5MGN	“	33,354	138	40	69
N5EKO	“	27,000	106	42	66
W5DLP	“	26,620	118	44	66
N5FFN	“	21,912	94	33	55
W5ZN	“	21,624	87	46	60
AI5DN	“	18,690	103	35	54
AA5ET	“	17,533	107	36	53
W9DXM	_“_	_9,240_	_84_	_29_	_41_
KG5RXE	“	3,311	30	17	26
W5WKK	“	2,788	35	11	30
KA4OTB	“	880	18	11	11
KI7CIM	“	522	13	8	10
W5PR	28	375,804	1168	28	104
WE6EZ	“	138,132	516	27	81
K8OZ	“	110,300	411	26	74
KD5J	“	23,562	138	20	43
KI5QKL	21	51,552	214	25	71
W5AAG	“	12,810	109	19	51
W5XNA	“	7,776	67	15	33
KI5ODW	14	384	11	7	9
*K5FUV	A	676,620	712	100	258
*WA5SOG	“	292,982	441	79	184
*KF5VDX	“	285,912	455	85	179
*K5XU	“	269,124	401	71	175
*WA5JMZ	“	259,316	418	73	168
*W5TMC	“	251,538	417	61	165
*K5MV	“	194,331	360	63	148
*NN5T	“	169,274	293	75	139
*K5DHY	“	144,308	307	51	121
*KD2KW	“	143,127	338	58	113
*AI5NE	“	101,200	227	61	115
*WA5ZKO	“	85,260	227	53	87
*K5TFL	“	61,460	164	49	91
*N5REL	“	57,057	184	51	92
*W5PKK	“	52,528	161	44	90
*AJ4F	“	37,873	123	47	74
*AE5LQ	“	34,524	109	53	73
*NF6P	“	32,616	125	40	68
*AI5HG	“	31,692	117	38	76
*N5ZKF	“	30,972	129	42	74
*NW5Q	“	29,070	108	41	61
*K5TS	“	24,150	83	37	68
*AA5AH	“	23,587	102	43	60
*W5RCG	“	23,496	117	24	64
*KD5FBA	“	23,184	90	41	71
*K5LAD	“	23,100	89	44	61
*KF5YUB	_“_	_18,960_	_87_	_27_	_52_
*ND7C	“	18,779	118	33	56
*W5KY	“	18,300	115	41	59
*KC7QY	“	17,301	89	26	53
*AA3C	“	15,260	87	28	42
*K5YX	“	15,035	80	35	62
*W5TSN	“	12,282	71	37	52
*NE5B	“	12,240	67	42	48
*WB5K	“	10,404	65	27	41
*KI5UTQ	“	9,438	60	34	44
*W2ODH	“	9,416	81	35	53
*N6CST	“	8,576	66	22	45
*KF5DDV	“	6,069	53	20	31
*K5OLV	_“_	_5,723_	_45_	_29_	_30_
*N6RH	“	4,416	58	29	40
*W3PWF	“	3,450	35	23	27
*WA5GEO	“	3,240	38	16	24
*KI5LST	“	3,196	48	21	26
*W5RAW	“	2,898	30	22	24
*KI6HQT	“	2,856	36	15	19
*KF5KWO	“	2,331	24	16	21
*K5NAR	_“_	_2,035_	_24_	_17_	_20_
*KI5PED	“	1,104	19	9	15
*KI5RQG	“	576	24	12	12
*AI5GU	“	380	26	11	9
*KD6UY	“	360	12	10	10
*KI5UPP	“	345	9	6	9
*K5HV	“	286	9	6	7
*K5HRB	“	255	12	5	12
*W5PTX	_“_	_209_	_15_	_5_	_6_
*W5CBP	“	56	10	7	7
*KG5TKV	“	8	2	2	2
*KD5AFS	28	12,027	81	19	38
*N5DTT	“	11,495	79	16	39
*NQ5M	“	7,548	57	15	36
*N5SKT	“	1,537	36	12	17
*K5TMH	“	1,488	24	6	18
*N5BIG	“	1,302	23	8	13
*AE5AS	“	527	13	8	9
*KI5AHF	_“_	_88_	_7_	_4_	_4_
*W5CUB	21	25,992	143	21	51
*KF5RLL	“	11,913	77	16	41
*KI5IQE	“	4,680	56	10	30
*K0MHC	“	216	8	3	6
*KI5NQC	“	150	16	8	7
*WB5BHS	“	63	5	2	5
*KB8VND	14	27,335	140	21	56
*KG5TKF	“	2,016	24	13	19
*KG5ZNJ	“	1,150	33	9	14
*KJ5CF	“	40	5	2	2
*W5LMO	“	36	7	3	3
*N5QNS	7	684	14	8	10
*KD5CMW	“	360	12	7	8

District 6

K6XX	A	2,272,739	2029	130	283
K6NA	“	1,478,655	1347	127	278
K6NR	“	634,725	748	102	213
N6TV	“	563,238	806	96	165
_W4EF_	_“_	_554,364_	_606_	_123_	_225_
AJ6V	“	505,047	842	84	153
W1PR	“	447,488	653	86	170
KW6S	“	217,984	399	78	130
AA6AA	“	203,050	303	104	158
K6YK	“	193,116	341	75	153
W6ZAR	“	147,615	322	72	123
N6TQ	“	117,738	207	72	139
_WQ6L_	_“_	_101,088_	_431_	_52_	_65_
_N6RK_	_“_	_83,000_	_191_	_64_	_102_
WA6URY	“	80,850	239	65	82
W6JBR	“	68,089	181	54	83
WA6GD	“	60,984	198	65	89
N6MM	“	58,380	163	54	86
WA6MRK	“	48,678	143	55	78
WB6KQA	“	48,139	118	63	98
K6DAV	“	35,568	133	44	60
N6GEO	“	34,335	131	51	58
W6ATV	“	29,643	97	48	75
AA6IO	“	29,430	114	43	66
KM6CW	“	29,120	128	52	78
AI6LY	“	24,969	102	38	49
K6PAD	“	20,492	78	38	56
KJ6JUS	“	16,154	90	35	47
K6AAI	“	12,636	82	38	43
W6GSQ	“	6,960	54	23	37
K6BEW	“	6,696	51	27	35
KB6A	“	5,904	48	18	30

NJ6G	“	3,234	34	18	24
N6TTV	“	2,982	31	20	22
KQ6RS	“	2,310	24	16	19
N6GP	28	2,666	31	15	16
WC6H	21	390,724	1058	33	104
					(OP: NU6S)
WD6DBM	“	20,769	126	23	46
N6IC	“	15,996	112	22	40
KE8FT	14	64,480	259	30	74
W6IA	7	144	8	3	3
W6RKC	3.7	2,001	30	12	17
*K6GHA	A	376,371	512	100	179
*N6OKU	“	195,337	355	73	156
*KD6RMS	“	58,149	188	46	71
*N4DLA	“	56,848	168	56	80
*KN6ODG	“	44,838	146	56	85
*N6JSO	“	33,578	132	48	55
*WE6CW	“	28,747	121	41	48
*KE6GLA	“	28,726	102	50	56
*W6MSN	“	28,670	128	38	56
*K6TLH	“	24,057	98	40	59
*N9BD	“	23,580	100	43	47
*AG6JA	“	23,520	95	46	52
*W6AAE	“	23,465	97	41	54
*N6BHX	“	20,930	121	33	32
*N6LL	“	18,720	81	40	50
*WF6Q	“	15,372	91	24	39
*KD6NFD	“	12,993	82	33	38
*NR7Z	“	12,264	72	32	41
*KQ6BN	“	10,950	67	37	38
*KC6NKK	“	10,292	78	29	33
*KQ6UP	“	10,140	61	38	40
*AJ6IY	“	9,231	66	26	25
*AD6RH	“	8,442	50	28	35
*K6KTS	“	8,308	67	29	33
**N6AJR*	*“*	*8,127*	*63*	*29*	*34*
**NA6NA*	*“*	*7,722*	*63*	*24*	*30*
*K6CSL	“	7,314	57	25	28
*WA6FWN	“	6,954	48	27	30
**WB6MPH*	*“*	*5,985*	*43*	*25*	*32*
*KB6ODH	“	4,590	47	22	23
*KM6VHD	“	4,514	44	18	19
*NI6P	“	4,158	45	26	28
*W6EMR	“	3,960	37	23	22
*AG6VH	“	3,920	38	23	26
*KF6JS	“	3,584	39	26	30
*KJ6PTX	“	2,574	31	20	19
*K6MUG	“	2,378	29	21	20
*K6BBQ	“	2,183	25	18	19
*KN6MHZ	“	1,891	23	15	16
*KW6SA	“	1,612	24	16	15
*KM6RRS	“	1,558	35	19	19
*KG6YJ	“	1,452	24	17	16
*W6VP	“	756	14	10	11
*K6ACV	“	578	14	8	9
*KN6VGL	“	352	9	7	9
*AE6XC	“	255	12	9	8
*KT2G	“	169	12	7	6
*W6JPL	28	7,335	67	18	27
					(OP: K6ICS)
*K7XE	“	5,282	56	14	24
**N6SPP*	*“*	*4,884*	*50*	*18*	*19*
*WK6A	“	3,534	42	15	23
*WW0MAN	“	2,244	26	14	19
*WA7BNM	21	92,432	318	29	80
*N6RM	“	26,044	148	23	45
*K6WBY	7	187	7	4	7

District 7

ND7K	A	3,007,544	2872	142	346
					(OP: @N6WIN)
K7RL	“	2,337,120	2154	130	302
W7YAQ	“	583,392	612	112	242
AB7YQ	“	515,508	750	90	176
K7IU	“	485,782	598	109	202
K9JF/7	“	455,598	592	100	197
W7XQ	“	439,231	566	94	205
N7UVH	“	270,642	525	82	176
N7WS	“	180,648	291	73	161
KS7T	“	163,930	379	66	128
K7JQ	“	157,341	345	68	111
K7STO	“	141,795	291	68	139
N7XCZ	“	94,245	229	68	115
AD7XG	“	93,450	211	57	118
KD7H	“	81,200	215	60	85
NQ7R	“	75,600	238	61	83
WU7X	“	74,298	222	60	114
WE7H	*“*	*66,880*	*160*	*57*	*95*
N3EG	*“*	*62,411*	*167*	*51*	*88*
W7PV	“	56,885	153	55	100
NK7L	“	54,244	156	48	94
W7FYW	“	47,012	132	61	100
N7LRG	“	46,046	155	55	88
K7MY	“	34,540	141	40	70
W2HZ	“	33,250	121	44	81
WG7X	*“*	*29,321*	*114*	*42*	*67*
N7DSX	“	25,365	101	42	53
W0FLZ	“	23,712	96	47	57
KJ7YYI	“	21,850	101	38	57
KH6VM	“	19,760	97	45	59
N7VGO	“	17,672	81	40	54
W7FD	“	14,616	83	36	48
KI7Y	“	10,207	63	29	30
K7TPH	“	8,255	57	27	38
K7EZQ	“	7,410	72	31	34
W7DK	*“*	*6,215*	*49*	*22*	*33*
					(OP: W7MKE)
AF7LZ	“	5,264	48	28	28
N7DWW	“	3,589	35	13	24
KE7NLU	“	2,914	38	20	27
K7AEZ	“	1,848	36	17	27
W7VXS	“	1,769	23	11	18
AI7MG	“	1,681	37	21	20
KI7IOC	“	1,551	26	14	19
W7PEB	“	1,363	21	14	15
N6LB	“	1,292	27	15	19
W7TX	“	816	14	11	13
KG7MVH	“	532	13	10	9
W7AT	28	53,040	273	24	56
					(OP: W7EW)
N7RQ	21	269,001	949	30	93
N5CR	“	171,384	572	29	82
W7WA	14	667,800	1828	37	122
KK7DP	7	3,774	75	16	21
K5IB	3.7	36	4	3	3
*WA7NB	A	311,428	607	75	151
*W6US	“	193,884	366	71	143
*N7VZU	“	99,351	223	59	112
*AF7NX	“	93,696	203	72	111
*W1DGL	“	74,772	172	71	115
*W7TMT	“	65,554	188	56	90
*W7SY	“	61,908	182	49	83
*K7YUR	“	45,560	133	57	79
					(OP: W7ZI)
*N6ITY	“	36,963	128	46	65
*AC7AF	“	34,965	122	39	66
*NF7E	“	33,375	116	56	69
*N7JVJ	“	27,918	130	44	55
*N7VS	“	25,484	109	39	53
*K7ROG	“	25,338	114	33	49
*K7YL	“	21,483	102	44	55
*N7DB	“	19,436	131	36	50
*KC3OSK	“	18,480	106	40	40
*KB7AK	“	18,050	92	45	50
*NS7U	“	17,889	81	41	48
*K6WDE	“	15,960	82	34	42
*WB7EUJ	“	15,570	141	40	50
*KE7X	“	14,600	74	33	40
*KI7MJU	“	14,220	79	39	51
*WA0PFC	“	13,130	75	27	38
*NA7P	“	11,169	65	35	38
*W7BKS	“	10,854	70	38	43
*W7IBI	“	10,744	64	27	41
*KC7MDT	“	10,030	66	29	30
*N7EEL	“	8,364	70	33	35
*N7JOE	“	8,192	53	28	36
*N7AME	“	7,440	63	29	33
*W7STV	“	7,176	56	32	37
*AB9BH	“	6,672	59	21	27
*AE7AP	“	6,336	50	21	27
*KE7ZAC	“	6,313	50	27	32
*WK7P	“	5,782	49	28	31
*WA7PVE	“	5,394	58	26	36
*KK7BWJ	“	5,148	50	22	22
*W6VRF	“	4,560	63	30	27
*K5SPP	“	4,368	41	20	22
*K7DNG	“	3,431	63	24	23
**K7DBN*	*“*	*3,234*	*34*	*23*	*19*
*KQ7TJ	“	2,552	37	23	21
*KG7OH	“	2,491	38	23	24
*K7MEE	“	2,400	25	19	21
*W7MTL	“	2,106	27	20	19
*KW7WP	“	1,980	26	17	19
*AC7MX	“	1,815	51	17	16
**W7PL*	*“*	*1,794*	*47*	*23*	*23*
*WU7W	“	1,716	30	18	21
*KI7SRQ	“	1,568	28	16	16
*K8TX	“	1,443	27	17	20
*N8WCR	“	1,386	44	17	16
*KD7WNV	“	1,376	33	22	21
*KK7HLH	“	1,271	21	15	16
*KJ7RNL	“	870	22	14	16
*KF7OJA	“	713	18	12	11
*NT7R	“	496	11	7	9
*KI7ILD	“	441	18	11	10
*K7LAP	“	392	16	14	14
*WB7UOF	“	322	9	7	7
*NK2J	“	306	10	9	8
*K7EDT	“	304	8	8	8
*N7GND	“	225	10	8	7
*N9NA	“	126	10	9	9
*KJ7AKV	“	90	5	4	5
**W7USA*	*28*	*21,390*	*110*	*22*	*47*
*KC7STK	“	16,131	103	19	38
*K7ULS	“	3,290	42	12	23
*W7CAR	“	1,728	31	10	14
*KJ7EDT	“	1,100	27	8	12
*N7LFO	“	120	7	7	5
*K7JSG	“	56	4	4	3
*NE7ET	“	6	1	1	1
*N7GWK	“	6	1	1	1
*N7SMD	21	18	5	4	2
*K7BWC	7	3,100	45	12	19
*KG9Z/7	“	147	10	3	4

District 8

NA8V	A	2,150,128	1630	126	362
K8GL	“	1,939,050	1580	114	336
KE8NBC	“	284,622	445	70	176
W8KEN	“	240,240	381	79	185
WD8S	“	223,909	395	46	157
KW8N	*“*	*220,440*	*468*	*48*	*119*
K3XO	“	173,169	317	65	148
KJ8H	“	170,628	297	81	155
N8HHG	“	147,798	277	59	148
WA8LRW	“	93,720	219	45	120
KB8O	“	55,413	158	48	93
KD8NKY	“	48,224	144	39	98
KE8E	“	44,954	152	42	91
KD8BXE	“	28,388	111	29	65
N8IE	*“*	*19,152*	*96*	*17*	*55*
W8MET	“	12,798	64	31	48
KB8NNU	*“*	*9,856*	*60*	*25*	*39*
KA8HKC	“	8,636	61	24	44
KD8OCT	“	2,784	43	16	32
K8ALH	“	660	11	9	11
W8AOR	*“*	*72*	*5*	*3*	*5*
W8GOC	14	19,832	119	17	50
AA8BV	7	5,390	48	15	34
W8SJS	“	272	12	7	9
K2PM	3.7	9,555	157	16	33
*K8ZM	A	740,124	753	89	267
*N8BAP	“	224,013	331	73	194
*N8BJQ	“	223,510	379	62	155
*W8LYO	“	155,856	296	61	143
*KE8RJU	“	142,064	259	60	148
*WA8TWM	“	120,000	257	69	131
*WB8JUI	“	119,925	229	56	139
*KW8KW	“	117,836	261	46	132
*K8VUS	“	104,208	228	44	123
*N5JED	“	102,920	255	51	115
*K7DR	“	94,119	251	43	94
*W8JRK	“	84,664	201	46	106
*N8BV	“	82,998	202	59	100
*KC8LA	“	70,357	171	53	108
*AB8OU	“	65,875	172	54	101
*W8TB	“	46,690	130	50	95
*N8WCP	“	45,360	149	40	86
*K2SY	“	38,500	119	30	95
*W8KNO	“	36,777	121	43	80
*WA3JAT	“	36,295	127	42	77
*W8SDC	“	31,920	135	38	74
*N8AJM	“	29,972	104	41	77
*NE8O	“	28,884	125	23	60
*W8EOG	“	25,764	99	42	72
*WB8MIW	“	24,864	97	29	67
*K8WU	“	23,310	98	29	61
*N5WCS	“	22,896	111	35	71
*K8KT	“	22,506	95	31	62
*N8QNT	“	18,312	84	28	56
*N8BZN	“	14,924	79	31	51
*NC8R	“	14,630	121	32	45
*W1CHL	“	14,013	78	32	49
*WA8UMT	“	10,804	57	26	47
**KE8MOI*	*“*	*10,608*	*74*	*24*	*44*
*WT8E	“	9,966	65	22	44
*W8NFM	“	8,976	55	24	44
**KC8R*	*“*	*4,320*	*39*	*18*	*30*
*NF8M	“	4,233	33	22	29
*KE8TTU	“	3,942	40	20	34
*K8RGI	“	3,445	60	25	28
*AA8SW	“	2,470	29	15	23
*KA9IVY	“	2,067	33	16	23
*KE8BNE	“	1,989	24	18	21
*KE8JVX	“	1,320	26	11	22
*N8ECI	“	1,080	26	12	12
*KD8TJB	“	966	18	7	14
*AD8JL	“	850	20	17	17
**WA8YZB*	*“*	*522*	*18*	*9*	*9*
*K8RDG	“	64	4	4	4
*N8II	28	326,960	852	26	108
*N8VW	“	90,780	326	24	78
*W8JGU	“	76,845	255	26	83
*W8RKW	“	12,567	97	17	42
*WB8JAY	“	7,720	73	10	30
*WA8KAN	“	3,105	50	7	20
*KC8ZMN	21	32,452	158	19	57
*WB8SAG	“	4,914	49	14	28
*NK8D	14	154	6	5	6
*W8WJC	7	903	17	8	13
*N5MKY	“	391	14	7	10
*N8TCP	“	228	11	5	7
*NM8W	“	35	3	2	3

District 9

W9RE	A	4,980,048	3324	144	434
K9BGL	“	901,812	1031	97	240
KD9MS	“	569,192	607	91	247
W9DZ	“	565,211	640	88	229
N9DJ	“	417,991	559	77	206
W9GT	“	302,016	445	65	177
NF9Z	“	224,250	379	67	163
N9JR	“	221,892	368	70	176
K9YZ	“	197,028	319	67	167
K9XN	“	196,140	355	61	149
KG9N	“	133,764	400	55	102
K9GX	*“*	*56,620*	*164*	*54*	*95*
W9/NP2I	*“*	*32,896*	*124*	*42*	*86*
W9KXQ	“	27,573	119	38	63
N9GH	“	26,136	99	42	66
W9AN	“	25,620	135	31	53
N9TO	“	22,386	90	28	63
K9ASE	“	16,280	88	22	52
K0PG	“	15,386	80	42	56
W9YZR	“	15,300	68	37	48
KW9R	“	10,422	67	18	36
K9ZN	*“*	*9,936*	*73*	*23*	*49*
NT9E	*“*	*1,786*	*32*	*16*	*22*
K0PJ	28	322,010	882	30	100
KW9A	“	173,476	509	30	94
KJ9C	“	44,826	179	22	71
WG9L	“	21,775	124	18	47
W9ILY	21	114,400	415	23	77
KB9ORA	14	216	7	5	7
K9CJ	7	7,436	64	16	36
*WD9CIR	A	285,500	429	68	182
*KD9GY	“	237,558	329	77	212
*KD9AC	“	188,710	323	73	153
*KU9R	“	170,000	335	56	144
					(OP: KB9RPG)
*N9EAX	“	168,036	284	68	160
*NY1V	“	149,917	289	54	143
*KD4ULW	“	147,581	295	66	137
*N9ESR	“	126,801	222	66	153
*AC9TO	“	99,858	218	62	116
*KB9OZI	“	85,424	218	49	103
*KF0CT	“	83,160	199	57	111
*W9IZ	“	73,304	178	52	102
*K9PMV	“	60,480	176	31	89
*KC9GPY	“	56,100	172	49	101
*W9WGN	“	52,496	146	46	90
*W8NWG	“	44,880	147	43	89
*K9WPV	“	43,470	138	40	86
*KD9ERS	“	42,570	135	48	81
*KD9CJX	“	42,228	132	53	85
*N9ATF	“	41,990	158	46	84
*KD9DBQ	“	40,824	124	41	85
*NY9X	“	39,984	163	39	73
*N9UPU	“	38,674	129	44	78
*KC9QFH	“	29,106	130	35	64
*ND9Z	“	27,032	130	37	72
*AI9K	“	26,450	99	44	71
*N9BT	“	25,100	108	37	63
*K9DRS	“	22,327	100	30	53
*KC9RRN	“	20,412	81	40	68
**KF4LXS*	*“*	*15,488*	*80*	*33*	*55*
*AC9QM	“	14,364	88	33	51
*WU9D	“	13,272	74	34	50
*W9PHL	“	13,090	67	29	48
*W1CLM	“	10,868	56	28	48
*NV9X	“	10,686	63	27	51
*KC9YL	“	9,438	71	24	42
*WA9TMU	“	9,039	55	29	40
*KD9QVB	“	7,656	50	20	38
*N9AFR	“	7,410	61	20	37
*K8VGL	“	7,326	52	29	37
*W9KG	“	7,238	58	13	34
*W9ABK	“	7,222	60	15	31
*KE9UA	“	6,900	47	23	37
*KC9NUW	“	4,641	40	20	31
*KE9V	“	4,606	43	15	32
*K9KJ	“	4,464	35	19	29
*WA9EKQ	“	3,366	35	20	31
*W9ERR	“	2,923	34	15	22
*KD8YNG	“	2,196	27	14	22
*N9TNT	“	2,074	25	15	19
*WB9BWP	“	2,006	25	13	21
*W9KMZ	“	1,863	25	9	18
*KD9EBS	“	1,764	24	14	22
*W3ZAP	“	1,560	24	9	17
*AJ9U	“	1,392	18	12	17
*KD9MGZ	“	1,008	24	12	16
*KD9GN	“	952	16	12	16
*N9MT	“	868	22	15	16
*WF9U	“	837	21	15	16
*K9SMM	“	504	13	5	9
*WB9IFL	“	399	10	9	10
*N9UX	“	364	16	7	7
*WA9MQP	“	221	13	9	8
*K9SM	28	51,084	238	23	63
*KD9PM	“	24,747	147	20	53
*W9MRH	“	20,519	118	21	50
**KD9HVW*	*“*	*16,897*	*107*	*16*	*45*
*KD9TWA	“	8,575	75	14	35
*KB9RUG	“	5,896	54	16	28
*KC9BZL	“	496	15	8	8
*N9EDL	“	126	9	1	5
*W9QL	21	64,155	240	27	78
*WB9NOO	“	297	9	3	8
*WQ9F	“	99	5	4	5
*K9ZXO	14	238	9	5	9

District 0

KQ0C	A	684,405	791	104	231
N7WY	“	365,662	547	63	179
K0JJR	“	323,820	470	76	181
N0UY	“	298,095	453	80	175
K9MWM	“	294,120	497	86	172
W0ETT	“	282,462	432	85	178
W4IFI	“	278,226	569	75	159
W7RF	*“*	*214,130*	*359*	*78*	*152*
KJ0I	“	210,784	352	77	147
AI0M	“	177,828	332	66	153
AD0H	“	141,855	428	61	132
N0ZB	“	85,842	188	50	121
KA9OZP	“	69,312	182	52	100
K9DU	“	68,175	187	39	96
K0TC	“	60,032	173	43	91
KF0ADW	“	50,410	155	49	93
K0JM	“	48,396	137	51	97
N0GN	“	45,731	141	50	89
W0IVJ	*“*	*38,985*	*151*	*39*	*74*
N0BUI	“	36,465	152	21	64
AD0WB	“	22,188	99	37	49
W0ZQ	“	10,582	59	26	48
KC0UUT	“	8,142	63	14	32
AG7O	“	6,014	59	25	37
WB0HHM	“	5,928	48	22	30
KD0NPT	“	5,886	46	21	33
NR0P	*“*	*3,145*	*30*	*17*	*20*
KD2RPX	“	2,520	31	18	22
NG0E	“	1,196	17	10	16
KD0JLE	“	360	15	11	9
K0BBB	21	131,125	424	30	95
N0OK	“	76,845	256	26	83
N0UU	“	36,894	162	21	65
WD0J	“	32,038	164	23	60
K3PA	1.8	70	45	4	3
*AC0W	A	559,721	642	93	238
*NG0C	“	387,816	559	82	204
*N0UR	“	298,505	500	62	165
*K0EA	“	277,585	425	72	173
*N9ARX	“	233,280	488	65	151
*AI6O	“	218,500	366	83	167
*NI0G	“	204,970	362	54	152
*W0ZF	“	182,781	332	68	139
*W0YJT	“	147,132	332	59	142
*W0IZ	“	143,930	324	62	123
*KA0PQW	“	138,390	273	72	138
*W0SJE	“	128,694	295	63	115
*KF0HCN	“	126,224	273	61	123
*KF0IDT	“	123,633	274	63	108
*K0JJM	“	74,100	196	50	106
*KB0ARZ	“	73,920	192	58	110
*N0NM	“	69,165	238	58	87
*N0AW	“	67,570	184	56	89
*W0PI	“	51,450	175	28	77
*W0WLA	“	48,465	159	55	80
*WY0X	“	46,125	189	45	80
*KO0Z	“	43,310	141	51	91
*K0SCO	“	38,571	133	49	80
*KY0O	“	37,560	127	38	82
*N9CD	“	33,512	111	42	76
*NG0T	“	31,512	109	35	69
*N0KK	“	29,988	118	32	66
*K0BL	“	26,226	105	29	64
*K0AIZ	“	25,830	124	25	57
*W5KV	“	25,647	111	44	59
*AA0AJ	“	22,620	136	31	56
*KB0CFD	“	22,320	100	34	59
*N0VRM	“	21,736	113	33	55
*WB0DHB	“	19,260	88	38	52
**AF0Z*	*“*	*15,385*	*74*	*36*	*49*
*N0TXW	“	15,355	89	30	53
*KC0VDY	“	14,280	79	28	40
*K0OP	“	12,456	82	29	43
*KE0ME	“	8,694	66	24	39
*KI0D	“	8,322	51	28	45
*AF0E	“	8,001	50	27	36
*K9OR	“	7,102	42	26	41
*WA2JQZ	“	6,840	49	27	33
*WA0E	“	6,540	58	28	32
*KA0REN	“	6,510	52	26	36
*KE0JYU	“	6,032	48	20	38
*N0BDS	“	4,644	45	24	30
*N0MDC	“	4,277	35	18	29
*NO2D	“	3,480	35	17	23
*KF0AIT	“	3,149	33	22	25
*N0OWP	“	3,071	36	15	22
*KK0D	“	2,679	37	22	25
*WA0LIF	“	2,268	30	15	21
*KD0WUQ	“	2,257	29	18	19
*K0VH	“	1,612	23	12	19
*WB0MLI	“	1,188	17	11	16
*KF0GZK	“	1,080	19	11	13
**AD0TZ*	*“*	*1,075*	*32*	*12*	*13*
**KA0N*	*“*	*984*	*17*	*11*	*13*
*AA0AC	“	864	16	11	13
*KK0SD	“	850	15	11	14
*N0JNM	“	575	13	12	13
*KD0FAB	“	560	15	9	11
*KE0YPI	“	450	14	7	8
*K0DVT	“	437	11	9	10
*N3JS	“	378	10	9	9
*KD5YPH	“	247	12	10	9
*KA0HMQ	“	238	10	6	8
**K0RRS*	*“*	*130*	*5*	*5*	*5*
*W0JOP	“	100	5	5	5
*WB0LQC	28	70,196	283	20	72
*KJ5CI	“	5,560	51	12	28
*N0JDK	“	4,641	48	15	24
*WX9WTF	“	4,056	46	16	23
*K7BG	“	2,072	29	11	17
*KB0KQI	“	551	14	9	10
*KF0ACN	“	286	8	6	7
*W0JIM	21	13,560	91	16	44
*N9HDE	“	8,816	75	16	42
*KB0KFH	14	5,412	57	16	28
*N0LRB	“	247	23	7	6
*AE0OJ	“	6	1	1	1
*N0KEV	7	42	3	3	3

Alaska

AL7LO	A	119,966	321	61	93
AL1G	“	59,202	333	27	51
WL7N	28	9,430	84	16	25
*KL1IN	A	2,296	49	15	13

Anguilla

*VP2EIH	A	2,072	23	15	22

Barbados

*8P1W	A	567,644	1241	60	149

Bermuda

*VP9NR	A	703	15	10	9

Canada

District 1

VY2TT	A	4,993,944	4405	97	339
					(OP: K6LA)
VA1XH	“	502,806	656	71	211
VY2DS	“	141,887	341	58	141
VA1RST	“	37,524	131	34	72
VE1XOR	“	2,449	30	10	21
VE9FI	3.7	50,304	444	13	51
*VE1RF	A	97,173	228	57	120
*VE1BSD	“	64,625	189	39	86
*VE9WRS	“	18,560	98	28	52
*VE9RLW	“	14,384	100	18	44
*VY2LI	“	8,004	61	23	35
*VE1SQ	14	38,637	195	17	64

District 2

VE2GSO	A	1,316,964	2317	59	183
VA2CST	“	145,290	369	52	122
VA2OBW	“	99,430	245	56	107
VE2VIA	“	28,800	142	29	61
VE2GT	28	270	9	3	7
VA2LGQ	14	6,528	60	14	34
*VE2HIT	A	378,092	500	81	205
*VE2IAA	“	202,825	556	58	117
*VA2CO	“	157,176	328	49	128
*VE2ZDR	“	114,700	313	41	107
*VA2CF	“	103,785	285	50	115
*VE2SMS	“	19,503	122	32	67
*VA2XZA	“	17,430	90	31	52
*VA2KS	“	11,200	65	26	44
*VA2GRU	“	9,735	73	24	35
*VE2JR	“	7,809	71	23	34
*VE2RRE	“	6,850	52	19	31
*VE2QV	“	1,508	25	11	15
**VE2XCA*	*“*	*825*	*32*	*7*	*8*
*VE2KLW	7	2,697	42	10	19
*VE2LJV	“	70	5	3	4
*VE2LRZ	1.8	496	65	2	2

District 3

XL3T	A	9,135,758	6291	137	456
					(OP: VE3AT)
VC3R	“	2,323,322	2521	99	292
					(OP: VE7VR)
VE3TW	“	636,222	736	80	241
VE3GYL	“	452,760	758	70	175
VE3GJP	“	423,522	690	79	200
VE3WVA	“	223,922	497	68	138
VA3IK	“	28,208	125	27	59
VE3MT	“	5,800	50	18	32
VA3OGG	“	5,415	56	25	32
VE3PN	*1.8*	*8,073*	*151*	*8*	*19*
*VA3OKG	A	331,420	542	60	167
*VA3RTG	“	247,446	399	60	173
*VE3TG	“	247,380	389	61	167
*VA3KRT	“	216,112	389	53	155
*VE3NFN	“	181,778	384	43	151
*VE3RVZ	“	163,936	324	60	128
*VA3DBT	“	150,822	311	55	134
*VE3GKT	“	131,338	287	61	133
*VA3GD	“	122,574	258	59	127
*VE3EPS	“	105,000	270	38	112
*VE3DZG	“	84,960	230	48	96
*VE3KOT	“	79,092	196	49	107
*VE3KBI	“	78,150	200	40	110
*VE3OMV	“	76,428	239	41	91
*VA3HDL	“	75,530	167	48	118
*VE3AXT	“	59,829	157	45	102
*VE3MQ	“	53,480	186	47	93
*VE3LMS	“	44,220	144	30	80
*VE3BZ	“	33,640	125	37	79
*VA3CK	“	33,060	119	42	74
*VE3VGJ	“	29,150	135	37	69
*VA3TPS	“	25,116	115	33	59
*VE3RXO	“	24,860	116	42	68
*VA3QB	“	20,467	91	35	62
*VE3FAC	“	19,448	106	17	51
*VE3SVQ	“	16,340	91	30	65
*VA3QAK	“	13,040	68	31	49
*VE3VMJ	“	11,060	77	30	40
*VA3CBU	“	8,756	94	14	30
*VE3KAH	“	4,418	41	21	26
*VA3PAI	“	2,030	26	11	18
*VA3SB	“	1,488	27	9	15
*VA3FN	“	528	16	10	12
*VE3CX	28	67,236	310	20	58
*VE3TM	“	47,600	210	17	63
*VE3TZF	“	264	8	5	7
**VA3MLV*	*14*	*131,859*	*626*	*23*	*68*
*VE3IDT	“	16,958	112	16	45
*VA3IHG	“	1,875	31	7	18
**VA3TTZ*	*“*	*286*	*10*	*5*	*8*
*VA3AC	1.8	1,540	137	3	4

District 4

VE4IM	A	215,730	790	55	80
VE4SG	14	180,226	983	24	73
*VE4GKM	A	754	23	12	14

District 5

VE5FX	A	150,144	324	53	131
VE5CPU	“	57,475	190	46	75
*VE5WD	A	12,096	71	39	45
*VE5SKI	“	2,482	32	17	17
*VE5GC	28	2,366	87	7	7

District 6

VE6IVN	A	82,450	210	60	110
VE6FT	“	15,128	104	27	35
VE6UM	28	131,390	973	21	49
					(OP: VE6BMX)
VA6TP	14	6,321	59	17	26
VE6CA	7	3,892	67	11	17
*VA6RCN	A	37,572	174	45	56
					(OP: VE3RCN)
*VE6CLG	“	26,677	115	47	56
*VE6SPS	“	22,374	159	30	36
*VE6ZC	“	20,174	120	37	40
*VE6GK	“	16,767	87	36	45
*VE6ZE	“	9,179	70	36	31
*VA6TVA	“	6,345	67	22	25
*VE6SYD	“	4,212	34	23	29
*VA6AGR	“	2,432	33	16	16
*VE6GTZ	“	1,620	26	14	16
*VE6CLE	“	792	28	12	12
*VE6KLE	“	480	24	9	6

District 7

VA7XU	14	34,788	329	18	34
*VE7CV	A	155,169	333	64	125
*VA7CTG	“	48,762	166	51	75
*VE7RSV	“	29,070	124	43	52

*VE7YAH	“	20,564	98	43	54
*VE7BGP	“	4,230	42	22	23
*VA7UY	“	1,980	38	17	16
*VE7GOG	“	888	21	13	11
					(OP: VA7QCE)
*VA7RYL	“	720	19	8	12
*VE7COR	21	12,810	132	17	25

Cayman Islands

ZF2AA	A	5,705,856	6293	108	308
					(OP: VE9AA)
*ZF2OO	28	161,568	985	15	57

Costa Rica

TI2JS	A	827,728	2289	62	114
TI5VMJ	21	391,964	1773	24	85
TI1T	14	623,952	2407	30	96
					(OP: TI2VVV)
*TI2OY	A	393,921	667	69	184
*TI2BSH	“	55,699	255	33	76
*TI2FAF	“	11,088	67	25	38
*TI3YAM	“	3,840	33	20	28
*TI3ATS	28	15,550	129	15	35
*TI5VWR	_14_	_1,034_	_20_	_10_	_12_

Cuba

CO2GG	A	516,960	954	65	175
CO2SG	7	2,852	40	7	24
*CO8NMN	A	1,245,128	2193	75	193
*CO2RQ	“	342,608	988	48	113
*CO8ZZ	“	241,533	839	47	94
*CM2JR	“	108,000	318	40	120
*CM2ARZ	“	61,404	206	32	87
*CO2VDD	28	77,256	452	20	54
*CO6EC	“	31,680	200	19	47

Dominican Republic

*HI3T	A	3,397,464	3610	102	326
*HI3A	“	640,320	980	80	210
					(OP: AD4Z)
*HI8J	“	204,864	496	55	139

Guadeloupe

*FG5GP	A	1,336,504	1832	67	217

Guatemala

*TG9ANF	14	431,607	1585	31	92
*TG9ADM	3.7	208	9	6	7

Martinique

FM5DN	A	33,668	197	28	48

Mexico

XE1CKJ	A	346,060	1383	44	77
XE2S	“	151,371	557	51	70
XE2T	“	64,923	570	25	32
XE2Q	“	29,412	402	14	22
XE1CT	28	456,114	1778	28	86
*XE1SPM	A	571,976	1837	49	103
*XE1ACA	“	220,306	891	49	69
*XE2ANT	“	64,368	629	23	31
*XE2NK	“	56,592	179	51	80
*XE1GLA	“	15,164	95	31	37
*XE1O	“	2,870	28	16	25
*XE1SVT	“	2,272	29	16	16
*XE2KSL	“	820	17	11	9
*XE1RE	“	525	18	8	7
*XE2JA	28	60,165	477	17	46
*XE1ZTW	“	37,027	253	17	44
*XE1CIC	“	35,464	375	15	29
*XE2AA	“	26,950	297	14	35
*XE1AQY	“	24,795	109	24	63
*XE2JT	“	6,794	62	16	27
*XE2N	21	210	14	8	7
*6D5C	7	12,032	117	19	28
					(OP: XE1H)

Panama

HP1ELV	A	8,362	127	14	23
*HP2BWJ	A	36,893	224	28	51
*HP1OIA	28	15,138	96	18	40
*HP1RIS	21	20,493	114	18	51
*HP1ALX	14	3,700	41	14	23

Puerto Rico

KP4PR	A	3,012,012	4112	82	252
WP4RF	“	378,180	1040	45	120
WP4YR	“	71,529	281	42	71
WP4WW	21	569,130	1909	25	97
					(OP: KP4JRS)
*WP3C	A	4,528,710	4938	94	311
*NP4VM	“	317,814	1019	45	102
*WP4TZ	“	266,178	542	60	158
*WP3GW	“	139,440	332	50	116
*KP4YO	“	85,590	264	39	96
*NP4CR	“	78,064	221	41	95
*KP4JFR	“	77,910	203	44	103
*NP3CW	“	68,912	238	34	84
*WP4JD	“	2,240	23	16	19
*WP4LFS	28	6	1	1	1
*NP4AW	14	22,800	163	17	43
*KP4DQC	7	4,560	49	8	32

Sint Maarten

*PJ7PL	28	184,828	1044	19	63

St. Kitts & Nevis

V47T	A	13,340,329	9403	137	462
					(OP: K5ZD)

US Virgin Islands

KP2M	A	4,586,904	4450	111	345
					(OP: KT3Y)
KP2B	28	1,331,424	4254	32	102
					(OP: EB7DX)

AFRICA

African Italy

*IH9/ IK5AEQ	A	1,558,025	1756	72	235

Algeria

*7X2GK	A	402,960	653	44	186

Canary Islands

ED8M	A	3,979,508	3270	94	318
					(OP: EA8DIG)
EA8ZS	“	3,440	36	15	28
EF8BBM	28	284,070	972	24	78
					(OP: EA4BQ)
*EA8DGO	A	337,725	536	50	175
*EA8AQV	“	283,290	464	54	156
*EA8BQM	“	209,838	600	42	81
*EA8BN	“	14,104	70	28	58
*EA8AUW	“	5,734	44	18	29
*ED8B	28	415,093	1103	29	104
					(OP: EA8TR)
*EA8DHH	“	150,450	454	26	92
*EA8DGZ	21	17,152	114	15	49

Ceuta & Melilla

*EA9ABC	21	459,225	1439	28	89

Egypt

*SU1SK	A	247,200	606	34	116

Kenya

5Z4FV	A	407,268	604	66	177

Madagascar

5R8AS	A	429,322	777	58	136
					(OP: JH8JWF)

Madeira Islands

CT3KN	A	9,193,977	5834	125	412
CR3Y	28	1,970,399	4470	34	117
					(OP: OM2KW)
CQ3J	“	1,710,060	3626	38	127
					(OP: CT3MD)
CR3DX	21	2,273,994	4763	34	128
					(OP: OM3RM)
CR3A	14	2,400,858	4973	37	129
					(OP: OM3BH)

Malawi

7Q6M	28	882,024	2158	31	112
7Q7JN	21	3,850	52	9	26

Morocco

*CN8PA	7	31,850	181	11	54

Namibia

*V55AF	A	326,043	804	44	109
					(OP: V51MA)
*V51WW	14	732	126	19	42

Senegal

6W1QL	21	52,948	310	11	51

South Africa

ZS2ABE	A	176,190	331	71	139
ZS6HON	“	61,800	216	31	72
ZS6PS	“	28,152	102	27	75
ZS2MAC	“	819	15	9	12
ZS6KOB	“	162	15	8	10
ZS6TVB	21	236,832	868	21	75
*ZS1AO	A	342,478	569	52	166
*ZS1S	“	114,608	265	45	107
*ZS2EC	“	37,072	132	41	71
*ZS6HI	“	36,630	129	43	68
*ZS6ELI	“	18,260	85	32	51
*ZR6DM	“	540	16	8	10
*ZS6MDX	“	475	24	12	13
*ZS2G	28	5,796	45	14	32

St. Helena

ZD7BG	A	891,549	1383	49	170

Sudan

*ST0HQ	28	301,920	858	28	92
					(OP: ST2M)

ASIA

Asiatic Russia

District 9

*UA9CUA	A	307,360	510	57	169
*UA9CAW	“	153,472	340	41	135
*RT9YT	“	70,752	268	42	90
*R8KAY	“	18,183	107	30	57
*RA9W	“	9,052	62	18	44
*UA9CHL	“	3,358	35	22	24
*RW9Y	“	1,250	18	10	15
*UB8QBD	28	1,254	24	4	15
*R9MBY	21	3,298	63	9	25
*RA9YC	“	171	17	5	14

District 0

R0WC	A	140,425	341	61	144
RA0ACM	“	66,429	274	38	83
RA0LMO	“	37,842	128	41	78
UA0DAR	“	29,568	191	34	43
R0QAF	_“_	_6,048_	_56_	_23_	_40_
RU0L	“	126	7	3	3
RN0CT	14	73,695	370	27	58
*UB0ABG	A	140,015	312	65	140
*RC0CD	“	66,465	427	43	62
*RA0LE	“	14,536	91	37	42
*RC0LAD	21	19,220	125	20	42
*UA0A	14	25,086	167	23	51
*UC0C	“	9,471	151	17	24

Asiatic Turkey

TA3DE	A	1,992,144	2357	64	230
YM7KA	“	1,164,745	1491	62	219
					(OP: TA7I)
TA2ANL	“	141,344	443	26	86
TA4AU	“	101,384	248	32	120
TA4ORZ	“	89,100	214	46	116
TA7AO	28	2,738	54	11	26
*TA5O	A	298,655	469	59	186
*TA2UCT	“	147,441	299	39	138
*TA2MN	“	97,608	250	32	115
*TA6B	“	90,915	238	35	110
*TC29EKM	“	87,240	291	27	93
					(OP: TA1BX)
*TA7YLY	“	70,875	212	30	95
*TA8DX	“	40,115	156	26	87
*TA3P	“	36,064	140	27	85
*TA7LZB	“	21,402	110	19	68
*TA0ACL	“	21,252	101	18	66
*TA2L	“	13,430	75	23	56
*TA0TA	“	9,676	64	17	42
*TA7I	“	8,046	63	19	35
*TA2DB	“	2,945	41	7	24
*TA4KDC	“	2,581	31	11	18
_*TA2NL/P_	_“_	_1,035_	_15_	_9_	_14_
*TA4Q	28	67,056	354	17	49
*TA4/ OH2KW	“	57,152	315	14	50
*TA2RG	“	28,880	166	22	54
*TA2E	“	26,828	149	23	53
*TA3BC	“	20,460	119	22	44
*TA0N	14	4,104	54	7	29
*YM7KK	“	3,168	44	4	20
					(OP: TA7OZJ)
*TA2DM	1.8	128	8	2	6

China

BA3MM	A	637,436	1163	88	204
BI4SZP	“	35,526	216	29	64
BG2VIA	“	2,394	42	18	20
BG6SNJ	“	1,794	22	17	22
BG3KKZ	“	703	27	9	10
BH4TKN	“	140	13	5	5
BG9NJY	28	19,987	114	19	60
BI4SDT	_21_	_242_	_8_	_4_	_7_
*BD4VGZ	A	256,795	527	58	145
*BG8TFN	“	126,244	452	53	95
*BG0DPG	_“_	_65,040_	_243_	_31_	_89_
*BI8FRF	“	63,510	251	55	91
*BH3PLA	“	57,387	203	46	95
*BD6JN	“	43,722	187	48	78
*BH2TVR	“	41,875	218	49	76
*BA6KC	“	38,907	182	51	80
*BG1WNU	“	30,734	215	47	74
*BG7TNB	“	28,080	157	33	71
*BH7CM	“	25,704	129	39	69
*BH6AGG	“	23,625	140	36	69
*BA7LRT	“	20,604	129	40	61
*BA3NHK	“	18,032	124	33	59
*BH1KTJ	“	16,796	158	31	45
_*BD4KM_	_“_	_16,318_	_102_	_27_	_55_
*BD4SVU	“	15,752	117	37	51
*BD3OD	“	14,442	116	36	51
*BH7FUC	“	12,744	88	27	45
*BH4TYL	“	10,688	115	27	37
*BA3MC	“	10,164	98	26	40
*BG8KII	“	10,082	75	30	41
*BH4FSD	“	10,080	61	27	45
*BA2BA	“	9,300	113	26	34
*BA4IT	“	8,932	83	30	47
*BH3ECQ	“	8,700	84	33	42
*BG6QAL	“	8,662	85	23	38
*BI1JOT	“	7,497	69	23	40
*BD6AHP	“	6,976	62	28	36
*BG0BPZ	“	6,790	84	26	44
*BH1XEC	“	5,865	78	30	39
*BG8FZ	“	4,794	54	21	30
*BD2IAQ	“	4,773	73	17	26
*BA7LCS	“	4,675	58	23	32
*BG0DAP	“	4,656	60	18	30
*BH2UAE	“	4,590	59	18	27
*BA7LYS	“	4,320	71	20	28
*BD4TWZ	“	3,861	63	16	23
*BG7SPN	“	3,526	43	17	24
*BI7LVU	“	3,393	50	17	22
*BA7LBM	“	2,923	40	14	23
*BI8EFI	“	2,419	61	15	26
*BD8AQY	“	2,405	36	15	22
*BG6LH	“	2,400	61	21	29
*BG6SZD	“	2,318	50	27	34
*BD4ULB	“	1,836	38	13	21
*BG8KUQ	“	1,617	30	14	19
*BH4FCY	“	1,225	34	17	18
*BG5FOX	“	924	21	15	18
*BH2SMF	“	816	50	11	13
*BG2TAA	“	658	52	23	24
*BH3XZT	“	525	34	12	13
*BD8AIS	“	506	26	10	13
*BH6PKX	“	459	20	12	15
*BH5HFK	“	391	15	7	10
*BH6AOV	“	174	33	12	17
*BD7JJQ	“	135	11	7	8
*BG8KUV	“	117	8	4	5
*BD4VDA	“	48	7	4	4
*BH4JPA	“	14	5	3	4
*BA4SCP	“	10	9	5	5
*BI1MCZ	28	31,755	206	21	52
*BG7XWF	“	30,550	310	21	44
*BG8BXM	“	15,250	112	16	45
*BG8PM	“	6,840	53	19	41
*BH1HUK	“	6,468	80	14	30
*BI8AO	“	4,928	62	16	28
*BD4SBH	“	352	18	5	6
*BG8KVC	21	44,019	296	19	54
*BG3ITB	“	40,626	329	20	54
*BD7LQM	“	32,178	411	19	43
*BH4AHC	“	14,280	127	19	37
*BG7SSK	“	14,200	134	17	33
*BY0AB	“	12,408	100	11	36
					(OP: BG0BWG)
*BG7LDM	“	12,012	266	18	26
*BG8AMG	“	11,550	102	15	40
*BH8OCW	“	11,460	127	19	41
*BH3DHE	“	9,016	85	17	32
*BG8INK	“	8,619	77	16	35
*BG8KCQ	“	7,065	70	14	31
*BG8IL	“	7,065	70	14	31
*BH4LLP	_“_	_2,765_	_49_	_12_	_23_
*BI1JBV	“	2,550	54	14	20
*BG8LCQ	“	448	51	6	8
*BD4QXR	“	380	15	9	10
*BH4LFG	“	324	36	8	10
*BH6JOG	“	320	20	9	11
*BI8CCJ	“	120	12	5	5
*BD7BW	“	60	5	5	5
*BD9CJH	“	30	3	3	3
*BD4ULO	“	16	2	2	2
*BD4SVT	14	1,950	66	13	17
*BH1IZQ	“	56	10	4	4
*BH2VPV	“	36	10	3	3
*BI1LGP	“	16	6	4	4
*BH4TIH	“	16	14	2	2
*BH8MSA	“	12	3	2	2
*BH4UMN	_“_	_4_	_3_	_2_	_2_
*BD8ARO	“	4	2	2	2

Cyprus

C4W	A	7,784,250	5086	110	425
					(OP: 5B4WN)
*5B4APJ	A	48,960	144	41	95
*5B4ANY	“	4,356	36	15	29
*5B4AJV	28	31,290	191	18	52

Georgia

4L2M	7	924,189	2297	31	116
*4L9M	28	54,531	270	15	58
					(OP: R3XA)
*4L4GB	“	594	24	9	18

Hong Kong

VR2XAN	28	943,795	2573	37	118
*VR2WTM	A	66,340	324	47	77
*VR2XAB	“	12,464	87	28	48
*VR2T	28	281,175	1115	28	87
					(OP: VR2ZQZ)
*VR2VRC	“	36,960	341	21	45
*VR2JM	14	7,298	93	13	28

India

VU2IVV	A	136,590	397	43	114
VU2EII	“	48,944	224	39	73
VU2BGG	“	27,972	103	35	73
VU2KIB	“	23,520	107	31	67
VU2IBI	28	56,932	256	22	64
*VU2ABE	A	107,415	373	51	104
*VU2SMS	“	69,278	202	37	97
*VU2MGS	“	20,075	153	23	50
*VU3IZJ	“	18,616	120	35	69
*VU2GRM	“	14,800	95	34	46
*VU2BQN	“	9,513	65	21	42
*VU3IBL	“	6,344	60	25	36
*VU3IZV	“	1,178	20	14	17
*VU2MCW	“	450	17	11	14
*VU3SIO	“	368	14	10	13
*VU2XJ	“	216	11	6	6
*VU3LMS	“	40	4	4	4
*VU3GDS	28	35,518	185	19	67
*VU2OO	“	15,170	144	17	57
*VU2RS	“	1,525	25	10	15
*VU3DXL	14	3,255	39	12	23
*VU2JOS	“	240	15	6	10
*VU2EKR	“	2	1	1	1
*VU3RGB	7	403	19	6	7

Iraq

YI1WWA	A	1,502,804	1784	68	246

Israel

*4X0T	A	2,152,332	2005	83	295
					(OP: 4Z5FI)
*4Z5MV	“	44,844	158	27	74
*4X6FB	“	28,645	125	19	66
*4Z5MY	“	308	8	6	8
*4Z5MU	28	17,400	101	15	45
*4Z5UN	7	244,881	783	27	90

Japan

District 1

JF1NHD	A	1,574,703	1544	125	262
					(OP: N6VI)
JK1OLT	“	972,360	1121	107	226
JR1GSE	“	637,377	922	101	176
JH1HIC	“	555,458	774	99	190
JQ1ABC	“	527,772	849	94	150
JH1QDB	“	489,048	671	98	189
JH1EVD	“	340,816	564	76	162
JH1OLB	“	303,150	560	82	133
JA1IAZ	“	158,194	328	64	117
JA1CRJ	“	121,680	252	65	115
JR1IJV	“	117,624	272	57	99
JR1JCB	“	100,650	264	66	99
JH1CTV	“	91,044	264	55	107
JM1PIH	“	66,792	214	55	77
JK1HIX	“	61,579	165	51	82
7K4GUR	“	60,129	179	41	90
JS1NDM	“	57,385	186	45	70
JH1LEM	“	54,002	147	55	79
JQ1IBI	“	48,411	180	30	69
JA1FFB	“	46,004	176	37	69
JA1RPK	_“_	_37,440_	_140_	_42_	_54_
JJ1WWL	“	31,833	109	54	77
JS1BIB	“	21,052	125	29	47
JK1HIY	“	21,040	97	32	48
JA1VUA	“	19,500	98	31	47
JM1LKI	“	15,930	84	37	53
JJ1XTG	“	14,008	92	27	41
JL1JJD	“	10,428	62	25	41
JA1IAW	“	7,065	59	15	30
JH1DGJ	“	2,278	23	12	22
7M2FTR	“	1,953	31	15	16
JA1JNM	“	1,716	20	14	19
JH1LYE	“	782	18	7	16
JE1RXJ	28	234,321	905	33	78
JA1ELY	_“_	_56,376_	_409_	_24_	_34_
JG1ITH	“	46,412	237	26	56
JA1FWS	“	7,980	83	18	42
JA1FNO	“	850	20	8	9
JA1GVM	“	6	1	1	1
JA1NFD	21	42,042	216	22	55
JO1VRK	“	40,753	197	25	58
JG1LHB	“	25,323	147	23	46
JA1GHR	“	23,218	93	29	65
JE1JNJ	“	17,700	120	20	39
JG1TUC	“	15,652	115	16	36
JF1KML	“	8,658	76	16	23
JR1NHD	“	3,483	45	14	13
JA1YPA	“	2,475	37	6	19
					(OP: JA1PEJ)
JK1NJH	14	55,104	214	30	66
JH1JNJ	“	96	6	4	4
JI1JPJ	7	1,302	26	10	11
JK1BAB	“	16	2	2	2
*JS1OYN	A	805,392	955	113	223
*JA1BJI	“	567,945	716	105	210
*JS1KKY	“	364,560	578	84	161
*JJ1VJQ	“	199,988	438	56	117
*JF1WNT	“	114,741	281	67	104
*JK1HWU	“	98,580	265	64	95
*JH1BHW	“	92,196	233	61	95
*JR1QBA	“	69,690	251	60	78
*JO1VVT	“	62,980	184	52	82
*JE1ICU	“	59,976	219	49	70
*JA1SCE	“	56,168	204	40	79
*JK1BVN	“	52,734	203	59	82
*JE1QHP	“	44,619	159	41	66
*JK1JAS	“	37,700	125	48	68
*JR1LEV	“	37,149	179	32	55
*JK1NSR	“	35,619	153	35	58
*JR1MRG	“	29,853	131	40	53
*7L3KJV	“	29,790	127	35	55
*JA1HNW	“	26,068	104	43	55
*JK1AUY	“	25,017	113	39	54
*JK1AUH	“	24,800	178	29	33
*JR1ABS	“	21,824	110	41	47
*JR1DVB	“	21,472	100	32	56
*JR1EMO	“	19,840	104	35	45
*JF1DWJ	“	18,096	88	36	51
*JA1ALE	“	15,484	98	33	46
*JR1TCY	“	13,452	71	31	45
*JL1EUP	“	11,160	61	29	43
*JF1VVR	“	8,636	67	27	41
*JP1SCQ	“	8,544	76	18	30
*JR1JRW	“	7,020	56	21	33
*JK1EXF	“	7,020	47	23	31
*JI1FLB	“	5,530	58	18	17
*JL1EUF	“	5,502	47	19	23
*JH1EYM	“	5,300	40	20	33
*JL1FAR	“	4,004	33	17	27
*JK1ECX	“	3,800	43	17	23
*JA1UOA	“	3,420	36	13	25
*JE1VMZ	“	3,375	41	20	25
*JK1HFB	“	2,128	30	17	21
*JI1LAI	“	2,100	26	12	18
*JH1KLE	“	2,014	25	18	20
*JH1HMC	“	1,820	37	12	16
*JL1LOF	“	1,632	30	11	13
*JA1STY	“	1,540	21	15	13
*JJ1UBX	“	1,300	26	12	14
*JA1TZG	“	960	18	12	12
*JG1LZY	“	748	22	7	10
*JE1GWO	“	594	15	9	9
*JG1LMT	“	480	14	10	10
*JA1EQO	“	294	11	6	8
*JS1YGS	“	264	8	5	6
					(OP: JA0BXP)
*JH1HHP	“	228	16	9	10
*JJ1TQD	“	170	7	4	6
*JR1USU	“	130	11	5	5
*JF1EPL	“	75	5	3	2
*JJ1LBJ	28	76,912	329	28	60
*JG1TVK	“	51,072	205	28	68
*7N2UQC	“	45,360	224	24	60
*JM1SMY	“	41,943	180	29	64
*JK1CNL	“	9,720	87	18	36
*JJ1KZZ	“	5,760	52	17	28
*JA1CHY	“	2,310	27	15	20
*JL1WRV	“	2,117	37	10	19
*7K1BIB/1	“	525	19	6	9
*JG1GCO	“	476	10	8	9
*7K4XNN	21	134,200	457	31	79
*JP1IXV	“	49,192	215	27	59
*JR1AKD	“	31,275	171	22	53
*JG1UKW	“	30,149	165	24	49
*JE1RRK	“	26,530	155	21	49
*JA1RYC	“	25,908	155	21	47
*JM1LAW	“	23,660	132	21	49
*JO1WQS	“	20,032	143	22	42
*JF1HAJ	“	14,560	111	19	37
*JF1GZZ	“	13,833	109	17	36
*JH1NLF	“	13,039	95	21	38
*7K4TKB	“	10,396	88	18	28
*JP1LRT	“	6,804	58	15	27
*JQ1VDJ	“	4,788	50	17	25
*JA1DBG	“	4,636	59	14	24
*JO1KTD	“	4,026	54	12	21
*JA1CTB	“	2,592	36	12	15
*JJ1SVC	“	2,560	44	10	22
*JA1JLP	“	2,244	42	14	19
*JK1PDC	“	1,891	35	12	19
*JE1GZB	“	1,836	32	12	15
*JM1XBD	“	1,638	23	10	16
*JJ1SWV	“	627	17	9	10
*JA1LKY	“	304	21	8	8
*JH1VIX	“	273	9	5	8
*JP1PEA	“	84	6	3	3
*7K1EAS	“	40	14	5	5
*JF1TEU	14	17,214	105	20	37
*JH1WHA	“	722	14	9	10
*JI1DGW	“	228	11	5	7
*JN1GNL	“	60	4	2	3
*JG1CMT	“	6	1	1	1
*JH1RDU	7	1,798	28	14	15
*JJ1BDX	“	36	3	2	2
*JA1KJC	3.7	171	8	5	4
*JE1SPY	1.8	160	44	5	5

