The RTTY Ditty, p. 66

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COMMUNICATIONS & TECHNOLOGY

APRIL 2022

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- Professor Heisseluft on Spectrum Rage, p. 25
- Winter Field Day, pgs. 56, 61

On the Cover: Gib Van Cleve, KEØPRK, of Ballwin, Missouri, sets up his VHF/UHF Yagi to attempt a Winter Field Day contact with the International Space Station. Details on page 80. Read about Winter Field Day on pages 56 and 61.

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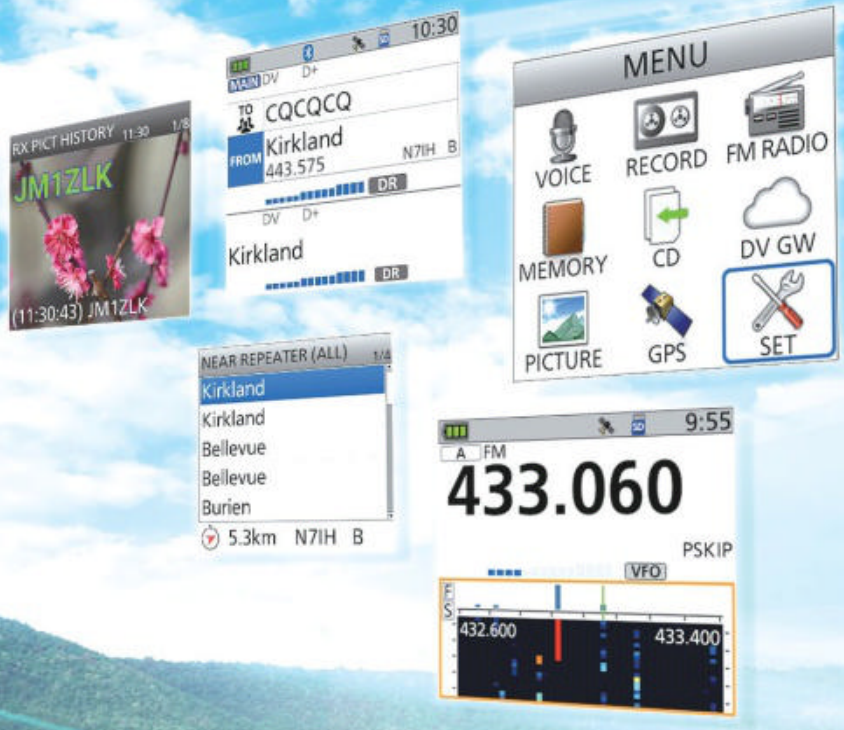

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ANNOUNCEMENTS

APRIL

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 2 and from 8 a.m. to noon, Sunday, April 3 at the Crossroads Arena, 2800 South Harper Road. Website: <http://acares.reiselt.com>. Talk-in 146.925. VE exams

MCKEESPORT, PENNSYLVANIA — The Two Rivers Amateur Radio Club will hold its 50th Annual Amateur Radio and Computer Show from 8 a.m. to 2 p.m., Sunday, April 3 at The McKeesport Palisades, 100 5th Avenue. Contact: Bill Powers, (412) 260-5699. Email: <atsfbill2@gmail.com>. Website: <www.trarc.net>. Talk-in 146.73. VE exams.

BRANSON, MISSOURI — The Four State QRP Group will hold OZARKCON from Friday, April 8 through Saturday, April 9 at the Stone Castle Hotel and Conference Center, 3050 Green Mountain Drive. Website: <http://ocon.rleepotter.com>.

CLAREMORE, OKLAHOMA — The Green Country Hamfest Inc. will hold the Green Country Hamfest 2002 from 4-9 p.m., Friday, April 8 and from 8 a.m. to 3 p.m., Saturday, April 9 at the Claremore Expo Center, 400 Veterans Parkway. Email: <info@greencountryhamfest.org>. Website: <www.greencountryhamfest.org>. Talk-in 147.09+ (PL 88.5). VE exams, DXCC / WAC / WAS / VUCC card checking.

BARTLETT, TENNESSEE — The Mid-South Amateur Radio Association will hold the Memphis FreeFest from 9 a.m. to 3 p.m., Saturday, April 9 at the Bartlett Station Municipal Center, 5868 State Road. Contact: Art Barnett, WA4PSS, (901) 619-5573. Email: <wa9pss@gmail.com>. Website: <https://tinyurl.com/mwv2n6ya>. Talk-in 147.21- (PL 107.2). VE exams.

BELLEVUE, NEBRASKA — The Bellevue Amateur Radio Club will hold the Bellevue ARC Spring Cleanup Hamfest from 9 a.m. to 3 p.m., Saturday, April 9 at the Reed Community Center, 1200 Lord Boulevard. Contact: Dennis Mitchell, KCØYKN, (402) 690-2587. Email: <kc0ykn@cox.net>. Website: <www.bellevuearc.org>. Talk-in 147.39+ (PL 131.8). VE exams.

CUYAHOGA FALLS, OHIO — The Cuyahoga Falls Amateur Radio Club will hold the 66th Annual Hamfest Electronics and Computer Show from 8 a.m. to 1 p.m., Saturday, April 9 at the Emidio and Sons Party Center, 48 E. Bath Road. Phone: (330) 790-1680. Email: <hamfest2022@cfarc.org>. Website: <www.cfarc.org>. Talk-in 147.270+ (PL 110.9) or 444.850+ (PL 110.9). Free VE exams.

NEW CASTLE, INDIANA — The Henry County Amateur Radio Club will hold its HCARC Tailgate II from 8 a.m. to noon, Saturday, April 16 at the Henry County Memorial Park, 2221 N. Memorial Drive. Contact: Steve Benson, (765) 529-6727. Email: <kd9ily@gmail.com>. Website: <http://w9ob.org>. Talk-in 147.390+ (PL 127.3).

RALEIGH, NORTH CAROLINA — The Raleigh Amateur Radio Society will hold the 48th Annual RARSfest and 2022 ARRL Roanoke Division Convention from 8 a.m. to 3 p.m., Saturday, April 16 at the Jim Graham Building-NC State Fairgrounds, 4285 Trinity Road. Contact: Jeremy Lindsley, K2HJX, (919) 523-9631. Website: <http://rarsfest.org>. Email: <ntorborg@me.com>. Talk-in 146.64 or 146.88 (PL 131.8). VE exams.

BRAINERD, MINNESOTA — The Brainerd Amateur Radio Club will hold the Brainerd Area Hamfest from 9 a.m. to 1 p.m., Saturday, April 23 at the Brainerd National Guard Armory, 1115 Wright Street. Website: <www.brainerdham.org>. Talk-in 147.225+. Card checking.

CENTER OSSIPEE, NEW HAMPSHIRE — The Lakes Region Repeater Association will hold its Spring Hamfest 2022 from 8 a.m. to 2 p.m., Saturday, April 23 at the Center Ossipee Town Hall, 55 Main Street. Email: <w1bstclub@gmail.com>. Website: <www.w1bst.org>. Talk-in 147.03

DE MOINES, IOWA — The Des Moines Radio Amateurs' Association will hold its 2002 Hamfest from 8 a.m. to 1 p.m., Saturday, April 23 at the Iowa State Fairgrounds-Elwell Family Food Center, 3000 E. Grand Avenue. Email: <info@dmraa.com>. Website: <http://dmraa.com/hamfest>. VE exams, DXCC card checking.

GALES FERRY, CONNECTICUT — The Radio Amateur Society of Norwich will hold the RASON Auction beginning 10 a.m., Saturday, April 23 at Our Lady of Lourdes Church Hall, 1650 CT Route 12. Contact: Mark Noe, KE1IU, <ke1iumark@gmail.com>. Website: <www.rason.org>. Talk-in 146.730- (PL 156.7).

GEORGETOWN, DELAWARE — The Sussex Amateur Radio Association will hold the Georgetown Hamfest and Delmarva Radio Electronics Expo and the 2022 ARRL Delaware State Convention from 7:30 a.m. to 2 p.m., Saturday, April 23 at the Cheer Community Center, 20520 Sand Hill Road. Contact: Jamie, W3UC, (410) 202-7690. Email: <hamfestdelware@gmail.com>. Website: <www.radioelectronicsexpo.com>. VE exams.

MOBILE, ALABAMA — The Mobile Amateur Radio Club will hold the Mobile Hamfest from 8 a.m. to 1 p.m., Saturday, April 23 at the Abba Shrine Temple, 7701 Hitt Road. Contact: David Huber, KK4JJM, <davidhuber@bellsouth.net>. Talk-in 146.94.

SONOMA, CALIFORNIA — The Valley of the Moon Amateur Radio Club will hold its Annual Hamfest from 8 a.m. to noon, Saturday, April 23 at the First Congregational Church of Sonoma, 252 W. Spain Street. Website: <www.vomarc.org>. Talk-in 145.350-. VE exams, fox hunt.

ATHENS, OHIO — The Athens County Amateur Radio Association will hold the Athens Hamfest from 8 a.m. to noon, Sunday, April 24 at the Athens Community Center, 701 East State Street. Contact: Carl Denbow, N8VZ, (740) 591-8471. Email: <carl@n8vz.com>. Website: <www.ac.ara.org>. Talk-in 145.15. VE exams.

ODENTON, MARYLAND — The Maryland Mobileers Amateur Radio Club will hold the MMARC 2022 Spring Hamfest from 7:30 a.m. to noon, Sunday, April 24 at the Odenton Volunteer Fire Department, 1425 Annapolis Road (Rt. 175). Contact: Bruce (410) 456-2500. Email: <bmcpherson73@verizon.net>. Website: <https://tinyurl.com/2p935p6k>. Talk-in 146.805- (PL 107.2). VE exams.

THOMPSON, CONNECTICUT — The Eastern Connecticut Amateur Radio Association will hold its Amateur Radio Flea Market from 8 a.m. to noon, Sunday, April 24 at the Raceway Restaurant at Thompson Speedway, 205 East Thompson Road. Contact: Jon, KA1MPG, (508) 943-4467. Email: <jonas217@verizon.net>. Website: <www.ecara.net>.

MILLERSBURG, OHIO — The RV Radio Network will hold its 2022 Spring Eyeball Rally from Monday, April 25 through Friday, April 29 at the Berlin RV Park & Campground, 5898 State Route 39. Website: <www.rvradionetwork.com>. Talk-in 146.55 or 146.48.

(Continued on page 30)

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HAM RADIO NEWS

$35 FCC License Fee Kicks In April 19th

The FCC's new $35 filing fee for nearly all amateur radio license applications takes effect on April 19th. The fee was among many adopted in December 2020 but the effective date was delayed until the Commission's computer systems could be upgraded to handle the changes. The new fee applies to most license-related applications, including new licenses, renewals and vanity call sign requests. It does not apply to license upgrades or purely administrative filings, such as a change of name or address. The fee is separate from the exam fee collected by most volunteer exam teams and is paid directly to the FCC via its Universal Licensing System website, <https://tinyurl.com/s799xxaw>. For more details, visit <https://tinyurl.com/44m8dmxt>.

Dayton Awards Announced

The Dayton Hamvention® Awards Committee has announced its 2022 honorees. The Dayton awards are considered among the most prestigious in amateur radio. The Amateur of the Year award goes to the Hamvention's own Jim Simpson, KF8J. A member of the Hamvention Committee continuously since 1973, Simpson twice served as General Chairman and has held a variety of other posts both within the Hamvention Committee and the parent Dayton Amateur Radio Association. He also founded the Xenia Weather Radio Network after the town that now hosts the Hamvention was devastated by a tornado in 1974, and has been instrumental in forming and continuing to help with the 4-H Amateur Radio Club in Xenia.

This year's Technical Achievement award goes to Adam Farson, VA7OJ/AB4OJ, in recognition of his decades of service in providing independent technical support for various HF radios, particularly ICOMs. He also conducts and reports on independent measurements of nearly all new radios, and has produced the only data radio for hobbyists that clearly delineates the performance of software defined radios (SDRs) across the spectrum of band noise levels.

The Hamvention's Special Achievement award this year goes to Kerry Banke, N6IZW. A microwave RF engineer, Banke has been a key contributor to the Amateur Radio on the International Space Station (ARISS) program, designing and building both flight hardware and test equipment to certify the spaceworthiness of ARISS gear.

The 2022 Club of the Year is Ohio's Highland Amateur Radio Association, based in rural Highland County. The club has nearly 150 members, maintains five repeaters, hosts two weekly nets with average attendance of 28 hams, and holds both monthly and bi-monthly programs. Members are involved with emergency communications, Parks on the Air, and volunteer examining.

The awards will be presented at the Dayton Hamvention in May, the first in-person gathering for the event since 2019.

Friedrichshafen On, "HamCamp" Off

The organizers of Europe's largest hamfest, "Hamradio" in Friedrichshafen, Germany, say the show will return in-person this year, but the co-located youth "HamCamp" will not be held. According to the Deutscher Amateur Radio Club (DARC), the available facilities could not safely house over 100 young hams and adult supervisors in accordance with Covid protocols. DARC says it hopes to resume HamCamp in 2023.

SP9FIH, 3DAØRU, Win 2021 Cass Awards

Janusz Wegrzyn, SP9FIH, has been named the single-op winner of the 2021 Cass Award, presented by ClubLog, DXLab, and the Northern California DX Club to the DXpeditions that work the greatest number of different amateurs. Wegrzyn was honored for contacting 9,684 unique stations during his two-week, one-man DXpedition to Sint Maarten, where he operated as PJ7P. This is his fifth consecutive Cass Single-Op award.

The 2021 Unlimited Cass Award, which goes to DXpedition groups, was awarded to 3DAØRU for its October operation from Eswatini. The group of eight Russian, Czech and Polish hams made contact with 24,985 separate stations during the operation, a new record for this award category. Complete rules are available at <www.cassaward.com>.

Radio Fallout from Ukraine Invasion Expands

Newsline reports that Russia and Belarus have been indefinitely suspended from the CEPT, the European Conference of Postal and Telecommunications Administrations, in the wake of the invasion of Ukraine. This affects amateur radio operation in Europe, as CEPT members accept amateur licenses from other member countries. This action suspends the automatic authority of hams from Russia and Belarus to operate in other parts of Europe, and of hams from other CEPT signatories (including the U.S.) to operate in Russia and Belarus.

Spratlys Get Even More Dangerous for Hams

The Spratly Islands in the South China Sea have long been on ham radio DXers' most-wanted lists, and getting there to operate has always been dangerous because of competing claims to the islands by various countries. Now, the Associated Press reports that China has "fully militarized" at least three of the islands in the region, quoting a top U.S. military commander as saying the islands have been equipped with anti-ship and anti-aircraft missile systems, fighter jets and laser and jamming equipment. According to U.S. Indo-Pacific Commander Adm. John C. Aquilino, this is part of what he describes as China's largest military buildup since World War II. DXpeditions to the area are strongly discouraged.

Milestones: JH1AJT, W2RS, Silent Keys

CQ Amateur Radio Hall of Fame member "Zorro" Miyazawa, JH1AJT, became a Silent Key in late March, according to DXNews.com. In addition to his DXing activities around the world, which included bringing along groups of other operators to be on the air while he conducted business in various locations, Zorro was the founder of the Foundation for Global Children, an international humanitarian organization focused on helping provide basic supplies and educational opportunities for children around the world.

Also leaving us in March was amateur satellite pioneer Ray Soifer, W2RS. In 1960, he was on one end of the first known amateur radio contact via satellite ionization trail reflection, according to the AMSAT News Service. In addition, Ray was at one end of the first-ever intersatellite relay communication between two earth stations — using OSCARs 6 and 7 — in any radio service. Soifer held many positions in the AMSAT organization, including Executive Vice President and acting President. He also served as chair of the IARU (International Amateur Radio Union) satellite forum and the IARU Region 2 VHF/UHF Committee.

AMSAT Receives Major Grant for Spaceframe Development

The AMSAT News Service reports that the amateur satellite group has been awarded a grant of close to $100,000 by ARDC (Amateur Radio Digital Communications) for development of a "3U" spaceframe with deployable solar panels. This structure — the size of three standard cubesats — will serve as the mechanical platform for AMSAT's GOLF series of high-altitude satellites and a new generation of low-orbit FM satellites, according to ANS. The GOLF satellites are intended for higher elliptical orbits, providing longer access times and greater coverage areas for hams here on the planet. AMSAT stressed, though, that as generous as the ARDC grant is, another $231,000 is needed to cover additional hardware development and launch preparation costs for just one GOLF satellite.

CONTENTS

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FEATURES

FOCUS ON: Russia's invasion of the Ukraine in late February raised the spectre of a new Cold War and led to immense sanctions against Russia and Belarus. See how the war has affected ham radio and CQ contests on page 8 and 12. Speaking of contests, the granddaddy of them all, the CQWW DX SSB, had another record breaking year. See how you did on pages 14 and 92.

COLUMNS

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Adv 3/22/ QST

ZERO BIAS: A CQ Editorial

BY RICH MOSESON,* W2VU

CQ, The "Spirit" of Ham Radio, and the War in Ukraine

It appears that *CQ* Publisher K2MGA and I have single-handedly (dual-handedly?) destroyed amateur radio by taking what we believe is a morally essential stand in response to Russia's unprovoked invasion of Ukraine and its tactics of specifically bombing civilian targets (actions which the U.S. government has categorized as war crimes). At least, that's the impression one gets from reading some of the e-mails we've been receiving ever since deciding that, at least for the WPX SSB Contest in late March, stations in Russia and Belarus would not be eligible for awards or trophies, and that contacts with these stations would have no contest point value. We have more specifics, along with a sampling of correspondence, both pro and con, on page **XX**. But I'd like to use this space to provide some perspective, as well as a more thorough explanation of the factors that led up to our decision.

In a nutshell, we started out by closely monitoring the discussions on the private CQ Contest Committee email reflector, representing the full spectrum of opinions. These guys, individually and collectively, are brilliant, highly-educated and very eloquent. Dick and I always value their perspectives.

Here's the basis of our decision: While we strongly respect amateur radio's tradition of staying above political frays, we feel that this situation is not about politics and debating which person or proposal is the best choice for dealing with a particular situation. Rather, this is about an unprovoked invasion of one sovereign country by another, compounded by Russia's deliberate targeting of civilians, as seen in repeated missile strikes on residential areas, hospitals and shelters. This is not politics; it is, as the U.S. State Department says, war crimes.

It is also highly reminiscent of the days leading up to the start of World War II, at which time the western powers pursued a policy of "appeasement" of the Nazis in hopes that they'd be satisfied with taking over just a few little countries. I've been reading up on those times and Russian President Vladimir Putin is taking pages directly out of Adolf Hitler's playbook, taking over Crimea (without much of a response by the West), encouraging ethnic Russians in eastern Ukraine to pursue independence, and using false-flag incidents to justify the invasion. These are all identical to tactics used by Hitler. In the 1930s, the West didn't respond until he invaded Poland. Will we wait for that today as well? This is not politics, this is life-and-death for Ukrainians and a possible prelude to World War III. We need to do all that we can to prevent that and we collectively need to stand up to Putin and say "No! This is not acceptable. There are consequences for your actions."

We understand that most Russian and Belorussian amateurs have no direct impact on their governments' policies or actions, and that many of them privately oppose the war. Many others support it, though (particularly if they believe Putin's propaganda), and we are aware of at least one Russian ham who has put together a literal hit-list of Ukrainian hams - identified by name and call sign - who are to be executed if captured. Talk about violating the spirit of amateur radio! (And this information comes from very reliable sources.)

We came to the conclusion that silence is complicity, and that we could not in good conscience sit back and pretend that none of this is happening and that all is right in the world, especially in our little ham radio world. It is not, and we must join hundreds of other private entities and sports federations in refusing to conduct business as usual with Russia and Belarus for as long as the atrocities in Ukraine continue.

The real ham spirit: Val, UT7NY (right), has taken in his friend Victor, UR8IDX, and Victor's wife, whose home in Mariupol was destroyed by Russian shelling. (Photo courtesy UT7NY)

Some of our correspondents suggest that our policy will discourage open communications between amateurs in different countries and will play into Putin's efforts to close off external communication channels to Russian citizens. With all due respect to our contests, an exchange of call signs and "59 123" is hardly a meaningful conversation about world affairs. In addition, we are not telling Russian amateurs that they may not participate in our contest, nor are we telling other amateurs that they may not contact stations in Russia. We are saying that if you do, those contacts will not be considered in your contest scores. That's all.

This is not going to destroy the "purity" and integrity of amateur radio, as some are suggesting (although creating amateur radio-based hit lists might); and our policy won't cause the Russian people to rise up and overthrow Putin. But if our actions add to the discomforts caused by government economic sanctions and the refusal of many private entities to conduct business in Russia, resulting in greater pressure on Putin to end the war, then so be it. We are sorry if non-involved amateurs feel inconvenienced by our policy, but nobody is dropping bombs on their houses and missiles on their hospitals. We stand by our decision.

We're Back in Print!

After six long months of digital-only purgatory, we are very excited – and greatly relieved – to have our print edition back again. It's a very long story, but a federal "economic disaster" loan that we needed to kickstart everything after Covid-related setbacks was repeatedly delayed until nearly the end of March. With that funding now in hand, we can restart the presses, get printed products back out to our non-digital readers and go back to the usual struggles to break even faced by most small businesses most of the time.

All subscribers will get the number of issues they've paid for – all print subscriptions have been extended by the number of missed issues, and digital copies of those missed issues are available for free download at < https://spaces.hightail.com/space/NdX2BByxbQ >. We're glad to finally be back in print and plan to stay there for a very long time to come. Your patience, support and understanding throughout these past several months mean more to us than you can imagine. Thank you!

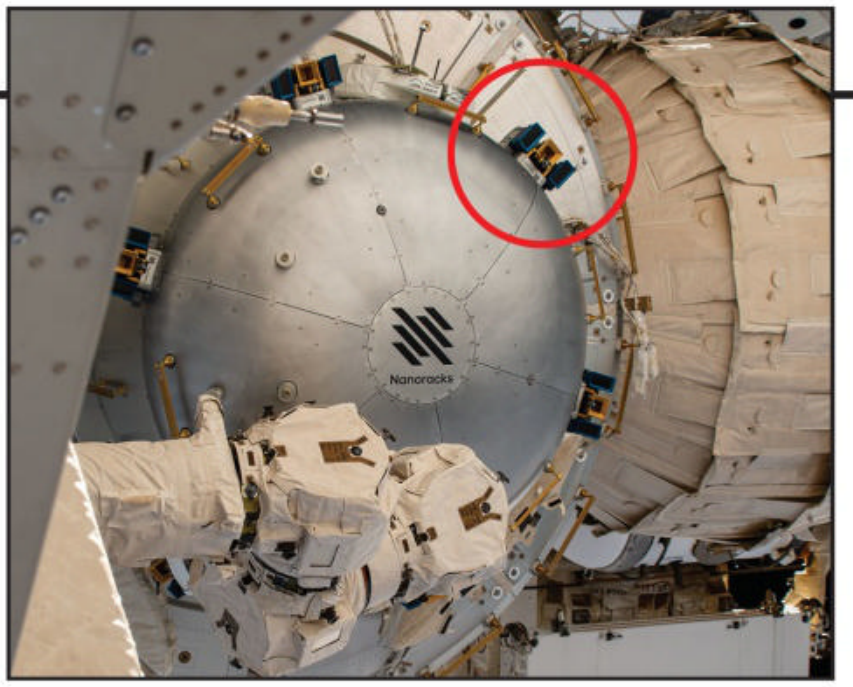
*Email: <w2vu@cq-amateur-radio.com>

There's Gotta Be a Ham on This Team!

NASA's Jet Propulsion Laboratory is coordinating a project involving scientists from three universities and two commercial companies to test a device that JPL says could set the stage for a future global quantum network … and we're pretty sure there's at least one ham on the team that's developing it. The milk-carton-sized technology demonstration experiment, scheduled for launch to the International Space Station later this year, is named the *Space Entanglement and Annealing Quantum Experiment*, abbreviated by the acronym *SEAQUE* (say it out loud and you'll understand the connection!).

Quantum computers have the potential of operating millions of times faster than conventional computers, according to JPL, and SEAQUE will test two new communication technologies to create quantum networks in the space environment. Building such a network would require the use of space-based *nodes* — essentially quantum repeaters — to securely receive and transmit quantum data from and to the ground using free-space optical communications. This experiment would test a technique for producing and detecting pairs of *entangled photons* which would carry the quantum data. The photon source on SEAQUE would split individual photons into entangled "daughter photons," according to JPL, and measuring one of them immediately results in changes in the measurement of the other, even if they are widely separated from each other. The photon source would use a waveguide — familiar to microwave-active hams — to split and transmit the entangled photons.

The second experiment would involve the use of an internal laser to repair damage caused by high-energy radiation in the space environment. It will use a process known as *annealing* to "bubble away" radiation-caused defects and reduce unwanted noise in the detector.



SEAQUE will be hosted on the International Space Station by the Nanoracks Bishop airlock. The blue-and-gold brackets attached to the side of the airlock are for external payloads. The technology demonstration will be installed at one of those sites. (NASA photo)

The SEAQUE module will be attached to the outside of the ISS, mounted on brackets already installed on the Bishop airlock, which is owned and operated by Nanoracks, a commercial participant in this experiment. The earliest possible launch date for SEAQUE is this coming August.

For more information, see <https://tinyurl.com/yek9smtk>.

Bombed-out apartment building in Kharkiv, Ukraine. (Photo courtesy Depositphotos.com)

CQ Contests and the War in Ukraine

Russia's invasion of Ukraine and subsequent attacks targeting civilians have set off a debate in the amateur radio community about the most appropriate way to respond, including no response at all. On March 17th, after considering a wide range of often eloquently written perspectives from members of the CQ Contest Committee and others, CQ management issued a policy statement limiting the contest participation of stations in Russia, Belarus, and the Donbas region of Ukraine to non-competitive entries. In addition, CQ will not award contact points or multipliers for contacts by others with these stations. To be clear, our action does not ban any station's participation in any CQ contest; rather, it applies to how certain logs and contacts will be scored.

As expected, our announcement has resulted in dozens of email responses, both in support and in (often strong) opposition. What follows is the text of CQ's statement as well as a representative sampling of responses. Additional background and explanation of CQ's decision will be found in this month's "Zero Bias" editorial on page 6.

STATEMENT OF CQ COMMUNICATIONS, INC., REGARDING CQ CONTESTS AND THE RUSSIAN INVASION OF UKRAINE

(Northport, NY 17 March, 2022) – CQ Communications, Inc., publishers of *CQ Amateur Radio* magazine and sponsor of the CQ World Wide DX and WPX Contests, announced today that in light of the invasion of Ukraine by Russia and Belarus, it will not accept competitive entries in any of its sponsored contests by amateur radio stations in Russia, Belarus or the separatist Donbas region of Ukraine (unofficial D1 prefix). Logs submitted by these stations will be accepted only as checklogs. In addition, contacts with these stations by other participants will have zero point value and will not count as multipliers.

This is in line with a similar action taken by the Radio Society of Great Britain, following the lead of other international sports federations around the world.

"We regret the need to take this action," said *CQ* Publisher Richard Ross, K2MGA, "and recognize that the vast majority of our fellow amateurs who are affected by it are innocent bystanders who had no role in their government's decision to invade another sovereign country. However, in light of the great suffering being inflicted without cause on the people of Ukraine by Russia's leaders, we cannot in good conscience stand by and do nothing."

The CQ policy will take effect with the 2022 CQ WPX SSB Contest on March 26 and 27. Future events will be considered on a case-by-case basis, depending on the situation at that time.