District 2

JF2QNM	A	1,791,325	1799	126	269
JR2PMT	“	300,160	510	78	146
JG2CNZ	“	256,908	424	96	141
JE2DJC	“	187,068	311	85	153
JE2BOM	“	122,230	276	58	112
JA2HOL	“	110,526	244	57	112
JQ2BBC	“	102,185	386	45	62
JF2FIU	“	73,500	219	61	86
JA2JWH	“	53,568	202	52	72
JR2BCF	“	43,758	164	32	67
JA2VHO	“	35,643	151	45	64
JH2BTM	“	30,744	142	28	56
JG2REJ	“	15,211	107	18	35
JF2CTS	“	13,430	90	36	43
JA2IXS	“	9,794	76	27	32
JA2BHJ	“	9,324	94	26	37
JI2ZEY	“	7,812	57	31	31
					(OP: JA2BIV)
JA2VQF	“	72	6	6	6
JH2KKW	28	21,597	124	22	47
JH2DFJ	“	63	7	4	3
JE2OTM	21	234,738	708	33	93
JE2PCY	“	17,877	121	22	37
JR2ALA	“	7,875	70	18	27
JE2LPC	“	462	11	6	8
JR2IOB	“	315	9	7	8
*JG2RFJ	A	184,828	375	65	131
*JA2KPW	“	111,350	271	60	110
*JA2ODB	“	86,976	220	51	93
*JA2GHP	“	79,186	234	49	88
*JI2KUJ	“	30,456	110	38	70
*JA2ULV	“	28,886	118	38	63
*JS2PHO	“	25,368	135	36	48
*JM2LEI	“	5,856	52	16	32
*JS2EEF	“	5,490	46	17	28
*JS2ITI	“	4,462	35	15	31
*JS2IWE	“	3,760	32	21	26
*JR2KQE	“	3,115	35	15	20
*JE2DOD	“	1,029	23	10	11
*JS2BGJ	“	820	15	9	11
*JR2BOF	“	714	16	8	13
*JJ2AVH	28	21,831	133	19	38
*JH2JNU	“	10,441	85	17	36
*JR2TRC	“	2,288	32	12	14
*JG2VSF	“	288	12	8	8
*JF2VFN	“	198	8	4	5
*JR2MIO	21	43,890	237	25	52
*7K1MAG/2	“	34,875	193	22	53
*JH2UVB	“	14,756	142	20	42
*JH2RIH	“	6,768	63	17	31
*JA2KKA	“	4,148	50	12	22
*JS2MYR	“	2,546	29	15	23
*JF2KWM	“	968	18	9	13
*JE2EVX	“	264	13	4	4
*JR2GYA	_“_	_24_	_7_	_4_	_4_
*JF2WXS	7	1,584	24	5	19
*JI2IXA	“	36	3	2	2

District 3

JH3CUL	A	798,163	883	115	234
JR3RIU	“	229,779	441	73	138
JA3IBU	“	203,256	407	73	143
JE3RMQ	“	63,700	180	43	87
JP3UBR	“	20,060	98	34	51
JA3LIL	“	14,204	94	23	44
JA3AVO	“	10,700	94	22	28
JA3KKE	“	10,368	66	30	34
JQ3ELZ	“	7,564	48	23	39
JR3UIC	“	6,760	48	30	35
JF3KCH	“	6,413	79	23	30
JA3BXF	_“_	_1,456_	_22_	_10_	_18_
JQ3DEW	“	864	28	12	15

JA3XOG	28	46,228	202	26	65
JA3QOS	“	7,844	74	19	34
JR3NZC	21	250,845	927	31	74
JA3LEZ	“	51,435	229	22	59
JN3MXT	“	3,081	45	15	24
JA3MQY	“	726	24	6	5
JL3DQX	14	81	6	5	4
JE3VRJ	7	8,652	100	18	24
*JL3MCM	A	450,790	581	103	202
*JF3DCH	“	198,288	385	75	129
*JP3KPJ	“	63,228	195	53	79
*JJ3TBB	“	61,600	192	51	89
*JM3FUW	“	55,348	166	58	79
*JA3UWB	“	50,925	207	39	66
*JH3JSJ	“	28,280	136	40	61
*JA3PFY	“	9,728	98	27	37
*JP3JUV	“	8,771	77	21	28
*JA3KDJ	“	3,800	55	17	23
*JF3RLV	“	3,483	37	17	26
*JL3AYP	“	2,604	38	14	17
*JK3OTH	“	2,451	46	18	25
*JP3MFV	“	2,080	27	15	17
*JH3GMI	“	2,030	26	14	15
*JH3FTZ	“	1,080	25	12	12
*JQ3BAV	“	825	19	12	13
*JQ3DXA	“	598	19	11	15
*JE3EDJ	28	79,116	269	31	83
*JE3GAR	“	36	4	3	3
*JF3BFS	21	207,252	727	30	78
*JF3IYW	“	36,421	186	25	52
*JA3JRI	“	20,460	140	22	38
*JM3QIS	“	6,350	62	21	29
*JG2CNS/3	“	2,755	45	12	17
*7L3ETZ/3	“	2,201	29	10	21
*JF3PLF	“	1,628	52	6	5
*8N3SEA	“	1,518	30	9	14
*JA3PYH	“	480	16	7	8
*JA3BBG	“	88	5	4	4
*JA3RAZ	“	45	3	2	3
*JR3JRI	14	735	19	8	13
*JG3DHN	“	42	3	3	3
*JE3JFW	“	2	1	1	1

District 4

JH4UYB	A	3,562,173	2887	142	329
JH4MTE	“	27,542	121	36	58
JA4RWN	“	17,550	97	27	51
JE4ADO	“	798	16	9	10
JG4AKL	28	79,254	304	28	74
*JE4MHL	A	462,354	601	94	199
*JI4WHS	“	111,210	281	66	99
*JA4JLT	“	105,908	284	55	111
*JA4LCI	“	105,144	271	56	100
*JJ4NZO	“	9,072	72	28	35
*JA4VPS	“	6,784	52	25	39
*JH4PUS	28	504	14	8	10
*JN4ESD	21	19,800	130	20	40
*JH4FUF	“	5,852	60	14	24
*JO4MJU	7	6	1	1	1

District 5

JA5SUD	A	221,850	348	89	166
*JJ5NFT	A	23,407	113	32	57
*JJ5RCX	“	1,080	26	12	18
*JJ5MIB	“	40	4	4	4
*JE5DKA	28	6,076	56	17	32

District 6

JA6BZI	A	694,127	808	94	229
JA6BWH	“	237,931	399	72	157
JA6EML	“	213,261	391	65	136
JH6QFJ	*“*	*181,908*	*363*	*64*	*122*
JE6CMG	“	58,310	202	35	84
JE6WGT	“	53,160	201	42	78
JA6FFO	“	29,150	147	37	73
JH6AUS	28	327,700	881	35	110
JR6CSY	“	406	11	6	8
JE6DNN	21	68,340	270	27	75
JA6HZN	“	16,864	98	21	47
JH6TNH	“	189	7	4	5
*JA6CVR	A	57,204	200	47	79
*JA6PTH/6	“	22,989	97	39	58
*JA6ONQ	“	22,680	130	29	55
*JH6SCA	“	1,500	26	11	14
*JO6NZN	“	648	15	11	13
*JH6FTJ	28	19,800	122	20	40
*JM6URL	“	16,065	103	18	45
*JA6CDC	“	690	14	10	13
*JA6WFM	21	285,219	822	35	94
*JG6VMO	“	5,720	60	15	29
*JK6SSS	“	1,200	30	9	11
*JF6ABL	14	855	19	9	10

District 7

JH7QXJ	A	1,259,760	1582	96	194
JG7AMD	“	968,365	1229	93	200
JM7SKE	“	174,720	341	76	132
JA7GFN	“	50,050	155	48	82
JA7VEI	“	14,427	83	30	33
JJ7PMS	“	14,399	75	35	42
JA7UES	“	13,926	73	27	39
JN7TAN	“	3,612	34	19	23
JH7BDS	“	416	10	8	8
JA7OWD	28	173,518	707	33	68
JO7KMB	“	1,860	28	12	18
JA7QVI	21	371,316	1013	33	99
JA7FTR	14	216,270	611	35	100
*JA7BEW	A	196,019	381	78	133
*JH7IHT	“	40,112	168	36	56
*JP7GRU	“	4,998	45	21	21
*JA7KHQ	“	4,361	37	21	28
*JA7MCB	“	2,108	24	16	18
*JL7GGH	“	2,040	32	15	19
*JE7KTI	“	1,176	26	13	15
*JE7GSU	“	1,120	24	10	10
*JR7HAN	“	558	13	9	9
*JH7ZKI	28	13,920	122	20	38
(OP: JR7FEK)					
*JA7HYS	21	88,218	290	33	84
*JE7KJG	“	61,008	250	28	65
*JE7KHL	“	12,375	95	19	36
*JH7PIN	“	2,320	44	13	16
*JA7RPC	“	250	9	4	6
*JH7IQQ	14	5,985	63	18	27
*JL7LUI	“	220	12	4	7
*JE7SRK	7	27	3	2	1

District 8

JA8RUZ	A	550,314	866	88	170
JH8XVT	“	195,585	367	78	143
JA8IJI	“	153,510	337	64	106
JA8TGD	“	14,848	94	20	38
JG8TDZ	28	16,536	94	25	53
JH8FIH	“	13,515	119	21	32
JA8DNV	3.7	616	18	12	10
*JA8RWU	A	341,648	542	89	173
*JL8PZO	“	45,540	142	55	77
*JM8FEI	“	45,310	174	46	69
*JR8QFG	“	19,584	108	29	39
*JM8PSY	“	11,627	91	33	44
*JE8KKX	“	10,336	59	28	40
*JA8CXY	“	9,400	66	21	29
*JE8UHY	“	6,960	58	27	31
*JH8IYN	“	1,920	24	12	20
*JA8JTZ	“	832	22	12	20
*JE8PHS	“	561	13	9	8
*JE8IAS	28	20	3	2	2
*JM8SMO	21	15,240	102	20	40
*JH8RXM	“	13,260	103	18	34
*JH8DHV	“	7,000	78	16	24
*JE8URC	“	2,112	30	11	13
*JA8HBO	“	1,560	44	12	14

District 9

JA9BCV	A	120,852	280	61	101
JA9CCG	“	73,600	232	50	78
JH9FCP	28	9,702	92	18	31
JA9LNZ	“	30	4	3	2
JH9CEN	21	867	25	6	11
*JA9TQY	A	53,972	208	35	68
*JE9EMA	“	51,471	162	48	85
*JF9QYV	“	34,128	137	35	73
*JA9LX	“	2,583	31	17	24
*JA9NEG	14	608	16	8	8

District 0

JH0ILL	A	341,874	578	83	151
JH0MXV	“	54,708	152	54	87
JJ0UIF	“	11,907	79	23	40
JJ0JDK	“	7,370	45	32	35
JA0CLB	“	6,042	50	26	27
JA0GCI	28	1,518	28	10	13
JJ0ACA	21	110,187	415	28	71
JA0GCY	“	37,576	175	27	61
JH0RQC	“	1,430	27	8	14
JJ0VNR	7	256,743	837	30	81
JA0JHA	3.7	16,215	100	25	44
*JH0MUC	A	138,348	302	68	115
*JA0BJY	“	15,989	101	19	40
*JR0DZH	“	10,416	62	30	32
*JI0WVQ	“	10,140	94	27	38
**JA0IAA*	*“*	*8,932*	*58*	*22*	*36*
*JR0BNF	“	8,866	63	27	35
*JA0RCK	“	7,630	43	28	42
*JJ0VXN	“	7,182	73	23	34
*JH0DUG	“	6,435	57	25	30
*JA0BZY	“	4,300	38	19	24
*JJ0WIE	“	2,496	54	12	20
*JR0GXA	“	221	7	7	6
*JJ0TUC	28	448	20	5	9
*JA0JHQ	21	300	9	6	6
*JA0OWR	“	24	3	3	3
*JA0BXP	“	6	1	1	1
*JH0EPI	14	26,496	144	28	44

Kazakhstan

UP0L	A	8,050,170	4927	135	475
(OP: UN9LW)					
UN3J	“	1,656,480	1832	102	306
UP2L	21	600,768	1649	31	113
UP7L	1.8	38,308	233	13	48
(OP: UN6LN)					
*UN1EAU	A	23,058	96	43	83
*UN0L	“	7,208	52	16	37
*UN7GF	28	25,702	172	16	55
*UN7QF	“	20,944	141	17	51
*UN7FJD	21	11,160	106	11	34
*UN7Q	14	14,278	106	15	44
**UN7LAS*	*7*	*5,460*	*52*	*8*	*34*

Kyrgyzstan

*EX0M	A	14,700	72	29	46
*EX8MK	28	1,320	22	12	18
*EX7ML	21	26,928	180	15	53

Lebanon

*OD5UI	A	165,321	401	35	122
*OD5OJ	28	16,940	112	15	40
*OD5ZF	7	4,794	57	7	27

Nepal

9N7AA	A	2,264,925	2601	85	260
(OP: S53R)					

Ogasawara

JD1BQP	A	200,554	804	54	95

Pakistan

*AP2MS	A	11,232	62	27	45

Qatar

*A71AE	14	20,667	93	24	59

Republic of Korea

HL2WA	A	1,038,800	1265	112	259
HL2ZN	“	279,174	532	72	166
HL5BCH	“	59,130	166	59	103
DS4FWI	“	28,072	104	42	74
HL2KV	“	24,236	126	30	53
HL2AHL	“	22,989	133	42	55
DS5DNO	“	6,804	59	24	30
HL4CEL	“	4,480	98	19	21
*DS3EXT	A	40	5	4	4
*6K2ILX	21	294	11	5	9
*HL2ASZ	7	920	20	11	12

Saudi Arabia

HZ7C	14	401,604	986	36	111
(OP: 7Z1SJ)					
*HZ1SK	28	405,840	1197	27	93
*7Z1VD	21	181,488	581	28	86
*HZ1CY	14	129,753	416	30	87

Singapore

9V1YC	A	543,150	1074	83	172
*9V1LD	7	525	17	6	9

Taiwan

*BV2NT	A	193,479	848	52	91
*BV4VR	“	18,532	113	34	48

Thailand

HS1LCI	A	384,696	752	61	155
E21YDP	28	50,052	303	22	64
*E20NGF	A	608,036	953	83	203
*E23HSW	“	44,352	171	42	84
*E20WUE	“	7,239	56	23	34
*HS0ZOK	“	3,325	48	14	21
*E24UWQ	“	1,292	32	14	20
*HS5TXB	“	899	21	13	16
*E20XMG	28	29,877	237	21	48
*HS5ZLD	“	352	16	7	9
*E29AHU	“	304	15	6	10
*E22UUW	21	52,488	317	24	57
**E25CRF*	*“*	*29,264*	*249*	*21*	*41*
*HS8MOM	“	10,062	145	12	27
*HS8JYX	“	2,616	45	10	14
*E20MWE	“	2,600	54	10	16
*HS8LVC	“	702	17	8	10
*HS5AES	14	4,674	52	13	25

United Arab Emirates

A65BB	28	939,757	2276	34	127
*A65/ DL2RMC	A	29,904	132	26	63
*A61FJ	21	128,736	506	21	75

Uzbekistan

*UK8IQ	A	44,911	233	24	73

Vietnam

*XV9NPS	21	3,010	54	12	23

West Malaysia

9M2YOT	A	199,773	688	51	100
9M2HUS	“	72,625	340	36	47
9M4BCN	“	30,940	180	33	58
(OP: JA1OCZ)					
*9M2L	A	157,220	673	56	84
(OP: 9M2SAF)					
*9M2MAD	“	38,133	262	25	32
*9W2RHR	“	11,037	129	16	23
*9M2CIF	“	7,854	103	14	19
*9M2DGA	“	4,512	67	14	18
*9W2BAF	“	2,990	56	10	13
*9W2XBS	“	2,726	48	13	16
*9W2AIX	28	46,575	388	21	48
*9W2AXL	“	4,592	74	16	25
*9W2FSY	“	504	16	8	10
*9W2JHZ	7	65,898	404	17	46
*9W2W	“	22,714	221	11	30
(OP: 9W2HXP)					
*9W2XTK	“	16,170	177	13	22
*9W2RPW	“	3,135	88	7	8
*9W2HAS	“	675	24	7	8
*9M2SAN	“	336	22	3	5

Maritime Mobile (Asia)

*YO4RYU/ MM	A	79,488	302	46	92

EUROPE

Albania

**ZA1AK*	*14*	*2,112*	*46*	*8*	*25*

Andorra

*C31LK	A	38,304	348	24	90

Austria

OE8MKQ	A	66,822	187	52	77
OE3L	*“*	*51,740*	*173*	*46*	*84*
OE9SEV	“	19,376	148	24	88
OE5WZO	“	18,914	110	34	64
OE6V	3.7	12,243	228	8	45
(OP: OE6JXA)					
*OE1HHB	A	806,949	1225	91	338
*OE1HLB	“	165,204	489	57	177
*OE1KFR	“	138,720	409	59	181
*OE3EDS	“	127,379	395	50	167
*OE1CIW	“	99,182	349	47	155
*OE3KAR	“	41,952	206	36	116
*OE3NHW	“	41,440	146	46	102
*OE6CGD	“	37,960	196	36	94
*OE7MOP	“	24,675	189	26	79
*OE1KSG	“	24,600	116	35	65
*OE7XWI	“	13,528	172	14	62
(OP: OE7HPJ)					
*OE3CBE	“	12,900	138	24	62
*OE5MKE/P	“	2,574	70	8	31
*OE5YGL	“	864	18	11	13
**OE5WEO*	*“*	*6*	*3*	*3*	*3*
*OE3MCS	28	1,150	24	9	14
*OE5FDM	“	160	6	5	5
*OE3OPW	14	7,672	101	13	43
*OE1PUT	“	0	8	3	6
*OE1VMC	7	3,870	81	8	35
*OE3WMW	1.8	5,580	173	4	32

Azores

*CR2B	A	2,178,800	2636	95	324
(OP: EA1BP)					

Balearic Islands

*EA6/ DK5IR	A	184,986	538	55	184
*EA6VY	“	22,624	149	26	86
*EA6AOH	“	19,656	141	32	85
*EA6OM	28	77,478	286	31	80

Belarus

EW4M	21	244,084	964	32	107
EW3LN	“	882	20	7	14
*EU1VA	A	145,068	403	57	174
*EU3A	21	135	5	4	5
*EW4KA	7	18,387	172	19	62

Belgium

OT5X	A	326,988	880	69	224
(OP: ON4DG)					
ON7QC	“	59,409	215	41	120
OT1Y	“	49,312	171	41	93
ON8AH	“	41,237	130	53	84
ON7ET	“	36,801	113	47	94
OR7G	14	22,140	375	12	48
*ON3AR	A	397,902	826	68	214
*ON5UJ	“	319,908	574	82	236
*ON2WI	“	250,902	680	61	202
*ON3VS	“	42,150	192	40	110
*ON5TB	“	40,755	220	37	106
*ON4MAD	“	40,680	203	32	88
*ON5ZYZ	“	35,581	147	33	58
*OT7E	“	27,685	147	32	81
*ON7DC	“	21,816	156	27	81
*ON3PAN	“	16,468	124	29	63
*ON5LS	“	9,768	114	18	56
*ON3BJK	“	2,280	62	6	32
*ON4SC	“	2,193	27	19	24
*ON3RC	“	1,656	34	13	23
*ON5WL	28	15,486	107	16	42
*ON3PAT	“	10,797	79	20	39
*ON5GF	“	7,301	78	16	33
*ON3ND	21	9,735	101	15	40
*ON6VOX	14	12,644	160	12	46
*ON8LX	7	47,346	595	13	65

Bosnia-Herzegovina

E7AA	28	757,568	2175	36	116
(OP: E77A)					
E71EZC	21	25,254	207	14	47
(OP: E74D)					
*E7/Z35M	A	117,552	582	38	148
*E73RB	“	74,520	343	40	140
*E77SH	“	56,072	160	55	108
*E76MB	“	35,100	160	38	92
*E74CX	“	27,064	148	36	100
*E73EKK	“	22,785	157	26	79
(OP: E73KT)					
*E78FK	“	17,484	134	23	71
*E75LR	“	8,024	69	26	42
*E78NGS	“	3,150	65	13	37
*E74TC	“	2,881	55	12	31
**E75RKM*	*21*	*987*	*22*	*8*	*13*
(OP: E75MHM)					
*E75IO	14	49,720	474	16	72
*E74SL	3.7	12,561	225	8	45
*E74FRS	“	7,980	204	5	37
(OP: E75PBP)					
*E70BA	“	240	18	3	12
*E70E	1.8	3,360	115	6	36

Bulgaria

LZ5Y	A	779,708	1209	89	308
(OP: LZ1YE)					
LZ1AQ	“	288,400	714	75	205
LZ9Z	“	172,840	688	33	116
LZ5E	“	129,554	349	63	148
(OP: LZ1DKZ)					
LZ2XF	“	27,904	155	35	74
LZ7EA	*“*	*10,152*	*116*	*18*	*54*
LZ4TX	28	724,108	2225	36	118
LZ1GU	14	18,693	265	14	53
LZ1ST	7	11,620	100	16	54
*LZ2PS	A	100,260	418	37	143
*LZ1QB	“	94,600	256	63	152
*LZ7M	“	86,490	260	55	131
(OP: LZ5VK)					
*LZ7V	“	61,940	287	43	120
(OP: LZ3GH)					
*LZ5PL	“	21,109	118	35	66
*LZ5IY	“	12,640	115	19	61
*LZ2FX	“	9,849	157	11	56
*LZ7MT	“	2,565	45	12	33
**LZ1NYK*	*“*	*42*	*3*	*3*	*3*
*LZ2JA	28	119,140	462	31	84
*LZ2GS	“	37,224	233	27	61
*LZ5GM	“	16,065	126	18	45
*LZ2VU	21	575,811	2326	33	104
*LZ9V	“	57,680	381	27	76
*LZ3SD	“	13,680	152	14	46
*LZ/ VA7BTE/P	14	560	29	4	16
*LZ1SEN	“	540	11	9	11

Croatia

9A1CVG	A	79,540	334	45	149
(OP: 9A5OIA)					
9A/DK7ON	“	3,402	54	13	29
9A3DUH	*7*	*620*	*13*	*8*	*12*
*9A9Z	A	515,831	962	81	242
(OP: 9A0W)					
*9A3SM	“	41,409	154	40	89
*9A1AL	“	18,590	125	30	80
*9A1EJ	“	12,880	102	25	67
*9A2KI	“	9,344	122	18	55
*9A1EA	“	8,400	72	23	52
*9A6V	“	6,018	73	18	41
(OP: 9A6NND)					
*9A2RZ	“	832	30	8	18
*9A8A	28	52,704	202	29	79
*9A9I	“	31,280	187	20	48
*9A1AY	“	25,641	153	23	54
*9A3TU	“	9,964	82	18	35
*9A6KZH	21	39,338	238	24	65
*9A6M	7	25,284	219	20	66
*9A4MZ	“	4,797	106	6	35
*9A1BN	“	1,870	45	8	26

Czech Republic

OK1KKI	*A*	*605,556*	*1087*	*83*	*273*
(OP: OK7PY)					
OK1LEV	“	154,744	436	60	172
OK2ZDL	“	131,800	324	59	141
OK2SFP	“	20,178	128	32	82
OK4FD	*“*	*4,462*	*53*	*17*	*29*
OK7W	21	889,760	2408	38	122
OK1XC	“	102,312	400	29	87
OK5D	3.7	150,474	1337	16	77
(OP: OK1DTP)					
OK1KTW	“	12,427	307	4	39
(OP: OK1DEZ)					
OK1DOL	“	4,428	123	5	31
OK4U	1.8	27,724	526	7	51
(OP: OK1TP)					
*OK2MBP	A	941,346	1400	94	340
*OL5Y	“	927,639	1010	96	327
*OK1LRD	“	500,118	1203	70	251
*OK2BRX	“	204,300	505	55	172
*OK2VK	“	176,736	519	54	170
*OL2A	“	146,041	441	50	167
(OP: OK2PEM)					
*OK1DKR	“	143,360	390	61	195
*OK1HEH	“	138,483	500	47	176
*OK7N	“	129,800	328	67	169
*OK2TS	“	122,946	375	47	139
*OK1UKY	“	97,900	394	50	170
*OK1BR	“	84,700	344	37	117
*OK2BB	“	83,328	296	42	126
*OK2DIK	“	77,688	311	35	121
*OK2TP	“	62,410	279	31	127
*OK1NYD	“	62,328	209	42	117
*OK4D	“	59,055	327	30	97
(OP: OK1MGJ)					
*OK1BLU	“	54,108	292	36	131
*OK1JCB	“	39,783	150	49	100
*OK1BJ	“	32,382	166	37	89
*OK1MJA	“	29,889	231	22	101
*OK2HF	“	28,160	123	36	74
*OK2WKW	“	28,026	118	34	47
*OK1TK	“	25,792	169	25	79
*OK1DVA	“	24,440	161	25	79
*OK1DXW	“	21,301	150	31	88
*OK2VIR	“	21,294	161	28	89
*OK2BRQ	“	21,094	173	19	87
*OK2MTB	“	21,018	119	33	80
**OK1HRD*	*“*	*19,776*	*138*	*31*	*72*
*OK3TV	“	16,892	115	29	74
*OK3MAT	“	16,296	148	18	66
*OK2ABU	“	10,974	109	22	71
*OK2HBR	“	10,521	182	13	50
*OK3FLY	“	9,504	94	28	60
*OK1PFM	“	3,196	54	16	31
*OK2BJ	“	3,053	33	18	25
*OK1TVL	“	1,638	50	12	27
*OK1MGA	“	760	53	12	28
**OK4NN*	*“*	*480*	*12*	*7*	*8*
*OK1LO	28	16,701	134	16	41
*OK1CSM	“	15,458	108	19	40
*OK1MDK	“	3,348	38	11	20
*OL5G	“	216	12	3	3
*OK1CLD	21	53,350	243	24	73
*OL9M	“	27,229	179	16	57
(OP: OK1MMN)					
*OK2BZE	14	62,832	328	29	90
*OK1FUK	“	9,728	106	17	47
*OK1FRO	“	1,053	33	6	21
*OK7R	3.7	13,160	351	5	35
(OP: OK1TNM)					

Denmark

OZ11A	A	982,464	1851	81	255
OZ4HQ	“	36,150	189	38	112
OV1RR	“	9,800	68	17	32
(OP: OZ1D)					
OU1E	“	2,550	29	14	20
OZ3BJ	28	63,388	235	23	83
OZ1HHH	“	2,376	36	8	14
(OP: OZ1D)					
OZ7X	14	693,900	2354	36	114
(OP: OZ5KF)					
OZ1D	“	1,222	25	8	18
(OP: OZ1HHH)					
*OZ1KKH	A	108,733	298	55	172
*OZ0JD	“	71,592	478	32	125
*OZ6AGX	“	48,657	271	29	118
*OZ1DYI	“	19,600	136	22	78
*OZ1DAE	“	1,008	28	9	19
*OZ8ZN	“	414	18	8	15
*OZ8ZS	28	20,540	163	16	49
*OZ6MU	“	84	23	10	18
*OZ9V	21	11,200	116	16	48
*OZ4NA	7	25,631	321	13	58

England

M4T	A	1,061,309	2089	83	266
(OP: M0BEW)					
M0MCV	“	683,012	1294	79	282
G1SCT	“	180,170	483	53	162
G0CNN	“	169,970	491	50	180
G3RWF	“	143,978	328	56	137
M0OIA	“	141,154	317	50	128
MX0KBS	“	113,664	389	48	144
M0RBE	“	90,072	314	43	119
M1DNC	“	76,284	287	41	115
G4LKD	*“*	*70,400*	*233*	*45*	*115*
M0CQL	“	57,408	248	40	116
G1EIX	“	49,375	197	38	87
G1IZQ	*“*	*47,124*	*165*	*47*	*79*
M0DSK	“	34,194	171	37	86
G7ONL	“	31,008	233	26	88
G4DBI	“	29,154	202	27	86
M0LTE	“	22,351	150	27	76
M0HHG	“	11,390	153	15	52
G8GNI	“	1,188	38	9	24
G2C	28	92,127	371	28	79
G0DTX	“	57,205	290	20	65
G0BVD	“	6,068	56	12	25
G3ZGC	“	5,848	60	12	22
G9D	21	63,180	300	24	84
(OP: G6NHU)					
M3A	“	36,163	300	13	30
(OP: M0UKR)					
G4WWG	“	25,125	185	17	58
M7O	*“*	*8,427*	*108*	*12*	*41*
(OP: M0VKY)					
M0AQM	14	41,238	425	15	64
M0ORH	“	35,607	275	20	63
G4L	7	31,218	300	17	69
(OP: G4LDL)					
*M1T	A	623,917	1106	79	264
(OP: M0KYB)					
*M0PLX/M	“	559,614	993	80	286
*G9P	“	406,391	1009	65	228
(OP: M0NCG)					
*G4DDL	“	220,704	581	57	185
*M1VPN	“	218,940	668	52	194
*G1K	“	198,860	588	54	190
(OP: M0RTQ)					
*M0MRP	“	196,200	622	47	178
*M0YKS	“	154,000	364	52	148
*M0MPM	“	146,268	446	50	154
*M0JND	“	135,218	394	49	145
*G4ADJ	“	134,550	427	42	165
*M0KPW	“	132,354	448	42	129
*M4M	“	111,864	344	42	135
*G1HLT	“	110,210	330	44	162
*G0JDL	“	98,452	359	38	125
*G7TYT	“	96,839	322	47	132
*G1PCR	“	85,715	298	41	114
*G8S	“	83,070	320	47	148
(OP: G4IDF)					
*2E0PLA	“	79,373	294	43	118
*2E0IGD	“	74,543	288	43	118
*M0WRE	“	70,517	278	40	111
*2E0LCX	“	64,092	292	36	111
*M0YTE	“	63,960	185	48	72
*G5LSI	“	59,305	209	40	105
*G7H	“	58,065	285	37	110
(OP: G7SYW)					
*2E0TXQ	“	53,655	231	37	110
*G8ZRE	“	52,925	276	32	113
*G0JLF	“	51,100	222	36	104
*G6UBM	“	50,250	206	45	105
*M7ALE	“	45,994	208	32	90
*M0FLF	“	43,232	220	30	82
*M0VSP	“	42,625	197	35	90
*G4WQG	“	41,124	199	26	66
*G8LNR	“	39,894	209	30	92
*M0MNM	“	38,676	174	39	93
*M0SDM	“	38,016	174	36	92
*2E0HUP	“	37,323	199	28	89
*M0JHV	“	35,872	193	31	87
*2E0CVN	“	35,814	242	29	98
*G0UXC	“	31,556	164	26	72
*G7NIB	“	29,640	199	26	69

*2E0EVM	“	27,140	178	31	87
*M7MRX	“	26,352	214	28	94
*G0DDZ	“	25,990	167	31	82
*G3R	“	25,440	156	26	70
					(OP: G0CDA)
*2E1ADT	“	25,194	159	30	72
*G0WJK	“	25,017	219	23	70
*G0UKZ	“	23,129	159	25	76
*2E0KKH	“	22,325	185	27	68
*G2KS	“	21,024	137	30	66
*M0AUG	“	16,072	120	25	57
*G7AER	“	15,958	113	31	70
*M0OXF	“	15,810	154	19	66
*G4CTP	“	14,952	159	18	66
*M0XTY	“	13,760	121	22	64
*M6ENS	“	12,804	98	20	46
*M0VKU	_“_	_12,636_	_77_	_35_	_43_
*2E0GYI	“	9,720	99	20	61
*M6GVP	“	9,520	87	23	62
*G0HDV	“	9,494	108	24	70
*M0HMS	“	8,816	100	19	57
*G4GMS	“	8,024	84	20	48
*G4FFN	“	7,980	63	24	52
*G8FRS	“	7,665	87	20	53
*G5ADY	“	6,360	57	21	32
*M0RNW	“	5,917	61	21	40
*M0XXJ	“	4,232	46	17	29
*2E1BRT	“	4,216	62	20	42
*G5AKB	“	3,894	48	13	20
*M0KNM	“	3,648	54	16	32
*G4BYE	“	3,528	59	17	32
*M0KUK	“	3,358	53	12	34
*M7SNG	“	3,150	40	16	29
*G3SAD	“	3,036	55	13	33
					(OP: G4BYE)
*M0MXX	_“_	_3,000_	_41_	_14_	_26_
*G6MXL	“	2,911	39	14	27
*2E0LHG	“	2,546	27	18	20
*2E0HNG	“	2,236	53	10	33
*G8NVX	“	1,904	37	10	24
*G1HYD	“	1,830	29	16	14
*M0LYB	_“_	_648_	_16_	_12_	_15_
*2E0PTY	“	480	18	10	14
*M0ROZ	“	306	18	4	13
*M0MGZ	“	256	16	4	12
*M6IBH	“	182	15	4	10
*G6AWK/P	“	130	7	4	6
*M0NMA	“	90	5	5	5
*M7TFT	“	54	8	3	6
*M5X	28	23,598	134	19	50
					(OP: G3RLE)
*G3MXH	“	17,765	113	17	38
*G0C	“	15,092	126	14	35
					(OP: G0CER)
*G4AYU	“	9,724	79	16	36
*M0TQR	“	9,700	86	15	35
*M0HLT	“	8,234	83	16	30
*G5TM	“	8,228	86	11	23
*G0ATG	“	8,192	88	11	21
*G4FFY	“	5,921	69	12	19
*M1MLM	“	2,898	48	8	13
*G4PFZ	“	1,220	35	9	11
*G1YOY	“	1,037	27	7	10
*G4OED	21	28,638	215	16	58
*M1TZR	“	27,208	198	15	61
*M3M	“	3,528	66	9	27
					(OP: G3PLE)
*M0VKR	“	1,144	30	6	20
*2E0VCC	14	50,384	381	21	73
*M0ACM	“	19,525	209	17	54
*M5P	“	18,840	298	14	46
					(OP: M5BIR)
*M0ORY/P	“	16,120	214	14	48
*M0PLA	“	14,400	194	13	47
*G0RAH	“	14,340	192	13	47
*G0TKZ	“	11,913	171	10	47
*G4WGE	“	5,043	111	8	33
*G4BEE	“	3,528	52	11	31
*M3WRL	“	1,421	49	6	23
*M0HPF	7	8,268	165	9	43
*M7DUO	“	1,419	58	7	26
_*G0W_	_3.7_	_48_	_5_	_3_	_5_

Estonia

ES0IA	A	39,984	153	50	97
*ES5TVI	A	171,196	504	62	192
*ES6PA	“	76,860	297	43	140
*ES5MEL	“	51,660	195	43	137
*ES6RMR	“	21,364	146	23	86
*ES8TPR	“	5,904	68	23	49
*ES8SX	21	18	2	1	2
*ES1TAR	14	48,654	350	24	78
*ES5RIM	7	1,885	65	4	25

European Russia

District 1

*R1ZM	A	34,013	234	24	89
_*RN1CW_	_“_	_3,960_	_32_	_18_	_26_
*RV1OO	“	3,948	46	15	27
*R1WBU	“	930	22	11	20
*RN1AO	14	255	19	3	12

District 3

R3RZ	A	390,033	958	73	214
RT2H	“	52,038	202	43	134
RZ3DAB	“	18,146	152	24	62
RM2U	“	14,193	96	33	50
RA3BQ	“	9,384	52	28	40
RA3XM	28	208,342	746	34	112
UA3R	“	22,736	296	13	45
					(OP: UA3RC)
*UA3BL	A	543,968	978	84	298
*RC5Z	“	318,396	670	86	252
*RN3DN	“	213,070	503	72	214
*R2OFF	“	63,080	280	31	121
*RA3DQP	“	53,144	287	31	115
*R5AV	“	30,688	182	31	106
*RZ3DOT	“	23,816	85	46	58
*R2ZCA	“	19,795	97	37	70
*RN3FS	“	15,704	88	33	71
*UB5MBA	“	12,180	92	21	66
*RV3YR	“	8,001	57	23	40
_*RD2E_	_“_	_6,032_	_54_	_22_	_36_
*R3LCW	“	3,315	51	15	36
*RA3V	“	2,448	52	14	34
*R2PT	“	2,379	29	13	26
*UA3DSS	“	450	9	9	9
*R3PIQ	28	6,426	77	13	29
*RT5F	21	23,936	181	19	69
*RZ5D	14	9,724	97	16	52
*R5DF	7	2,720	28	14	26
*R5RA	“	1,316	41	6	22
*R3DCY	“	837	22	8	19

District 4

RA4W	A	14,742	108	28	63
R4MM	28	82,390	495	26	81
R4SA	7	81,699	553	25	88
*UA4FDK	_A_	_88,788_	_279_	_52_	_144_
*RN4ZT	“	77,280	250	49	161
_*R4AC_	_“_	_38,220_	_185_	_35_	_105_
*UA4WJ	“	32,639	163	34	93
*UA4FX	“	31,416	191	27	105
*R4PCT	“	28,595	155	37	96
_*UC4Y_	_“_	_22,230_	_132_	_26_	_69_
*RA4FP	“	6,486	46	17	30
*RN4HAB	“	1,505	41	11	24
*UA4WGM	28	20,540	183	18	47
*UB4FFB	14	195	13	3	10

District 6

_RK6C_	_28_	_1,674_	_22_	_13_	_18_
UC7C	7	6,820	110	10	45
*R6KX	A	293,917	519	81	218
*RA6LIS	“	109,335	421	46	151
*R6DCS	“	78,735	407	42	139
*R7AY	“	13,940	62	36	49
*R6DOP	14	4,646	82	10	36
*RC7KY	7	33,666	312	21	72
*R7NP	3.7	4,794	102	8	39
*RA7KX	1.8	8,003	174	8	45

District 9

*RA9FEL	21	20,838	213	14	55
*UA9FGJ	“	18,286	150	20	62

European Turkey

TA1API	A	55,568	217	40	111
*TA1BX	A	75,545	533	27	118
*TA1AQW	“	1,155	31	10	25
*TA1MK	14	8,944	150	9	43

Faroe Islands

_OY1OF_	_A_	_6,540_	_69_	_17_	_43_
*OY1R	7	8	2	2	2

Fed. Rep. of Germany

DM6V	A	6,035,036	4709	134	440
					(OP: DL7FER)
DL2CC	“	2,677,106	2606	111	346
DL4ZA	“	694,784	1178	82	286
DL5RMH	“	619,320	1033	90	300
DH1UK	“	561,260	771	89	291
DJ4MO	“	430,950	664	85	240
DG1IU	“	343,100	644	75	217
DL2LBK	“	273,564	455	74	232
_DK3TA_	_“_	_203,252_	_579_	_58_	_186_
DH2RTW	“	198,450	489	64	181
DK9BM	“	188,436	530	55	191
DD7UW	“	177,712	551	53	179
DL3AO	“	170,772	331	72	156
DL8UI	“	144,928	274	74	150
DL4ABR	“	126,801	361	49	144
DH2MI	“	123,556	327	48	110
DB5SM	“	113,184	448	48	168
DJ8FR	“	97,608	260	46	122
DL7PIA	“	95,918	316	57	142
DK6CQ	“	93,766	245	51	122
DL6DVU	“	80,704	219	54	154
DL5AWE	“	79,459	299	45	136
DL7ZZ	“	79,292	364	36	136
DL5PIA	“	76,368	291	52	120
DK0UU	“	75,816	309	44	112
					(OP: DG7HL)
DG1YBN	“	73,566	256	48	135
DJ3ABC	“	69,774	189	59	115
DF6RI	“	58,050	252	39	111
DL5NSM	“	53,940	202	45	110
DC1OA	“	43,758	204	38	115
DK3QZ	“	41,850	166	26	64
DK4RL	“	40,170	141	40	90
DL6NAV	_“_	_40,120_	_172_	_31_	_87_
DJ2IA	“	31,017	111	47	100
DL0AH	“	29,887	120	45	76
					(OP: DG5YHE)
DF6QE	“	27,141	113	42	67
DD1TT	“	26,555	124	41	72
DD8PU	“	21,624	140	29	77
DB3FS	“	19,491	144	28	61
DK0SU	“	17,577	125	23	70
					(OP: DF7SA)
DL2JST	“	9,867	96	21	48
_DL7CO_	_“_	_9,315_	_74_	_25_	_56_
DL8DSL	“	8,250	45	29	37
DL1MPR	“	7,740	50	26	34
DL6SBD	“	7,526	63	26	45
DK1FW	“	6,050	47	19	36
DL4JY	“	3,150	38	15	20
DG5DH	“	2,107	29	22	27
DO1MQ	“	1,782	22	14	19
DF5BX	“	360	12	7	8
DM0Y	28	466,892	1382	33	118
					(OP: DL3BQA)
DL3LAB	“	12,048	98	15	33
DG3NCZ	“	1,305	26	9	20
DM0A	14	498,400	1760	36	104
					(OP: DK4EE)
DL9LM	“	10,251	128	14	53
DB3FJ	7	21,600	260	13	62
DL5RU	“	13,416	134	15	63
DL2VIW	1.8	1,920	66	5	27
DL2DSA	“	1,595	80	4	25
DK3AX	“	88	9	3	8
*DP5P	A	783,955	1165	86	315
					(OP: DL1MHJ)
*DL8UV	“	428,400	712	85	265
*DF3IS	“	341,264	654	62	215
*DC2AN	“	324,898	631	72	250
*DG5MLA	“	307,134	605	72	230
*DO1KRT	“	267,488	657	50	158
*DF4SR	“	170,407	475	55	184
*DL1EHG	“	164,318	464	48	146
*DF6QC	“	164,032	501	58	175
*DL0NG	“	160,930	420	57	152
					(OP: DK8NC)
*DJ4WT	“	152,559	413	53	154
*DL7VX	“	141,702	453	49	177
*DL7NV	“	141,581	399	55	156
*DL2NEA	“	139,965	404	59	156
*DL8ULO	“	134,194	448	47	182
*DK6QW	“	114,124	246	64	142
*DK2BO	“	111,853	314	51	152
*DL2RPN	“	108,605	361	49	154
*DL3DRN	“	106,774	354	53	144
*DL1SDX	“	101,332	300	50	138
*DL0RUS	“	100,254	276	53	101
					(OP: DJ2QV)
*DK3YD	“	99,645	281	50	145
*DH8DR	“	98,496	327	46	125
*DM6EE	“	97,271	319	55	156
*DH6BH	“	93,577	250	54	127
*DO1IBJ	“	86,565	273	40	105
*DJ5NJ	“	82,820	249	54	110
*DL9HB	“	79,170	251	46	128
*DN4CQ	“	77,440	277	47	129
*DD3JN	“	76,608	298	37	134
*DH3SBB	“	70,115	238	50	135
*DM5TM	“	68,952	252	47	122
*DJ3GE	“	65,552	205	40	96
*DL2GMI	“	64,944	252	36	96
*DH9DX/P	“	63,300	253	40	110
*DF2FM	“	62,884	217	44	114
*DL9PKW	“	62,832	288	37	117
*DB4LI	“	61,138	221	42	112
*DL1RTO	“	59,008	211	39	89
*DK0BM	“	56,834	340	40	117
					(OP: DK7CH)
*DG1RS	“	50,355	247	36	99
*DB4LL	“	49,266	242	39	114
*DO1SSB	“	47,619	327	30	87
*DL7UHD	“	46,136	205	40	106
*DL8LDN	“	45,402	194	41	100
*DK2TX	“	45,240	186	32	72
*DK1TS	“	44,979	195	39	102
*DM2AWM	“	44,044	198	39	104
*DL1MKW	“	43,624	200	36	97
*DO7OO	“	43,335	217	30	77
*DJ3IV	“	43,030	147	47	83
*DL7KJ	“	40,320	210	34	92
*DM5CQ	“	40,171	173	38	101
*DL1YTT	“	39,182	188	42	101
*DF9IX	“	38,586	179	33	85
*DL8ZAJ	“	38,135	178	38	107
*DG3BZ	“	37,979	185	43	120
*DL1VJL	“	35,282	118	43	75
*DL1TV	“	33,235	203	28	87
*DB3MI	“	33,012	196	33	98
*DB4OS	“	32,725	168	37	82
*DO9YY	“	29,988	167	27	75
*DA9L	“	28,730	158	26	59
					(OP: DO1BEN)
*DO8JL	“	28,512	109	35	64
*DL1AG	“	28,184	152	31	73
*DB5ZF	“	26,910	204	28	87
_*DC5AQ_	_“_	_26,795_	_145_	_34_	_81_
*DL4NWM	“	26,741	150	31	90
*DK9TF	“	26,398	130	39	95
*DK4KH	“	26,200	136	32	68
*DL7NY	“	25,970	147	29	77
*DG7AK	“	25,404	150	33	83
*DK1TBL	“	25,252	135	31	76
*DM3AW	“	25,056	127	30	66
*DF4WO	“	24,780	156	32	86
*DL7VRG	“	23,000	133	33	92
*DO3ME	“	22,742	140	26	57
*DO1FPT	“	22,338	143	28	74
*DK8PL	“	21,120	153	31	89
*DB1RUL	“	21,074	114	27	55
*DK1FY	“	20,952	121	30	78
*DG0DM	“	20,910	136	32	70
*DL1GO	“	19,838	151	29	80
*DL8SDC	“	19,158	120	25	37
*DD1ZA	“	18,837	142	23	68
*DM2DLG	“	17,985	160	27	82
*DL1THR	“	17,784	152	31	73
*DL8MV	“	16,352	116	33	79
*DK1MI	“	16,154	95	26	56
*DG7DBR	“	15,900	153	26	74
*DL4SHE	“	15,747	93	32	55
*DG3NAB	“	15,576	164	19	69
*DL6CWM	“	15,308	102	27	59
*DL1KP	“	15,215	113	24	61
*DG7FBB	“	15,141	96	28	75
*DO6CH	“	14,792	99	27	59
*DJ9CN	“	14,774	102	24	59
*DG1YHP	“	14,685	122	22	67
*DL6RG	“	14,448	117	29	57
*DG9FBA	“	14,352	112	21	57
*DJ0MA	“	14,110	134	21	62
*DO2ACR	“	13,715	92	22	43
*DC6GF	“	13,612	111	24	58
*DL7RBA	“	12,920	145	24	71
*DK3YB	“	12,642	95	27	71
*DL1FMG	“	12,403	101	27	52
*DA9A	“	12,348	80	22	41
					(OP: DO1NPF)
*DG6DAF	_“_	_12,243_	_69_	_29_	_48_
*DL3MB	“	11,457	114	18	49
*DL1JGG	“	10,956	129	19	64
*DL2MM	“	10,556	76	21	37
*DK5KF	“	9,867	123	14	55
*DL9TU	“	9,490	91	27	46
*DG1DPN	“	9,317	98	20	57
*DL9ZWG	“	9,184	88	22	60
*DL1WMF	“	8,162	82	21	56
*DL2OO	“	8,080	86	25	55
*DH9BAJ	“	7,772	76	21	46
*DL7FUA	“	7,038	46	22	29
*DL5BL	“	6,887	52	28	43
*DL3OH	“	6,882	47	25	37
*DJ7NT	“	6,554	76	17	41
*DM4OLC	“	6,370	89	17	48
*DB2ZJ	“	5,767	75	22	51
*DO2LYB	“	5,764	69	12	32
*DF8UO	“	5,450	49	16	34
*DK9MOS	“	5,396	61	22	54
*DK9ZE	“	5,248	65	20	44
*DO5MN	“	5,226	58	13	26
*DO1HGS	“	5,073	58	15	42
*DO7UWE	“	5,000	52	16	34
*DO9JOC	“	4,628	62	14	38
*DL9MFY	“	4,625	50	16	21
*DL2MFR	“	4,576	54	18	34
*DK4EF	“	4,425	52	20	39
*DG7SCB	“	4,292	59	16	42
*DF6NI	“	4,088	38	23	33
*DL9UW	“	4,000	48	17	33
*DO5RBB	“	3,984	70	10	38
*DL7UN	“	3,835	54	19	40
*DC7SEP	“	3,816	47	18	35
*DL5CV	“	3,685	68	13	42
*DO9HN	“	3,360	47	16	32
*DL4XT	“	3,306	48	13	25
*DL9SP	“	3,264	40	18	30
*DB8SM	“	3,264	50	15	36
*DG3DJ	“	3,198	46	12	29
*DB4RG	“	3,196	27	22	25
*DO8ZB	“	3,159	45	15	24
*DL1ZB	“	3,087	49	17	32
*DO2MAV	“	3,042	32	17	22
*DO1LPH	“	2,736	38	14	22
*DL1STV	“	2,700	49	13	32
_*DB9RZ_	_“_	_2,698_	_38_	_15_	_23_
*DO1SLB	“	2,691	39	15	24
*DM8FW	“	2,419	35	15	26
*DJ9MA	“	2,392	69	12	40
*DO1TOM	“	2,336	78	5	27
*DK9OS	“	2,300	47	12	34
*DG1SR	“	1,968	36	14	27
*DO6GT	“	1,700	39	10	24
*DM3KC	“	1,650	40	10	23
*DK2PC	“	1,519	48	7	24
*DO1FZL	“	1,512	46	12	24
*DL5KCI	“	1,476	22	16	20
*DL2WWM	“	1,353	43	12	29
*DO4MTB	“	1,288	27	8	15
*DP6C	“	1,221	39	5	28
					(OP: DL7FP)
*DL6DJ	“	1,147	35	11	26
*DF2ET	“	1,118	34	6	20
*DL7FP	“	1,054	37	5	26
*DJ3TH	“	1,050	23	14	16
*DO1HKL	“	1,020	32	11	19
*DR100RY	“	957	49	5	24
					(OP: DB8AH)
*DF1GRA	“	924	22	13	20
*DO5CTH	“	910	26	9	17
*DL9FB	“	783	27	7	20
*DO8MMO	“	735	21	8	13
*DO1NSB	“	720	16	9	11
*DL1AWC	“	650	22	7	19
*DO5JH	“	648	25	9	15
*DM4KR	“	630	21	11	19
*DO1TKL	“	600	26	7	18
*DN2TN	“	550	22	6	16
_*DC7MF_	_“_	_459_	_15_	_7_	_10_
*DH8MHY	“	400	20	7	13
*DH6BAI	“	391	21	8	15
*DO7BM	“	360	14	7	13
*DL2FED	“	300	13	9	11
*DL5DTG	_“_	_162_	_6_	_4_	_5_
*DB4SCW	“	121	11	5	6
*DL9GK	28	52,380	231	22	68
*DK1KW	“	34,275	200	22	53
*DK4IO	“	30,940	164	22	48
*DH0GDS	“	28,356	177	20	48
*DH1PAL	“	21,840	101	23	68
*DL2RZG	“	21,560	129	21	49
*DL2LDE	“	14,272	94	20	44
*DL6NCY	“	12,626	80	21	38
*DF7LS	“	7,008	64	17	31
*DL6EZ	“	5,440	64	12	22
*DM3TB	“	3,914	39	15	23
*DL9ZBN	“	2,940	50	10	25
*DB8AH	“	1,827	33	10	11
*DL3KDP	“	1,240	22	8	12
*DB6YC	“	935	20	8	9
*DG1BQC	“	780	17	8	12
*DO1NPX	“	189	9	4	5
*DH2WA	“	128	7	3	5
*DL1SBF	“	77	6	3	4
*DO2MZ	“	8	2	2	2
*DO1OTW	21	79,326	349	26	87
*DL9ZP	“	54,611	282	24	73
*DO1FDK	“	39,285	220	26	71
*DO3UW	“	26,076	173	21	61
*DL5KUD	“	16,456	126	17	51
*DL1LSW	_“_	_4,794_	_60_	_14_	_33_
*DO1TLP	“	224	19	6	10
*DO6AN	“	132	10	4	7
*DO9ABC	“	24	3	3	3
*DL3BWF	14	18,343	152	22	61
*DL7BTW	“	2,135	53	7	28
*DG6SBO	“	1,368	41	9	27
*DL9GWA	“	1,350	44	6	21
*DB1VQ	“	855	20	7	8
*DG6SCP	“	682	23	6	16
*DH1DH	“	100	10	4	6
*DB1SEM	“	2	1	1	1
*DL2NY	7	874	44	3	20
*DJ7GS	3.7	10,455	221	7	44
*DJ4DN	“	4,998	119	5	37
*DO6NI	“	4,218	134	4	33
*DO7EP	“	1,368	68	4	20
*DO1SBS	“	18	6	2	4
*DL1HSI	1.8	330	26	2	13
*DM2BPG	“	247	27	4	15

Finland

OH5BM	A	1,584,008	2192	121	388
OH2PQ	“	909,030	1092	115	356
OH1VR	“	516,738	801	97	329
OH2BA	“	362,950	621	83	267
					(OP: JK3GAD)
OG2X	“	194,916	614	55	167
					(OP: OH2RM)
OH6MSZ	“	96,570	410	42	132
OH1NPM	_“_	_63,293_	_186_	_58_	_109_
OH5NS	“	47,275	210	40	115
OH3JR	“	38,000	101	53	99
OH1XY	“	37,950	129	39	76
					(OP: OH3CV)
OH4UI	“	24,633	101	38	81
OH1RX	“	22,785	87	41	64
_OH3KX_	_“_	_6,262_	_95_	_11_	_51_
OH5NZ	28	14,208	76	21	43
OG6B	“	13,715	108	16	49
					(OP: OH1ZAA)
OG8M	21	507,122	1636	36	118
					(OP: OH8MCT)
OH7BG	“	151,492	976	28	93
OH5ZA	“	1,380	37	7	23
					(OP: OH1ZAA)
OH8X	14	1,019,869	3293	38	129
					(OP: OH6UM)
OH7JL	“	6,499	56	15	52
OH9COG	“	450	19	5	13
					(OP: OH1ZAA)
OH1QX	7	3,276	65	9	30
					(OP: OH1ZAA)
OH3MHA	3.7	1,711	56	4	25
					(OP: OH1ZAA)
*OH9GGY	A	279,984	539	70	234
*OH1NOA	“	178,946	514	49	213
*OH3MM	“	96,515	391	44	155
*OH3UAI	“	71,656	257	44	125
*OH3MZ	“	30,680	210	30	88
*OH5UQ	“	22,698	138	27	90
*OH2BXT	“	18,515	146	26	89
*OH2BR	“	15,750	95	29	61
*OH7UM	“	4,712	56	18	44
_*OH1H_	_“_	_832_	_32_	_10_	_22_
*OH1TS	“	666	40	8	29
*OH5MQ	“	660	19	9	11
*OH3AA	“	210	7	7	7
					(OP: OH2KI)
*OH7CBC	“	80	8	3	7
*OH3MC	21	16,146	131	20	58
*OH3HS	14	6,780	66	12	48
*OH6Z	3.7	416	22	4	22

France

F4HZZ	A	299,556	462	92	222
F6ARC	“	163,685	593	39	56
F4HPX	“	148,645	412	55	162
F4DXP	“	133,472	406	49	145
F4FJZ	“	121,968	330	65	177
F4HGF	“	87,612	400	51	145
F1MLN	“	51,090	175	45	86
F5PCV	“	34,510	152	30	55
F4HNP	“	32,928	148	37	61
F6KAR	“	32,736	194	30	94
					(OP: IZ0HAK)
F6EQZ	“	24,354	127	24	42
F5BTH	“	22,172	105	35	57
F4FNT	“	19,594	138	26	75
F1PNJ	“	18,810	149	26	64
F4JFN	_“_	_7,946_	_62_	_22_	_36_
F4IEH	“	6,708	88	21	57
F4GQP	“	1,634	45	12	31
F5LIW	28	255,915	791	32	89
F4IDC	“	249,240	685	35	99
F5PHY	“	32,164	152	23	63
F4WBL	“	11,590	70	23	38
F1UTB	“	308	10	5	6
F5LBL	21	44,339	223	26	75
F1GFK	7	864	41	6	21
*F4CDR	A	403,650	733	81	264
*F4WDL	“	361,860	642	83	243
*F4DXX	“	305,923	646	62	221
*F4ETG	“	296,250	643	63	187
*F4HRG	“	295,596	690	60	178
*F4BIT	“	287,260	613	66	205
*F5PNI	“	210,786	565	59	199
*F6BQG	“	175,006	389	64	190
*F4CZV	“	172,752	427	60	176
*F4IVC	“	137,800	488	51	149
*F5JU	“	126,801	265	60	159
*F6DRP	“	118,413	412	46	131
*F5IRP	“	98,670	238	54	111
*F5OQL	“	95,691	265	52	115
*F5GGL	“	95,580	212	56	180
*F6FNA	“	92,984	338	49	148
*F4IDT	“	81,324	281	44	118
*F5GN	“	76,791	197	55	124
*F4JBG	“	75,820	250	47	123
*F4GDO	“	71,371	417	29	120
*F4IGP	“	68,850	269	39	114
*F1GKS	“	67,236	269	41	115
*F4IMK	“	62,900	269	36	112
*F5OHH	“	58,353	260	34	125
*F4JJY	“	56,376	158	53	109
*F4IIQ	“	54,378	247	42	129
*F5JME	“	53,397	314	36	117
*F4EKH	_“_	_51,944_	_252_	_37_	_114_
*F4IAY	“	49,800	167	45	105
*TM5G	“	45,402	266	41	100
					(OP: F8TRL)
*F5KLE	“	44,890	226	34	100
*F4KKV	_“_	_43,560_	_141_	_41_	_80_
					(OP: F5RMK)
*F4GLK	_“_	_36,176_	_129_	_42_	_77_
*F5TFW	“	35,346	143	42	95
*F4HQO	“	34,428	120	45	106
*F4DVO	“	29,869	227	27	92
*F1DJE	“	28,602	177	30	96
*F4ADZ	“	27,825	140	35	70
*F1HTU	_“_	_26,784_	_157_	_29_	_79_
*F1JGJ	“	22,213	142	27	70
*F4HPZ	“	19,323	104	34	79
*F1HUM	“	18,868	123	29	77
*F5AGL	“	18,810	106	29	61
*F6LIA	“	18,328	92	38	78
*F4APX	“	17,550	137	21	54
*F4HAQ	“	17,444	109	30	59
*F4IZZ	“	15,048	87	39	75
*F4IAW	“	12,800	116	19	61
*TM90GF	“	11,904	158	25	71
					(OP: F4AHN)
*F4IVI/P	“	9,960	120	20	63
*F5FDC	“	5,900	93	16	43
*F4IDB	“	5,395	70	21	44
*F5MLJ	“	5,330	55	18	23
*F4HRN	“	4,284	55	24	44
*F6GTX	“	2,860	62	14	38
*F4IRV	“	2,728	57	11	33
*F4ANS/P	“	2,632	46	15	32
*F4FTA	“	2,106	30	11	16
*F4JAW	“	2,080	37	10	22
*F4GFT	“	672	23	8	20
*F4JAK	“	616	21	10	18
*F5LMG	“	600	21	8	16
*F5PVJ	“	494	24	6	13
*F4JMJ	“	240	14	11	13
*F/EA2EQW	“	204	10	8	9
*F4HVV	“	133	19	6	13
*F1ICR	28	18,000	138	17	43
*F6API	“	792	28	8	14
*F4EIH	14	110,538	482	34	104
*F4VSD	“	13,053	193	9	48
*F5UGQ	“	4,000	86	7	33
*F4JAB	_“_	_2,451_	_41_	_9_	_34_
*F4WEC	“	588	39	7	21
*F5MGD	7	450	23	4	14

Greece

SV2DSJ	A	696,420	1395	93	272
SV4LGX	“	106,040	344	61	159
SV6JHA	“	68,557	153	61	118
SV8/DK3SJ	“	28,350	92	55	80
SV3SPD	“	16,008	119	28	64
SV8JVH	“	11,502	105	18	36
SV1SQU	“	1,170	15	11	15
SV1PMR	21	558	31	7	11
*SV2HJQ	A	625,872	1406	71	241
*SV2YC	“	354,456	676	77	247
*SV1PMH	“	261,765	602	67	210
*SV1SXV	“	147,420	451	60	192
*SV4SCL	“	111,588	398	48	156
*SV1JFL	_“_	_43,848_	_262_	_30_	_96_
*SV1OCQ	“	43,654	211	41	105
*SV1CEI	“	25,048	94	43	58
*SV2RZJ	“	14,652	128	25	74
*SV1PMZ	“	9,438	97	21	57
*SV1RVI	“	7,381	104	12	49
*SV1CIF	“	7,254	63	27	51

*SV1JDY	“	5,427	53	23	44
*SV2SKD	“	_2,419_	_45_	_13_	_28_
*SV7CUD	“	2,385	33	18	27
*SV1EEM/8	“	2,035	51	17	38
*SV4LQW	“	1,845	41	11	30
*SV1MO	“	792	14	11	11
*SV1AGU	“	20	6	4	6
*SV1AZL	28	6,952	70	17	27