A Sampling of Responses

The response to our announcement has certainly been passionate, ranging from full support to accusations that we are destroying amateur radio. Here is a sampling (some have been edited for length):

I heartily applaud this move by CQ Communications. 73,
Hugh, VE3AYR

You guys made me proud to know you and to be able to call you colleagues.
Doug, KR2Q

Thank you. So sad that even good people in Russia need to be punished. It must be done.
Herb, K2LNS

I have participated in CQ sponsored contests for more than 50 years. These contests represent the very best in international human relations. They embody the spirit of cooperation that brings people together. Your decision is punishing the very people who support peaceful coexistence. It reflects badly on all of us. Please reconsider this action.
Tom, KA1IS

(You are) crazy! Politics and radio? Did the fashion go like that? We've lost our conscience! Time will pass and you will invite radio amateurs again. Go to hell!
RK8A

I want to commend you on taking this action. Guaranteed you will take a lot of flak for doing this. But you are correct — how can we as people morally sit behind the "hams are supposed to be apolitical" mantra and ignore what is happening.
John, VE4VJR

Thank you for your frankness, so you betrayed everyone who believed in your justice and democracy.
Children's collective radio stations RZ3DZI, R2DBC, which have been participating in your contests since 2008, will now work in EURASIA-CHAMP, Crimean Cup, RDXC, and other Asian contests.
Good luck with your CQ USA-Canada-Israel test.
RX5A

With all due respect and despite the current sad situation engendered by the Russian leaders, I think that the CQ's decision about Russian and Belarus operators for the WPX SSB goes against the ham spirit (ham radio should have nothing to do with politics)! It just punishes people who have nothing to do with the situation and it would change nothing.
Dimitri, F4DSK/TM3Z

I fully support CQ's position on the CQ WPX Contest. This mirrors the RSGB. I hope that ARRL will do the same soon. RSGB related that most sporting venues were banning Russia and Belarus. Amateur Radio contesting is essentially a sport, as the WRTC so encourages … You have my full support.
73, Bob, N2OO

I am totally against Russian invasion of Ukraine but, I am also totally against feel good policies that do nothing to change the situation for the good. I've been on a U.S. Navy ship chasing Soviet submarines in the Mediterranean, I have met Russian soldiers in Bosnia-Herzegovina, and I have had a couple of QSOs with Russian amateurs outside of contesting, so I can say with confidence that I have a good understanding between war, peace, and the crazy things in between. As amateur radio operators I think that we should stay as neutral as possible.
If the new rule change stays I will not be participating in the contest which only takes away one point for many and a lot of fun for me.
Jim, KG4WOJ

I don't agree. Russian hams have no more control over their government than I have over the idiots in Washington. Even at the height of the Cold War we as hams still kept the lines of communication open. We need to do everything we can to support Ukraine but cutting off communication does not help the situation. It just moves us closer to World War III. Isolating Russian hams will push them to support the corrupt government. Talking to them might produce a different result.
Martin, N4UU

Bravo. Thank you for taking this unprecedented but completely appropriate action.
Ron, N6EE

Thank you, I support this 100%.
Steve, N1SEP

Knowing how many Russian AROs reacted to the fall of the Soviet Union (a very positive reaction) I find it difficult to believe that they support Russia's current invasion of Ukraine. However, threatened with severe punishment they are constrained from speaking out against Putin. To essentially punish Russian contest operators for something they likely do not support and certainly cannot do anything to prevent accomplishes nothing positive. Your position, like that of the RSGB, is being viewed as nothing more than politically correct grandstanding. Many comments I have read since your press release indicate amateurs are done with CQ Publishing and CQ sponsored contests. I am one of them. Bad move. Bad for your business and bad for amateur radio contesting. Finally, it is NOT consistent with one of the purposes of amateur radio which is the building of international good will among amateurs.
Jerry, N7WR

I understand the desire to do something. I understand the logic of making Russian / Belarus / Donbas submitted logs checklogs. But what is the policy regarding Russian, etc. contesters operating outside of Russia, etc. What about multi-ops that include a Russian operator?

Whatever the intent, it is mere lip service. It accomplishes nothing ... Further, it makes no sense to penalize all other participants by having contacts with those stations count as zero points and zero mults. Serious entrants are going to make hundreds of QSOs each that become just a waste of time.
Radiosport is not one where you can exclude a nation's individual athletes or teams from competing. Radiosport is not one where you can move the venue of championship matches out of the country. A comparison to other sports federations is disingenuous.
73, Ken, K6LA / VY2TT

Regrettable decision, my friends! Amateur Radio can't be following world politics. It is a neutral activity that must remain by all mean.
Laurent, JJ1MBU

There are many of us who support your move, and the sooner the fascist regimes are completely isolated from the rest of the world, politically, economically, culturally, and in any other way, the sooner this idiocy is stopped and only then can we go back to our normal every-day ham radio operation with hams all over the world. In the meantime, I and many others stand by and fully support you and others who are protesting the genocidal war.
Thank you for your support of the innocent people of Ukraine and I am looking forward to participating in CQ contests, including working all UA and EM amateurs once their fascist 19th century czar wannabe is dead in his bunker.
Zoran, WA7AA

I will never again participate in one of your contests OR order ANY of your products!!!
W5YBT

I really don't want to make this a political issue. It is my opinion that politics has no place in our hobby.
With that being said I find CQ Magazine's announcement to strip the scores of Russian operators to be quite a surprise and somewhat disturbing. It doesn't seem right to me that our fellow hams and contesters have to pay the price for the actions of a dictator government. Even if our Russian friends were active participants in the invasion, which I'm pretty sure they are not, do we also blame them for following orders? I think it's bad form on the part of CQ magazine.
Fred, WX1S, USAF RET

You are crazy. You started a genocide against the Russians. You are fascists.
Your support for the fascist regime in Ukraine will come back to you badly. My contempt for you.
RUSSIAN BLOOD ON YOUR HANDS, LOOK AT YOUR HANDS!
YOU ARE NOT RADIO AMATEURS, YOU ARE FASCISTS!
Serge, R7KW

Radio has always been out of politics. Your contest doesn't exist for me today.
Alex, RW3RN

I am deeply disappointed in your decision to exclude amateur operators in Russia, Belarus, and Donbas from contest participation. I think this is a betrayal of the spirit of the international brotherhood / sisterhood of amateur radio operators.
I have enjoyed CQ, but if you do not reverse this decision, my current subscription to CQ will be my last.
Jeffrey, W5MUF

My very hearty congratulations for your excellent statement — well reasoned and written. In my humble opinion, these are the times that real leaders separate themselves from the ordinary. You have earned my and many others adulations. May you and your team at CQ lead many years. Warm regards,
John, N9NA

While I completely condemn the war and the Russian government's actions, I believe we should not mix politics and amateur radio. Amateur radio was authorized in many authoritarian countries because it has always been apolitical. It was permitted to improve science, created friendships, and make bridges between cultures.
Everyone can decide not to make a QSO with a Russian station, but this should not come as a contest organizer or sponsor decision.
I don't expect you to change your decision, but still believe you would like to know all points of view from fellow OMs.
Yan - ZL4YY / XV4Y

I grew up behind the iron curtain in former Y2-land, which was occupied till the '90s by former Soviet Union troops. Believe me, I know how most of the Russian Hams feel now. Ham Radio had been one of the few things which gave us the opportunity to still be connected with the free world and escape the dictatorship and propaganda at least for a short time. You are now cutting this very last opportunity to those who think like us. The others wouldn't have taken part in your contests anyway. So, please re-consider your decision and keep the Russian Hams welcome in our community. Otherwise, you might even give the Russian officials more ammunition with respect to "The others are the bad guys..."
Pit, DK3WE/KU6I

Our cause is right, victory will be ours. Fascism will not pass. You, gentlemen, have not learned the prophets of history.
RK3IR

I am far from advocating in any way the war and the war crimes that Putin is committing in Ukraine. Nor could I, as a member of nation living in a country that has direct experience of the Russian occupation. I have lived under this totalitarian regime for almost half my life. But it is not ordinary people or radio amateurs who are leading the attack. From the point of view of people who have experienced nothing but democracy in their lifetime, it may look very simple, but these ordinary people have no real power to influence anything at the moment. These people live in a country where totalitarianism is becoming more and more entrenched, where any speaking out against the regime threatens imprisonment and oppression not only for themselves but also for their loved ones and families, where you can be thrown in prison for simply taking part in a demonstration against the war, where there is no real media that is not controlled by the government, where people hardly know the truth about the atrocities their dictator is committing against the people of Ukraine.
What I am trying to do here is to protect our hobby from political influence and help keep it clean, to continue the idea of being tolerant and supporting each other that has existed for over 100 years ... It is no different in Ukraine now. Let us sympathize with the Ukrainian people, let us all do what we can to help, but to ostracize Russian and Belarusian amateurs for something that their government is doing and in which they have no part or fault is wrong.
Jiri, OK2WY

While I 100% disagree with Russia's decision to invade Ukraine, what CQ has done with limiting their participation is disgusting. As a ham of almost 50 years, our hobby never had borders.
Until CQ realizes how completely ignorant this decision is, I will not be participating in ANY CQ sponsored contests (was looking forward to WPX), returning ALL of CQ awards, and going forth promoting a boycott of CQ events inside of my contest club. Grow up, guys. This is a damned hobby, stop trying to be something you aren't.
Chuck, KI9A

By now you've heard from many hams on CQ's decision. I am in complete agreement with it, and support it 100%. Russia has forced Ukraine to go QRT. While this is not the fault of Russian hams, the fact is Ukrainian hams will not be participating due to hostile action.
To allow the nation that forced them off the air to participate would, I believe, result in an unfair contest. In a sense, it would be rigged. And hams in Ukraine would certainly be listening to their Russian counterparts working the world while they sit in fear for their lives and those of their families.
Thank you for this action. I know this will cause tempers to flare, but given the actions of the entire world to support Ukraine, I think we had no choice. Regards.
Bob, WF3H

People are starting an email campaign re your decision. Some out of good motives no doubt, and others for less pure reasons. In view of the indiscriminate slaughter of Ukrainian men women and children and the exclusion of Russia and Belarus from international sport your decision to ban them from Radiosport is right, in my opinion. I wish it were not so but we have to do everything possible to signal to our fellow Russian hams the evil of Putin's war.
Dave, G4BUO

Thank you for your decision concerning support for my country and ban for Russian amateurs connected with Russian invasion. For those who say that radio has nothing in common with politics and the poor Russians are innocent, and Putin alone does it all — just say that it is not Putin who have already killed more than 100 kids and thousands of civilians in Ukraine during the last 3 weeks. More than 75% of Russian citizens support their government in this aggression.
Pavlo, UX1VT

The Ukrainian Amateur Radio League thanks you for your position and support of Ukraine.
For more than three weeks Ukraine has been defending our right to sovereignty and the principles of democracy. The Russian aggressor will not be able to overcome a nation that has never forgiven anyone for direct aggression for hundreds of years. The aggressor's losses in three weeks are so great that his victory is impossible. The Russian aggressor cannot defeat the Ukrainian Army, so he is bombing our cities with cluster bombs, ballistic missiles, phosphorus charges. But we will win.
Ukrainians are grateful to the citizens of the United States and its leaders, to friendly countries around the world for their financial support and assistance with weapons.
Sincerely,
Anatoly Kirilenko, UT3UY
Vice-President, UARL

EMERGENCY COMMUNICATIONS

A Different Kind of EmComm: Amateur Radio and the War in Ukraine

Compiled from Internet Reports

Photo A. "Ham Radio 2.0" podcast host Jason Johnston, KC5HWB (right), interviews two Polish hams from the Masovian Amateur Radio Emergency Communications Net (Masovia is the largest state in Poland) about WinLink activities related to refugees from Ukraine. See text for links. (YouTube screen shot)

While amateur radio in Ukraine has been temporarily shut down due to the Russian invasion, amateurs in surrounding countries are providing assistance for refugees and preparing for other emergency needs. The following information has been compiled from internet reports that were current as of mid-March. In an ever-changing situation such as what is currently happening in Ukraine and other parts of Eastern Europe, some of what you read here may be out-of-date by the time you see it, but it still provides a snapshot of what hams are doing to help in any way they can.

Polish Hams Provide WinLink Messaging

The Polish Amateur Radio Union (Polski Związek Krótkofalowców) reported on its Facebook page in late February that SP hams were using WinLink to send health-and-welfare messages through a hybrid of amateur radio and the internet. An excerpt:

Dear HAM operators, in the face of the latest threats in our region and a possibility of an incoming wave of refugees, with over 2 million already living in Poland, we would like to remind you that we are at your disposal.

If you are a licensed amateur radio operator, you can send information by e-mail to your relatives in Poland or Emergency Services via the Winlink system, which works on HF bands, independently of access to the local ICT infrastructure <https://winlink.org/WinlinkExpress>.

We advise you to download the software, install it and check its operation.

Polish WinLink nodes are QRV on 160, 80, and 20 meters
SR5WLK dial frequency 3595.5 kHz USB
SR3WLK dial frequency 14111 kHz USB
SP3IEW dial frequency 1865 kHz USB

If we receive information about the cut-off of the Internet in the region in danger, we will be QRV daily as SP0MASR @ 18-20 UTC on the frequencies 3770 kHz +/- QRM, 7110 kHz +/- QRM. In such a situation, please communicate in Polish or English.

We are here to serve you.

The "Ham Radio 2.0" podcast recently posted an interview with two Polish hams about the WinLink efforts (see *Photo A*). You may watch it on the Ham Radio 2.0 website at <https://www.livefromthehamshack.tv/> or on YouTube at <https://tinyurl.com/2p96sjm8>.

Romanian Hams Placed on Alert

Southgate Amateur Radio News reported in late February that, according to Germany's Deutsche Amateur Radio Club

(DARC), " radio amateurs (in Romania) have been contacted by the government to offer their expertise should the situation deteriorate." The report from the DARC website (translated from German by Southgate), also makes note of the activities in Poland as well as other countries accepting refugees, along with general cautions on making on-air contact with stations in Ukraine. Some excerpts:

As has been reported several times in the past few days, war is currently raging in Ukraine and as a result, the use of amateur radio stations is currently prohibited. The situation is being monitored very closely by IARU Region 1 and its member countries, and measures to support the refugees are being prepared, particularly in the countries that are on the route of the refugee movements.

In Romania, radio amateurs have been contacted by the government to offer their expertise should the situation deteriorate. In Poland, mobile phone providers are setting up temporary mobile phone stations and refugees are granted free use of mobile phones and trains. Furthermore, Polish radio amateurs have also activated more Winlink gateways to give Ukrainian radio amateurs more options for communication should the cellular networks fail or be switched off.

In principle, however, every radio amateur who is currently transmitting from the Ukraine is risking his life. If you listen to a Ukrainian station, you should definitely not shout about it. The dissemination of call signs, locations and frequencies - whether on a band or in a cluster - should be avoided in any case.

In the current situation, the best we can do is listen. We should not try to call Ukrainian radio amateurs ... Otherwise, as usual, if you hear the words "Emergency", "Welfare Traffic" or the abbreviation "QUF", stop transmitting, listen and follow a few simple rules:

- When you receive such traffic, listen and write down everything you hear.
- Stay on the frequency until it's clear you can't help AND someone else is helping.
- Don't send until you are 100% sure you can help!
- Follow the instructions of the control station

The control station is the station that has the emergency or has been designated as such by the station in distress.

The emergency call can then be passed on to the local police, who have the appropriate contacts in the Foreign Office. Of course, you have to explain calmly and factually what kind of information you have. Don't panic and stay calm.

And always remember that we are a medium to deliver messages. We can and we do - but no more. In particular, explaining to others how to help is not our job.

If you have searches for missing persons, there is the Red Cross search service, which is already active in countries with refugee flows. Even if the IT systems of the search service are paralyzed by a cyber attack, the service is still available.

The Red Cross writes the following on its website:

"The concern and fear for family members, friends and acquaintances in Ukraine is unimaginably great. Individual inquiries can be sent to <away-migration(at)drk.de>.

Search requests - even if no active search is possible in Ukraine at the moment - are accepted by the DRK tracing service, i.e. by all DRK tracing service advice centers at all DRK association levels: <https://www.drk-suchdienst.de/>."

What is not needed are people who think that they are now "saving the world" with their emergency radio kits and know everything better anyway. The Ukrainian President has already received confirmation from Elon Musk and Starlink that the appropriate equipment for broadband Internet access via satellite is on the way and mobile networks are currently also working, i.e., communication via shortwave is currently not needed and I repeat myself: The best we can do is listen.

CQ will provide updates as necessary via the CQ Newsroom at <http://cqnewsroom.blogspot.com>

[With thanks to PZK, DARC, Southgate Amateur Radio News and Ham Radio 2.0]

Help Wanted – Emergency Communications Editor

N8BHL has had to step down as *CQ*'s Emergency Communications Editor and we need a new Contributing Editor to fill his shoes. If you're an experienced EmComm leader and at least a reasonably good writer, with time to prepare and write a monthly column, please contact Editor Rich Moseson, W2VU, via e-mail at <w2vu@cq-amateur-radio.com>.

Hats Off to PY Hams Providing Emergency Communications

In last month's column, a report by Martin Butera, PT2ZDX/LU9EFO, told us about the amateur radio response to floods and landslides in the city of Petropolis, located in Rio de Janeiro, Brazil. As this report was being written and edited, the tragedy was still ongoing and the area was in complete chaos. We included a partial list of participating amateurs at the end of that column and now have the following names and calls to add to that original list:

ROER - Rede De Operações De Emergência De Radioamadores (Amateur Radio Emergency Operations Network): Fernando, PU1THE; Fabrício, PY1IR; Humberto, PY1TTN; Rafael, PU1RJD; Anderson, PY1FI; Luis, PU1JJH; Carlos, PU1JDU
Caxias Civil Defense: Angelo, PY1LIF
GRATE - Grupo De Radioamadores De Teresópolis (Amateur Radio Group of Teresópolis): Carlos, PY1CG
CRAN - Clube De Radioamadores De Nilopolis (Nilopolis Amateur Radio Club): Marcelo, PY1MT
REER – Rede De Emergencia De Radioamadores Do Estado Do RJ (Amateur Radio Emergency Network of Rio de Janeiro): Andre, PU1LAW; Rafael, PU1TKS

Hats off to all radio amateurs who participated in this response and to all emergencies and public service activities everywhere. – *The editors*

Results of the 2021 CQWW DX SSB Contest

For me, working the world with 5 watts and a low dipole is only possible during a CQ WW weekend! – Jan, PG2AA.

BY JOHN DORR*, K1AR

Well, the 73rd running of the CQWW SSB contest is complete! There are very few contests with that legacy. Of greater note, however, is that the WW's popularity rose to all-time highs this time around. Having received 9,801 logs — a new record — nearly 1/3 of your submissions were received in the first 24 hours after the contest. Perhaps more amazing is that a staggering total of 4,313,558 QSOs were reported, representing an average of 440 QSOs/log. We have a lot to celebrate this year.

In the end, however, one of the best ways to measure popularity is in the comments you send to us. We literally receive thousands of emails, social media posts, and soapbox experiences from around the globe each year. The vast majority of your feedback praised the return of high-band conditions. Our patience paid off this year as propagation finally cooperated. Here's a just a few examples:

It felt like the good old days with 40M, 20M, and 15M packed with loud European callsigns and significant signs of life on 10M. It will only get better! – VC3X.

Wow, what a change from previous year! Great improvement in the numbers of worked zones and countries … – XE2B.

We achieved our goal of giving three rookies and new members of the club a taste for contesting and great conditions. We let them make use of most of the good openings (Solveig, JW5MUA; Kine, JW5IUA; and Joern, JW5LUA). Our Spanish visitor, Javier, EA1HEO, also significantly contributed. Old hands were JW6QIA Peter and JW6VDA Tom. Great fun as always! – JW5E.

*Email: <cqk1ar@gmail.com>

Years of friendship and lots of hard work yield results from PJ4K!

Perhaps of equal significance was the fact that the impact of COVID isolation began to subside. While contest DXpedition travel was still down, many of the multi-ops returned to the playing field. It was great to hear the large contest stations from around the world come back to life as well as a number of traveling contesters — both single operators and multi groups.

So, with a lot to report, let's get to the results.

How About Those Results!

Well, I predicted last year that the 2021 CQWW would be even better! And, by nearly every metric (logs received, hours operated, number of active multipliers, total QSOs in contest, etc.), that turned out to be true.

The world Single Operator race was dominated again this year by Juan, EA8RM, at 13.4 million (M), a score almost identical to last year — logging 8,173 QSOs. Juan's closest competitor was accuracy champion (See *Table 4*) Yuri, VE2IM (VE3DZ) who was nearly 4M points behind.

The U.S. Single Operator rankings were led this time around by Bob, KQ2M, with an impressive score of 6.7M dethroning Randy, K5ZD, who posted a respectable 6.3M while operating with a single radio in the Classic overlay. It took 4.3M to make it into the Top-10 this time around as was demonstrated by AB3CX's fine score.

Amongst the World QRP crowd, Willy, UA9BA, destroyed the competition with a huge 1.1M result, almost three times larger than his closest competitor, Vitas, LY5G. Working almost 1,100 QSOs from central Asia is something to marvel at by everyone.

There was a much closer horserace with the World Single Operator Assisted group as Sergio, PT5J (PP5JR) bested John, P4ØW (W2GD) by only 38,000 at about 12M. As an aside, the 2021 P4Ø operation by W2GD was his 156th trip to Aruba over 36 years beginning in 1986.

The single-band rankings demonstrated just how much propagation has improved as D4L (IZ4DPV) scored an amazing 2.4M (4028 / 36 / 136) on 10

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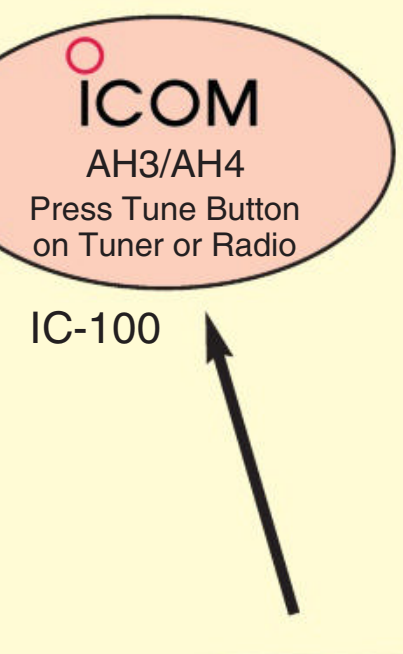

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Press Tune Button on Tuner or Radio
IC-100

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Press Tune Button on Tuner
IC-108

KENWOOD
AT-300
Key Radio and Press Tune Button on Tuner
IC-106

YAESU
dx101, 3000
Press Tune Button on Tuner
IC-115

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Memories: 2000
Retune Time: Less than 1.0 second
Voltage: 13.8 VDC +/-15%
Current Draw: 500 mA tuning, 20 mA idle
Size: 6.3”x6.3”x1.5”, 160x160x40mm
Weight: 1.5 pounds, 680 grams

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meters. In sharp contrast, last year's winner (PY2YU) only made a winning score of 625 thousand (K) with E77A coming in second at 174K. It took a 431K score by CA4PSH to make the Top-10 this time around.

The multi-operator universe returned in force with P33W continuing their dominant multi-single position at 22M, beating #2 TM6M by almost 8M points. The emerging PJ4K team took the Multi-Two honors at 24.9M with perennial competitor, PJ2T, beating out the team at K3LR with a final score of 29.9M.

The popularity of overlays continues to grow as there was significant participation in both the Classic and Rookie categories. In the end, Yuri, VE2IM (VE3DZ) grabbed the top spot for his Classic overlay entry at 5.2M. Darko, YU3DKO, posted a leading Rookie score of 1.7M in the high-power group — very good work for a new contester. Aljaz, S55AL's, 400K score within the low-power Rookie participants was equally notable.

Speaking of overlays, this year's results include two new categories: Youth and Explorer. With a combined group of nearly 150 entries, there were a number of first-time submissions, as SO9I (SQ9ORQ – High Power) and DJ4MX (Low Power) won the Youth competition. while the Explorers were led by 9G5FI (Single Operator) and SX2I (Multi-Operator). It's going to be exciting to watch these overlay categories flourish in the years to come as the young guns and mad scientists show us what they can do.

The World is at Our Fingertips in the CQWW!

While we are still significantly below the numbers of the last decade, I'm happy to report that global activity is increasing again in the CQWW with a 6.2% increase in total worked entities this year (See *Table 1*). Of course, the contributing factors are both reduced travel restrictions and improved conditions.

Table 1

Year	# Entities Worked
2013	236
2014	235
2015	232
2016	224
2017	202
2018	199
2019	215
2020	193
2021	205

Table 1. Total number of entities submitting logs in the 2021 CQWW SSB Contest and previous years.

2021 CQWW DX SSB PLAQUE WINNERS AND DONORS

SINGLE OPERATOR

World
Juan Hidalgo, EA8RM
Donor: Southern California DX Club

World – Low Power
VP9I (Opr.: Jeff Kinzli, N6GQ)
Donor: Slovenian Contest Club

World – QRP
Willy Umanets, UA9BA
Donor: Jeff Steinman, N5TJ

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

World – Assisted Low Power
WP3C (Opr.: Yuri Rakushchynets, N2TTA)
Donor: Gail Sheehan, K2RED

U.S.A.
Robert L. Shohet, KQ2M
Donor: Potomac Valley Radio Club – KC8C Memorial

U.S.A. – Low Power
Terry Zivney, N4TZ
Donor: North Coast Contesters

U.S.A. – QRP
Randy M. Shirbroun, NDØC
Donor: Pat Collins, N8VW

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

U.S.A. – Assisted Low Power
Jim Bowman, KS1J
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
OK6T (Opr.: Martin Bohadlo, OK1WCF)
Donor: Tim Duffy, K3LR

Europe – QRP
Vitas Krasnickas, LY5G
Donor: Steve "Sid" Caesar, NH7C

Europe – Assisted
Jon Zumalabe, EA2W
Donor: Martin Huml, OL5Y

Europe – Assisted Low Power
TM3Z (Opr.: Dimitri Cosson, F4DSK)
Donor: HB9NE Doubs Contest Group

Africa
Antonio Betancor, EA8BQM*
Donor: Chris Terkla, N1XS

Asia
Oleg Shevtsov, RM9I
Donor: Nodir Tursun-Zade, EY8MM

Caribbean / Central America
KP2M (Opr.: Phillip Allardice, KT3Y)
Donor: John Rodgers, WE3C

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

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

South America
Roberto Ramirez, CE3CT
Donor: Yankee Clipper Contest Club

Canada
CF3A (Opr.: Ron Vander Kraats, VE3AT)*
Donor: Contest Club Ontario –VE3WT Memorial

Indonesia
Yana Koryana, YB1AR
Donor: Karsono Suyanto, YBØNDT

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

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V85, YB, DU) – High Power
DY1T (Opr.: Thelma C. Pascua, DU1IVT)*
Donor: YB Land DX Club

ASEAN (XZ HS XW XU 3W 9M 9V V85 YB DU) – Assisted
Tim Seed, DU3TW
Donor: Champ C. Muangamphun, E21EIC – Siam DX Group

SINGLE OPERATOR, SINGLE BAND

World – 28 MHz
D4F (Opr.: Massimo Cortesi, IZ4DPV)
Donor: Joel Chalmers, KG6DX

World – 21 MHz
D4Z (Opr.: Piotr Majchrzak, SQ9D)
Donor: John Rodgers, WE3C

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

World – 7 MHz
UP4L (Opr.: Valeriy Zhilyayev), UN7LZ)
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
OK7W (Opr.: Stanislav Kostal, OK1CID)
Donor: OL7M Contest Group, QRO.cz, RemoteQTH.com

U.S.A. – 28 MHz
Jeff Stuparits, W4DD
Donor: John Rodgers, WE3C

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

U.S.A. – 14 MHz
Ed Parish, K1EP
Donor: Yankee Clipper Contest Club – KC1F Memorial

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

U.S.A. – 3.7 MHz
Bud Governale, W3LL
Donor: John Rodgers, WE3C

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

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

Europe – 21 MHz
CR6T (Opr.: Antonio Rui Sousa Santos, CT1ESV)
Donor: OH-DX-Ring, OH2AM – OH2SB Memorial

Europe – 14 MHz
UA2FW (Opr.: Alex Orlov, RW4WR)
Donor: Charles Wooten, NF4A

Europe – 7 MHz
Ivo Jereb, S57AL
Donor: Central Texas DX and Contest Club – NT5C Memorial

Europe – 3.7 MHz
Ariel Vazquez, EE3M*
Donor: Friend of Klaus – DJ4PT Memorial

Europe – 1.8 MHz
SN7D (Opr.: Mateusz Pigon, SQ7D)*
Donor: Robert Kasca, S53R

Caribbean / Central America (7 MHz)
V31XX (Opr.: Bill Kollenbaum, K4XS)
Donor: Nate Moreschi, N4YDU

Oceania (28 MHz)
VK4A (Opr.: Andrew Munson, VK4NM)
Donor: Bruce D. Lee, KD6WW

Table 2

Category	AF	AS	EU	NA	OC	SA	ALL	% of total
ALL_H_A	5	90	548	692	37	47	1419	21.3%
ALL_H_U	6	143	346	393	58	27	973	14.6%
ALL_L_A	5	83	611	347	28	59	1133	17.0%
ALL_L_U	10	256	1190	697	172	108	2433	36.5%
ALL_Q_A		6	18	5	2	1	32	0.5%
ALL_Q_U		15	75	23	9	3	125	1.9%
EM			7	1			8	0.1%
ES	1		3	3		2	9	0.1%
M2	1	19	39	23	6	6	94	1.4%
MM		8	22	19	3	3	55	0.8%
MSH	5	28	132	50	8	10	233	3.5%
MSL	1	25	72	22	13	10	143	2.1%
ALL	34	673	3063	2275	336	276	6657	100.0%
% by Continent	0.5%	10.1%	46.0%	34.2%	5.0%	4.1%	100.0%	

*Single band entries not included in analysis.

Table 2. Received 2021 CQWW SSB Logs by Entry Class

Asia (21 MHz)
Alexander Krayzman, 4Z4AK
Donor: DFW Contest Group – W5PG Memorial

OVERLAY CATEGORIES

World – Classic
VE2IM (Opr.: Yuri Onipko, VE3DZ)
Donor: John Rodgers, WE3C

U.S.A. – Classic
Randy Thompson, K5ZD
Donor: BeLoud.US

Europe – Classic
Helmut Heinz, DK6WL
Donor: Steve Cole, GW4BLE Memorial

Asia – Classic
Yuri Kurinyi, RG9A
Donor: Willy Umanets, UA9BA

Japan – Classic
Koetsu Sato, JH7QXJ
Donor: Hajime Kato, JO1RUR

World – Rookie
Darko Vukojicic, YU3DKO
Donor: Tim Duffy, K3LR – N8SM Memorial

U.S.A. – Rookie
John Schroeder, K4QQG
Donor: Tim Duffy, K3LR – K3TUP Memorial

Europe – Rookie
Roberto Ursino, IUØOVB*
Donor: EA Contest Club

World – Youth
SO9I (Opr.: Przemyslaw Balcerzak, SQ9ORQ)
Donor: YOTA Camp

North America – Youth
Axel W. Bruderer, KI6RRN
Donor: Neil Rapp, WB9VPG

Europe – Youth
Ivan Zivcic, 9A2ZI*
Donor: IARU Region 1 Youth Working Group

South America – Youth
Nicolas Ribeiro Batistuti, PY2IG
Donor: IARU Region 2 for YOTA

Africa – Youth
No entries
Donor: IARU Region 1 Youth Working Group

Asia – Youth
JE2YRB (Opr.: Masahiro Tajima, JL8XSO)
Donor: YOTA Japan

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

Explorer – Single Operator
9G5FI (Opr.: Tom Hitzner, DL2RMC)
Donor: Worldwide Radio Operators Foundation

Explorer – Multi Operator
SX2I (Oprs.: SV2AEL, SV2BFN, SV2BXZ, SV7CLI, SV2GJV, SV2HTI, SV2HXV, SV2HXX, SV2JAO, SV2MHF)
Donor: Worldwide Radio Operators Foundation

MULTI-OPERATOR, SINGLE TRANSMITTER

World
P33W (Oprs.: RA3AUU, UA4FER, R3DCX, LZ2HM, R4FO, RK4FD, 5B4AIF, RN3QO)
Donor: Southern California DX Club – W6AM Memorial

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

U.S.A.
KC1XX (Oprs.: K1QX, KC1XX, KM3T, N1EZ, W1FV, WA1Z)
Donor: Carolina DX Assoc. – Ted Goldthorpe, W4VHF and Ken Boyd, K4DXA Memorial

U.S.A. – Low Power
W1QK (Opr.: W1QK, NG1R)
Donor: KZ5DX – DX HOGS

Africa
CQ9T (Oprs.: CT3HF, CT3KN, CT9ABC, CS9ABE)
Donor: WRTC 2Ø22

Asia
4X1DX (Oprs.: 4X6FR, 4X1DX)*
Donor: Willy Umanets, UA9BA

Europe
TM6M (Oprs.: F1AKK, F1UVN, F4DXW, F4FDA, F4FFZ, F8DBF, F8FKJ)
Donor: Gail Sheehan, K2RED

Europe – Low Power
ED7O (Oprs.: EB1TR, EC1A, EC7MA, EA7EU, EC5AN)
Donor: EA Contest Club

Oceania
VK6N (Oprs.: VK6SJ, VK6VY, VK6NU, VK6MIT, VK6LIN, VK6BAP, VK6ML, VK6MAN, VK6BEC)
Donor: Junichi Tanaka, JH4RHF

South America
PJ4G (Oprs.: K2NG, K4NHW, KO8SCA, PJ4NX)
Donor: Victor Burns, KI6IM – The Cuba Libra Contest Club

Caribbean/Central America
ZF1A (Oprs.: NN1C, K1XM, KQ1F, K6JO, K7ZO)
Donor: Bob Raymond, WA1Z

Canada
VE3EJ (Oprs.: VE3EJ, VE3EK, VE3MM, VE3OI)
Donor: John Sluymer, VE3EJ

Japan
JA7ZFN (Oprs.: JA7NLW, JG7PSJ, JH7XMO, JP7DKQ, JA1CTB)
Donor: Arizona Outlaws Contest Club

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V8, YB, DU)
E2A (Oprs.: E25KAE, E24OYI, E29TGW, E2ØNKB, E21EIC)
Donor: Bruce Frahm, KØBJ

MULTI-OPERATOR, TWO TRANSMITTERS

World
PJ4K (Oprs.: DL8OBQ, K1XX, K3CT, N3RD, N4RV, N6KT, N7ZZ, PJ4DX, WA3LRO)
Donor: Array Solutions

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

Europe
ES9C (Oprs.: ES1BVG, ES2ADO, ES2GW, ES2MC, ES4BO, ES5HTA, ES5QA, ES5RY, ES5TV, ES6QC, ES7GM, URØMC, US2YW, UW7LL, YL3DW, YL3JA)
Donor: D4C Monteverde Contest Team – IR4X Monte Capra Contest Team – I4EAT Memorial

South America
HD8R (Oprs.: EA1SA, EA5RM, EA7X, F2JD, F5CWU, F8ATS, IK5RUN, IN3ZNR)*
Donor: Worldwide Radio Operators Foundation

Japan
JR8VSE (Oprs.: JR8VSE, JE8KKX, JN2FCL)
Donor: Yokohama DX Club (YDXC)

ASEAN (XZ, HS, XW, XU, 3W, 9M, 9V, V8, YB, DU)
7A2A (Oprs.: YB1TJ, YB1RKT, YB2DX, YB2XVT, YB3KM)
Donor: Champ C. Muangamphun, E21EIC – Siam DX Group

MULTI-OPERATOR, MULTI-TRANSMITTER

World
PJ2T (Oprs.: WØCG, NN3W, KL2A, G4BVY, G4XUM, M5RIC, K8PGJ, N2BA, ND8L)
Donor: Dave Leeson, W6NL & Barb Leeson, K6BL

U.S.A.
K3LR (Oprs.: N2NC, N5UM, K3LR, N9RV, W2RQ, K3LA, N2NT, K1AR, N3SD, AA5B, K3UA, N3GJ, N3RA, WM2H)
Donor: Jim Lawson, W2PV Memorial

Europe
M6T (Oprs.: GØAEV, GØJJG, GØVJG, GØWCW, G2NF, G4ADM, G4BUO, G4MJS, G4PIQ, G4TSH, G7TWC, MØBCT, MØHKB, MØMDR, MØTGV, PT2F)
Donor: Finnish Amateur Radio League

CONTEST EXPEDITIONS

World – Single Operator
A47RS (Opr.: Efstathios Maliakis, SV5DKL)
Donor: National Capitol DX Association - Stuart Meyer, W2GHK Memorial

World Multi-Op
PYØF (Oprs.: PT2IC, PY4AZ, PY6RT, PY7RP)
Donor: Gail Sheehan, K2RED

**Awarded to second place finisher*

Will there be bigger numbers to come? I say that's a safe bet. There's more than one group setting their sights on working 200 countries on a single band. Will it ever be done?

Pick a Category, Any Category

There's good news this year. The number of multi-op entries — a wildly popular group of categories — was significantly higher (See *Table 2*). While the pandemic continued to keep many operators at home, we experienced a year-over-year increase of 140 multi-op entries (36%) spread equally across all categories. Was there pent-up demand to get back together? You bet there was!

How Many Hours Did You Operate in the CQWW?

Well, you had to admire consistency. Last year's analysis showed that the medium number of hours operated in the CQWW SSB contest for single operators was 10.5 hours. It turned out that this year's average is about the same (See *Table 3*) as about half of us are in this range (47.6%).

Looking at the data from another perspective, the single operator group invested an approximate cumulative total of

Juan, EA8RM, the SOAB champion has over 13 million reasons to be smiling!

2021 CQWW DX SSB TOP SCORES

WORLD

SINGLE OPERATOR
HIGH POWER
All Band

EA8RM 13,431,245
VE2IM (VE3DZ) .9,717,785
CF3A (VE3AT)...7,994,096
KQ2M 6,729,076
K5ZD 6,311,403
RM9I 5,994,040
C4W (5B4WN)...5,883,312
VY2TT (K6LA) ...5,704,800
K4ZW.....5,661,114
N1UR.....5,410,820

28 MHz
D4F (IZ4DPV)....2,356,029
PY2YU.....1,764,828
CT9ABY
(OM2KW).....1,148,189

21 MHz
D4Z (SQ9D).....2,414,968
CR3DX (OM3RM)2,296,170
P43A.....1,422,745

14 MHz
CR3A (OM3BH) .2,175,460
D4L (IK2NCJ) 2,023,580
UA2FW
(RW4WR) 1,236,576

7 MHz
UP4L (UN7LZ).....952,055
V31XX (K4XS).....936,258
S57AL.....861,606

3.7 MHz
ISØ/OM2TW
(OK8WW) 331,655
CQ3J (CT3MD).....287,768
EE3M.....192,351

1.8 MHz
OK7W (OK1CID) ..118,548
SN7D (SQ7D).....77,376
NP2J (K8RF) 41,796

LOW POWER
All Band

VP9I (N6GQ) 3,585,504
OK6T
(OK1WCF).....2,121,010
HI3T.....1,791,049
N4TZ.....1,544,160
WW4XX (LZ4AX)..917,285
RG5A/6.....806,053
JH1EAQ.....788,322
IV3ZYB 753,424
OK2MBP.....740,484
TI2JS 699,489

28 MHz
EA8TX 728,218
CS9/PD3EM 465,500
CT3IQ.....330,786

21 MHz
ZW2T (PY2RKG)..464,264
PY2QT.....344,487
JF3BFS.....225,456

14 MHz
4L2M.....565,508
PY2NY.....425,111
TG9ANF 203,228

7 MHz
4Z5UN 259,787
LA2AB (SP2ASJ)..184,080
UT3UOR.....128,810

3.7 MHz
CO2JD.....82,709
OU8A (5PØO) 64,032
W3LL 49,329

1.8 MHz
SNØR (SQ9IAU).....29,264
SP6LUV.....27,528
OK1LRD 23,618

QRP
All Band

UA9BA.....1,151,712
LY5G 426,408
LZ1DM.....389,628
JH1OGC.....241,824
NDØC.....230,426
K8ZT.....198,276
UR5FEO.....190,938
PY2BN.....181,470
IZ4AIF.....168,525
HG6C (HA6IAM)...151,074

28 MHz
VR2T (VR2ZQZ)...237,075
4I1EBC 60,610
LZ2RS 26,650

21 MHz
F8AKS 102,276
YBØSSF 57,681
TA2IB.....56,960

14 MHz
YU1NR 44,700
USØMS 43,008
HF5WIM 31,428

7 MHz
LY2NK 20,301
DL1BAX.....16,491
PG2AA.....11,183

3.7 MHz
OL4W (OK1IF).....13,248
UT4UBZ.....3,569
IZ5OVP.....1,260

1.8 MHz
HA1TI 5,904
HF7A 4,104

ASSISTED
HIGH POWER
All Band

PT5J (PP5JR)..12,001,288
P4ØW
(W2GD) 11,959,017
EA2W 8,470,308
KH7Q
(KU1CW) 7,925,904
OMØR
(OM3GI).....7,606,230
HG8R (HA8JV) ..7,565,566
ZF5T (K5GO/
ZF9CW) 7,533,535
SN7Q
(SP7GIQ).....6,870,082
LY7Z.....6,706,524
R2QA.....6,182,145

28 MHz
CX2DK.....1,327,183
LU6ETB
(LU7DW).....923,868
LR7D (LU9ESD)...847,177

21 MHz
CQ3W (DF7EE).1,488,792
9Y4D.....1,454,184
DL2ARD 1,452,752

14 MHz
DL6FBL 1,774,600
OK7K (OK1BN) .1,628,802
PP4T (PY4BZ)...1,508,925

7 MHz
US1Q
(UW2QU).....1,096,979
SN3A (SP3GEM)..930,411
YU7XX (YT1X) 734,240

3.7 MHz
OM6NM 325,584
HA1TJ.....271,600
VE9CB.....253,240

1.8 MHz
IZ5ICH 78,120
S56X.....65,860
GM4AFF 64,425

ASSISTED
LOW POWER
All Band

WP3C (N2TTA) .2,751,343
HI8RD.....2,320,782
TM3Z (F4DSK) ..2,221,184
HZ1TT 2,206,676
KS1J.....1,832,124
UP7L (UN6LN) ..1,571,253
PA9M.....1,530,397
WE9R 1,493,796
SQ6H
(SQ6PLH) 1,295,151
UA9R.....1,287,072

28 MHz
PY2EX.....639,850
ZV1T (PP1WW)....557,056
WP4SD.....407,712

21 MHz
IK4LZH 527,468
PY2CX.....385,728
EA8DED
(OH2BP) 297,000

14 MHz
PY4JW.....685,980
UR3GU.....477,318
HGØR (HAØNAR).....441,842

7 MHz
VE2IDX (VE3ZF) ..359,840
OL9R (OK6RA).....271,128
G8X (G4FJK).....161,920

3.7 MHz
IH9/OK1M.....233,910
E73AA 66,378
OK1AY.....53,208

1.8 MHz
S54ZZ.....46,926
OK6Y (OK2PTZ).....35,100
YT8A.....34,112

ASSISTED
QRP
All Band

ED5R (EA5Z).....1,601,280
UZ7M (UT9MZ) 594,135
ON6NL.....460,332
JA6GCE.....334,508
IZ3NVR.....320,117
UN8PT.....237,986
SP5PDA 177,731
YU1LM.....102,858
IZ1ANK.....95,520
OK1DMP 81,620

28 MHz
YP8A (YO8WW).....59,558
BA7CK.....22,843
SN5R (SP5XMU).....9,882

21 MHz
HG3C (HA3HX) 36,582
SV1NK.....26,257
KG1E.....14,022

14 MHz
EA5HJV 265,392
EA3O.....138,880
RT4W 53,466

7 MHz
OT6M (ON9CC).....13,560
PD2JM.....5,856
KP3ER (NP3V) 2,541

3.7 MHz
OMØA
(OMØAAO).....19,040
HF9CW.....8,695
SP5ES.....5,588

1.8 MHz
LY2OU.....6,004
YO8WW.....5,047

MULTI-OP
SINGLE TRANSMITTER
High Power

P33W.....22,422,596
TM6M 14,606,216
KC1XX.....14,560,432
IR4X.....13,906,971
E7DX 13,550,160
LZ5R.....13,441,288
VE3EJ.....13,214,691
PJ4G.....13,111,480
ZF1A.....13,011,800
KP3Z.....12,514,080

Low Power

FY5KE 10,901,754
V3A.....4,519,686
ED7O.....4,509,773
HZ1LG 4,509,756
DD4A 4,158,960
IB9T 3,649,171
ED7B 3,410,676
VP5DX.....3,314,760
IQ3RK.....2,774,511
IR9R 2,757,900

MULTI-OP
TWO TRANSMITTER

PJ4K.....24,916,506
ES9C 18,602,780
EI7M 18,472,050
HD8R.....17,996,120
CR6K.....17,546,958
PX2A 15,951,068
II2S 14,661,120
ED1R 14,299,362
IR6T.....14,214,200
9A7A.....13,411,518

MULTI-OP
MULTI-TRANSMITTER

PJ2T 29,985,664
K3LR.....27,941,270
A73A.....24,902,052
M6T 20,557,230
EW5A 19,500,560
DFØHQ.....18,698,750
LZ9W 18,465,060
YT5A.....17,055,180
KL7RA 14,364,000
DP7D 11,945,140

EXPLORER
Single Operator

9G5FI.....3,401,025
RL6M 1,254,829
K7RB 123,690
W2MRD 3,483
PY2MD 1,320

EXPLORER
Multi Operator

SX2I.....5,937,680
Z6ØA 4,110,700
9H6A.....3,611,520
IQ4RN.....2,236,416
EE7K 1,113,315
IB2C.....978,656
KP2B 648,324

ROOKIE
High Power

YU3DKO.....1,708,137
IUØOVB.....1,147,500
K4QQG.....686,092
AC3LZ 468,666
IU1NKS.....364,181
9M2TDX 363,312
ED2B (EA2ESB)...263,822
W3MAM.....246,280
LX1LC.....233,264
W4SSF 200,910

ROOKIE
Low Power

S55AL.....399,966

Table 3

op hours	AF	AS	EU	NA	OC	SA	ALL	% of All	Cum. %
0.1-5	5	164	635	546	75	35	1460	23.9%	23.9%
5.1-10	2	135	655	537	64	60	1453	23.8%	47.6%
10.1-15	9	86	495	389	64	45	1088	17.8%	65.4%
15.1-20	4	73	363	287	41	41	809	13.2%	78.7%
20.1-25	2	60	326	178	31	29	626	10.2%	88.9%
25.1-30	2	35	141	88	18	16	300	4.9%	93.8%
30.1-35		21	87	76	10	8	202	3.3%	97.1%
35.1-40	1	8	43	35	1	6	94	1.5%	98.6%
40.1-45	1	9	38	18	2	4	72	1.2%	99.8%
45.1-48		2	5	3		1	11	0.2%	100.0%
ALL	26	593	2788	2157	306	245	6115		
Median hours	13.9	9.9	10.8	9.9	10.7	12.8	10.5		

Median time: 10.5 hours

Table 3. Analysis of Operating Times for 2021 CQWW SSB Contest Single-Op All Band entries

N3GT.....356,425
EA4HKF.....294,690
2WØLKX.....271,152
EA5IXO.....231,594
SP3DAT.....209,965
4I1EBD.....197,166
PU5DPL.....188,604
VA3IDD.....186,245
KC3QVQ.....175,032

CLASSIC
High Power
VE2IM
(VE3DZ).....5,264,064
K5ZD.....4,784,670
RG9A.....4,162,044
UA9MA.....3,806,075
WH7T
(WH7W).....3,739,392
K1DG.....3,392,264
S53MM.....2,726,595
DL2CC.....2,682,548
EA4KD.....2,414,192
CE3CT.....2,372,210

CLASSIC
Low Power
WW4XX (LZ4AX)..917,285
RG5A/6.....772,686
EA8TX.....716,078
OL5Y.....631,350
K1HT.....616,641
3G1D (XQ1FM)....560,028
UA3BL.....541,310
DJ3HW.....540,592
AC4G.....536,568
PA2TMS.....529,320

YOUTH
High Power
SO9I
(SQ9ORQ).....5,263,831
9A2ZI.....2,326,753
JE2YRB
(JL8XSO).....1,788,830
YU3AWA.....1,466,465
KI6RRN.....1,409,580
DL3ON.....1,083,013
NTØK (K6BFL).....760,767
PY2IG.....563,563
KD9V.....224,238
DK5AV.....204,336

YOUTH
Low Power
DJ4MX.....654,150
YP1EX (YO9LIG)..232,427
DL3MLA.....196,128
DB5DY.....180,752
SP5PDA.....177,731
OE9SEV.....164,424
YU3LAX.....113,600
N4WLL.....100,646

KE8HBV.....97,865
YD2UWF.....76,076

UNITED STATES

SINGLE OPERATOR
HIGH POWER
All Band
KQ2M.....6,729,076
K5ZD.....6,311,403
K4ZW.....5,661,114
N1UR.....5,410,820
K5TR.....5,006,144
W9RE.....4,845,002
K1DG.....4,665,320
K3ZO.....3,718,080
ND7K
(@N6WIN).....3,036,215
K5GN.....2,978,531

28 MHz
W4DD.....252,416
W5PR.....219,744
K1WHS.....138,516

21 MHz
KU2M.....705,962
KØEJ.....623,664
N4OX.....556,308

14 MHz
W6AFA.....159,104
N5CR.....146,388
KE8FT.....93,002

7 MHz
W7WA.....442,382
K9CJ.....26,492
WDØBGZ.....24,273

3.7 MHz
WA2BCK.....33,810
K9ZO.....28,194
W1FQ.....18,368

1.8 MHz
AG4W.....3,774

LOW POWER
All Band
N4TZ.....1,544,160
WW4XX
(LZ4AX).....917,285
K8ZM.....624,325
K1HT.....616,641
N1DD.....592,812
K5FUV.....574,128
AC4G.....536,568
N7IR.....442,260
NGØC.....392,042
WA3LXD.....348,096

28 MHz
N8II.....170,558
W8TWA.....63,440
N1WRK.....44,354

21 MHz
WA5SOG.....70,785
NF7E.....64,647
W8JGU.....62,208

14 MHz
K1EP.....159,936
WA7BNM.....59,843
WB2KHO.....35,721

7 MHz
NY1E.....33,040
N8VW.....18,088
W4GDV.....2,052

3.7 MHz
W3LL.....49,329
KS3F.....4,550

QRP
All Band
NDØC.....230,426
K8ZT.....198,276
W6QU (W8QZA)...113,373
N4WLL.....100,646
K4WY.....36,570
N8LJ.....35,200
W7FS.....20,384
N3CI.....11,480
W7LG.....7,750
N7JI.....6,579

ASSISTED
HIGH POWER
All Band
K3WW.....5,592,496
W3PP (AA1K)....5,073,630
AA3B.....4,950,540
AB3CX.....4,703,658
K4AB.....4,046,868
N3RS.....3,999,816
N2SR.....3,772,240
W2MKM.....3,462,674
NW3Y.....3,426,947
KK6P (W7IV).....3,271,334

28 MHz
K1MM.....475,344
WV4P.....191,352
WO4O.....177,480

21 MHz
WW4LL.....479,100
NR4L.....259,992
W6PH.....214,650

14 MHz
KVØQ.....454,905
K1JB.....302,784
N7DD.....263,835

7 MHz
W9PA.....88,206
N9LR.....15,833
K2LE.....14,694

3.7 MHz
W3NO.....84,482
KN2M.....13,862
AI6Z.....2,139

1.8 MHz
K5UR.....2,975

ASSISTED
LOW POWER
All Band
KS1J.....1,832,124
WE9R.....1,493,796
W3KB.....1,196,685
N4XL.....1,191,265
W1NT.....1,169,299
N3AAA.....618,184
WO1N.....515,520
W2YR.....476,392
KC1SQ.....429,275
AD1C.....421,940

28 MHz
N3UA.....195,939
N4IJ.....86,456
W9XT.....49,998

21 MHz
W6NCB.....48,685
K2SQS.....40,474
W9QL.....30,108

14 MHz
N9TGR.....132,258
W4LC.....70,252
KC1G.....3,564

7 MHz
W3CC.....2,232

3.7 MHz
K7LU.....1,638

ASSISTED
QRP
All Band
WB4OMM.....3,150
WO7T.....2,596
N6AN.....1,680
NO5V.....1,184

21 MHz
KG1E.....14,022
K2GMY.....8,084

MULTI-OP
SINGLE TRANSMITTER
High Power
KC1XX.....14,560,432
K1LZ.....7,849,968
NV9L.....5,978,412
K8AZ.....5,181,780
W2A.....4,345,230
W8PR.....2,805,115
K9RS.....2,783,231
KC3R.....2,729,090
N4SS.....2,666,122
K1KP.....2,470,404

Low Power
W1QK.....1,396,395
W3ZGD.....611,340
W1FM.....591,374
WA1F.....483,218
NN6P.....345,800
KT4XA.....177,822
KT3T.....149,079
K4CBW.....64,170
AD4XT.....56,168
W8AJT.....41,100

MULTI-OP
TWO TRANSMITTER
W3LPL.....11,708,631
K1RX.....10,437,328
K9CT.....7,757,400
K1CC.....7,533,834
K2AX.....6,709,300
W2CG.....6,017,270
AA4VT.....4,324,023
W6YX.....2,986,284
NJ3I.....2,496,945
N7DX.....2,274,612

MULTI-OP
MULTI-TRANSMITTER
K3LR.....27,941,270
K1TTT.....10,253,024
WX3B.....10,232,750
N1RR.....5,289,424
K3EST.....5,150,697
K1KI.....3,117,994
WA3EKL.....2,699,880
W3MF.....2,258,308
NE3F.....2,106,473
W1AW.....1,327,435

EXPLORER
Single Operator
K7RB.....123,690
W2MRD.....3,483

ROOKIE
High Power
K4QQG.....686,092
AC3LZ.....468,666
W3MAM.....246,280
W4SSF.....200,910
KJ8H.....171,051
AA5H.....140,400
K7WXB.....81,450
KC3RDV.....38,280
N7RBL.....18,564
KX7TL.....11,900

Low Power
N3GT.....356,425
KC3QVQ.....175,032
K1MWH.....135,744
K3KDX.....134,568
N3AML.....111,384
K4LEN.....110,400
W9TCV.....101,598
N8CWX.....55,900
KD9RPB.....53,010
KI2D.....51,136

CLASSIC
High Power
K5ZD.....4,784,670
K1DG.....3,392,264
N2IC.....1,911,429
K3AJ.....1,569,067
K2SSS.....1,108,282
W1JQ.....1,006,542
W3KL.....996,130
K1RM.....984,718
KD7RF.....783,696
W4KW.....754,725

Low Power
WW4XX (LZ4AX)..917,285
K1HT.....616,641
AC4G.....536,568
N8II.....469,588
N7IR.....442,260
WA3LXD.....348,096
NØUR.....315,100
W6DVS.....262,548
K4DR.....214,376
N1DC.....204,670

YOUTH
High Power
KI6RRN.....1,409,580
NTØK (K6BFL).....760,767
KD9V.....224,238

YOUTH
Low Power
N4WLL.....100,646
KE8HBV.....97,865
W8UA.....61,087
KE8RJU.....35,258
N8AJM.....12,551
W8MTB.....2,345

Table 4

Call	Cont	Cat	Raw QSOs
VE2IM	NA	High Power	6483
K5ZD	NA	High Power	3844
EA4KD	EU	High Power	2473
OK6T	EU	Low Power	2364
VC3X	NA	High Power	2334
FG5GP	NA	High Power	1412
R3OM	EU	High Power	1296
K6NA	NA	High Power	1229
OE1HHB	EU	Low Power	1185
UA9BA	AS	QRP	1083
DU7JAY	OC	High Power	1049
PZ5RA	SA	Low Power	1003

(99%+ callsign accuracy with >1000 QSOs)

Table 4. Most accurate 2021 CQWW SOAB Unassisted entries

78,500 hours of operating time in last year's WW. That equals 3,271 days or 62.9 years. Those numbers make me tired just looking at them. My advice is to keep this data to yourself (that's a hint to those of you with spouses or significant others).

There is Accuracy, Then There is ACCURACY!

We have amongst us an elite group of operators that regularly demonstrate outstanding skills, especially in log accuracy. Leading the pack was Yuri, VE2IM (VE3DZ) who only busted 14 calls out of 6,483 QSOs an error rate of 0.2%. This is in sharp contrast to the average for all logs of 1.8%. Randy, K5ZD, was not far behind with only 13 busted calls (0.3%). The remainder on this list (See *Table 4*) share in our well-deserved accolades. While there is a natural skill in achieving these results, the other key point is in how intentional each of these operators are in "getting it right." It takes work, concentration, experience, and even a little bit of luck. Congratulations to each of you.

Celebrating our Youth Operators

As reported earlier, we launched a new Youth Overlay category in this year's CQWW contest. The goal was simply to offer well-deserved visibility to the youngest operators (in our case, 25 years old or less) in our contest community and hopefully provide an incentive for more to participate. With over 100 logs received, I'm happy to report the initial launch was successful.

Not surprisingly, over half of the Youth logs came from Europe, who are leading the world in recruitment and growth. But, with entries from every major continent, the opportunity for future growth abounds. My thanks go to Philipp, DK6SP, and Luc, LU6FAM, who spearheaded this effort as well as the many new sponsors of CQWW Youth plaques (14 in total). Next year will be even better.