Guernsey

*MUØFAL	28	1,584	30	8	10

Hungary

HA1BC	A	766,035	825	102	333
(OP: DL1MAJ)					
HA2D	“	48,336	359	25	81
(OP: HA9MDP)					
HA5MIG	“	21,186	191	23	76
HA5EA	14	13,440	127	17	53
*HA7AVU	A	51,948	246	33	115
*HA3FHH	“	27,720	116	34	50
*HA5BMS	“	17,280	116	31	65
*HG1VN	“	4,484	58	19	40
*HA8KM	“	2,250	38	14	31
*HA3OOM	“	957	35	8	21
*HG8CK	“	644	35	5	18
*HAØLZ	28	12,720	87	21	39
*HAØVI	7	11,658	184	11	47
*HA8MBM	“	735	53	4	17

Iceland

TF3T	A	2,281,500	3000	99	369
TF1AM	“	251,804	903	56	182
TF8KY	“	151,488	499	46	146
*TF2MSN	A	152,736	339	63	195
*TF3VS	“	41,720	259	29	120
*TF4WD	“	39,325	251	30	113
*TF3JG	“	4,087	60	20	41

Ireland

EI5KG	A	508,284	968	64	188
EI7HDB	“	213,857	515	53	170
EI7FRB	28	154	6	5	6
EI5GUB	1.8	6,525	158	6	39
*EI4GNB	A	697,340	1126	74	266
*EI4KU	“	385,776	743	69	235
*EI3ENB	“	150,096	443	51	185
*EI4II	“	145,665	373	51	144
*EI6IKB	“	40,136	148	41	75
*EI5FQB	“	26,656	135	32	80
*EI7LC	“	22,464	143	32	85
*EI5HZB	“	4,988	57	18	40
*EI3LC	“	4,779	59	20	39
*EI7INB	“	2,847	37	16	23
*EI9IKB	“	1,850	42	10	27
*EI8IOB	28	6	1	1	1
*EI2JIB	14	4,848	133	9	39
*EI9IDB	“	77	9	4	7
*EI9ITB	“	44	8	3	8

Isle of Man

*GDØAMD	A	82,641	342	37	126

Italy

IZ1OSP	A	1,020,740	1661	103	357
I4JED	“	588,924	781	106	263
IU1NKS	“	546,720	876	81	254
I1NVU	“	499,998	628	101	233
IZ6ERS	“	426,504	1033	74	238
IU5GBQ	“	379,600	1119	77	215
IZ2BVC	“	304,912	770	70	253
I4XNN	“	211,616	348	81	191
IU8NKW	“	167,170	617	51	178
IU1FSL	“	152,964	542	58	194
IZ3DVU	“	152,872	306	64	133
IZ1SAI	“	145,530	600	47	163
IU4LEC	“	127,490	308	56	153
IK8NSR	“	89,420	241	58	112
IW2MYG	“	80,850	215	61	149
IZ2ZQP	“	68,445	438	32	85
IZ8EQG	“	56,684	235	37	111
IO4M	“	45,540	201	43	89
IU2IHM	“	41,472	172	41	87
IZ1HHT	“	31,137	148	35	72
IU1QCW	“	30,744	100	44	78
IZ1GRH	“	30,438	105	44	70
IW5DPF	“	24,897	97	40	89
IN3IIR	“	20,250	120	27	108
IK2IKW	“	15,345	87	31	68
IZ1HCS	“	13,923	179	17	74
IK4HPS	“	10,585	114	21	52
IWØBLW	“	8,112	78	15	24
IZ1MLS	“	_7,645_	_59_	_23_	_32_
IZØUIN	“	7,381	102	19	42
I6KIU	“	6,858	51	20	34
IU2LFP	“	5,265	39	27	38
IZ2GMR	“	1,820	20	17	18
IU2LVV	“	176	6	5	6
IZ1DXG	“	32	4	4	4
II3F	28	332,622	910	33	120
(OP: IV3ZYB)					
IZ5EKV	“	70,227	505	17	34
I4AUM	“	68,370	276	26	80
IZ8DSX	“	67,496	236	30	88
IUØPXQ	“	12,826	96	18	35
IU4CSS	“	7,400	61	18	32
IY3A	21	1,030,002	2686	36	123
(OP: IZ3EYZ)					
IO3M	14	257,040	1294	29	107
(OP: IU3PMA)					
IWØHLZ	“	45,220	453	20	65
_II3Z_	“	_44,649_	_274_	_24_	_75_
(OP: IV3JAG)					
IU2JMZ	“	6,264	75	15	21
IU3KMF	“	304	24	5	14
IN3AHO	7	22,099	275	17	60
IK1BPL	“	15,048	195	16	56
IU2JFG	“	7,300	142	9	41
IZ3GJL	3.7	5,808	135	8	40
IU1DOF	“	5,084	136	6	35
*IK7NXU	A	328,490	509	82	225
*IUØDHV	“	313,686	600	80	234
*IK2QLX	“	306,344	545	74	224
*IK2SAR	“	244,314	402	76	218
*IK5AMB	“	244,237	421	76	211
*IZ6BTN	“	236,016	490	65	199
*IZ2BKA	“	215,760	496	59	181
*IZ2OOS	“	204,530	476	64	162
*IN3HKZ	“	_130,830_	_599_	_44_	_166_
*IW3SOA	“	125,130	367	50	144
*IZ1RDQ	“	124,544	335	64	160
*I4VIL	“	123,580	290	54	131
*IU3EDK	“	120,310	343	56	171
*IZ7GLL	“	118,230	325	56	154
*IW1FPK	“	117,465	415	50	141
*IU7EDX	“	114,680	324	51	137
*IW2NBL	“	109,616	414	43	165
*IZ5CMC	“	105,094	347	42	145
*IZ3XNJ	“	97,983	302	48	143
*IU3GJD	“	90,816	357	42	150
*IKØALT	“	87,087	298	48	155
*IU5KRE	“	83,183	267	54	139
*IW2ENA	“	79,348	244	50	116
*IW2LXD	“	77,264	235	53	123
*IK2WXQ	“	69,870	214	48	122
*IK2JTS	“	67,584	341	42	134
*IK2DJY	“	64,080	169	60	120
*IU1HGO	“	62,530	219	48	137
*IWØSAG	“	60,060	233	41	113
*IZ5VTJ	“	59,984	196	52	132
*IK2OFS	“	58,674	204	45	82
*IU1PZX	“	58,512	210	46	113
*IU1OPM	“	58,474	177	55	118
*IV3EHH	“	55,242	185	46	116
*IU3OCN	“	54,776	192	48	119
*I5OYY	“	53,222	136	48	130
*IZ5EKX	“	53,196	167	52	104
*IZ3ZLT	“	52,635	193	41	104
*IK3MLF	“	49,135	151	45	110
*IW3AGO	“	47,278	225	41	113
*IU8JPG	“	_46,816_	_134_	_41_	_92_
*IW8EAS	“	46,575	175	37	98
*IW4CXK	“	46,574	165	43	103
*IZ3PYR	“	46,001	192	41	116
*IWØAEN	“	45,260	170	44	102
*IK2AUK	“	41,734	215	36	118
*IZ8QPA	“	36,234	278	31	91
*IV3EAD	“	36,068	183	32	95
*IU1OLR	“	34,362	159	37	101
*IZ8CZR	“	33,981	169	44	97
*IK3XTT	“	32,144	144	38	60
*IU3MEY	“	31,868	166	37	87
*IK8ARF	“	31,696	143	39	73
*IKØVSY	“	29,211	136	38	69
*IU7GRA	“	29,116	163	37	79
*IZ1DNQ	“	29,104	124	34	73
*IK4XQT	“	29,082	165	32	79
*IN3ENN	“	28,438	147	36	82
*IZ7VII	“	26,973	117	36	75
*IN3RWF	“	26,924	196	32	95
*IZ3GGR	“	24,921	97	42	75
*IV3IPA	“	23,391	125	33	80
*IZ2XCK	“	21,808	166	29	87
*IN3IZO	“	20,424	158	29	82
*IK3XTV	“	19,200	123	33	63
*IW5ELA	“	19,035	97	26	55
*IU2IJD	“	19,005	145	25	80
*I1YGQ	“	17,368	108	31	73
*IU2GGD	“	17,056	78	34	48
*IK4MTF	“	14,245	87	26	51
*IU7MEZ	“	13,056	84	36	66
*IU3BPW	“	_12,852_	_93_	_24_	_44_
*IZ1JII	“	12,376	77	27	41
*IZ3ZOO	“	12,320	108	23	65
_*IB5R_	“	_11,534_	_168_	_18_	_61_
*IU2IQX	“	11,400	56	32	44
*IU3QEU	“	11,004	92	26	58
*IK2YSJ	“	10,455	107	22	63
*IN3MNS	“	10,266	73	22	65
*I2BZN	“	9,960	127	17	66
*IK8RKH	“	8,122	83	19	43
*IZ1BDQ	“	7,469	72	27	50
*IU2OZU	“	6,666	87	16	50
*IK2OLJ	“	6,208	67	20	44
*IN3HVL	“	5,472	87	17	55
*IN3EGC	“	5,440	68	19	45
*IU1HJF	“	_5,133_	_43_	_24_	_35_
*IZ2QCP	“	4,992	50	19	45
*IZ8HUW	“	4,914	55	13	50
*IU2CKU	“	4,544	108	12	59
*IU1MRH	“	4,130	58	20	39
*IK1ZOE	“	4,080	97	17	51
*I2XYI	“	3,905	47	19	36
*IZ6MPZ	“	3,796	48	16	36
*IZ2KWV	“	3,648	54	14	34
*IUØPXM	“	3,520	42	16	24
*IK6FHG	“	3,404	30	19	27
*IU8LUM	“	3,348	56	16	38
*IWØEZW	“	3,312	50	15	33
*IK1HZZ	“	3,145	33	17	20
*IK6VNU	“	2,844	31	18	18
*I2RBR	“	2,170	30	13	18
*IZ1CJZ	“	2,048	22	15	17
*IU1FIB	“	2,001	29	9	14
*IU2IVN	“	1,457	33	11	20
*IN3EJM	“	1,330	30	11	24
*IUØDUM	“	1,260	17	13	15
*IU4PRA	“	1,248	29	13	19
*I1RB	“	1,215	38	17	28
*IU5GKO	“	1,200	20	11	14
*IZ1BPS	“	1,056	20	13	11
(OP: IZ1BPS/IA5)					
*IU4OAY	“	1,020	35	10	24
*IK8YFW	“	910	19	11	15
*IZ1XEE	“	780	13	10	10
*I/DG8MDN/P		“	728	16	11
15					
*IW4CPU	“	665	13	9	10
*IU1PZC	“	630	14	9	12
*IZØTYF	“	575	21	7	16
*IZ8PWN	“	513	12	9	10
*IZ1FRM	“	384	8	8	8
*IN3ADW	“	240	8	5	5
*IU8PWP	“	135	11	6	9
*IU3OUR	“	90	8	3	6
*IZ5OVP	“	32	4	4	4
*IZ8CLM	“	24	2	2	2
*IW2ILQ/P	“	16	2	2	2
*IR4Q	28	94,242	343	29	84
(OP: IU4MRU)					
*IK3SSG	“	30,569	148	26	51
*IX1CKN	“	29,304	184	20	46
*IV3DDN	“	25,429	169	18	41
*IZ1NGZ	“	20,925	130	21	54
*IK8IOO	“	15,252	122	20	42
*IZ1MHY	“	4,619	51	12	19
*IZ5XRC	“	3,267	45	12	21
*IKØSME	“	1,596	42	6	13
*IU7QCK	“	1,320	31	9	15
*IK2AIT	“	851	22	9	14
*IK7RWE	“	600	12	10	10
*IK2LQT	“	528	11	8	8
*IU7PKX	“	154	9	6	8
*IU4PRT	“	36	4	3	3
*IUØNHF	21	80	6	5	5
*IK5VQI	“	_64_	_4_	_4_	_4_
*IQ4JO	14	219,890	1417	27	83
*IU4DAF	“	28,107	242	18	63
*IV3ZNK	“	12,528	96	21	51
*IZØOVW	“	11,988	232	10	44
*IU6AIG	“	4,263	77	7	42
*IZ4XHG	“	2,993	43	10	31
*IU3QNT	“	2,196	47	8	28
*IN3GYK	“	1,890	46	7	28
*IZ2GMT	“	476	20	5	12
*IU1JFH	“	460	17	5	15
*IK1ZNM	“	169	9	4	9
*IZ1GQI	7	23,384	313	15	59
*IZ7NMD	“	14,760	270	12	48
*IU1MRG	“	11,375	134	14	51
*IZ5MMK	“	1,288	36	7	21
*IN3HEZ	3.7	13,932	249	7	47
*IW5ECP	“	4,704	112	6	36

Kaliningrad

RA2F	14	8,060	70	19	43
*UA1OMX/2	A	2,457	35	16	23

Latvia

YL7A	A	540,714	993	85	312
(OP: YL2GM)					
YL2PJ	“	97,152	299	51	141
_YL3CW_	“	_8,388_	_107_	_12_	_24_
YL2SM	28	487,653	1429	35	124
YL2CI	21	276,985	980	34	121
YL2BJ	“	187,128	831	31	107
YL3FT	1.8	28,500	489	9	51
*YL3ND	A	143,349	500	45	168
*YL2NK	“	32,964	228	26	108
*YL3GY	“	25,134	166	32	86
*YL3ANB	“	5,670	63	16	38
*YL5W	28	81,740	335	28	94
(OP: YL2GN)					
*YL2LW	21	32,121	251	18	65
*YL3ANT	“	486	17	6	12
*YL2UH	14	6	1	1	1

Lithuania

LY2MM	A	520,367	935	87	292
LY3CY	“	91,517	378	36	137
LY2BIS	14	14,960	274	10	45
LY1M	7	4,120	89	7	33
*LYØNAS	A	58,720	318	32	128
*LY2EW	“	53,048	329	31	121
*LY4MP	“	8,658	97	21	53
*LY1LP	“	1,512	58	7	29
*LY9A	“	8	2	2	2
*LY5GT	3.7	16,165	308	7	46
*LY3NX	“	7,452	204	4	32
*LY3DA	“	12	3	2	2

Luxembourg

*LX1GQ	A	155,232	466	58	173

Moldova

*ER1JA	A	145,886	636	35	146
*ER1MM	“	3,744	42	20	32

Netherlands

PC2T	A	1,096,980	1297	98	291
PA3CJP	“	82,641	303	44	119
PAØMIR	“	60,705	249	47	124
PA4DN	“	55,650	248	44	115
PE1LUB	“	_36,059_	_138_	_40_	_67_
_PA9JO_	“	_27,621_	_179_	_29_	_70_
PA1NHZ	“	3,388	53	13	31
PA3J	“	2,773	49	12	35
*PD1AT	A	242,627	549	69	184
*PA3EOU	“	188,370	570	55	179
*PD5ML	“	187,660	455	55	165
*PD3RL	“	159,099	490	44	137
*PD5ISW	“	103,194	397	43	119
*PAØCT	“	102,627	331	48	141
*PH5M	“	90,643	304	48	113
*PA3MET	“	_85,461_	_345_	_42_	_141_
*PE1OBL	“	79,092	268	49	120
*PA1VS	“	76,639	296	44	129
*PD7V	“	67,596	279	34	97
*PE1KWH	“	51,125	195	39	86
*PD1TV	“	49,088	264	28	90
*PH2A	“	45,672	213	38	94
*PA2CVD	“	42,900	266	29	103
*PA7TG	“	40,141	194	37	100
*PA7J	“	36,080	197	28	82
*PD1ABO	“	28,227	221	21	76
*PC4AD	“	23,670	133	29	61
*PAØPIW	“	_22,713_	_208_	_24_	_89_
*PA2VS	“	22,310	204	23	74
*PA3DTR	“	20,097	123	32	67
*PC4J	“	18,240	114	25	55
*PE1LDS	“	17,848	175	19	73
*PD6Z	“	17,848	153	25	67
(OP: PDØHF)					
*PA9X	“	17,702	120	33	73
*PA3ARM	“	13,861	104	25	58
*PA3CXB	“	13,818	111	27	67
*PA3DBS	“	12,220	92	20	32
*PEØCWK	“	12,160	96	23	53
*PA3EQN	“	_12,150_	_146_	_16_	_59_
*PDØAG	“	11,680	145	18	62
*PBØACU	“	11,388	114	20	58
*PA3EWG	“	10,336	101	22	54
*PA3GEO	“	7,740	64	21	39
*PE1MCF	“	7,210	92	19	51
*PD7LJ	“	7,198	66	17	44
*PE4I	“	5,723	78	16	43
*PD2GSP	“	5,335	49	22	33
*PA3HLE	“	5,029	39	20	27
*PD2HSB	“	3,552	77	12	36
*PA1VD	“	2,888	50	11	27
*PD4V	“	2,808	26	15	24
*PD4BER	“	2,632	54	10	37
*PDØLFJ	“	1,862	53	8	30
*PE2D/P	“	1,176	30	8	20
*PDØWVB	“	899	28	9	20
*PA3CVR	“	384	21	6	18
*PD1TOM	“	368	9	8	8
*PD1AK	28	828	14	11	12
*PDØMGX	14	9,396	136	13	41
*PD1ANB	“	946	47	4	18
*PD5ANT	“	408	26	4	13
*PA1JN	“	156	12	3	10
*PA3FIW	7	882	49	2	19
*PA3HCB	“	9	3	1	2

North Macedonia

Z33B	A	44,484	241	36	96
Z35Y	21	7,956	118	11	40
*Z35W	A	495,830	987	86	272
*Z35K	“	67,424	212	48	148
*Z35O	“	60,164	198	49	120
*Z34PEC	“	19,838	139	24	67
*Z32ZZZ	“	12,533	119	17	66
*Z33F	21	9,519	99	15	42
*Z35U	7	31,950	253	17	73

Northern Ireland

MI1A	A	130,530	403	51	178
(OP: MIØULK)					
*MIØJZZ	A	132,354	388	44	127
*GI7NKK	“	86,086	365	38	116
*MIØOBC	“	32,712	204	31	85
*MIØDWE	“	4,750	53	18	32
*2IØWMN	“	988	28	8	18

Norway

LA3BPA	A	476,354	802	78	304
LC5C	“	171,587	743	35	162
(OP: LA6KOA)					
LA7VK	“	30,600	181	29	91
LB3AG	“	6,400	43	28	36
LA1AAA	“	4,240	52	18	35
LA6OP	21	52,750	245	27	98
LAØGE	14	36,764	296	20	71
LC9S	“	7,052	160	7	36
(OP: LA9GSA)					
_*LA2AB_	_A_	_256,688_	_807_	_59_	_204_
_(OP: LB4UH)_					
*LA9TY	“	226,045	494	61	204
*LA1XFA	“	222,031	493	59	180
*LA3RNA	“	46,664	219	35	117
*LA7TN	“	43,014	274	30	104
*LB4YI	“	28,782	205	35	82
*LBØHI	“	_4,560_	_42_	_24_	_36_
*LC7D	“	3,024	53	12	36
(OP: LA6PBA)					
*LA5ELA	“	_680_	_24_	_14_	_20_
*LB4MI	“	660	22	7	15
*LBØGI	“	580	16	13	16
*LA9WDA	28	18,020	129	12	41
*LB1R	“	1,566	34	9	20
*LA8RTA	14	1,127	53	4	19
*LC9X	1.8	5,655	163	5	34
(OP: LA9XGA)					

Poland

SQ3WW	A	215,783	484	65	212
SP1JQJ	“	143,040	445	46	146
SP5ICS	“	84,711	284	44	143
SP9SDR	“	63,954	237	46	125
SN8V	“	49,455	222	42	115
(OP: SP8HPW)					
SP9CLO	“	43,307	259	28	99
SO5N	“	33,282	184	36	93
(OP: SP5BMU)					
SP6JZL	“	31,892	120	42	92
SP8BQL	“	10,147	79	24	49
SP6CES	“	54	3	3	3
SP8ARY	28	26,460	114	30	60
SP7VTQ	“	5,088	36	20	28
SP7IIT	“	2,618	29	14	20
SP9LAW	21	65,190	268	29	77
SQ9DXT	“	8,968	97	15	44
SP9JBE	“	7,668	75	13	41
SP9MAT	14	65,817	491	24	79
SP4LVG	7	120,524	918	25	91
SP6A	3.7	10,700	241	6	44
SP9TPZ	1.8	4,000	100	7	33
*SP9DTE	A	415,373	720	78	265
*HF9F	“	402,732	875	72	252
(OP: SQ9LPO)					
*SP5UFK	“	395,927	799	79	268
*SP6VWX	“	307,515	716	57	228
*SN7R	“	280,525	1173	44	185
(OP: SP7RFF)					
*SQ3HLB	“	202,876	399	70	198
*SP3GTP	“	180,632	500	60	208
*SP2GMA	“	170,478	498	53	178
*SP8CHI	“	161,397	424	59	178
*HF9E	“	160,230	437	62	183
*SP3BKR	“	152,131	585	47	164
*SQ9ITH	“	131,556	265	76	152
*SP5TE	“	131,250	404	53	157
*SP2JFY	“	126,336	399	52	172
*SP9BMH	“	123,984	382	48	168
*SP2TMT	“	119,900	289	58	162
(OP: SQ2BNM)					
*SP2GCE	“	118,405	401	47	152
*SP9ADG	“	106,981	378	60	157
*SP5DRE	“	99,345	344	45	134
*SQ6POC	“	95,996	313	50	156
*SP9GMI	“	77,714	307	48	134
*SQ5DTL	“	65,620	204	47	123
*SP4SP	“	64,592	297	47	129
*SP3LM	“	64,413	276	40	113
*SP9ODM	“	61,152	300	33	123
*SQ9IAB	“	60,750	263	40	110
*SO5WD	“	58,934	307	36	122
*SQ4CTS	“	55,536	327	30	126
*SP8CGU	“	55,335	239	32	87
*SP6DHH	“	47,652	221	33	99
*SP9FMP	“	46,046	221	39	122
*SP5X	“	45,780	219	34	106
*SQ2TAC	“	45,300	227	38	112
*SP4AAZ	“	42,280	216	34	117
*SQ2ZE	“	41,540	224	33	101
*SP1DMD	“	39,431	165	42	89
*SP2MHS	“	37,466	232	30	101
*SP9MKG	“	37,448	221	33	91
*SP5ALV	“	37,398	170	42	96
*SP5ENG	“	35,242	225	30	104
*SP2ROC	“	33,516	142	39	75
*SP9TS	“	32,900	200	25	69
*SP7LK	“	32,184	226	22	86
*SQ3IOE	“	_29,618_	_191_	_27_	_91_
*SP9QBA	“	28,792	218	25	97
*SP9R	“	28,512	202	27	72
(OP: SP9BRP)					
*SP1GDK	“	25,840	108	38	57
*SQ7OTK	“	25,625	139	39	86
*SQ8NT	“	25,620	182	26	96
*SP5TM	“	24,625	153	33	92
*SP5BOT	“	23,421	158	30	81
*SP4DDS	“	23,188	177	26	98
*SP9IHP	“	19,920	82	31	52
*SP9ALZ	“	17,480	142	25	70
*SQ8T	“	16,112	119	27	79
*SP8MRD	“	_15,975_	_103_	_24_	_47_
*SP2AWJ	“	15,360	107	25	71
*SP1ETT	“	14,578	191	14	60
*SP2JJD	“	13,974	139	25	77
*SQ3DQ	“	13,746	123	20	59
*SO6MZ	“	13,200	87	30	70
*SP2TQQ	“	12,096	118	22	62
*SP5BYC	“	10,030	70	24	35
*SP8BOZ	“	9,918	99	24	63
*SP9TL	“	9,648	116	16	51
*SN3N	“	9,600	99	19	56
(OP: SP3ATB)					
*SP4SAF	“	9,417	108	17	56
*SQ8MXC	“	8,811	90	21	68
*SQ5CZN	“	8,611	61	28	51
*SP2HSA	“	7,590	70	21	45
*SP4DIR	“	6,784	106	15	49
*SQ7NPA	“	6,336	35	29	35
*SP5ETS	“	5,246	80	16	45
*SP3MKL	“	4,410	58	14	35
*SP8VGA	“	3,776	77	13	46
*SP2UKG	“	3,172	49	14	38
*SP4HXV	“	2,964	49	15	37
*SP9BB	“	2,790	42	14	31
*SP9ODU	“	2,115	29	19	28
*SQ7WOJ	“	1,591	40	10	27
*SP9GZW	“	1,554	55	8	29
*SP3UCW	“	1,470	26	13	22
*SP3FSM	“	1,240	22	14	17
*SQ6PA	“	1,189	31	11	18
*SP3BES	“	800	16	12	13
*SP3OLO	“	575	23	7	16
*SQ6ILH	“	510	12	8	9
*SP2ADY	“	_408_	_12_	_5_	_7_
*SP3RAT	“	377	26	9	20
*SP9EXE	“	144	10	6	6
*SP8IOV	“	30	3	3	3
*SP8IMG	28	134,160	461	31	99
(OP: SP8MG)					
*SP6JOE	“	98,496	387	29	85
*SP3LWP	“	84,825	316	30	87
*SP8UFT	“	71,980	235	31	91
*SP8UZJ	“	52,060	236	27	68
*SP9SSD	“	8,428	75	17	32
*SQ9MEE	“	7,546	72	17	32
*SQ5AAG	“	5,863	67	15	26
*SP9Z	“	3,180	42	13	17
*SP8D	“	2,970	41	14	16
*SP3CMX	“	2,400	52	8	24
*SP7VVB	“	1,380	20	10	13
*SP9TTT	“	945	19	8	13
*SQ2EEQ	“	48	6	3	3
*SP3W	21	33,196	201	19	67
*SQ9BDB	“	20,435	169	16	51
*SP9HZW	“	19,368	127	18	54
*SP8AR	“	9,782	70	19	48
(OP: SQ8BGR)					
*SP4MPA	“	8,925	85	13	38
*SQ8AL	“	8,062	78	15	43
*SN7O	“	7,920	79	11	37
(OP: SP7IVO)					
*SP6EUA	“	5,504	80	10	33
*SP2GTJ	“	_4,633_	_47_	_14_	_27_
*SQ5SUL	“	3,154	51	10	28
*SQ8MZW	14	34,000	345	18	62
*SQ8W	“	16,368	174	14	52
*SP3QFZ	“	7,632	106	10	43
*SP2GR	“	6,762	118	9	40
*SP3BAH	“	5,382	107	9	37
*SQ9ZAY	“	4,446	63	9	29
*SQ7BTY	“	3,393	65	9	30
*SP9DLS	“	3,268	83	6	32
*SP3DRM	“	2,379	36	10	29
*SP7MJL	“	2,310	50	8	27
*SO1MK	“	1,175	34	5	20
*SQ2DYL	“	651	25	4	17
_*SP3PW_	“	_475_	_27_	_5_	_14_
*SP9MIG	“	399	23	4	15
*SP4JKK	“	_342_	_18_	_6_	_13_
*SQ9B	“	40	8	3	7
*SP4CUF	7	30,954	365	14	63
*SP9NSJ	“	7,150	140	7	43
*SQ7LQJ	“	2,272	65	8	24
*SP8GK	“	1,380	55	5	25
*SP3DFB	“	836	38	4	18
*SP9MUF	“	63	7	4	5
*SP3QDX	“	40	9	3	5
*SQ8NGV	3.7	28,842	561	8	49
*SP4SHD	“	22,176	327	10	53
*SQ9MR	“	16,472	303	9	49
_*SP6DZ_	“	_4,477_	_117_	_4_	_33_
*SP6LUV	1.8	26,255	467	9	50
*SNØR	“	19,822	395	7	46
(OP: SQ9IAU)					
*SQ8MFM	“	12,691	294	6	43
*SQ9PPT	“	315	26	3	12

Portugal

CT2HUK	_A_	_62,034_	_284_	_40_	_107_
CT1EBM	“	40,296	166	44	102
CT1BWO	“	4,620	40	20	22
CT1FJW	“	54	3	3	3
CR6E	28	40,950	234	16	59
(OP: CT7AIX)					
CT7AQS	“	35,392	208	19	45
CQ7P	21	252,180	1448	27	81
(OP: CT1BOP)					
CT7AUP	14	82,950	535	23	82
CR6T	7	848,318	3210	33	118
(OP: CT1ESV)					
CT1AL	“	2,800	64	8	27
CT1EKD	3.7	19,520	210	11	53
*CS7AWL	A	151,844	460	49	154
*CT2JBD	“	39,100	223	33	82
*CT2KNA	28	277,405	1352	26	83
*CT7AOL	“	15,088	85	20	62
*CT7/ HB9AAP	14	20,584	210	18	65
*CT2HKY	“	616	30	5	17
*CT1ENI	“	_24_	_2_	_2_	_2_

Republic of Kosovo

Z62NS	A	599,654	1225	60	221
Z61DX	“	133,308	621	36	102
*Z66BCC	1.8	100	10	3	7
(OP: DO2XX)					

Romania

YPØC	A	1,779,138	2684	97	326
(OP: YO3CZW)					
YO8SBQ	“	917,184	1576	97	311
YO8BDW	“	855,646	1367	101	317
YO3RU	“	775,376	1360	87	281
YO3GNF	“	345,153	727	73	236
YO7CJB	“	175,296	491	55	194
YO2AA	“	98,235	316	45	140
YO7IIY	“	81,939	314	47	144

YP3A	28	165,300	787	29	87
					(OP: YO3IMD)
YO2LEL	“	16,896	102	19	45
YO2SH	14	19,684	171	17	59
*YO7SR	A	619,440	1127	81	267
*YR2X	“	523,852	707	94	277
					(OP: YO2LEA)
*YO8/LZ4UU	“	215,298	726	53	190
*YO6EL	“	183,222	493	57	186
*YO4RST	“	177,375	399	58	157
*YO3DAM	“	169,416	482	55	179
*YO8PS	“	140,293	390	58	181
*YO4AAC	“	136,728	401	55	161
*YO8SMM	“	122,436	416	47	181
*YO5DAS	“	110,966	351	51	175
*YO6PVX	“	90,280	404	40	145
*YO6HSU	“	78,568	263	48	136
*YO5BRE	“	67,860	349	33	123
*YO6MP	“	63,360	282	45	135
*YO5PVZ	“	58,986	235	43	131
*YO2MJZ	“	50,400	261	29	115
*YO2MIT	“	46,900	283	34	106
*YO7LDT	“	43,146	198	35	106
*YO8BFB	“	42,050	192	40	105
*YO8BDQ	“	40,975	137	48	101
*YO8AAZ	“	39,457	152	44	143
*YO3YV	“	34,304	208	31	103
*YO5PUV/P	“	29,376	150	34	74
*YO2MOO	“	27,360	130	38	76
*YO6DBL	“	25,676	149	31	100
*YO8DRV	“	24,444	191	25	72
*YO6QCD	“	22,632	189	26	97
*YO3CIY	“	15,886	103	27	67
*YO7MPI	“	11,954	97	28	58
*YO6PLL	“	8,282	93	25	57
*YO5ODT	“	6,890	103	13	40
*YO5DBM	“	5,775	87	12	43
*YO4GOU	“	4,608	70	16	48
*YO9FLL	“	2,990	59	12	34
*YO7HHE	“	1,476	49	8	28
*YO9BNP	“	700	20	10	15
*YO3APJ	28	49,104	217	27	72
*YO2CMI	“	23,850	134	24	51
*YO4CSL	“	3,608	42	16	25
*YO5CTS	“	3,024	54	12	24
*YO6DBA	“	1,488	52	7	17
*YO3KPA	21	29,930	239	21	61
					(OP: YO3GOD)
*YO2IS	“	27,643	212	19	58
*YO3ND	“	23,639	195	19	58
*YO2NWW	“	22,268	166	21	55
*YO8TNB	14	19,497	219	12	55
*YO7PED	“	15,330	156	18	55
*YO2LTA	“	7,695	140	11	46
*YO7HBY	“	7,105	121	9	40
*YO4BXX	“	4,300	87	7	36
*YO9HG	“	864	41	6	21
*YO3JW	7	36,921	321	19	74
*YO8RZJ	1.8	1,352	57	5	21

San Marino

*T77NC	A	360	23	9	15
					(OP: IU4AAJ)
*T77CX	28	51,336	418	14	32

Sardinia

ISØ/ OM2TW	3.7	319,277	1877	22	97
					(OP: OK8WW)
*ISØIYM	A	39,889	327	32	81
*ISØLYN	“	22,932	131	28	70
*ISØHNW	“	19,838	110	29	62
*ISØILP	“	6,596	61	24	44
*ISØPAH	“	6,222	64	18	43
*ISØBPX	28	16,860	111	18	42
*ISØGRB	14	100,896	899	20	76

Scotland

GM2V	A	120,328	379	37	132
					(OP: GM3WOJ)
GM5BDX	“	54,171	240	30	87
MMØLGR	“	33,930	198	28	89
GM5X	28	623,858	1890	31	115
					(OP: GM4YXI)
_MM3T_	_“_	_48,438_	_303_	_22_	_59_
GM2Y	“	8,480	96	13	27
					(OP: MMØDXH)
*2MØVGT	A	80,460	407	38	142
*GM9C	“	78,370	383	36	134
					(OP: MMØGHM)
*MMØLBX	“	64,050	253	43	132
*GM7MTK	“	32,595	185	34	89
*MMØEDZ	“	25,875	146	32	83
*2MØWIC	“	13,699	125	25	78
*MMØSDK	“	8,625	111	17	52
*GM7OAW	“	7,236	78	18	49
*MMØTXT	“	7,062	82	12	21
*MMØCPZ	“	4,040	49	16	24
*MMØMUN	“	3,800	58	13	37
*2MØVEY	“	3,698	73	10	33
*2MØBEC	“	2,478	39	9	33
*2MØYZT	“	1,242	25	8	10
*2MØIIG	“	132	10	4	7
*GM3TAL	28	65,852	260	24	77
*MM7BWK	“	9,494	112	10	37
*GM6DX	21	1,760	36	9	23
*GM3ZDH	14	17,024	216	12	52
*GM4JYB	1.8	1,716	69	2	24

Serbia

YT3D	A	2,435,860	2711	121	387
YTØW	“	832,614	1507	77	225
					(OP: YU1JW)
YT1RK	“	24,444	162	23	74
YU7WW	“	2,982	52	11	31
YT7B	14	494,700	2111	34	116
YT5DXX	7	175,890	1185	27	103
YT2ZZ	“	33,030	320	19	71
_YT4A_	_3.7_	_5,992_	_58_	_14_	_42_
*YU4EWW	A	56,625	315	27	98
*YT2VP	“	42,799	231	36	91
*YT2SIN	“	40,880	212	40	100
*YU4MVP	“	39,000	183	37	88
*YU4GUV	“	18,414	193	21	78
*YT3VLA	“	10,452	78	25	53
*YT2MDM	“	10,368	138	23	73
*YU1ML	“	9,581	139	13	54
*YU1UUU	“	9,450	82	19	56
*YU6TM	“	8,584	119	17	57
*YU4BGN	“	7,600	151	9	41
*YU4PTL	“	5,368	88	11	50
*YU4SRB	“	2,820	82	16	44
*YU3MPN	“	896	46	9	23
*YT4ZZ	28	35,148	181	25	62
*YU1VG	21	39,867	277	23	74
*YU7XW	14	32,508	255	22	64
*YT2ISM	“	2,890	85	7	27
*YT5LD	“	2,720	48	10	22
*YU5T	“	39	11	3	10
*YU4ZLA	7	4,418	92	9	38
*YT8A	1.8	14,716	284	7	45
*YU1P	“	4,212	114	5	34

Sicily

IT9FUN	A	227,374	398	77	221
IT9DWF	“	3,465	91	11	44
IT9NSM	_“_	_3,403_	_31_	_20_	_21_
IR9W	28	728,854	2086	37	121
*IT9FRX	A	411,669	1156	57	180
*IT9BGE	“	54,480	225	37	83
*IT9AOI	“	13,872	68	38	64
*IT9IRL	“	10,184	118	19	48
*IT9HEQ	“	5,782	54	19	40
*IT9AJP	28	22,392	120	24	48
*IT9AXQ	21	8,680	91	15	41
*IT9EWR	7	126,260	596	27	91

Slovak Republic

OM7K	A	3,035,167	3187	121	388
					(OP: OM7RU)
OM4M	“	518,721	974	79	278
					(OP: OM4KK)
OM3CPF	“	170,200	631	47	183
OM5R	7	365,560	2073	29	101
					(OP: OM5WW)
*OM4IK	A	338,245	806	66	239
*OM6DN	“	238,386	580	53	148
					(OP: OM6FN)
*OM1EE	“	93,026	393	42	151
*OMØTM	“	61,374	240	45	114
*OM7AG	“	57,263	296	41	132
*OM6APR	“	55,645	287	32	123
*OM3CDN	“	34,840	257	26	108
*OM8AGA	“	25,536	211	20	76
*OM8ADU	“	25,320	172	31	89
*OM7AHJ	“	5,922	42	26	37
*OM3ZAH	“	4,758	110	13	48
*OM7ANT	“	2,360	21	19	21
*OM7AT	“	500	20	8	17
*OM8JP	14	14,381	155	18	55
*OM7SR	“	2,940	72	9	33
*OM8GRS	“	1,000	32	6	19
*OM6TX	3.7	22,420	365	8	51
*OM6MM	“	5,452	123	7	40

Slovenia

S53MM	A	5,834,028	4494	147	489
S57K	“	2,283,131	2658	109	310
S51JQ	“	202,725	362	59	166
S5ØLD	_“_	_21,597_	_172_	_18_	_51_
S57AL	7	775,465	3282	35	120
S51CK	“	388,798	2054	31	115
S53O	1.8	65,284	835	13	63
*S57NAW	A	556,140	839	91	299
*S57YB	“	251,082	616	64	197
*S56C	“	133,425	439	51	174
*S53WW	“	111,930	317	52	130
_*S53DT_	_“_	_50,560_	_185_	_45_	_115_
*S53KS	“	35,910	197	29	76
*S5ØPB	“	28,914	197	30	92
*S57WW	“	20,520	160	23	85
*S58MU	“	11,430	82	29	61
*S51C	“	6,348	70	19	50
*S5ØBH	“	1,862	41	11	27
*S56MH	“	1,254	31	14	24
*S53MR	7	35,189	400	13	64
*S54ZO	“	759	17	8	15
*S53NW	3.7	25,288	440	7	51

Spain

EB5A	A	4,027,944	3507	127	425
EA5DFV	“	2,543,590	3072	99	307
EA3CI	“	2,125,164	2464	100	333
EA2XR	“	462,313	971	68	209
EA3HJO	“	230,396	625	61	180
EA1FDJ	“	178,849	429	64	165
EA3OH	“	169,195	400	58	189
EC4T	“	102,037	345	50	117
EA4HLP	“	33,516	136	39	75
EA3IND	“	26,001	173	26	81
EA4HKV	“	25,942	135	32	77
EA7IYF	“	17,556	134	31	83
_EA5NY_	_“_	_2,200_	_41_	_19_	_25_
EC7R	28	545,904	1973	33	111
ED3C	“	542,121	1354	36	121
					(OP: EA3HXT)
EE3A	“	522,692	1327	37	112
					(OP: EA3ATM)
EA5EL	“	156,798	805	23	70
EC5C	“	29,500	190	17	42
EA5GVV	14	1,064	23	8	20
EA3HHF	“	660	19	7	13
ED5R	7	930,155	3275	33	122
					(OP: EA5Z)
EE7L	3.7	151,892	1287	15	77
*ED7R	A	1,260,336	2371	80	261
					(OP: EA7GX)
*EA4HKF	“	687,635	1188	76	279
*EA3FZT	“	424,960	726	78	254
*EA4WW	“	244,480	604	57	199
*EA2EWL	“	238,420	526	69	193
*EE2A	“	175,689	415	62	181
					(OP: EA2SN)
*EA3DJL	“	161,920	399	52	168
*EA3BRL	“	144,480	430	45	165
*EA5UJ	“	119,900	362	52	168
*EA1HTF	“	90,288	280	51	158
*EA3HLF	“	87,044	298	50	138
*EA3W	“	54,576	216	38	106
*EA4RR	“	53,724	260	36	112
*EA4IL	“	52,773	188	48	99
*EA1JCE	“	51,170	289	36	134
*EA2AR	“	47,880	198	41	111
*EA4Z	“	47,100	224	41	116
*EA3IMR	“	45,758	184	40	97
*EA5HEW	“	44,822	173	44	102
*EA5HJA	“	39,888	255	28	116
*EA4GJT	“	36,237	172	37	104
*EA5DB	“	32,963	156	39	80
*EA5IXX	“	31,855	159	32	83
*EA4HLZ	“	30,464	141	37	91
*EA2ESK	“	25,839	158	27	72
*EA4EIY	“	25,545	115	39	92
*EB3AKL	“	22,011	132	27	60
*EA5AML	“	21,912	138	27	61
*EA5JDG	“	16,833	119	29	64
*EA5JBG	“	16,554	109	29	64
*EC1ABR	“	15,744	96	24	40
*EA4ESM	“	15,660	105	24	63
*EA3EAN	“	14,355	121	22	65
*EA7GSL	“	14,168	88	30	62
*EA2EWB	“	12,717	82	28	53
*EA4GZU	“	11,305	91	25	60
*EA1FKI	“	11,305	108	22	63
*EA4WF	“	10,890	87	19	47
*EA4FIT	“	10,863	79	24	47
*EA3GYE	“	9,834	74	23	43
*EA1BDC	“	8,940	127	18	42
*EA3ATO	“	8,475	103	20	55
*EA4HRJ	_“_	_7,705_	_68_	_27_	_40_
_*EE5X_	_“_	_7,599_	_63_	_21_	_30_
					_(OP: EA5KO)_
*EA1BZN	_“_	_7,056_	_54_	_24_	_39_
*EA1JBW	“	6,853	65	26	51
*EA3HWC	“	4,864	56	14	18
*EA7KRB	“	4,320	65	17	37
_*EB2DJ_	_“_	_3,621_	_59_	_12_	_39_
*EA4AZ	“	3,478	26	21	26
*EA1FNS	“	3,145	37	16	21
*EA1JDC	“	2,730	32	17	25
*EA7HCB	“	2,580	42	16	27
*EA5BAH	“	1,938	31	15	23
*EA4HFK	“	1,892	41	15	29
*EA7WV	“	1,769	24	11	18
*EA5EZA	“	1,620	35	11	25
*EA1FPG	“	1,200	23	13	17
*EA2BSJ	“	324	16	11	16
*EA1R	28	349,536	1145	33	99
*EA7AAF	“	134,760	578	28	92
*EA3T	“	83,260	295	32	83
*ED5I	“	77,760	390	22	74
					(OP: EA5IWZ)
*EA7VJ	“	56,465	217	29	86
*EA7VA	“	28,971	167	24	63
*EA1LP	“	22,644	138	21	53
*EB5CS	“	22,021	137	17	44
*EC4TR	“	11,990	188	13	42
*EA4EQD	“	9,792	78	20	44
*EA2PLN	“	7,470	70	15	30
*EA7FWM	“	5,029	47	16	31
*EA4EJR	“	4,692	52	12	22
*EB3A	“	4,680	49	15	25
*EA5DLP	“	2,444	36	12	14
*EA4HIA	“	176	15	6	10
*EA2DSG	“	132	8	5	6
*EA5V	“	48	4	4	4
*EA5BCQ	21	62,315	320	23	80
*EE1B	“	60,074	321	20	78
					(OP: EA1Y)
*EA3KT	“	42,840	263	20	70
*EA2AVM	“	6,273	75	12	29
*EA3HLM	“	2,277	48	7	26
*EA3HKY	“	2,277	48	7	26
*EE3M	14	481,585	1802	36	119
					(OP: EA3CX)
*EA5EOR	“	82,600	459	28	90
*EA1DHB	“	63,050	452	23	74
*EA3FUJ	“	16,698	138	19	50
*EA5JIH	“	1,776	28	11	26
*EA7JTT	“	1,482	21	11	15
*EA2XG	“	960	27	6	18
*EA5MR	“	638	21	5	17
*EA7IUK	“	496	51	7	24
*EA1BCK	7	14,973	184	13	56
*EA4IS	3.7	21,608	237	12	61
*EA1FBU	“	266	12	7	12

Sweden

SM5Q	A	479,983	685	92	267
SEØDX	“	204,765	401	69	186
SA6OHM	“	51,800	286	35	113
SM3PZG	“	47,082	228	40	93
SFØD	“	30,345	285	19	86
					(OP: SMØDSF)
SM6YEC	“	28,380	172	30	80
SM6NT	“	20,273	171	22	75
SA6SKA	“	15,312	144	21	66
SA5HUB	“	416	22	11	15
SE3T	“	405	9	6	9
SD1A	21	14,472	126	16	51
					(OP: SM1TDE)
*SM5DXR	A	108,640	495	36	158
*SJ7M	“	106,536	399	45	139
*SB5X	“	97,512	297	50	154
*SGØM	“	94,326	356	46	153
					(OP: SAØAQT)
*SE4L	“	86,592	379	37	127
					(OP: SAØFIA)
*SE6K	“	55,784	325	30	122
					(OP: SM6FZO)
*SM5ACQ	“	34,648	180	39	103
*SA6KOD	“	25,480	204	24	80
*SA6CCZ	“	20,904	174	22	82
*SD9D	“	15,714	109	26	71
*SM6S	“	2,451	51	9	34
*SM5LSM	“	2,368	62	9	28
*SG3O	“	621	19	11	16
					(OP: SM3AGO)
*SA7BMV	“	528	22	7	15
*SM6WET	28	15,840	95	21	59
*SM6C	21	13,561	119	19	52
*SA7J	14	3,393	93	6	33

Switzerland

HB9TOC	A	2,775,852	3089	115	383
HB9AWS	“	638,050	1119	81	269
HB9RN	“	183,241	447	57	200
*HB9SHI	_A_	_25,938_	_102_	_41_	_58_
*HB9HFM	_“_	_16,720_	_136_	_22_	_66_
*HB9GUK	“	5,600	54	17	23
*HB9EGA	“	3,698	52	13	30
*HB9HEI	“	3,168	32	18	30
*HB9FHV	“	1,584	34	12	24
*HB9GFP	_“_	_198_	_6_	_6_	_5_
*HB3XAG	“	110	6	5	6
*HB9FLX	21	3,840	52	12	28

Ukraine

UT3UV	A	25,215	166	35	88
UY5OO	“	8,736	52	33	45
UT5ECZ	28	20,440	120	22	51
UT1KWA	14	5,535	107	9	36
*UT3SO	A	206,628	592	54	203
*US6IKF	“	81,216	195	68	124
*UW8SM	“	77,264	283	47	129
*US7UK	“	50,616	188	53	118
*UR1HR	“	43,624	124	49	84
*UR5UJ	“	29,475	155	39	92
*UT5Q	“	3,774	36	21	30
*UT9UY	“	930	20	12	19
*UX3UU	“	665	15	9	10
*UT6EE	28	46,354	231	23	75
*UR5WEB	“	19,872	124	22	47
*UR9QQ	“	5,896	78	15	29
*UT3EV	14	287,421	1533	35	114
*UT7DX	“	64,885	624	21	74
*UT1KY	“	6,288	109	7	41
*UR5WCQ	7	35,105	331	17	68
*UT7NY	3.7	10,241	198	8	41

Wales

MWØYVK	A	1,475,625	1688	96	279
MWØJKU	“	340,180	668	61	172
GW5NIC	“	19,418	130	23	50
MWØKMS	14	41,796	196	26	82
GW1W	7	50,634	332	18	69
					(OP: EA1DDO)
_GW9J_	_3.7_	_7,550_	_129_	_11_	_39_
					(OP: GWØGEI)
*GW4HBK	A	102,612	310	48	156
*GW1PJP	“	83,332	266	48	118
*MW1MDH	“	68,623	295	39	124
*GW3JVB	“	30,107	214	29	90
*MW6PNW	“	12,441	123	19	68
*GW4W	28	43,040	218	19	61
					(OP: GW4EVX)
*MWØMFX	“	96	10	2	2
*MW8R	21	130,848	655	27	89
					(OP: GW4SHF)
*GW5L	14	82,100	651	23	77
					(OP: GW4ZAR)

OCEANIA

Australia

VK4A	A	3,310,680	3235	113	263
					(OP: VK4NM)
VL2A	“	1,179,570	1829	82	164
VL2B	“	174,512	327	71	137
					(OP: VK2BJ)
VK5RS	“	95,635	255	50	105
VL2N	“	44,462	190	35	59
					(OP: VK2PN)
VJ2D	“	30,144	119	33	63
VK7GN	“	20,880	95	35	45
VK7QP	“	12,870	87	27	39
VK5MK	“	11,826	74	33	40
VK7C	“	8,255	51	30	35
					(OP: VK7GH)
VJ3A	“	8,190	49	23	40
VL5L	“	1,960	27	12	16
VK6KR	“	1,650	22	16	17
VL2G	28	2,760	48	11	13
					(OP: VK2GR)
VK1A	21	1,000,714	2550	33	110
					(OP: VK2IA)
VK4QS	“	10,972	90	20	32
VL4U	14	287,184	899	29	95
VJ2J	“	85,456	295	26	83
					(OP: VK2CZ)
VJ3O	“	66,708	232	29	80
					(OP: VK3TX)
VK3IO	7	69,680	421	24	43
*VK4Y	A	203,720	389	80	140
*VJ2Z	“	69,160	199	47	83
*VK2PAA	“	52,535	206	33	62
*VK5LTD	“	50,610	188	38	67
*VL2W	“	33,396	119	50	71
*VK3LF	“	21,200	108	31	49
*VK3OM	“	18,696	103	32	50
*VK2NP	“	16,464	94	33	51
*VK3GJG	“	15,760	98	31	49
*VK4SP	“	14,484	76	29	42
*VK6DAV	“	9,880	83	26	39
*VK1O	“	8,700	69	27	33
*VK5Y	“	6,708	59	20	32
*VK3TDK	“	4,104	41	17	21
*VL6K	“	2,356	30	16	15
					(OP: VK6WX)
*VK2JEH	“	1,806	37	19	23
*VK4MGL	“	1,232	20	12	16
*VK7DW	“	646	16	9	10
*VK3DLN	“	306	10	9	9
*VK7IAN	“	276	9	5	7
_*VK3DL_	_“_	_99_	_11_	_5_	_6_
*VK1XYZ	_“_	_32_	_5_	_3_	_5_
*VK8NSB	28	246,560	873	30	85
*VK5COL	“	435	14	7	8
*VK3VDX	21	738	25	8	10
*VK2SLM	“	12	2	1	1
*VK3GF	14	1,311	28	8	11
*VK2GPU	“	231	7	6	5
*VK2EG/P	“	176	6	5	6
*VK5UE	“	18	4	3	3
*VK3STL	7	4	2	2	2

Brunei Darussalam

V85RH	A	4,246,905	3613	133	302
					(OP: JO1RUR)
*V85AHV	A	45,291	223	39	54
*V85T	“	36,208	279	28	45
*V85ZX	“	3,690	47	17	24

East Malaysia

9M6MUL	28	800	20	6	10
*9M8DEN	A	540,882	1077	64	135
*9W6MST	“	16,168	201	20	27
*9W6PKJ	“	4,865	102	14	21
*9M6RTV	21	616	30	6	8
*9W6MOZ	7	1,062	43	7	11

Fiji

3D2AG	A	168,918	671	36	58

Guam

*KH2INC	A	28,458	227	23	28
					(OP: KH2ZZ)

Hawaii

KH7M	A	4,877,180	4516	133	252
					(OP: N6AA)
WH7T	“	4,440,352	4438	117	227
					(OP: WH7W)
_KH6KW_	_“_	_51,254_	_234_	_49_	_49_
AH6FC	“	29,798	126	42	52
KH6LC	“	4,635	109	8	7
KH6Y	“	1,302	24	12	9
NH6V	28	23,840	404	9	11
					(OP: @KH6LC)
*KH6CJJ	A	1,680,840	2313	94	158
*KH6XX	“	48,675	264	34	41
*KH6HT	“	3,828	31	24	20
*WH6FQI	_28_	_1,525_	_29_	_12_	_13_

Indonesia

YBØECT	A	1,316,040	1438	99	231
YE9BJM	“	1,309,812	1259	103	269
YB1ACC	“	109,956	313	62	92
YB1AYO	“	106,470	217	66	116
YB8UTI	“	105,076	395	38	71
YB1APD	“	90,240	244	56	104
YC8DUL	“	79,902	223	43	95
YB5DDE	“	79,192	270	52	100
YC1RYX	“	65,408	207	36	92
YCØSCZ	“	47,595	189	33	62
YB2UFM	“	25,256	109	31	57
YC3CNE	“	25,080	103	34	61
YB4PE	“	24,738	117	31	62
YB8RVI	“	23,925	181	30	45
YB1VHC	“	23,229	97	31	56
YBØKXO	“	22,302	105	48	70
YB1SKR	“	16,849	111	28	55
YCØATP	“	16,498	110	29	44
YBØDRV	“	11,245	77	26	39
YB1RQX	“	10,332	64	24	39
YC3BUE	“	9,882	109	23	38
YB7SQX	“	8,784	65	30	42
YB2SPP	“	5,159	94	24	43
YC6HSK	“	3,936	64	17	24
YB9YKI/8	“	2,952	39	16	25
YC7LTE	“	1,232	23	10	12
YC8SGY	_“_	_1,056_	_31_	_15_	_17_
YB1EQI	“	861	26	8	13
YB9YSS	28	2,438	59	10	13
YF8DJ	21	42,846	245	23	51
YB9YKU	“	19,520	125	22	42
YC3GOQ	“	19,057	139	17	42
YC4JPR	“	11,330	100	16	39
YB3BLJ	“	10,241	77	15	34
YF2UFA	“	6,992	70	15	31
YC4SJA	“	3,096	43	9	27
YB8ACM	“	629	69	16	21
YC4RWH	“	567	27	11	16
YB1DX	14	323,177	911	32	99
YB2MM	“	47,988	193	23	70
YC7EVA	7	30,600	179	18	50
YB8SHY	“	6,456	102	11	13
YF4SDF	“	3,977	93	14	27
YC2CQO	“	3,306	37	15	23
YC4XAM	“	2,744	54	10	18
YE3DFB	“	2,484	41	13	23
YC2DMA	“	2,412	51	16	20
YC1CUN	“	2,093	36	10	13
YB2XDU	“	1,400	30	10	10
YF3DZU	“	1,288	29	11	12
YCØAJM	“	1,280	30	8	8
YC8AYJ	“	1,054	28	7	10
YC8ET	“	165	48	6	9
YC3GRK	“	35	6	2	3
*YB9ELS	A	336,960	519	70	170
*YB2CPO	“	266,240	488	66	142
*YCØBDB	“	222,560	402	67	147
*YB9VED	“	212,829	516	68	115
*YB9LCM	“	192,254	387	68	126
*YB1SNS	“	117,369	261	70	119
*YB1CQU	“	105,258	258	53	106
*YCØVM	“	91,324	244	57	101
*YB8RW	“	87,048	370	41	52
*YB9AOS	“	85,995	262	43	92
*YC9DPO	“	73,359	220	51	92
*YB7WR	“	70,007	190	48	89
*YB1BCH	“	63,804	219	54	102
*YB9MX	“	59,697	270	33	66
*YB1LRG	“	57,584	223	42	80
*YC1BTK	“	52,275	175	40	83
*YB1MW	“	49,149	214	47	82
*YB8UF/7	“	42,330	215	35	50
*YB1INQ	“	37,332	159	38	64
*YC1MCD	“	27,423	144	33	66
*YB1DCW	“	26,746	118	31	55
*YC5NBY	“	26,208	104	41	71
*YC8ES	“	24,138	117	34	47
*YC1KAJ	“	23,328	114	30	51
*YC3AJO	“	23,055	98	28	59
*YB3FUA	“	21,141	121	28	53
*YCØOXA	“	20,398	104	33	61
*YC1CWO	“	19,104	105	36	60
*YB1KEL	“	18,096	151	26	61
*YD1REA	“	15,912	88	29	39
*YC7YCP	“	15,912	104	30	42
*YCØBOY	“	15,750	106	26	44
*YC1CBY	“	15,721	102	35	44
*YC9BOE	“	15,428	105	27	49
*YBØSCV	“	15,265	95	33	38
*YC8FEE	“	15,189	102	26	35
*YB3PIN	“	15,008	100	28	39
*YB1DUU	“	14,356	118	24	50
*YDØASO	“	13,671	99	24	39
*YC1FDF	“	13,588	107	27	52
*YD1CGW	“	13,570	93	26	33
*YC5KXI	“	13,104	78	22	41
*YB8UFM	“	13,064	127	22	24
*YB7YDB	“	12,719	91	31	48
*YB3ATK	“	10,620	120	26	33
*YB5ELS	“	10,452	102	27	40
*YC1FCN	“	10,260	68	21	39
*YB4LYD	“	10,080	80	21	35
*YF1ANL	“	9,954	96	30	49
*YC2YWF	“	9,744	72	20	36
*YB1GRZ	“	9,610	83	21	41
*YC9LAG	“	9,234	88	18	39
*YC2KDU	“	8,330	74	18	31
*YBØULI	“	7,830	60	25	33
*YB6UAF	“	7,085	64	28	37
*YC1WOZ	“	6,996	62	21	32
*YE3EKS	“	6,776	66	15	29
*YB4SNK	“	6,625	113	22	31
*YCØARK	“	5,658	67	20	26
*YCØHLE	“	5,500	56	16	28
*YD3DCZ	“	5,152	48	18	28
*YB2CTE	“	5,152	49	20	26
*YC5AKO	“	4,440	69	16	24
*YE9CZY	“	4,429	62	19	24
*YCØSPC	“	4,130	47	14	21
*YB5MB	“	4,081	77	21	32
*YE7LTN	“	3,960	56	17	27
*YCØAUN	“	3,936	50	21	27
*YB4PD	“	3,456	37	14	22
*YD1EMV	“	3,010	40	16	19
*YG9EEY	“	2,976	50	14	18
*YB8SCP	“	2,944	40	14	18
*YBØDOS	“	2,862	60	23	31
*YB7NUS	“	2,738	32	13	24
*YB1IM	“	2,394	31	15	23
*YB3EDD	“	2,183	40	16	21
*YB7VGB	“	2,145	27	20	19
*YB1GIP	“	1,820	45	20	32
*YB4TM	“	1,512	49	12	16
*YDØBMC	“	1,392	43	13	16
*YB1KFQ	“	1,326	23	12	14
*YB1XST	“	1,104	33	9	14