Some Thoughts from the Director

I'm happy to report that after hours of extensive log checking, using some of contesting's most advanced resources,

2021 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
EA8RM	134/6/37	428/15/61	1309/25/84	1599/27/79	1434/26/82	3269/28/99
VE2IM	186/10/29	779/17/74	1472/27/91	2000/32/99	1624/26/103	364/20/59
CF3A	217/10/34	661/17/58	969/26/95	1800/35/99	1255/26/100	485/19/64
KQ2M	28/9/23	422/15/65	372/22/75	1474/38/112	1527/29/96	653/21/73
K5ZD	63/9/31	240/14/61	300/21/75	1563/35/109	1160/31/102	493/18/75

USA TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
KQ2M	28/9/23	422/15/65	372/22/75	1474/38/112	1527/29/96	653/21/73
K5ZD	63/9/31	240/14/61	300/21/75	1563/35/109	1160/31/102	493/18/75
K4ZW	28/8/20	292/20/72	570/27/83	987/33/99	1041/28/102	576/21/69
N1UR	74/9/34	283/18/65	510/22/79	848/35/99	1051/26/98	608/21/74
K5TR	26/11/18	111/17/47	1004/28/74	815/34/87	1611/34/104	664/25/68

WORLD SINGLE OPERATOR ASSISTED ALL BAND

PT5J	14/6/10	239/24/66	597/34/102	1365/38/115	1689/33/116	2327/31/116
P4ØW	58/8/17	442/18/71	1457/26/104	1150/31/95	1626/30/109	2096/26/78
EA2W	61/9/42	500/18/76	1113/30/104	1536/37/116	1505/38/117	977/34/100
KH7Q	15/10/8	168/24/32	1408/31/77	1338/36/98	2184/33/89	386/24/42
OMØR	171/9/48	577/19/80	1000/34/104	1093/36/107	1509/37/113	612/33/90

USA SINGLE OPERATOR ASSISTED ALL BAND

K3WW	40/10/28	221/15/71	395/27/91	1068/32/113	883/29/115	583/22/91
W3PP	45/10/29	196/18/71	156/26/79	994/36/110	1004/32/121	413/26/97
AA3B	33/7/20	272/16/73	421/24/87	739/32/110	860/27/106	498/27/101
AB3CX	61/9/32	252/18/72	270/27/91	773/34/104	663/27/111	578/25/91
K4AB	24/7/15	198/17/64	254/26/82	551/35/101	934/32/113	597/26/88

WORLD MULTI-OPERATOR SINGLE TRANSMITTER

P33W	229/13/57	745/20/84	1634/35/114	2298/38/138	2577/39/136	2171/36/116
TM6M	172/9/46	481/20/86	1615/34/118	2208/38/130	2258/39/141	1111/34/113
KC1XX	45/11/43	719/22/92	1777/31/121	1468/37/131	1921/32/132	618/28/116
IR4X	50/8/49	679/19/94	1329/36/117	1512/38/137	2516/40/147	945/35/123
E7DX	129/10/62	799/21/88	1854/37/126	1654/39/139	2286/38/140	938/36/124

USA MULTI-OPERATOR SINGLE TRANSMITTER

KC1XX	45/11/43	719/22/92	1777/31/121	1468/37/131	1921/32/132	618/28/116
K1LZ	73/13/52	348/20/82	591/29/108	1375/36/116	1258/31/120	378/25/100
NV9L	17/8/16	336/19/70	338/30/99	814/35/116	1059/37/126	598/28/98
K8AZ	21/8/19	213/17/69	228/29/94	901/36/118	772/32/123	683/25/100
W2A	1/1/1	137/16/65	355/26/97	1177/35/114	906/28/113	84/22/83

WORLD MULTI-OPERATOR TWO TRANSMITTER

PJ4K	155/14/33	1007/23/81	3057/29/110	1661/34/116	3982/32/113	2600/28/85
ES9C	523/14/65	1566/25/99	2205/37/126	2985/39/142	3529/39/150	1019/33/121
EI7M	370/12/57	1200/20/87	2183/33/115	2808/36/124	3245/40/136	1454/33/117
HD8R	10/7/7	588/22/51	1552/27/93	1630/34/105	3549/34/109	3023/29/102
CR6K	292/11/53	1048/20/91	2159/32/112	2677/38/136	2921/37/129	1744/29/114

USA MULTI-OPERATOR TWO TRANSMITTER

W3LPL	43/11/41	721/21/88	912/30/111	1601/38/131	1448/34/132	876/28/108
K1RX	63/10/31	436/17/80	1137/24/98	1942/36/123	1575/33/119	623/23/88
K9CT	31/9/15	312/22/65	732/31/99	1318/37/121	1504/36/132	693/30/103
K1CC	45/7/28	261/19/78	650/27/102	1223/34/120	1129/33/130	514/26/105
K2AX	47/9/29	236/17/70	242/27/90	1234/37/118	1033/31/120	827/26/102

WORLD MULTI-OPERATOR MULTI-TRANSMITTER

PJ2T	196/13/31	1084/21/88	3027/33/122	2880/33/120	4195/35/119	3152/29/95
K3LR	600/16/60	888/25/94	2687/34/133	3259/39/148	3326/38/151	1577/31/120
A73A	252/8/48	789/19/73	2215/35/121	3017/37/133	3184/39/124	2263/35/114
M6T	664/10/58	2175/22/97	3905/36/135	2341/39/140	2008/38/133	1678/35/127
EW5A	981/15/68	1760/24/101	2696/37/127	3554/38/137	2451/38/139	1264/34/107

USA MULTI-OPERATOR MULTI-TRANSMITTER

K3LR	600/16/60	888/25/94	2687/34/133	3259/39/148	3326/38/151	1577/31/120
K1TTT	211/12/45	536/22/87	1012/27/102	2141/37/129	1325/31/122	731/26/106
WX3B	38/8/20	470/19/78	534/28/95	2002/37/118	1800/34/118	975/24/92
N1RR	37/6/25	182/17/66	303/24/82	625/29/90	1772/26/105	436/23/76
K3EST	123/12/13	223/21/42	749/33/80	922/37/117	1182/34/98	708/26/60

the CQWW Contest Committee can declare that the overwhelming majority of log submissions are truthful and honest. Just to be clear, our primary role is to produce results that are accurate and reflect what really happened in the contest. Contrary to the opinion of a few folks, we do not set out each year to determine ways to disqualify competitors. In that context the results speak for themselves with only 13 logs eliminated from the results out of 9,801 received entries (0.13% of the total).

However, it is also noteworthy that each year there are a few logs that are reclassified — ranging from moves to Assisted or Checklogs. Sometimes this is done at the competitor's request; in other situations, it's to accommodate what we have discovered during the log checking process. It's important to note that some of this year's changes took place because requested audio recordings were not supplied, which is outlined in the rules. As a reminder, it will be very rare for us to ask for your recording. However, rather than view this rule as a punitive strategy, it can be a helpful tool for you — both in terms of confirming our analysis or providing self-discovery on ways to improve your operating skills.

On another subject, the CQWW continues to disallow self-spotting. While there appears to be a movement to allow this practice in other contests, we will likely maintain our position for the foreseeable future. Fortunately for all, the word is getting out that self-spotters will be caught, as the number of violators has significantly dropped in recent years. This is particularly true on CW, where the effectiveness of reverse beacon network (RBN) spotting has rendered the notion of self-spotting to be largely redundant.

Table 5

Country	AS	EU	NA	OC	SA	Grand Total
9A		3				3
9M6				1		1
BY	10					10
CM			1			1
CT		1				1
DL		13				13
DU				2		2
E7		1				1
EA		1				1
EI		2				2
F		1				1
G		4				4
IT9		1				1
JA	5					5
K			13			13
LY		1				1
LZ		1				1
OE		2				2
OK		2				2
PY					3	3
S5		1				1
SP		11				11
SV		1				1
TA	1					1
UA		3				3
UR		1				1
VE			1			1
VK				2		2
VU	2					2
YB				4		4
YL		1				1
YO		4				4
YT		2				2
ZL				1		1
Summary	18	57	15	10	3	103

Table 5. Breakdown of Youth entries by geography

EUROPE TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
DM6V	51/7/29	494/12/54	859/23/73	1173/31/87	1106/29/75	734/26/60
EA3QP	59/6/26	400/11/51	779/19/62	1327/27/70	1314/25/66	1037/29/62
DK6WL	135/9/42	519/14/61	607/27/81	803/27/91	636/32/91	576/31/72
4O3A	23/4/15	183/7/41	840/29/88	690/26/73	1651/30/90	645/25/62
TM2Y	181/6/39	612/14/57	421/15/64	697/27/68	880/30/71	556/27/59

EUROPE SINGLE OPERATOR ASSISTED ALL BAND

EA2W	61/9/42	500/18/76	1113/30/104	1536/37/116	1505/38/117	977/34/100
OMØR	171/9/48	577/19/80	1000/34/104	1093/36/107	1509/37/113	612/33/90
HG8R	224/9/44	672/19/71	1071/32/95	1413/37/118	1188/38/117	561/33/105
SN7Q	137/5/38	437/18/73	560/29/91	880/33/107	1415/34/102	969/32/112
LY7Z	243/10/55	602/17/74	1189/38/117	1324/38/127	1243/38/128	307/31/86

EUROPE MULTI-OPERATOR SINGLE TRANSMITTER

TM6M	172/9/46	481/20/86	1615/34/118	2208/38/130	2258/39/141	1111/34/113
IR4X	50/8/49	679/19/94	1329/36/117	1512/38/137	2516/40/147	945/35/123
E7DX	129/10/62	799/21/88	1854/37/126	1654/39/139	2286/38/140	938/36/124
LZ5R	72/10/53	848/23/93	1793/36/121	2294/38/134	2051/38/138	1183/35/114
SP8R	187/12/59	745/20/90	1651/37/123	1944/38/128	1765/37/139	491/33/114

EUROPE MULTI-OPERATOR TWO TRANSMITTER

ES9C	523/14/65	1566/25/99	2205/37/126	2985/39/142	3529/39/150	1019/33/121
EI7M	370/12/57	1200/20/87	2183/33/115	2808/36/124	3245/40/136	1454/33/117
CR6K	292/11/53	1048/20/91	2159/32/112	2677/38/136	2921/37/129	1744/29/114
II2S	222/10/57	1079/21/93	1862/37/124	2199/38/131	2362/39/139	889/34/107
ED1R	286/12/57	1195/21/93	2067/32/108	2179/37/130	2144/38/124	1534/35/111

EUROPE MULTI-OPERATOR MULTI-TRANSMITTER

M6T	664/10/58	2175/22/97	3905/36/135	2341/39/140	2008/38/133	1678/35/127
EW5A	981/15/68	1760/24/101	2696/37/127	3554/38/137	2451/38/139	1264/34/107
DFØHQ	951/15/67	1909/23/100	3448/36/123	2383/39/138	2020/38/143	1075/33/120
LZ9W	689/11/62	1922/24/101	3297/35/127	3464/38/136	2392/37/136	1127/34/101
YT5A	714/14/63	1830/24/94	2935/35/121	3407/38/132	2372/38/130	1015/32/99

TOP SCORES IN VERY ACTIVE ZONES

Zone 3
ND7K (@N6WIN) 3,036,215
K6XX.....1,939,200
K6NA 1,352,184
VA7RR.....858,108
VA7DX.....744,504

Zone 4
CF3A (VE3AT).....7,994,096
K5TR.....5,006,144
W9RE 4,845,002
K5GN.....2,978,531
VC3X (VE7VR) 2,464,398

Zone 5
KQ2M.....6,729,076
K5ZD.....6,311,403
VY2TT (K6LA) 5,704,800
K4ZW.....5,661,114
N1UR.....5,410,820

Zone 14
DM6V (DL7FER).....4,926,416
EA3QP.....4,419,236
DK6WL 3,724,054
TM2Y (N5ZO) 3,237,876
DL2CC.....2,701,604

Zone 15
4O3A (4O4A).....3,660,790
S53MM 2,726,595
OM7RU.....2,485,615
*OK6T (OK1WCF) 2,121,010
OH2PQ 1,277,772

Zone 16
R8WF.....3,043,425
EW2A.....1,808,733
UT5EL.....1,575,520
R2ARR.....1,440,193
RM4HZ 1,022,352

Zone 20
C4W (5B4WN).....5,883,312
YPØC (YO3CZW).....2,572,453
4Z4AK.....946,810
YO8BDW 831,448
4X1MM 830,109

Zone 25
JH4UYB.....3,599,750
JF2QNM 2,400,000
JH7QXJ 1,422,949
JR1GSE.....1,090,144
JA2AXB 914,373

*Low Power

Celebrating Our Youth Operators!

Here's a youthful 15-year-old Emilio, OA4CBU, hard at work from OA4O!

A very enthusiastic Youth operator, Marija, YU3AWA, right before the CQWW.

Hello from Peru – OA4CBU/OA4O!

Hi! I am Emilio, OA4CBU, and am 15 years old, having just received my ham radio license in May 2021. I've recently started to get interested in amateur radio contests and finally had the opportunity to participate in 2021 the CQWW SSB contest. Joining the Radio Club Peruano (RCP) team, I was able to quickly learn more about this wonderful contesting activity as well as ham radio overall and its possibilities.

My first experience in a major contest was very interesting, operating from the headquarters of the Radio Club Peruano. From the first moment I called CQ, I experienced some difficulties such as the constant "pile up" or high levels of QRM. However, for me it has been a very rewarding and fun. I expect to participate in more contests in 2022. Many thanks to my colleagues and RCP team who gave me this opportunity and to the stations that contacted OA4O while I was operating! 73!

Operating from Serbia – YU3AWA!

Hello, my name is Marija, YU3AWA. I've been waiting for the new Youth category for a long time. I am glad that I had the opportunity to participate in the CQWW SSB 2021 competition submitting my log as a Youth operator. Operating as a high power, all band entry, I enjoyed working so many different DX stations! My thanks to Aleksandar, YT3H, for allowing me to operate from his ham shack.

You may have noticed that there were many active youngsters participating from many DX locations in this year's CQWW contest. I am proud to be one of them! In my short amateur radio career, I experienced amazing band conditions on both 10 and 15 meters for the first time. I didn't want to miss the opportunity to work many new DXCC entities which were plentiful, especially the islands in the Caribbean. I "lost" a lot of time as a station hunter, but it was a unique opportunity for me to log new countries. It's very possible that I did not have the best strategy for this 48-hour contest, so next time I plan to call CQ more frequently, racking up more points and multipliers!

Although I worked the competition as a high-power entry, I used rather modest equipment that cannot be compared to other "big gun" contest locations. Nevertheless, I was very satisfied with my results. This was my best CQWW SSB contest to date!

I am completely convinced that the new Youth category will encourage and incentivize many young people to participate in future CQWW contests. It will give the new young operators a chance to stand out and achieve respectable scores and rankings. For me, this new category was one of the best things that's been done to benefit new amateur radio operators and the youth community.

– 73/88, Marija, YU3AWA

Greetings from Canada – VE3OMV

Hello from Ontario, Canada. My name is Maria Polyanska, VE3OMV. The CQWW events are truly amazing contests. From the excitement of experimenting with antennas in anticipation of being able to hear DX, to the thrill of hearing

A proud Youth operator, Maria, VE3OMV, showing off her newly installed vertical antenna.

a new station, these contests offer memorable experiences while allowing me to put contacts in the log.

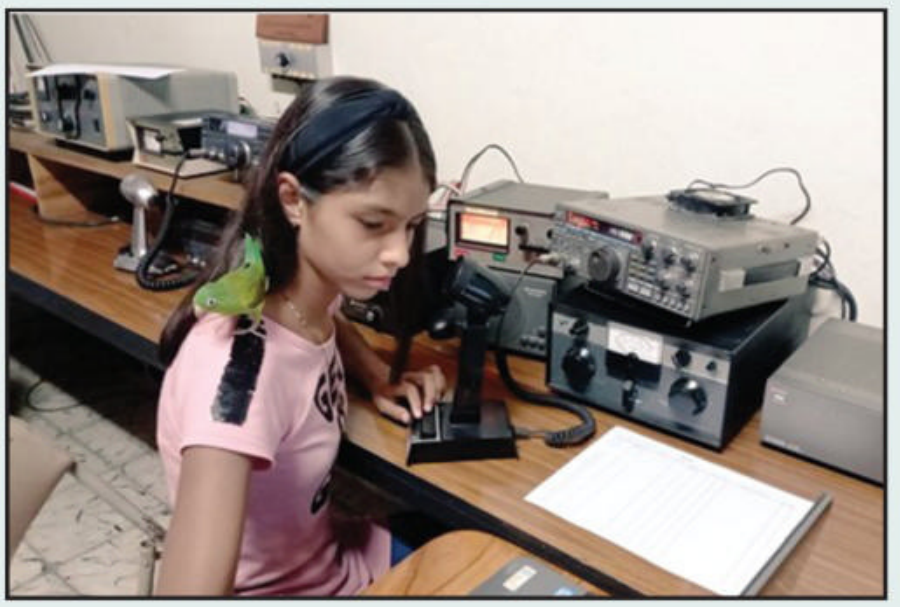
I first discovered the CQWW contest from members of my CWOps CW Academy class. The CQWW contests were the first that I operated using my own callsign, VE3OMV, having been just licensed in September 2021.

The most interesting area that I dedicated my time towards was the 15-meter band. When I was learning to acquire my license, an instructor would tell me something about propagation. To be honest, I didn't totally understand all of his points. In particular, I didn't really think that a band could quickly change — I simply thought it was just an exaggeration. However, I was able to experience that myself! I saw how 15 meters was not limited to one part of the world because the conditions are constantly changing. In the morning from my part of the world, the band is open to much of Europe, slowly progressing towards the African region around noon. In the afternoon, I would usually hear South and Central America and then Japan and North America in the evening. It was a fascinating discovery. I cannot wait to learn more! If I had not participated in these contests, I do not believe that I would have seen this. It is not every day that the band is packed with stations from so many diverse places.

As I was still a new operator and this being my first big contest, one contact really surprised me. It was a friendly operator from Japan on 15 meters in the late evening. I had barely ever heard any stations from Japan from my location, so I was excited to potentially have this contact in my log. It was easy at first — but then there was so much QSB! At any moment the signal would alternate between being loud and drifting away to be extremely faint. I tried calling the station but they could not hear me. I tried again in about 15 minutes and they were so loud. It sounded as if he was not a DX at all. We finally made a successful contact.

Not only did I really enjoy the 2021 CQWW SSB contest; I cannot wait to do it again next year!

– 73/88, Maria, VE3OMV



Youth operator, Mily, YS1YXI, operating in her first CQWW contest.

Greetings from El Savador – YS1YXI!

My name is Mily Erazo, YS1YXI. During 2020, I was present during the CQWW contest, but only as an SWL because I still did not have my amateur radio license to be able to operate. Nevertheless, I joined a YS contest team anyway. I really loved the intensity of the CQWW SSB Contest, which takes place every year during the last weekend of October. It wasn't until last year (2021) that I was finally able to operate.

El Salvador was present for another year in the CQWW 2021 contest from the *Club de Radio Aficionados de El Salvador* (CRAS). Our pre-contest strategy required that each individual operator considered: Food, sleep management, rest times, equipment, and other resources to guarantee the best individual and collective results.

In the end, my first CQWW was a great experience for me, I was able to enjoy amazing pile-ups and share the weekend with some great radio amateurs: Mario Giolitti (YS1TG), José Arturo (YS1MS), and my dad Juan (YS1JFE) — all part of what we called Team YS!

73, from the City of Ilopango,

– Mily, YS1YXI

Exploring in the CQ WW from EE7K

BY JUAN DE LAS CUEVAS, EA7AKK

Background

Upon hearing the news of a new Explorer overlay category in the CQWW, the EE7K team was excited to participate. Some of the operators had significant experience, having participated in MS, SOSB, and SOAB operations. In addition, a few team members had already implemented remote radios and we were aware that, sooner or later, advanced use of this option had to be considered by the CQWW committee — especially considering the growing use of remote stations and the state-of-the-art IP technologies.

Victor, EA7FUN, having fun "Exploring" from EE7K.

One of the recurring problems we have experienced while operating MS stations is the breakdown of our receivers due to the presence of high RF currents and / or mistakes while switching filters. In addition, we usually had to erect several antennas for low bands, always right before the contest. For these reasons, EA7FUN and I started to improve our own remote stations. Moreover, as a result of an agreement with the *"Union de Radioaficionados de Sevilla"* we managed to install a new remote site at a TV broadcast center at 932 meters above sea level, 100 kilometers from our city, using a 4G router connection and a wire multi-band dipole for 40 / 80 / 160 meters.

In the end, we implemented four, single-radio amateur stations located within Seville's province limits, without using any SDR receivers, as we thought that this would not be fair to other participants.

Operation

In some ways, this year's installation seemed to be simpler considering we didn't need to deploy RF devices. However, as usual, challenges arose in our operation — computing. It seemed we had countless PCs to control everything: Radios, antenna rotators, power amplifiers, as well as contest logging (using the newest version of Wintest™). Once we finally had everything working and were on-the-air, operating remained challenging. Everyone across our network had to be aware of multiple configuration parameters and be ready to solve any difficulty but in a remote way. Of course, we experienced the usual problems when using computers, including blue screens, lack of connectivity, and network overloading. Some latency was found transmitting with the ICOM 7610. And, we couldn't find a way to connect a PTT pedal to drive this particular radio, so we implemented a keyboard shortcut to switching TX/RX.

In the end, however, we intended to simply enjoy this new category and that goal was accomplished. We have tested new techniques as well as a different approach to radio contesting. Of course, our goal was making a high score, but we also learned a lot and plan to try again in the coming years because we think this category is going to become a even more popular in the future.

Finally, there is the on-going debate of combining Single Operator Assisted and Unassisted categories. Again, while the legitimate use of assistance continues to grow, we are maintaining the position that these two categories should remain separate in the CQWW.

The Final Curtain

One of my greatest privileges in contesting is to closely work with the dedicated CQWW Contest Committee team. The effort this group puts forth into producing the results that you are reading is simply amazing, with some members having been with us for decades. For this year's effort and all the other ones from the past, I simply want to say, "thank you!" Thanks to: CT1BOH, José Nunes; EA4KD, Pedro Vadillo; ES5TV, Tonno Vahk; F6BEE, Jacques Saget; GØMTN, Lee Volante; HA1AG, Zoli Pitman; IK2QEI, Stefano Brioschi; JH5GHM, Katsuhiro (Don) Kondou; K1DG, Doug Grant; K1EA, Ken Wolff; K3LR, Tim Duffy; K3WW, Charles Fulp; K3ZO, Alfred A. (Fred) Laun, III; K5ZD, Randy Thompson; KR2Q, Doug Zwiebel; LA6VQ, Frode Igland; LU5DX, Martin Monsalvo; MØDXR, Mark Haynes; OH6LI, Jukka Klemola; PA3AAV, Gert Meinen; RA3AUU, Igor (Harry) Booklan; S5ØA, Tine Brajnik; S5ØXX, Kristjan Kodermac; UA9CDC, Igor Sokolov; VE3EJ, John Sluymer; VK2IA, Bernd Laenger; and YO3JR, Andrei (Andy) Ruse. Lastly, a special shout-out goes to Steve Bolia, N8BJQ, who stepped down after many years of dedicated committee service.

I know that many of you are already preparing for the next CQWW. See you in October!

– 73, John, K1AR
CQWW Contest Director

(Scores begin on page 91)

Professor Emil Heisseluft investigates how slow website speeds enhance spectrum rage, especially during DX contests.

A CQ Exclusive: Slow Website Speeds Cause Spectrum Rage

BY PROFESSOR EMIL HEISSELUFT*
LAUTON INSTITUTE, GROSSMAULAN DER DONAU, AUSTRIA
HEISSELUFT.EMIL@MASHUGA.ORF.AR

It has been more than 15 years since Professor Heisseluft investigated the problem of spectrum rage. His seminal work in the early 2000s, codified in the April, 2005,[1] issue of CQ magazine, revealed for the first time how the Federal Communications Commission (FCC), justly concerned about how such rage was wreaking havoc on the amateur bands, was considering the enactment of new rules that would require license applicants and currently licensed amateur radio operators to pass a psychological exam in order to retain their licenses. Those who failed immediately would lose all privileges. Since the publication of that early work, the problem of spectrum rage on the amateur bands has grown larger. Yet, little has been done to understand the root cause of the increase. Now, a new study undertaken by the Lauton Institute's Center for Research of Abnormal Personalities has revealed the true nature of the driving mechanism behind rising spectrum rage: Slow website speeds. That is the subject of this year's investigative report. – W2VU

Introduction and Background

The Lauton Institute has a long and distinguished history of participating in the exploration of bleeding-edge science, regardless of the field. As readers already may be aware, the Institute has performed seminal work in the fields of molecular biology, genetic engineering, ichthyology, optics, radiowave propagation, digital-signal processing, electronic sensors, advanced modulation schema, fluid dynamics, space physics, orbital mechanics, space vehicle propulsion systems, human physiology, commodities trading, and other equally daunting fields.

For example, it was our Institute's Center for Research of Abnormal Personalities (CRAP; see *Photo A*) that first investigated the phenomena behind spectrum rage on the high-frequency (HF) bands. Addressed here, of course, were operators who deliberately tuned up on top of an ongoing exchange (or, as you say, a "QSO"), interfered with the on-the-air operations of a DXpedition, acted as "policemen" during major DX operations, pirated callsigns, jammed a net, took over an operator's "established" contest frequency, or simply appeared to have no purpose in life other than to inflict their immaturity, lack of self-control, and psychological problems on the law-abiding operators of your nation.

Spectrum rage is yet another manifestation of what we experience every day on the road as we go to and from work or tend to our daily business, *except* that on the road, things frequently turn deadly. Further, it's amazing how even the smallest delay in

Photo A. The Lauton Institute's Center for Research of Abnormal Personalities (CRAP), which, among other things, studies DXers, is located in this forested setting just outside Grossmaulan der Donau, Austria.[2] 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.

** Professor Heisseluft is currently in a secure undisclosed location in Ukraine, helping officials there use the stealth cloaking technology he described in his 1981 and 2009 CQ articles to hide entire buildings, and possibly cities, from the Russian military. He may be conveniently contacted via CQ magazine.*

obtaining service — for example, having to wait in a supermarket checkout line or watching the clock after having placed an order in a restaurant — can "set off" the psychologically stressed. Is the problem simply one of too many people overloading the roads or a restaurant's kitchen (in the two cases cited here)? Have the demands we make in our day-to-day lives outweighed the resources available? These are certainly part of the problem.

However, in examining what's happened to the amateur bands over the last 15 years, researchers at the Lauton Institute identified another critical stress mechanism: *Slow website speeds*.

How Do Slow Website Speeds Increase Web Stress and Spectrum Rage?

There can be no greater levels of stress encountered by members of the radio amateur community than those incurred during a DX competition. These competitions include the CQ World Wide phone and CW contests held every fall as well as similar competitions held by the ARRL every winter. Among the techniques used by many operators during such contests is something called QSO finding assistance. Here is how it's defined by the sponsors of the CQ DX contests:

"QSO finding assistance: The use of any technology or other source that provides callsign or multiplier identification of a signal to the operator. This includes, but is not limited to, use of a CW decoder, DX cluster, DX spotting websites (e.g., DX Summit), local or remote callsign and frequency decoding technology (e.g., CW Skimmer or Reverse Beacon Network), or operating arrangements involving other individuals."

Whether or not any given station may use QSO finding assistance depends on the *category* in which the station participates. For example, for the CQWW DX Contest, if a station participates in Category C. Multi-Operator Categories (all-band operation only), in which any number of operators is allowed to participate, QSO finding assistance is permitted. Thus, these operators may use the internet in the conduct of their contest operations ... and therein lies the potential for slow website speed, web stress, and opportunities for spectrum rage.

To analyze the impact of slow website speed on contest operators, the Lauton Institute's Center for Research of Abnormal Personalities created a medically-based scientific experiment involving members of the Institute's DX contesting club (see caption, *Photo A*). The experiment was conducted during the 2021 CQ World Wide CW DX Contest. Specifically, the experiment required the Institute's DX contesting club to enter the competition under Category C and to use any and all QSO finding assistance available. The Austrian Internet Service Provider (ISP) serving the Institute nominally provides 500 Mbps download / 10 Mbps upload capabilities. *However, provisions were made during the contest to adjust those speeds in order to gauge the impact of slower speeds on operator performance. In addition, the internet connections to various operator workstations were interrupted randomly for a second or two.* Finally, to ensure total objectivity and to provide for a thorough medical review of an operator's physical condition, all contest participants were monitored to gather alpha wave, EEG, and blood pressure data.

Scientific Experiment Results During the 2021 CQWW CW DX Contest

It hardly comes as a surprise to learn that *any* type of delay in accessing a website or the information contained therein during a period of high stress — and what can be more stressful than competing in a DX contest? — only serves to raise an operator's stress level. For example, our experiment confirmed the work of Foviance,[3] who found the participants in his study had to concentrate 50% harder when websites were slow. (NB: Foviance used alpha waves to measure his subjects' responses.)

Members of the Institute's scientific team also observed that when they slowed the internet's download speed or cut it off completely at an operator's workstation, even for a few seconds, the results were horrific. Operators at affected positions started cursing at their equipment; some even screamed at it. A few threw pens at their modems while one was observed to throw her coffee cup at the wall. (Fortunately, it was empty.)

Harris International, in 2011,[4] observed similar behavior by Americans who became frustrated by the failure of their mobile transactions (58% exhibiting similar rage; 56% reacted in a similar manner when finding themselves stuck in traffic). In the case of the Harris study, 35% of respondents cursed at their phone, screamed at it, or even threw it in anger. In 2018, consistent with our findings, angst among the operators rose significantly when they landed on a page that wasn't interactive soon after it was rendered. This resulted in "rage clicks" or the tapping of an element repeatedly in quick succession, frustrating the operator even more.

Finally, our research confirmed the work published in 2020 by Cyber-Duck,[5] which showed slow-loading pages caused users the most stress. In the case of their study, slow loading caused an average 21% increase in systolic blood pressure. Needless to say, this is the last thing a contest operator needs after drinking gallons of coffee during the 48 hours of a DX competition. No wonder we at the Lauton Institute require doctors and nurses to be in attendance at our DX contesting club during all competitions!

Summary

To date, many of us thought spectrum rage largely resulted from an overcrowding of the bands (especially the HF bands). The phenomenon is especially troublesome during periods of high activity — for example, during DX and other contests, operations by DXpeditions, and so forth. Now, however, recent work by the Lauton Institute's Center for Research of Abnormal Personalities suggests another mechanism has appeared that increases significantly the level of rage already observed on the amateur bands: Slow website speeds. Specifically, during periods of on-air competition or DX chasing at stations using internet-based QSO finding assistance, slow website speeds increase operator stress levels, leading to spectrum rage. Further studies, and techniques for amelioration, are needed.

Notes:

1. Heisseluft, Prof. Emil, "Psychological Testing of Amateur Radio Applicants ... The Cure for Spectrum Rage," *CQ* Magazine, April 2005, pp. 44-46
2. Castle Hochosterwitz, this file is licensed under the Creative Commons Attribution-Share Alike 3.0 Austria license. Photo by Johann Jaritz
3. <https://tinyurl.com/2wtscfta>
4. <https://tinyurl.com/8bm5pw8r>
5. <https://tinyurl.com/53vku6ex>

Inspired by Bob Heil's "pine board project" and the blues tradition's cigar box guitars, AB1DQ built a 5-watt vacuum tube transmitter out of cigar boxes! PT2ZDX/LU9EFO shares the story as well as an interview with the builder.

Smoke (But No Mirrors): The Cigar Box QRP Transmitter

BY MARTIN BUTERA,* PT2ZDX/LU9EFO

When it comes to assembling homemade QRP transmitters, pretty much every kind of container is fair game. QRP rigs built in sardine cans, tuna tins, or mint tins are already classics. But have you ever thought about using cigar boxes? Here is the story of one American radio amateur, James M. Surprenant, AB1DQ (*Photo A*), who combined his passions of radio and smoking a good cigar to produce a beautiful 5-watt transmitter. James was inspired by the famous "Cigar Box Guitar" and by Bob Heil, K9EID's "Pine Board Project,"[1] to assemble his radio project (*Photo B*).

Photo A. James M Surprenant, AB1DQ, and his two passions: Radio and smoking cigars. (Photos courtesy of AB1DQ, except as noted)

Cigar Box Guitars

Guitars made from cigar boxes (*Photo C*) are an old American tradition. This form of construction dates back more than 150

* Email: <martin_butera@yahoo.com.ar>

Photo B. AB1DQ's QRP transmitter project, using cigar boxes.

Photo C. Here are some examples of "cigar box guitars," photographed in Hood River, Oregon. (Courtesy of Bob White)

years. From the mid-1860s to the early 1950s and before the mass production of musical instruments lowered costs, it was common to see people make their own guitars or other stringed instruments out of old cigar boxes and pieces of wood.

Homemade instruments really became popular during the Great Depression of the 1920s and 1930s. Poverty didn't stop people from wanting to enjoy music and have fun with family and friends.

Today these guitars are icons of blues culture, simple, small, and — for some — a little clumsy. But these guitars originally made from cigar boxes were how many of the early "bluesmen" got their starts.

AB1DQ was also inspired by the "Pine Board Project" developed by Bob Heil, K9EID, of Heil Sound. The project is an homage to a bygone era when radio amateurs built DIY projects with

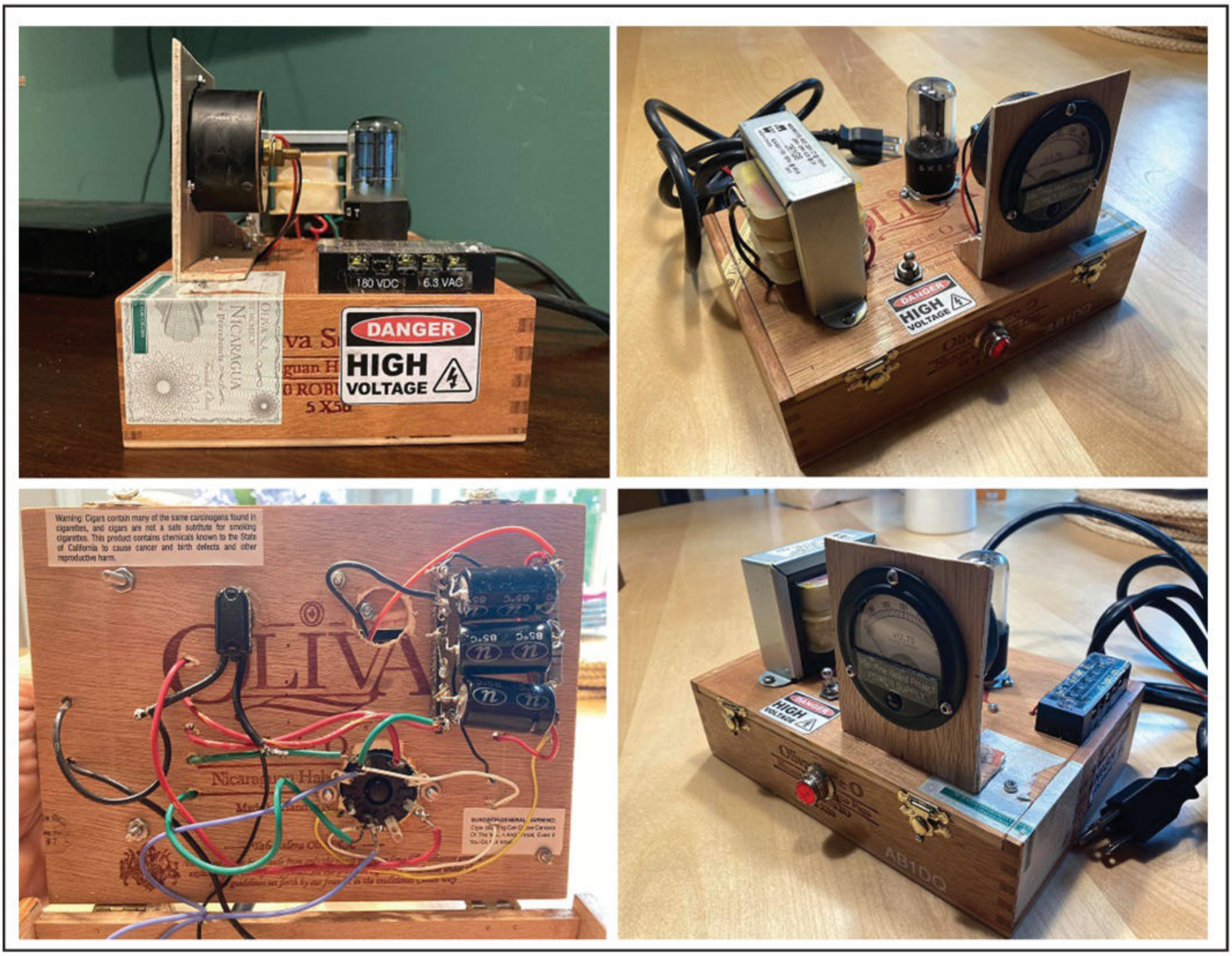


Photo D. This is AB1DQ'a first power supply, which he put together for the transmitter project. Unfortunately, it didn't work properly, and he had to start again.

Photo E. Starting to assemble the second power supply, James drills holes in a cigar box.

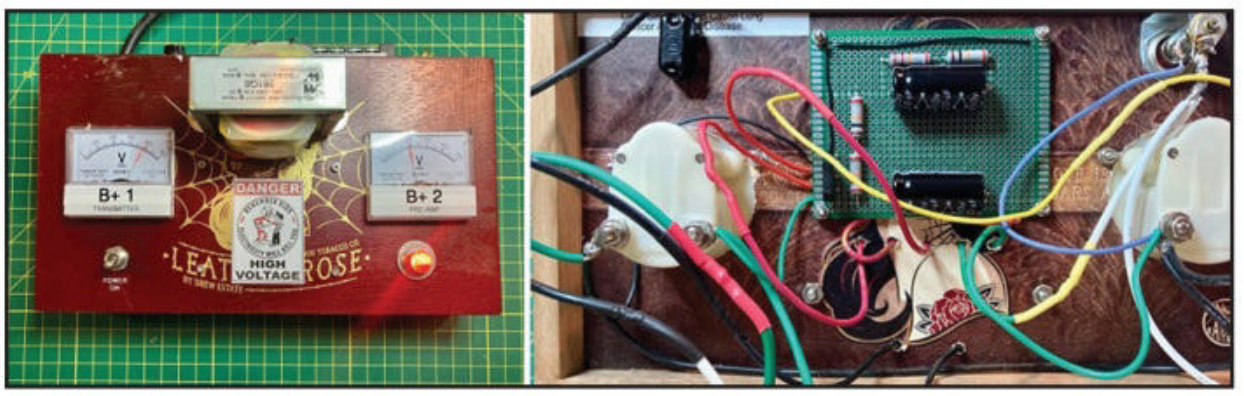


Photo F. These photographs show how the second power supply was assembled, both inside and outside.

Photo G. Power meters add a new dimension to Bob Heil's Pine Board Project, which provided half the inspiration for James's project. Left: B+ No. 1 will deliver almost 400-volts DC to the transmitter. Right: B+ #2 will provide the 12AX7 tube plate with a safe voltage of 190-volts DC.

exposed circuitry. Bob also developed the concept with the goal that anyone who built the project, guided by the schematic, could see the circuit, with the aim of learning a little more about schematics and how to build everything while having fun. K9EID's original project is based on three modules: The high-voltage power supply, the two-band microphone preamplifier / equalizer, and the transmitter. AB1DQ went a little further and incorporated an RF meter into his version of the project.

Additional information on Bob Heil's original Pine Board Project may be found on the Heil Ham Rdio website at <https://tinyurl.com/478dxm7k>.

AB1DQ's Radio Art

Here exclusively you will be able to see photographs of AB1DQ's beautiful

ANNOUNCEMENTS *(from page 2)*

DEERFIELD, NEW HAMPSHIRE — The New England Amateur Radio Festival (NEAR-Fest) will be held from 9 a.m. Friday, April 29 through 2 p.m., Saturday, April 30 at the Deerfield Fairgrounds, 34 Stage Road. Website: <http://near-fest.com>.

BOONSBORO, MARYLAND — The Antietam Radio Association will hold The Great Hagerstown Hamfest beginning 7 a.m., Saturday, April 30 at the Washington County Ag-Center, 7313 Sharpsburg Pike. Contact: Steve Struharik, WA8EIH, (240) 818-1248. Email: <strukariks@gmail.com>. Talk-in 147.090+ (PL 100). VE exams, card checking, fox hunt.

BRISTOL, PENNSYLVANIA — The Warminster Amateur Radio Club will hold its 2022 Hamfest and 2022 ARRL Eastern Pennsylvania Section Convention beginning 7 a.m., Saturday, April 30 at the Bucks County Community College-Lower Bucks Campus, 1304 Veteran's Highway (Route 413). Email: <hamfest@k3dn.org>. Website: <www.k3dn.org>. Talk-in 147.09+ (PL 131.8) or 443.95+ (PL 131.8). VE exams, DXCC card checking.

CATLETTSBURG, KENTUCKY — The River Cities Amateur Radio Association will hold its Spring Tailgate Hamfest from 10 a.m. to 4 p.m., Saturday, April 30 at the Catlettsburg C & O Train Depot Parking Lot, 497 26th Street. Contact: Chris Straiton, N4TNA, <n4tna@yahoo.com>. Website: <www.jcarc.net>. Talk-in 146.940- (PL 107.2). Free VE exams.

CEDARBURG, WISCONSIN — The Ozaukee Radio Club will hold its 42nd Annual Spring Indoor Swapfest from 8 a.m. to noon, Saturday, April 30 at Columbia St. Mary's Center, W67N890 Washington Avenue. Contact: Tom Tretheway, KC9ONY, (262) 421-6351. Email: <swapfest@ozaukeeradioclub.org>. Website: <http://ozaukeeradioclub.org>. Talk-in 146.91 (PL 127.3).

EAST GRAND FORKS, MINNESOTA — The Forx Amateur Radio Club will hold the Forx ARC Hamfest 2022 from the 8 a.m. to 1 p.m., Saturday, April 30 at the Heritage Village, 219 20th Street NE. Website: <www.wa0jxt.org>. Talk-in 146.940- (PL 123).

PALMYRA, NEW YORK — The Drumlins Amateur Radio Club will hold the 35th Annual Drumins Hamfest from 8 a.m. to 1 p.m., Saturday, April 30 at the Palmyra VFW Post 6778, 4306 Route 31. Contact: Rich Hamill, KC2TNJ, (315) 986-8589. Email: <hamfest@drumlinsarc.us>. Website: <www.druminsarc.us>. Talk-in 146.745 (PL 71.9).

SPRING GROVE, PENNSYLVANIA — The York Hamfest Foundation will hold the 2022 York Hamfest from 8 a.m. to 1 p.m., Saturday, April 30 at Elicker's Grove Park, 511 Roth Church Road. Email: <duane.sterner@yahoo.com>. Website: <www.yorkhamfest.org>. Talk-in 147.330+ (PL 123). Free VE exams, DXCC / WAS / VICC / WAC card checking.

SULLIVAN, ILLINOIS — The Moultrie Amateur Radio Klub will hold its 59th Annual MARK Hamfest from 8 a.m. to 1 p.m., Saturday, April 30 at the Sullivan American Legion, 2 E. Strain Street. Phone: (217) 254-7574 (day) or (217) 873-5287 (evenings). Email: <w9nw@yahoo.com>. Website: <http://qsl.net/mark>. Talk-in 146.655- (PL 162.2).

MAY

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

TOLEDO, OHIO — The Lucas County Amateur Radio Emergency Services will hold its Trunk Sale & Swap Meet from 9 a.m. to noon, Sunday, May 1 at the Toledo Speedway, 5639 Benore Road. Phone: (567) 318-2291. Email: <lucascountyares@gmail.com>. Website: <http://tinyurl.com/lcaresswap>. Talk-in 146.610- (PL 103.5).

CADILLAC, MICHIGAN — The Wexaukee Amateur Radio Club will hold the Cadillac Amateur Radio and Computer Swap from 8 a.m. to noon, Saturday, May at the Mackinaw Trail Middle School, 8405 Mackinaw Trail. Website: <www.wexaukeearc.org>. Talk-in 146.98. VE exams, card checking

PERU, INDIANA — The Cass County, Grant County, Miami County, and Kokomo Amateur Radio Clubs will hold the North Central Indiana Hamfest and 2022 ARRL Indiana State Convention from 9 a.m. to 2 p.m., Saturday, May 7 at the Miami County 4-H Fairgrounds, 1029 W. 200 North. Contact: Mitch Miller (765) 661-5893. Email: <ncihamfest@gmail.com>. Website: <http://ncihamfest.com>. Talk-in 147.345+ (PL 131.8). Free VE exams.

SUCCASUNNA, NEW JERSEY — The Splitrock Amateur Radio Association will hold the 2022 North Jersey Tailgate Hamfest beginning 8 a.m. at the Roxbury Senior Center, 72 Eyland Avenue. Email: <hamfest@splitrockara.org>. Website: <www.splitrockara.org>. Talk-in 146.985- (PL 131.8). VE exams, DXCC card checking.

SUPERIOR, WISCONSIN — The Arrowhead Radio Amateur Club will hold its HAMFEST! From 9 a.m. to 1 p.m., Saturday, May 7 at the Head of Lakes Fairgrounds-Multi-Purpose Building, 4700 Tower Avenue (WI Hwy. 35). Contact: Robert Schultz, KCØNFB, (218) 481-7458. Email: <arac_hamfest@charter.net>. Website: <http://thearac.org>. Talk-in 146.940- (PL 103.5), 147.000- (PL 103.5), or 146.940- (PL 151.3). VE exams, card checking.

XENIA, OHIO — The Dayton Amateur Radio Association will hold the Dayton Hamvention from 9 a.m. to 5 p.m., Friday, May 20; 9 a.m. to 5 p.m., Saturday, May 21; and from 9 a.m. to 1 p.m., Sunday, May 22 at the Greene County Fairgrounds, 120 Fairgrounds Road. Phone: (937) 276-6930. Email: <info@hamvention.org>. Website: <http://hamvention.org>. Talk-in 146.940- (PL 123) or 146.985- (PL 123). VE exams, special event station W8BI.

GOSHEN, CONNECTICUT — The Southern Berkshire Amateur Radio Club will hold its 30th Annual Hamfest from 8 a.m. to noon, Saturday, May 21 at the Goshen Fairgrounds, 116 Old Middle Street. Contact: Lee, K1LEE, (860) 435-0051. Email: <k1lee@arrl.net>. Website: <www.sberk.org>. Talk-in 147.285+ (PL 77). VE exams.

VERDI, NEVADA — The Sierra Nevada Amateur Radio Society will hold the Reno Ham Swap beginning 8 a.m. Saturday, May 21 at the Cabela's Parking Lot, 8650 Boomtown Garson Road. Email: <info@renohamswap.com>. Website: <www.renohamswap.com>. Talk-in 147.210+ (PL 100).

WEST FRIENDSHIP, MARYLAND — The Maryland FM Association will hold the Memorial Day Tailgate Hamfest from 7 a.m. to 1 p.m., Sunday, May 29 at the Howard County Fair Grounds on Route 144. Phone: (301) 641-5313 (6-10 p.m.). Email: <marylandfm@verizon.net>. Website: <http://marylandfm.org>. Talk-in 146.16+ (PL 107.2) or 449.0- (PL 107.2). VE exams.

design; we will briefly detail the three parts that work together and finally, I invite you to read an interesting interview with James Surprenant, to get to know this North American radio amateur, who is behind this beautiful project.

High-Voltage Power Supply

Photo D shows James's first version of the power supply, which he then had to replace. After completely building the transmitter, he was disappointed to register less than a watt on both 40 and 80 meters.

After tracking and verifying the whole project twice, he discovered that the problem came from the power supply. It was a problem with the voltage, and he had no choice but to build another power supply (*Photos E* and *F*), now with new modifications that gave an optimal result of 5 watts output (*Photo G*).

A note of caution: AB1DQ asked me to make it clear to all readers to be extremely careful since this project produces lethal voltages. Before starting to put together this type of design, first know the dangers of working with high voltages and how to be safe. If you are not experienced in working with high-voltage circuits, seek out a more experienced ham to help you stay safe. Ultimately, you will be solely responsible for any risk you take in building or working on such circuits.

Microphone Preamplifier and Equalizer

The mic preamp and EQ (*Photo H*) consists of a classic 12AX7 tube, creating a high-gain preamp that feeds in, providing enough output to drive the transmitter's 6V6-based Heising modulator.

The Transmitter

Finally, the transmitter (*Photo I*) is basically designed to work in the 80- and 40-meter bands. Among some details that we can see and mention are that this transmitter uses a 41-turn plate coil, in which the last 14 turns can be shortened to resonance at 40 meters.

The transmitter has a 6AG7 tube, which is configured as a low-power crystal-controlled electron-coupled oscillator. Power output is 5 watts.

Interview with James Surprenant, AB1DQ

As many already know, I like to think of amateur radio as something more than a need to put together technical pro-

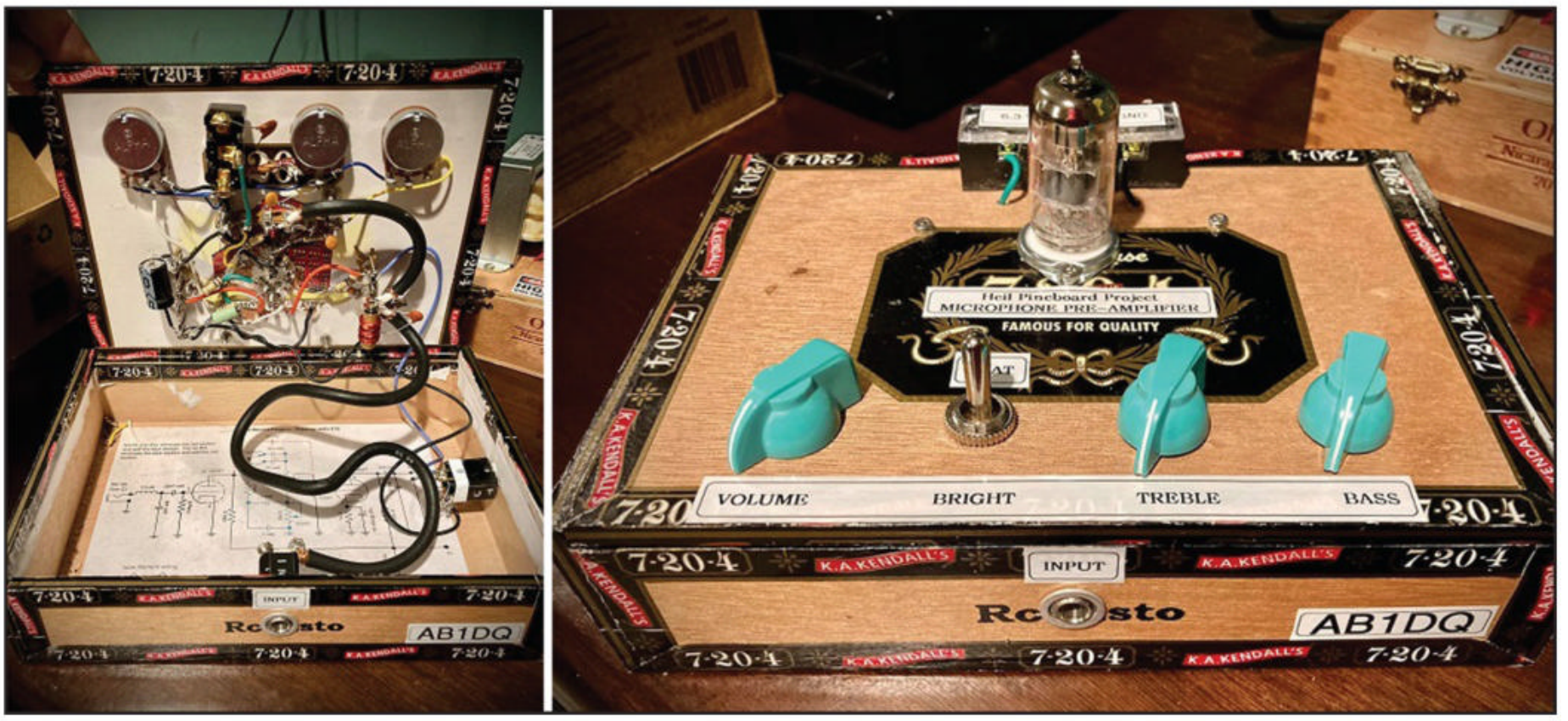


Photo H. Images of the microphone preamplifier and equalizer.

jects, and that's why I invite you to meet the man behind this curious design, in an exclusive interview.

CQ: How did you become interested in amateur radio?

AB1DQ: Well, I've been a radio kid since my childhood. I grew up in a three-story apartment building, located in Lawrence, Massachusetts. My grandfather lived on the first floor and worked in a radio and television repair shop, which was located in the basement of the same building. As a child, I spent many hours watching my grandfather work.

Photo I. The transmitter assembled in the cigar box.

My grandfather's radio workshop in the basement was one of my favorite places to hang out.

CQ: How did you get started in amateur radio and what were your first pieces of radio equipment?

AB1DQ: It was only in the late 1970s and early 1980s that my love of radio was fueled by the CB radio scene and my discovery of an old Sears 9227 Wayfarer radio in my grandfather's basement that helped hunt down several shortwave stations and I started to collect my first QSLs as a broadcast listener (BCL).

Then I remember upgrading my BCL shack with a Realistic DX-100 and then the DX-200. I will never forget when my dad and I placed a longwire antenna diagonally on the roof of our building.

CQ: Which radio stations are your favorites and what memories do you have of those years?

AB1DQ: Well back then, the Cold War was at its height, and the bands were full of state propaganda stations. I listened a lot to Radio Tirana, Radio Kiev, Radio Moscow, Radio Havana, and Radio Peking. I had fun collecting QSL cards, station flags, and various other souvenirs. I remember once receiving a copy of WRTH (the *World Radio-TV Handbook*) from Radio Deutsche Welle, a full-length phonograph album of Liszt's Hungarian Rhapsodies from Radio Budapest, and too many magazines from Radio Peking.

As great as it was to receive all of this, the biggest thrill was every time one of my cards was read on the air. I miss those old shortwave shows, particularly the one on Radio Moscow, hosted by the late great Joe Adamov.

It was a beautiful time. I remember spending too much time listening to the radio, most nights tuning in to my favorite shows, writing and submitting reception reports, and dutifully submitting my records to the clubs each month.

CQ: When did your passion for building radio kits begin?

AB1DQ: My first experience was the Radio Shack Science Fair One Tube 28-100 kit. I was about 9 years old when my dad built it with me on my grandfather's basement workbench. I've been hooked on building ever since.

CQ: So how did you finally become a radio amateur?

AB1DQ: Exactly 20 years ago, in 2002, after moving to a new house, I went to a local radio store to buy a long-wire antenna kit for my shortwave radios. While I was there, I had an impulse to buy the Ham Radio Technician Study Guide. A month later, I passed the ham radio exam and from the first moment, I went back to building ham-related kits, just like when I was a kid. I still love melting solder as it takes me back to my childhood. I enjoy building QRP sets and other kits, as well as restoring old radios (*Photo J*). I have several pieces of my grandfather's old test equipment on my workbench, including his EMC 205 tube tester, which I recently refurbished.

CQ: Now let's move on to your other passion. How did you get into the world of cigars?

AB1DQ: Habanos ... yes, they have been a pleasure for the last 15 years. My beloved grandfather, who also introduced me to radio and electronics, smoked cheap machine-made cigars called 7-20-4s that were made locally in Manchester, New Hampshire by a man named R.G. Sullivan. They were cheap and smelled pretty bad, but my grandfather enjoyed them.

Today, the 7-20-4 is a premium hand-rolled cigar that I often enjoy when I can get my hands on it, and it allows me to remember my grandfather fondly when I enjoy one.

CQ: What are your favorite cigars?

AB1DQ: I have several favorites. For those who do not know much about cigars, I can tell you that, of course, I love the classic cigars from the island of Cuba such as the famous Cohiba and Bolívar brands, although I also have a preference for Nicaraguan fillers and lately among my favorites is the Oscar Valladares brand, which is manufactured in the Republic of Honduras.

CQ: Do you have a favorite place to smoke cigars?

AB1DQ: Yeah sure, it's called the "Owl Shop" (*Photo K*). It's a wonderful Habanos lounge here in New Haven where I often get together with other friends on Fridays to smoke a Habano and have a whiskey.

In addition to his passion for ham radio and cigars, James is a fan of the Boston Red Sox and New England Patriots. He is also passionate about photography and music. You can learn more about James on his personal blog at <https://ab1dq.com>.

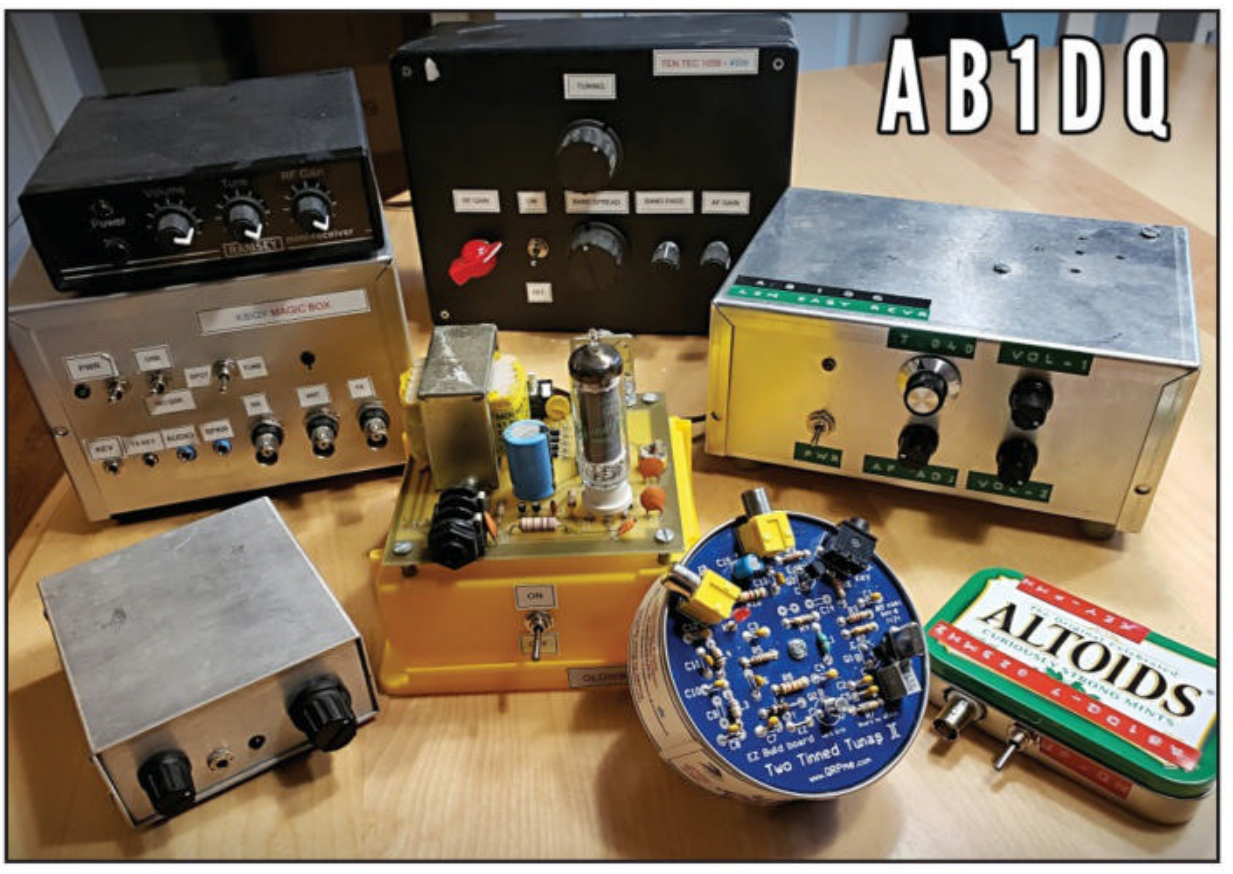


Photo J. AB1DQ's QSL card features several of the other nice projects that he has put together.

Photo K. Cigar aficionado James Surprenant at The Owl Shop, his favorite place to smoke cigars.

what's new

Elite RF's New Amplifier

RFMW announces design and sales support for a high-power amplifier module from Elite RF, the MB030512M565028 incorporates advanced, state-of-the-art LDMOS technology to deliver 350 watts of saturated power from 30 to 512 MHz.