*YC0IEM	“	1,058	16	10	13
*YB0YAD	“	986	27	13	16
*YF1APQ	“	950	18	10	15
*YD3CYO	“	946	17	10	12
*YD3AHB	“	840	23	11	13
*YC1BVK	“	760	18	8	12
*YC7HYK	“	630	23	8	13
*YB1MBV	“	608	53	7	12
*YG9EBT	“	570	24	9	10
*YC1BAW	“	570	17	7	12
*YB1EIG	“	527	29	7	10
*YB7WBC	“	432	19	11	16
*YB5HPT	“	374	26	7	10
*YC7FAI	“	238	7	7	7
*YG1ARX	“	210	14	7	7
*YD0AWI	“	102	8	2	4
*YC2KME	28	61,692	246	28	69
*YD9MBM	“	25,110	163	21	41
*YD0BCG	“	19,941	109	21	48
*YD1CHM	“	19,338	123	17	49
*YB3BGM	“	16,461	113	18	41
*YD1CMZ	“	13,520	123	23	42
*YE0PO	“	11,055	86	17	38
*YD8CPZ	“	9,630	79	16	29
*YC2UXN	“	7,191	61	17	30
*YD9BJX	“	4,464	44	15	21
*YB7GRN	“	3,286	39	10	21
*YB1HDR	“	2,820	38	7	23
*YG1AEX	“	1,911	39	10	11
*YD3BSB	“	1,770	25	12	18
*YD2UTC	“	1,196	18	11	15
*YB7SKM	“	714	20	9	8
*YB2YEN	“	580	13	10	10
*YD2UXA	“	322	11	6	8
*YD2URO	“	252	10	6	8
*YB9GV	21	99,387	466	24	57
*YC3RJL	“	61,656	307	26	58
*YC9FAR	“	61,314	346	18	48
*YC2KJC	“	31,428	160	23	58
*YB2VYY	“	30,030	158	23	54
*YC7UDD	“	29,824	189	22	42
*YB1DFE	“	28,368	145	16	56
*YB8CMT	“	16,688	140	19	37
*YB1BGI	“	14,457	127	19	42
*YB1NIN	“	9,472	93	21	43
*YB8JEC	“	8,685	89	17	28
*YC0NAN	“	7,900	62	13	37
*YC2BDZ	“	6,552	56	18	34
*YC2KEJ	“	6,116	74	17	27
*YC0SCL	“	5,764	59	17	27
*YB8XOB	“	5,632	53	16	28
*YC2OQR	“	5,040	70	15	30
*YB7OO	“	3,570	44	14	20
*YB1MBA	“	2,700	30	9	21
*YC2AUP	“	1,880	35	13	27
*YB9GDP	“	988	27	8	11
*YC9BVB	“	777	23	10	11
*YC1DEA	“	121	7	5	6
*YB4NY	14	16,284	121	18	41
*YB4HPI	“	5,980	75	15	31
*YB4PDT	“	5,405	68	17	30
*YB8MJG	“	3,888	55	13	23
*YD0NHG	7	33,616	164	23	65
*YC5LCZ	“	23,529	129	22	47
*YD8IKY	“	11,040	109	19	29
*YB7JZ	“	7,950	89	14	36
*YD7ICF	“	6,125	87	14	21
*YD3BSA	“	5,445	90	12	21
*YD2ABS	“	5,346	68	14	19
*YC7BNN	“	5,220	79	13	16
*YC7LXI	“	4,445	73	14	21
*YD9ACX	“	4,371	59	13	18
*YG9PBV	“	4,320	61	14	18
*YD9HJD	“	3,844	52	13	18
*YC1LFI	“	3,696	40	14	28
*YG2AUI	“	3,638	50	11	23
*YD1FRU	“	3,604	48	13	21
*YD1IOU	“	2,940	48	12	18
*YC1IDB	“	2,781	51	12	15
*YC2DOP	“	2,772	49	12	16
*YD1FMV	“	2,759	39	13	18
*YD2CZV	“	2,233	52	12	17
*YC3RNW	_“_	_2,160_	_32_	_9_	_18_
*YD9WFT	“	2,075	43	10	15
*YF2BMJ	“	2,002	52	12	14
*YC1RDH	“	1,632	90	11	13
*YC1JEE	“	1,566	32	12	15
*YD1CZE	“	1,360	34	8	12
*YD9NRM	“	1,247	36	12	17
*YG8FX	“	1,200	39	9	11
*YB1JBV	“	1,180	46	8	12
*YD9UAN	“	1,166	28	11	11
*YD3BTX	“	1,054	30	7	10
*YG2AFA	“	1,045	31	9	10
*YD2RTG	“	1,045	36	7	12
*YD3TWK	“	1,034	21	11	11
*YD2KFP	“	989	45	9	14
*YC1JDW	“	980	27	8	12
*YB3PJY	“	896	28	12	16
*YC2COM	“	888	63	10	14
*YB8PVU	“	867	30	7	10
*YD2UGB	“	810	22	7	11
*YD9GHS	“	792	27	8	10
*YG1AWS	“	780	24	6	9
*YF9UBD	“	756	22	8	10
*YD2CRO	“	735	32	7	8
*YC7SQV	“	650	22	5	8
*YB3GEV	“	646	23	8	11
*YD3DBG	“	560	15	7	9
*YD9LAU	“	522	30	13	16
*YF8FY	“	518	22	5	9
*YC8FIL	“	495	34	7	8
*YC1LGO	“	416	19	5	8
*YD0OFR	“	352	32	6	10
*YG2AUD	“	348	13	5	7
*YF5WQN	“	336	25	5	7
*YD1DBI	“	325	40	5	8
*YB7CV	“	320	20	3	5
*YD7AJD	“	290	11	4	6
*YC8GPH	“	272	13	8	8
*YF4ICC	“	234	8	5	8
*YD2HBF	“	220	12	4	6
*YC7HPF	“	210	11	5	5
*YD0OXG	“	184	23	2	6
*YB7SLV	“	112	6	4	4
*YD9RHV	“	98	12	7	7
*YD9CVS	“	78	5	3	3
*YD3CQX	“	77	5	3	4
*YC8BEE	“	72	5	3	3
*YD2NIR	“	63	11	3	4
*YD1LAS	“	63	23	3	4
*YG2APA	“	56	8	3	5
*YG3AJJ	_“_	_49_	_4_	_3_	_4_
*YG3EOQ	_“_	_36_	_3_	_2_	_2_
*YD1APP	“	36	9	1	2
*YG3AUH	“	35	20	2	3
*YC8AKU	“	27	7	4	5
*YC2BXX	“	12	5	2	4
*YD3GHI	“	9	21	1	2
*YG2AVP	“	8	9	3	5
*YF3CXB	“	7	8	3	4

Mariana Islands

KH0UA	A	922,209	1501	69	150
*AH0/WA7WJR	21	30,420	260	21	24

Marshall Islands

*V73MS	A	13,056	98	31	37

New Caledonia

FK8IK	A	1,834,939	2232	104	203
FK4QX	28	89,240	337	26	71
*FK8GM	21	200,408	736	30	74

New Zealand

ZL2ABK	A	1,135,836	1728	75	159
ZL1Y	“	264,627	432	88	155
					(OP: ZL2MF)
ZL2UO	“	156,046	332	61	112
ZL1W	“	114,708	288	51	107
					(OP: ZL1XS)
ZL2GD	“	38,918	131	48	74
ZL4RMF	“	18,920	88	35	53
ZL1RQ	28	304,000	1356	29	51
ZL2RVW	14	117,944	476	23	69
ZL1CAP	“	2,940	36	12	18
*ZL1BQD	A	18,732	103	34	50
*ZL3PIE	“	9,920	69	26	36
*ZL1MTO	“	7,293	60	21	30
*ZL3CRG	“	5,814	48	20	31
_*ZL2XC_	_3.7_	_280_	_8_	_7_	_7_

Philippines

DU1IVT	A	152,146	457	48	79
DU1/KC6OAV	“	1,924	25	15	22
DU1EV	28	100,244	514	24	52
DU1EG	7	38,430	305	17	44
4F3FSK	3.7	266	18	3	4
*DV3SB	A	256,038	696	56	83
*DV1IIW	“	85,248	315	47	97
*DV7MIS	“	55,330	214	40	70
*DW7NDM	“	42,631	209	37	52
*DU1SH	“	36,498	340	32	47
*DU6/N7MOT	“	24,156	147	30	31
*4F9HKZ	“	23,880	258	23	37
*DU1VGX	“	15,946	105	22	45
*DU9BZT	“	14,478	116	18	39
*DV7SKY	“	8,142	135	19	27
*DV6XDS	“	5,166	69	18	23
*DU1/N6HPX	“	4,536	70	27	27
*DU2R	“	4,141	62	17	24
*DU2CI	“	2,997	48	13	24
*DU1/NF0O	“	2,408	43	13	15
*4G1OAL	“	1,007	27	9	10
*DV7DYH	_“_	_117_	_7_	_3_	_6_
*DV1DLX	28	76,024	422	25	43
*4E9VVN	“	44,368	300	25	34
*DU8WP	“	435	49	5	10
*DV1UCX	21	93,730	559	23	47
*DU9WTZ	“	89,034	494	22	49
*4G1FKH	“	35,112	276	20	36
*DU1VNA	“	11,152	126	15	26
*DU1JM	“	5,497	93	11	12
*DV2LWT	“	2,975	115	9	16
*4F9DOC	14	3,630	60	11	19
*DU1JI	“	3,549	67	8	13
*DU3AW	“	3,168	51	12	20
*4I1MVI	“	35	9	3	4
*DU9BX	7	4,420	88	13	21
*DW2FCR	“	2,160	57	8	12
*DW2KED	“	377	18	6	7

Samoa

5W1SA	21	338,552	1190	32	69

Wallis & Futuna Islands

*FW1JG	A	117,656	290	59	95

SOUTH AMERICA

Argentina

LW1D	A	957,726	1795	58	140
					(OP: LW1EUD)
LU8VLE	“	453,180	1246	45	95
LU1VM	“	282,997	823	45	98
LU3HIP	“	205,668	636	35	81
LP1A	“	86,576	405	40	72
LQ5A	“	73,130	278	31	72
_LP7D_	_“_	_12,339_	_195_	_12_	_15_
					(OP: LU7EXX)
LU7HN	28	607,608	2034	26	82
LT1E	“	393,848	1500	25	79
L50DY	“	335,340	1128	28	80
					(OP: LW3DG)
LW1F	21	1,018,026	2647	32	106
					(OP: LU5FC)
LO5D	“	470,456	1446	33	91
					(OP: N2TTA)
LU9MBY	14	204,864	820	28	69
LU2DVI	3.7	1,326	33	12	14
*LR5H	A	386,295	878	65	130
*LW4EF	“	368,064	931	52	110
*LU1WCL	“	144,921	611	32	71
*LU4JEA	“	90,060	502	25	54
*LV1E	“	77,271	271	50	79
*LW3DBW	“	68,800	327	26	74
*LU5HCB	“	63,336	245	39	77
*LU4XAP	“	39,458	185	36	73
*LT100KC	“	27,295	205	45	58
					(OP: LU6KA)
*LW6DIV	“	22,576	154	25	43
*LU7DLS	“	18,387	133	38	43
*LU9LZR	“	13,416	120	40	46
*LU1EXR	“	11,830	86	27	38
*LU1DW	“	11,718	62	23	40
*LU6DDC	“	4,756	63	14	27
*LU9CSM	“	4,560	102	20	28
*LP1D	“	946	34	9	13
					(OP: LW6EGE)
*LU9JDZ	“	828	28	10	13
*LS7H	28	261,250	1089	24	71
*LV1F	“	237,350	965	23	71
					(OP: LU4FTA)
*LQ5D	“	169,078	737	22	69
					(OP: LU9DA)
*LQ5H	“	107,448	502	23	65
*LU5UFM	“	44,336	294	21	47
_*LU5MT_	_“_	_27,522_	_164_	_18_	_48_
*LW7DQW	“	12,552	203	12	12
*LU1XAV	“	5,320	67	14	21
*L20X	“	4,768	102	9	23
*LU1CGB	“	3,298	47	15	19
*LU7AOW	“	774	34	9	9
*LU9DKU	“	663	32	9	8
*LU4DPL	_“_	_12_	_2_	_1_	_1_
*L71D	21	140,448	572	25	71
					(OP: LU7DUE)
*LU5EVK	“	9,520	105	17	23
*LU5MEC	7	752	40	7	9
*LU1RAF	“	364	33	5	8
*LU7DFC	“	4	4	2	2

Aruba

P40T	A	9,398,793	5965	130	411
					(OP: VE3DZ)

Bolivia

CP5HK	A	126,888	399	49	87

Bonaire

PJ4K	A	16,224,072	9386	153	444
					(OP: N6KT)

Brazil

PY2KJ	A	1,360,072	1452	85	241
PY2SBY	“	480,788	948	65	131
PY3PDR	“	108,770	289	51	98
PY2KP	“	69,700	187	60	110
PV8DX	“	11,286	77	22	32
PY3MPS	“	2,392	61	23	23
PS7CY	“	1,131	19	15	14
PY2PZL	“	1,120	49	12	16
PY1PM	“	930	30	13	18
PV2G	28	1,729,506	4219	32	109
					(OP: PT2IC)
PY5WW	“	403,192	1453	25	76
PY2EX	“	110,916	507	21	57
ZW5B	“	39,120	301	14	34
					(OP: LU8EOT)
PP2BK	“	33,696	288	14	40
PY2MM	21	112,320	542	23	55
PY3TD	14	85,590	410	27	63
PY3CB	“	22,440	130	21	47
PP5OT	“	1,298	32	11	11
PY9MP	7	6,519	55	19	34
PY2EU	“	5,754	59	10	32
*PY2RE	A	399,190	851	60	130
*PY4XZ	“	91,560	284	40	80
*PY2LPM	“	71,589	228	51	96
*PY2MIB	“	63,364	226	50	96
*PY2XL	“	51,448	194	37	81
*PY2RMY	“	51,392	249	29	59
*PY3VV	“	40,704	198	38	68
*PY2YVN	“	38,236	199	29	50
*PY2PN	“	37,152	228	25	61
*PY1WE	“	37,060	221	36	73
*PY2SRL	“	31,482	128	31	68
*PT7PT	“	22,050	160	17	46
*PP5WEB	“	19,295	105	33	52
*PY2RVM	“	18,975	138	27	48
*PY2VCP	“	15,387	95	22	47
*PY2LGM	“	14,129	135	28	43
*PP5RB	“	13,230	102	26	44
*PY4ARS	“	10,800	83	26	34
*PP5BJF	“	9,954	114	26	37
*PY2AB	“	5,852	55	14	30
*PY3RK	“	4,995	44	20	25
*PY2GVR	“	4,532	67	16	28
*ZV2F	“	4,284	54	24	27
					(OP: PY2SFA)
*PY2TDB	“	4,142	57	12	26
*PY1EZ	“	3,589	43	14	23
*PR7KSA	“	3,096	95	18	25
*PT2JAR	“	2,010	46	13	17
*PY4ZAP	“	1,855	64	15	20
*PP5DCM	“	1,710	27	13	17
*PT2APO	“	1,425	32	11	14
*PY2TNS	“	825	15	12	13
*PY2YJ	“	744	25	10	14
*PY2ITM	“	247	14	6	7
*PY2OF	“	169	7	6	7
*PS8AB	“	150	5	5	5
*PY2VTR	“	140	9	7	7
*PY2UD	28	761,118	1855	29	112
*PY2RSA	“	228,796	877	24	70
*PU2UAF	“	202,154	695	29	93
*PU2WDX	“	185,094	846	21	57
*PU2MST	“	136,968	519	25	79
*PU3POE	“	44,737	270	22	61
*PU2MIW	“	44,116	214	20	62
*PU2YBW	“	39,216	210	18	58
*PY1PDF	“	31,552	229	16	52
*PU4MDO	“	25,456	294	13	24
*PU2ULN	“	18,900	120	18	45
*PU1AJN	“	16,898	178	18	53
*PY2AAK	“	16,461	132	16	43
*PU8PSF	“	15,810	154	15	47
*PU2RDB	“	14,991	129	15	42
*PU2RTO	“	14,250	125	18	39
*PU2NZV	“	13,328	112	18	38
*PY2ERC	“	13,064	121	18	28
*PP5IN	“	11,040	130	15	31
*PU3VON	“	10,948	104	14	32
*PY4TC	“	10,700	81	18	32
*PU7BEN	“	9,650	85	13	37
*PU2TNT	“	8,379	84	15	34
*PU2OXB	“	7,840	98	15	25
*PY2ROA	“	7,524	101	14	30
*PU2SEX	“	6,493	102	16	27
*PU5LMJ	“	6,440	60	16	30
*PU2WME	“	6,032	54	19	33
*PU3HCL	“	5,688	91	15	21
*PY2DPM	“	5,215	80	13	22
*PU5GLG	“	4,958	69	13	24
*PY2PLC	“	4,520	78	14	26
*PU2TBK	“	4,464	67	14	22
*PY2ASA	_“_	_2,574_	_61_	_14_	_19_
*PU2NKT	“	2,552	43	11	18
*PU2FDD	“	2,484	44	15	21
*PU3BAD	“	2,175	39	12	17
*PU2RKJ	“	1,829	46	11	20
*PU2WYP	“	1,656	62	9	14
*PU5SKW	“	1,534	25	12	14
*PR7KG	“	1,242	51	10	17
*PU2POD	“	945	22	9	12
*PU2MCY	“	777	21	9	12
*PU5CLO	“	768	29	8	8
*PU2XMP	“	434	27	5	9
*PU8PJG	“	319	61	10	19
*PU9PED	“	273	29	6	7
*PU2NHD	“	224	22	6	10
*PU5SVE	“	150	11	5	5
*PU7JDP	“	90	6	5	4
*PU5BXB	_“_	_80_	_5_	_4_	_4_
*PU3EBJ	_“_	_15_	_17_	_8_	_7_
*ZW2T	21	280,854	827	28	98
					(OP: PY2RKG)
*PY2QT	“	167,918	573	28	85
*PS8DX	“	18,054	120	17	42
_*PY2KO_	_“_	_11,475_	_81_	_19_	_32_
*PY2NY	14	375,972	1165	32	82
*PY1FJ	“	13,500	119	18	32
*PY2BRP	“	7,052	76	10	31
*PP5KT	“	1,608	37	10	14
*PY1KW	7	7,350	127	15	34
*PY4BAL	“	12	22	2	2

Chile

CB8E	A	1,374,720	2138	77	163
					(OP: CE8EIO)
CE2LE	“	494,382	1215	59	99
CE4JZO	“	441,861	1058	58	101
XQ3SK	“	232,824	776	49	60
CB4A	“	136,125	460	44	81
					(OP: CE4UFC)
XQ1CY	28	168,350	883	23	47
CE3TL	“	18,350	159	18	32
CE4PS	21	307,165	975	28	87
CE3QY	14	292,905	981	29	86
XR6N	“	39,402	280	20	46
					(OP: CE6VMO)
CE3NR	“	11,050	88	22	43
CE1BF	3.7	513	20	10	9
*CE6CGX	A	799,680	1455	64	140
*CE5PR	“	86,436	341	47	79
*CE1UGE	“	85,790	324	47	68
*CB3CE	“	51,300	225	45	63
					(OP: CE3KWA)
*CE4CBJ	“	17,370	118	41	49
*CA6NFR	“	2,544	82	19	29
*CE2CFK	“	2,146	62	16	21
*CE4JW	“	1,305	26	16	13
*CB6LR	28	308,454	1131	21	80
					(OP: CE6GDR)
*CE4CBK	“	76,393	448	22	57
*CE5UBR	_“_	_64,015_	_426_	_18_	_41_
*CA2SLJ	“	26,455	260	18	37
*XQ5CIE	“	26,398	174	19	48
*CE6FYN	“	7,869	114	16	27
*CD6LKR	“	5,004	64	13	23
*CA1DBS	“	2,030	41	13	16
*CE4SES	“	1,782	39	9	13
*CD7OFZ	“	816	22	8	8
*CD6YUS	“	21	5	4	3
*CE5WOW	21	2	1	1	1
*XQ5OS	14	25,550	170	24	49
*CE5AUC	“	8,096	81	16	30

Colombia

HK3C	A	1,650,880	2602	54	166
*HK3X	A	527,670	987	58	137
*HK4ZZ	“	63,832	209	52	106
*HK4RB	21	7,824	67	17	31
*HK3ZD	“	1,554	28	9	12
*HK4CM	14	8,476	69	17	35
*HK6P	3.7	84	4	3	4

Curacao

*PJ2SD	A	8,816	70	21	37

Ecuador

*HC5VF	21	66,672	338	22	50
*HC2AO	“	35,028	337	11	25
*HC2TKV	14	69,036	564	16	28
*HC2PY	7	23,184	129	18	51

Falkland Islands

VP8TAA	A	63,630	406	22	41

Peru

OA4SS	A	1,228,766	2125	67	135
OA4DAG	“	545,532	1266	47	122
*OA4DOS	A	50,125	241	48	77

Suriname

*PZ2YT	28	725,000	2218	27	89
*PZ5RA	“	417,938	1486	21	80

Uruguay

CX1AV	28	378,522	1411	24	78
*CX9AU	A	82,288	310	53	86
*CX1CAN	“	7,772	88	26	32
*CX2BAH	28	265,530	971	24	82
*CX8DS	“	214,578	884	23	68
*CX5ABM	“	98,952	514	22	54
*CX2TQ	“	10,081	218	8	9

Venezuela

YV4ABR	28	182,253	897	22	57
_*YV8AD_	_A_	_92,100_	_244_	_44_	_106_
*YV4GMG	“	91,360	454	22	58
*YV6BXN	“	70,720	161	52	118
*YV1FWI	“	20,930	150	29	62
*4M1W	28	266,864	1086	26	78
					(OP: YV1SW)
*YV5IUA	“	125,173	629	15	56
*YV7MAY	21	43,848	208	24	60
*YV1GIY	“	27,643	169	22	55
*YV4EK	14	521,420	1579	25	91
*YV5AEP	7	17,110	106	12	47

ASSISTED

NORTH AMERICA

United States

District 1

NN1SS	AA	4,209,824	2545	133	453
AA1ON	“	4,182,408	2477	136	476
WK1O	“	3,593,244	2299	128	436
W1GD	“	3,541,670	2050	140	465
K1RX	“	2,428,656	1922	109	347
N1IXF	“	2,191,392	1576	110	394
AK1MD	“	1,462,334	1160	108	346
WX1S	“	1,402,011	952	117	404
K1JB	“	1,389,034	991	118	384
N1RR	“	1,224,252	1299	94	278
W1OO	“	1,220,592	1016	103	328
					(OP: K1ESE)
W1FJ	“	1,151,016	850	107	375
WT1A	“	1,025,100	829	110	340
WK1J	“	1,003,632	931	92	314
W1HS	“	976,131	1035	78	273
AC1EV	“	904,718	1028	79	238
AA1SU	“	873,600	970	97	293
KB1W	“	825,968	810	79	282
W1ARY	“	776,412	789	81	270
W3SM	“	708,120	695	81	279
K2RB	“	702,051	800	65	266
NF1O	“	677,368	656	86	287
W1UK	“	642,600	545	93	332
K1KA	“	633,040	593	99	311
W1DX	“	621,504	563	104	312
					(OP: W1AN)
W1KM	“	550,405	579	90	245
K1EO	“	382,400	452	84	236
KX1X	“	381,442	497	65	204
KV1J	“	370,755	436	84	231
N1KM	“	351,540	398	86	238
NE1F	“	343,560	435	67	213
K1BZ	“	298,116	378	78	216
W1HNZ	“	283,216	426	60	188
N1IBM	“	254,469	339	63	208
KK1L	“	232,800	317	88	203
W1JGM	“	199,520	371	67	165
W1RM	“	198,418	248	93	218
KA1IOR	_“_	_169,970_	_267_	_56_	_174_
W1NG	“	157,584	222	74	194
K1VW	“	148,824	267	60	152
N1KWF	“	140,910	305	46	137
KC1GTK	“	132,924	226	67	161
WZ1V	“	125,643	222	66	151
WA1ZYX	“	111,718	242	45	121
W1TC	“	111,708	226	31	143
K1SM	“	103,490	238	44	114
KE1VT	“	103,039	223	49	118
K1RV	“	86,292	173	63	141
K1TH	“	61,191	192	25	92
KB1YO	“	53,376	145	31	97
W1WRA	“	41,762	130	38	95
W1UJ	“	38,784	110	39	89
N1SV	“	26,220	149	14	55
KC1OXM	“	18,091	98	24	55
W1JR	“	16,262	67	31	63
W1QWT	“	6,210	48	13	33
NJ2DX	“	5,974	37	22	36
W1DSC	“	960	16	9	15
W1UE	28A	262,780	647	28	112
N1MM	“	223,524	623	25	101
NW2P	“	139,430	357	30	116
					(OP: N6EE)
WM1G	14A	108,000	338	28	92
KG1E	7A	18,291	105	18	49
*KS1J	AA	1,486,660	1293	88	322
*KA2KON	“	695,980	730	75	265
*KC1SQ	“	647,608	694	84	254
*N1API	“	564,349	546	82	291
*K1TR	“	516,672	586	69	243
*WO1N	“	424,826	512	80	231
*N1DID	“	383,396	496	69	223
*N1TQ	“	287,754	418	56	185
*KG1V	“	118,007	230	57	142
*W1AUV	“	97,695	214	46	121
*AK1X	“	87,945	196	44	121
*KI1G	“	78,442	159	59	123
*AB1XQ	“	71,485	203	36	109
*ND1X	“	64,410	202	22	91
*K1EHT	“	50,336	151	49	94
*AE1T	“	37,009	119	38	81
*AG2K	“	31,164	106	30	76
*N1ERS	“	29,007	125	27	72
*N1YL	“	25,578	97	30	68
*N1AAM	“	15,840	75	30	58
*K1TNX	“	15,204	75	28	56
*KB1RVU	_“_	_12,560_	_67_	_29_	_51_
*K1LHO	“	11,837	73	28	61
*NT1K	“	11,620	61	17	53
*N1HTS	“	6,956	51	14	33
*K1XS	“	5,838	49	12	30
*N1UNH	“	4,995	44	13	32
*WX1USN	“	3,910	43	13	33
*AG1A	“	3,024	32	20	28
*KW1DX	“	714	12	9	12
*KC1QOD	“	630	12	8	10
*W1IRL	“	108	6	6	6
*N1DG	28A	516,502	1133	30	128
*K1AFC	“	14,570	83	14	48
*K1IG	“	260	8	5	8
*N1KJS	14A	4,700	48	14	36
*K1NDU	“	440	14	7	13
*K1IM	7A	18,292	150	17	51
*W1DYJ	3.7A	3,848	42	12	25

District 2

N2SR	AA	4,869,000	2955	138	462
AB3CX	“	4,444,160	2471	144	496
N2MM	“	2,936,082	1930	127	444
KA2K	“	2,546,604	1648	124	433
NY6DX	“	2,385,783	1793	122	409
N2RC	“	2,385,659	1598	120	401
KF2O	“	1,913,616	1196	128	454
WR2G	“	1,890,678	1589	91	326
W2RD	“	1,854,798	1235	125	412
KC2TN	“	1,789,857	1233	119	394
KE1IH	“	1,710,368	1344	106	346
K3TS	“	1,594,112	1195	110	369
KZ2I	“	1,523,146	1367	94	304
WO2T	“	1,466,032	1151	107	365
W2TV	“	1,417,787	1123	110	359
W2YR	“	1,378,238	1012	114	385
N2SQW	“	1,370,700	1094	109	341
K2RET	“	1,361,652	1016	113	374
AB2E	“	1,288,008	873	117	419
W2GDJ	“	1,199,562	849	115	392
NN2NN	“	963,330	888	96	298
W2YV	“	909,450	729	105	345
					(OP: N2GC)
K2BX	“	822,593	845	87	262
WO2X	“	774,792	662	95	327
WK2M	“	738,699	736	85	318
AG2J	“	613,800	742	83	247
KM2O	“	610,090	599	89	272
K2EP	“	596,750	612	79	262
WB2WPM	“	549,376	680	69	227
WA2DNI	“	536,100	649	62	238
W2QJ	“	532,248	524	104	298
WB2NVR	“	467,190	589	69	221
WB2NFL	“	443,385	532	76	219
KD2JOE	“	442,596	516	77	231
N1JP	“	439,829	546	77	222
_N2NI_	_“_	_438,656_	_537_	_74_	_224_
WA2MCR	“	408,260	519	77	221
W2MV	“	392,168	465	71	227
NS2N	“	292,002	425	75	171
K2ANZ	“	282,162	467	67	179

WB2PJH	“	257,712	389	64	172
K3MTT	“	235,770	326	59	212
WA2TDE	“	201,924	303	63	174
WA2UBK	“	198,403	346	43	156
N2NKX	“	185,005	297	64	163
WO2Y	“	137,142	292	33	138
WE2DX	“	135,171	254	56	151
KD2UBH	“	135,044	252	65	147
W6JTB	“	108,480	269	41	119
W2JV	“	77,616	198	33	111
N2HMM	“	68,464	156	58	118
K2QPN	“	62,550	162	39	100
_W2VQ_	_“_	_61,180_	_174_	_42_	_98_
KR2Q	“	58,995	156	44	91
K7RB	“	56,889	144	41	106
NG2X	“	46,720	111	51	109
W2ZS	“	42,625	133	35	90
KC2OSR	“	42,578	141	33	89
AA2PR	“	37,800	103	59	91
WK2H	“	23,848	105	23	65
WB2LBQ	_“_	_22,500_	_84_	_28_	_72_
WF2B	“	9,867	62	23	46
_K2QO_	_“_	_4,488_	_50_	_9_	_24_
KC2IEB	“	4,018	33	12	29
K2QB	28A	88,392	278	24	92
W2KV	“	46,125	157	26	99
WA2OAX	21A	483,653	1143	32	119
WT2J	“	31,692	155	16	60
N2KA	3.7A	1,976	28	7	19
*NC1A	AA	651,130	777	65	233
*W2NTV	“	445,808	616	64	208
*KS2G	“	366,202	496	77	206
*NY2A	“	345,216	538	59	189
*KD2P	“	340,134	500	61	188
*W2FDJ	“	308,574	415	75	204
*W2AAB	“	296,112	437	60	188
*WA2QAU	“	249,744	378	61	181
*K2PJC	“	198,186	353	46	155
*NM2R	“	129,150	249	53	152
*N2EPE	“	102,912	222	61	131
*W2LCQ	“	80,661	195	50	117
*KD2PTX	“	60,640	137	47	113
*K3WHD	“	42,656	134	36	88
*K2AL	“	31,301	105	33	80
*KD2UVT	“	28,080	98	37	83
*KD2SGM	“	27,013	101	41	78
*KD2KEH	“	12,000	62	28	52
*K2SQS	_“_	_4,800_	_43_	_12_	_28_
*W2KYM	“	4,557	45	15	34
*W2MSA	_“_	_2,772_	_28_	_13_	_23_
*N2NRV	“	936	14	13	13
*K2ZR	28A	37,696	191	18	58
*K2IW	“	37,146	167	17	65
*N2YBB	“	16,704	98	16	48
*K2NV	“	736	16	4	12

District 3

K3WW	AA	6,141,828	3512	145	499
AA3B	“	5,674,212	3262	141	492
N3RS	“	5,085,948	2842	146	488
NW3Y	“	3,592,015	2164	137	458
W3MA	“	3,411,529	2130	139	454
K3PP	“	3,302,796	2021	132	456
KU2C	“	2,566,912	1583	134	458
W3FIZ	“	2,392,486	1606	123	415
NN3Q	“	2,344,986	1608	121	397
W8FJ	“	2,322,750	1487	129	441
K3SW	“	2,113,054	1521	113	401
WC3N	“	2,088,048	1490	111	381
K3WJV	“	2,066,376	1373	126	411
NT2DR	“	1,964,235	1581	102	353
W3GM	“	1,962,195	1388	113	396
					(OP: W3FV)
K3WU	“	1,788,774	1353	118	376
K3MD	“	1,664,514	1383	105	366
K1RH	“	1,636,584	1271	100	356
NF3R	“	1,560,132	1279	103	350
K3ZU	“	1,519,850	991	136	429
WB2ZAB	“	1,423,098	1106	114	343
WW3S	“	1,279,791	953	117	360
W3ICM	“	1,270,512	1075	114	345
K3RL	“	1,233,392	923	120	371
N3AM	“	1,199,950	950	109	357
N3FJP	“	1,168,090	1013	92	315
K3ZA	“	1,158,300	999	100	329
W3FOX	“	1,140,000	933	106	350
NT3U	“	1,068,507	815	109	364
WY3A	“	1,030,050	992	91	287
N3ZA	“	986,232	815	104	332
KD3TB	“	970,470	878	100	310
KB3Z	“	927,914	851	89	312
AG4Q	“	920,402	877	102	304
N3AD	“	903,903	797	106	323
N3FCP	“	858,730	801	94	301
N3EEN	“	854,958	892	83	256
K3ATO	“	809,480	807	98	294
N3RJ	“	760,518	826	74	260
K3FMQ	“	718,410	565	105	357
AK3B	“	625,392	689	84	260
K3AK	“	613,410	647	82	263
NX3Z	“	609,000	652	79	269
K3OO	“	546,208	486	108	308
K3TEJ	_“_	_545,950_	_560_	_83_	_275_
W3FR	“	544,600	593	91	259
KC3HXF	“	536,760	688	61	223
K3NM	“	511,609	504	90	281
W3XOX	“	508,760	583	87	235
K2XR	“	481,187	463	87	284
W3OU	“	472,230	525	75	255
W3JX	“	464,204	534	68	248
K3BHX	“	446,653	522	70	247
W3UL	“	367,488	465	74	214
KF3C	“	353,664	450	77	211
W3LL	“	331,290	327	100	305
KA3YJM	“	316,665	500	58	169
K3TN	“	307,040	372	79	225
W3SQ	“	305,214	428	63	195
NN3RP	“	289,587	426	53	196
W3MAM	“	228,313	383	61	168
KG4USN	“	226,908	292	73	224
WA3AAN	“	200,618	312	68	174
N3DUE	“	195,500	327	64	166
W3MM	“	185,928	284	72	182
					(OP: W3EA)
K3SOM	“	180,565	275	58	187
N3KF	“	164,052	322	49	140
K3CY	“	153,660	307	52	143
W3RE	“	145,642	265	65	141
WB3IWC	“	136,500	305	31	125
W3IZ	“	101,556	227	36	120
N3WMC	“	73,315	193	45	110
KD3H	“	72,720	160	57	123
K3TM	“	69,144	193	34	100
N3ZP	“	67,598	185	40	106
N3NGE	“	66,750	139	60	118
N3AML	“	64,800	160	48	114
K3QIA	“	50,220	154	37	87
KC3UEX	“	41,796	185	28	80
N3OZT	“	32,670	126	36	63
N3RM	“	30,261	94	45	86
W2QFV	“	28,482	116	30	64
W3YR	“	28,126	123	22	60
N2IW	“	21,527	83	39	64
WV2M	“	18,815	94	14	57
K3RMB	“	8,164	56	17	35
W3NRJ	“	4,368	45	19	33
KC3DQA	“	3,450	46	17	29
K3PH	“	874	14	9	14
NY3C	28A	147,340	377	28	111
N3XF	“	74,932	203	26	105
W3NO	3.7A	59,580	237	20	70
K3MM	“	22,400	162	12	44
*N3AAA	AA	1,317,580	1076	111	341
*W3KB	“	1,306,216	1025	111	347
*NS3T	“	722,990	730	92	275
*K3KDX	“	302,118	429	65	193
*W3CC	“	242,550	304	72	222
*W3DLD	“	188,784	358	42	142
*K3URT	“	133,566	269	54	143
*N3BAS	“	126,528	234	46	146
*NR3Z	“	118,776	259	45	123
*KA3D	“	80,262	156	48	134
*NE3I	“	66,300	184	35	95
*K3RLW	“	45,672	145	59	114
*KE3KU	“	41,984	150	35	93
*KC3UDO	“	39,788	146	33	83
*W3WHK	“	35,380	140	38	84
*N3HRO	“	27,645	115	28	67
*KC3SVR	“	22,040	96	27	68
*KA3KAG	“	21,306	88	30	76
*K3RSS	“	11,736	61	22	50
*WA7PBE	“	8,946	58	25	46
*W3TAS	“	7,150	50	13	37
*N3NQP	“	6,102	50	21	33
*W3RFX	_“_	_714_	_12_	_10_	_11_
*AB3GS	“	374	12	10	12
*KC3TYX	“	156	7	5	7
*KB3NJB	28A	42,930	209	19	62

District 4

K4AB	AA	5,004,090	2794	152	506
NO9E	“	3,322,100	2181	134	422
W4RM	“	2,891,756	1942	130	426
N4WW	“	2,599,308	1582	143	475
N6AR	“	2,458,511	1537	137	446
K4PI	“	2,293,548	1607	126	398
KX2T	“	2,162,700	1609	111	375
K4RO	“	2,122,510	1430	138	425
N1RM	“	2,016,736	1451	114	382
K3IE	“	1,976,170	1459	121	369
K3DNE	“	1,800,285	1411	106	361
K3QH	“	1,757,025	1537	124	389
N4QS	“	1,416,865	1259	95	300
K5VIP	“	1,204,173	994	98	335
N4PQX	“	1,144,121	779	122	395
K4CAE	“	1,134,521	963	107	354
W4KW	“	942,064	940	114	274
ND4Y	“	916,400	836	98	297
K4QQG	“	865,386	868	102	291
K4WMS	_“_	_854,143_	_701_	_110_	_357_
K4JKB	“	852,768	739	109	323
W3IP	“	792,610	628	114	355
N4CW	“	776,520	768	79	281
N4LA	“	770,814	608	114	344
N3MN	“	713,661	692	94	283
WC3W	“	712,990	686	98	312
AA4R	“	657,342	722	74	259
NE4EI	“	641,598	649	96	270
N4EXA	“	629,850	693	78	247
K5EK	“	592,999	533	100	307
AA4V	“	577,395	598	96	255
AJ4A	“	575,990	461	120	362
NF4A	“	557,424	627	77	239
N4PD	“	547,191	536	98	275
K2LS	“	502,980	623	75	228
K4VTE	“	499,888	605	81	233
W4WWQ	“	458,337	542	90	233
W4NZ	“	430,012	468	95	242
N4RLD	“	424,751	640	75	194
NQ4I	“	417,962	483	81	242
AC2AC	“	417,360	543	74	208
AC4MC	“	403,480	527	78	202
N3MK	“	366,792	370	80	292
K1BDC	“	363,240	369	83	277
AA4GA	“	328,104	406	68	226
K2WK	“	308,102	436	61	193
K2TE	“	296,980	368	75	235
N4TL	“	292,448	428	68	179
K2AOE	“	256,302	361	67	194
AA4DD	“	219,500	314	70	180
K4TMG	“	218,526	320	81	177
N4KH	“	213,857	358	60	163
KZ3P	“	205,953	327	73	164
K2SD	“	200,151	392	49	140
NZ4N	“	198,940	300	74	171
AA5JF	“	192,066	257	62	207
W1BQ	“	189,397	311	58	163
WB4EHG	_“_	_180,995_	_265_	_74_	_191_
K3JWI	“	180,853	294	62	161
KO4VW	“	177,310	294	70	168
N3KN	“	171,084	300	58	154
K2WPM	“	169,048	323	46	141
W3PJ	“	166,600	266	73	165
AI4WU	“	163,850	280	72	154
W4JVN	“	137,600	235	56	159
K3RV	“	137,600	234	62	153
KW4LS	“	134,964	341	42	121
KK4R	“	123,519	226	67	142
K8YC	“	116,886	184	66	176
K4KKC	“	111,510	243	57	132
W4VIC	“	111,321	230	41	148
KK4ODQ	“	108,667	239	33	136
K4SO	“	105,092	200	65	123
K8YFM	“	105,084	272	34	105
KT4O	“	100,192	187	62	140
KA4RRU	“	88,960	216	47	113
KG3V	“	83,030	167	57	133
K4SHW	“	79,170	183	57	117
KZ5ED	“	70,500	157	59	129
NN4X	“	70,005	128	77	118
W4ATL	“	64,962	168	58	104
KZ1X	“	56,502	160	31	98
WO4D	“	54,316	140	46	102
AF2D	“	53,286	124	49	117
WD9GMK	“	53,157	146	40	101
K3PXJ	“	52,380	152	43	92
KB9RKK	“	47,880	122	49	103
KU4FX	“	42,545	135	38	89
NU4E	“	36,010	108	53	77
K2SX	“	31,992	115	44	80
W4RQ	“	31,644	111	30	78
N4CWZ	“	31,565	105	34	73
K8LF	“	29,103	107	38	71
W4CMM	“	26,136	120	36	63
N4FP	“	24,975	100	44	67
NN4NT	“	22,540	96	29	63
KB4OI	“	22,344	88	38	76
KS4X	“	20,909	77	40	63
K1ZW	“	17,945	74	39	58
K4ELI	“	16,732	75	33	56
NS4X	“	14,060	70	24	52
K8AC	“	13,284	61	29	52
K0MO	“	12,462	66	23	44
N4GU	“	11,825	74	13	42
K9QJS	“	9,798	54	22	47
N1PEB	“	9,112	57	25	43
_KE4D_	_“_	_8,255_	_49_	_21_	_44_
KB4QZH	_“_	_5,400_	_35_	_23_	_31_
N4IDH	“	4,850	41	20	30
W8WZ	“	3,772	32	19	27
W4TG	“	3,744	29	21	27
N4CNZ	“	3,420	36	16	29
W4GHV	“	3,363	41	27	32
WD4DAN	“	3,195	50	16	29
KE4YOG	“	2,418	25	17	22
KM4HQE	“	2,040	21	14	20
ND2O	“	1,680	21	15	20
KN4RHC	_“_	_1,450_	_19_	_11_	_18_
K4XG	“	352	8	8	8
N0CRL	“	280	8	6	8
KX4JN	“	280	8	6	8
K4NMR	“	84	4	3	4
N4EEB	28A	618,852	1457	31	125
WJ2D	“	284,592	693	29	118
W1AJT	“	161,379	453	26	103
K4FS	“	135,592	350	29	107
W3US	“	58,144	224	23	69
K3SV	“	52,128	196	23	73
N3CW	“	28,560	126	20	65
KM4HI	21A	203,060	533	31	112
WA4JUK	14A	114,829	348	32	89
WF7T	“	96,247	446	27	82
KC2YEB	_“_	_24_	_2_	_2_	_2_
W6KW	7A	65,508	251	26	80
W4PG	“	31,995	158	18	63
KD4RH	“	5,700	52	9	29
KM2G	3.7A	16,897	105	12	49
W4TTY	“	4,998	40	16	33
K2KW	1.8A	77	6	3	4
*N2YO	AA	1,539,699	1189	104	367
*N4XL	“	1,013,520	921	103	309
*KK4ADQ	“	595,643	687	75	242
*KG2MM	“	363,870	434	79	232
*W4EE	“	295,596	437	71	181
*N9TF	“	273,420	398	76	176
*KG4IGC	“	224,000	347	77	179
*N4DW	“	216,790	306	69	197
*K3GWK	“	211,992	319	77	187
*N2OG	“	201,815	351	60	163
*KM4AF	“	193,623	257	80	197
*N2ESP	“	175,700	269	73	178
*W4HRL	“	151,905	283	57	148
*K4DR	“	146,601	311	46	133
*KN4UOW	“	144,585	298	51	138
*NR1K	“	144,504	255	65	158
*NE5W	“	135,342	232	60	159
*W4LT	“	132,275	279	52	133
*K4VBM	“	131,138	250	63	140
*WS4WW	“	122,838	255	43	134
*W4TM	“	119,250	225	71	154
*NK4O	“	105,200	210	63	137
*K6ES	“	96,446	239	50	116
*K5VG	“	86,376	186	43	140
*K3ABE	“	79,849	171	46	141
_*NT4W_	_“_	_71,446_	_204_	_39_	_100_
*KM4IAJ	“	66,300	179	50	106
*N4BQQ	“	64,728	147	53	121
*W4ZD	“	57,007	190	28	81
_*WR4K_	_“_	_55,480_	_148_	_44_	_102_
*KN4USA	“	45,030	118	45	113
*WA4IPU	“	42,828	131	37	92
*K4LDC	“	38,586	120	37	81
*KB4YPN	“	38,170	146	34	76
*AD4YQ	“	36,811	118	43	88
*KD4LEM	“	30,199	120	29	72
*WA8IHW	“	30,179	111	33	70
*WN8Y	“	29,750	111	41	84
*KN4TCF	“	29,606	99	36	77
*NA4X	“	26,182	102	34	72
*K4TTM	“	25,172	82	38	78
*KT3T	“	24,970	92	40	70
*KK4E	“	24,308	92	42	61
*K2ZBA	“	23,940	93	23	72
*KA3PCX	_“_	_22,422_	_87_	_35_	_66_
*KN4HGI	“	19,320	77	39	66
*AF4NJ	“	15,416	70	30	52
*KE0L	“	14,476	60	36	58
*KC4WQ	“	13,200	60	30	50
*K4MI	“	11,232	53	30	48
*NG4V	“	10,428	62	28	51
*K4IEY	“	9,675	63	20	55
*K4OMD	“	9,462	77	19	38
*NU4N	“	9,300	59	20	42
*W4JH	“	6,496	47	23	33
*WB9VPG	“	6,405	44	21	40
*KC2DPF	“	4,100	38	15	26
*AA4LR	“	3,990	49	14	16
*AD4SA	“	3,608	35	15	26
*K4PQL	“	3,388	34	14	30
*WC4H	“	2,135	26	12	23
*KK4SNO	“	1,645	26	14	21
*W8QI	“	975	16	11	14
*KO4YJA	“	792	20	11	13
*K4LXX	“	720	13	7	13
*K2LAT	_“_	_494_	_15_	_12_	_14_
*W4CMG	“	450	11	6	9
*KO4ZRB	“	104	8	5	8
*N9MLR	“	96	5	3	5
*W4RN	28A	304,428	790	27	111
*N3UA	“	224,000	561	29	111
*WA2LMC	“	45,630	209	23	67
*K4JPD	“	35,178	160	25	57
*N4SFC	“	19,698	107	16	51
*N1GMV	“	14,310	97	15	38
*KO4CNU	“	480	11	7	9
*KQ4AEJ	“	90	7	5	5
*KO4TDQ	“	6	1	1	1
*N4IJ	21A	151,230	394	33	109
*WA1FCN	“	130,438	404	31	90
*KO4WPO	14A	5,891	66	10	33
*K4WWP	“	3,016	37	7	22
*AA4NP	7A	2,430	28	9	21

District 5

N2IC	AA	5,410,368	3305	158	448
K5WA	“	3,491,298	2096	157	500
N5RZ	“	2,538,800	1775	149	428
KE5MMT	“	1,256,752	1022	123	335
WZ5M	“	1,194,384	1004	110	337
N5XJ	“	1,154,538	1206	78	265
W9DCT	“	1,093,680	964	113	307
AA5H	“	1,001,250	811	120	330
AD5XD	“	816,740	774	101	287
K5TA	“	560,399	572	111	248
NT5V	“	548,236	594	86	252
_N5OT_	_“_	_492,410_	_456_	_116_	_294_
W5GN	“	490,686	671	74	220
KC5DI	“	473,984	607	91	231
WW5L	“	458,858	541	89	224
K5NZ	“	455,793	471	99	278
W5LO	“	451,242	504	91	227
WB0TEV	“	439,920	355	128	342
W2GS	“	375,360	504	76	196
N5AA	“	363,744	324	113	308
					(OP: K5NA)
K5PS	“	350,649	381	93	240
K5JTH	“	331,632	430	70	212
N5KWD	“	330,820	449	80	198
N5EE	“	317,282	441	80	182
K4DG	“	234,459	357	73	166
W5GCX	“	223,146	364	73	158
W5GFI	“	190,950	362	52	138
N5WNG	“	190,950	256	93	192
_N5ZC_	_“_	_188,500_	_287_	_86_	_164_
_N5QJ_	_“_	_178,068_	_309_	_70_	_158_
K5DU	“	153,201	247	56	167
K5TIA	“	125,584	281	63	125
AC4CA	“	114,580	244	52	118
KK5LO	“	92,950	199	51	118
KE5CDE	“	77,010	181	60	110
KG5VK	“	61,047	166	33	100
WV5Y	“	60,590	160	56	90
KA5M	“	57,105	153	39	96
WD0GTY	“	42,770	121	44	86
K5TU	“	30,179	105	26	77
W5KI	“	25,080	91	44	66
WD5ENH	“	23,760	100	33	66
W0ZW	“	21,112	76	41	63
WA5LXS	“	20,746	97	30	52
N5ZKK	“	20,468	85	30	56
K5PAR	“	6,300	48	26	34
KC5EGZ	“	2,709	27	16	27
W5RZ	“	1,209	18	14	17
N5JGE	“	450	11	8	10
NJ0F	28A	344,800	793	33	127
N5KAE	14A	1,170	17	9	17
K5UR	1.8A	4,510	64	13	28
*WB5N	AA	343,072	459	87	215
*AB5NX	“	176,244	317	63	165
*KI5GNH	“	166,992	319	58	138
*K5DXR	“	156,122	237	79	172
*WA5LFD	“	149,366	289	78	149
*KG5KRZ	“	106,689	255	61	122
*K5MR	“	94,584	214	51	117
*AB5KM	“	43,035	122	54	97
*KJ6DQ	“	35,047	123	37	64
*N3BUO	“	32,262	113	41	73
*KJ5FA	“	30,916	106	51	67
*N0LD	“	28,832	131	39	67
*AG5AY	“	28,815	102	38	75
*N5VHT	“	27,474	107	43	71
*K2ZP	“	14,112	69	34	50
*W5CSM	“	11,592	93	29	40
*KI5MPX	“	10,044	63	33	48
*W5JCC	“	7,254	48	18	44
*AF5CC	“	5,353	43	20	33
*KI5FQJ	“	2,379	22	17	22
*KC6ZBE	“	2,088	22	15	21
*KC5UXO	“	1,767	20	12	19
*KF5VH	“	340	9	8	9
*KN5S	“	48	3	3	3
					(OP: K5WW)
*AF5JM	28A	703	15	7	12
*WA5WFE	21A	77,998	240	29	89

District 6

N6RV	AA	2,418,950	1855	137	368
NT6X	“	1,705,190	1529	115	295
W6YI	“	664,986	521	141	356
N6ZFO	“	637,092	775	101	205
WE6Z	“	608,190	774	99	231
K6TQ	“	353,375	513	82	175
W7PC	“	315,040	325	81	277
N6QQ	“	284,890	374	85	225
WA6KHK	“	223,925	338	94	171
K6RIM	“	175,480	313	70	135
_WA7G_	_“_	_169,417_	_322_	_69_	_122_
K6MM	“	146,878	265	62	144
W8GJK	“	144,690	278	76	119
N5KO	“	121,334	227	70	136
WX6G	“	109,956	229	74	130
K6GFJ	“	76,172	211	47	90
WI6X	“	74,088	194	61	86
W6MOB	“	63,918	150	63	96
WD6T	“	59,520	154	60	95
KG6AO	“	54,520	147	56	89
K6DW	“	51,912	154	56	70
W6SC	“	49,852	160	46	75
W1SRD	“	41,615	105	53	92
K6XV	“	29,016	111	47	57
NK6A	“	28,690	119	35	60
W6XK	“	26,896	114	34	48
K6WV	“	25,544	113	42	61
AJ6TL	“	22,752	106	41	55
K6ELE	_“_	_20,412_	_106_	_38_	_43_
_AI6DR_	_“_	_10,812_	_67_	_31_	_37_
W6SX	“	9,728	58	35	41
W6DPM	“	4,278	35	17	29
AF6SA	“	3,772	32	18	23
KF6I	“	1,176	19	10	11
KK6P	28A	63,976	271	25	63
					(OP: W7IV)
W6AFA	21A	370,668	1058	33	105
*KM6WCC	AA	97,020	243	57	108
*N6ORB	“	85,820	220	51	89
*NT5A	“	67,520	201	66	94
*KE6PLA	“	59,892	185	58	80
*W6RQ	“	33,880	117	42	68
*KD6HOF	“	32,643	140	41	52
*KW6AA	“	20,882	76	46	60
*K6ST	“	15,300	84	40	45
*NO6G	“	10,812	65	32	36
*KN6MYI	“	5,885	41	22	33
*W6APH	“	1,720	29	22	21
*K6EI	“	1,075	16	11	14
*AE6PL	“	648	14	12	12
*W6RGS	“	600	11	10	10
*W6ZL	28A	67,080	275	25	61
*AC6DX	“	22,494	122	24	45
*WQ6X	“	7,831	76	17	24
*KA9A	7A	3,570	39	15	27
*WZ6ZZ	3.7A	960	23	10	10

District 7

N6TR	AA	1,428,116	1188	125	312
N9RV	“	1,131,444	1377	100	218
KA6BIM	“	1,042,860	1038	117	273
K7AR	“	758,970	725	123	282
W7GES	“	720,556	745	109	252
AA7V	“	591,826	538	104	294
KH7X/W7	“	527,065	637	115	270
					(OP: KH6ND)
N7GCO	“	505,968	587	101	231
W7PP	“	441,620	534	92	219
W7CXX	“	411,510	504	105	214
AC7DC	“	351,024	492	95	189
K7SS	“	324,852	491	89	164
K7WP	“	285,600	395	82	190
K4XU	“	270,480	363	94	200
KN7K	“	239,904	386	86	152
KE6GFI	“	205,725	439	76	135
K7QA	“	198,372	322	73	171
WB6JJJ	“	195,143	333	83	138
AL7RF	“	192,477	316	90	159
K0NG	“	184,440	334	82	150
NK7C	“	164,160	330	85	143
K0IP	“	144,359	231	74	167
KD7VIK	“	144,192	297	64	128
K7WXB	“	141,966	293	65	133
WA7AN	“	134,596	244	68	141
					(OP: K9DR)
N7RBL	“	132,258	279	77	124
K7VIT	“	131,760	274	68	112
KN7Y	“	130,071	283	75	116
WA7DUH	“	121,056	228	69	139
K6WSC	“	120,960	185	85	167
KA7LJQ	“	113,238	265	55	107
N7IP	“	109,272	186	77	155
KB7AZ	“	97,188	201	66	116
KC7V	“	95,765	218	63	116
K9PY	“	92,700	210	66	114
W7RIS	“	79,407	213	61	112
KB7HDX	“	64,800	184	52	83
W7DBA	“	54,329	167	51	70
K9RZ	“	45,974	147	48	79
K7EKD	“	44,160	141	51	87
KX7TL	“	34,136	101	44	92
NZ2S	“	33,561	145	46	67
N7EPD	“	32,334	114	40	62
_WA7TV_	_“_	_31,204_	_126_	_47_	_69_
KK7GO	“	31,161	93	53	88
WU9B	“	29,754	125	36	51
AC7GL	“	26,784	107	39	54
W6OAT	“	25,668	113	42	51
K7GS	“	23,976	99	46	65
K7EG	“	23,136	97	28	68
W7NIK	“	22,311	94	44	67
KF7U	“	20,025	104	25	50
KG7QXE	“	17,922	82	41	46
KA6RWL	“	14,620	69	32	54
WA7BAM	“	9,344	49	28	45
WA7CPA	“	6,499	45	28	39
AK7MG	“	5,508	40	23	31
WT8P	“	3,362	42	18	23
W7FCL	“	2,646	41	21	28
KR7D	“	144	7	4	5
KK7L	“	128	6	4	4
N6SS	28A	248,381	658	32	105
W7RN	“	169,500	698	28	85
					(OP: K5RC)
K2RD	“	148,104	488	29	92
N7DD	21A	328,614	896	34	109
W7IL	“	183,084	605	29	85
KI7N	“	1,260	24	10	11
W7ZR	14A	10,030	81	22	37
W7CO	“	2,295	31	14	13
AD7LJ	“	1,134	24	12	15
N7RK	7A	15,561	96	22	41
KB7QFE	“	77	4	3	4
*N7IR	AA	367,242	462	99	192
*KK7RR	“	221,098	382	81	146
*N7MZW	“	197,985	387	68	133
*WA0WWW	“	183,201	298	78	159
*W7OM	“	180,576	334	76	140
*KD7PCE	“	177,366	315	71	135
*K6PF	“	136,715	309	69	116
*WN6W	“	107,500	247	68	104
*WZ8T	“	93,024	244	46	98
*N7ESU	“	57,232	160	51	95
*K7STU	“	45,752	170	58	75
*WA7YXY	“	35,105	122	45	74
*K7VAP	“	28,116	112	41	58
*KC7H	“	27,392	139	49	58
*K7HV	“	24,871	84	43	76
*WA7RJ	“	23,529	109	39	54
*WA7YAZ	“	21,505	96	31	54
*N0BK	“	13,908	79	32	44
*NA6JD	“	12,859	91	33	44
*K7MK	“	10,248	63	26	35
*NU7K	“	10,224	58	31	41
*W7ZRC	“	9,600	59	18	42
*W7JHR	“	5,544	48	27	29
*K7ACZ	_“_	_4,512_	_32_	_19_	_28_
*K7TDM	“	4,484	53	29	30
*KE7NGO	“	3,648	56	26	31
*KK7FEL	“	3,510	35	19	26
*WM5F	“	768	17	8	8
*N7FXT	“	522	14	9	9
*WA7SHP	“	378	11	9	9
*KK7A	“	378	10	9	9
*N7GRC	“	306	11	7	10
*W0OKE	“	66	8	5	6
*AC6DF	“	20	11	6	4
*AK8E	28A	29,155	135	24	61
*NS7B	“	17,546	105	22	40
*W0BF	“	16,250	91	23	42
*N7MSI	“	48	3	3	3
*N7XB	“	24	2	2	2
					(OP: NX7B)
*KB7JJG	“	24	2	2	2
*W8TJM	21A	11,800	79	20	39
*WV7S	“	940	17	8	12
*WA8ZNC	14A	3,312	53	16	20

District 8

WA3C	AA	2,691,414	1642	133	458
K8CX	“	2,025,364	1522	116	366
N4RA	“	1,994,362	1325	122	425
N8CWU	“	1,838,668	1402	121	373
KG8CW	“	1,456,128	1157	119	355
K8ROX	“	993,762	745	114	364

WA8Y	“	736,560	753	100	272
KE8HBV	“	540,792	626	83	250
KV3R	“	479,214	515	81	256
N8BI	“	457,710	515	83	247
N4EL	“	407,392	599	52	180
KA8G	“	318,602	492	63	178
K8AJJ	“	233,541	371	61	170
N8HO	“	233,179	349	57	194
W8HPJ	“	130,494	297	50	132
AD8FD	“	129,720	207	71	159
AB8M	“	124,806	245	52	131
W8PU	“	114,868	225	54	134
WZ8P	“	108,297	231	56	135
KC8ZKI	“	102,718	211	56	147
N8SDR	“	102,510	220	48	122
W8UF	“	95,634	195	62	136
N9RC	“	85,695	158	60	137
_W8MJ_	_“_	_67,824_	_154_	_40_	_117_
W8EH	“	59,340	168	39	90
W8RID	“	44,409	143	35	78
AC9GK	“	41,866	134	39	82
N4LSJ	“	37,185	116	32	79
K8ESQ	“	34,916	110	36	80
NR8Z	“	33,750	102	45	80
KD8FS	“	33,276	129	26	68
KT8Y	“	29,928	127	28	58
KE8RCI	_“_	_23,968_	_92_	_30_	_77_
KB8HGW	“	8,556	61	19	43
W8LRJ	“	2,655	25	20	25
KE8DAX	“	1,755	23	8	19
K8ALM	“	592	13	5	11
W8CZN	28A	170,240	424	31	121
W3HKK	“	138,178	433	26	92
K8TLC	“	2,550	38	9	21
*K8LY	AA	670,542	712	78	261
*AA8CA	“	422,530	516	81	229
*N8HRZ	“	415,716	515	80	214
*N8OH	“	263,856	370	82	194
*W8GX	“	221,712	325	70	178
*KE8PX	“	196,605	296	74	183
*KC9LA	“	172,584	304	74	142
*K4YJ	“	169,694	280	64	153
*N8CUB	“	120,960	220	62	148
*N8ACP	“	97,913	209	58	121
*WS6K	“	89,034	172	61	148
*WB8TCB	“	75,078	169	68	126
*W8AIT	“	48,233	148	45	94
*KE8NSW	“	40,610	122	43	88
*AC8RJ	“	29,412	84	49	80
*N8RGA	“	23,544	92	39	70
*N8CWX	“	17,472	73	34	62
*N8FYL	“	4,914	47	14	25
*N8KZZ	“	4,503	40	23	34
*W8TGB	“	3,094	35	12	22
*N8UVM	_“_	_247_	_10_	_6_	_7_
*KB8HHA	“	88	5	4	4
*KE8BWQ	28A	2,548	34	12	16
*AK2U	14A	2,244	29	10	23