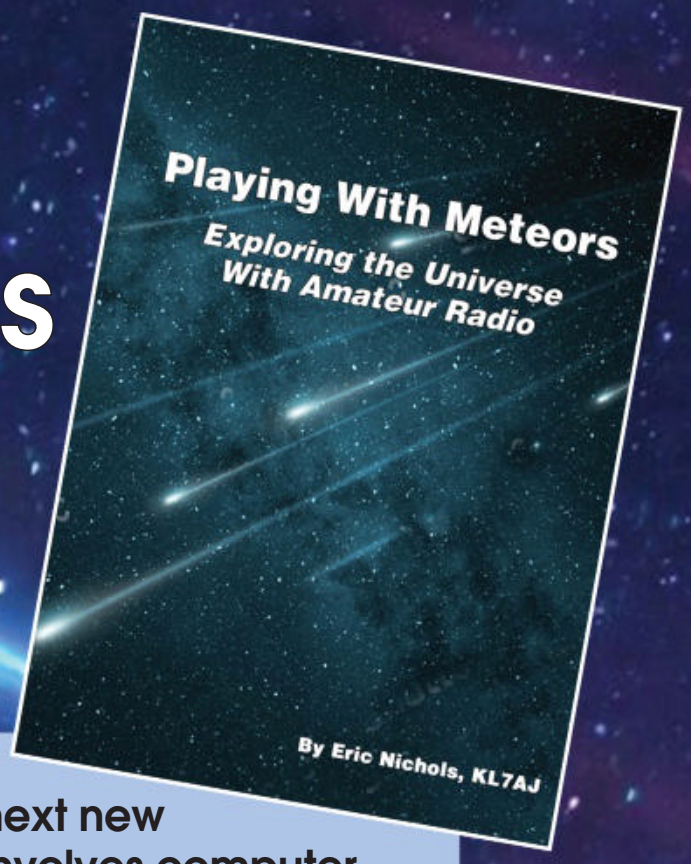
Biased class AB, the amplifier provides 52 dB of gain and works in CW or pulsed mode to support applications including electronic warfare (EW), commercial and military radios, jammers, scientific, and laboratory use. The MB030512M565028 can be used in narrowband and multi-octave bandwidth applications and comes with an industry leading 5-year warranty.

The Elite RF MB030512M565028 is available now with pricing available on request. For more information, visit RFMW <https://tinyurl.com/yfj6kue3>.

Playing With Meteors

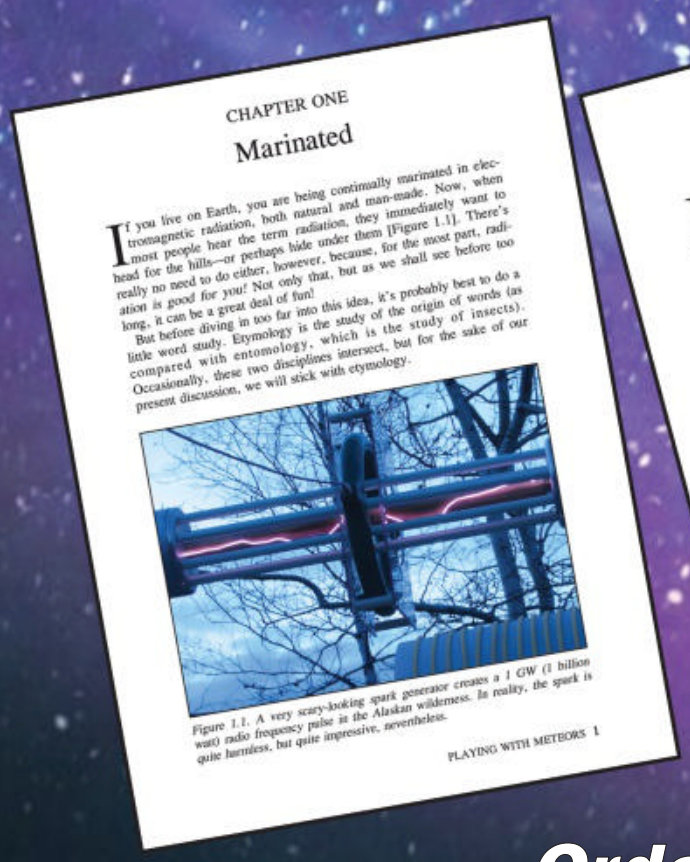
Exploring the Universe With Amateur Radio

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

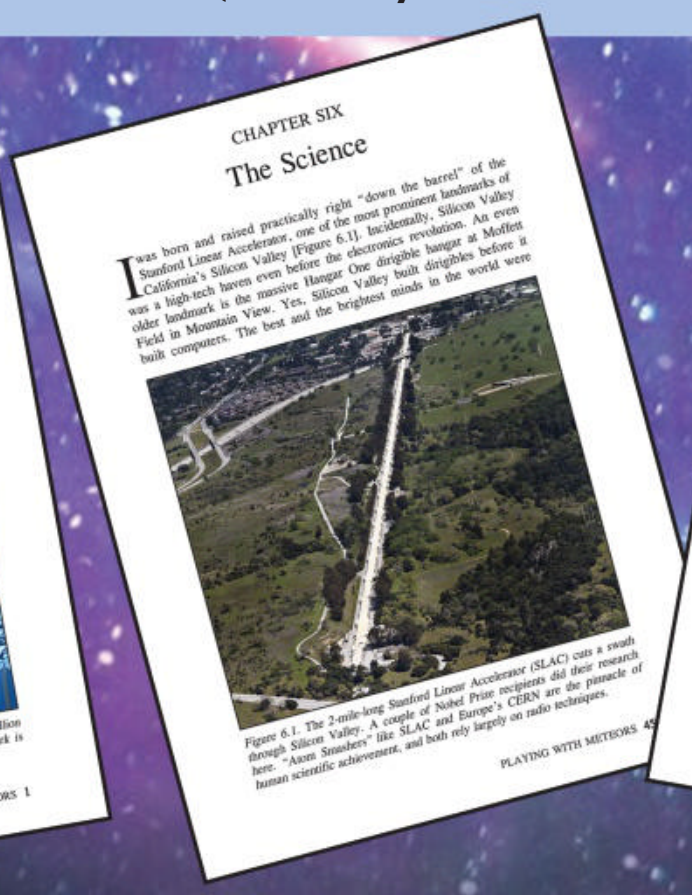
Marinated

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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Is 3-D modeling software an accurate and useful tool for designing and optimizing baluns? K1BUK set out to find the answer and shares the results of his research with us. Plus, he's got some tips to help you build your own.

Predicting Balun Performance Using 3-D Models

BY DAVE AHLGREN,* K1BUK

After I retired and got back into ham radio, I put up an 88-foot dipole fed with 45 feet of home-brewed ladder line. W2FMI's book [Ref. 1] inspired me to make my first balun, which I named "Balun #1" (*Photo A*).[1] I connected Balun #1 between my external antenna tuner and the ladder line, and I made lots of contacts on the HF bands. Balun #1 worked well, but I wasn't sure it was the best design, so I looked into a model-based simulation as a way to answer some questions:

1. What's the best way to connect a balun and a tuner?
2. What leads to power loss in baluns and how much is lost?
3. Can models predict the characteristic impedance of the balun's wound transmission line?
4. What ferrite material works best over the HF range?
5. Can models predict the Common Mode Rejection Ratio (CMRR)?
6. Do baluns wound with coax or made with ferrite beads work as well as wire-wound baluns?

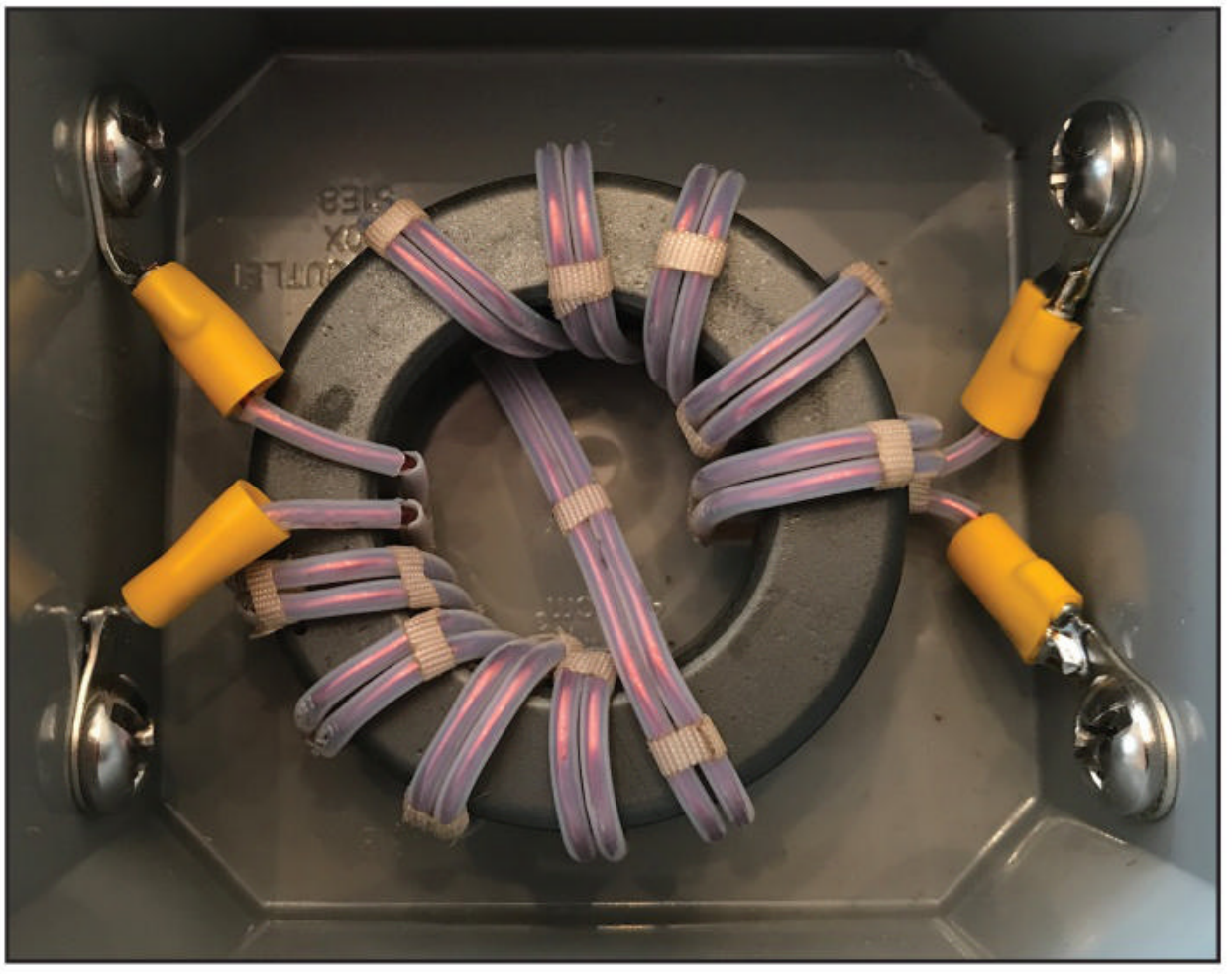

Photo A. Cross-wound 2-wire Balun #1, 11 turns #14 AWG wire, type-52 core with Teflon PTFE insulation (X-11-52-2W-PTFE) in PVC box.

Making a realistic 3-D balun model requires a CAD program able to characterize the physical and material properties of wires, cores, enclosures, and ground planes. The program carries out swept frequency simulations that predict how the physical balun will perform. I used EMCoS Studio, a comprehensive electromagnetic system simulator [Ref. 2]. EMCoS Studio's libraries describe the properties of materials used in balun construction, and it models the skin effect, which causes wire losses to increase with frequency. I obtained data from Fair-Rite, Inc. to characterize types 31, 43, 52, and 61 ferrite materials [Ref. 3].

Building the 3-D model involves several steps:

1. Create a dimensioned geometric drawing. The EMCoS program provides a set of built-in shapes and tools that a designer uses to create a drawing. The program allows the user to define variables that represent, for example, toroid ID (inside diameter) and OD (outside diameter), wire radius, and wind angle. The use of variables makes it easy to describe a balun of any size. I made a geometric description of a single turn that could be copied and rotated around the toroid's center, creating a virtual winding process.

2. Associate a component with each geometric shape. Components include dielectrics, wires, sources, loads, and ports. The user adds conducting plates to model ground planes and enclosures and can specify single- or double-sided conduction on surfaces. In modeling Balun #1, I assigned PTFE-insulated AWG 14 copper wires to the geometric paths for windings and leads, and type 52 ferrite to the toroid. I connected a voltage source with 50-ohm internal impedance to the balun's unbalanced input and a 50-ohm load across the balanced output.

3. Divide the structure into a mesh. Wires are meshed by rods and surfaces by triangles. Refining the mesh elements increases computer memory demand and computation time. The goal is to generate a mesh such that further refinement does not change com-

* Email: <djahlgren@cox.net>

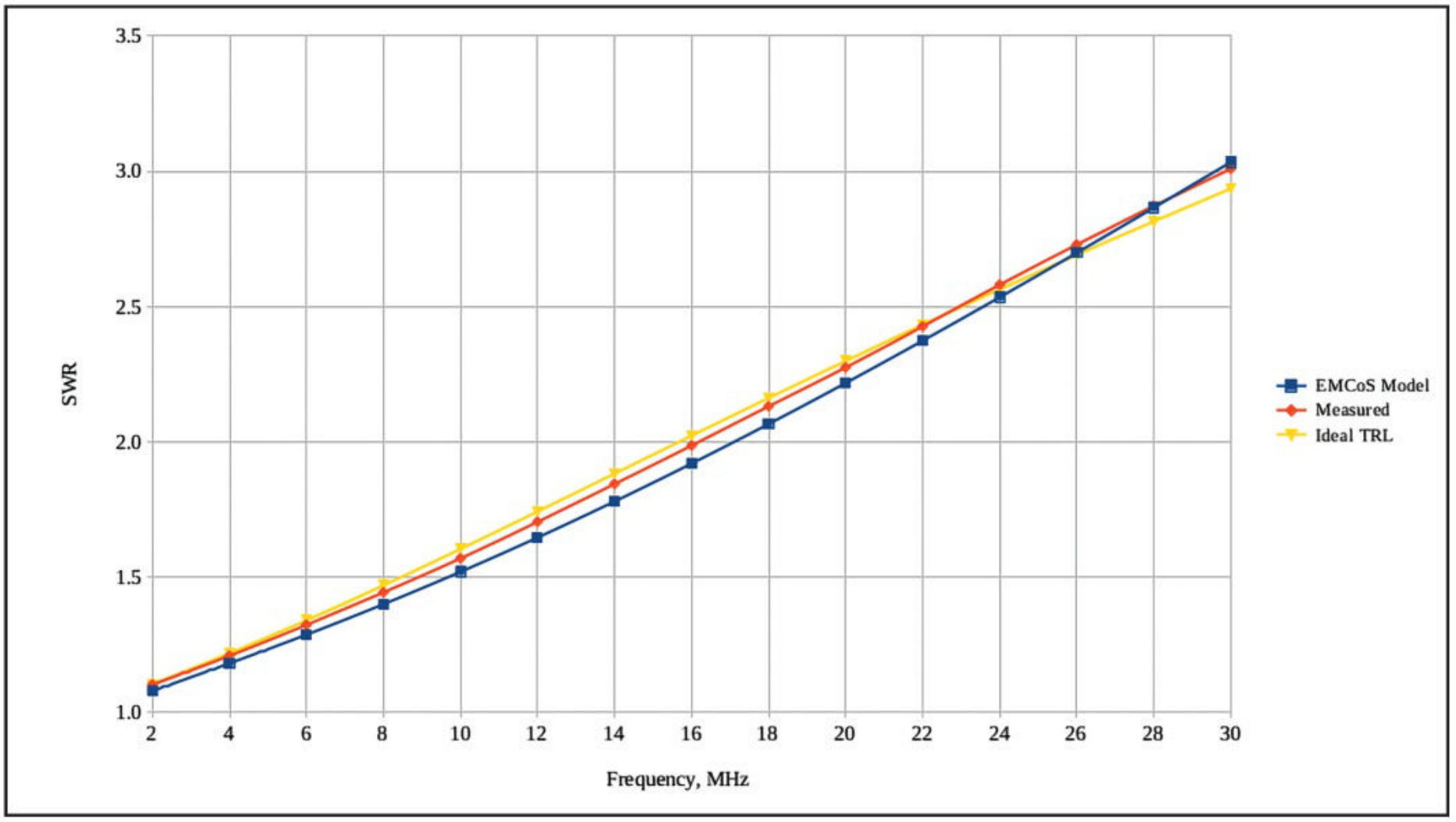

Figure 1. Comparison of SWR curves — measured (red) and predicted by lossless transmission line model (yellow) and 3-D model (blue).

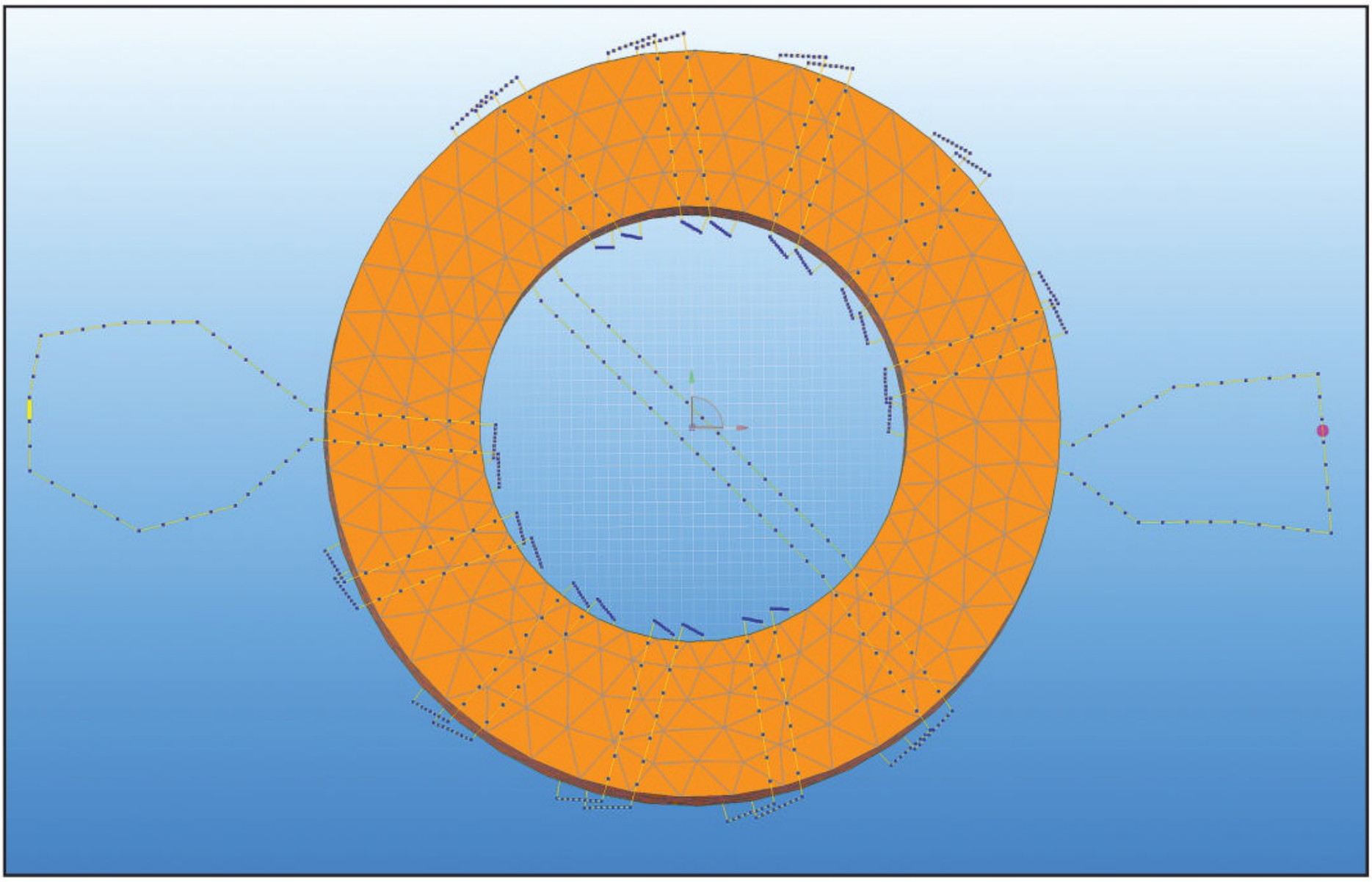

Figure 2. Model of cross-wound balun X-11-52-2W (Balun #1). Source is pink and 50-ohm load is yellow.

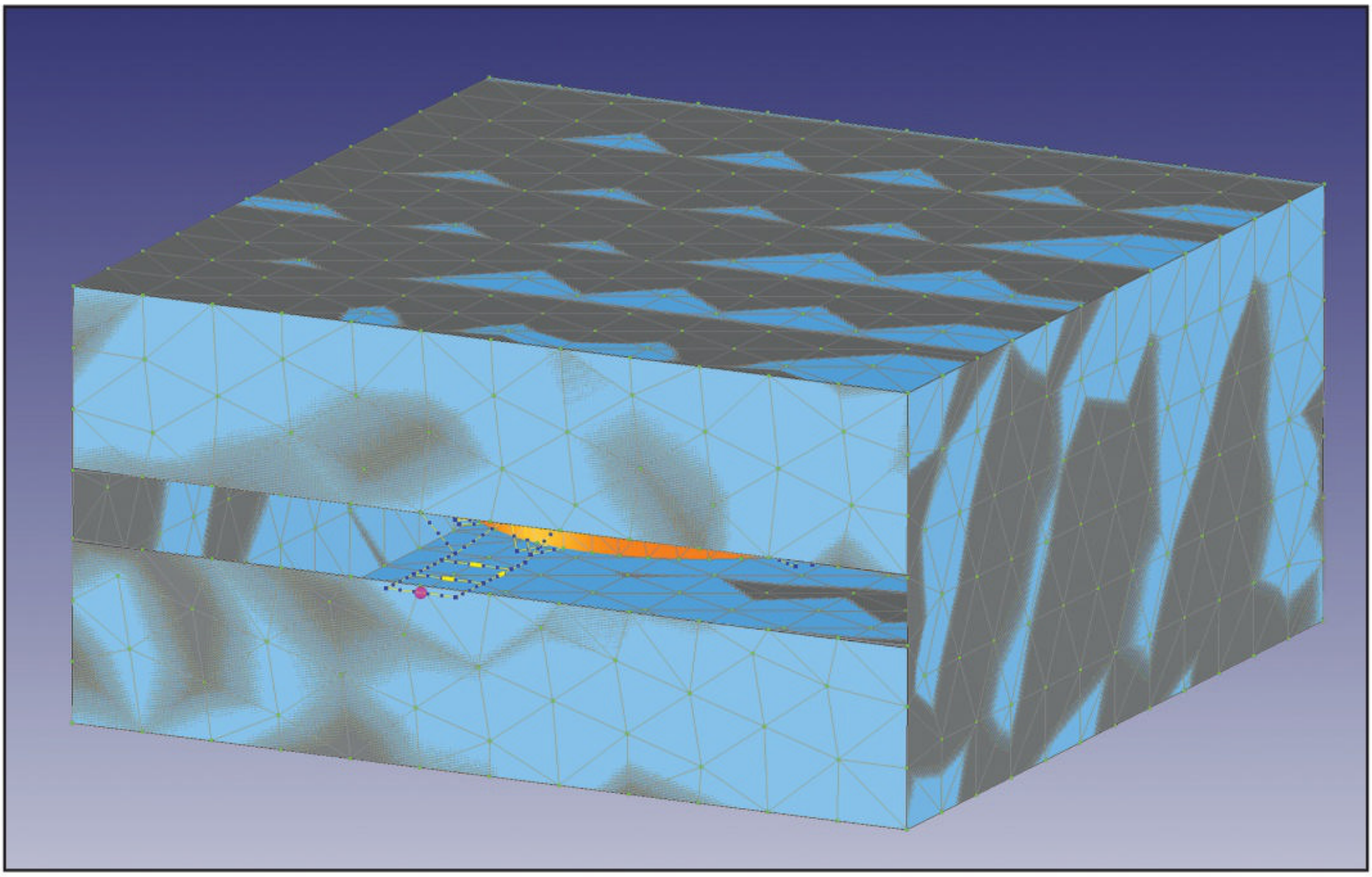

Figure 3. ATB system with boxed X-9-52-2W balun, RF source (pink), pi-network (yellow). Green dots mark mesh vertices.

puted results. EMCoS Studio offers four meshing modes used in this study:

- Fast Mesh — generates a coarse mesh useful when testing;
- Automatic Uniform Mesh — generates a mesh based on the model's feature sizes;
- Automatic Adaptive Mesh — refines the mesh to account for curvature; and
- Manual Uniform Mesh.

EMCoS Studio checks for errors and can perform re-mesh when necessary.

4. Define the computational task. Set the frequency range, number of points, and responses to be simulated; e.g., SWR, voltages and currents, and scattering parameters. Power balance analysis accounts for radiation and for loss on wires, loads, and cores.

5. Run simulation and examine results. The EMCoS utility program SimDAT tabulates and plots results. Animated visualization of current flow in the mesh helps to find connection errors in models. All computations were carried on a Windows 10® laptop with I-9 processor and 16 GB of RAM. The largest data sets required 6 GB RAM with some run times exceeding 30 minutes.

Experiment 1: Modeling Balun #1

The goal was to make a 3-D model of Balun #1 and show that it could 1) predict SWR performance, and 2) be used to compute the characteristic impedance Z_{OL} of the balun's wound transmission line (TRL). To start, I connected a 50-ohm load across the balanced leads of Balun #1 and measured the SWR on the unbalanced side from 2-30 MHz using a vector network analyzer, the NanoVNA-F [Ref. 4]. The red curve in *Figure 1* shows the result. Next, I calculated the SWR curve based on the mathematical model of a lossless transmission line connected to a 50-ohm load. The best fit to the measured SWR curve was obtained with Z_{OL} =117 ohms (*Figure 1*, yellow curve). Then I made a 3-D model of Balun #1 — cross-wound with a TRL consisting of two parallel #14 copper wires insulated with Teflon (PTFE) 0.015-inch thick and separated center-to-center by 0.095 inches (*Figure 2*) — and ran the simulation. As can be seen from *Figure 1*, the SWR curves — from measured data and the two models — agree closely.

It was possible to determine Z_{OL} from the 3-D model by making two simulation runs, the first to get Z_{SC}, the input impedance of the TRL with a short circuit load, and the second to get Z_{OC}, the input impedance of the TRL with an open circuit load. Then, the characteristic impedance is given by Equation 1:

$$Z_{OL} = \sqrt{Z_{SC} Z_{OC}}$$

This equation was evaluated at 15 equally spaced frequencies on the 2- to 30-MHz range. The average value, with highest and lowest removed, was Z_{OL} = 113 ohms, within 4% of Z_{OL} = 117 ohms obtained with the lossless TRL model.

To prepare for the next experiment, I also wanted to design a balun with Z_{OL} close to 50 ohms. By connecting two 2-wire lines in parallel, I would make a TRL with Z_{OL} about 57 ohms.

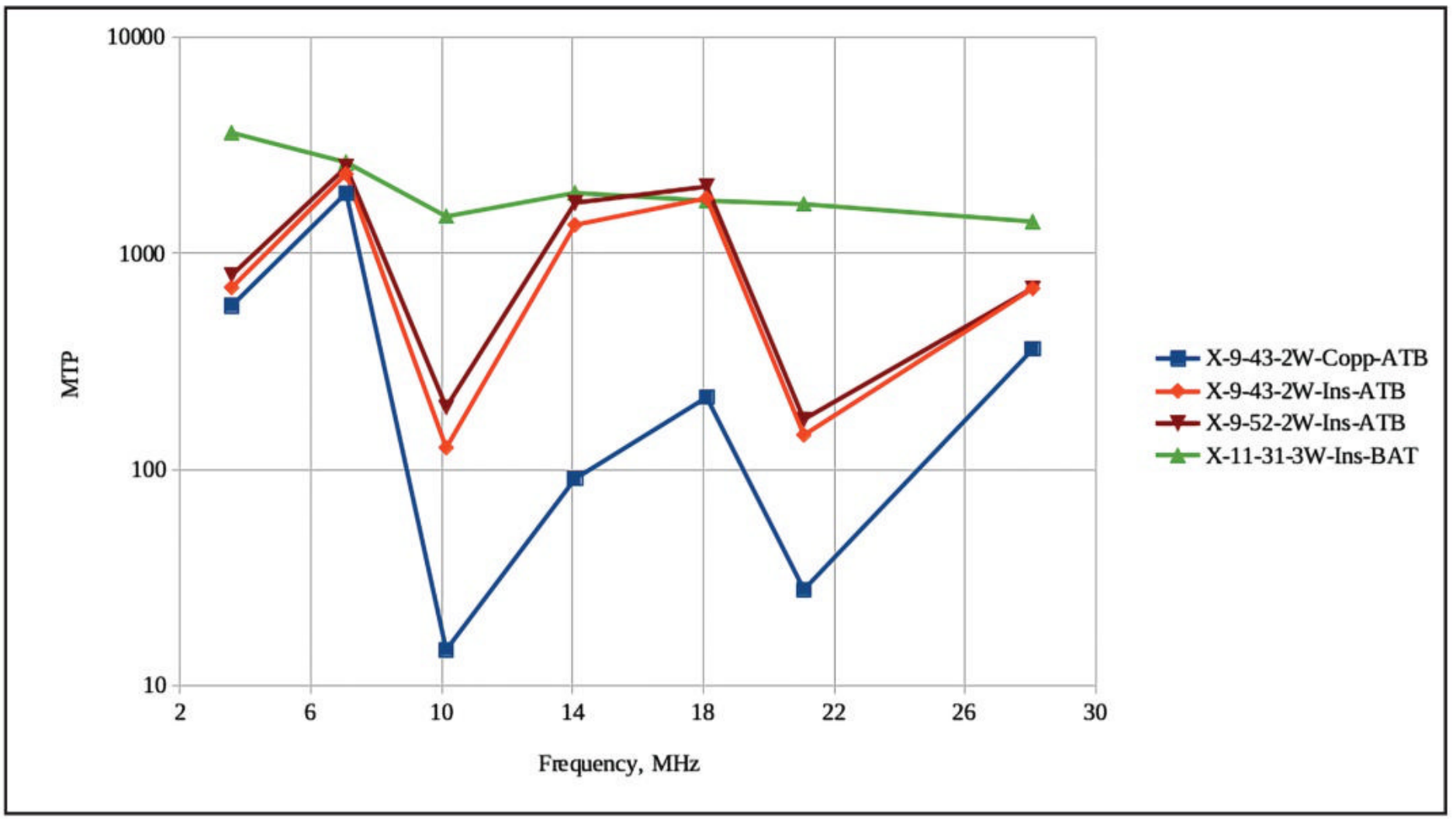

Figure 4. Maximum Transmitter Power (MTP) at FT-8 frequencies for best ATB and BAT baluns. Heating loss = 5 watts, 50% transmit duty cycle. Copp =copper box, Ins = non-conducting box.

The structure had three wires — a PTFE-insulated center wire (a shared "hot" lead), and a closely spaced wire on each side. The outside wires served as the ground lead on the balun's unbalanced end and as one of the two balanced leads on the other end. I made several 3-wire 3-D models as well as a physical balun, X-9-52-3W (again, see *Note 1*). I measured the SWR with this balun with 50-ohm load over the HF range. The best fit to the lossless TRL model yielded $Z_{OL} = 56$ ohms. Using the 3-D model and the short / open circuit measurement method, I obtained $Z_{OL} = 57.2$ ohms, again in close agreement. These results provided further verification of the 3-D model.

Experiment 2: ATB or BAT?

As mentioned above, I connected Balun #1 between the unbalanced output of my automatic tuner and the ladder line feeding my 88-foot dipole (Antenna Tuner-Balun connection, ATB). Was this the best connection or would it be more efficient to place the balun at the tuner's input (Balun-Antenna Tuner, BAT)? This question underlies Experiment 2, which compares power handling capacity and operating voltages for baluns in the ATB and BAT configurations. From Fair-Rite, Inc. I learned that 300-500 milliwatts per cubic centimeter of core loss (6.8-11.4 watts for size 240 toroid) limits temperature rise leading to thermal runaway.[2] So, I set a conservative limit of 5 watts for total heating loss (core plus wire losses). From the simulation results, I calculated the transmitter power (the Maximum Transmitter Power, or MTP) that would cause 5 watts of heating loss for transmissions with a 50% duty cycle, a realistic upper limit for FT-8 communication. The MTP was the first criterion for evaluating designs. The second would be the Common Mode Rejection Ratio (CMRR), considered in next experiment.

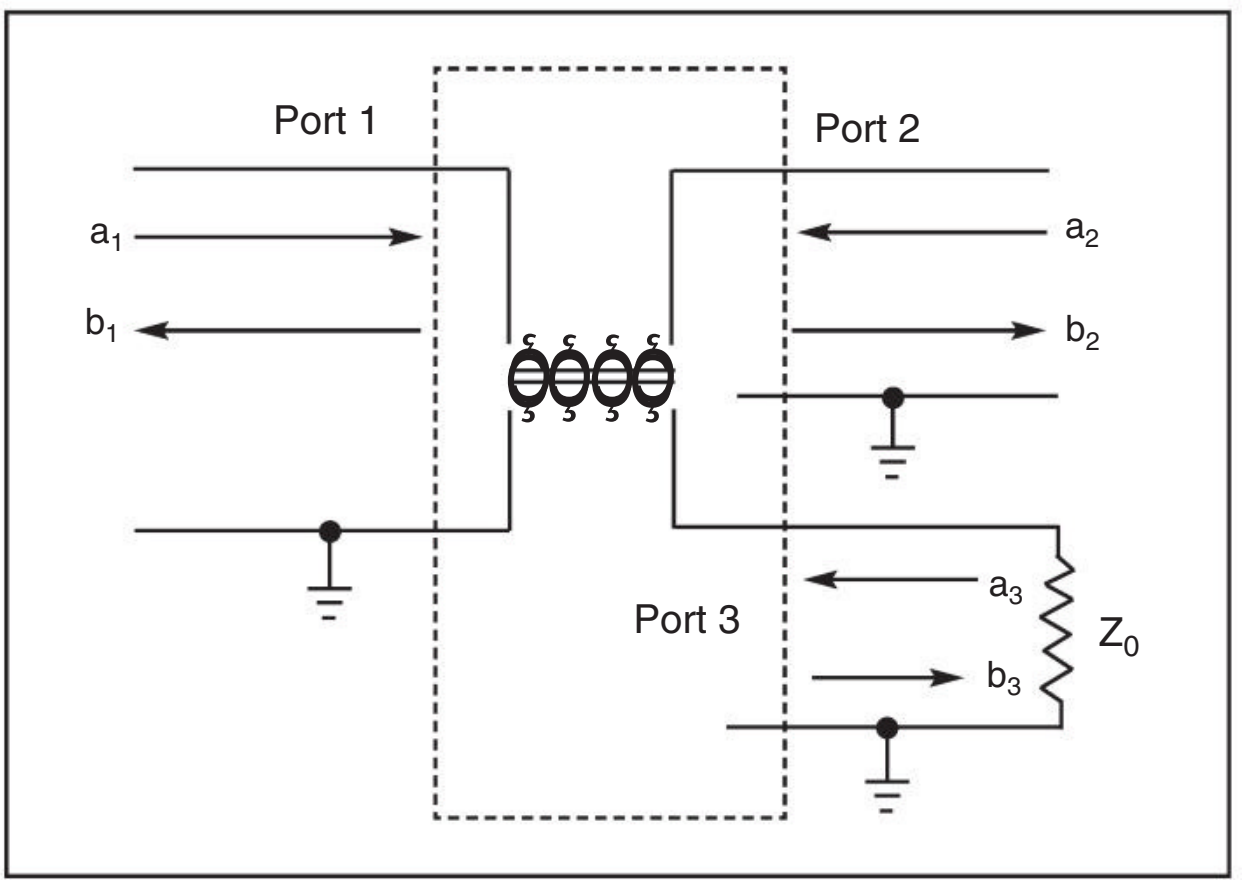

Figure 5. Balun as a 3-port network. (Illustration by Emily Leary)

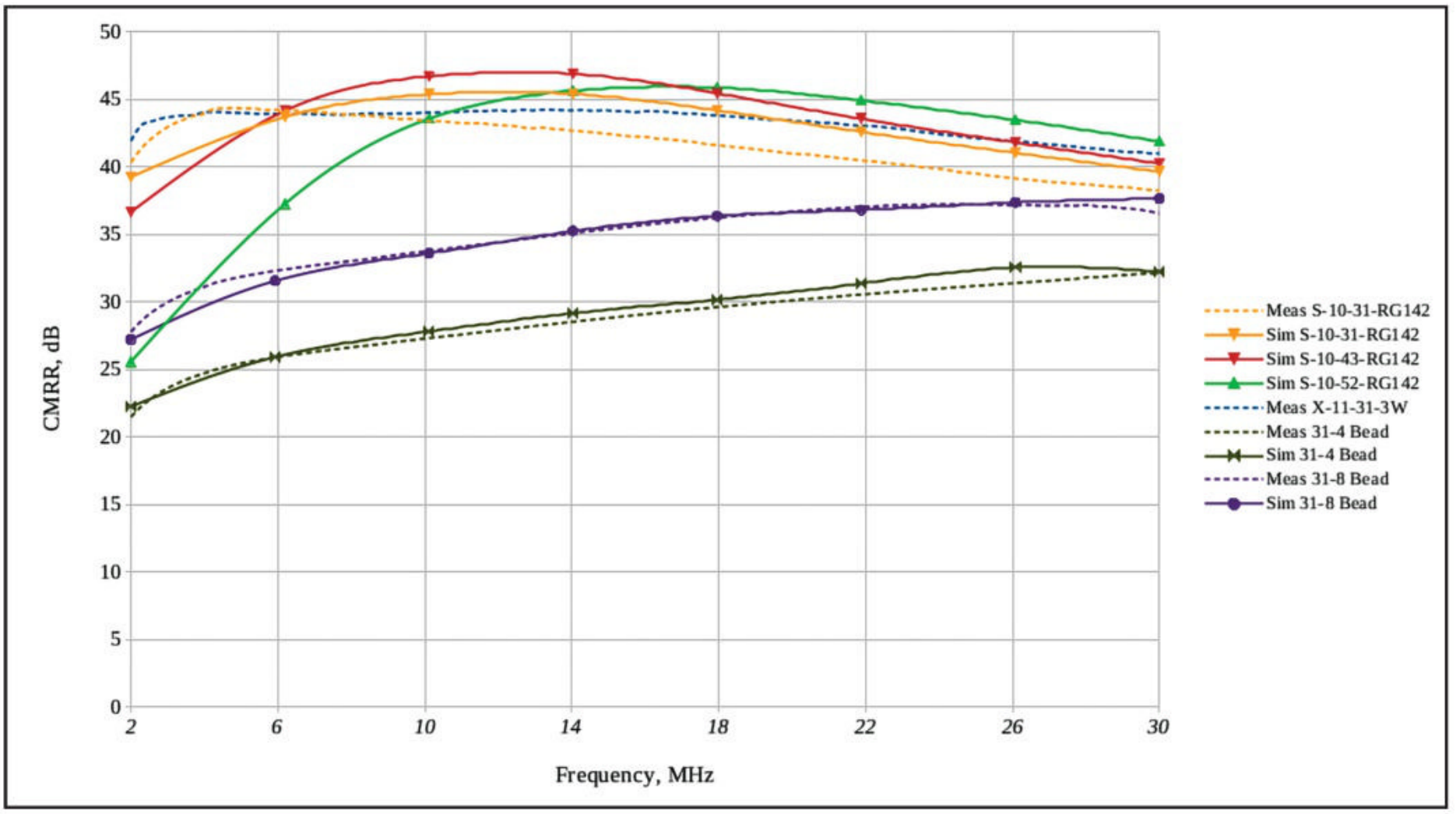

Figure 6: Comparison of simulated and measured CMRR curves for coax-wound, 3-wire, and 4- and 8-bead baluns.

To start, I measured $Z_A = R_A + jX_A$, the impedance at the ladder-line's terminals at the FT-8 frequencies on the 80-, 40-, 30-, 20-, 17-, 15-, and 10-meter bands. *Table 1* shows that Z_A varies widely with frequency, from nearly resistive on 40 meters to highly reactive on 30 and 15 meters, where the antenna's length is close to a multiple of a wavelength and the SWR on the balun's transmission line is very high. The ATB model consisted of the output balun and a lossless pi-network tuner. The tuner's inductance and capacitance values were computed and included in the model.[3] I simulated 18 different cross-wound two-wire baluns including versions with 9, 11, or 13 turns wound on type 52, 43, or 61 cores. Each ATB balun was housed in a 4.72- × 4.72- × 2.36-inch (12- × 12- × 6-centimeter) box, half made of copper and half of an insulating material. Boxes had slits on front and back for access to the balun leads. The ground lead of the unbalanced side was connected to the box. To study the BAT system, I made models of 3-wire baluns with 7, 9, and 11 turns on type 31, 43, 52, and 61 cores housed in non-conducting boxes.

Figure 4 shows the MTP curves for the best 2-wire baluns for the ATB connection: X-9-43-2W-PTFE and X-9-52-2W-PTFE, both in non-conducting boxes. The latter has higher MTP values at the critical frequencies, 194 watts vs. 126 watts on 30 meters and 171 watts vs. 144 watts on 15 meters. The MTP curve for X-9-43-2W-PTFE (copper box) is typical of copper-boxed baluns, which exhibited high core losses on 30 and 15 meters with MTP values as low as 14 watts. Simulations of BAT systems showed much higher MTP values. As *Figure 4* shows, MTP values for the best BAT balun (X-11-31-3W) approached or exceeded the legal limit at all FT-8 frequencies.

The full load voltage appears across the balun's output terminals in the ATB configuration. With the load presented by my 88-foot antenna, the amplitude ranges from a low of 108 volts on the 40-meter band to nearly 2,500 volts on 30 meters. In this configuration, the balun must be insulated against high voltages, even at the 100-watt level. In contrast, simulations of the BAT system at that power level indicated balun voltages less than 115 volts in amplitude at all frequencies.

This experiment leads to several conclusions:

- The BAT configuration offers lower heating losses and voltage stress than the ATB configuration. A concern is that an automatic tuner's ground connection will be at RF potential in the BAT configuration.
- High RF voltages and heating losses in ATB systems may be lowered by designing antenna and feedline to avoid highly reactive, mismatched loads. Although my 88-foot antenna and feedline must be redesigned, they make an interesting case study!
- Be sure to house your balun in a non-conducting box.

Experiment 3: Common Mode Rejection Ratio (CMRR)

The CMRR is the ratio of the differential mode gain of the balun to its common mode gain, expressed in decibels. The CMRR measures how well the balun performs the balanced-to-unbalanced transition. To compute the CMRR the balun is considered a three-port network (*Figure 5*): Port 1 is the unbalanced output, Port 2 connects to one of the balanced-side leads, and Port 3 to the other. The three-port network is characterized by scattering parameters (s-parameters), either measured or computed from the model. The s-parameters describe the magnitude and phase relationships among voltage waves traveling into the ports (signals a_1, a_2, and a_3 in *Figure 5*) and out of the ports (signals b_1, b_2, b_3). The s-parameters are normalized with respect to reference impedance Z_0 = 50 ohms, and the CMRR values computed from them represent the balun's performance when its ports

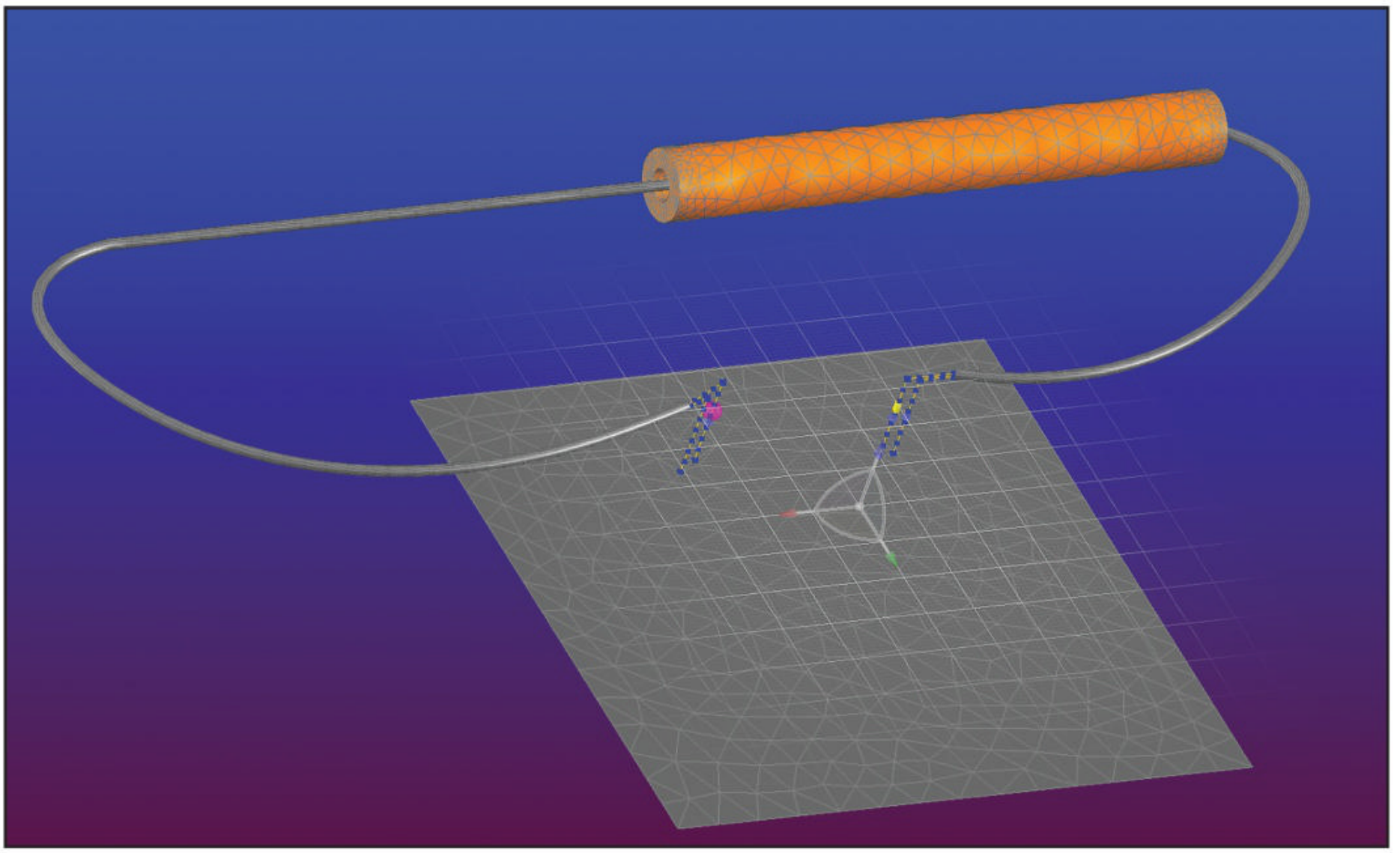

Figure 7. Model of RG-142 choke balun, 4 beads with ground plane.

are terminated in that impedance. This condition holds when measuring with the NanoVNA-F or when the balun operates in a matched BAT system. The CMRR is computed from Equation 2.[4]

$$\text{CMRR(dB)} = 20 \times \log_{10}\left\{\frac{|s_{12} - s_{13}|}{|s_{12} + s_{13}|}\right\}$$

EMCoS Studio calculates the transmission coefficients s_{12} and s_{13} from the model. The measurement of these coefficients follows a two-step method outlined by Skelton [Ref. 5]. The first step is to measure s_{12} as follows. Set $a_3 = 0$ by terminating balun Port 3 with a 50-ohm resistance, connect balun Port 1 to the NanoVNA-F's s_{21} port, and drive Port 2 of the balun from the s_{11} port of the NanoVNA-F. The NanoVNA-F now measures s_{12}. In the second step, exchange balun Ports 2 and 3 and measure s_{13}. In this study, the measurements were carried out on a jig having a copper ground plane and SMA port connectors.

Freq (MHz)	R_A (ohms)	X_A (ohms)
3.573	10	133
7.074	56.4	-4
10.136	657	-4479
14.074	80	218
18.100	133	111
21.074	225	-947
28.074	146	-137

Table 1: Impedance $Z_A = R_A + jX_A$ measured at feed line terminals, for 88-foot dipole fed with 450-ohm ladder line.

Figure 6 compares simulated and measured CMRR curves for 3-wire, coax-wound, and beaded designs suited for use as choke baluns or in BAT systems. I made models having 6, 8, or 10 turns of virtual RG-142 coax on type 43 and 31 cores.[5] The best performer over the HF range had 10 turns on type-31 core (S-10-31-RG142). The 3-wire balun X-11-31-3W offered somewhat higher CMRR than S-10-31-RG142, but either would perform well in a BAT system. I also modeled the CMRRs of baluns made with type 31 and 43 beads (*Figure 7*). Models incorporated a 50-centimeter (19.7-inch) length of RG-142 and 1, 2, 4, or 8 beads. Simulated and measured responses agreed, and type-31 beads excelled over the HF range. Results indicated that CMRRs of 30 dB on 80 meters and above are realizable, and that doubling the number of beads increases the CMRR by about 6 dB.

I also observed the following:

- The most efficient baluns for my ATB system were X-9-43-2W-PTFE and X-11-52-2W-PTFE (Balun #1) in non-conducting boxes. Balun #1 had better MTP performance, but X-9-43-2W-PTFE had the better CMRR (by about 6 dB) on the 160- and 80-meter bands.
- The CMRRs of straight- and cross-wound baluns were equivalent. For example, simulations of 8-turn 2-wire baluns predict a difference of less than 0.3 dB across the HF range.

Experiment 4: Make Some Baluns!

Now it's your turn … you can take advantage of some of my

modeling results to build your own baluns. Here are a few options:

1. Wire Baluns. The X-9-43-2W-PTFE balun was the best to use in an ATUB system with my 88-foot doublet antenna. The best-performing 3-wire balun, especially useful in a BATU system, was X-11-31-3W-PTFE. To make these baluns you'll need the materials below.

- Thermaleze® wire AWG #14, Amidon AWG#14 HAPT <https://tinyurl.com/356tryw9>
- Teflon® tubing #14 gauge, Amidon <https://tinyurl.com/2p8dutw8>
- Glass cloth tape 1/2 inches, Amidon <https://tinyurl.com/2p8hj9u9>
- #95 Polyimide tape, Amidon <https://tinyurl.com/2p87c7up>
- 6-inch Zip Ties
- Enclosure (if desired): 4- x 4- x 2-inch PVC outlet box. Home Depot <https://tinyurl.com/2pu47k4m>
- For X-9-43-2W-PTFE: Type-43 ferrite ring, Fair-Rite P/N 943003801. Mouser Electronics P/N 623-5943003801 <https://tinyurl.com/2p9h25fb>
- For X-10-31-3W-PTFE: Type-31 ferrite ring, FT-240-31. Sources include Amazon <https://tinyurl.com/4wrspene> or Amidon <https://tinyurl.com/52vm43fv>

Step 1: Before winding either balun, wrap the toroid with two layers of Polyimide tape.

Step 2:

(for X-9-43-2W-PTFE): Cut wire, tubing and glass cloth tape as follows:

- Two 28-inch (71-centimeter) lengths Thermaleze® wire
- Two 27-inch (69-centimeter) lengths Teflon® tubing 14 gauge
- 24 inches glass cloth tape

(for X-11-31-3W-PTFE): Cut wire, tubing and glass cloth tape as follows:

- Three 28-inch (71-centimeter) lengths Thermaleze® wire
- One 27-inch (71-centimeter) length Teflon® tubing 14 gauge
- 24 inches glass cloth tape

Step 3: Assemble your transmission line. The two-wire line used in balun X-9-43-2W requires Teflon® insulation on both wires. Pushing the wire through the tubing may be a tight fit. Cut the wires to length and pull them evenly over a thick dowel to straighten out kinks. With a small file, remove burrs from the wire ends. Apply silicone spray to a clean cloth and rub along the wire before inserting into the Teflon. Work the wire through the tubing until complete. An alternative is to use #12 Teflon tubing, one size larger than the wire, which eases assembly. Assemble the transmission line by laying the wires on a flat surface and binding them together using 1-inch lengths of fiberglass tape spaced about 1-1/2 inches apart. Double up the taping on each end of the line. Follow the same process for the 3-wire line, which requires Teflon® tubing on the inner conductor only.

Step 4: Mark the midpoint of the transmission line. Insert the line through the toroid so that the midpoint is at the center of the toroid. Wind the necessary number of turns tightly, spacing the turns equally so that they fill about 5/6 of the toroid. Secure the ends of the windings with Zip Ties.

Step 5: Remove the enamel insulation from wires, tin the ends carefully, and add connectors. Mount the balun in a plastic box. I used stainless steel bolts, washers, and nuts. Enjoy using your new choke balun and make many QSOs!

2. Coax-Wound Balun. To make your coax-wound balun X-10-31-RG142, you'll need:

- Type 31 ferrite ring, FT-240-31
- Approximately 30 inches of RG-142 cable. I found RG-142 on eBay. You can substitute RG-8X or RG-58.

Wind 10 turns around the toroid, secure ends with Zip Ties, and add your connectors, enclosure, etc.

3. Beaded Coax Balun. To make a beaded balun using type-31 or 43 materials you'll need beads manufactured by Fair-Rite (for 1/4-inch coax, part numbers 2631540002 and 2643540002), both available from Mouser Electronics. An alternative is to buy a kit with 5 beads (Model BA-58) available from Palomar Engineers <https://tinyurl.com/2xk97wsx>. Palomar also offers a 10-bead kit.

Summary

Model-based simulations and measurements from the physical baluns they represent demonstrated that:

- Models predict SWR performance and may be used to estimate the characteristic impedance of the balun's transmission line.
- Models may be used to identify the sources of power loss and to predict which designs have the best MTPs.
- Models may be used to compare the CMRRs of balun designs, whether wire-wound, coax-wound, or beaded.

The experiments showed that 3-D models are valuable tools for evaluating design choices; e.g., core size and material, winding properties (wire gauge, type of insulation, and number of turns), tuner / balun configuration, and enclosure material.

Acknowledgements

I thank EMCoS, Inc. for supporting this project. I especially thank Maria Nikolashvili and Nana Tsitskishvili for answering my many questions. I also thank Michael Arasim, Product Manager at Fair-Rite, Inc., for sharing guidelines on core power dissipation. This study is dedicated to radio amateurs who suffered from COVID-19.

References:

[1] J. Sevick W2FMI, "Understanding, Building, and Using Baluns and Ununs," CQ Communications, 2003.

[2] <www.emcos.com/?products=emcos-studio>

[3] <www.fair-rite.com>

[4] <https://deepelec.com/en>

[5] R. Skelton, "Measuring HF Balun Performance," QEX, November-December 2010, pp. 39-41.

Notes:

1. I labeled baluns by their properties: 1) cross wound (X) or straight wound (S); 2) number of turns; 3) core material, and 4) number or type of wire in the winding. The crossover wire in X-type baluns passes through the core so it counts as a turn. Balun #1 (a.k.a. X-11-52-2W-PTFE) was wound on a size 240 toroid (2.4-inches OD, 1.4-inches ID, and 0.5-inches thick) made of type 52 ferrite. All baluns in this article used that core size.

2. Thermal runaway becomes a concern at about 1,000 milliwatts per cubic centimeter of ferrite material.

3. Matching network design tool: <https://tinyurl.com/2p9cwknb>.

4. The vertical bars signify the magnitude of the quantity within them.

5. RG-142 is a 1/4-inch PTFE-insulated 50-ohm coax.

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The 21st annual CQ World Wide Foxhunting Weekend will be held on Saturday, May 14th and Sunday, May 15th, 2022. *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.

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

If you've ever built a radio from a kit, you are the beneficiary of the work of people like W6APZ, who spent the early days of his engineering career designing kits for folks like us to build. Here's a look at the other side of the kit business.

My Most Challenging Assignment

BY RICH STIEBEL,* W6APZ

My most challenging assignment as a young electrical engineer was being hired as a project engineer for the legendary Knight-Kit Electronics, a division of Allied Radio Corporation.

Knight-Kit, like its primary rival Heathkit, made many instruments and amateur radio products. I was in my mid-20s and had relatively little professional experience, but I had earned my amateur radio license at age 15, before the Novice license became available. That meant that I had to pass a Morse Code test of sending and receiving at 13 words-per-minute, plus a detailed technical examination that included drawing schematics, doing many technical calculations, and explaining the purpose of each electronic part used in any particular circuit. This was quite a challenge for someone in high school, but I did it.

The vice-president of Knight-Kit was also a ham; he had a ham station in his office. I credit my being hired to my amateur radio background, having built my first transmitters and receivers from schematics in various ARRL books.

The Citizens Band, in the old 11-meter ham band, had just been opened at that time and Heath came out with a super-regenerative receiver with a 5-watt transmitter, the maximum allowed power. My first assignment was to design a Knight-Kit to compete with this Heath product. The only problem was: I didn't have any idea of what made a super-regenerative receiver work. What to do?

Fortunately, I had heard about the John Crerar Library, which at that time was located near downtown Chicago. It was *the* technical library in the Midwest. I spent a whole day in that library reading everything written in English about super-regenerative receivers and how they worked. I was forced to stop my research when the references were to articles in German or French. However, by the end of the day, I now understood what each part in the receiver did and how it affected bandwidth and sensitivity.

Armed with that knowledge, I went to work the next day and designed a receiver more selective than the Heath unit and with the same sensitivity to received signals. I also designed a 5-watt transmitter with an output power in excess of three watts. Lacking access to the latest test equipment, I had to keep the signal generator on the other side of my workbench in order to get a low enough signal into the receiver to check it out. To tune up the transmitter, I used a #47 light bulb soldered into an RF connector plugged into the transceiver where the antenna would normally go. Knight-Kit did not have RF power meters in those days, so I'd tune the transmitter for maximum brilliance of the light. This transceiver was advertised as the C-11 (*Photo A*), which became a very successful seller.

From the C-11 to the C-27

I could not rest on my laurels, however. My next assignment was to design a Citizens Band transceiver with a superheterodyne receiver that looked like an intercom. Sales had decided what the exterior of the transceiver should look like and required using the speaker as a microphone, which

Photo A. The author's first design project, the Knight-Kit C-11 super-regenerative Citizens Band transceiver. (Images from vintage Knight-Kit catalogs).