District 9

WB9Z	AA	5,813,697	3146	161	520
K9NW	“	2,606,615	1642	133	438
N9TTK	“	1,452,256	1272	105	311
K9KE	“	1,410,750	1057	119	356
AJ9C	“	1,326,682	1000	120	371
N9ZM	“	1,227,660	1058	112	308
WO9Z	“	1,033,969	869	112	319
N2BJ	“	1,018,050	1085	76	254
KB0V	“	770,525	697	119	306
W9KEY	“	699,132	765	94	254
K9TI	“	639,468	648	99	283
KW9E	“	616,524	681	87	245
AC9S	“	610,416	692	87	227
AK9PL	“	553,392	609	89	247
W0ELT	“	500,256	584	89	235
KM9E	“	441,192	471	103	269
N5RP	“	421,950	533	66	224
K9CCW	“	347,520	505	58	182
K9AWS	“	321,368	432	89	200
W9YK	“	318,504	431	78	198
_W9XY_	_“_	_315,010_	_417_	_90_	_199_
WB8BZK	“	188,384	312	70	162
K9DJT	“	161,530	215	83	207
KC9K	“	161,385	235	82	183
N9SB	“	156,560	299	53	137
KJ9B	“	153,360	239	72	168
KD9V	“	147,500	246	87	163
W9HT	“	145,168	263	67	144
K9CI	“	144,352	266	64	144
KC9EOQ	“	125,672	270	55	129
AA9L	“	94,536	241	48	108
KK9V	“	91,443	190	62	125
WB9VGO	“	85,340	194	58	112
K9YX	“	67,482	191	40	98
KA9I	“	67,150	156	54	104
W9CY	“	49,926	141	48	109
KC9BG	“	38,125	115	33	92
W9RN	“	34,155	114	39	76
K9LA	“	33,264	105	29	97
K9STM	“	27,140	99	43	72
N9RMB	“	13,608	63	30	51
W9EJL	“	12,212	65	26	60
WI9WI	“	8,120	45	26	44
K9QKL	“	7,560	52	30	40
KN9P	“	1,632	21	15	17
AA9A	28A	441,450	1135	32	118
AG9S	“	114,480	370	23	85
N9GUN	“	6,424	54	14	30
W9PA	21A	280,716	754	32	117
N9TCA	“	17,301	84	24	55
N9LR	7A	31,125	194	23	60
*WE9R	AA	1,740,975	1251	127	374
*KC9JML	“	220,069	349	69	160
*W9VQ	“	218,160	330	62	178
*KD9CLH	“	164,318	298	52	142
*AA9JS	“	152,496	313	68	148
*K9PW	“	134,310	292	47	118
*N9UA	“	127,720	190	59	189
*WA9LEY	“	99,186	212	59	124
*K9VD	“	87,246	245	40	91
*K9PG	“	78,077	176	48	115
*KB9FPY	“	53,600	158	42	92
*K9FRO	“	42,444	128	46	85
*K9MCK	“	34,112	128	32	72
*KD9NNZ	“	33,401	119	43	84
*NM9P	“	28,060	102	43	72
*W9PI	“	18,952	81	28	64
*K0CD	“	18,870	71	38	64
*KD9NYE	“	14,110	62	38	47
*NQ9A	“	10,200	63	30	45
_*AG9A_	_“_	_9,380_	_51_	_26_	_41_
*KD9OIN	_“_	_7,735_	_45_	_25_	_40_
*K9WNG	“	3,234	36	19	23
*AA9RK	“	2,448	28	17	19
*WA9IVH	“	1,682	22	11	18

*K9WBT	“	1,680	24	15	20
_*K9QA_	_“_	_1,200_	_18_	_10_	_15_
*KD9SAW	“	650	14	11	14
*W9XT	28A	163,280	445	31	99
*N9VPV	“	26,424	132	20	52
*N9NCY	“	2,000	28	8	17
*N9TGR	21A	146,727	375	30	107
*WB9HFK	“	40,940	172	24	65
*W9QEE	14A	532	15	9	10

District 0

WA0MHJ	AA	1,260,601	912	128	365
W0BM	“	934,400	862	105	295
K0YR	“	776,720	795	113	267
W0PSY	“	743,684	802	99	257
K0CN	“	515,052	547	97	245
W0MB	“	492,020	622	81	211
N0QO	“	414,960	559	79	194
K0TRL	“	412,134	527	78	220
NW0M	“	403,233	560	71	186
N0AT	“	390,445	434	94	247
K0ARY	“	385,866	468	68	223
K0CF	“	378,420	526	67	188
K1KD	“	373,248	522	69	187
AA0FO	“	308,853	470	70	173
W0RX	“	283,974	341	96	222
K5ZG	“	269,916	431	72	177
W0PMO	“	263,940	316	83	235
KV0I	“	255,374	462	65	173
WB0N	“	243,398	356	82	180
NX0I	“	236,406	390	79	167
K0AD	“	232,080	394	74	166
AK0BC	“	226,014	308	81	190
W8XAL	“	202,212	321	86	160
N5KB	“	178,752	350	57	139
K0RJW	“	160,440	300	60	131
K0PC	“	154,176	264	68	151
KC6R/0	“	127,263	286	47	130
W0OR	“	119,574	201	69	165
K0GD	“	109,230	288	55	110
W0NY	“	98,658	234	53	109
WX0Z	“	94,336	207	67	109
WB0WIV	“	94,287	216	51	108
K0IR	“	88,556	198	58	111
NS0R	“	81,838	199	58	108
W0PR	“	78,720	196	56	104
AB4BA	“	72,300	192	62	88
W0GJ	“	62,046	157	64	98
N0KQ	“	58,032	166	48	96
KT0A	“	42,699	126	46	83
KS0AA	“	42,284	133	47	77
K0TG	“	31,174	113	40	69
_AK0DX_	_“_	_29,088_	_137_	_39_	_57_
KI0F	“	26,076	101	35	71
W7II	“	26,058	101	34	67
W0UY	“	25,944	108	27	65
W0MN	“	19,504	98	37	55
AD0RW	“	16,863	85	26	47
WD5ACR	“	4,851	40	22	27
K0TLG	“	4,785	38	24	31
K9TWW	“	2,688	24	19	23
AD0AB	“	132	12	7	5
KB0EO	28A	150,088	371	33	113
K0EU	“	6,574	64	15	23
N0RN	21A	41,055	172	25	60
KV0Q	14A	313,058	843	38	119
NI0K	“	49,294	219	24	74
*AE0DX	AA	550,525	681	84	221
*K0KX	“	484,552	617	89	207
*W0JM	“	428,139	544	87	216
*K0XF	“	351,542	501	88	186
*K0RC	“	264,480	357	96	208
*N0EO	“	209,700	357	71	154
			(OP: AA0AW)		
*K0TJT	“	150,902	287	66	131
*AD1C	“	141,882	260	74	140
*K0SV	“	135,801	270	61	130
*KN0L	“	115,276	259	61	118
*AE0JR	“	114,835	254	58	135
*W0UC	“	108,600	218	68	132
*K4IU	“	77,401	194	49	108
*KF9MT	“	72,611	184	59	102
*K0IL	“	67,320	160	55	115
*ND0TS	“	43,710	147	59	82
*W0OS	“	42,826	109	56	105
*N0UJJ	“	32,287	144	28	55
*KB0NES	“	29,592	115	40	68
*W0ADL	“	24,592	95	42	64
*WB0LJK	“	18,920	72	45	65
_*AK0M_	_“_	_17,577_	_78_	_36_	_57_
*K0WRY	“	11,644	64	37	45
*KO9V	“	9,520	59	30	38
*K0MPH	“	9,372	53	31	40
*W6GMT	“	1,802	23	14	20
*KF0EIR	“	1,638	26	18	21
*N0RC	“	1,080	21	15	15
*N0UK	28A	10,400	76	17	35
*KF0ADU	“	35	3	2	3
*KE0ITC	21A	10,738	76	13	46
*W0SAB	14A	6	1	1	1

Alaska

AL2F	AA	171,717	670	51	60
KL7KK	“	149,769	497	49	80
*KL4OB	AA	2,070	44	12	11
*KI6RRN/ KL7	“	624	22	7	6
*KL1JP	21A	91	5	4	3

Belize

V31XX	AA	8,312,928	5859	146	478
V3A	14A	390,228	1382	30	94
			(OP: V31MA)		

Bermuda

VP9AD	AA	71,231	177	47	116

Canada

District 1

VA1CC	AA	135,235	235	52	163
VO2NS	“	91,042	477	30	68
VE9XX	28A	574,650	1505	30	120
VO2AC	“	348,066	1216	23	99
VO1CH	“	236,022	656	26	113
*VE9WH	AA	71,485	192	47	98
*VE9RA	14A	32,096	225	15	53
*VE9ML	1.8A	24	6	1	2

District 2

VA2WA	AA	7,979,664	4961	138	478
VA2EBI	“	1,299,682	1001	107	371
VE2CSM	“	201,472	716	34	94
VE2OV	“	193,842	315	74	168
VE2EZD	“	96,560	257	36	106
VA2QR	“	74,400	177	48	112
VE2EVQ	“	11,222	73	25	37
VE2WAT	28A	113,288	354	25	94
VE2IDX	14A	754,290	2159	38	115
			(OP: VE3ZF)		
*VA2OT	AA	281,505	464	61	184
*VE2HTC	“	135,590	281	49	133
*VE2HEW	“	125,343	304	53	118
*VE2OWL	“	41,064	127	33	83
*VA2VT	28A	1,485	21	11	16

District 3

VA3DF	AA	2,812,857	1754	133	440
VA3MW	“	1,026,432	1130	95	289
VA3WB	“	987,530	1059	88	282
VE3NE	“	774,333	920	83	274
VA3CW	“	731,747	759	93	268
VA3LR	“	562,998	635	73	236
VE3KTB	“	330,261	457	78	205
VE3ZZ	“	279,424	439	59	177
VE3EY	“	216,064	370	63	148
VA3TNM	“	200,668	333	65	162
VA3PC	“	171,360	248	67	188
VE3BK	“	113,405	250	57	128
VE3YT	“	83,763	316	45	78
VE3NR	“	69,600	165	45	115
VE3YAA	“	62,878	160	43	106
			(OP: VE3DQ)		
VE3RCC	“	53,856	161	47	97
VE3LRL	“	35,332	127	39	82
VE3QN	“	14,850	77	23	52
VA3WPS	“	13,468	65	27	47
VE3KG	28A	297,916	810	28	114
VA3WW	“	57,387	198	24	87
VE3VN	21A	780,604	1859	32	125
*VE3WG	AA	707,363	862	88	249
*VA3SWG	“	505,196	994	57	155
*VE3VY	“	389,424	698	66	178
*VE3CWU	“	379,440	532	67	188
_*VE3BX_	_“_	_314,688_	_873_	_53_	_123_
*VA3IDD	“	288,225	537	60	165
*VA3WU	“	187,812	273	77	205
*VE3HZ	“	132,430	351	51	119
*VE3HG	“	83,772	192	42	114
*VE3FZ	“	56,448	155	42	102
*VA3IPG	“	48,180	159	44	88
*VE3MF	“	33,655	99	36	91
*VE3ETE	“	25,500	127	34	66
*VE3MV	“	16,185	79	32	51
*VA3CJZ	“	9,628	68	20	38
			(OP: VA3WPS)		
*VA3ROC	“	8,658	55	30	44
*VE3JZT	“	7,839	65	27	40
*VE3OU	“	2,442	28	12	21
*VA3MQS	“	2,412	35	13	23
*VE3DPS	“	630	16	7	11
*VA3EJN	28A	32,376	159	19	57
*VA3OOL	14A	31,080	143	21	63

District 4

VE4VT	AA	2,309,725	2740	110	297
*VA4HZ	AA	5,850	50	17	28
			(OP: VE4HAZ)		

District 5

VE5MX	28A	222,264	1001	23	75
*VE5SF	AA	756,510	1095	88	214
*VE5KS	28A	39,888	214	22	50

District 6

VE6TN	AA	1,064,532	1323	98	250
VE6FI	“	376,272	1199	58	98
VA6MA	“	76,160	234	61	99
VE6DDD	_“_	_6,222_	_41_	_28_	_33_
VE6WQ	21A	309,350	1247	27	88
*VE6CSX	AA	19,106	106	39	43
*VA6TI	“	1,470	30	18	17

District 7

VE7NY	AA	988,880	1764	74	161
VE7WNK	“	274,050	406	88	173
VE7IZ	“	85,994	235	58	88
VE7FE	“	36,846	147	33	56
VA7TU	“	15,975	98	29	46
VE7DX	28A	160,565	921	25	60
VE7SZ	21A	276,840	987	31	89
VE7TI	14A	1,560	24	7	19
*VA7BEC	AA	553,440	1062	79	161
*VE7AX	“	100,260	214	64	116
*VE7HS	“	72,216	244	54	82
*VE7BV	“	59,360	176	56	84
*VA7DXC	“	44,786	198	42	56
*VA7EET	“	640	14	11	9
*VA7LGN	_“_	_63_	_7_	_4_	_3_

Costa Rica

TI7W	AA	88,173	359	28	73
			(OP: N3KS)		
TI2CC	28A	874,208	2775	29	107
TI1K	3.7A	127,038	620	20	73
			(OP: TI5CDA)		
*TI2WMP	AA	747,240	1321	71	189

Cuba

*CO2XN	28A	896,940	2539	31	120

Dominican Republic

HI8RD	AA	4,097,275	3958	112	343
*HI8HRD	AA	579,832	1051	71	171
*HI3TT	“	22,479	209	18	41
*HI3MM	21A	178,500	879	23	77
*HI3MPC	14A	148,149	960	24	57
*HI3K	7A	16,335	139	13	42
*HI8HCW	“	2,624	32	9	23

Guadeloupe

FG4KH	AA	1,283,256	1519	71	241
			(OP: F1DUZ)		
FG8OJ	“	33,276	119	25	69

Honduras

*HR9/ K6VHF	AA	1,189	22	15	14

Martinique

*FM1HN	14A	214,935	846	26	89

Mexico

4A2B	28A	5,271	113	10	11
			(OP: XE2B)		
*XE2AD	AA	295,500	621	58	139
*XE2OK	“	64,640	521	30	34
*XE2JS	28A	382,699	1624	26	83
*XE1EE	“	17,720	192	17	23
*XE1AY	14A	962	19	9	17

Puerto Rico

KP3DX	AA	8,487,812	5976	145	477
			(OP: NP4Z)		
_WP4SK_	_“_	_187,180_	_345_	_49_	_147_
*KP4PUA	21A	515,460	2269	26	84

St. Barthelemy

FJ/ SP9FIH	21A	1,124,052	3196	32	109

St. Martin

_*FS5GL_	_AA_	_0_	_4_	_4_	_4_

US Virgin Islands

*NP2X	AA	784,966	1380	73	193
			(OP: K9VV)		

AFRICA

African Italy

*IH9YMC	28A	169,244	516	30	86

Canary Islands

EA8AM	28A	852,561	2267	30	99
EF8K	“	408,240	1102	29	106
			(OP: EA8DET)		
*EC8AQQ	AA	293,670	526	44	151
*EA8DIB	“	21,483	84	29	64
*EA8DED	28A	36,288	209	12	51
			(OP: OH2BP)		
*EA8CNR	21A	107,892	338	23	88

Ceuta & Melilla

*EA9KB	7A	56,800	292	13	58

Madeira Islands

CQ3W	28A	2,356,893	4550	38	141
			(OP: DF7EE)		
CT3HF	“	521,016	1337	30	106
*CT3KU	28A	63,840	254	22	74

Mauritius

3B8CW	AA	253,992	394	71	157

Morocco

*CN8SG	14A	243,048	815	24	80

Namibia

V55Y	28A	1,135,136	2535	34	118
			(OP: V51WH)		

South Africa

*ZS6JBZ	AA	6,076	53	21	28

Tanzania

*5H8HZ	28A	9,964	86	11	36
			(OP: TA1HZ)		
*5H3TSA	21A	2	1	1	1

Zambia

9J2BS	AA	42,681	141	41	82

ASIA

Asiatic Russia

District 9

UA9CDC	AA	1,062,815	947	101	314
UA9AX	“	8,378	46	27	44
RX9DZ	“	4,560	38	25	32
UA9CTT	7A	17,112	116	12	50
*UA9MA	AA	2,241,680	1537	130	430
*UA9JFH	“	35,226	138	29	74
*RZ9L	28A	48,132	217	18	66

District 0

R0AGY	AA	234,804	451	52	152
RZ0L	“	22,041	106	38	55
UA0SU	“	3,008	26	22	25
RM0W	21A	99,704	439	24	79
*UD0W	14A	144	6	4	4

Asiatic Turkey

TC60TRAC	AA	4,238,696	3866	84	308
			(OP: TA7OM)		
TA4J	14A	73,752	458	10	46
TA3X	7A	4,563	49	11	28
*TA3O	AA	4,080	36	15	25
*TA4CS	“	60	4	3	3
*TA2NC	28A	19,839	137	14	37
*TC99TC	21A	191,973	764	20	69
			(OP: TA2IJ)		
*TA2SUA	14A	44,204	194	21	65
*TA3EP	“	1,071	20	6	15
*TA7MHZ	7A	12,928	109	15	49
*TA7SSB	“	4,674	57	9	32

Azerbaijan

*4K6FO	28A	247,038	799	27	87

China

BA4DL	AA	917,350	1238	98	252
BG2AUE	_“_	_157,314_	_499_	_49_	_108_
BD1IIJ	“	3,451	110	14	15
BH1NGG	“	850	24	11	14
BD7MM	28A	717,552	2000	35	116
			(OP: BD7IS)		
BA4TB	21A	463,044	1487	35	106
BD3CB	“	131,672	554	27	82
BI4WRI	“	87,300	428	25	72
			(OP: BD4HZX)		
BD5FFK	“	65,700	370	26	64
BY4SZ	14A	85,950	601	28	62
			(OP: BI4XDT)		
BD4RQ	3.7A	5,724	173	13	14
_BY6BB_	_1.8A_	_44_	_14_	_2_	_2_
			(OP: BG6GQE)		
*BG0CAB	AA	959,928	1207	73	223
*BH6KOK	“	293,571	627	71	178
*BG3IAY	“	115,937	327	63	128
*BG3ILY	“	44,160	166	35	85
*BH4AYG	“	40,820	149	49	81
*BG5BAA	“	38,727	171	42	75
*BG6HOK	“	22,572	121	37	62
*BI1NJI	“	20,425	123	37	58
*BG5GLV	“	20,400	132	30	50
*BH3EYL	“	12,956	127	32	50
*BD3QT	“	11,880	119	33	55
*BI4MPH	“	8,512	78	28	36
*BH3CGF	“	5,115	110	26	29
*BG3GBZ	“	3,975	58	24	29
*BH6ODC	“	3,534	77	17	21
*BG8KUB	“	3,087	48	22	27
*BH4RRG	“	2,772	39	19	25
*BD4UJ	“	2,530	36	19	27
*BA5AB	“	2,220	24	16	21
*BG6QLL	“	2,090	30	17	21
*BI6LFJ	“	1,457	35	15	16
*BD7JIR	“	600	18	12	13
*BG0DFS	“	408	21	10	14
*BD8AJV	“	90	7	5	5
*BD4VXX	“	90	18	13	17
*BG8GAM	“	24	2	2	2
*BH7JUO	28A	216,828	785	29	85
*BI8FYD	“	8,692	78	15	38
*BG5UZW	“	2,201	42	14	17
*BI4VXX	“	1,000	20	6	14
*BA7LAC	“	297	13	4	5
*BG4UQX	21A	55,521	301	25	68
*BH8MDV	“	50,828	212	24	73
*BH8PVC	“	14,874	122	18	49
*BI4VKA	“	12,996	98	17	40
*BG5GDP	14A	688	52	7	9
*BH3EMV	“	506	31	10	12

Cyprus

5B4AQT	AA	1,152,580	1023	93	310
5B4AAB	“	175,545	278	62	173
5B4AOF	“	3,906	33	17	25
C44C	28A	449,972	1183	34	112
			(OP: 5B4AHJ)		
5B4KH	21A	608,256	1530	31	113
5B4AHZ	14A	271,558	813	29	90
*5B4AJT	28A	80	4	4	4

Georgia

4L8A	AA	91,504	235	39	113
*4L5EE	28A	399,630	1434	24	81
*4L5P	“	45,920	208	20	60
*4L4NW	14A	112,210	473	23	75
*4L7ZS	1.8A	480	12	5	11

Hong Kong

VR2XYL	21A	23,232	249	18	46
VR2XMT	14A	1,992	51	9	15
*VR25C	21A	2,133	49	10	17
			(OP: VR2YDC)		

India

VU2ZMK	AA	576,688	810	61	205
VU2YYF	“	197,800	420	39	133
VU2DCC	“	79,016	190	48	118
VU2YAP	“	50,697	177	37	94
*VU2DED	AA	826,946	1007	81	232
*VU3NPI	“	160,380	335	51	147
*VU3ESV	“	154,448	340	51	145
*VU2YQ	“	4,536	43	25	31
*VU2YUU	“	1,344	33	21	27
*VU2FGQ	21A	36,024	202	21	55

Iraq

*YI3WHR	14A	4,318	47	7	27

Israel

4X1IM	AA	489,185	783	49	178
4Z1MS	“	99,280	273	39	97
4Z1DZ	“	85,671	196	46	125
4X1BQ	“	1,330	20	15	20
4X1MM	28A	1,259,827	2804	35	128
4X0A	“	509,229	1434	32	105
*4X1ST	AA	464,702	658	56	210
*4Z5OI	“	151,536	244	64	167
*4Z4KX	“	6,636	54	31	48

Japan

District 1

JE1LFX	AA	1,681,125	1662	112	263
JM1XCW	“	729,000	872	91	209
JF1LMB	“	197,072	380	78	140
JG1FML	“	173,900	361	68	117
JL1CNY	“	150,311	314	72	125
JA1XRA	“	130,200	254	66	120
JJ1XBQ	“	105,400	232	66	104
JH1ACA	“	33,702	114	53	70
JS1KQQ	“	29,400	128	33	65
JN1ILK	“	26,144	143	26	50
JI1FOE	“	19,459	117	32	29
JA1WWO	“	11,205	53	36	47
JA1ILA	“	10,296	56	26	40
JN1THL	“	8,798	64	23	30
JA1KZP	_“_	_5,400_	_46_	_25_	_29_
JK1WSH	“	150	7	6	4
JA1XEC	28A	147,660	488	31	84
JE1FQV	“	131,527	463	33	88
JJ1RDX	“	85,137	311	32	79
JH1SJN	“	60,466	250	29	69
JE1CKA	21A	440,014	1107	33	118
JH1APK	“	39,234	190	25	53
JE1RZR	14A	113,331	372	32	79
JA1LNZ	7A	19,000	94	26	50
JF1UMK	“	18,316	97	24	52
7M4CLF	“	297	11	5	4
*JH1EAQ	AA	1,030,501	1020	125	254
*7J1ADJ	“	191,160	307	87	183
*JH8PHT/1	“	159,705	346	71	124
*JJ1MBU	“	93,288	199	65	119
*JG1XIO	“	91,680	243	60	100
*JF1RYU	“	42,900	144	42	68
*JI1HFJ	“	38,703	143	33	64
*JA1GFD	“	37,128	153	41	63
*7K1VKU	“	34,398	144	35	63
*JA1UXV	“	29,682	103	38	64
*JI1RSF	“	4,756	50	14	27
*JA1NEZ	28A	34,320	194	27	53
*JH1RFM	“	26,196	130	22	52
*JL1EEI	“	23,331	134	28	49
*JF1OVA	“	13,098	90	21	38
*JH0UUY/1	“	5,560	62	16	24
*JJ1AEB	7A	10,608	85	20	32
*7M4KSC	“	16	2	2	2

District 2

JR2GRX	AA	4,055,466	2941	155	364
JN2AMD	“	925,739	1132	111	226
JA2XCR	“	599,292	615	121	251
JJ2CJB	“	510,393	698	96	203
JH2XQY	“	87,730	206	56	99
JH2FXK	“	86,019	199	53	106
JA2HYD	“	19,995	83	37	56
JF2XGF	28A	99,904	353	31	81
JA2KQE	“	39,648	196	26	58
JA2KVD	“	36,865	148	31	70
JJ2VLY	21A	25	3	2	3
JA2GTW	7A	46,176	173	30	74
*JF2VAX	AA	718,947	832	104	229
*JS2KWL	“	41,516	166	36	71
*JF2OZH	“	7,800	54	30	35
*JG2AIG	21A	10,300	88	16	34
*JF2MBF	3.7A	544	15	9	8

District 3

JA3AOP	AA	1,129,848	1199	109	249
JN3TMW	“	485,112	562	106	222
(OP: JF1RPZ)					
JM3UGA	“	37,800	123	50	70
JH3EQP	“	13,860	88	29	41
JK3NSD	“	1,825	25	9	16
JF3LOP	28A	104,980	383	29	87
JF3LGC	*“*	*14,652*	*86*	*20*	*46*
JR3RIY	21A	281,930	893	32	89
JO3DDD	“	96,720	430	27	66
JA3VOV	“	5,547	62	16	27
*JF3EIG	AA	59,305	155	56	89
*JN3DSH	“	44,286	141	36	85
*JE3OUU	“	6,534	68	22	32
*JH4PUL/3	“	2,829	33	17	24
*JR3RWB	28A	100,210	361	30	80
**JL3VUL/3*	*21A*	*325,252*	*1102*	*32*	*92*
*JG3FEA	“	62,055	209	27	78
**JA3YVI*	*“*	*1,700*	*35*	*11*	*14*

District 4

JH4UTP	AA	1,679,391	1636	118	281
JA4RED	“	115,165	283	53	102
JA4GXS	“	54,516	157	52	80
JA4CZM	“	54,496	164	51	80
JH4CPC	“	37,252	106	54	85
JE4USZ	“	27,840	120	39	57
JR4VEV	28A	84,364	351	24	68
JM4WUZ	1.8A	24	3	3	3

District 5

JJ5RBH	AA	218,436	381	75	143
JH5MXB	“	53,808	198	40	78
*JH5FTY	28A	6,148	44	19	34

District 6

JA6MWW	AA	439,499	598	82	201
JK6DXD	28A	40,832	178	25	63
*JH6QIL	AA	104,940	239	55	104
*JH6OPP	“	84,785	225	56	99
*JE6PJP	“	1,066	19	11	15
*JH6WHN	28A	637	17	7	6

District 7

JA7NVF	AA	2,292,994	2312	117	257
JF7PHE	“	706,200	965	97	203
JH7CUO	“	66,038	223	45	61
JA7ZP	“	7,320	62	27	33
JH7RTQ	“	1,674	18	15	16
JA7GYP	14A	135	5	4	5
JH7MQD	7A	348,864	977	34	104
*JP7NOW	AA	54,280	186	43	75
*JH7VTE	“	37,742	130	49	64
*JH7XVB	7A	6,860	65	21	28

District 8

JA8COE	AA	1,297,890	1620	98	199
JH8SLS	“	84,084	174	64	118
JR8ORC	*7A*	*18*	*2*	*2*	*1*
*JH8CXW	21A	5,832	67	15	21

District 9

JH9DRL	AA	292,415	473	89	162
JE9PFD	“	3,000	41	18	22
*JF9JTS	21A	23,380	127	25	45
(OP: JAØTEA)					

District Ø

JJØJML	AA	888,140	918	123	244
JAØFVU	“	336,156	505	99	158
JJØPKS	28A	339,625	1048	33	92
*JHØNEC	AA	284,856	434	84	165
*JRØELG	“	192	6	6	6
*JAØNFP	7A	294	14	4	3

Kazakhstan

UP5B	AA	1,159,500	1369	68	232
(OP: UN7ZO)					
UN9L	28A	494,060	1469	30	110
UN3G	“	41,563	189	21	68
UN7FW	“	42	5	3	3
*UN2E	28A	83,655	335	20	79
*UN4PG	“	46,926	184	23	76
*UN4L	21A	381,450	1001	31	119
*UNØLM	14A	200,850	699	26	77

Kuwait

9K2HN	28A	564,068	1280	36	130
9K2JJ	“	258,720	978	23	75
9K9A	14A	1,054,356	2324	37	127
(OP: 9K2OD)					
9K9C	7A	135,897	532	20	77

Lebanon

OD5TX	28A	243,205	687	29	98

Macao

*XX9BB	28A	88	10	5	6

Qatar

A71BX	28A	742,371	1782	36	125
A71EM	21A	157,304	528	23	83

Republic of Korea

DS5TOS	21A	12,483	85	18	39
*HL5YI	AA	13,475	90	31	46
*HL1VAU	28A	25,116	149	20	49
*D7ØLW	14A	5,891	59	16	27
(OP: HL1VAU)					

Saudi Arabia

HZ1TT	AA	1,626,452	1847	75	241
HZØYL	28A	773,744	1891	34	114
*HZ1TL	AA	1,738,550	1915	69	250

Singapore

*9V1HY	AA	20,496	106	36	48

Taiwan

BV2LA	AA	145,290	378	53	121
BW2/ JP1RIW	21A	205,260	1025	30	80
*BU2EP	AA	175,110	439	62	133
*BX6ACR	“	17,415	112	34	47
*BU2EV	“	11,616	110	25	41
*BV3UN	“	1,540	29	8	14
*BV3US	“	1,326	32	11	15

Tajikistan

EY8MM	7A	391,952	1098	27	104

Thailand

HS5NMF	AA	1,743,469	2008	105	286
*HS8NKB	AA	203,565	412	58	147
*HS8KAY	“	152,646	327	56	150
*HS1JZT	“	24,700	106	30	65
*HS4MLV	“	1,344	26	11	13
**HS8JWH*	*“*	*486*	*10*	*8*	*10*
*HS8HEX	21A	7,965	79	14	31
*E2ØHHK	14A	6	1	1	1
*E27AAA	7A	336	19	5	7

United Arab Emirates

A61ZX	21A	146,064	569	22	80
A65DR	“	19,810	103	16	54
(OP: G7SLP)					
*A61HA	28A	42,660	269	13	47

Uzbekistan

UK9AA	7A	191,748	607	24	92

Vietnam

XV9BPO	AA	45,276	210	30	68

EUROPE

Aland Islands

*OHØV	AA	1,031,085	1360	107	388
(OP: OH6LI)					

Austria

OE2S	AA	4,846,485	2990	152	555
(OP: OE2VEL)					
OE9MON	“	765,911	1292	70	243
OE5KKP	“	679,098	978	100	299
OE6MDF	“	543,204	838	79	237
OE1TKW	“	399,852	637	84	264
OE6RNT	“	352,490	779	85	264
OE8DDX	“	291,555	1356	42	167
OE6Z	*“*	*97,240*	*262*	*57*	*163*
(OP: OE6MMD)					
OE2LCM	“	88,641	181	80	121
OE5JSL	28A	99,765	333	35	100
OE3G	“	99,000	376	28	92
(OP: OE3KAB)					
OE1SGU	“	10,624	66	23	41
*OE5MZL	AA	60,188	236	49	115
*OE2RPL	“	16,638	115	29	65
*OE3SZE	“	44	8	4	7
*OE2ROL	7A	24,702	336	13	56

Balearic Islands

EA6EE	AA	70,794	194	47	91
EC6DX	28A	632,016	1639	36	132
EA6FO	21A	369,720	1172	34	122
(OP: EA3AIR)					
*EA6SX	28A	385,616	1011	34	120

Belarus

EW1OW	AA	106,133	339	53	158
EU1DX	“	76,923	174	67	122
EV1R	28A	182,070	539	34	119
EW2A	21A	274,816	1019	33	119
EW1M	7A	56	8	3	4
*EW1P	AA	64,768	168	60	124
*EU7X	“	5,795	45	23	38
*EU2EU	28A	19,275	115	25	50
*EU2F	14A	217,394	1106	33	113
*EW4GL	“	40,180	288	25	73
*EW7TSW	7A	5,777	93	12	41

Belgium

OR1Z	AA	560,320	1469	62	210
OO7P	“	465,010	470	126	364
ON6MR	“	295,020	558	76	222
OP7T	“	68,747	233	47	114
(OP: ON4IT)					
ON7TA	“	60,738	185	47	112
ON4TTT	28A	121,856	360	32	104
ON4TO	“	103,334	359	27	94
*ON8UK	AA	272,890	485	79	211
*ON7AH	“	188,750	315	73	177
*ON3AT	“	3,266	31	20	26
*ON4VDV	“	1,665	37	8	7
*ON6LR	28A	300	10	5	5
*ON7BBR	14A	47,571	330	23	78

Bosnia-Herzegovina

E7ØAW	AA	943,236	1689	92	307
E72U	“	36,204	145	31	53
E78WW	28A	340,803	868	37	134
E71A	“	235,375	794	29	96
*E78T	AA	131,026	614	38	153
*E77FA	21A	212,325	688	33	116
*E77X	7A	25,456	243	18	68
*E73KT	“	7,410	132	11	46
*E79D	1.8A	26,523	414	10	53

Bulgaria

LZ6Y	AA	1,894,848	2320	123	433
LZ2FP	“	249,210	557	65	205
LZ1UK	“	43,956	221	34	74
LZ1W	“	43,432	140	49	73
LZ2FDI	“	3,760	62	13	34
LZ1MS	28A	172,315	601	32	111
LZ8R	“	10,679	76	19	40
LZ3BB	14A	20,700	304	12	38
LZ2ZG	1.8A	45	8	3	6
*LZ6O	AA	305,088	581	86	250
(OP: LZ3DX)					
*LZ8GT	“	204,876	591	63	189
*LZ1UBO	“	36,340	182	37	78
*LZ2JU	“	31,339	141	38	83
*LZ1VCT	“	29,972	159	37	81
*LZ6DV	“	24,080	188	36	104
*LZ8A	28A	292,896	963	35	109
(OP: LZ2DF)					
*LZ1ZP	“	68,804	306	25	78
*LZ3DJ	21A	16,730	157	16	54

Corsica

TK5EP	*AA*	*458,738*	*578*	*99*	*203*
*TK/ DL5GA	AA	452,800	1262	68	215
*TK4TH	“	308,847	1019	44	147

Crete

SV9JI	AA	61,537	297	41	108
*SV9SMS	AA	25,896	167	26	78
*SV9CJO	28A	28,046	221	20	54

Croatia

9AØBB	AA	6,073,920	3707	164	596
(OP: 9A3XV)					
9A5RTW	“	1,079,910	954	125	382
9A4BA	“	219,032	506	69	193
9A1KDE	“	119,543	247	58	115
(OP: 9A2VR)					
9A3AG	“	22,995	119	36	69
9A7JCY	28A	203,357	570	36	103
9A2U	“	19,188	125	22	56
(OP: 9A3BWP)					
9A6D	“	15,272	69	32	60
9A3YT	14A	93,599	457	31	96
*9A2EU	AA	2,591,238	1807	158	559
*9A3GVJ	“	594,392	1023	92	290
*9A6DJX	“	133,744	405	52	156
*9A6A	“	90,649	210	65	182
*9A5FM	“	80,152	329	43	129
*9A2GA	“	71,574	275	38	113
*9A5BAA	“	47,895	230	38	117
*9A7ABN	“	12,470	97	26	60
*9A2B	“	12,420	110	23	69
*9A7Y	“	6,771	43	22	39
*9A5ISS	“	5,760	60	22	42
*9A5BWW	“	1,364	24	12	19
*9A9R	28A	711,828	1730	37	132
*9A6ZZ	21A	39,690	173	31	59
*9A3QB	7A	20,824	210	15	61

Czech Republic

OK1BN	AA	1,663,200	1978	85	265
OK1GK	“	1,440,105	1320	135	454
OL1T	“	920,778	1465	86	308
(OP: OK6DJ)					
OK1DOY	“	618,870	637	104	317
OK2QA	“	163,593	367	56	163
OK1VK	“	129,752	298	63	133
OK1C	“	94,435	252	54	133
OK1FMX	“	41,124	194	39	99
OK4AR	“	37,628	161	35	57
OK4X	“	26,980	234	25	70
OLØW	28A	174,230	513	30	101
OK6CX	“	9,805	77	18	35
OK2HA	“	624	20	5	11
OL9Z	14A	1,184,448	3427	39	147
(OP: OK2PVF)					
OL3R	“	295,408	1204	35	113
(OP: OK1VWK)					
OK1DUG	3.7A	11,781	221	7	44
*OK1K	AA	388,833	665	83	256
(OP: OK1XOE)					
*OK1ALX	“	371,135	531	100	273
*OK4DZ	“	306,629	487	84	205
*OK5OK	“	85,813	370	32	129
*OK2YZ	“	68,145	236	48	129
*OK3SN	“	50,974	216	41	113
*OK1DLX	“	9,044	55	27	41
*OK1TRJ	“	5,307	73	17	44
*OK1HBO	“	3,836	50	13	15
*OK1TD	28A	84,095	314	31	90
*OK2BPU	14A	54,288	305	26	78
*OK1AY	3.7A	11,544	214	7	45
*OK6Y	1.8A	29,295	473	10	53
(OP: OK2PTZ)					

Denmark

OZ7AM	AA	1,046,400	1067	106	374
5Q2J	“	978,579	1100	107	334
OZ1FHU	“	426,060	700	87	318
OZ1KZX	“	64,328	177	53	119
OZ1T	“	49,132	193	47	126
OZ7DK	“	40,176	197	37	107
OZ1KIH	“	37,113	204	35	104
OZØQF	*“*	*12,927*	*143*	*19*	*74*
OZ2PBS	28A	98,560	299	32	108
OZ1ADL	21A	421,659	1163	37	124
OZ1ZD	“	37,062	166	28	59
*OZ6CM	AA	336,530	456	93	272
*OZ1KVM	“	297,111	793	60	231
*OZ4MU	“	222,720	293	95	253
*OZ1CK	“	143,104	346	53	155
*OZ1RD	“	88,587	326	45	148
*OZ6TM	“	25,308	190	23	91
*OU2P	“	5,828	79	16	46
*OZ4VW	28A	11,993	63	21	46
*OZ9AAR	14A	16,946	164	18	56

England

GØMTN	AA	2,343,304	2282	123	464
GØBNR	“	1,870,800	1616	129	471
G3RXQ	“	1,303,456	1468	107	399
MØICR	“	928,560	1298	79	286
MØNSI	“	775,437	1230	77	260
MØKPD	“	654,874	989	82	292
M6N	“	451,095	818	67	188
(OP: MØNPK)					
G4NBS	“	355,008	621	56	202
MØK	“	129,990	395	51	159
(OP: G8FMC)					
MØDCX	“	89,229	327	39	108
G4IRN	“	82,792	196	60	98
M4U	“	79,055	269	47	116
(OP: MØJVC @MØJVC)					
G4RRM	“	66,810	179	55	115
G7TPL	“	52,309	129	52	129
MØNGN	“	50,912	157	52	120
M5KJM	“	39,672	111	53	99
G4LPP	“	36,480	102	69	91
G4ERW	“	34,580	256	23	68
MØTPT	“	33,630	239	29	89
MØNAM	“	29,458	142	32	71
MØHOM	“	23,814	144	23	75
MØEAS	“	14,105	81	34	57
M1PTR	“	12,408	70	25	69
MØNJW	“	11,316	92	21	71
MØKCV	“	6,298	48	28	39
MØJYP	“	5,952	38	26	36
MØDSL	“	2,784	75	7	25
G6URD	“	1,935	35	15	30
M5A	28A	746,214	1773	36	127
(OP: G3WVG)					
M7X	“	411,417	1004	35	118
(OP: GØTSM)					
MØMCX	“	130,536	524	23	75
G4LPD	“	56,257	215	25	76
G3P	“	37,754	172	20	66
(OP: G3WPH)					
G4WWS	“	20,538	124	22	41
G1MSE	*“*	*17,980*	*132*	*18*	*44*
MØYRX	“	6,960	49	19	39
M7W	21A	76,255	222	33	118
(OP: G3TBK)					
GØB	“	29,848	139	21	70
(OP: MØBUL)					
G8X	7A	239,242	1750	22	100
(OP: G4FJK)					
G3M	“	90,000	992	18	72
(OP: GØVVE)					
M1N	“	23,100	387	10	56
(OP: M1DST)					
*M3AWD	AA	1,264,081	1576	101	378
*MØWLF	“	1,083,308	1253	91	265
*M1U	“	1,013,250	1104	113	412
(OP: MØUTD)					
*2EØINN	“	502,008	954	65	247
*G4P	“	439,500	944	66	234
(OP: G3YPP)					
*G8KEK	“	204,470	553	52	202
*MØNVK	“	192,225	511	58	175
*GØFGI	“	165,483	314	57	186
*G4OZG	“	151,905	487	50	155
*M6ETL	“	120,170	309	54	143
*GØH	“	113,324	328	45	119
(OP: GØHEU)					
*G8HBS	“	98,670	343	49	146
*2EØIFC	“	87,262	302	40	121
*G4CXT	“	85,212	264	45	117
*MØLKW	“	73,235	392	35	116
*MØMGP	“	70,526	276	43	136
*MØLDW	“	67,500	221	52	128
*GØRXA	“	51,450	238	36	111
*MØURB	“	37,515	221	29	94
*MØWMS	“	34,629	203	32	87
*MØXFJ	“	25,788	137	25	59
*MØCGF	“	23,114	93	43	84
*G1WVK	“	22,135	162	24	71
*G3RTU	“	21,600	171	23	73
*G4PNC	“	19,698	95	31	67
*2EØGKW	“	12,410	97	24	49
*2EØEBM	“	12,285	81	28	63
*MØRKK	“	10,458	105	15	48
*MØVLX	“	9,504	84	22	50
*MØOAU	“	8,720	80	23	57
*M7JRF	“	8,625	128	18	51
*G1VWC	“	7,854	64	27	50
*G7MBH	“	7,004	72	21	47
*G7G	“	6,608	60	23	33
*MØJQQ	“	6,466	106	13	48
*G4AWP	“	2,730	29	18	24
*MØIPU	“	2,635	35	12	19
*2EØKCI	“	1,152	30	12	24
*G4JFS	“	990	17	11	11
*MØVQP	“	600	18	8	16
*GØFCT	“	255	9	6	9
*GØMBA	28A	24,726	132	23	55
*G4HPY	“	14,070	74	20	47
*M7TDV	“	2,040	32	9	15
*M5W	21A	404,250	1190	35	115
(OP: MØHMJ)					
*G1GEY	“	12,988	105	14	54
*G4N	7A	5,712	107	9	39
(OP: G4ZVB)					

Estonia

ES1CN	21A	34,037	196	22	79
*ES1BH	AA	48,018	267	37	114

European Russia

District 1

*R1MJ	AA	6,175	79	16	49

District 3

RM3DA	AA	2,055,105	2302	132	453
RZ3B	“	1,360,184	2122	91	337
RD5R	“	131,179	329	65	168
RA3S	“	12,337	63	27	46
R2AOQ	“	1,530	17	14	16
RG2A	“	990	15	8	14
RU3SD	“	216	6	6	6
RC2A	“	216	6	6	6
RA3OA	28A	369,738	1321	34	133
RA3RCL	“	100,625	487	28	87
RL5A	“	65,291	341	24	85
RL3A	21A	1,145,088	2938	40	152
(OP: RL3FT)					
UI5R	14A	269,280	1452	34	119
*RK2M	AA	103,936	328	55	169
*R3IBZ	“	23,622	213	27	66
*R3QX	“	16,856	92	32	66
*R2AL	28A	83,472	267	32	116
*RA3RLJ	21A	44,526	478	16	66
*UA3YCX	“	5,512	71	13	39
*RZ3Z	14A	139,620	793	30	100
*R3TE	“	90,042	511	30	99
*UA3PI	7A	8,255	173	14	51

District 4

RU4PU	*AA*	*189,810*	*315*	*84*	*249*
UA4CC	28A	102,691	645	23	80
*RA4DX	AA	226,443	536	67	220
*RN4SN	“	174,616	326	73	226
*UA4CNJ	“	117,746	349	58	168
*RW4O	“	35,235	135	44	91
*RU4SO	“	34,935	167	32	105
*UB4NAL	“	5,952	58	21	41
*RW4NW	“	36	4	3	3
*RW4C	21A	6	1	1	1
*UF4N	14A	294	15	4	10

District 6

RX6AM	AA	94,714	391	47	95
RM7G	“	40,100	220	26	74
R7DI	28A	50,944	182	30	98
R6CA	“	19,760	96	25	51
*UA6YN	AA	315,810	663	73	257
*RV6LCT	“	6,090	37	25	33
**RJ6N*	*“*	*54*	*3*	*3*	*3*
**RA6DT*	*28A*	*81*	*5*	*4*	*5*
*R7KCW	21A	234,612	972	32	101
(OP: R6KVA)					
*RT6C	1.8A	54	5	4	5

District 9

RG8G	AA	16,954	127	24	74
*UA9XX	AA	8,064	99	18	54

European Turkey

**TA1HF*	*AA*	*1,225*	*33*	*12*	*23*
*TA1FM	“	986	34	9	20
*TA1ED	14A	27,621	271	18	63

Faroe Islands

OY1CT	AA	64,464	194	34	170

Fed. Rep. of Germany

DF9XV	AA	3,200,108	2138	147	515
DK7R	“	2,674,647	2195	145	512
(OP: DK7AM)					
DL6ZBN	“	1,586,032	1321	141	437
DL9UP	“	1,498,774	1293	136	478
DL7ON	“	1,412,829	1197	141	498
DL5JS	“	1,395,275	1506	92	333
DL1NKS	“	1,332,441	1786	111	362
DL1NEO	“	1,246,154	962	128	446
DK9IP	“	1,187,236	953	139	447
DK5DQ	“	1,185,904	1385	94	282
DK4VW	“	1,148,812	1198	111	350
DK2IT	“	1,122,193	1336	108	395
DF2RG	“	1,109,220	1001	127	429
DK6SP	“	1,085,640	1129	123	422
DG9SEH	“	1,081,591	1244	97	330
DL8AAE	“	1,081,440	1173	107	373
DL7URH	“	1,080,540	1012	125	415
DL5IC	“	941,184	1152	84	260
DJ5AN	“	899,040	867	118	362
DK8ZZ	“	837,310	989	89	276
DH2PA	“	779,688	999	114	354
DQ5T	“	730,566	646	117	372
(OP: DL4LAM)					
DL1ATZ	“	699,244	843	98	344
DF8XC	“	692,850	775	112	335
DL7AOS	“	671,895	1071	91	314
DL1CG	“	633,996	888	88	308
DK8AX	“	525,890	563	112	318
DL1SEH	“	446,106	708	75	223
DL4DBM	“	412,692	559	88	269
DL4SKF	“	410,552	737	71	225
DQ1P	“	402,732	501	106	290
(OP: DK1IP)					
DK5AV	“	386,884	816	72	239
DF2LH	“	375,558	473	91	227
DD5VL	“	360,570	542	87	270
DJ2TG	“	349,560	618	85	275
DM4IM	“	342,720	811	73	233
DG8DP	“	319,227	679	67	224
DJ6HR	“	307,785	397	91	264
DL3SKF	“	300,048	510	76	228
DK2AT	“	284,087	583	73	216
DC1HR	“	283,500	398	89	235
DJ5MO	“	266,476	682	60	157
DL6TK	“	231,977	410	73	156
DC2CL	“	216,800	371	73	198
DL7YS	“	210,255	365	74	247
DL6AG	“	206,112	315	83	221
DL4JLM	“	204,828	359	65	137
DF8V	“	204,088	382	75	188
(OP: DF8VO)					
DL9ECA	“	194,285	383	62	183
DL9SCO	“	183,516	573	70	176
DL8WEM	“	168,805	326	72	173
DAØC	“	168,734	475	61	178
(OP: DK8WG)					
DL5RDO	“	162,932	321	70	183
DK2CX	“	155,232	328	69	183
DJ9MH	“	132,432	255	75	192
DL4PY	“	129,839	297	53	104
DL3SFB	“	126,144	321	53	166
DF6QV	“	125,477	410	40	147
DL7CX	“	122,255	246	72	173
DL2DQL	“	119,067	246	65	148
DK6TW	“	114,330	421	52	154
DL5ASK	“	109,953	280	54	117
DB7BN	“	104,706	369	41	148
DL5ST	“	99,675	297	54	171
DJ6TB	“	99,360	246	61	119
DL4YAO	*“*	*96,368*	*244*	*53*	*99*
DL8UAT	“	95,584	174	71	135
DK1AX	“	94,757	244	58	139
DL5OCD	“	84,107	228	53	98
DG7NFX	“	77,850	217	52	121
DK5JM	“	77,602	179	60	101
DL1LOD	“	74,700	200	52	114
DR5W	“	73,910	209	52	138
(OP: DL1RTL)					
DL7AUO	“	68,904	296	39	135
DL8RDL	“	66,516	191	49	89
DR5X	“	65,096	296	28	51
(OP: DL8LAS)					
DHØDM	“	47,520	187	43	101
DK3GI	“	45,200	138	43	70
DH8GHH	“	43,615	222	36	107
DL1STG	“	43,274	143	49	105
DG5LW	“	41,021	221	29	98
DB1MUC	“	36,828	128	36	88
DD4DA	“	33,312	139	35	61
DL1BUG	“	33,306	113	46	76
DK4JA	“	31,964	150	35	87
DL5XJ	“	20,254	95	30	52
DG2NMH	“	18,426	111	35	76
DF4MAA	“	15,111	81	25	48
DK3HV	“	14,022	71	30	52
DL3ABL	“	10,380	61	24	36
DF9LJ	“	8,096	136	10	12
DB3KB	“	6,798	60	25	41
DL6UAA	“	5,814	36	24	33
DL3BY	“	5,625	60	11	34
DL9SEV	“	5,512	40	21	31
DL7TJ	“	4,897	35	25	34
DC8TT	*“*	*4,752*	*88*	*11*	*43*
DK8CB	“	4,743	47	20	31
DL4FCJ	“	2,880	26	21	24
DJ5LA	“	2,496	36	11	15
DL2AMD	“	2,065	23	16	19
DF3QG	“	1,680	20	14	16
DQ5M	“	144	6	4	4
(OP: DK6SP)					
DL5M	“	90	5	3	3
(OP: DK6SP)					
DKØED	“	90	5	3	3
(OP: DK6SP)					
DL8GM	“	24	2	2	2
DR1D	28A	838,332	1933	37	137
(OP: DL8UD)					
DD2ML	“	699,650	1701	37	138
DKØ5ØBN	“	391,114	978	37	130
(OP: DL2SAX)					
DL5L	“	147,364	491	31	102
(OP: DGØOKW)					
DL6JZ	“	95,106	327	30	91
DL9NEI	“	33,250	178	20	50
DN4AN	“	297	11	5	4
DL1FY	“	6	1	1	1
DC2PG	“	6	1	1	1
DL2ARD	21A	1,369,088	2994	39	152
DH8BQA	“	650,988	1677	35	134
DL5AN	“	299,085	791	35	122
DL4DXF	“	97,664	348	30	98
DL5YM	“	11,001	102	12	45
DJ6TF	“	8,255	63	21	44
DL6FBL	14A	1,588,020	3667	40	159
DH1TT	“	484,273	1392	39	124
DL1TC	“	33,488	134	28	84
DK6BA	“	1,155	21	10	11
DKØIG	“	18	3	1	1
(OP: DK6SP)					
DM3VL	“	6	1	1	1
DM3W	7A	108,290	657	30	100
(OP: DM6DX)					
DK5TX	“	3,741	69	9	34
DR3W	1.8A	7,380	202	7	38
(OP: DL6MHW)					

*DL1GME	AA	1,248,555	1283	113	404
*DF2AJ	“	1,143,018	1096	128	421
*DK1KC	“	764,522	1045	89	329
*DL4VAI	“	539,462	786	82	259
*DJ2FL	“	466,470	775	83	272
*DL1MP	“	318,600	546	69	231
*DL2NBU	“	314,960	470	85	225
*DL9DX	“	313,635	634	73	236
*DL1ABR	“	293,168	649	65	227
*DL5KBO	“	264,096	529	64	188
*DK7TX	“	181,818	380	66	193
*DL2ALY	“	161,200	379	63	185
*DG6OAG	“	159,850	402	56	174
*DM1KM	“	156,972	308	73	181
*DO4OD	“	141,834	337	51	180
*DL2OE	“	136,488	249	80	184
*DO1CS	“	132,192	428	50	154
*DL6RAI	“	131,775	324	63	188
*DK5WO	“	124,341	350	57	160
*DR7T	“	118,604	249	57	142
					(OP: DF1DN)
*DM4EAX	“	115,997	328	57	170
*DO7PIP	“	109,350	365	43	119
*DC5CH	“	103,416	388	36	150
*DJ6DO	“	89,872	325	43	121
*DL2LRT	“	89,621	315	49	168
*DL2SWR	“	79,092	179	56	113
*DB2WD	“	74,095	254	49	154
*DL2FK	“	73,101	234	50	127
*DA22LGS	“	62,352	253	41	103
					(OP: DL7ACN)
*DL2OHL	“	62,040	247	45	120
*DL4MFR	“	61,502	198	51	140
*DL4GBA	“	60,900	200	39	111
*DL4DRW	“	56,189	198	51	110
*DM2HEY	“	53,298	210	43	119
*DH1DA	“	51,590	197	38	96
*DL9YJ	“	51,305	210	42	113
*DG2MB	“	50,244	199	42	117
*DO9PL	“	49,896	200	36	90
*DL5ANS	“	47,571	175	51	106
*DB5ABS	“	42,485	218	38	107
*DC2CB	“	42,018	179	41	100
*DA3T	“	40,432	162	46	106
					(OP: DL8DXL)
*DM4AB	“	36,120	157	41	99
*DL4YR	“	36,043	119	47	86
*DO9SR	“	36,024	198	25	89
*DK3WE	“	33,480	156	34	86
*DL1GWS	“	32,619	182	34	97
*DL5ALW	“	32,109	136	41	98
*DL1DF	“	29,889	150	34	89
**DK5WN*	*“*	*26,676*	*129*	*37*	*71*
*DK2ZO	“	26,536	174	29	95
*DK3WW	“	25,944	92	51	90
*DK7SM	“	23,052	160	25	88
*DL3IAS	“	22,898	85	40	67
*DF7CB	“	22,184	134	35	83
*DM7DS	“	19,074	136	28	74
*DF1GA	“	18,124	115	29	63
*DL2ADI	“	17,949	84	38	55
*DL6RBH	“	16,435	123	24	71
*DL7ED	“	14,805	77	37	68
*DK7AC	“	12,566	99	28	75
*DG4MH	“	12,282	100	24	65
*DG2BHB	“	11,730	100	20	49
*DM6AT	“	11,408	63	34	58
*DL4NHP	“	10,836	82	26	58
*DH6KM	“	10,716	100	22	54
*DJ8UHU	“	10,270	87	24	55
*DL1EJD	“	8,316	87	23	43
*DK4RR	“	8,195	88	17	38
*DM6LE	“	7,469	63	28	49
*DF8ZH	“	7,205	49	24	31
*DM2XM	“	6,873	72	25	54
*DL6UMR	“	6,624	58	24	45
*DF7GG	“	6,519	51	21	32
*DL8AX	“	6,144	55	25	39
*DB4REB	“	5,850	83	16	49
*DM7AK	“	5,796	50	27	42
*DO1PGH	“	5,720	50	19	33
*DB1WT	“	5,280	75	17	49
*DL1AMT	“	4,819	86	15	46
*DL9FBF	“	4,095	37	16	23
*DK1SI	“	4,056	36	22	30
*DO3OLI	“	2,898	60	12	30
*DH1PV	“	2,392	50	12	34
*DO2MS	“	2,232	28	14	22
**DL1KLF*	*“*	*2,226*	*44*	*17*	*36*
*DM5CW	“	1,953	39	10	21
*DC2CT	“	1,620	22	11	16
*DM4YWL	“	1,140	32	9	21
*DM4WH	“	1,056	29	10	22
*DH0GHU	“	1,008	16	12	16
*DG3YJB	“	805	17	10	13
*DL9LA	“	627	26	13	20
*DD4SG	“	551	15	7	12
*DL8JDX	“	374	10	8	9
*DL1NKB	“	285	9	7	8
*DF2AP	“	220	12	5	6
*DD7AB	“	132	8	4	7
*DP4M	28A	84,842	289	29	89
					(OP: DJ4MH)
*DF0RW	“	49,470	196	25	72
					(OP: DL1EFW)
*DH5MK	“	22,800	111	28	52
*DO4TP	“	20,325	108	21	54
*DL3LJ	“	20,228	151	15	37
*DM4MN	“	10,304	60	20	44
*DG1VL	“	6,201	62	12	27
*DL4SDW	“	2,139	31	9	14
*DB1BAC	“	1,224	17	8	16
*DK1YH	14A	5,808	118	8	36
*DL7FB	“	4,512	83	7	41
*DL1FW	“	1,316	33	8	20
*DM3F	“	814	21	6	16
					(OP: DH5FS)
*DJ6OI	3.7A	10,320	220	7	41
*DJ5AM	“	210	17	3	11

Finland

OH1F	AA	3,743,784	3297	146	506
					(OP: OH1TM)
OH8L	“	1,664,971	2061	123	416
					(OP: OH8LQ)
OH8WW	“	1,482,030	1840	110	389
OG3B	“	1,200,100	1461	120	430
OG6N	“	1,036,830	1155	119	451
					(OP: OH6NIO)
OH6RE	*“*	*670,792*	*1333*	*86*	*296*
OH1Z	“	547,404	975	98	331
OH8KXK	“	350,817	741	85	252
OH7KBF	“	259,854	559	70	252
OH6OS	“	199,728	339	65	227
OH1EB	“	176,449	405	71	206
OH5BE	“	161,455	277	74	171
OH6DX	“	117,486	300	61	153
OH1MM	“	109,143	275	56	145
OH3NAQ	“	89,722	235	57	169
OH7KD	*“*	*73,726*	*238*	*46*	*147*
OH3RF	“	68,160	207	58	134
OH2BJ	“	55,440	191	45	99
OH5KW	“	54,405	152	48	107
OH1X	“	41,736	139	36	105
OH5VT	“	29,904	109	34	78
OH2KI	“	19,502	85	36	62
OH6TN	*“*	*1,539*	*19*	*11*	*16*
OG7A	28A	147,423	404	33	124
					(OP: OH6MW)
OG9X	21A	204,591	969	33	108
OH1TD	14A	6,713	56	20	29
OH7K	7A	246,500	1454	33	112
					(OP: OH8SR)
OH1HB	“	1,312	35	7	25
OH2BO	1.8A	2,795	58	7	36
*OH7GGX	AA	227,230	453	72	238
*OH7KC	“	22,572	157	27	87
					(OP: OH7MFO)
*OH4KA	“	1,080	28	12	24
*OH7L	“	169	8	6	7
					(OP: OH8TV)
*OH2MAS	“	168	6	6	6
*OH3JP	“	16	2	2	2
*OH6FSG	21A	3,321	44	12	29
*OH6JUM	14A	7,344	118	9	39

France

F4IVV	AA	4,290,297	3532	137	446
TM9C	“	2,723,664	2759	122	415
F4AIF	“	2,006,118	2201	124	407
TM2Y	“	1,788,633	1188	145	478
					(OP: F6BEE)
F1RHS	“	1,650,588	1477	126	397
F4DPW	“	1,234,525	1402	105	370
F8CRS	“	1,152,570	1054	124	391
F6EZV	“	885,468	1392	100	352
F5MYK	“	824,190	1049	107	308
F4GTT	“	516,032	1123	74	278
F6CZV/P	“	297,246	418	82	239
F6GPT	“	276,125	766	63	172
F4JJS	“	247,342	473	79	204
F4HRM	“	232,128	356	85	203
F5IDJ	“	197,895	316	78	159
F6KGL	“	163,404	392	59	145
					(OP: F4IRF)
TM0GL	*“*	*160,071*	*407*	*61*	*172*
F4HIN	“	119,848	375	51	160
F5TVG	“	95,880	194	60	175
F4JPE	“	70,200	332	47	148
F5SDD	“	59,717	228	40	93
F5BMI	“	35,828	170	34	72
F5PHW	“	8,556	44	28	41
F5VIF	“	1,440	28	11	21
F4IRA	“	75	5	2	3
TM0T	28A	1,137,724	2604	37	142
					(OP: F4HQZ)
TM0DX	“	747,244	1825	38	140
					(OP: F4FPG)
F5NBX	“	557,440	1349	36	124
F8DFP	“	6,235	52	17	26
F4GGQ	21A	876,978	2322	37	129
F8DVD	14A	631,625	2206	37	126
F4EMI	“	159,505	970	27	88
F4FJH	7A	186,615	1329	22	95
*TM3Z	AA	3,736,488	2944	137	507
					(OP: F4DSK)
*F5DRD	“	439,420	688	82	264
*F5TGR	“	253,008	403	68	184
*F4CVQ	“	209,475	303	82	233
*F5SGI	“	176,379	403	57	170
*F6DZD	“	175,950	439	54	176
**F5TGC*	*“*	*124,485*	*339*	*56*	*159*
*F4IYU	“	83,990	252	50	135
*F4CVO	“	79,184	203	62	134
*F1IKA	“	77,322	296	36	111
*F5KLF	“	55,257	143	54	109
					(OP: F8AOF)
*F4FRF	“	43,470	184	39	99
*F4HOT	“	39,184	199	35	89
*F4HZA	“	37,118	157	40	94
*F8CPA	“	34,650	172	34	71
*F4HYQ	“	33,117	199	37	96
*F5FRM	“	15,485	120	25	70
*F4BHK	“	15,130	66	35	54
**F4FAQ*	*“*	*7,992*	*69*	*24*	*48*
*F4DSA	“	7,881	71	24	47
*F4JAO	“	4,512	48	16	32
*F1TRF	“	532	10	9	10
*F4FFH	“	475	11	9	10
*F4GYM	“	99	6	5	6
*F4FLO	“	24	6	1	1
*F8CGL	28A	114,597	371	33	86
*F4FSV	“	35,757	171	25	62
*F4DNU	“	6,000	68	18	30
*F4WCE	21A	15,753	114	19	40
*F4IXM	“	522	17	7	11
*F4HUA	14A	1,767	41	8	23
*F4BIV	7A	50,715	383	21	84
*F4IRT	“	24,840	191	18	74
*F4FHV	3.7A	132	8	5	7

Greece

SV8OVH	AA	155,760	300	86	209
SV2KGA	“	77,448	215	57	111
SV1SLC	“	17,712	88	33	75
SV2CXI	“	2,867	31	21	26
SV1BJW	“	2,058	33	10	32
SV3AQT	“	150	5	5	5
SX2K	28A	142,417	620	29	92
					(OP: SV2BXZ)
J42L	21A	919,191	2977	37	132
					(OP: OK1CDJ)
SV1JG	14A	149,471	934	32	99
*SV3RPQ	AA	599,445	1325	73	242
*J41J	“	235,850	688	60	205
					(OP: SV1PMQ)
*SV2DXG	“	85,225	267	47	128
*SV1AAK	“	69,738	204	55	122
*SV2SIF	“	38,442	194	36	93
*SV3NYZ	“	27,540	132	38	97
*SV1ONV	“	25,728	146	36	98
*SV8SYK	“	19,602	120	30	51
*SV2RMR	“	3,610	39	15	23
*SV1VJ	“	612	12	8	9
*SV2RIM	“	66	7	4	7
*SV1EJD	“	8	2	2	2
*SV8CS	28A	49,496	206	29	63
*SV2HJW	“	46,640	234	25	55
*SV2DFK	“	27,158	161	23	51
*SV1QVY	14A	3,024	92	8	34

Hungary

HA2KMR	AA	1,635,627	1763	117	380
HA7RY	“	1,017,117	1327	105	328
HA6P	“	812,535	1263	69	216
					(OP: HA6PX)
HA3OU	“	638,145	942	109	326
HA5AQ	“	209,797	320	86	215
HA2UF	*“*	*43,056*	*165*	*48*	*108*
HG8YKO	“	21,567	304	11	68
HG3R	28A	848,056	1965	37	147
					(OP: HA3NU)
HA3LN	“	682,352	1665	37	139
HA4A	“	360,157	959	36	125
					(OP: HA4FF)
HA8M	“	280,420	869	35	105
					(OP: HA8FM)
HA5JI	21A	1,260,080	2951	38	152
HA8A	“	1,082,771	2594	39	140
					(OP: HA8DZ)
HG1S	“	922,952	2285	35	137
					(OP: HA1DAE)
HA8FK	“	484,224	1516	35	121
HA1AH	14A	644,716	1947	40	138
HA8IB	“	471,086	1808	40	121
HA1TJ	3.7A	203,796	1329	21	87
*HA8EV	AA	246,050	703	57	202
*HA1BB	“	157,740	300	75	164
*HA8AR	“	67,044	414	27	124
*HA1GBR	“	36,720	201	37	99
*HA5OO	“	17,334	112	24	57
*HA7MS	“	9,976	55	32	54
*HA5PP	28A	303,552	796	34	119
*HA3HA	“	113,283	414	31	92
*HA8MV	“	3,724	48	14	24
*HA3FMR	“	1,566	28	12	17
*HA6PJ	14A	42,966	291	23	76
*HA8V	7A	5,664	102	8	40

Iceland

TF3AO	21A	4,879	109	7	34
TF2LL	7A	28,301	211	21	70
*TF3JB	14A	154	6	5	6

Ireland

EI5JQ	AA	135,590	257	77	221
EI6HB	*“*	*56,414*	*212*	*40*	*94*
*EI8GP	AA	158,885	471	48	167
*EI3ISB	“	41,745	184	36	85
*EI6HZB	“	32,508	118	38	88
*EI8KV	“	21,600	158	24	76
*EI9ES	“	4,070	68	13	42
*EI1E	14A	85,728	637	22	72
					(OP: EI4KH)
*EI9HX	7A	89,748	609	23	85
*EI8KW	“	5	3	2	3
*EI6JK	1.8A	2,610	89	4	26

Isle of Man

MD4K	21A	838,755	2453	35	136
					(OP: G3NKC)

Italy

IR2Q	AA	7,310,784	4388	163	591
					(OP: IK2PFL)
IB0L	“	4,081,244	3403	130	432
					(OP: IK0ETA)
IO6A	“	3,202,332	3307	133	436
					(OP: IK6QON)
IU0OVB	“	1,514,955	1704	112	345
IZ3NYG	“	1,384,317	1412	141	390
IZ2ODM	“	1,305,464	1194	117	376
IB2M	“	1,127,520	1037	119	367
I2WIJ	“	843,684	922	117	384
I2OLV	“	679,470	737	112	314
IK2XSL	“	669,874	888	87	220
IK1PMR	“	642,257	768	107	332
IK1TTD	“	442,680	965	77	280
I0LYO	“	407,316	654	99	274
IZ3XEF	“	379,431	500	90	209
I2BRT	“	317,772	477	78	213
IZ0OTV	“	311,260	440	87	229
IK5PWS	“	298,452	513	87	236
IU0OPT	“	182,784	418	73	199
IZ6OUX	“	179,529	627	59	190
IB6B	“	164,121	353	68	159
					(OP: IZ6FXS)
IZ2JCD	“	160,593	293	76	193
IZ2ZSF	“	137,217	347	59	100
IK3SSW	“	120,445	276	64	157
IZ4TNW	“	102,910	236	76	175
I5MPN	*“*	*99,000*	*268*	*55*	*165*
IZ1LAY	“	89,095	225	59	114
IU1HHH	“	44,525	215	29	108
4U9A	“	37,680	213	34	86
					(OP: E73A)
IK3ORD	“	32,000	110	52	73
IW3QTG	“	29,946	94	49	89
IW3GST	“	29,610	142	35	91
IW0RQJ	“	23,360	168	24	56
IK2WSJ	*“*	*8,576*	*52*	*32*	*35*
IW2NOO	“	7,480	70	19	36
IZ1WIX	“	5,750	41	17	33
IK1JTP	“	4,160	30	23	29
IR1Q	“	3,864	95	11	45
					(OP: IU1JCZ)
IZ1NBX	“	3,300	57	14	30
IK0TIX	“	2,597	31	18	31
IZ2CSX	“	1,776	28	16	21
IK2QIN	“	1,624	20	14	15
IU4FCW	*“*	*1,440*	*25*	*14*	*22*
IZ7NLJ	28A	428,526	1117	37	134
IO3X	“	401,388	955	35	131
II3W	“	278,880	676	36	130
					(OP: I3VFJ)
IR4B	“	252,096	625	35	121
					(OP: IK4AUY)
IK2SND	“	181,032	498	35	117
IK4POI	“	92,256	358	31	65
IK7IMO	“	70,760	290	30	86
IZ1PMC	“	44,275	166	26	89
IU2IDU	“	24,653	116	28	61
I7CSB	“	19,224	100	22	50
IK2UME	“	11,124	78	19	35
IK2CLB	“	3,813	33	15	26
IU4CHE	21A	136,752	525	30	82
IW1CHX	14A	263,054	1445	29	92
IU3BTY	“	218,448	815	34	110
IK5RLP	“	110,654	718	33	89
IZ4VTZ	“	814	17	9	13
IX1HPN	7A	72,865	824	18	77
IK2XDE	“	70,092	630	22	86
IB3M	3.7A	222,860	1615	21	89
					(OP: OE6MBG)
IK2QPR	“	143,936	1099	20	84
I1JTQ	“	116,748	999	17	77
IK0NMJ	1.8A	21,924	398	10	53
*IK4RQJ	AA	504,888	539	100	336
*IK1ZOF	“	494,263	757	84	259
*IB7B	“	435,916	716	89	243
*IK6OIN	“	420,800	713	79	241
*IK1RGK	“	405,405	642	76	221
*IK2ULV	“	374,865	683	81	254
*IZ2SXZ	“	367,666	591	72	286
*IU4NGP	“	284,130	465	82	248
*IU7IGI	“	282,900	499	69	177
*IW1RLC	“	279,822	679	71	227
*IK7JNM	“	258,142	431	95	288
*IK4ZIF	“	248,805	366	93	192
*IV3JAK	“	203,112	470	68	205
*IZ0DXD	“	176,904	416	67	206
*IK1MTZ	“	172,516	345	63	173
*I4ABG	“	145,824	415	51	166
*IU2JWF	“	121,536	299	58	153
*IU1KGS	“	104,533	300	54	167
*IZ5NRF	“	99,682	227	61	136
*IK7LMX	“	91,317	240	51	132
*IK4OMU	“	60,000	204	42	108
*IU2CVS	“	58,590	177	52	103
*IU5HES	“	57,970	173	56	131
*IZ4KAN	“	52,052	158	53	129
*IQ5ZP	“	47,260	196	44	126
					(OP: IZ5DKR)
*IK5JRZ	“	45,496	194	31	90
*IN3HUU	“	44,831	212	36	91
*IW1RBI	“	40,548	140	45	79
*IC8TEM	“	40,002	169	36	82
*I2OGV	“	33,798	142	34	95
*IU4KET	“	30,680	199	33	97
*IW1QEA	“	28,340	159	28	81
*IK3TCK	“	28,224	168	35	91
*IZ2OBS	“	24,804	106	36	81
*IW2FUT	“	24,112	148	25	63
*IK2CMI	“	23,246	123	31	87
*IU0PVZ	“	21,808	163	29	87
*IU0LRV	“	20,566	138	33	80
*IK8TEM	“	18,328	124	35	81
*IZ8FCA	“	15,930	164	21	69
*IV3HAX	“	15,554	103	23	54
*IZ2BHQ	“	15,180	66	39	53
*IU1GNA	“	11,160	64	24	38
*IZ1KGY	“	10,744	76	23	56
*IZ1EOP	“	8,848	61	28	51
*IU4MTO	“	7,884	56	26	47
*IC8/UR8QX	“	6,264	44	25	33
*IK4JQQ	“	6,213	100	11	46
*IU1LCK	“	5,460	51	15	50
*IW3BAS	“	5,427	57	25	42
*IK3DVY	“	2,650	36	18	32
*IU1IMC	“	2,432	26	14	18
*IK3SCB	“	2,068	31	17	30
*IU0PYH	“	1,566	20	11	18
*IW7ED	“	1,122	58	8	25
**IZ4XAI*	*“*	*1,080*	*20*	*12*	*15*
*IU7OTK	“	899	33	9	22
*IU6LSJ	“	650	15	12	14
*IW3HV	“	504	20	6	12
*IN3EJN	“	432	12	7	11
*IK2MMM	“	306	10	7	10
*IK2YGZ	28A	247,270	623	36	122
*IZ8BGY	“	69,664	333	26	86
*IZ8GNR	“	68,499	206	30	99
*IZ2KPE	“	61,272	234	27	84
*IZ8EPY	“	35,796	246	17	59
*IW5EID	“	25,938	129	24	75
*I1GXV	“	16,240	99	23	47
*IZ2ABI	“	11,300	85	15	35
*IU2ECB	“	5,248	61	11	21
*IU8ADS	“	920	18	9	14
*IC8FBU	“	819	23	6	7
*IK4LZH	21A	524,308	1400	34	130
*IV3UHL	“	74,467	338	28	85
*IR8W	“	24,708	176	22	65
*IZ1PKV	“	13,601	101	19	48
*IZ5FDD	“	2,627	27	13	24
*IU4MTY	14A	20,580	228	14	56
*IZ5IOV	“	11,346	116	14	47
*IA5/ON8JA	“	3,948	66	8	39
*IW2NEF	“	3,850	52	13	22
*IA5/ ON2PAM	“	156	10	4	9
*IR4P	7A	71,344	557	22	90
					(OP: IK4RVG)
*IZ4REF	3.7A	62,916	768	15	69
*IB5A	“	2,070	69	4	26
					(OP: IZ5OQX)

Kaliningrad

UA2FZ	AA	40,981	155	41	66
*UD2F	28A	572	18	8	14

Latvia

YL7X	14A	342,626	1383	37	126
					(OP: YL2LY)
*YL2KO	AA	205,860	495	74	218
*YL5T	“	6,000	81	15	45
*YL3IR	“	4,838	36	28	31
*YL2EA	28A	14,912	101	21	43
*YL3JI	“	2,380	25	12	22

Lithuania

LY4A	AA	6,783,575	5155	162	613
LY7T	“	384,264	800	76	248
LY2SA	“	282,387	491	81	258
LY2AX	“	23,432	100	37	64
LY7Y	“	19,468	120	23	39
					(OP: LY1VP)
LY2K	“	17,472	100	23	41
LY1R	28A	90,282	355	26	97
LY7M	1.8A	210	17	2	12
*LY2N	AA	280,612	558	69	223
*LY5AX	“	167,014	385	58	168
*LY4BF	“	160,770	475	56	177
*LY9W	“	124,169	358	57	170
					(OP: LY3HD)
*LY2GN	“	87,360	394	41	154
*LY3AB	“	75,036	436	32	124
*LY2MC	“	66,051	276	38	141
*LY2CO	“	40,656	261	27	85
*LY3I	“	4,779	63	19	40
*LY5XX	“	1,080	20	11	16
*LY2TS	28A	132,568	423	32	114
**LY4Q*	*“*	*437*	*13*	*7*	*12*
*LY3LB	14A	216	18	3	9
*LY2AT	3.7A	10,965	210	7	44
*LY5YY	“	2	1	1	1

Luxembourg

LX7I	AA	757,520	1834	41	129
					(OP: F4HWS)
LX1LC	“	686,154	1177	83	274
LX1FP	“	97,240	307	46	141
LX1SG	28A	99,779	347	30	83
LX1UN	3.7A	4,602	132	6	33

Malta

9H1CG	AA	11,970	64	25	38

Moldova

ER1BF	AA	247,256	783	59	189
*ER3CT	AA	250,830	576	65	205

Netherlands

PA4WM	AA	2,241,198	2194	119	415
PA3AAV	“	2,230,232	2064	123	473
PA1LX	“	513,620	933	82	223
PA4EL	“	504,360	623	93	267
PC2K	“	490,842	716	88	245
PC3M	“	403,056	617	79	232
PA3EVY	“	359,916	532	86	181
PA3ETM	“	248,192	517	56	168
PE1PIX	“	108,680	349	57	152
PF1MO	“	102,265	292	43	138
PC4H	“	82,476	296	46	128
PA1X	*“*	*73,255*	*226*	*45*	*116*
PA4GDR	“	51,042	252	35	106
PA5N	“	48,891	198	36	93
PA2A	“	41,715	200	39	96
PA3ELQ	“	32,648	153	31	75
PA4R	“	11,664	70	30	42
PA5KT	“	11,520	100	21	51
PA1AKM	“	4,860	69	11	43
PA9RW	“	4,590	53	14	40
PA3MRO	“	3,910	29	21	25
PA1LEX	“	1,440	30	10	22
PI4DX	28A	792,352	1839	36	140
					(OP: PD1DX)
PD4RW	“	4,144	48	13	24
PA3DRL	21A	24,660	117	25	65
PA4OES	14A	3,861	52	12	27
*PA9M	AA	1,898,824	1866	126	442
*PA8KW	“	465,318	727	90	288
*PA1BD	“	303,133	602	65	168
*PF1SCT	“	301,119	655	59	214
*PA4O	“	261,392	589	64	208
*PE1EWR	“	257,320	533	65	215
*PC1PM	“	244,921	696	60	197
*PD2TW	“	199,485	501	54	141
*PA3BUD	“	172,120	347	73	187
*PD1RO	“	169,911	564	47	142
*PA3MM	“	108,353	295	46	115
*PD5S	“	93,280	316	39	121
*PA2JCB	“	80,229	257	45	96
**PA2HD*	*“*	*72,928*	*306*	*44*	*128*
*PE0CD	“	72,581	263	52	129
*PA50PKZ	“	60,160	191	57	103
*PA0B	“	58,022	301	30	104
*PA3HFJ	“	57,440	218	41	119
*PE1RWP	“	57,408	227	42	114
*PD7K	“	55,728	274	32	97
*PD1B	“	45,210	174	42	95
*PE4A	“	35,250	174	35	90
*PA4HJH	“	33,655	153	38	89
*PE1NBD	“	33,240	124	40	80
*PA8E	“	30,192	192	37	99
*PA3CGJ	“	30,130	199	25	90
*PE1FTV	“	29,290	163	31	70
*PA3DSB	“	28,560	173	31	88
*PD3LPA	“	25,276	115	27	62
**PA0FEV*	*“*	*25,228*	*135*	*35*	*84*
*PG6F	“	24,416	175	26	83
*PD0W	“	23,205	183	27	78
**PA3DNA*	*“*	*17,250*	*102*	*24*	*51*
*PA2Z	“	16,089	108	28	65
*PC7E	“	14,833	156	21	70
*PA5AD	“	13,694	145	21	61
*PA0RBL	“	12,775	97	21	52
*PA3JB	“	11,811	141	23	70
*PE1HWO	“	11,550	100	20	57
*PE5JW	“	11,174	115	24	50
*PA5W	“	10,001	59	28	45
*PA1MAR	“	8,340	71	22	38
*PA4J	“	8,322	69	23	50
*PD1DRE	“	8,136	87	20	52
*PA1TO	“	6,975	87	19	56
*PA1BK	“	5,280	50	17	27
*PA3A	“	5,100	58	21	39
*PA0LIE	“	3,976	50	17	39
*PD0JMH	“	2,666	50	9	34
*PD5JOS	“	888	14	11	13
*PD1BHZ	“	525	11	10	11
*PA2WLE	“	266	9	6	8
*PE4BAS	28A	130,662	420	29	90
*PA4JJ	“	69,336	247	31	77
**PD2JAM*	*“*	*32,712*	*150*	*25*	*62*
*PD4RD	“	3,872	48	11	21
*PD0FW	“	1,323	17	12	15
*PD4US	“	288	8	5	7
*PA0JED	21A	12,663	104	16	47
*PA0RRS	“	987	21	8	13
*PG2AA	14A	32,472	240	21	67
*PD0RS	“	5,848	124	7	36

North Macedonia

**Z32U*	*AA*	*5,565*	*47*	*21*	*32*
*Z39A	7A	8,784	77	13	59

Northern Ireland

GI4SNA	AA	155,375	283	81	194
MI5K	3.7A	40,328	519	13	58
					(OP: MI0SLE)
*MI4I	AA	89,961	320	48	143
					(OP: GI4SJQ)

Norway

LA6ZP	AA	332,310	712	68	217
LB6KC	“	268,128	506	73	263
LA8OM	“	256,824	659	53	193
LA8HGA	“	201,250	438	56	119
LA7XK	“	40,950	177	41	109
LA6SK	“	2,128	22	17	21
LA9BM	“	238	13	5	12
LC8C	21A	54,827	345	25	84
					(OP: LA8FTA)
LC5K	1.8A	9,844	237	7	39
					(OP: LA5YJ)
*LA5LJA	AA	421,898	708	89	297
*LC9A	“	107,062	390	47	152
					(OP: LB1TI)
*LB0WI	“	55,444	225	38	129
*LA6CF	“	50,688	155	54	122
*LA1SDX	“	41,272	293	27	107
					(OP: LA4XLA)
*LC7W	“	16,692	90	30	48
					(OP: LB7UI)

*LA3CLA	“	13,563	121	24	75
*LB4ZI	“	13,299	91	33	60
*LB6UH	“	9,088	55	25	39
*LA9NKA	28A	57,600	238	22	74

Poland

SN7Q	AA	6,590,200	4582	156	508
					(OP: SP7GIQ)
SN7D	“	3,461,302	3341	127	406
					(OP: SQ7D)
SN8K	“	1,212,903	1679	92	277
					(OP: SQ8ERS)
SN7B	“	1,017,569	1186	111	392
					(OP: SQ7BFC)
HF1K	“	844,200	1286	97	372
					(OP: SP1MGM)
SP3HLM	“	836,406	795	113	373
SP1NY	“	768,570	895	107	304
SP9KDA	“	431,262	832	85	257
SP3HRN	“	412,080	802	87	253
SQ8N	“	367,875	432	109	266
SP2GWH	“	356,662	605	85	217
SO5L	“	291,951	648	71	226
					(OP: SP5WIT)
SP3A	“	271,700	481	68	207
SP2XX	“	111,492	237	73	155
SO9P	“	102,300	239	66	154
SP5UGP	“	75,400	254	58	142
SP9IVD	“	56,270	219	41	129
SP2V	“	50,250	266	30	120
SP7V	“	23,001	128	34	89
SQ6BOR	“	2,800	26	16	24
HF9R	“	2,444	31	17	30
SP3SC	*“*	*936*	*14*	*12*	*14*
SQ9RPX	“	440	17	6	14
SQ6LJV	“	147	7	4	3
SP2JMR	28A	74,865	304	28	77
SP8K	“	45,661	229	21	56
SP5GNI	“	30,452	138	27	65
SP1O	“	16,640	109	24	56
SQ6NEJ	“	7,656	68	15	29
SN2B	21A	914,205	2237	37	140
					(OP: SQ2GXO)
SN5X	“	827,159	1953	37	142
					(OP: SP5GRM)
SQ9V	“	73,396	307	30	88
SP9EML	“	43,470	206	28	77
HF6R	“	15,768	91	23	50
					(OP: SP6FAF)
SQ2A	14A	1,336,704	3552	40	152
					(OP: SQ9UM)
SP7TEE	“	207,904	932	34	112
SP5DC	“	24	2	2	2
SN3A	7A	660,576	2678	37	131
					(OP: SP3GEM)
SP1SR	“	11,210	175	10	49
SP2PIK	3.7A	95,351	886	18	79
					(OP: SP2MKT)
SQ7NSN	“	33,120	457	12	57
SP5ELA	“	26,796	400	11	55
SP3GTS	“	21,600	219	13	62
SO4P	“	21,576	361	11	51
					(OP: SP4DEU)
SO5MAX	“	11,752	236	8	44
*SQ6H	AA	1,603,928	2093	121	408
					(OP: SQ6PLH)
*SP2R	“	1,171,383	1371	104	415
*SN8J	“	661,181	938	79	244
					(OP: SP8ALT)
*SP3H	“	443,037	826	87	270
*SP9PD	“	320,565	686	70	231
*SN3J	“	295,875	788	66	197
					(OP: SP3DAT)
*SP7TEX	“	221,370	458	71	211
*SP5EWX	“	220,759	427	86	243
*SQ1REX	_“_	_213,792_	_507_	_64_	_198_
*SP7JS	“	205,056	545	58	209
*SQ3POS	“	120,625	330	53	140
*SQ9SEB	“	120,564	435	49	155
*SQ7OVT	_“_	_110,976_	_340_	_51_	_153_
*SP8FB	“	105,780	326	54	161
*SP3BBS	“	77,430	258	46	128
*SQ9KDT	“	59,755	237	51	134
*SP2HHX	“	55,130	196	42	107
*SQ9PUW	“	53,790	264	40	123
*SP6NIV	“	50,508	215	40	98
*SP3FMF	“	49,434	235	33	121
*SQ9ZAX	“	48,789	185	49	90
*SQ5JUP	“	44,055	145	49	116
*SP8GNF	“	41,700	170	41	109
*SQ3TGN	“	33,500	219	34	100
*SP4KHM	“	30,744	202	27	95
					(OP: SP4GAP)
*SP2DKI	“	30,744	115	40	86
*SP7CF	“	25,984	143	36	92
*SP3ZHP	_“_	_22,320_	_269_	_16_	_64_
					(OP: SQ3JPV)
*SP7HOV	“	5,382	39	18	28
*SP9WOL	“	4,662	43	20	22
*SP2WGB	“	3,770	59	15	43
*SQ9ALW	“	2,204	40	12	26
*SP2GOW	“	2,109	23	16	21
*SQ3M	“	1,352	19	11	15
*SP6MI	“	1,161	15	13	14
*SP7JDI	“	180	6	4	6
*SN0W	28A	106,765	354	30	101
					(OP: SQ9HQ)
*SP9RHN	“	96,868	341	32	90
*SP3CCT	“	29,412	161	23	53
*SP6TRH	“	5,764	51	16	28
*SP9XCN	21A	207,360	716	31	113
*SO0N	“	97,395	394	31	98
					(OP: SQ9CNN)
*SP3LD	“	50,032	220	25	81
*SP9UOP	“	32,806	208	24	70
*SQ6PLD	“	11,748	72	19	47
*SP4DZT	14A	173,280	782	35	117
*SP6DVP	“	92,520	533	32	88
*SP3WKW	“	48,888	392	22	75
*SN5N	“	48,126	418	16	62
					(OP: SP5KP)
*SP7JLH	“	45,954	264	26	85
*SQ1WO	“	8,262	83	15	39
*SP9JZT	“	5,024	148	5	27
*SP3AYA	7A	62,178	678	14	72
*SP2N	3.7A	26,260	446	10	55
					(OP: SQ2HCW)
*HF7A	1.8A	11,025	255	6	39

Portugal

CT1BOL	AA	1,562,288	1435	125	393
CT7AKW	“	511,280	772	79	229
CT1FSG	“	409,552	1109	45	134
CT7/DL6IAK	“	255,024	958	44	132
CT1GFK	28A	30,954	106	31	103
CT1ETX	14A	89,600	448	25	87
CT7AHV	3.7A	11,501	213	7	46
*CT1BXT	AA	720,450	809	101	349
*CT2GSN	“	183,556	617	54	164
*CT7ABP	“	149,210	396	55	160
*CT7ADQ	“	116,116	247	61	225
*CT7AWB	“	93,558	356	48	138
*CT1BOH	“	34,884	120	45	69
*CR7BCP	“	33,176	239	23	81
*CT1EXR	“	30,186	153	28	58
*CT1BWU	“	11,310	68	33	54
*CT5GOJ	28A	18,450	124	20	55

Republic of Kosovo

*Z68XX	AA	142,494	652	47	140
					(OP: DL2JRM)

Romania

YO9HP	AA	2,565,696	2808	118	434
YQ6A	“	1,993,383	2099	131	466
					(OP: YO6BHN)
YO4NF	“	929,370	1998	82	308
YO7OWI	“	240,759	393	87	246
YO5AVN	“	193,800	397	68	217
YO4AR	“	101,016	384	46	161
YO2MFC	“	14,027	83	30	53
YO8ERC	“	13,376	70	32	56
YO8BSE	“	756	18	12	15
YO8SSB	28A	99,416	338	31	105
YO9RIJ	“	2,250	39	11	19
YR8D	3.7A	21,868	387	15	62
					(OP: YO8WHT)
*YO9IAB	AA	111,150	431	38	157
*YO5QDI	“	108,480	416	41	151
*YO7BGA	“	100,436	300	58	153
*YO2DFA	“	46,035	187	43	112
*YO9GDN	“	8,208	59	24	24
*YO4FZX	28A	3,960	70	11	22
*YO6CFB	“	1,225	19	11	14
*YO6XK	21A	77,504	358	26	86
*YO6LA	14A	7,599	133	8	43

Sardinia

IM0A	28A	226,941	832	33	110
					(OP: IS0BSR)
IS0NHT	“	165,718	511	32	101
IS0MHD	“	32,357	108	33	98
*IS0HXK	AA	10,011	65	27	44

Scotland

GM0V	AA	2,986,380	2976	105	365
					(OP: GM0OQV)
MM9I	“	2,836,865	2685	116	449
					(OP: GM0OPS)
GM4Z	“	257,742	448	74	148
					(OP: GM4ZUK)
GM0AZC	“	45,696	167	39	89
GM0VMV	“	31,900	193	31	85
MM5AII	“	15,554	121	24	53
MM0TFU	28A	230,736	618	31	107
*MM4D	AA	86,884	352	31	85
					(OP: GM4ATA)
*GM5TDX	“	63,842	327	40	97
*2M0KIE	“	40,470	211	40	102
*MM7EST	“	2,244	50	11	33
*MM0GOR	3.7A	10,944	229	7	41
*MM1E	1.8A	4,576	99	7	37
					(OP: MM0GOR)

Serbia

YT7R	AA	2,554,434	2706	129	444
					(OP: YU7BW)
YU7KW	“	816,704	1142	109	339
YU3DKO	“	90,729	303	47	106
YT7AA	“	22,500	180	21	69
YT1X	28A	636,888	1569	37	131
YT8WW	“	564,068	1511	37	129
YU5W	“	226,452	607	37	130
YU7OM	“	5,490	54	12	33
YT0Z	21A	857,394	2320	36	135
					(OP: YU1ZZ)
YT7X	“	68,234	331	28	81
					(OP: YU7CF)
YT6T	“	51,921	310	21	60
					(OP: YU7CM)
YU2MFM	14A	120	6	4	6
YT1A	7A	517,450	2222	34	124
YT3K	“	109,088	818	22	90
YU1LD	3.7A	91,430	982	15	67
*YU4AST	AA	78,937	328	49	144
*YT5BOS	“	50,949	203	49	104
*YT5IVN	28A	12,540	76	18	39
*YU7ZZ	21A	83,286	382	30	96
*YU5M	14A	291,600	1354	38	112
*YT7E	“	76,446	683	20	73
*YT5ANA	3.7A	24,428	379	9	53

Sicily

IR9Z	AA	1,075,184	1709	91	360
					(OP: IT9VCE)
IT9YHR	“	2,016	20	17	19
IT9HBT	28A	811,407	1943	37	142
IO9J	“	121,030	359	33	97
IT9IVU	21A	50,065	260	24	71
IB9T	14A	1,055,544	3200	40	143
					(OP: IT9BLB)
IT9ESW	7A	8,400	73	16	54
*IT9DGG	AA	279,645	503	74	235
*IT9ZMX	“	63,940	245	38	101
*IW9GRL	“	45,144	136	50	121
*IW9BJP	“	31,524	147	39	109
*IT9BYS	“	11,289	65	31	40
*IT9XTP	28A	389,928	1106	34	120
*IT9WDC	“	261,145	667	34	111
*IT9ACN	“	69,570	308	19	71
*IT9RZU	“	49,569	242	25	68
*IF9A	21A	263,568	1031	35	117
					(OP: IT9ATF)
*IT9VDQ	14A	4,089	58	10	37

Slovak Republic

OM0R	AA	8,357,640	5155	166	605
					(OP: OM3GI)
OM7LM	“	22,000	134	27	83
OM7JG	*“*	*5,152*	*51*	*19*	*37*
OM1DZ	“	2,394	27	18	24
OM2VL	21A	1,234,815	2772	39	152
OM3CW	14A	145,920	804	28	92
*OM5CM	AA	154,330	503	55	175
*OM6MW	“	67,816	326	39	134
*OM1AKU	“	60,021	299	42	129
*OM5UM	“	33,000	198	32	100
*OM1AVV	“	27,930	163	33	81
*OM6AI	“	23,600	148	27	91
*OM1ST	“	21,424	175	20	84
*OM1MJ	“	20,943	94	41	76
*OM1BCO	“	9,638	100	24	55
*OM7PY	28A	11,948	96	20	38
*OM5KM	3.7A	28,121	454	8	53
*OM4AQP	“	9,585	210	5	40

Slovenia

S53M	AA	6,630,894	4136	167	611
					(OP: S53ZO)
S52WW	“	1,073,904	1764	76	236
S59AA	“	81,282	209	53	133
S55DX	“	71,340	157	53	111
S51DX	“	29,161	173	31	90
S58D	28A	769,850	1822	37	136
S56Y	“	498,630	1241	36	129
S58AT	“	10,508	52	33	38
S50K	21A	1,141,554	2676	39	144
S50R	“	934,719	2342	36	137
S56B	“	239,355	905	31	104
S57DX	14A	1,004,640	3035	39	145
S55G	“	63,099	304	31	92
S51YI	7A	538,720	2322	31	117
S57O	“	114,840	978	21	89
S56X	1.8A	48,709	732	10	57
*S55X	AA	987,852	1558	107	324
*S52BT	“	553,900	799	85	297
*S56A	“	431,834	557	105	337
*S52ON	“	330,576	869	64	220
*S55KA	“	108,460	313	55	165
*S55AL	“	97,614	398	45	129
*S52W	“	41,160	196	42	98
*S59MA	“	40,103	182	34	85
*S56VHR	“	11,648	110	24	67
_*S55TZ_	_“_	_9,956_	_110_	_19_	_57_
*S51RBC	“	7,029	64	26	45
					(OP: S57LR)
*S55BG	28A	106,449	387	32	79
*S50B	“	27,690	133	23	55
*S52ZW	21A	31,862	164	24	65
*S51WU	“	4,708	60	13	31
*S57ZT	7A	18,340	228	12	58

Spain

ED3X	AA	6,366,204	4734	145	524
					(OP: EA3QP)
EA1L	“	4,096,648	3934	116	420
EA7DHT	“	1,453,098	2414	95	303
EA7I	“	1,234,032	2030	92	284
EA1BLI	“	1,110,417	2031	78	285
EA3AR	“	763,175	1242	67	178
EA4AW	“	682,272	985	85	283
EC3AIT	“	394,524	505	93	258
EA3OW	“	384,120	597	76	254
EA1AA	“	383,385	537	88	217
EF1A	“	357,408	669	70	222
EA1OL	“	353,734	679	67	207
EC1T	“	341,136	510	84	225
EA1BNF	*“*	*310,809*	*404*	*98*	*233*
EA4UV	“	306,160	402	95	249
EA2A	“	188,916	441	52	121
EF5T	“	183,372	609	58	164
					(OP: EA5JDN)
EB2RA	“	149,425	436	38	101
EA1DA	“	137,655	458	44	117
EA4HQV	“	113,120	247	66	158
EA2CCG	“	67,980	413	29	103
EA3HRE	“	39,690	163	43	92
EA3IN	*“*	*37,386*	*139*	*43*	*91*
EA2DDE	“	34,100	129	46	54
EF2O	“	33,147	219	35	92
					(OP: EA2AOO)
EA4K	“	22,572	104	33	66
EA3XL	“	11,946	73	28	38
EA5HRM	“	7,770	49	30	40
EA3IJT	“	510	10	7	10
EC5K	28A	443,877	1165	37	124
ED4T	“	258,258	706	32	111
					(OP: EA4R)
EA2KB	“	122,047	468	30	97
EA5J	“	112,576	624	18	46
EA5GS	“	109,726	523	23	60
EA7O	“	95,104	356	30	98
EA5VR	“	72,180	410	24	66
EA3KN	“	32,849	124	31	76
EA5IGO	“	23,577	297	12	17
EA4DE	“	9,930	135	11	19
EB1IC	*“*	*4,656*	*37*	*19*	*29*
EE5K	21A	942,210	2801	37	134
					(OP: EA5DF)
ED3E	“	271,776	891	35	117
EA1KP	“	39,676	195	25	84
EA1B	“	31,635	123	28	83
EA7BUU	“	24	2	2	2
EA7TS	14A	93,462	702	25	86
EA5RC	7A	86,110	637	23	86
EC5APA	“	9,555	139	15	50
EA2GR	“	5,658	120	9	37
EB5KT	3.7A	28,638	357	12	62
EA1HV	1.8A	2,448	66	7	29
*EA4EUI	AA	1,080,178	1256	96	311
*EA1G	“	768,016	1083	87	281
*ED3Z	“	703,105	1185	78	295
					(OP: EA3ICJ)
*EA7BD	“	695,968	976	86	330
*EA7K	“	687,016	1000	100	322
*EA1IQM	“	545,072	989	75	251
*EA5W	“	503,844	767	78	285
*EA3XR	“	431,851	679	82	241
*EA5JEG	“	413,699	641	84	179
*EA4NI	“	412,515	777	70	239
*EA4EF	“	403,650	702	71	228
*EA5KB	“	223,839	548	51	158
*EA5GX	“	175,059	463	48	111
*EA1AW	“	160,769	334	64	129
*EA1ITX	“	134,408	376	53	159
*EA1FW	“	112,266	374	65	133
*EA5DGK	“	106,764	300	56	161
*EA5FCW	“	71,576	211	53	131
*EA3IFV	“	61,596	181	53	121
*EA1T	“	55,352	155	50	98
*EA1DAV	“	39,216	154	38	91
*EA7A	“	36,250	122	39	86
*EA5IUS	“	36,036	174	32	67
*EA2GP	“	28,380	146	39	90
*EA4HIH	“	18,018	136	21	56
*EA4HOT	“	16,815	115	34	61
*EA4HOK	“	13,193	75	31	48
*EA4EUW	“	7,777	78	23	54
*EA5IQN	“	7,194	71	22	44
*EA1AAP	“	4,774	56	20	42
*EA4GJM	“	500	16	10	15
*EB5HAH	“	399	20	6	15
*EA4AFP	“	350	9	7	7
*EA7Z	28A	579,320	2075	34	106
*EA2LMI	“	514,755	1314	36	119
*EC3CVD	“	366,380	1078	33	107
*EE7E	“	307,457	1113	31	100
*EA2DMH	“	195,704	596	33	103
*EA4AA	“	179,672	614	35	113
*EA1ACP	“	172,620	500	35	105
*EE3Z	“	151,776	407	31	113
					(OP: EA3NO)
_*EA1GY_	_“_	_129,888_	_463_	_32_	_91_
*EA7KOL	“	103,884	473	29	103
*EC5KXA	“	78,897	313	27	92
					(OP: HK1A)
*ED1O	“	44,073	236	19	64
*EA5HJO	“	38,367	194	21	66
*EA4FVT	“	35,026	162	28	55
*EB1ADD	“	21,090	124	17	57
*EA5JN	21A	73,696	459	24	88
*EA5JDC	“	67,367	492	22	79
*EA5IXO	“	42,456	240	20	67
*EA4FJX	“	37,950	159	25	90
*EC4TA	“	5,346	85	8	14
*EA2EVC	14A	5,800	100	9	41
*EA2CE	7A	14,910	154	14	56
*EA3CN	3.7A	18,585	317	10	53
*ED3M	1.8A	10,300	226	8	42
					(OP: EA3FP)

Sweden

SK7K	AA	621,746	1004	73	220
					(OP: SM7XEN)
SM5EPO	“	401,391	635	80	229
8S0C	“	262,496	323	99	317
					(OP: SM0MPV)
SM6MVE	“	176,750	513	56	194
SM3YBP	“	172,750	463	51	199
SM5VFE	“	113,634	308	59	155
SM6YNO	“	34,692	122	32	66
SE5E	“	7,590	72	23	46
					(OP: SM5AJV)
SK3W	28A	340,704	1110	32	124
					(OP: SM3SGP)
SE5N	21A	5,544	60	14	22
					(OP: SM5ISM)
7S9A	14A	61,610	502	23	78
SB7W	“	12,308	125	15	53
*SE4E	AA	324,900	832	65	235
					(OP: SM4DQE)
*8S8S	“	168,861	463	59	172
					(OP: SM5XSH)
*SM3OMO	“	71,556	256	47	131
*SM7BHM	“	27,864	162	19	62
*SA3MGL	“	14,442	154	20	63
*SE5W	“	6,760	53	19	33
					(OP: SM5NQB)
*SF5O	“	600	10	10	10
					(OP: SM0EOS)
*SD0N	“	400	10	8	8
					(OP: SM0NSJ)

Switzerland

HB9DQL	AA	1,037,622	1104	99	339
HB9EHJ	“	533,871	837	85	266
HB9OAU	“	499,074	1055	81	292
HB9CVQ	“	373,500	895	58	192
HB9BOI	“	355,338	503	89	253
HB9BTI	“	293,400	589	73	227
HB9HJI	“	243,880	623	63	205
HB9HHN	“	197,784	537	54	192
HB9HID	“	122,783	363	52	147
HB9CRY	“	108,997	266	54	107
HB9FEX	“	90,272	292	56	161
HB7X	“	48,825	209	31	62
					(OP: HB9FMU)
HB9EXR	“	4,340	44	20	42
HB9HLM	28A	306,565	978	31	102
HB9IQB	14A	49,257	223	28	89
*HB9CU	AA	865,650	1039	98	300
*HB9CIC	“	101,104	285	46	96
*HB9HTF	“	68,052	291	37	122
*HB9TWU	“	38,354	179	36	91
*HB9BXQ	“	37,375	142	40	75
*HB9HKE	“	7,752	68	28	48
*HB9FSE	“	1,530	19	14	16
*HB9HRG	“	1,104	46	13	33
*HB3XAW	“	825	13	12	13
*HB9FBK	14A	891	31	5	22
*HB9HPO	“	588	22	6	15

Ukraine

UW1M	AA	466,488	646	99	297
UT0U	“	290,304	605	80	176
					(OP: UT5UDX)
UX0FF	“	175,953	329	79	188
US5QUB	“	145,285	311	61	184
UT5UGR	“	88,800	311	48	112
US8QQ	“	15,036	63	35	49
UR5EDX	“	4,830	40	21	25
UT0RM	“	1,825	27	10	15
UR7EZ	“	1,196	18	9	14
UT5EL	28A	42,750	179	27	68
UZ0U	14A	253,176	1085	35	119
					(OP: UY5ZZ)
UY3U	“	150,921	972	32	91
					(OP: UT8UF)
UW7LL	3.7A	32,873	427	13	58
*UT1UL	AA	314,565	513	77	236
*UR5RP	“	196,402	358	81	202
*UT6CW	“	45,144	142	42	129
*US5WBJ	“	17,738	105	30	68
*UR9LM	“	9,768	97	25	63
*UW7CN	“	9,313	63	22	45
_*UX3IW_	_“_	_4,293_	_33_	_22_	_31_
*UW5U	28A	94,560	373	27	93
					(OP: UY2UA)
*UT1US	21A	4,995	55	14	31

Wales

MW0LKX	AA	386,280	695	73	260
GW0ARK	“	272,208	431	80	241
GW9T	28A	730,240	1816	35	128
					(OP: MW0ZZK)
GW4J	“	238,469	676	32	101
					(OP: GW0ETF)
MW2I	“	49,168	177	31	81
					(OP: GW5NF)
*MW0CRI	21A	80,476	379	27	97

OCEANIA

Australia

VJ4T	AA	4,429,000	3720	127	303
VJ2W	“	644,436	764	95	211
VK4L	“	134,044	260	62	126
VK3Y	“	94,140	210	67	113
VK6DW	“	27,025	93	42	73
VK3KE	“	8,512	64	26	38
VK3ICM	“	1,050	18	11	10
VK3X	*21A*	*13,629*	*93*	*22*	*37*
					(OP: VK3GK)
VK4DX	14A	158,619	524	28	83
*VK6OZ	AA	181,076	380	69	154
*VK2AZ	“	18,810	86	36	54
*VK3YV	“	11,840	67	31	43
*VJ4G	“	2,989	30	24	25
*VK1NS	“	782	15	10	13
*VK2NR	“	450	9	9	9
*VK5WU	14A	4,141	42	16	25
_*VL2U_	_“_	_3,724_	_37_	_13_	_25_
					(OP: VK2BNG)

East Malaysia

*9W6EZ	28A	27,720	181	25	31

Guam

NH2DX	21A	462,314	1189	37	102
					(OP: KG6DX)

Hawaii

WH6R	AA	118,300	367	58	72
AH7C	“	1,536	20	13	19

Indonesia

YB0BAC	AA	1,166,100	1348	95	230
YB0AGW	“	94,990	221	55	106
YB0ET	“	56,007	177	47	80
YB1MAE	“	41,965	194	32	77
YB0PJF	“	37,744	127	42	70
YB2IQ	“	34,384	117	32	80
YB4HKR	“	33,026	151	34	64
YC1CRR	“	28,200	110	36	64
YB7YGR	“	24,531	89	48	63
YB9DE	“	23,805	189	27	42
YB1RUS	“	8,856	62	17	37
YB0ISE	“	6,840	44	20	37
YB2CRN	“	5,548	56	13	25
YC3GFN	“	4,464	55	24	38
YB0SAS	“	4,160	46	19	21
YB1DOL	28A	36,784	175	23	53
YB3IZK	“	19,266	140	16	41
YB2TS	“	1,728	24	8	16
YB3BX	“	476	14	6	11
YB1RET	21A	102,368	333	28	84
YC8RAG	“	11,552	120	14	24
YF3DGK	“	1,595	29	11	18
YB3FTD	“	1,254	19	6	16
YB0DJ	“	35	3	2	3
YE3AA	14A	1,456	18	11	17
YE3FAX	7A	3,816	55	15	21
YC7OCS	“	1,854	44	7	11
YF3EOY	“	390	21	4	6
*YC2VOC	AA	1,185,453	1322	81	240
*YB0NSI	“	441,451	590	84	197
*YB1LUE	“	278,460	428	70	182
*YB8IBD	“	105,032	315	50	102
*YB1MIG	“	63,168	198	51	90
*YC0JOY	“	56,581	157	46	91
*7C9R	“	52,029	170	46	77
					(OP: YB9GWR)
*YC2DBW	“	26,910	94	40	75
*YB1ABY	“	26,829	118	32	67
*YC1TCA	“	24,128	95	34	70
*YB2CAA	“	23,618	118	41	57
*YF3DEA	“	23,250	125	27	48
*YD2BIU	“	20,910	109	32	53
*YC6HRI	“	16,756	88	27	44
*YE9PBZ	“	16,350	85	28	47
*YC4SMK	“	11,096	62	30	43
*YC9UAB	“	9,954	68	27	36
*YG1BMZ	“	9,240	89	25	31
*YE8DWC	“	8,456	68	24	32
*YC1BMI	“	5,376	67	15	27
*YC1AUI	“	4,312	36	21	28
*YC2FAJ	“	3,948	40	19	23
*YF1AAH	“	3,567	33	17	24
*YC2MPF	“	2,604	52	13	18
*YC1HLT	“	1,960	52	12	23
*YE3ESW	“	1,647	23	11	16
*YC9BFQ	“	1,450	28	12	17
*YC1JZK	“	893	32	8	11
*YB9JIP	“	874	25	10	13
*YB7XYO	“	544	26	13	21
*YF8AFW	“	384	14	6	6
*YB1HR	28A	63,038	301	27	59
*YC9AAI	“	42,525	189	23	58
*YB1DIU	“	40,670	183	27	56
*YB2ECG	“	25,272	170	20	32
*YD3ASV	“	24,455	155	24	43
*YB0JVZ	“	10,092	62	17	41
*YD9BIJ	“	6,888	59	16	26
*YG3EMH	“	6,345	49	15	32
*YD2UWF	“	2,080	33	11	21
*YD3CZV	“	315	13	7	8
*YD0RFS	“	231	9	5	6
*YG2AZV	“	42	3	3	3
*YC5AKH	21A	95,670	428	27	63
*YB1EGP	“	51,243	260	23	70
*YC0SJK	“	15,142	86	20	47
*YC2XCD	“	10,664	116	16	27
*YC1GHZ	“	4,826	49	10	28
*YC1IFR	“	3,104	61	12	20
*YF8FOR	“	2,920	59	9	11
*YF3FZR	“	2,006	32	11	23
*YG2BEB	“	570	15	7	8
*YC1BTG	“	304	9	7	9
*YC2CKY	“	42	3	3	3
*YB2ERL	14A	1,166	20	8	14
*YD8NEH	7A	2,520	52	11	17
*YC2CZF	“	2,492	38	12	16
*YE3DGS	“	384	25	5	7
*YC3BQO	“	264	34	9	13
*YC1LNE	“	261	41	4	5
*YG1BJZ	“	225	17	3	6
*YG3ARL	“	140	8	3	4
*YF3ERE	“	140	7	4	6
*YG4SAP	“	27	7	1	2
*YG3ASH	“	18	3	1	2

New Zealand

ZM4T	AA	4,427,000	3424	130	336
					(OP: ZL3IO)
ZM1A	“	321,300	524	80	145
					(OP: ZL3CW)
ZL4NR	“	44,268	143	41	83
ZL2RX	“	13,124	80	27	41
ZL1T	28A	5,796	113	9	9
					(OP: ZL1ANH)

ZL1BBW	14A	63,936	236	25	71
ZL4YY	“	13,552	98	18	38
*ZL2MM	AA	1,320	20	10	14

Philippines

DU3T	AA	1,869,923	1820	116	273
DV3A	“	555,864	945	75	153
4E3X	21A	52,954	253	26	57
*4I1EBD	AA	735,804	1235	75	168
*4I1BNC	“	13,826	92	25	37

SOUTH AMERICA

Argentina

LV1D	AA	210,512	396	67	156
LU7MT	“	55,031	203	42	71
LU9OZX	“	52,345	170	50	95
LU8DPM	28A	1,706,912	3692	37	127
					(OP: LU7DW)
LT6M	“	703,437	2000	27	102
					(OP: LU8MHL)
LU3WC	“	528,640	1734	25	87
LU7YZ	“	482,328	1637	23	93
LU3MO	“	166,540	593	27	83
LU2D	21A	79,695	412	18	51
					(OP: LU2DX)
L33M	“	50,840	225	24	58
					(OP: LU3MAM)
*LU6ETB	AA	1,159,434	1385	92	214
*LU1MAW	28A	112,765	492	20	75
*LU7DV	“	50,869	216	19	72
*LU9EAE	“	4,154	73	11	20
*LU5ILA	21A	5,434	79	14	24

Brazil

PT5J	AA	11,807,370	6228	157	521
					(OP: PP5JR)
PY2WH	“	3,320,730	3222	96	282
PY2KC	“	2,295,120	2215	93	300
PP2CC	“	1,728,545	1703	97	280
PV2K	“	1,590,522	1624	86	268
					(OP: PY2KNK)
PT1K	“	1,580,020	1957	70	225
					(OP: PP1KV)
PY5AMF	“	1,174,950	1241	95	255
PY4RGS	“	550,539	778	77	172
PS2M	“	521,216	816	75	181
					(OP: PY2OX)
PY1FI	“	344,805	713	50	131
PY3FOX	“	295,767	687	61	116
PY3PA	“	263,865	664	57	90
PT7BI	“	206,610	562	35	107
PY3DX	“	118,104	294	54	114
PY2VN	“	41,360	142	37	73
PY2TOP	“	32,802	181	20	46
PY4ME	“	30,240	147	29	67
PY4LI	“	22,344	138	46	52
PT2AP	“	19,007	126	25	58
PY3APY	“	16,905	116	27	42
PY5KA	“	8,364	68	23	45
PY5DK	“	5,684	42	21	37
PT2NP	“	4,557	41	17	32
PY2AE	“	3,237	54	16	23
PW2L	28A	1,047,087	2606	30	109
					(OP: PY2MNL)
PY5ZHP	“	456,565	1298	28	99
PY2DY	“	398,208	1100	33	103
PT4Z	“	216,999	975	19	62
					(OP: PY4JW)
PY2TMV	“	103,253	553	23	56
PY5IN	“	80,106	378	21	57
PY4DK	“	62,250	331	16	59
PY2LC	“	40,716	181	25	62
PY2EBD	“	17,528	139	13	43
PY2GZ	“	13,311	196	13	16
PY2NFE	“	1,342	34	11	11
PY8WW	21A	471,960	1274	31	107
PY2PPZ	“	24,221	209	15	38
PY6BA	14A	1,096,176	2358	37	127
PY3LX	“	18,316	117	24	52
PY2XJ	*“*	*14,025*	*161*	*13*	*20*
PT6T	“	1,150	23	8	17
					(OP: PY6TS)
PY3TR	“	247	11	7	6
PY5QW	7A	101,200	391	28	72
ZV1T	“	64,703	336	25	64
					(OP: PP1WW)
PY5DC	3.7A	176	25	5	6
*PY5FO	AA	649,728	1076	64	152
*PT7ZT	“	246,826	534	54	113
*PY3RS	“	232,408	442	65	144
*PY1RY	“	181,792	331	57	151
*PY6BK	“	137,940	331	46	119
*PT2AW	“	90,839	245	41	92
*PR7RBA	“	75,920	277	38	92
*PY2DR	“	75,715	354	29	66
*PY1AN	“	64,949	251	38	69
*PY2GM	“	51,448	189	38	80
*PP2CS	“	45,375	189	47	78
*PY5II	“	42,784	160	35	77
*PY1NS	“	32,368	138	42	77
*PY2WLM	“	31,104	198	33	63
*PY2POA	“	30,281	135	37	70
*PP5ZB	“	24,024	116	37	54
*PP2RON	“	20,768	151	25	34
*PY3FA	“	19,800	117	20	52
*PP5FZ	“	19,564	117	31	42
*ZV8C	“	18,750	108	25	50
*PY5CC	“	18,432	106	30	42
*PY3FBI	“	18,150	97	28	47
*PY2MSB	“	12,060	130	22	38
*PY2KME	“	10,143	69	24	45
*PY3TAM	“	6,996	72	16	28
*PP1AA	“	6,161	119	25	36
*PY4WWW	“	5,580	56	24	36
*PY1ID	“	4,400	82	13	27
*PV8AAS	“	4,320	39	15	30
*PY5IQ	“	4,200	41	18	32
*PY2OKB	“	3,900	57	36	42
*PY2MIA	“	3,332	65	12	22
*PP5TI	“	2,800	38	22	28
*PU1KVD	“	2,475	58	13	20
*PY1SGT	“	1,856	37	11	18
*PY5VE	“	1,776	30	16	21
*PT2YW	“	1,400	49	10	18
*PY2NNM	“	696	25	13	16
*PU2SDX	28A	525,555	1401	30	105
*PY4YY	“	354,654	1205	27	87
*PY2CX	“	328,909	903	29	104
*PY2BRA	“	294,252	981	29	84
*PU4MMZ	“	223,816	808	27	74
*PY2VZ	“	222,360	775	25	84
*PY2CPS	“	161,249	615	27	80
*PU1JSV	“	113,040	529	26	54
*PU2USK	“	96,471	461	22	59
*PY2FRQ	“	83,172	348	21	66
*PS2B	“	61,523	500	18	29
*PU2OGQ	“	45,792	202	26	70
*PY2HT	“	44,032	209	24	62
*PU1SKO	“	42,032	220	17	57
*PU5ABB	“	41,244	212	22	62
*PT9SS	“	37,730	231	17	53
*PU2STZ	“	37,636	149	22	75
*PU2VLW	“	33,258	225	19	50
*PV2D	“	31,110	152	23	62
					(OP: PY2AD)
*PU7IRR	“	30,514	183	16	57
*PY2MOR	“	29,422	177	25	69
*PU4BOT	“	26,274	199	16	42
*PU2MZI	“	24,402	124	20	63
*PY4XX	“	24,272	141	22	52
*PY2DN	“	20,410	142	20	45
*PU2LOD	“	20,242	154	17	41
*PY1CD	“	20,224	144	20	44
*PU3RIN	“	20,064	108	19	57
*PU1KPS	“	18,876	133	20	46
*PP1BM	“	18,645	164	14	41
*PY7GB	“	18,368	126	17	47
*PY1SX	“	17,112	96	15	47
*PU2ORS	“	16,038	124	21	45
*PY1LU	“	13,566	105	18	39
*PY2TTN	“	13,464	111	18	50
*PU2TWZ	“	12,322	118	18	43
*PU2VPW	“	11,200	146	19	37
*PY1KIH	“	11,139	146	16	31
*PU8MGB	*“*	*10,432*	*60*	*17*	*47*
*PU7HLT	“	9,672	98	15	37
*PU8YPL	“	9,050	98	15	35
*PU2XYT	“	8,976	112	15	33
*PY2ZDU	“	7,896	85	14	28
*PU3YST	“	7,175	91	12	29
*PY1MK	“	7,052	83	15	28
*PU2YXB	“	5,940	83	14	31
*PU2RXE	“	5,559	93	17	34
*PU5AGM	“	5,440	87	11	21
*PU5KJN	“	4,900	78	13	22
*PU5MFI	“	4,608	62	12	24
*PU3LTA	“	4,536	68	13	23
*PU2NUS	“	3,348	44	12	24
*PU1KGE	“	3,306	65	13	16
*PP5FMM	“	2,553	56	10	13
*PY1XA	“	2,380	145	20	48
*PU3LOB	“	2,325	40	12	13
*PU7ASP	“	1,876	32	12	16
*PU4WTB	“	1,843	75	6	13
*PU4HUD	“	931	28	8	11
*PY5PLL	“	828	20	5	13
*PU3BDJ	“	782	36	8	9
*PU5NAO	“	528	18	8	8
*PU1LEO	“	476	40	8	9
*PY4NF	“	429	32	5	8
*PY2OKW	“	260	12	7	6
*PY3BEG	“	78	5	3	3
*PU2PYB	“	70	5	4	3
*PU2NAX	“	16	8	2	2
*PY2FSR	21A	149,842	565	26	72
*PY1DX	“	58,806	252	29	70
*ZW2A	“	55,200	254	26	66
					(OP: PY2SGL)
*PY2TC	14A	214,832	720	31	85
*PY2COY	“	6,647	149	8	9
*PS8ET	“	6,272	41	16	40
*PT2SR	“	2,295	98	5	4
*PV8AZ	7A	493	12	7	10

Chile

CE1TT	AA	1,840,896	2276	80	226
XQ4KTM	“	590,189	1099	69	164
CE3NC	“	145,071	308	68	131
CE3VRT	“	2,001	30	13	16
XQ7IR	28A	285,325	1016	24	89
CE5NK	“	2,233	36	11	18
XQ1KZ	21A	487,492	1278	34	100
*CE2GT	AA	127,534	312	63	124
*CE2SCZ	“	89,838	402	31	62
*CE4PPC	“	66,976	278	42	62
*CA2YWW	“	25,344	209	22	42
*XQ3WD	28A	416,312	1493	21	83
*CE3LI	“	16,668	206	14	22
*CA6JQN	“	1,340	32	5	15
*CE1PTT	21A	100,521	489	24	57
*CE1RT	“	71,552	337	24	62
*CE7KF	“	11,280	100	20	40

Colombia

HK4W	AA	151,632	425	42	120
_*HK3J_	*AA*	*1,904*	*25*	*9*	*19*
*HK3EA	7A	565,677	1623	27	96

Paraguay

ZP5VIA	AA	17,550	146	18	47
ZP5DA	“	10,224	56	26	46

Trinidad & Tobago

*9Z4Y	28A	290,297	978	28	85

Uruguay

CX7RM	AA	162,830	343	60	130
CX4CP	“	56,408	254	30	58
CX6VM	“	45,154	158	46	61
CX7ACH	“	891	34	10	17
CX2CC	28A	739,500	2262	29	96
CX9ARH	“	310,905	1113	24	81
CX1RL	“	242,997	933	25	82
CX5UA	“	219,510	878	22	68
CX7SS	21A	1,182,613	2970	33	116
CX3AT	14A	294,804	971	30	84
*CX2RA	28A	182,784	717	22	74

Venezuela

YV5NEA	14A	412,191	1271	26	91
*YV5RAB	AA	995,371	1150	81	218
*YV5LMW	“	2,520	26	17	25

QRP

K8ZT	A	349,160	457	75	215
HG6C	“	279,405	636	75	240
					(OP: HA6IAM)
JH1OGC	“	264,252	430	92	152
UR5FEO	“	263,228	600	72	244
MI5JYK	“	226,252	622	44	185
JH7UJU	“	189,981	341	82	127
DK8R	“	167,555	495	54	181
M7XTT	“	166,014	501	52	155
W6QU	“	131,130	265	72	114
					(OP: W8QZA)
SO2U	“	125,292	395	49	163
SP9TKW	“	116,604	389	54	183
PY2BN	“	111,706	418	32	69
JK2VOC	“	107,520	301	66	94
HA5BA	“	88,615	342	47	138
W3EK	“	77,355	228	35	100
KA8SMA	“	72,695	182	50	105
M3RZO	“	61,577	305	37	102
SP8DR	“	55,250	196	48	122
OH3KQ	“	48,900	195	40	123
E77XL	“	46,810	222	36	119
M6KCI	“	46,472	266	35	113
I3MDU	“	40,755	198	33	110
IK3BVD	“	40,448	208	32	96
9A4OP	“	39,837	209	40	107
VE2ZL	“	39,298	185	34	64
N7JI	“	35,805	152	47	46
PY2PLL	“	32,072	180	23	53
SP5LCT	“	28,908	180	27	105
EA2AFV	“	25,351	172	30	71
LZ3AW	“	24,528	152	29	83
M7BCE	“	23,064	150	26	67
NF2L	“	22,892	94	34	63
PA7N	“	22,557	195	22	81
N3CI	“	19,926	95	23	59
EA3TJ	“	19,570	135	26	69
R4FJ	“	17,649	97	37	74
G8AFN	“	17,574	118	29	72
DJ3HW	“	16,650	104	23	52
EI3CTB	“	16,600	149	22	78
M0KWK	“	14,355	125	23	76
BH7JFR	“	14,025	113	28	47
SP3PDO	“	13,770	114	27	75
					(OP: SP3TYJ)
M7ELC	“	12,103	99	30	61
KB4FUW	“	11,826	75	31	50
MM0INH	“	11,760	110	22	62
DG3T	“	11,322	76	22	52
					(OP: DF5RF)
9M2SPN	“	11,270	104	20	29
DX4EVM	“	10,720	124	16	24
					(OP: DV4ZAR)
WC7S	“	10,296	65	28	38
IU3MBY/3	“	9,975	106	26	69
N8XA	*“*	*9,600*	*64*	*19*	*41*
DL6MDG	“	9,417	89	24	49
M7DAD	“	9,324	104	20	54
K7FR	“	9,316	70	31	37
YB0OHG	“	8,208	63	19	38
EA4U	“	8,040	68	21	46
W1IG	“	7,923	50	21	36
M7GGY	“	7,392	73	25	52
KD2RZW	“	7,375	48	19	40
JG6XYS	“	7,228	67	21	31
IN3JRZ	“	6,993	101	14	49
JE3AKU	“	6,783	73	22	29
IZ0ZFK	“	6,723	75	24	57
KD2MU	“	6,612	55	21	37
CE3RIF	“	6,579	83	22	29
UA3OQ	*“*	*5,963*	*83*	*17*	*50*
SP9UA	“	5,917	76	17	44
M6IGE	“	5,640	80	17	43
M6YIK	“	5,376	86	14	42
N3WS	“	3,800	45	21	29
YB1TIA	“	3,600	37	16	24
VU3YDA	“	3,536	41	22	30
DF7XR	“	3,381	45	16	33
IK1BBC	“	3,162	54	16	35
DL5QS	“	3,105	39	17	28
DF9HC	“	3,015	45	17	28
PA0ZAV	“	2,808	54	12	40
OE6NOA/P	*“*	*2,805*	*35*	*16*	*17*
YB1BBW	“	2,479	37	16	21
IK3XTY	“	2,091	38	17	24
PY2BND	“	1,870	44	15	19
M0YJB	“	1,776	36	12	25
PY2MQ	“	1,767	59	13	18
SM/OZ4PAT	*“*	*1,598*	*45*	*10*	*24*
AF9J	“	1,530	24	13	17
BG2JET	“	1,488	34	13	18
SQ5SAA	“	1,440	32	11	19
3W9A	“	1,440	39	15	21
					(OP: HS1JQP)
CE3PCG	“	1,400	28	17	18
					(OP: CE3BC)
UW5EJB	“	1,380	26	9	21
SQ8P	“	1,050	29	12	23
DC7UP	“	1,044	30	10	26
JE0CBS/1	“	1,035	18	11	12
ZL2MLQ	“	980	26	15	20
VK4OTZ	“	896	21	14	14
N0LMQ	“	840	18	10	10
KI0G	“	825	22	12	13
HB9HGW	“	798	18	10	11
IU1MVZ	“	792	18	10	14
K9XB	“	754	17	11	15
LY5G	“	704	20	12	20
VK8D/P	“	589	16	8	11
HK4KM	“	500	13	8	12
YB3BAR	“	448	14	7	7
KB3SQV	“	425	12	6	11
IU2DXF	“	416	12	8	8
N6HI	“	400	9	7	9
9A/OE9IHR	“	380	14	8	12
DL7PY	“	306	18	5	13
VU2MIB	“	272	11	7	10
S58ROK	*“*	*260*	*22*	*5*	*15*
JJ0SFV	“	221	12	6	7
IW5CWC	“	132	7	5	6
EA4HSY	“	99	8	4	7
OE7KNK/P	“	98	9	6	8
BG5VAR	“	70	15	5	5
KI5MFF	“	69	15	10	13
PY1XR	“	60	4	3	3
DB7YI	“	30	3	3	3
TI2YO	28	96,995	457	24	71
IZ4AIF	“	75,114	287	31	86
ZY6G	“	66,935	504	15	40
					(OP: PY6GOE)
K1WHS	“	51,624	252	16	56
IZ1ANK	“	46,221	221	25	68
F2CT	“	39,767	187	22	69
KE0WPA	“	35,646	173	23	55
PY2VQ	“	33,165	183	16	51
JA2MWV	“	23,572	139	23	48
SQ8MFB	“	22,752	175	22	50
4X6DK	“	22,400	125	19	51
LV4V	“	20,916	151	15	48
					(OP: LU4VZ)
LU7VCH	*“*	*19,654*	*122*	*18*	*44*
YB1UUN	“	19,344	117	19	43
EB3EPR	“	16,762	100	20	38
DK5FF	“	15,080	120	18	40
JA4XHF/3	“	14,514	101	21	38
SN5Z	“	7,176	94	12	34
F8AKC	“	6,724	62	16	25
WB3GBL	“	6,624	64	12	36
YG3FAP	“	6,566	58	20	29
YO5OHY	“	6,468	67	15	29
SN5R	“	6,292	50	18	34
					(OP: SP5XMU)
PU5ALE	“	5,328	69	12	25
F6FTB	“	4,860	57	12	18
W8IQ	“	4,590	41	15	30
IT9NAN	“	4,160	72	10	30
IT9IRV	“	3,256	40	13	24
DL5EC	“	3,224	50	9	17
US5VX	“	2,886	34	15	22
EA3FHP	“	2,686	39	12	22
EA2GM	“	2,584	50	10	24
PR1D	“	2,380	47	8	20
					(OP: PY1PTS)
PY2UGO	*“*	*2,068*	*56*	*8*	*14*
K0VK	“	1,848	32	12	16
W4RLS	“	1,035	19	8	15
PU3VRW	“	969	35	6	13
JL1KLK	“	846	25	7	11
KA7T	“	704	17	11	11
IW2ODC	“	703	23	9	10
DV9IGT	“	672	18	6	8
CE3ERM	“	540	22	7	8
BG3LTM	“	504	36	6	12
PP1JE	“	390	27	5	8
JA1GZK	“	250	11	5	5
YO8DHD	“	209	7	5	6
JA5NSR	“	154	6	5	6
G4SGI	“	84	9	2	2
F4IVY/P	“	65	5	2	3
VK3KRL	“	60	6	2	3
4F9AM	“	32	4	2	2
DM5QZ	“	6	1	1	1
EY8BA	21	119,082	498	20	69
JR4DAH	“	83,040	338	28	68
F8AKS	“	78,987	323	28	85
TA2IB	“	58,800	264	17	67
ND0C	“	47,229	188	24	67
SY1AEA	“	42,588	364	21	70
JQ1NGT	“	34,992	196	25	47
LZ2RS	“	34,278	234	20	67
JR1NKN	“	23,374	168	20	38
YC4SIZ	“	18,880	119	18	41
HF5WIM	“	12,600	120	15	48
EA2BO	“	10,384	119	13	46
JR2EKD	“	9,588	78	14	33
JI1NZA/1	“	8,880	94	15	25
SP4NKJ	“	8,085	101	15	40
M6W	“	7,399	98	11	38
					(OP: G3WW)
IW2NRI	“	5,920	74	9	31
IW1BCO	“	5,852	75	11	33
JA1KPF	“	5,280	56	17	23
UT0NB	“	4,608	62	13	35
PY2CER	“	1,749	26	13	20
7L1DST	“	1,728	30	10	14
JK1NWD	“	1,430	29	12	14
JI6NFX	“	1,254	34	10	12
R7RBE	“	638	15	8	14
YU4BMX	“	468	20	5	13
JI1AEP	“	435	11	6	9
BI4SQM	“	240	16	5	5
BI1JNP	“	176	16	6	5
YU1NR	14	63,546	396	30	89
G2X	“	42,201	374	19	62
					(OP: G0DCK)
RT4W	“	30,644	238	21	73
YO8RC	“	23,625	230	15	60
LA7WRA	“	20,631	243	13	56
SP9NSA	“	15,844	159	15	53
IZ8EWD	“	15,123	148	14	57
YO4BEX	“	13,860	179	12	54
W2VRK	“	12,393	91	13	38
ON4MGY/P	“	8,268	124	9	44
MM0XDG	“	4,469	97	8	33
M0JBA	“	3,492	113	6	30
PY2MAM	“	3,200	51	10	22
E77MA	“	2,788	82	6	28
SP7K	“	2,622	72	7	31
EA7JTP	“	1,653	50	6	23
IW2EPE	“	1,485	50	5	28
GW0VSW	*“*	*1,457*	*47*	*6*	*25*
OE3VET	“	1,150	42	5	20
SQ1NXO	“	1,144	38	6	20
SN5L	“	777	37	6	15
M3TZX	“	775	31	5	20
BA7LFI	“	585	16	7	8
IK5RUN	“	480	12	8	12
E77BW	“	288	18	5	13
K4CUZ	“	230	9	3	7
Z33ST/P	“	126	15	4	10
VU3ICW	“	126	6	4	5
IU1QEA	“	100	8	4	6
ON2EE	“	96	10	3	9
K1NLL	“	80	12	5	5
9M2RAD	“	36	3	2	2
BG3RRJ	*“*	*18*	*5*	*3*	*3*
IZ4VQS	7	23,858	236	15	64
OK6OK	“	18,496	251	13	55
HA3GC	“	9,760	139	10	51
LY2NK	“	9,750	182	7	43
SV1DZB	“	6,765	126	10	45
G4Y	“	3,772	87	11	35
					(OP: M6OXO)
GM4M	“	3,696	124	4	29
					(OP: GM4UBJ)
HG7J	“	2,925	66	7	32
E78CB	“	2,730	63	6	33
YD8SPY	*“*	*2,349*	*37*	*11*	*16*
IS0AGY	“	2,255	95	8	33
SQ9DEO	“	2,100	56	7	28
9A2EY	“	1,860	59	5	25
UT5UUV	“	1,792	56	5	23
YD2UFR	“	1,725	53	9	14
SP7PSD	“	1,560	51	5	25
WU2M	“	1,333	26	11	20
SP3JUN	“	1,260	46	5	23
YD6ROA	“	960	22	9	11
BH4FBB	“	527	17	8	9
ON4ANE	“	504	31	3	15
YC0BAS	“	406	12	6	8
IZ3NVR	“	266	22	2	12
BH4TQX	“	260	26	5	5
DG2FDD	“	216	20	2	10
EA8DIG	“	210	7	3	7
PD0RZH	“	112	17	2	6
2E0TKO	“	81	9	2	7
WA2NYY	“	60	4	3	3
OL4W	3.7	8,159	202	5	36
					(OP: OK1IF)
PA0AWH	“	1,972	72	4	25
SN0E	*“*	*400*	*29*	*4*	*16*
					(OP: SO8OO)
JH1APZ	*“*	*65*	*5*	*3*	*2*
ES6KW	“	42	4	3	4
UB4IIQ/UA6L		“	2	1	1
1					
UN9LDC	1.8	3,354	43	5	21
HA1TI	“	3,232	107	4	28
LY4T	“	2,880	90	4	28
DL1AOB	“	1,568	61	3	25
UT4UBZ	“	108	10	4	8

QRP ASSISTED

NORTH AMERICA

United States

District 1

KO1H	28A	21,294	133	15	48

District 4

K2PI	AA	19,448	80	24	64

District 5

NO5V	AA	8,576	57	21	43
AC5O	28A	85,902	342	26	77

District 7

N6MZ	28A	13,456	89	19	39

District 3

VE3BFU	7A	266	26	4	3

District 7

VA7IR	3.7A	50	13	2	3

ASIA

Asiatic Turkey

TA9J	AA	92,416	228	36	116

China

BH7QP	AA	1,053	18	13	14
BA4WI	21A	11,628	132	18	39

Israel

4Z4UO	28A	4,154	63	6	25
4X5WZ	“	24	2	2	2

Japan

District 1

JK1TCV	AA	55,510	169	46	76
JM1NKT	21A	59,040	250	27	63

District 2

JM2RUV	14A	80	4	4	4

District 3

JF3KQA	14A	1,276	26	10	12
JH3DMQ	7A	714	17	9	8

District 6

8J6YAB	28A	19,987	130	22	57
					(OP: JA6VZB)
JA6GCE	21A	127,050	423	32	89

District 8

JK8VPQ	28A	7,566	76	15	24

West Malaysia

9M2CDX	7A	48	9	1	3

EUROPE

Austria

OE3MDB	7A	3,588	76	7	32

Belgium

OQ4B	28A	17,818	111	20	39
					(OP: ON4BHQ)

Bosnia-Herzegovina

E70AA	*28A*	*8,046*	*76*	*15*	*39*
E73AA	21A	34,020	275	17	64

Bulgaria

LZ2AF	AA	1,377	25	10	17

Croatia

9A/					
IZ3NVR	1.8A	2,904	93	4	29
9A4QV	“	576	34	3	15

Czech Republic

OK2FD	AA	225,990	373	70	200
OK1DMP	“	22,272	87	41	87
OK8CX/P	“	9,951	88	27	66

Denmark

OZ6OM	21A	11,036	88	16	46

England

G4ABX	AA	8,208	78	19	35
G1G	21A	15,180	171	14	46
					(OP: G4KIV)

Fed. Rep. of Germany

DO8AB	21A	16	2	2	2

France

F4GWM	AA	47,080	254	29	78

Greece

SV1NK	21A	33,396	244	22	70

Hungary

HG5O	AA	138,831	412	59	172
					(OP: HA5OB)

Italy

IZ5CMI	28A	5,070	48	14	25
IZ2QKG	14A	5,040	102	7	38
IO5K	3.7A	12,210	213	8	47
					(OP: IK5TBK)

Lithuania

LY2OU	21A	46,420	243	24	86

Luxembourg

LX3AA	28A	22,750	160	18	47

Netherlands

PE2K	AA	53,298	337	37	104

Northern Ireland

MI1M	14A	31,540	232	19	64
			(OP: MIØLLG)		

Norway

LC5L	AA	6,206	77	18	40
			(OP: LB4FH)		

Poland

HF9CW	AA	136,344	459	53	175
SQ5CW	"	129,024	473	54	170
SP9RQH	"	69,600	217	51	123
SP7M	28A	4,329	47	14	25
SP5PDA	14A	18,673	215	14	57
SP5FKW	3.7A	13,167	276	9	48
SP5ES	"	11,820	190	9	51
SQ9SX	"	99	9	3	8

Serbia

YU1LM	AA	103,601	371	47	164
YT1BD	14A	5,838	51	16	26

Sicily

IT9RBW	AA	22,401	114	30	101
IW9FRA	28A	3,920	48	14	21
IT9RJE	21A	64,920	290	29	91

Slovak Republic

OMØRX	21A	97,104	410	28	91
OM6AS	14A	35	5	2	5

Slovenia

S59GS	28A	8,957	81	15	38
S54ZZ	1.8A	18,872	350	8	48

Spain

EF3O	28A	48,222	196	23	71
			(OP: EA3O)		
EA5S	3.7A	10,123	186	8	45

Wales

GW5P	7A	560	28	4	16
			(OP: GWØEGH)		

OCEANIA

Hawaii

NH6O	AA	4,940	51	25	27

Indonesia

YB2NDX	AA	48,768	168	48	79
YE3DGO	"	14,553	100	20	43
YBØSSF	21A	86,204	373	28	64
YC1LJT	"	5,328	60	14	22
YC2CLH	"	2,688	54	14	18
YC8IKU	"	2,142	33	12	22
YB1DGG	"	1,140	27	9	11
YC8FKN	"	972	38	10	17
YC8CGK	"	969	27	8	9
YD8FLF	7A	1,102	29	8	11
YF7RDM	"	864	20	7	11

Philippines

DU7RH	28A	392	21	4	4

SOUTH AMERICA

Argentina

LW9HZI	28A	4,046	64	15	19

Brazil

PY9DM	28A	28,764	185	18	50
PY2MDF	"	13,167	87	18	45
PY1CMT	"	648	34	5	7
PP1ZZ	14A	7,350	74	14	36

Chile

CE4WT	AA	4,930	54	28	30
3G3O	28A	308	18	6	5
			(OP: XQ3OP)		

MULTI-OPERATOR SINGLE-TRANSMITTER

NORTH AMERICA

United States

District 1

W1TJL	2,221,032	1509	122	415
AI4MD	1,218,516	1025	101	337
NC1CC	1,174,832	1072	94	310
N1KT	141,372	306	58	140
NM1B	119,504	240	55	139
*WW4LL	3,342,634	2118	125	446
*W1QK	1,168,790	1035	92	321
*W1OP	283,884	483	59	187
*W1JSR	160,590	307	52	150

District 2

W2IRT	2,067,450	1407	118	407
*K1RQ	12,144	66	34	54

District 3

K9RS	7,117,835	3955	151	534
K3AJ	2,409,097	1737	119	390
KC3NNO	540,355	590	83	252
NS3L	323,424	421	73	215
K3OQ	215,694	379	44	163
N3SVB	15,288	70	20	64
*W3ZGD	958,500	847	105	321

District 4

K4RM	3,704,810	2211	146	483
N4UU	3,093,960	2257	130	440
NJ4P	2,591,512	1617	147	469
N4SS	2,565,640	1732	126	413
AD4ES	1,630,120	1222	119	372
W4MLB	1,333,238	1265	111	347
*WA1F	1,020,992	988	90	281
*KT4XA	455,975	549	85	220
*AA2MF	281,162	354	62	240
*AD4XT	114,264	273	53	131
*KM4WPR	19,292	93	38	68

District 5

*W5WX	6,840	67	28	44
*KI5UMW	1,984	28	13	19
*W3XO	1,595	21	11	18

District 6

NX6T	1,482,264	1771	118	228
W6TK	665,280	757	102	218
N6VOH	160,244	348	91	145
NN6P	130,500	325	63	87
ADØBO	*3,920*	*53*	*26*	*30*

District 7

W7RM	3,960,408	2670	157	407
NA2U	3,257,604	2554	146	412
WM7A	865,251	927	113	268
W7VJ	646,000	717	100	240
W7YED	24,598	102	38	60
AB7HP	984	20	11	13
*N6JRL	19,800	123	46	64

District 8

K8AZ	4,458,135	2445	151	508
*KA8YNW	166,192	306	63	158
*W8AJT	72,800	170	54	128
*N8YXR	30,969	113	38	73

District 9

K9YY	1,979,964	1505	125	361

District Ø

WØMI	16,200	77	35	46
*KEØOR	63,574	182	38	95
*ADØFJ	3,311	30	19	24

Canada

District 1

VO1GRC	319,318	1065	45	113

District 2

VE2PIB	954,487	1265	81	236

District 3

VE3EJ	11,834,130	6049	173	597
VC3U	4,057,184	2800	139	469
*VE3LON	32,660	123	37	78

District 6

VE6SV	3,025,599	3481	119	300

District 7

VE7SAR	609,000	973	90	190

El Salvador

*YS1YS	762,736	1499	68	179

Mexico

4A7R	43,240	481	19	27

Puerto Rico

KP4AA	9,535,011	6621	140	489
KP4US	340,326	581	68	191

St. Kitts & Nevis

V48DM	304,029	1197	26	85

St. Lucia

*J68HZ	7,195,568	6253	128	396

St. Martin

TO5M	8,227,119	6453	130	433

Turks & Caicos Islands

*VP5DX	4,417,865	4043	112	373

AFRICA

Reunion Island

FR4KR	3,872,730	4150	76	258

ASIA

Asiatic Russia

District 9

*RL9M	6,875	60	14	41
*RM8Y	782	14	9	14
*UB8O	84	4	3	4

Asiatic Turkey

TC3X	5,464,836	4178	102	366
*TC7G	2,722,296	2676	78	294
*TC7TR	1,283,040	1598	53	235
*TC3EC	71,276	256	23	80
*YM3KZ	4,704	91	8	34

China

B7C	3,285,696	3158	111	325
B1Z	2,586,682	2619	134	377
BD4UNT	1,832,658	2463	103	251
B4T	1,688,094	1989	106	281
BA7MT	383,469	1082	67	152
BG5BWZ	337,212	713	70	158
BH2RO	183,350	569	62	128
BA3RA	45,123	252	24	65
*BY4DX	530,376	1103	85	179
*BI8AM	492,894	766	74	204
*BY6DX	285,440	519	77	179
*BD7LMB	171,770	492	59	119
*BY1TL	1,488	59	15	16

Cyprus

P33W	24,948,370	10103	178	700

Hong Kong

*VR2YIM	51,409	299	37	64
*VR2UNG	6,363	123	25	38

Japan

District 1

JQ1YUF	1,341,764	1473	105	251
*JA1YAD	22,785	115	39	54

District 2

JI2ZJS	3,394,593	2433	149	380
*JA2YKA	348	11	5	7

District 3

JL3ZHU	261,000	487	77	148

District 4

*JA4YPE	9,729	67	26	43

District 5

*JA5FDJ	1,465,354	1197	137	336

District 7

JA7ZFN	5,358,936	3076	171	465

Saudi Arabia

*HZ1BW	4,339,212	3565	101	343

Taiwan

*BV2A	242,144	740	58	126

Thailand

*HS2UPR	135,124	339	56	110
*E21AK	37,976	192	34	67
*E27AH	3,139	43	18	25

United Arab Emirates

A61QQ	4,089,730	3471	96	334

West Malaysia

9M2U	179,952	545	50	113

EUROPE

Aland Islands

OHØZ	510,017	777	84	239

Austria

OE5XRL	576,910	1316	75	235
OE4C	541,280	1700	64	208
OE1XTU	235,683	475	70	231
OE1XA	*43,068*	*271*	*39*	*109*
*OE5XPM/P	14,112	97	33	63

Azores

CQ8M	6,814,720	5590	126	479

Belarus

EW5A	13,254,210	7707	178	696
*EW8ZO	69,745	304	41	144

Belgium

OT7J	71,712	765	16	67

Bosnia-Herzegovina

E7DX	15,649,472	8429	179	699
*E7GZ	1,014,930	1092	122	415
E74BYZ	*8,084*	*173*	*8*	*39*

Bulgaria

LZ5R	13,684,872	8264	179	677
LZ7A	1,222,446	1907	105	369
LZ2KTS	25,252	117	41	77

Corsica

*TK5KT	666,027	1186	82	305

Croatia

9A5Y	10,045,200	6072	172	653
9A9D	72,618	302	38	109
*9A9J	1,608,275	1578	128	447
*9A1CRT	899,200	1698	85	315
*9AØKG	132,096	434	68	188

Czech Republic

OK5Z	8,852,112	5283	176	661
OL7T	1,767,031	2063	118	409
OK2KOJ	872,175	1192	101	334
*OL1Z	1,529,280	1706	120	420
*OL8ØWPN	298,809	858	61	218

England

G7C	4,916,864	3718	151	567
G4ANT	4,122,880	3054	141	499
G5O	2,004,944	2147	95	369
G3B	1,586,144	1434	115	396
G4R	1,356,750	1780	86	316
G6AD	1,196,744	1455	103	351
MØREG	324,532	673	71	245
*M4Y	1,426,062	1788	106	421
*MØYRC	79,055	362	40	123

Estonia

ES2B	102,295	242	64	141
*ES7A	1,996,150	2157	134	516

European Russia

District 1

RU1A	10,015,776	6439	177	661

European Russia

*R5AN	100,035	319	52	143
*RZ3DZI	13,311	110	23	64

District 4

RT4G	3,773,172	3679	155	567
*RZ4NWB	3,233	41	15	38

European Turkey

*YM1XEA	33,938	258	31	111

Fed. Rep. of Germany

DRØW	8,888,808	5194	170	638
DP7D	6,778,390	4310	163	592
DP9A	4,390,779	3019	155	568
DP7R	1,596,784	1795	123	415
DL2W	1,132,098	1191	131	430
DP4G	569,916	1030	72	252
DD4A	560,448	1374	35	133
DLØHMK	542,208	1015	84	300
DKØTU	494,550	1117	78	237
DR2P	312,650	618	72	253
DP7P	33,880	168	35	86
*DLØAJ	832,041	1033	101	322
*DC6K	695,296	920	90	298
*DL1D	603,165	893	97	298
*DG4O	299,806	688	76	262
*DMØE	71,115	265	48	117
*DN2TL	4,582	59	19	39

Finland

OH5Z	4,303,291	3450	167	606

France

TM6M	14,895,924	7844	178	649
F8KCF	3,501,641	3043	141	470
F6KRK	2,620,360	2548	118	427
TM2RJ	1,569,960	1977	114	327
TM1Q	1,128,810	1931	87	295
TM1D	896,586	955	104	334
F6KJS	823,137	1322	95	304
F6KFV	683,730	978	91	335
F4KLW	*524,388*	*763*	*90*	*266*
F8KHN	504,450	1007	79	263
F5KSE	477,242	825	84	277
F4KJN	476,190	682	96	237
TM8R	316,799	807	68	203
TMØR	73,696	630	22	72
*F6KPW	310,959	728	67	230
*F4IZG	186,018	535	61	197
*F4KMI	179,765	464	57	172
*F4KIY	147,175	311	64	139
F6KMB	*60,984*	*267*	*41*	*127*

Greece

SZ1A	3,916,690	3693	154	564
J42I	3,886,344	4016	134	482
SZ7SER	333,879	1013	62	211

Hungary

HG6N	7,426,440	5083	157	578
HG5A	7,344,029	5053	157	594
HA3DX	3,808,432	3429	143	489
HG5P	*29,213*	*190*	*38*	*93*

Italy

IR4X	15,237,992	7577	178	675
IR4M	11,621,455	6602	176	623
IR6T	11,524,994	6151	172	634
II8K	7,365,920	4988	162	598
IR7T	6,252,345	4483	157	586
IB1D	5,242,203	3379	156	555
IR2L	4,196,980	3373	149	543
IV3WMS	2,259,096	1821	131	457
IQ2MI	2,140,625	2054	141	484
IQ1RF	1,872,052	2549	118	438
IR7R	1,529,580	1825	115	415
IQ8BB	1,190,115	1839	117	382
IQ4CT	*617,638*	*1251*	*71*	*243*
IR3P	531,763	1008	93	296
IU7GQZ	429,951	712	89	272
IQ3CO	314,825	618	71	186
IR2C	204,851	629	40	87
IQ2XI	162,708	320	71	227
IQ5LV	121,142	379	60	178
IQ3TN	69,700	367	38	132
*IO3F	3,311,885	2741	154	559
*IQ2DN	759,750	940	95	280
*IQØTE	60,536	273	46	115
*IWØEYT	43,754	176	38	93

Latvia

YL1ZX	835,212	1295	104	385
*YL1ZS	8,960	110	20	60

Liechtenstein

HBØA	1,712,142	2039	91	347

Luxembourg

*LX8M	3,399,088	3241	134	489

Netherlands

PA6AA	1,340,394	1444	109	397
PI4RS	594,863	1249	84	275
PC2L	404,140	939	54	166
PI4MM	170,595	555	60	195
*PI4KAR	856,000	1085	98	330
*PA6DX	481,320	1266	59	193

North Macedonia

Z35T	4,063,962	3703	132	469

Northern Ireland

*MNØVFW	73,080	364	38	130

Norway

LA1ØØB	1,013,842	1546	91	358
LN2G	301,020	739	62	228

Poland

SP8R	10,226,502	5960	174	648
SO7E	1,885,930	2318	111	404
*3Z1K	1,361,118	1836	119	384
*SN6E	327,316	627	79	267
*SP9YGD	319,716	690	69	263
*SN9H	254,617	640	61	232
*SP6ZHP	50,978	230	34	108
*SP9PBB	5,940	88	10	50
SP4KVA	*1,558*	*45*	*13*	*28*

Portugal

*CR5L	1,508,350	1472	113	372
*CR5K	189,750	474	60	193
*CS4AT	2,478	36	16	26

Romania

*YP1EX	490,364	1125	70	262
*YO4KAK	39,576	195	35	101

Sardinia

ISØANU	1,758,184	2283	117	421
IQØID	1,640,935	2518	96	341
ISØBWM	1,128,809	1364	122	369

Scotland

MM2N	4,513,916	3967	132	461
GM5G	1,107,160	1744	74	282
*GM4AGG	22,236	129	31	71

Serbia

YU5R	631,116	1078	85	288
YU1AFV	83,864	915	20	68
*YTØB	43,648	257	27	97
*YU7GMN	4,050	138	21	54

Sicily

II9P	7,345,620	5227	159	573
IO9A	5,659,192	4974	137	479

Slovak Republic

OM7M	10,997,343	6361	172	665
*OM6H	301,940	599	75	235

Slovenia

S58Y	2,404,299	2273	126	375
S58W	1,104,964	1207	124	408
S54K	611,220	1386	75	259
*S54I	274,066	959	51	203

Spain

EE7P	5,341,960	4842	115	405
EE1G	947,169	994	125	426
EF3R	244,856	790	62	192
ED5A	224,400	515	74	201
ED2W	51,408	231	34	85
*ED7O	5,900,622	4531	152	555
*ED1B	3,475,200	2960	135	505
*ED3D	924,288	1327	92	292
*EA5RCG	725,641	1229	89	324
*EA3MR	468,430	976	79	258
*ED1W	439,488	920	87	249
*EA5WZ	276,080	482	84	256

Sweden

SJ2W	7,246,272	5265	164	588
SJØX	966,228	1642	103	335
SK6DG	886,812	1634	90	312
SK6AW	284,310	870	49	185
SK6EI	214,122	588	55	199
SE3Y	53,380	197	48	109
*SK6AB	30,562	199	30	88

Switzerland

HB9ZZ	90,404	230	52	142
*HB2C	97,278	403	38	148

OCEANIA

Australia

VK2M	699,980	863	96	214
VL4A	538,740	1061	75	144
VK4KSS	11,704	105	23	33

Cocos (Keeling) Islands

VK9C	104,663	503	20	63

East Malaysia

*9M4CRP	8,055	113	19	26
*9M4CKT	2,625	41	17	18

Guam

AH2R	6,584,220	4458	146	388

Hawaii

NH6JC	779,207	1919	58	85

Indonesia

7D1C	1,852,548	2139	83	234
7AØD	178,200	392	66	150
7AØB	2,700	69	11	16
*7AØA	300,906	603	69	160
*7E1A	35,258	139	37	85
*7E1T	32,960	159	42	61
*7A5K	15,600	101	21	39
*7B1K	1,776	25	17	20

New Zealand

*ZL3AC	4,472	57	22	30

Philippines

*DX3A	109,032	674	28	38
*DX9EVM	65,892	530	30	46
*DX7HQ	24,387	321	15	18
*DX2EVM	23,408	157	32	44

SOUTH AMERICA

Argentina

LP1H	10,619,928	6130	153	483
LS2D	4,428,813	3669	117	354
LO7H	4,097,771	3692	117	292
L74V	1,314,950	2040	84	154
LU3DK	945,126	1946	51	131
LT5D	732,942	1148	85	192
AY1V	616,759	1338	66	143
LU3DNT	181,584	703	24	73
*LU2UF	185,704	546	56	83
*LU2HHH	147,862	473	45	76

Bonaire

PJ4G	19,282,256	8999	168	581

Brazil

PT4A	6,330,444	4367	122	402
PQ5B	4,331,516	3598	110	342
PY2NA	1,657,465	1618	94	271
PR2RP	603,351	1176	55	128
ZY2A	25,088	158	18	46
*PY2RH	493,619	1172	48	103
*PY2MIG	465	22	8	7

Chile

CB3W	2,981,394	2816	116	295
CB1C	2,186,340	2159	114	276

French Guiana

*FY5KE	13,951,476	6926	152	541

Paraguay

ZP5AA	3,321,864	3308	98	266
*ZP6RAI	615,846	1116	65	152

Uruguay

CX5A	2,436,880	2763	95	272

MULTI-OPERATOR TWO-TRANSMITTER

UNITED STATES

W3LPL	16,260,048	7614	171	627
K1CC	10,751,922	5195	162	576
K9CT	8,219,670	4765	167	543
K2AX	6,387,920	3776	139	477
W2MKM	6,047,919	3578	138	483
KM8Q	4,197,402	2610	151	487
AA4VT	3,844,200	2475	139	461
KQ3F	*3,346,926*	*2147*	*131*	*430*
W4NF	3,150,264	2117	126	426
K8LX	2,220,568	1551	129	403
W2EN	1,980,090	1509	111	379
KT7E	1,831,648	2257	125	291
W8BI	1,170,240	1068	114	346
W1FM	1,099,406	964	92	321
WA8MCD	935,730	980	99	271
WC8VOA	853,550	873	103	294
NRØT	682,970	808	90	236
W1SRG	494,560	646	63	218
K4GSO	341,530	431	77	210
K4GIG	46,800	175	40	77

NORTH AMERICA

ZF1A	24,295,992	14766	160	564
VA2UR	8,744,256	6067	138	474
VE9FM	536,760	742	59	221
HP1XT	332,677	523	79	198
VY2OM	*270,675*	*490*	*57*	*168*
WP3E	137,059	378	51	118
VE3VM	69,310	196	41	104

AFRICA

EA8RM	38,749,256	15442	178	690
S79VU	329,058	613	63	139

ASIA

4X7R	13,881,375	7185	140	535
E2A	10,417,873	6523	158	509
JA7YRR	3,960,236	3163	140	329
9M2A	1,459,350	1956	90	255
JA6ZPR	1,356,588	1723	87	231
BY1AS	1,047,266	1495	94	268
BD4RWR	922,320	1878	75	177
E2E	874,725	1408	85	236
YM3VBR	654,522	1189	47	164
VU3SPD	277,109	501	53	164
TC3A	168,320	432	45	115
BVØTY	62,274	474	42	65
JA6YBR	20,900	101	39	56

EUROPE

CR6K	19,736,855	11637	174	641
EI7M	18,787,860	11161	175	631
ES9UKR	16,250,324	10585	182	717
9A1P	15,959,447	9686	179	654
ED1R	15,804,510	9861	171	626
II2S	15,133,842	8712	174	648
9A7A	14,630,778	8637	174	648
TM7A	13,665,560	8328	168	592
HG7T	*11,618,000*	*7916*	*169*	*616*
PI4COM	10,933,312	6854	165	608
UA4M	9,517,775	7580	169	606
CR6P	8,291,052	6817	127	467
UW5Y	7,766,664	6191	146	550
DP6T	7,611,910	5145	159	596
OR2M	7,211,372	4574	159	590
IQ4FA	6,922,230	4949	154	560
EI9E	6,772,761	5223	137	502
DP6A	6,642,400	4832	162	598
SX9V	6,265,332	6110	154	557
SO4R	5,950,830	5388	145	532
DAØT	5,940,912	4625	153	579
CR5T	5,810,375	5072	130	445
IR3Z	4,844,456	3617	161	555
GM2T	4,670,784	4057	138	510
M4A	4,402,200	3643	134	504
DAØRR	3,555,409	3120	137	474
IO7T	3,317,137	3112	131	456
IO9R	3,163,104	4331	119	404
OM5M	3,062,728	2932	134	488
C37N	3,007,248	3302	107	409
PI4M	2,948,470	3038	125	452
OZ5W	2,703,204	2789	139	473
OE5T	2,521,440	2338	118	392
SZ3P	2,232,292	3824	104	354
OQ4Q	1,771,684	1739	123	425
PAØAA	1,448,568	1734	111	420
LA4C	1,104,813	1688	93	366
ED2R	1,078,245	1920	94	347
HG5KID	327,600	766	68	184
M3P	278,850	649	65	221
LA1K	254,421	1037	49	194
LN1K	185,166	1154	31	131
EA4RCH	15,106	144	27	56
SM6XUZ	1,050	35	7	23

OCEANIA

VJ4K	9,331,920	6548	149	371
KH6J	6,655,584	5692	133	283
P29RO	6,142,680	5098	123	330
7A1A	1,543,969	1686	99	268
7AØC	698,763	992	89	210
VK4DH	510,900	626	101	224
7C8C	88,163	383	51	80
7E3E	13,833	102	24	29

SOUTH AMERICA

P4ØL	24,628,032	12135	162	542
PX2A	17,619,751	9789	149	498
PP4T	9,509,292	6711	120	387
CE3CT	7,397,297	5365	132	377
LU9WE	257,730	745	65	148

MULTI-OPERATOR MULTI-TRANSMITTER

UNITED STATES

K3LR	25,835,784	11935	184	700
K1LZ	21,461,871	9743	182	667
WX3B	11,870,899	7000	147	514
K1TTT	11,127,144	6222	161	588
W3PP	6,004,999	3451	147	490
K1KI	5,509,664	3016	147	521
K3EST	5,432,178	4234	154	425
W2A	3,848,526	2383	136	458
K1KP	3,700,234	2504	124	418
NE3F	2,836,592	1882	130	438
W3MF	2,761,542	1770	129	429
WT3K	2,586,612	1669	135	453
W2NPT	237,805	404	60	179
K5LRW	80,852	206	66	98

NORTH AMERICA

V26B	20,092,748	12429	157	519
KL7RA	9,489,835	7792	141	382
VE5PV	1,665,906	3283	79	179
VE6AO	189,572	1183	39	44

AFRICA

D4Z	50,007,304	19262	188	704
CN3A	47,413,520	18558	182	713

ASIA

A44A	13,212,196	7418	146	516
JT5DX	8,345,944	6218	138	446
JA3YBK	8,025,864	5171	162	440
B7P	7,289,749	5603	154	439
JA6YLP	122,793	333	62	121
BI1JY	98	12	7	7

EUROPE

M6T	21,693,672	12942	180	702
LZ9W	19,672,752	12698	183	705
YT5A	19,599,723	12700	183	690
DFØHQ	17,362,332	10981	185	712
OT5A	11,082,512	8610	159	583
F6KOP	9,377,250	7712	160	590
LN8W	8,720,502	6750	164	630
TM1K	8,668,737	5922	157	536
PI4CC	8,092,608	6242	160	586
ES3V	3,096,320	3638	138	518
EE4Y	2,356,925	2557	132	443
MØHFC	2,295,168	3279	110	406
OZ4GM	1,202,016	2052	101	355
LN2T	1,126,913	1985	94	345
G3V	756,448	1149	83	269
PI4D	676,368	1042	92	304
TM8AB	308,700	721	67	227
LY2ZO	274,572	791	55	206
CS5CC	137,616	425	55	189
SP8ZOC	63,126	303	47	142
IQ2VC	42,560	224	39	121

OCEANIA

7A2A	3,760,680	3082	125	337
DX1MK	165,767	659	44	75
7I3I	84,774	282	48	94
VK2W	67,050	215	62	88
7A3C	22,776	155	37	67

SOUTH AMERICA

PJ2T	34,239,262	15729	172	601
HD1A	4,698,446	4110	114	340
ZZ3M	218,326	726	64	109
CB3VS	122,496	388	70	104

EXPLORER SINGLE-OPERATOR

S53K	479,765	815	72	233
9A1DR	87,516	291	50	137
SQ5EXM	16,380	98	27	63
W2MRD	11,304	61	25	47
PY2YAS	7,168	61	21	35

EXPLORER MULTI-OPERATOR

OT7T	9,900,208	7678	159	617
IOØA	4,328,676	3987	142	501
EA4URE	3,519,552	4109	121	431
9H6A	3,297,650	4500	111	394
EE7K	1,961,756	2124	131	435
IB2C	652,320	841	110	343
BY3CQ	*647,280*	*1561*	*79*	*182*
9M8J	231,504	647	66	116
EA6URL	138,533	265	86	195

ROOKIE

NORTH AMERICA

United States

District 1

KFØINO	42,075	193	16	59
KC1OXM	18,091	98	24	55
*KC1RET	65,412	178	33	105
*KC1QEM	56,574	173	34	92
*N1KJS	4,700	48	14	36
*KC1QOD	630	12	8	10
*K1NDU	440	14	7	13
*K1THE	16	2	2	2

District 2

KD2UBH	135,044	252	65	147
KD2ZEL	*143,856*	*492*	*25*	*83*
*N2EPE	102,912	222	61	131
*KD2VSD	92,160	227	43	117
*KI2D	67,781	171	50	111
*KD2WOZ	57,624	160	37	110
*KD2WDN	920	16	9	14

District 3

K3AK	613,410	647	82	263
W3FR	544,600	593	91	259
N3AML	64,800	160	48	114
KC3UEX	41,796	185	28	80
KC3RRF	18,288	123	20	52
*N3BAS	126,528	234	46	146
*KR3L	80,842	194	47	119
*K3THS	55,176	183	41	91
*KC3UDO	39,788	146	33	83
*N3HRO	27,645	115	28	67
*KC3SVR	22,040	96	27	68
*N3BMX	21,335	96	26	59
*KN1OLA	12,250	72	25	45
*WB3JAC	11,748	71	32	57
*KC3TYX	156	7	5	7

District 4

KO4VW	177,310	294	70	168
KO4DJG	7,497	62	16	35
*K1MWH	250,776	437	57	159
*KY4KP	220,834	384	58	160
*K4ZMF	30,866	111	42	80
*KO4IVS	21,408	104	35	61
*N4TLC	8,379	64	26	37
*KO4WPO	5,891	66	10	33
KO4ENU	*3,808*	*83*	*24*	*32*
*K4PQL	3,388	34	14	30
*WE4BE	1,820	24	9	19
*KO4JKV	1,365	23	13	22
*KO4IJH	594	12	10	12
*KO4ZRB	104	8	5	8
*KQ4AEJ	90	7	5	5
*N4RAF	36	4	3	3

District 5

W9DCT	1,093,680	964	113	307
KI5QKL	95,964	288	37	95
*ND7C	18,779	118	33	56
*KI5UTQ	9,438	60	34	44
*KI5IQE	4,680	56	10	30
*KI5LST	3,196	48	21	26
*KC5UXO	1,767	20	12	19
*KI5PED	1,104	19	9	15
*KI5RQG	576	24	12	12
*KI5UPP	345	9	6	9
W5PTX	*209*	*15*	*5*	*6*
*W5LMO	36	7	3	3
*KI5MFF	69	15	10	13

District 6

*KN6ODG	44,838	146	56	85
*N6JSO	33,578	132	48	55
*W6MSN	28,670	128	38	56
*K6WBY	187	7	4	7
K7WXB	141,966	293	65	133
N7RBL	132,258	279	77	124
*KC3OSK	18,480	106	40	40
*W7BKS	10,854	70	38	43
*KK7BWJ	5,148	50	22	22
*KK7FEL	3,510	35	19	26
*K7DNG	3,431	63	24	23
*K7LAP	392	16	14	14
*N7GRC	306	11	7	10
*N7LFO	120	7	7	5

District 8

KE8RCI	*23,968*	*92*	*30*	*77*
*N8ACP	97,913	209	58	121
*KE8NSW	40,610	122	43	88
*W1CHL	14,013	78	32	49
*W8RKW	12,567	97	17	42
KE8MOI	*10,608*	*74*	*24*	*44*

District 9

*N9ATF	41,990	158	46	84
*W9PHL	13,090	67	29	48
*N9NCY	2,000	28	8	17
*W9KMZ	1,863	25	9	18

District Ø

KFØADW	50,410	155	49	93
*AEØDX	550,525	681	84	221
*KFØHCN	126,224	273	61	123
*KFØIDT	123,633	274	63	108
*NØJDK	6,450	55	19	31
*KFØACN	286	8	6	7
*NØLRB	247	23	7	6

Canada

District 2

*VE2HTC	135,590	281	49	133
*VE2KLW	2,697	42	10	19

District 3

VE3GJP	423,522	690	79	200
*VA3OKG	331,420	542	60	167
*VA3OOL	166,690	307	62	149
*VE3KOT	79,092	196	49	107
*VE3JZT	7,839	65	27	40
*VA3PAI	2,030	26	11	18
*VA3IHG	1,875	31	7	18

District 6

*VE6CLG	26,677	115	47	56
*VA6TVA	6,345	67	22	25
*VE6SYD	4,212	34	23	29
*VA6AGR	2,432	33	16	16
*VE6CLE	792	28	12	12

District 7

*VA7CTG	48,762	166	51	75

Costa Rica

*TI3YAM	3,840	33	20	28

Mexico

*XE1O	2,870	28	16	25

Puerto Rico

*WP4TZ	266,178	542	60	158

ASIA

China

BGØDPG	*65,040*	*243*	*31*	*89*
*BI8FRF	63,510	251	55	91
*BG8KVC	44,019	296	19	54
*BI1NJI	20,425	123	37	58
*BD4SVU	15,752	117	37	51
*BG8AMG	12,027	103	16	41
*BI1JOT	7,497	69	23	40
*BH1XEC	5,865	78	30	39
*BH3CGF	5,115	110	26	29
*BI8AO	4,928	62	16	28
*BD4TWZ	3,861	63	16	23
*BD4SVT	1,950	66	13	17
*BG8KUQ	1,617	30	14	19
*BH4FCY	1,225	34	17	18
*BH3EMV	506	31	10	12
*BG8LCQ	448	51	6	8
*BI8CCJ	144	13	6	6
*BD7JJQ	135	11	7	8
*BD4VDA	48	7	4	4
*BD4ULO	16	2	2	2
*BH4FBB	527	17	8	9
*BG3LTM	504	36	6	12

India

VU2EII	48,944	224	39	73
*VU3IZV	1,178	20	14	17

Japan

District 1

JK1BAB	16	2	2	2
*JJ1VJQ	199,988	438	56	117
*JK1AUY	25,017	113	39	54
*JK1ECX	3,800	43	17	23
*JK1PDC	1,891	35	12	19

District 2

*JS2MYR	2,546	29	15	23

District 3

*JQ3DXA	598	19	11	15

District 4

*JO4MJU	6	1	1	1

District 5

*JJ5RCX	1,080	26	12	18

District Ø

*JJØVXN	7,182	73	23	34

Pakistan

*AP2MS	11,232	62	27	45

Thailand

E25CRF	*29,264*	*249*	*21*	*41*

West Malaysia

*9M2MAD	38,133	262	25	32
*9M2DGA	4,512	67	14	18
*9M2RAD	36	3	2	2

EUROPE

Austria

*OE3EDS	127,379	395	50	167
*OE5MZL	60,188	236	49	115
*OE1KSG	24,600	116	35	65
*OE7KNK/P	98	9	6	8

Belarus

*EW7TSW	5,777	93	12	41

Belgium

*ON3BJK	2,280	62	6	32

Bulgaria

*LZ8GT	204,876	591	63	189

Corsica

*TK4TH	308,847	1019	44	147

Croatia

9A5RTW	1,079,910	954	125	382

Czech Republic

OK4AR	37,628	161	35	57
*OK2BB	83,328	296	42	126
*OK3SN	50,974	216	41	113
*OK1JCB	39,783	150	49	100
*OK2MTB	21,018	119	33	80
*OK3TV	16,892	115	29	74

England

*MØNVK	192,225	511	58	175
*2EØIGD	74,543	288	43	118
*MØLKW	73,235	392	35	116
*MØYTE	63,960	185	48	72
*G5LSI	59,305	209	40	105
*2EØTXQ	53,655	231	37	110
*MØXFJ	25,788	137	25	59
*2EØGKW	12,410	97	24	49
*MØRKK	10,458	105	15	48
*2EØGYI	9,720	99	20	61
*MØJQQ	6,466	106	13	48
*M7TDV	3,534	40	15	23
*MØKUK	3,358	53	12	34
*M7DUO	1,419	58	7	26
MØLYB	*648*	*16*	*12*	*15*
*MØROZ	306	18	4	13
*MØMGZ	256	16	4	12
*M7XTT	166,014	501	52	155

Estonia

*ES5TVI	171,196	504	62	192
*ES5MEL	51,660	195	43	137

European Russia

District 3

*R3DCY	837	22	8	19

European Turkey

*TA1AQW	1,155	31	10	25

Fed. Rep. of Germany

DD5VL	360,570	542	87	270
*DL9DX	313,635	634	73	236
*DM1KM	156,972	308	73	181
*DO7OO	43,335	217	30	77
*DL7KJ	40,320	210	34	92
*DB3MI	33,012	196	33	98
DC5AQ	*26,795*	*145*	*34*	*81*
*DGØDM	20,910	136	32	70
*DJØMA	14,110	134	21	62
*DO2ACR	13,715	92	22	43
*DL7RBA	12,920	145	24	71
*DM6LE	7,469	63	28	49
*DJ7NT	6,554	76	17	41
*DB4REB	5,850	83	16	49
*DM7AK	5,796	50	27	42
*DO1PGH	5,720	50	19	33
*DO5MN	5,226	58	13	26
*DL2MFR	4,576	54	18	34
*DL9UW	4,000	48	17	33
*DO1SLB	2,691	39	15	24
*DL1FW	1,316	33	8	20
*DO1TLP	1,218	29	11	18
*DL9LA	627	26	13	20
*DO1TKL	600	26	7	18
*DO1NPX	189	9	4	5
*DB4SCW	121	11	5	6
*DO1SBS	18	6	2	4
*DO2MZ	8	2	2	2

France

F4JJS	247,342	473	79	204
F4JPE	70,200	332	47	148
*F4IVC	137,800	488	51	149
*F4IYU	83,990	252	50	135
*F4JJY	56,376	158	53	109
*F4IZZ	15,048	87	39	75
F4JAB	*2,961*	*43*	*11*	*36*
*F4JAW	2,080	37	10	22
*F4JAK	616	21	10	18

Greece

*SV1SXV	147,420	451	60	192

Hungary

HA5MIG	21,186	191	23	76
*HA1GBR	36,720	201	37	99
*HA8KM	2,250	38	14	31

Iceland

*TF3JG	4,087	60	20	41

Ireland

*EI7LC	22,464	143	32	85
*EI7INB	2,847	37	16	23
*EI9IKB	1,850	42	10	27

Italy

IUØOVB	1,514,955	1704	112	345
IU1NKS	546,720	876	81	254
IUØOPT	182,784	418	73	199
II3Z	*44,649*	*274*	*24*	*75*
		(OP: IV3JAG)		
IN3IIR	20,250	120	27	108
IUØPXQ	12,826	96	18	35
*IU4NGP	284,130	465	82	248
*IV3JAK	203,112	470	68	205
*IU1PZX	58,512	210	46	113
*IU1OPM	58,474	177	55	118
*IU1OLR	34,362	159	37	101
*IV3IPA	23,391	125	33	80
*IU2OZU	6,666	87	16	50
*IUØPYH	1,566	20	11	18
*IU4PRA	1,248	29	13	19
*IU4OAY	1,020	35	10	24
*IU7OTK	899	33	9	22
*IU4PRT	36	4	3	3

Latvia

*YL3ANB	5,670	63	16	38
*YL3ANT	486	17	6	12

Luxembourg

LX1LC	686,154	1177	83	274

Netherlands

*PA1VS	76,639	296	44	129
*PA7TG	40,141	194	37	100
*PE4I	5,723	78	16	43
*PD2HSB	3,552	77	12	36
*PD4V	2,808	26	15	24

Norway

*LBØWI	55,444	225	38	129
*LBØGI	580	16	13	16

Poland

*SP9PD	320,565	686	70	231
*SN3J	295,875	788	66	197
		(OP: SP3DAT)		
*SP7JS	205,056	545	58	209
*SP3BKR	152,131	585	47	164
*SQ9SEB	120,564	435	49	155
*SP9ADG	106,981	378	60	157
*SQ9MR	58,112	385	33	95
*SP3WKW	48,888	392	22	75
*SP2ROC	33,516	142	39	75
*SP9TS	32,900	200	25	69
*SP9QBA	28,792	218	25	97
*SP5BOT	23,421	158	30	81

Portugal

*CS7AWL	151,844	460	49	154

Romania

YO8ERC	13,376	70	32	56
*YO3DAM	169,416	482	55	179
*YO2MIT	46,900	283	34	106
*YO8DRV	24,444	191	25	72
*YO6PLL	8,282	93	25	57

Scotland

*2MØVGT	80,460	407	38	142
*GM5TDX	63,842	327	40	97
*2MØVEY	3,698	73	10	33
*MM7EST	2,244	50	11	33

Serbia

YU2MFM	120	6	4	6
*YU4AST	78,937	328	49	144
*YU4EWW	56,625	315	27	98
*YT2SIN	40,880	212	40	100
*YU4MVP	39,000	183	37	88
*YU1UUU	9,450	82	19	56
*YU3MPN	896	46	9	23
*YU4BMX	806	26	7	19

Slovak Republic

*OM8GRS	1,000	32	6	19

Slovenia

*S55BG	106,449	387	32	79
*S55AL	97,614	398	45	129

Spain

EF5T	183,372	609	58	164
		(OP: EA5JDN)		
EA4HQV	113,120	247	66	158
EA3IND	26,001	173	26	81
EA4HKV	25,942	135	32	77
*EA4HKF	687,635	1188	76	279
*EA5JEG	413,699	641	84	179
*EA2EWL	238,420	526	69	193
*EA3IMR	45,758	184	40	97
*EA4HLZ	30,464	141	37	91
*EA4HOT	16,815	115	34	61
*EA5JBG	16,554	109	29	64
*EA4HSY	99	8	4	7

Sweden

SA6OHM	51,800	286	35	113
*SA6KOD	25,480	204	24	80
*SA3MGL	14,442	154	20	63

Switzerland

HB9HHN	197,784	537	54	192
HB9HID	122,783	363	52	147
*HB9HRG	1,104	46	13	33
*HB9HGW	798	18	10	11

Ukraine

*US5WBJ	17,738	105	30	68

OCEANIA

Australia

*VK3GJG	15,760	98	31	49
*VK3DLN	306	10	9	9
*VK3KRL	50	6	2	3

Hawaii

KH6KW	*51,254*	*234*	*49*	*49*

Indonesia

YC3BUE	9,882	109	23	38
YC6HSK	3,936	64	17	24
*YDØBCG	20,519	112	22	49
*YD9BIJ	18,408	89	32	46
*YC6HRI	16,756	88	27	44
*YD1REA	15,912	88	29	39
*YDØASO	13,671	99	24	39
*YD1CGW	13,570	93	26	33
*YC4SMK	11,096	62	30	43
*YF1ANL	9,954	96	30	49
*YD9HJD	3,844	52	13	18
*YG1AEX	1,911	39	10	11
*YD3BSB	1,770	25	12	18
*YD1CZE	1,360	34	8	12
*YB1KFQ	1,326	23	12	14
*YD2UTC	1,196	18	11	15
*YD3BTX	1,054	30	7	10
*YD9GHS	792	27	8	10
*YD2CRO	735	32	7	8
*YD3DBG	560	15	7	9
*YD9LAU	522	30	13	16

*YC1DEA	156	8	6	7
*YDØAWI	102	8	2	4
*YD9RHV	98	12	7	7
*YG2AZV	42	3	3	3
*YG3AUH	35	20	2	3
*YG4SAP	27	7	1	2
*YG3ASH	18	3	1	2
*YB1BBW	2,479	37	16	21
*YC8IKU	2,142	33	12	22
*YD2UFR	1,725	53	9	14
*YC8CGK	969	27	8	9
Marshall Islands				
*V73MS	13,056	98	31	37
New Zealand				
*ZL3PIE	9,920	69	26	36
*ZL3CRG	5,814	48	20	31
*ZL2MLQ	980	26	15	20
Philippines				
*4G1FKH	35,112	276	20	36
*4G1OAL	1,007	27	9	10
*DW2KED	377	18	6	7

SOUTH AMERICA

Argentina

*LU1WCL	144,921	611	32	71
*LU1XAV	5,320	67	14	21

Brazil

*PU4BOT	26,274	199	16	42
*PP1BM	18,645	164	14	41
*PY2AAK	16,461	132	16	43
*PU2VPW	11,200	146	19	37
*PU7HLT	9,672	98	15	37
*PU7BEN	9,650	85	13	37
*PU1KVD	2,475	58	13	20
*PU4WTB	1,843	75	6	13
*PT2YW	1,400	49	10	18
*PY2OKW	260	12	7	6
PU5BXB	*80*	*5*	*4*	*4*

Chile

*CD6LKR	5,004	64	13	23
*CA6JQN	1,340	32	5	15

Curacao

*PJ2SD	8,816	70	21	37

CLASSIC

NORTH AMERICA

United States

District 1

KQ2M	4,467,840	3412	117	363
W1JQ	1,035,954	918	88	314
NG1M	807,234	1019	71	220
W1WEF	624,987	723	80	241
K1RM	235,524	741	24	90
K1RO	234,080	373	55	169
NE1RD	116,571	238	57	126
W1OHM	48,678	153	34	88
W1FQ	21,229	116	18	53
W1HI	19,093	121	14	47
W1/PY1MX	*13,410*	*99*	*30*	*60*
K1ALA	1,342	28	7	15
*K1BX	1,593,606	1402	92	307
*N1DC	393,666	527	67	206
*N1ALO	370,953	486	78	219
*KA1YQC	293,702	412	66	196
*W1JIM	215,031	366	62	167
*K1HT	166,662	303	58	139
*KR1A	164,101	314	50	147
*WA1HXH	121,638	241	63	131
*AF1R	104,912	243	44	122
*N1SFE	89,748	223	46	116
*ND1T	56,832	161	32	96
*N1ADX	56,400	152	39	102
*N1OIG	42,066	135	32	82
*WB2ITX	39,445	125	32	83
*KB1FX	25,760	110	28	64
*NV1P	11,040	68	19	41
*K1NZ	4,452	36	21	32
K5ATA	*3,577*	*33*	*19*	*30*
*N1YIS	3,234	32	21	28
*KC1NCN	2,926	31	12	26
*N1UMJ	1,472	39	8	24

District 2

KN2M	1,466,874	1149	120	334
W2CN	465,885	550	83	232
KC2G	332,555	415	80	213
KB2DX	25,990	89	42	73
KC2BBI	14,364	68	24	52
*N2MTG	216,648	357	70	166
*WB2KLD	203,451	344	57	162
*KE2SD	125,660	247	63	143
*W2VU	12,994	67	27	46
*WB2AIV	2,976	34	19	29
*K2HVE	682	21	6	16
*W2VJ	276	8	4	8
*KC2SEK	108	5	4	5
*K2JF	12	2	1	1
*WB2BWU	8	2	2	2
*NF2L	22,892	94	34	63

District 3

K3FF	382,382	498	68	218
W3KL	*296,484*	*549*	*49*	*137*
4U1WB	246,642	570	62	160
		(OP: AJ3M)		
N3LH	196,900	338	62	158
N3MWQ	94,800	223	43	115
W3BGN	59,013	392	15	64
WW3HAM	8,778	65	17	40
*WK2G	110,016	438	22	74
*KD3HN	98,102	194	52	129
*KD9QS	82,082	341	41	102
*NH7TV	47,082	145	34	84
*AB3JF	41,344	134	43	93
*WM2Y	38,186	116	39	83
*AC3EK	24,411	104	27	76
*WD8RYV	23,310	88	33	72
*NR3S	23,184	99	24	60
*KB3RKM	15,675	74	24	51
*K3ADA	12,975	64	24	51
*N8URE	12,283	68	21	50
*AJ3DI	3,956	35	17	29
*N3UP	770	16	9	13
*N3WS	3,800	45	21	29

District 4

KØEJ	2,636,412	1929	132	366
WS7X	1,553,752	1585	82	277
KU8E	1,088,235	1044	101	304
AC4G	472,068	545	97	227
N1LN	400,650	976	30	120
W3DQS	263,592	391	65	187
NE8P	233,112	736	30	102
W4FNZ	198,882	326	82	179
K4BAI	143,927	269	57	146
WN3F	100,470	237	46	124
WG4MC	100,392	210	57	131
WA8YVF	89,670	231	36	111
KN4LIU	55,577	152	49	100
N9GQA	53,636	230	36	70
K4NWX	53,190	146	42	93
NC4S	49,147	163	29	90
KM4ALL	48,622	119	49	102
K1GU	37,560	130	40	80
K3WR	24,232	102	37	67
KR4EZ	14,948	94	24	50
KA3MTT	14,560	69	38	53
W3UO	11,537	75	36	47
KJ4BIX	*3,744*	*43*	*8*	*24*
W8FN	3,597	40	9	24
*WW4XX	1,303,932	1168	97	302
		(OP: LZ4AX)		
*WA3LXD	524,210	605	82	228
*KC4TEO	259,182	403	64	174
*WA4JA	155,020	270	72	158
*NC4MI	150,500	317	42	133
*KM4SK	139,744	294	47	129
*N3GB	119,704	399	22	82
*KW4SW	119,144	221	71	141
*K4TMC	114,814	348	25	93
*W4IOD	105,165	243	46	125
*KV4ZY	84,348	160	52	146
*K3YDX	71,380	169	53	113
*K4SBZ	61,593	173	44	103
*W4WCD	56,677	184	52	105
*K4FJW	54,806	152	45	89
*N4OO	40,500	195	22	59
*N4DJ	31,680	111	37	73
*K4FTO	26,558	111	31	67
*AK4VQ	23,496	101	26	62
*N4LKB	14,773	70	21	58
*KN4IXT	11,988	76	28	46
*K4ADX	10,668	59	32	52
*K4WY	8,208	73	13	35
*KA1RRX	8,016	74	14	34
*K8MR	7,705	46	28	39
*KB6QPI/4	6,264	42	21	37
*K4QR	5,085	52	12	33
*KV4AC	4,386	42	12	31
*WS4Z	1,232	24	8	14
*NS4E	972	16	13	14
*KF4NQN	6	1	1	1

District 5

N5YT	820,386	803	106	277
N5AW	772,213	956	84	227
WQ5L	692,289	858	79	212
KM5VI	654,922	887	89	228
AI5SF	320,712	439	88	188
KD5QHV	238,387	408	69	154
W5ORC	235,470	396	67	168
N5TJ	177,030	316	60	150
W9DXM	*9,240*	*84*	*29*	*41*
*WA5JMZ	259,316	418	73	168
*NN5T	169,274	293	75	139
*AI5NE	101,200	227	61	115
*W5CUB	50,140	172	40	75
*NW5Q	29,070	108	41	61
*K5TS	24,150	83	37	68
*AA5AH	23,587	102	43	60
*KC7QY	17,301	89	26	53
*N5SKT	1,537	36	12	17
*K5TMH	1,488	24	6	18
*KD6UY	360	12	10	10
*KD5CMW	360	12	7	8
*K5HV	286	9	6	7
*K5HRB	255	12	5	12
*KØMHC	216	8	3	6
KI5AHF	*88*	*7*	*4*	*4*
*W5CBP	56	10	7	7
*KG5TKV	8	2	2	2
*N3CI	19,926	95	23	59

District 6

K6NR	634,725	748	102	213
AJ6V	505,047	842	84	153
WC6H	328,679	931	31	100
		(OP: NU6S)		
K6YK	193,116	341	75	153
WD6DBM	90,948	229	62	97
WA6URY	80,850	239	65	82
W6JBR	68,089	181	54	83
KE8FT	64,480	259	30	74
WA6MRK	48,678	143	55	78
KB6A	5,904	48	18	30
N6TTV	2,982	31	20	22
W6RKC	2,001	30	12	17
*N4DLA	56,848	168	56	80
*K6TLH	24,057	98	40	59
*N6BHX	20,930	121	33	32
*KQ6UP	10,140	61	38	40
*WK6A	8,580	59	29	37
*K6KTS	8,308	67	29	33
*W6EMR	3,960	37	23	22
*AG6VH	3,920	38	23	26
*KJ6PTX	2,574	31	20	19
*WWØMAN	2,244	26	14	19
*KM6RRS	1,558	35	19	19
*KG6YJ	1,452	24	17	16
*KT2G	169	12	7	6

District 7

K7RL	2,337,120	2154	130	302
AB7YQ	515,508	750	90	176
K9JF/7	455,598	592	100	197
N7RQ	269,001	949	30	93
K7JQ	157,341	345	68	111
WE7H	*66,880*	*160*	*57*	*95*
K7MY	34,540	141	40	70
W2HZ	33,250	121	44	81
WØFLZ	23,712	96	47	57
N7VGO	17,672	81	40	54
W7FD	14,616	83	36	48
KI7Y	10,207	63	29	30
KE7NLU	2,914	38	20	27
K5IB	36	4	3	3
*N7VZU	99,351	223	59	112
*W7TMT	65,554	188	56	90
*NF7E	33,375	116	56	69
*N7VS	25,484	109	39	53
*K7ROG	25,338	114	33	49
*N7DB	19,436	131	36	50
*NS7U	17,889	81	41	48
*KC7STK	16,131	103	19	38
*WB7EUJ	15,570	141	40	50
*KI7MJU	14,220	79	39	51
*WAØPFC	13,130	75	27	38
*KC7MDT	10,030	66	29	30
*N7JOE	8,192	53	28	36
*K7BWC	3,100	45	12	19
*W7MTL	2,106	27	20	19
*AC7MX	1,815	51	17	16
*WU7W	1,716	30	18	21
*K8TX	1,443	27	17	20
*KD7WNV	1,376	33	22	21
*KI7ILD	441	18	11	10
*N9NA	126	10	9	9
*KJ7AKV	90	5	4	5
*K7JSG	56	4	4	3
*N7SMD	18	5	4	2
*N7JI	35,805	152	47	46

District 8

KD8NKY	48,224	144	39	98
KE8E	44,954	152	42	91
K2PM	9,555	157	16	33
W8SJS	272	12	7	9
*N8II	326,960	852	26	108
*N8BAP	224,013	331	73	194
*KW8KW	117,836	261	46	132
*K7DR	94,119	251	43	94
*N8BV	82,998	202	59	100
*K2SY	38,500	119	30	95
*W8EOG	25,764	99	42	72
KC8R	*4,320*	*39*	*18*	*30*
*NF8M	4,233	33	22	29
*KE8TTU	3,942	40	20	34
*AA8SW	2,470	29	15	23
*KE8BNE	1,989	24	18	21
*KD8TJB	966	18	7	14
*AD8JL	850	20	17	17
*NK8D	154	6	5	6

District 9

W9DZ	565,211	640	88	229
W9GT	302,016	445	65	177
N9JR	221,892	368	70	176
K9YZ	197,028	319	67	167
K9XN	196,140	355	61	149
KJ9C	44,826	179	22	71
KØPG	15,386	80	42	56
*WD9CIR	285,500	429	68	182
*N9EAX	168,036	284	68	160
*NY1V	149,917	289	54	143
*AC9TO	99,858	218	62	116
*KB9OZI	85,424	218	49	103
*W9IZ	73,304	178	52	102
*W9QL	64,155	240	27	78
*KC9GPY	56,100	172	49	101
*N9UPU	38,674	129	44	78
KF4LXS	*15,488*	*80*	*33*	*55*
*NV9X	10,686	63	27	51
*KC9YL	9,438	71	24	42
*K8VGL	7,326	52	29	37
*WA9EKQ	3,366	35	20	31
*W3ZAP	1,560	24	9	17
*AJ9U	1,392	18	12	17
*KD9GN	952	16	12	16

District Ø

WØETT	282,462	432	85	178
W7RF	*214,130*	*359*	*78*	*152*
KJØI	210,784	352	77	147
KØBBB	106,743	355	30	89
NØZB	85,842	188	50	121
K9DU	68,175	187	39	96
KØJM	48,396	137	51	97
NØUU	36,894	162	21	65
WDØJ	32,038	164	23	60
AG7O	6,014	59	25	37
NGØE	1,196	17	10	16
*NGØC	259,080	418	76	178
*WØZF	182,781	332	68	139
*WØSJE	128,694	295	63	115
*KBØARZ	73,920	192	58	110
*WBØLQC	70,196	283	20	72
*WØPI	51,450	175	28	77
*WYØX	46,125	189	45	80
*KOØZ	43,310	141	51	91
*KØSCO	38,571	133	49	80
*KØAIZ	25,830	124	25	57
*KBØCFD	22,320	100	34	59
*KBØKFH	5,412	57	16	28
*KKØD	2,679	37	22	25
*NØJNM	575	13	12	13
*KDØFAB	560	15	9	11
*KD5YPH	247	12	10	9
*NDØC	47,229	188	24	67
*NØLMQ	840	18	10	10

Alaska

AL7LO	119,966	321	61	93

Canada

District 1

VA1XH	502,806	656	71	211
*VE1BSD	64,625	189	39	86
*VE9RLW	14,384	100	18	44
*VY2LI	8,004	61	23	35

District 2

VA2LGQ	6,528	60	14	34
VE2GT	270	9	3	7

District 3

VE3TW	636,222	736	80	241
VE3GYL	452,760	758	70	175
*VA3KRT	216,112	389	53	155
*VA3DBT	143,336	303	54	130
VA3MLV	*131,859*	*626*	*23*	*68*
*VE3TM	131,784	311	37	115
*VA3CK	33,060	119	42	74

District 5

VE5CPU	57,475	190	46	75
*VE5SKI	2,482	32	17	17
*VE5GC	2,366	87	7	7

District 6

VE6IVN	82,450	210	60	110
VE6CA	3,892	67	11	17
*VE6ZC	20,174	120	37	40
*VE6GK	16,767	87	36	45

District 7

*VE7COR	12,810	132	17	25
*VA7RYL	720	19	8	12

Cayman Islands

ZF2AA	3,170,244	4470	89	240
		(OP: VE9AA)		

Cuba

*CO8NMN	793,026	1598	70	164
*CO8ZZ	241,533	839	47	94

Guadeloupe

*FG5GP	1,336,504	1832	67	217

Mexico

XE1CKJ	346,060	1383	44	77
*XE1ZTW	38,241	254	18	45
*XE1CIC	35,464	375	15	29
*6D5C	14,040	121	23	31
		(OP: XE1H)		
*XE1SVT	2,272	29	16	16
*XE2N	210	14	8	7

Panama

*HP1RIS	20,493	114	18	51

Puerto Rico

*WP3GW	139,440	332	50	116
*KP4YO	85,590	264	39	96

Sint Maarten

*PJ7PL	204,210	1051	23	67

US Virgin Islands

KP2M	4,586,904	4450	111	345
		(OP: KT3Y)		

AFRICA

African Italy

*IH9/IK5AEQ	1,558,025	1756	72	235

Canary Islands

ED8M	3,979,508	3270	94	318
		(OP: EA8DIG)		
*ED8B	415,093	1103	29	104
		(OP: EA8TR)		
*EA8BQM	209,838	600	42	81
*EA8AUW	5,734	44	18	29
*EA8DIG	210	7	3	7

Kenya

5Z4FV	407,268	604	66	177

Madeira Islands

CT3KN	4,838,712	3727	105	339

Namibia

*V55AF	326,043	804	44	109
		(OP: V51MA)		
*V51WW	732	126	19	42

South Africa

*ZS1AO	338,040	567	51	165
*ZS6HI	36,630	129	43	68
*ZS6ELI	18,260	85	32	51
*ZS6MDX	475	24	12	13

ASIA

Asiatic Russia

District 9

*UA9CAW	153,472	340	41	135
*R8KAY	18,183	107	30	57

District Ø

RØQAF	*6,048*	*56*	*23*	*40*

Asiatic Turkey

YM7KA	1,147,720	1475	62	218
		(OP: TA7I)		
TA2ANL	141,344	443	26	86
TA4ORZ	89,100	214	46	116
*TA7I	8,046	63	19	35

China

BG9NJY	62,064	195	38	106
*BH3PLA	57,387	203	46	95
*BD6JN	43,722	187	48	78
*BD3OD	14,442	116	36	51
*BH3DHE	9,016	85	17	32
*BG8INK	8,619	77	16	35
*BG8KCQ	7,065	70	14	31
*BG8IL	7,065	70	14	31
*BD6AHP	6,976	62	28	36
*BH4LFG	1,190	51	16	19
*BH4TIH	16	14	2	2
*BH4TQX	260	26	5	5
*BI1JNP	176	16	6	5

Georgia

*4L9M	57,519	272	17	60
		(OP: R3XA)		

India

VU2IBI	141,185	362	39	112
*VU2SMS	69,278	202	37	97
*VU3GDS	52,771	206	28	85
*VU2MCW	450	17	11	14
*VU2JOS	240	15	6	10
*VU3LMS	40	4	4	4

Israel

*4Z5MY	308	8	6	8

Japan

District 1

JK1OLT	972,360	1121	107	226
JR1GSE	637,377	922	101	176
JA1CRJ	121,680	252	65	115
JH1CTV	91,044	264	55	107
7K4GUR	60,129	179	41	90
JR1NHD	3,483	45	14	13
JA1FNO	850	20	8	9
JH1LYE	782	18	7	16
*JS1KKY	364,560	578	84	161
*JO1VVT	62,980	184	52	82
*JK1BVN	52,734	203	59	82
*7N2UQC	45,360	224	24	60
*JR1LEV	37,149	179	32	55
*JR1DVB	21,472	100	32	56
*JR1EMO	19,840	104	35	45
*JK1EXF	7,020	47	23	31
*JJ1KZZ	5,760	52	17	28
*JL1FAR	4,004	33	17	27
*JA1CHY	2,310	27	15	20
*JL1WRV	2,117	37	10	19
*JH1RDU	1,798	28	14	15
*7K1BIB/1	697	21	7	10
*JH1VIX	273	9	5	8
*JH1HHP	228	16	9	10
*JE1SPY	160	44	5	5
*7K1EAS	40	14	5	5
*JJ1BDX	36	3	2	2
*7L1DST	1,728	30	10	14
*JK1NWD	1,430	29	12	14
*JEØCBS/1	1,035	18	11	12
*JI1AEP	435	11	6	9
*JA1GZK	250	11	5	5

District 2

JG2CNZ	181,050	338	88	125
JE2BOM	122,230	276	58	112
JA2JWH	53,568	202	52	72
JR2ALA	7,875	70	18	27
JH2DFJ	63	7	4	3
*JG2RFJ	184,828	375	65	131
*JI2KUJ	30,456	110	38	70
*JS2PHO	25,368	135	36	48
*JA2KKA	18,300	104	30	45
JR2GYA	*24*	*7*	*4*	*4*

District 3

JR3RIU	229,779	441	73	138
JP3UBR	20,060	98	34	51
JA3QOS	7,844	74	19	34
JL3DQX	936	22	13	13
*JL3MCM	352,898	502	94	183
*JP3KPJ	63,228	195	53	79
*JJ3TBB	61,600	192	51	89
*JA3KDJ	3,800	55	17	23
*JA3BBG	88	5	4	4
*JE3AKU	6,783	73	22	29

District 4

*JH4FUF	5,852	60	14	24

District 6

JA6BZI	694,127	808	94	229
JA6BWH	237,931	399	72	157
*JA6CVR	57,204	200	47	79
*JH6FTJ	54,050	184	43	72
*JG6VMO	5,720	60	15	29
*JH6SCA	1,500	26	11	14
*JF6ABL	1,464	25	12	12

District 7

JG7AMD	968,365	1229	93	200
JH7QXJ	842,786	1208	89	170
JA7QVI	513,024	1103	51	116
JA7OWD	184,016	713	36	70
JA7GFN	50,050	155	48	82
JA7VEI	14,427	83	30	33
JA7UES	13,926	73	27	39
*JA7HYS	88,218	290	33	84
*JA7KHQ	4,361	37	21	28
*JA7MCB	2,108	24	16	18
*JA7RPC	250	9	4	6

District 8

JA8RUZ	550,314	866	88	170
JH8XVT	195,585	367	78	143
*JA8RWU	338,504	538	89	173
*JM8FEI	45,310	174	46	69
*JM8SMO	20,498	111	27	47
*JR8QFG	19,584	108	29	39
*JE8UHY	6,960	58	27	31
*JA8HBO	1,560	44	12	14

District 9

*JA9NEG	608	16	8	8

District Ø

*JIØWVQ	10,140	94	27	38
*JHØDUG	6,435	57	25	30
*JAØOWR	24	3	3	3

Kazakhstan

*UN1EAU	23,058	96	43	83

Kyrgyzstan

*EX8MK	1,320	22	12	18

Lebanon

*OD5UI	165,321	401	35	122
*OD5ZF	4,794	57	7	27

Nepal

9N7AA	2,264,925	2601	85	260
		(OP: S53R)		

Saudi Arabia

HZ7C	401,604	986	36	111
		(OP: 7Z1SJ)		
*HZ1SK	405,840	1197	27	93
*HZ1CY	129,753	416	30	87

Thailand

*E22UUW	52,488	317	24	57

West Malaysia

9M2HUS	72,625	340	36	47
*9W2AIX	46,575	388	21	48
*9W2FSY	504	16	8	10

EUROPE

Austria

*OE3KAR	41,952	206	36	116
*OE5MKE/P	2,574	70	8	31
*OE3MCS	1,325	25	10	15
OE5WEO	*6*	*3*	*3*	*3*

Balearic Islands

*EA6OM	77,478	286	31	80
*EA6VY	22,624	149	26	86
*EA6AOH	19,656	141	32	85

Belarus

*EU1VA	145,068	403	57	174

Belgium

ON7QC	59,409	215	41	120
ON7ET	36,801	113	47	94
OR7G	22,140	375	12	48
*ON5UJ	319,908	574	82	236
*ON8LX	47,346	595	13	65
*ON4MAD	40,680	203	32	88
*ON7DC	21,816	156	27	81
*ON5GF	7,301	78	16	33
*ON4SC	2,193	27	19	24
*ON4MGY/P	8,268	124	9	44

Bosnia-Herzegovina

*E7/Z35M	117,552	582	38	148
*E77SH	56,072	160	55	108
*E76MB	35,100	160	38	92
*E73EKK	22,785	157	26	79
(OP: E73KT)				
*E7ØE	3,360	115	6	36

Bulgaria

LZ5Y	779,708	1209	89	308
(OP: LZ1YE)				
*LZ7M	86,490	260	55	131
(OP: LZ5VK)				
*LZ5PL	21,109	118	35	66
*LZ/VA7BTE/P		560	29 4	
16				
*LZ3AW	24,528	152	29	83

Croatia

9A3DUH	*620*	*13*	*8*	*12*
*9A2KI	9,344	122	18	55
*9A1EA	8,400	72	23	52
*9A2RZ	832	30	8	18
*9A4OP	39,837	209	40	107

Czech Republic

OK2ZDL	131,800	324	59	141
OK1XC	102,312	400	29	87
*OL5Y	927,639	1010	96	327
*OL2A	143,424	434	50	166
(OP: OK2PEM)				
*OK7N	129,800	328	67	169
*OK2BZE	62,832	328	29	90
*OK1NYD	62,328	209	42	117
*OK1DXW	21,301	150	31	88
*OK1LO	16,701	134	16	41
*OK3MAT	16,296	148	18	66
*OK7R	13,160	351	5	35
(OP: OK1TNM)				
*OK3FLY	9,504	94	28	60
*OK1TVL	1,638	50	12	27
*OL5G	216	12	3	3

Denmark

OZ11A	982,464	1851	81	255
OV1RR	9,800	68	17	32
(OP: OZ1D)				
OZ1HHH	2,376	36	8	14
(OP: OZ1D)				
OZ1D	1,222	25	8	18
(OP: OZ1HHH)				
*OZ4NA	25,631	321	13	58
*OZ8ZN	414	18	8	15

England

M4T	1,061,309	2089	83	266
(OP: MØBEW)				
G9D	225,852	520	59	177
(OP: G6NHU)				
GØCNN	169,970	491	50	180
G2C	92,127	371	28	79
MØORH	44,154	291	24	75
MØAQM	41,238	425	15	64
MØDSK	34,194	171	37	86
G4L	31,218	300	17	69
(OP: G4LDL)				
MØLTE	22,351	150	27	76
*MØPLX/M	289,044	708	63	216
(OP: MØPLX/M)				
*G4DDL	220,704	581	57	185
*G1K	198,860	588	54	190
(OP: MØRTQ)				
*M1VPN	161,394	561	48	174
*MØYKS	154,000	364	52	148
*MØJND	135,218	394	49	145
*MØKPW	132,354	448	42	129
*M4M	111,864	344	42	135
*GØJDL	98,452	359	38	125
*MØTQR	54,426	220	38	103
*G8ZRE	52,925	276	32	113
*GØJLF	51,100	222	36	104
*G4WQG	41,124	199	26	66
*G8LNR	39,894	209	30	92
*MØJHV	35,872	193	31	87
*M5X	34,621	159	25	64
(OP: G3RLE)				
*G4OED	28,638	215	16	58
*2EØEVM	27,140	178	31	87
*GØDDZ	25,990	167	31	82
*G3R	25,440	156	26	70
(OP: GØCDA)				
*GØWJK	25,017	219	23	70
*MØACM	19,525	209	17	54
*G3MXH	17,765	113	17	38
*G4CTP	14,952	159	18	66
*GØRAH	14,340	192	13	47
*G4AYU	9,724	79	16	36
*G5TM	8,228	86	11	23
*G4FFN	7,980	63	24	52
*G8FRS	7,665	87	20	53
*G5AKB	3,894	48	13	20
*G4BYE	3,528	59	17	32
*G4BEE	3,528	52	11	31
*G3SAD	3,036	55	13	33
(OP: G4BYE)				
*G6MXL	2,911	39	14	27
*M6KCI	46,472	266	35	113
*M6W	7,399	98	11	38
(OP: G3WW)				
*M6IGE	5,640	80	17	43
*MØJBA	3,492	113	6	30
*MØYJB	1,776	36	12	25
*2EØTKO	110	10	3	8

Estonia

ESØIA	39,984	153	50	97
*ES6PA	76,860	297	43	140
*ES1TAR	45,800	339	24	76
*ES5RIM	1,885	65	4	25
*ES6KW	42	4	3	4

European Russia
District 3

*UA3BL	489,211	917	80	287
*RC5Z	318,396	670	86	252
*RN3DN	213,070	503	72	214

District 4

**UA4FDK*	*88,788*	*279*	*52*	*144*
*R4PCT	28,595	155	37	96
**UC4Y*	*22,230*	*132*	*26*	*69*
*UB4IIQ/				
UA6L/QRPP	2	1	1	1

District 6

RK6C	*4,316*	*39*	*18*	*34*
*RA6LIS	109,335	421	46	151
*R6DOP	4,646	82	10	36

District 9

*RA9FEL	20,838	213	14	55
*UA9FGJ	18,286	150	20	62

Fed. Rep. of Germany

DL2CC	2,677,106	2606	111	346
DL5RMH	619,320	1033	90	300
DH1UK	561,260	771	89	291
DMØA	498,400	1760	36	104
(OP: DK4EE)				
DJ4MO	409,596	621	85	234
DK9BM	188,436	530	55	191
DL4ABR	126,801	361	49	144
DJ8FR	97,608	260	46	122
DF6RI	58,050	252	39	111
DB3FJ	21,600	260	13	62
DKØSU	17,577	125	23	70
(OP: DF7SA)				
DL6SBD	7,526	63	26	45
DK1FW	6,050	47	19	36
DL4JY	3,150	38	15	20
DL2DSA	1,947	82	6	27
*DP5P	417,544	816	72	256
(OP: DL1MHJ)				
*DC2AN	304,580	600	70	244
*DF4SR	170,407	475	55	184
*DL7VX	134,532	436	47	175
*DL2RPN	108,605	361	49	154
*DL1SDX	101,332	300	50	138
*DLØRUS	100,254	276	53	101
(OP: DJ2QV)				
*DK3YD	99,645	281	50	145
*DM6EE	97,271	319	55	156
*DO1IBJ	86,565	273	40	105
*DL9HB	79,170	251	46	128
*DN4CQ	77,440	277	47	129
*DD3JN	76,608	298	37	134
*DH9DX/P	63,300	253	40	110
*DL1RTO	59,008	211	39	89
*DKØBM	56,834	340	40	117
(OP: DK7CH)				
*DB4LL	49,266	242	39	114
*DM5CQ	40,171	173	38	101
*DF9IX	38,586	179	33	85
*DL8ZAJ	38,135	178	38	107
*DL1TV	33,235	203	28	87
*DO9YY	29,988	167	27	75
*DA9L	28,730	158	26	59
(OP: DO1BEN)				
*DHØGDS	28,356	177	20	48
*DL1AG	28,184	152	31	73
*DG7AK	25,404	150	33	83
*DM3AW	25,056	127	30	66
*DO1FPT	22,338	143	28	74
*DL2RZG	21,560	129	21	49
*DK8PL	21,120	153	31	89
*DM2DLG	17,985	160	27	82
*DL5KUD	16,456	126	17	51
*DL4SHE	15,747	93	32	55
*DG3NAB	15,576	164	19	69
*DG1YHP	14,685	122	22	67
*DC6GF	13,612	111	24	58
*DA9A	12,348	80	22	41
(OP: DO1NPF)				
*DK5KF	9,867	123	14	55
*DG1DPN	9,317	98	20	57
*DL9ZWG	9,184	88	22	60
*DL1WMF	8,162	82	21	56
*DL7FUA	7,038	46	22	29
*DL5BL	6,887	52	28	43
*DO7UWE	5,000	52	16	34
*DJ4DN	4,998	119	5	37
**DL1LSW*	*4,794*	*60*	*14*	*33*
*DO9JOC	4,628	62	14	38
*DL9MFY	4,625	50	16	21
*DG7SCB	4,292	59	16	42
*DL7UN	3,835	54	19	40
*DB8SM	3,264	50	15	36
*DL1ZB	3,087	49	17	32
*DO1TOM	2,336	78	5	27
*DL6DJ	1,147	35	11	26
*DB6YC	935	20	8	9
*DH1DH	100	10	4	6
*DO9ABC	24	3	3	3
*DJ3HW	16,650	104	23	52
*DF7XR	3,381	45	16	33
*DF9HC	3,015	45	17	28
*DG2FDD	216	20	2	10
*DB7YI	30	3	3	3

Finland

OH2PQ	909,030	1092	115	356
OH1VR	516,738	801	97	329
OH2BA	362,950	621	83	267
(OP: JK3GAD)				
OG2X	194,916	614	55	167
(OP: OH2RM)				
OH6MSZ	96,570	410	42	132
OH1RX	22,785	87	41	64
OG6B	13,715	108	16	49
(OP: OH1ZAA)				
OH1QX	3,276	65	9	30
(OP: OH1ZAA)				
OH3MHA	1,711	56	4	25
(OP: OH1ZAA)				
OH5ZA	1,380	37	7	23
(OP: OH1ZAA)				
OH9COG	450	19	5	13
(OP: OH1ZAA)				
*OH1NOA	178,946	514	49	213
*OH3MZ	30,680	210	30	88
*OH2BXT	18,515	146	26	89
*OH2BR	15,750	95	29	61

France

F5LIW	574,864	913	70	178
F5LBL	44,339	223	26	75
F5PCV	34,510	152	30	55
F1UTB	308	10	5	6
*F4WDL	341,820	609	83	241
*F4BIT	287,260	613	66	205
*F4ETG	234,000	529	61	179
*F5GN	76,791	197	55	124
*F4IGP	68,850	269	39	114
*F4IIQ	54,378	247	42	129
*F5JME	53,397	314	36	117
*F4IAY	49,800	167	45	105
*F4DVO	29,869	227	27	92
*F1DJE	28,602	177	30	96
*F1ICR	18,000	138	17	43
*F4IAW	12,800	116	19	61
*TM9ØGF	11,904	158	25	71
(OP: F4AHN)				
*F4HRN	4,284	55	24	44
*F4HVV	133	19	6	13

Greece

SV2DSJ	693,500	1387	93	272
SV1PMR	558	31	7	11
*SV1PMH	261,765	602	67	210
*SV1OCQ	43,654	211	41	105
*SV2RZJ	14,652	128	25	74
*SV1RVI	7,381	104	12	49
*SV7CUD	2,385	33	18	27
*SV1AGU	20	6	4	6

Hungary

HA1BC	766,035	825	102	333
(OP: DL1MAJ)				
HA2D	48,336	359	25	81
(OP: HA9MDP)				
HA5EA	13,440	127	17	53
*HA5BMS	17,280	116	31	65
*HA1TI	3,232	107	4	28

Ireland

*EI4KU	385,776	743	69	235
*EI2JIB	14,608	180	21	67
*EI3LC	4,779	59	20	39
*EI3CTB	16,600	149	22	78

Isle of Man

*GDØAMD	82,641	342	37	126

Italy

I4JED	588,924	781	106	263
IZ1OSP	513,166	1020	91	288
I1NVU	499,998	628	101	233
IZ6ERS	426,504	1033	74	238
IU5GBQ	379,600	1119	77	215
IZ2BVC	257,853	676	66	237
IU8NKW	167,170	617	51	178
IU1FSL	152,964	542	58	194
IZ1SAI	145,530	600	47	163
IK8NSR	89,420	241	58	112
IZ8DSX	67,496	236	30	88
IO4M	45,540	201	43	89
IZ1HHT	31,137	148	35	72
IU1QCW	30,744	100	44	78
IK2IKW	15,345	87	31	68
IZ1HCS	13,923	179	17	74
IU2JFG	7,300	142	9	41
I6KIU	6,858	51	20	34
IZ3GJL	6,604	137	10	42
IU3KMF	304	24	5	14
IZ1DXG	32	4	4	4
*IK7NXU	266,000	471	71	195
*IUØDHV	246,960	504	75	219
*IZ2BKA	215,760	496	59	181
*IU7EDX	114,680	324	51	137
*IW2NBL	109,616	414	43	165
*IZ3XNJ	97,983	302	48	143
*IU3GJD	90,816	357	42	150
*IKØALT	87,087	298	48	155
*IW2ENA	79,348	244	50	116
*IK2DJY	64,080	169	60	120
*IWØSAG	60,060	233	41	113
*IK2OFS	58,674	204	45	82
*I5OYY	53,222	136	48	130
*IZ3ZLT	52,635	193	41	104
*IZ8QPA	36,234	278	31	91
*IU3MEY	31,868	166	37	87
*IK8ARF	31,696	143	39	73
*IU7GRA	29,116	163	37	79
*IZ1DNQ	29,104	124	34	73
*IU4DAF	28,107	242	18	63
*IZ7VII	26,973	117	36	75
*IK4MTF	14,245	87	26	51
*IU7MEZ	13,056	84	36	66
**IU3BPW*	*12,852*	*93*	*24*	*44*
*IZ3ZOO	12,320	108	23	65
**IB5R*	*11,534*	*168*	*18*	*61*
*IU1MRG	11,375	134	14	51
*IK2YSJ	10,455	107	22	63
*IK8RKH	8,122	83	19	43
*IK2OLJ	6,208	67	20	44
*IN3HVL	5,472	87	17	55
**IU1HJF*	*5,133*	*43*	*24*	*35*
*IU1MRH	4,130	58	20	39
*IK1ZOE	4,080	97	17	51
*I2XYI	3,905	47	19	36
*IZ6MPZ	3,796	48	16	36
*IZ2KWV	3,648	54	14	34
*IK6FHG	3,404	30	19	27
*IU8LUM	3,348	56	16	38
*IK1HZZ	3,145	33	17	20
*IZ1CJZ	2,048	22	15	17
*IU1FIB	2,001	29	9	14
*IN3GYK	1,890	46	7	28
*IN3EJM	1,330	30	11	24
*IUØDUM	1,260	17	13	15
*IW4CPU	665	13	9	10
*IU1PZC	630	14	9	12
*IK2LQT	528	11	8	8
*IZ8PWN	513	12	9	10
*IZ1FRM	384	8	8	8
*IUØNHF	80	6	5	5
*IZ8CLM	24	2	2	2
*IN3JRZ	6,993	101	14	49
*IZØZFK	6,723	75	24	57
*IK3XTY	2,091	38	17	24
*IW2EPE	1,485	50	5	28
*IZ3NVR	266	22	2	12

Latvia

YL7A	540,714	993	85	312
(OP: YL2GM)				
YL2CI	276,985	980	34	121
YL2PJ	97,152	299	51	141
*YL2LW	36,990	259	21	69
*YL2NK	32,964	228	26	108
*YL3GY	23,575	160	31	84

Lithuania

LY1M	10,650	126	16	55
*LY2EW	53,048	329	31	121
*LY5GT	16,165	308	7	46
*LY2NK	9,750	182	7	43
*LY4T	2,880	90	4	28

Luxembourg

*LX1GQ	155,232	466	58	173

Moldova

*ER1JA	145,886	636	35	146

Netherlands

PAØMIR	60,705	249	47	124
PA9JO	*27,621*	*179*	*29*	*70*
*PA2VS	22,310	204	23	74
*PA3DBS	12,220	92	20	32
**PA3EQN*	*12,150*	*146*	*16*	*59*
*PD2GSP	5,335	49	22	33
*PA3HLE	5,029	39	20	27

Northern Ireland

*MIØDWE	4,750	53	18	32

Norway

LA3BPA	476,354	802	78	304
LB3AG	6,400	43	28	36
*LB1R	1,566	34	9	20
*LA7WRA	20,631	243	13	56

Poland

SP5ICS	84,711	284	44	143
SP9JBE	11,016	83	19	49
*SP9DTE	415,373	720	78	265
*SP5UFK	339,480	706	74	254
*SP8CHI	160,716	422	59	177
*SP8IMG	134,160	461	31	99
(OP: SP8MG)				
*SQ9ITH	131,556	265	76	152
*SP5TE	131,250	404	53	157
*SP2TMT	119,900	289	58	162
(OP: SQ2BNM)				
*SP5DRE	98,078	340	45	133
*SQ6POC	95,996	313	50	156
*SP8UFT	71,980	235	31	91
*SP4SP	61,242	281	47	126
*SP1DMD	39,431	165	42	89
*SP7LK	32,184	226	22	86
*SP6LUV	26,255	467	9	50
*SQ7OTK	25,625	139	39	86
*SP5TM	24,625	153	33	92
*SQ8W	16,368	174	14	52
*SQ8T	16,112	119	27	79
*SP2AWJ	15,360	107	25	71
*SQ3DQ	13,746	123	20	59
*SO6MZ	13,200	87	30	70
*SP2TQQ	12,096	118	22	62
*SP2HSA	7,590	70	21	45
*SP2GR	6,762	118	9	40
*SP8D	6,448	64	21	31
*SQ5AAG	5,863	67	15	26
*SP8VGA	3,776	77	13	46
*SQ9PPT	315	26	3	12
*SP9MUF	77	8	5	6
*SO2U	125,292	395	49	163
*SP9UA	5,917	76	17	44
*SQ5SAA	1,440	32	11	19

Portugal

CT7AQS	35,392	208	19	45
*CT2KNA	277,405	1352	26	83
*CT2HKY	616	30	5	17

Republic of Kosovo

*Z66BCC	100	10	3	7
(OP: DO2XX)				

Romania

YO3RU	775,376	1360	87	281
YO8BDW	446,224	907	85	249
YO3GNF	345,153	727	73	236
YO2AA	98,235	316	45	140
*YO7SR	619,440	1127	81	267
*YO8/LZ4UU	215,298	726	53	190
*YO6EL	183,222	493	57	186
*YO4RST	177,375	399	58	157
*YO5PUV/P	29,376	150	34	74
*YO8TNB	19,497	219	12	55
*YO3CIY	15,886	103	27	67
*YO7PED	15,330	156	18	55
*YO7MPI	11,954	97	28	58
*YO2LTA	7,695	140	11	46
*YO4CSL	7,260	56	27	39
*YO7HBY	7,105	121	9	40
*YO4GOU	4,608	70	16	48
*YO9HG	3,290	65	12	35
*YO7HHE	1,476	49	8	28
*YO8RZJ	1,352	57	5	21
*YO9BNP	700	20	10	15
*YO4BEX	13,860	179	12	54
*YO5OHY	6,468	67	15	29

Sardinia

*ISØPAH	6,222	64	18	43

Scotland

GM2V	120,328	379	37	132
(OP: GM3WOJ)				
MM3T	*48,438*	*303*	*22*	*59*
GM2Y	8,480	96	13	27
(OP: MMØDXH)				
*GM9C	78,370	383	36	134
(OP: MMØGHM)				
*GM3ZDH	17,024	216	12	52
*GM7OAW	7,236	78	18	49
*MMØXDG	4,945	99	9	34

Serbia

YT3D	2,435,860	2711	121	387
YTØW	754,579	1414	76	213
(OP: YU1JW)				
*YT2VP	42,799	231	36	91
*YU7XW	32,508	255	22	64
*YT2MDM	10,368	138	23	73
*YU4PTL	5,368	88	11	50

Sicily

IT9DWF	3,465	91	11	44
IT9NSM	*3,403*	*31*	*20*	*21*
*IT9FRX	411,669	1156	57	180
*IT9EWR	126,260	596	27	91
*IT9BGE	54,480	225	37	83
*IT9IRL	10,184	118	19	48

Slovak Republic

*OM4IK	208,025	573	61	204
*OM6APR	55,645	287	32	123
*OM3CDN	34,840	257	26	108
*OM8AGA	25,536	211	20	76
*OM8JP	14,381	155	18	55
*OM7SR	2,940	72	9	33
*OM7ANT	2,360	21	19	21
*OM7AT	500	20	8	17

Slovenia

S5ØLD	*21,597*	*172*	*18*	*51*
*S57NAW	324,065	601	81	248
*S57YB	217,476	549	63	189
*S56C	133,425	439	51	174
*S53WW	111,930	317	52	130
*S53KS	35,910	197	29	76
*S53NW	25,288	440	7	51
*S57WW	20,520	160	23	85
*S5ØBH	1,862	41	11	27

Spain

EB5A	4,027,944	3507	127	425
EA5DFV	2,543,590	3072	99	307
EA3CI	2,125,164	2464	100	333
EC7R	545,904	1973	33	111
EE3A	522,692	1327	37	112
(OP: EA3ATM)				
EA3HJO	230,396	625	61	180
EC5C	29,500	190	17	42
EA7IYF	17,556	134	31	83
EA5GVV	1,064	23	8	20
*EE2A	175,689	415	62	181
(OP: EA2SN)				
*EA1HTF	90,288	280	51	158
*EA3HLF	87,044	298	50	138
*EA3T	83,260	295	32	83
*EA3W	54,576	216	38	106
*EA4GJT	36,237	172	37	104
*EB3AKL	22,011	132	27	60
*EA5AML	21,912	138	27	61
*EA5JDG	16,833	119	29	64
*EA4ESM	15,660	105	24	63
*EA1BCK	14,973	184	13	56
*EA4WF	10,890	87	19	47
*EA4FIT	10,863	79	24	47
*EA4EQD	10,296	79	21	45
*EB3A	7,535	67	18	37
*EA2AVM	6,273	75	12	29
*EA2XG	960	27	6	18
*EA2BSJ	324	16	11	16
*EA3TJ	19,570	135	26	69
*EA4U	8,040	68	21	46

Sweden

SEØDX	204,765	401	69	186
SM3PZG	47,082	228	40	93
SFØD	30,345	285	19	86
(OP: SMØDSF)				
SM6YEC	28,380	172	30	80
SD1A	14,472	126	16	51
(OP: SM1TDE)				
SE3T	405	9	6	9
*SJ7M	106,536	399	45	139
*SGØM	94,326	356	46	153
(OP: SAØAQT)				
*SA6CCZ	20,904	174	22	82

Switzerland

*HB9FLX	27,480	137	39	81
**HB9GFP*	*198*	*6*	*6*	*5*
*HB3XAG	110	6	5	6

Ukraine

*UT3SO	198,900	584	53	202
*US6IKF	79,610	191	68	122
*UW8SM	77,264	283	47	129
*US7UK	50,616	188	53	118
*UR1HR	43,624	124	49	84
*UR5WCQ	35,105	331	17	68
*UR5UJ	29,475	155	39	92
*UT7NY	10,241	198	8	41
*UX3UU	665	15	9	10
*UT5UUV	1,792	56	5	23

Wales

GW1W	50,634	332	18	69
(OP: EA1DDO)				
*MW8R	130,848	655	27	89
(OP: GW4SHF)				
*GW4HBK	102,612	310	48	156
*GW4W	43,040	218	19	61
(OP: GW4EVX)				

OCEANIA

Australia

VL2A	1,179,570	1829	82	164
VJ3O	66,708	232	29	80
(OP: VK3TX)				
VK4QS	54,610	173	52	75
VK5MK	11,826	74	33	40
VL2G	2,760	48	11	13
(OP: VK2GR)				
*VK4Y	136,818	299	74	124
*VL2W	33,396	119	50	71
*VL6K	2,356	30	16	15
(OP: VK6WX)				
*VK3GF	1,311	28	8	11
*VK7DW	646	16	9	10
*VK5COL	435	14	7	8
*VK5UE	18	4	3	3

Brunei Darussalam

V85RH	1,939,839	2264	108	211
(OP: JO1RUR)				

Hawaii

WH7T	4,440,352	4438	117	227
(OP: WH7W)				
AH6FC	29,798	126	42	52
*KH6CJJ	1,060,811	1659	88	135
*KH6XX	48,675	264	34	41

Indonesia

YB1AYO	106,470	217	66	116
YB8UTI	105,076	395	38	71
YC8DUL	79,902	223	43	95
YB2MM	47,988	193	23	70

YB4PE	24,738	117	31	62
YB8RVI	23,925	181	30	45
YBØKXO	22,302	105	48	70
YB9YKU	18,944	122	22	42
YB1RQX	10,332	64	24	39
YB3BLJ	10,241	77	15	34
YB8SHY	6,456	102	11	13
YB2SPP	5,159	94	24	43
YB9YSS	2,438	59	10	13
YC2DMA	2,412	51	16	20
YC1CUN	2,093	36	10	13
YB2XDU	1,400	30	10	10
YC7LTE	1,232	23	10	12
YB1EQI	861	26	8	13
*YB8RW	87,048	370	41	52
*YB9GV	79,776	423	22	50
*YC9DPO	73,359	220	51	92
*YC3RJL	61,656	307	26	58
*YC5NBY	26,208	104	41	71
*YCØOXA	20,398	104	33	61
*YB1KEL	18,096	151	26	61
*YB3BGM	16,461	113	18	41
*YB4NY	16,284	121	18	41
*YC8FEE	15,189	102	26	35
*YB1DUU	14,356	118	24	50
*YB8JEC	11,124	94	21	33
*YB3ATK	10,620	120	26	33
*YC2YWF	9,744	72	20	36
*YD8CPZ	9,630	79	16	29
*YB7JZ	7,950	89	14	36
*YBØULI	7,830	60	25	33
*YB6UAF	7,085	64	28	37
*YC2BDZ	6,552	56	18	34
*YB8XOB	5,632	53	16	28
*YB2CTE	5,152	49	20	26
*YC7LXI	4,445	73	14	21
*YB5MB	4,081	77	21	32
*YB8MJG	3,888	55	13	23
*YB1HDR	2,820	38	7	23
YC3RNW	*2,160*	*32*	*9*	*18*
*YB7VGB	2,145	27	20	19
*YG8FX	1,200	39	9	11
*YD9UAN	1,166	28	11	11
*YC2COM	888	63	10	14
*YG1AWS	780	24	6	9
*YF9UBD	756	22	8	10
*YB2YEN	736	15	11	12
*YB1EIG	527	29	7	10
*YF8FY	518	22	5	9
*YB5HPT	374	26	7	10
*YB7CV	320	20	3	5
*YD2HBF	220	12	4	6
YG3AJJ	*49*	*4*	*3*	*4*
*YC8AKU	27	7	4	5
*YB1TIA	3,600	37	16	24
YD8SPY	*2,349*	*37*	*11*	*16*

Mariana Islands

*AHØ/ WA7WJR	30,420	260	21	24

New Zealand

ZL2ABK	1,113,372	1696	75	159
ZL2GD	38,918	131	48	74

Philippines

DU1IVT	152,146	457	48	79
4F3FSK	266	18	3	4
*DV1UCX	93,730	559	23	47
*DV1DLX	76,024	422	25	43
*DW7NDM	42,631	209	37	52
*DU1VGX	15,946	105	22	45
*DU1VNA	11,152	126	15	26
*DU1JM	5,497	93	11	12
*DU2R	4,141	62	17	24
*DW2FCR	2,160	57	8	12
*DU8WP	435	49	5	10
*4I1MVI	35	9	3	4
*DV9IGT	672	18	6	8

Wallis & Futuna Islands

*FW1JG	117,656	290	59	95

SOUTH AMERICA

Argentina

LU1VM	282,997	823	45	98
LU9MBY	204,864	820	28	69
LP1A	86,576	405	40	72
LQ5A	73,130	278	31	72
*LQ5D	169,078	737	22	69
		(OP: LU9DA)		
*LV1E	77,271	271	50	79
*LW3DBW	47,005	260	24	61
*LU9LZR	13,416	120	40	46
*LU5EVK	9,520	105	17	23
*LU9CSM	4,560	102	20	28
*LU7AOW	2,144	57	16	16
*LU5MEC	752	40	7	9
*LU1RAF	364	33	5	8
*LV4V	20,916	151	15	48
		(OP: LU4VZ)		

Aruba

P4ØT	5,338,158	3913	118	351
		(OP: VE3DZ)		

Brazil

PY2KJ	1,360,072	1452	85	241
PY5WW	403,192	1453	25	76
PY2MM	201,300	619	40	82
ZW5B	39,120	301	14	34
		(OP: LU8EOT)		
*PY2NY	375,972	1165	32	82
*PY2RE	235,710	595	55	107
*PY2RSA	228,796	877	24	70
*ZW2T	170,430	566	25	89
		(OP: PY2RKG)		
*PU2MIW	44,116	214	20	62
*PU2YBW	39,216	210	18	58
*PY2YVN	38,236	199	29	50
*PY1WE	37,060	221	36	73
*PY2DPM	22,968	138	33	54
PY2KO	*11,475*	*81*	*19*	*32*
*PU2TNT	8,379	84	15	34
*PY2BRP	7,052	76	10	31
*ZV2F	4,284	54	24	27
		(OP: PY2SFA)		
*PY1EZ	3,589	43	14	23
*PU3BAD	2,175	39	12	17
*PT2JAR	2,010	46	13	17
*PP5DCM	1,710	27	13	17
*PU2MCY	777	21	9	12
*PU8PJG	319	61	10	19
*PY2OF	169	7	6	7
*PY2VTR	140	9	7	7
*PY2BN	111,706	418	32	69

Chile

CB8E	1,374,720	2138	77	163
		(OP: CE8EIO)		
CE2LE	494,382	1215	59	99
CE4PS	307,165	975	28	87
XQ3SK	232,824	776	49	60
CE3TL	18,350	159	18	32
*CE1UGE	85,790	324	47	68
CE5UBR	*64,015*	*426*	*18*	*41*
*CB3CE	32,883	167	41	56
		(OP: CE3KWA)		
*CA2SLJ	26,455	260	18	37
*XQ5CIE	26,398	174	19	48
*XQ5OS	25,550	170	24	49
*CE4CBJ	17,370	118	41	49
*CE6FYN	7,869	114	16	27
*CA6NFR	2,544	82	19	29
*CE2CFK	2,146	62	16	21
*CE3PCG	1,400	28	17	18
		(OP: CE3BC)		

Colombia

*HK4CM	8,476	69	17	35
*HK4RB	7,824	67	17	31

Ecuador

*HC2TKV	69,036	564	16	28

Peru

OA4SS	1,228,766	2125	67	135
OA4DAG	545,532	1266	47	122

Suriname

*PZ2YT	725,000	2218	27	89

Uruguay

*CX9AU	82,288	310	53	86

Venezuela

*YV1GIY	28,598	170	23	56

YOUTH

NORTH AMERICA

United States

District 2

*N2NJW	825	14	11	14

District 4

*NR1K	144,504	255	65	158
*NØJMP	36,366	125	31	83
*K4IEY	9,675	63	20	55
*W8QI	975	16	11	14
*KQ4AKR	384	9	7	9

District 6

*KN6VGL	352	9	7	9

District 8

KE8HBV	540,792	626	83	250
*KE8RJU	142,064	259	60	148
*N8AJM	29,972	104	41	77
*NC8R	14,630	121	32	45

District 9

KD9V	147,500	246	87	163
K9ZN	*9,936*	*73*	*23*	*49*

District Ø

*KEØWPA	35,646	173	23	55

Canada - District 3

*VE3GKT	131,338	287	61	133
*VE3OMV	76,428	239	41	91

ASIA

Asiatic Russia

District 9

*UB8QBD	1,254	24	4	15

Asiatic Turkey

*TA7YLY	70,875	212	30	95

China

*BD4VGZ	256,795	527	58	145
*BG7LDM	12,012	266	18	26
*BG5UZW	2,775	45	17	20
*BD8AQY	2,405	36	15	22
*BG5GDP	688	52	7	9
*BH3XZT	525	34	12	13
*BGØDFS	408	21	10	14
*BH6AOV	174	33	12	17
*BG5VAR	70	15	5	5

Cyprus

5B4AQT	1,152,580	1023	93	310

India

*VU2EKR	2	1	1	1

Japan

District 1

*JG1CMT	6	1	1	1

District 8

*JM8PSY	11,627	91	33	44

District Ø

*JJØTUC	448	20	5	9

EUROPE

Austria

OE8DDX	291,555	1356	42	167
OE9SEV	19,376	148	24	88
OE6NOA/P	*2,805*	*35*	*16*	*17*

Bosnia-Herzegovina

E7ØAW	943,236	1689	92	307
*E74CX	27,064	148	36	100

Croatia

9A2U	19,760	126	23	57
		(OP: 9A3BWP)		
9A/DK7ON	3,402	54	13	29
*9A3GVJ	594,392	1023	92	290

Czech Republic

OK1LEV	154,744	436	60	172
OK2HA	624	20	5	11

England

*M7ELC	12,103	99	30	61

Fed. Rep. of Germany

DK6SP	1,085,640	1129	123	422
DK5AV	386,884	816	72	239
DC2CL	216,800	371	73	198
DL7PIA	95,918	316	57	142
DG5LW	41,021	221	29	98
DN4AN	297	11	5	4
*DL2ALY	161,200	379	63	185
*DM5TM	68,952	252	47	122
*DO8JL	28,512	109	35	64
*DK1YH	5,808	118	8	36
*DO2LYB	5,764	69	12	32
*DL4XT	3,306	48	13	25
*DO3OLI	2,898	60	12	30
*DN2TN	550	22	6	16

France

F4IDC	249,240	685	35	99

Greece

*SV8SYK	19,602	120	30	51

Hungary

*HA1BB	157,740	300	75	164
*HA8MBM	735	53	4	17
*HG8CK	644	35	5	18

Ireland

*EI8KW	14	4	3	4

Italy

IN3HKZ	*130,830*	*599*	*44*	*166*
*IU7QCK	1,224	31	9	15

Lithuania

*LY5AX	167,014	385	58	168
*LY3LB	216	18	3	9

Luxembourg

LX7I	757,520	1834	41	129
		(OP: F4HWS)		

Netherlands

*PDØW	23,205	183	27	78

Poland

*SP3GTP	180,632	500	60	208
*SP3LM	64,413	276	40	113
*SQ8NT	25,620	182	26	96
*SP4DIR	6,784	106	15	49
*SP9DLS	3,268	83	6	32
*SQ9ALW	2,204	40	12	26
*SQ9B	40	8	3	7

Romania

*YO2NWW	22,268	166	21	55
*YO5DBM	5,775	87	12	43

Serbia

YT5DXX	175,890	1185	27	103

Spain

*EA2ESK	25,839	158	27	72

OCEANIA

Australia

*VK4OTZ	896	21	14	14

Indonesia

*YC5AKO	4,440	69	16	24
*YC1AUI	4,312	36	21	28
*YD2UWF	2,080	33	11	21
*YD3CZV	315	13	7	8
*YG3ARL	140	8	3	4
*YC1LJT	5,328	60	14	22

Mariana Islands

KHØUA	922,209	1501	69	150

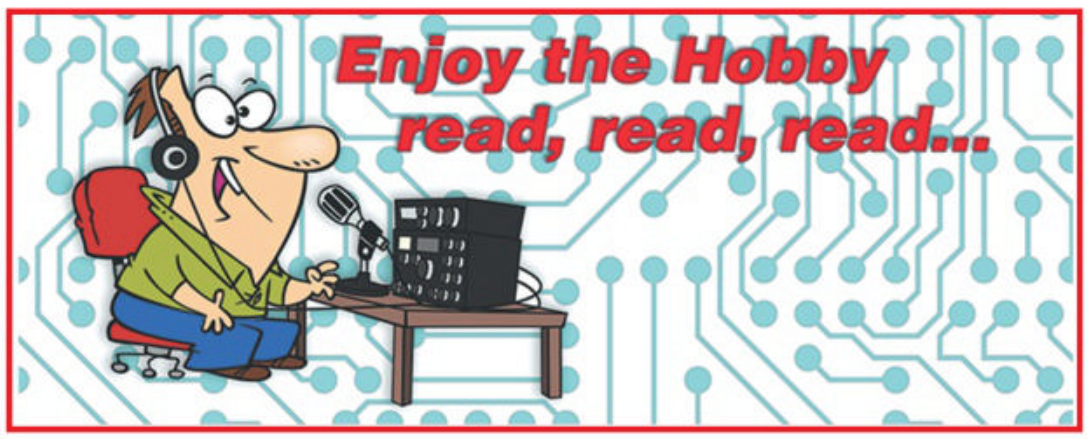
New Zealand

ZL1CAP	2,940	36	12	18

SOUTH AMERICA

Brazil

*PY2POA	30,281	135	37	70



Oops…

1 is the *Loneliest* Number … Especially When It's *Left Out*!

In K4HRK's March article, "*A Collapsible Tri-Band Antenna for 6 Meters, 2 Meters, and 70 Centimeters with a 10-Meter Option*," we accidentally overstated the SWR of his antenna at the various band edges (leaving out a very important "1."). Under "Performance," the first paragraph should read as follows:

Using my VNA, these are my standing wave ratios on different bands:

- 10 meters – 1:1 center of band and 1.6:1 at the edges
- 6 meters – 1:1 center of the band and 1.9:1 at the edges
- 2 meters – 1.3:1 flat across the band
- 70 centimeters – 1:1 flat across the band

We regret the error and hope this makes you feel even better about trying this antenna!

Check Logs

2EØXSH, 3V8SS, 4X4LF, 4Z4AK, 4Z5ML, 9A2WB, 9A3VM, 9A5W, 9A6TT, 9K2NO, 9K2YD, 9K2YM, A41CK, AE8RN, AG7YX, BA5CW, BD4SDX, BD7OB, BD8ALD, BG2WV, BG3HJT, BG3IPT, BH1MCB, BH5HGI, CT1DVV, CT1EPC, CX2AQ, D44PM, DF3OL, DF4FR, DF5RF, DF7AT, DF9HI, DF9XI, DG8OBN, DJ4CW, DJ6TK, DJ6YX, DK1DSA, DK5OCE, DK7A, DLØFIS, DL1YAB, DL2DXA, DL3AG, DL5JAG, DL6MRM, DL7JV, DL8TV, DL8WJM, DL9YBI, DM1PL, DM4VPF, DM5JBN, DN4PSG, DPØPOL, DU8ZN, E74O, EA1IQ, EA1S, EA2QU, EA3BP, EA3D, EA3RR, EA4EER, EA4EM, EA4LU, EA5IYI, EA6SA, EA7DQH, EA7GTJ, EA7P, EA8DNF, EC7B, ED8W, EI6KW, EI7CC, EI7KD, ER3DX, ES4RD, EU1FQ, EU1KY, EW1I, EW4RF, F1UBA, F4EUG, F4ICR, F4IYB, F6HQP, F8FQJ, G3PXT, G4NXG, G5W, G6MSY, G7COU, GIØLDI, GU4EON, GW4BKG, HAØGK, HA1AG, HA2MM, HA7VK, HA8BE, HA8JV, HA8QZ, HA8TP, HB9DOS, HB9EYP, HB9H, HB9HRJ, HK3CJJ, HSØZDY, IØWBX, I3MTM, IIØI, IK1YDB, IK8NBE, IQ3TR, IT9AQR, IU2BHI, IU2LWL, IU8JLN, IV3IPS, IV3OKO, IW1ARB, IW1FRU, IW1GEU, IZ1KGK, IZ1UJE, J35X, JA6CNX, JH1BNC, JH4RUM, JR2VBK, JS6RTJ, JT1CS, JW7QIA, KØDS, KØGT, K3HW, K3SK, K4RSA, K6ZP, K9FW, KA2MGE, KC5QBG, KC7DC, KJ4QHL, KK7CJV, KM3T, KN6TTU, KO4YKW, LA2GKA, LA3T, LA5FBA, LA6VQ, LA9OI, LC5R, LU1VDF, LU7MCJ, LU8ADX, LY1LB, LY2BAA, LY5T, LZ1JZ, LZ1MC, LZ1ND, LZ1PUB, LZ1RGT, LZ1YF, LZ1YR, MØCVO, MØHFY, M6EAM, N1CFO, N2TPQ, N3IQ, N4EFS, N8BE, N8LLC, OE2E, OH1MIE, OH2IS, OH4SS, OH5BQ, OH7CW, OH8SE, OH9W, OK1CZ, OK1ES, OK1TA, OK1WCF, OK2BFN, OK2SG, OK2TJ, OL7K, OM2FY, OM8MF, PA1EJO, PA1TK, PA2LO, PA7JWC, PB8DX, PC3T, PG7V, PP5IP, PP5MGT, PU2KMM, PU2MBO, PU2XKK, PU3SDF, PY5DP, R2AA, R4KO, R7TJ, RA3TAR, RA3XDX, RA5AW, RA9AMO, RA9AU, RC3U, RM2A, RN3OG, RU3UR, RX3ASQ, RX3DTN, RX3XA, RX9WN, RZ2D, S5ØU, S52TW, S54E, S58WW, SA6JOF, SB3W, SD4C, SF6J, SI6V, SM6MSG, SM7IUN, SN2S, SN9AT, SO5O, SO5TC, SO6K, SO9I, SO9O, SP2EWQ, SP2LQP, SP3BP, SP3EMA, SP3J, SP4LVK, SP5AH, SP5GDY, SP5NZF, SP5RT, SP5Z, SP6CIK, SP6TRX, SP7CVW, SP7JPN, SP7MC, SP8SN, SP9BIJ, SP9DPM, SP9HWY, SP9LAS, SP9WLC, SQ1BSY, SQ5AM, SQ5CZP, SQ5RTI, SQ7BFS, SQ8L, SQ9ANS, SQ9C, SQ9CXC, SQ9MZ, SQ9S, SV1ME, SV2HXV, SV2RSZ, SV4FFL, SV9QCF, SX5P, TI2/N5NU, TK5MH, UAØSR, UA3AGW, UA6ACA, UA6JBX, UA6JQ, UN8PT, UR3CRO, UR5WCW, US5ETV, UT5UHX, UT7UW, VA2EW, VE2KTA, VE3OUI, VE7XFA, VK5MAV, VK6HDY, VU2PTT, VU3XIO, W1PL, W3JJ, W4JFK, W5RJR, W6MVT, W6YA, W7QF, W8DON, W8QZA, WB6UIA, WCØM, WIØP, WO1Z, YB1ACN, YB1AM, YB1CMJ, YB8MGN, YB8OBM, YC1FGH, YC7HSL, YC8SLX, YC9ENO, YO2BCO, YO3IPR, YO4RDW, YO7EY, YO9DF, YU1DW, ZL1JLA, ZL1TM, ZL2AYZ

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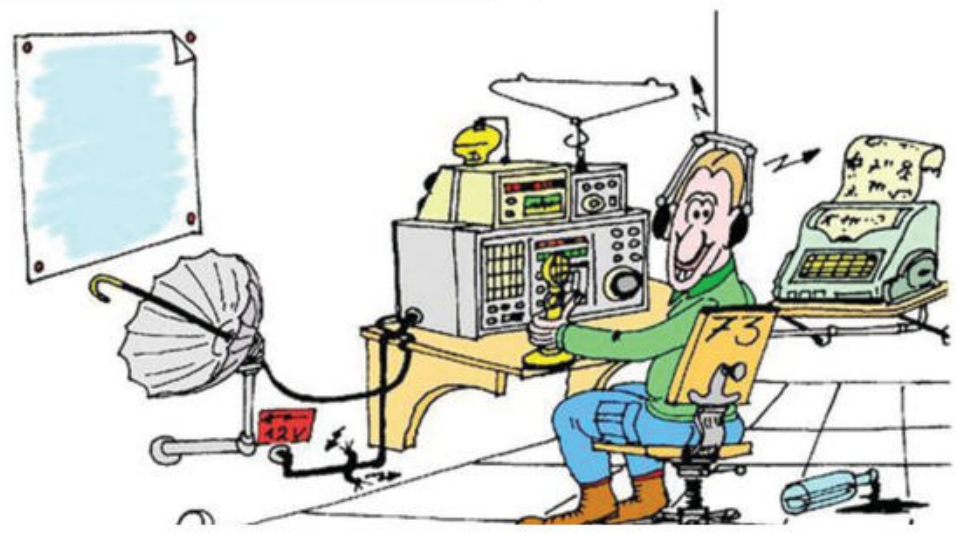
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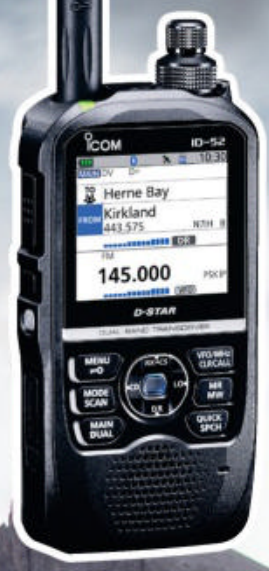
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