Photo B. The C-27 superheterodyne Citizens Band transceiver was intended to look and work like an intercom.

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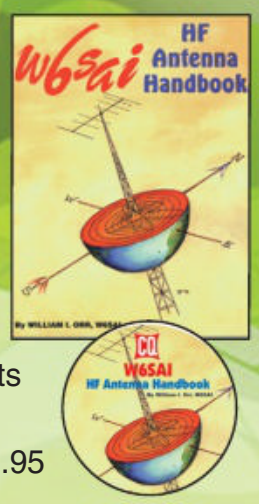

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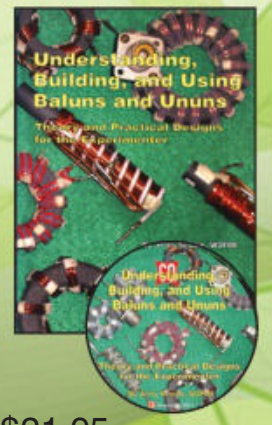

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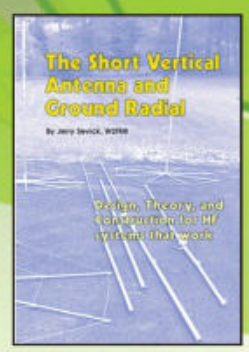

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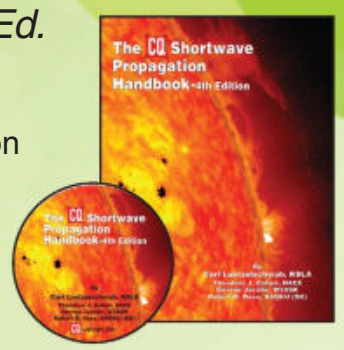

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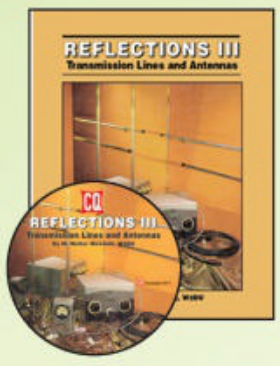

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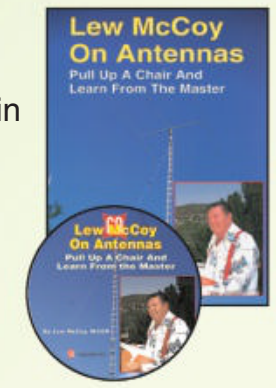

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turned out to be a special project because of the molded plastic case that I was given to use. The reverberation of the speaker against the case was a particular challenge which we solved by using a special backing on the speaker. This transceiver was called the "C-27" for the then 27 CB channels available (*Photo B*).

Having designed the C-11 transmitter on a printed circuit board, I was able to use that design as part of this superheterodyne transceiver. I designed the C-27 to be able to tune the entire band at the flip of a switch, or operate both transmitter and receiver on preselected crystal frequencies, providing flexibility for use when mobile.

Mobile operation using the speaker as a microphone was not practical, so I designed a plug-in microphone that could be attached to the C-27. The C-27 was designed with an external vibrator power supply to produce the high voltage needed by the vacuum tubes when operating mobile.

The design of a very selective receiver was a challenge due to the requirement to keep the number of parts, hence the cost, down. At that time, the use of a "Q-multiplier" was not unusual. A Q-multiplier consisted of controlled feedback which effectively narrowed the otherwise wider bandwidth of the intermediate frequency. In those days a Q-multiplier was an external device, but in my design, the Q-multiplier became an integral part of the circuit. Designing the receiver on a printed circuit board ensured that any kit builder would achieve the desired narrow bandwidth not common in CB sets at that time.

While CB transmit crystals met FCC specifications, they were not all precisely on the same frequency, though they were on the specified channel. The C-27 was selective enough to select two independent transmitters ostensibly on the same channel. This turned out to be very important, as the FCC had not taken into account the skip provided by the sunspot cycle in the early 1960s. This resulted in a cacophony of signals audible on virtually every channel of the band. Being able to select one signal and reject others was very important.

Calling Mom …

We were living on the north side of Chicago at the time and my in-laws were living in a suburb, Highland Park, Illinois. My wife wanted to talk to her mother frequently, but long-distance calls to the suburbs were expensive back then. I signed out for two C-27 radios which I built, installed a three-element CB beam on my in-laws' house and one on the roof of our apartment so my wife could talk to her mother whenever she wanted.

At the end of one such call, we got a call off the back of the beam from a CBer in Oklahoma who had heard our signal. That C-27 really worked!

CB users formed clubs and quickly recognized the special selectivity of the C-27. These clubs contacted Knight-Kit and I was invited to give talks to the various clubs in the Chicago area. This gave me a little bit of the feeling of what a rock star must feel like.

A Mobile Focus

Knight wanted a more economical transceiver and a better form factor for mobile use. I was asked to design the C-22 transceiver (*Photo C*) to fit that requirement. Again, I was given the physical size and appearance by the sales and advertising departments of Allied Radio. This kit offered the possibility of transmitting and receiving on any of five crystal-controlled channels or transmitting on any of these five frequencies and tuning the band manually on receive.

My job was to design the insides to match. This time, I kept in mind that this radio might just work well on the 10-meter amateur band with a little forethought. I designed the radio to use 10-meter crystals in the receiver so that they could be plugged into the transmitter when I converted the radio to 10 meters.

Once the design was finished and in production, on my own time I converted the C-22 to 10 meters. The quarter-wave

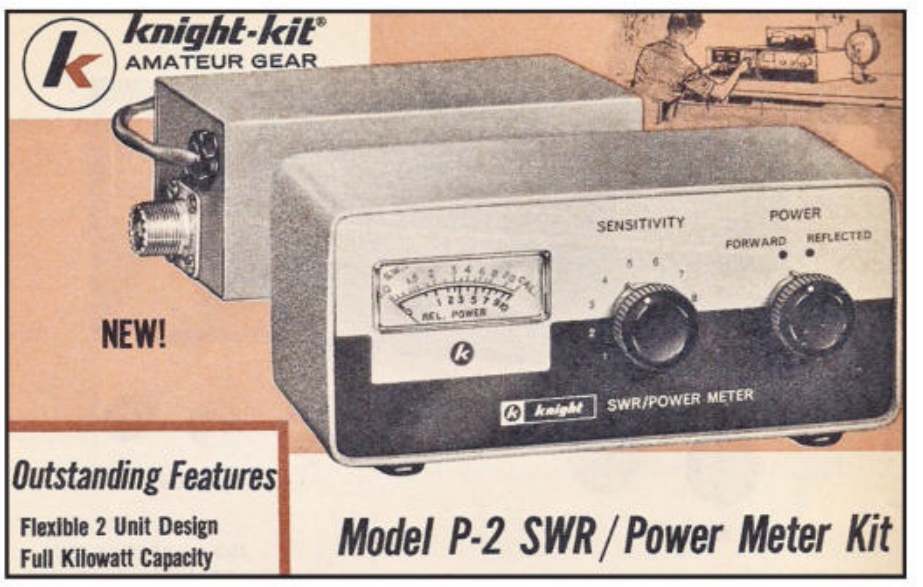


Photo D. P-2 SWR / power meter.

Photo C. The C-22 superheterodyne CB transceiver was designed with mobile use in mind.

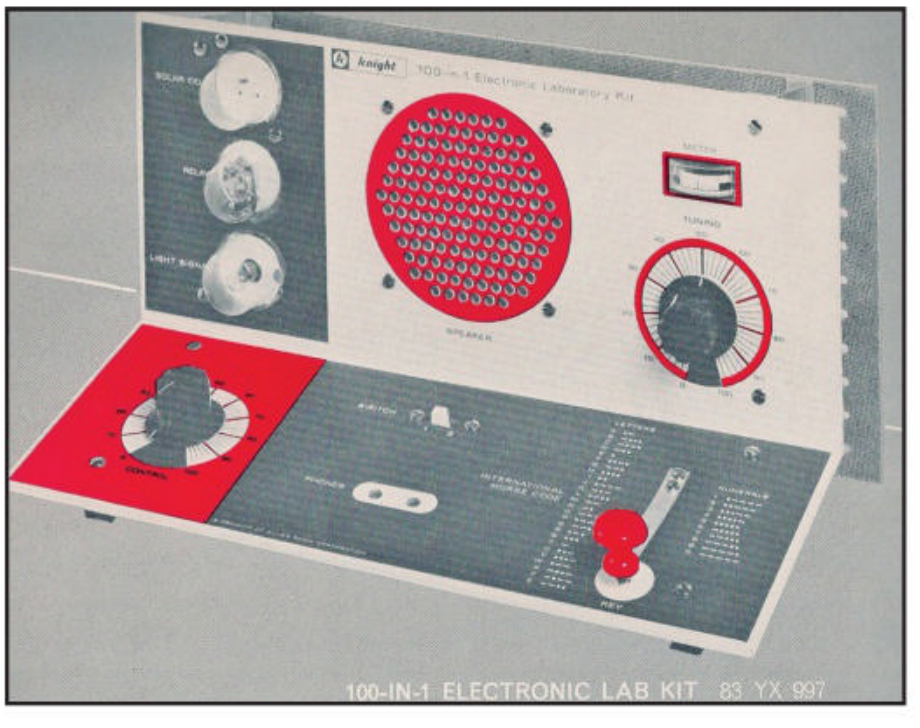


Photo E. 100-IN-One Electronic Lab kit.

CB whip on my car loaded up very well on ten. I used the Knight-Kit P-2 SWR / Power Meter (*Photo D*) that I also designed to maximize the power into the whip. "Radio-Electronics" published my article on this subject in May 1963.

I got a transmit crystal for 29.640 MHz, which was the Civil Defense emergency frequency in use in Chicago. Extensive 2-meter use had yet to get started in Chicago, so 10 meters was used. Knight did not think there would be a market for a 10-meter version of the radio, but I used this 10-meter conversion of the C-22 mobile for many years communicating all over the city and suburbs.

Getting Transistorized

Transistors were just beginning to be made for the high HF band. RCA came out with a three-transistor CB transceiver using a super-regenerative receiver. Since I was busy on another project at the time, another engineer turned this into a Knight-Kit. The physical design of this kit was intentionally made very easy to build. The idea was to get people hooked on kit building so they would purchase other Knight-Kits. We had secretaries building these kits and providing feedback on ways to make the assembly simpler. It was decided to sell this kit for exactly what Allied paid for the parts, $9.95, to get a lot of people making building it.

This kit was so successful that when Knight ordered the parts in the greater quantities required by sales, the parts quantity discount resulted in the company actually making money on each kit sold.

In my spare time, I converted this kit into a 6-meter transceiver which provided good short-range communication. Ham radio possibilities were always on my mind. I converted challenging assignments as opportunities to learn new aspects of electronics.

Promoting Electronics Education

Another challenge that I was given was to design a "100-IN-One Electronic Lab" kit (*Photo E*). This kit had to have over 100 projects that the experimenter could build and not provide any danger to a child using the kit while operating off 120 volts house power. I accomplished this by having the power transformer built with the 120-volt input wires terminating inside the transformer, so only low voltage was accessible outside the transformer.

In the early 1960s, transistors for frequencies above the audio range were not commercially available. Vacuum tube manufacturers saw their opportunity to develop 12-volt tubes for car radios that would not need high voltage. I made use of one of these tubes, the 12U7 dual triode, in this kit. Most of the circuits I could build with transistors could also be built using the 12U7 tube. This fact helped achieve the more than 100 circuits in this electronic laboratory kit, while providing electron tube theory.

The experimenter did not need to know how to solder, as I used Fahnestock clips and springs with "handles" on them to attach the wires that were required to build any circuit. One could simply pull on the handles to expand the spring, insert the wire between the loops of the spring, and let go to obtain a secure electrical contact.

The front of this kit had all the controls and outputs to give the builder the control and "feedback" that the circuit just built was working. This front panel contained a large speaker, light bulb, relay, meter, solar cell, tuning control, volume control, Morse code key, and a place to plug in headphones.

I enjoyed working on this kit, but not all the circuits that I built could be incorporated into the final design. One such design involved modulating a light bulb with voice which was detected with the solar cell. While this circuit "worked," I found that the non-linearity of the light bulb caused distortion in the received audio signal. This particular project required more parts than it was economical to include, and therefore had to be excluded from the final product. The challenge of this kit was to build the maximum number of circuits with a minimum number of parts.

All of the above challenges contributed to my experience as a young engineer and all were possible because of my stringent ham radio background.

MATH'S NOTES

BY IRWIN MATH,* WA2NDM

A Modern "Cone of Silence"?

As springtime and summer approach, we look forward to days spent outside with barbeques, parties and the usual events that take place at this time of the year. We are among these who thoroughly enjoy the outdoors, but at my QTH, there is a problem. We have a neighbor who insists on cutting his grass and making similar disturbing noises, usually when we are trying to have a quiet peaceful outdoor lunch or dinner. Being on the approach path of a local airport also does not help since at certain times, usually when we are having dinner, the sound of low-flying aircraft drowns out everything else for an hour or two. Is there some sort of *legal* solution?

After pondering this issue for some time, the following two thoughts came to mind: The first reminded me of an old TV show called "Get Smart" which featured a so-called "cone of silence" which was employed whenever a private conference was required. The second was of the use of so-called "sound-cancelling headphones" commonly available for use in very noisy environments such as in a helicopter cabin. So, I thought, why not expand on these to make my yard quiet?

Both use a simple principle of sampling a noise source and then reproducing it, 180° out of phase, along with the original in order to cancel it out. Figure 1 shows this graphically. You will notice that we used sine waves for this explanation as it is easier to understand, but complex noise signals are handled in exactly the same way. You will see that the inverted sine wave (blue) matches the original sine wave (red) exactly and if both of these are produced at the exact same time and at the exact same level, they will cancel each other out (the green line).

Our first thought was that this is really very simple. Just amplify the original noise, feed it through a 180° phase inverter, play it back and there you are! This, by the way, is how many noise-canceling systems (through earphones or headphones) actually work. To test this further when we put on a pair of such earphones that we borrowed from a friend, the scheme worked quite well and everything was quiet. The only problem was that it was so good that we also could not hear each other talk. This, we quickly realized, was because the microphone on the outside of the earphones was picking up everything outside and inverting it so that everything was also cancelled. In addition, the padding on the earphones was such that no outside sound could get through.

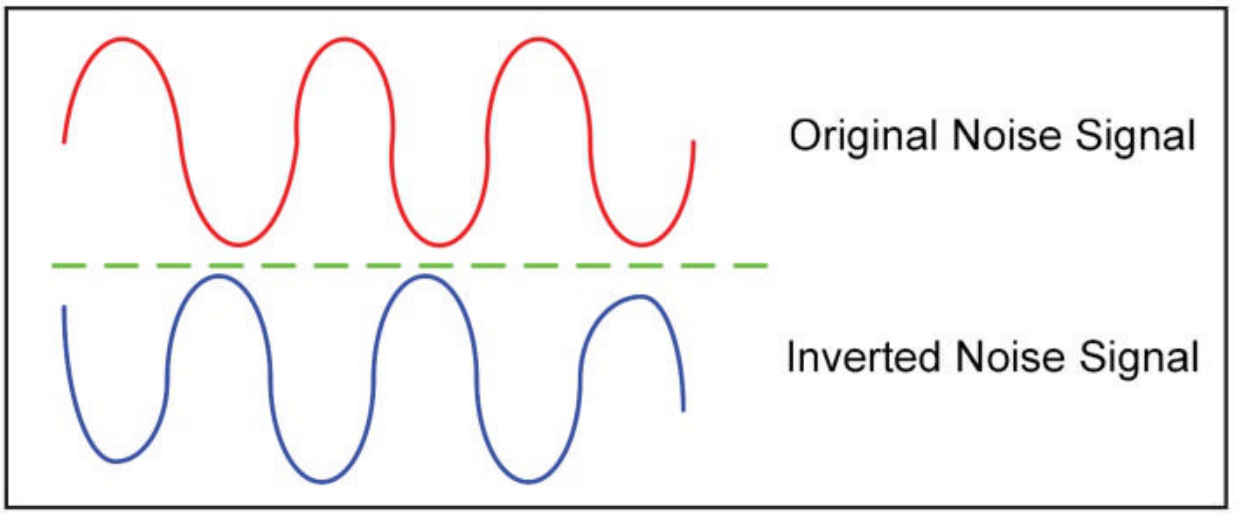


Fig. 1- Noise/Signal Relationships

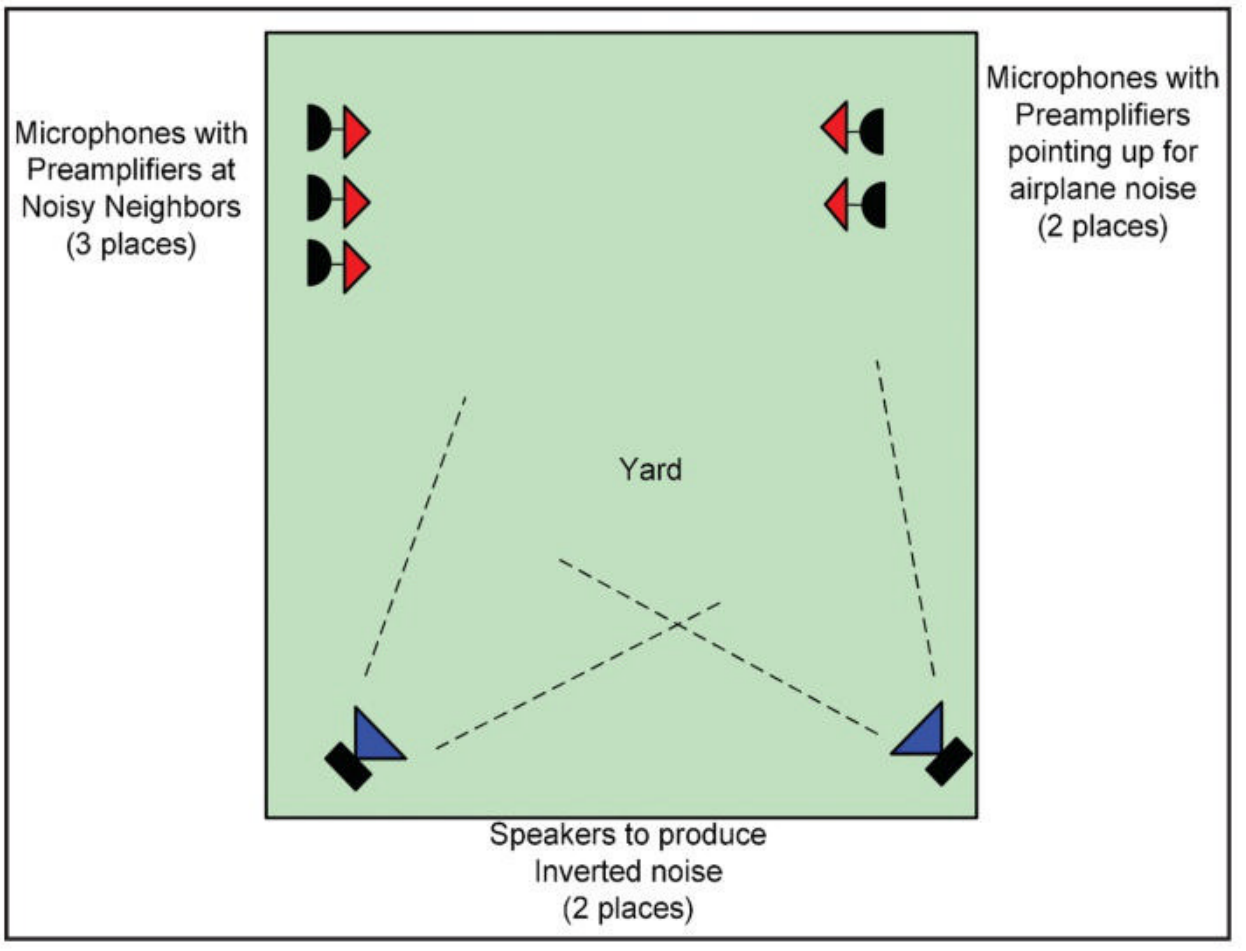


Fig. 2- Layout of Microphones and Speakers in Yard

Obviously, we could not easily do this to an entire yard. In our yard, however, we did have a couple of speakers set up to play music at various points when we were outside. We decided to use these, along with an additional power amplifier, to configure what we thought would work. Since it would not be as perfect as the enclosed space in the headphones, perhaps enough sound would leak through so we could carry on a conversation with reduced noise.

As you can see from Figure 2, we set up several inexpensive electret microphones around the perimeter of the yard at what we determined were the most sensitive places. These were connected to individual battery-powered preamplifiers with individual volume controls and phase inverters, and located in the places where most of the annoy-

*c/o CQ magazine

ing sound originated. We even set up two additional microphones, phase inverters and preamplifiers pointing directly upward to deal with airplanes. Finally, all of this was connected to a simple 5-channel audio mixer that we built as shown in the final configuration diagram of Figure 3. For those interested, the detailed preamplifier with the volume control and phase inverter circuits are shown in Figure 4. These are battery operated for convenience but hard-wired to the mixer. A switch was also included to turn the phase inverter on or off if required. The details of the mixer are not shown as it could simply be various inputs of the amplifier that you might use.

After all was built and connected, we waited for the noise to occur. When it did, we carefully adjusted all volume controls and the phase inverters for the best results. I am both happy and sad with the results. In some cases, it worked pretty well, but in other cases it did not work at all! Whether this was due to the variations in changing sound levels, the frequency response of the whole system, the location of all microphones or that fact that it was the very beginning of April remains to be seen.

What do you think?

73, Irwin, WA2NDM

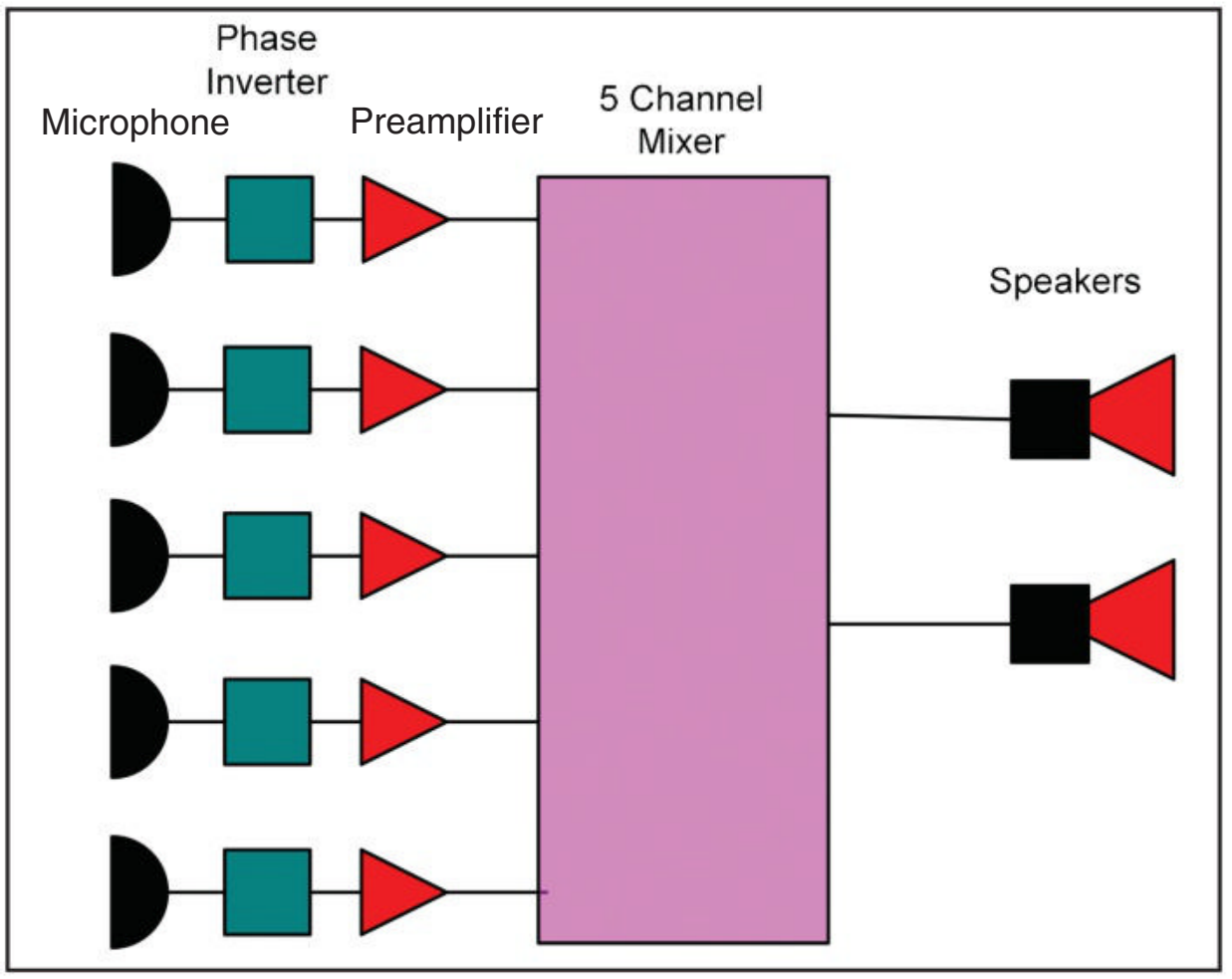


Fig. 3- Noise Cancelling System Layout

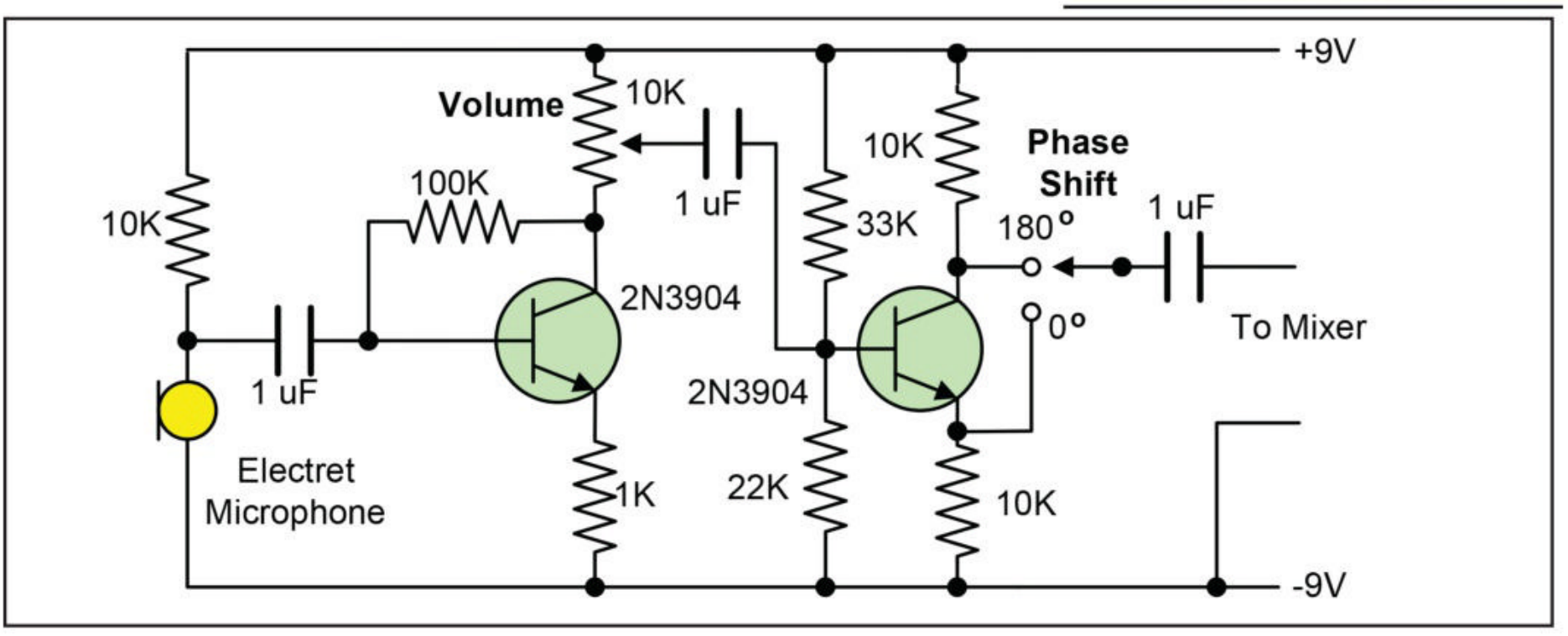


Fig. 4- Preamplifier and Phase Inverter Circuit

THE LISTENING POST

BY GERRY DEXTER

"Alarming" Sinking of Jakarta

~ Indonesia's capital city is sinking at an "alarming" rate they say. So, the government has begun the long process of building a new one. Thus, Jakarta (on Java) will be abandoned in favor of a new capital at Nusantara in East Borneo. I don't know what will happen to the 20 million or so residents of Jakarta, or whether the Voice of Indonesia will end up being reborn there. A change like that would be kind of like moving Washington, D.C. to, oh, say Lincoln, Nebraska!

~ Another opposition broadcaster targeting Eritrea has gone active. Erisat Radio using 11690 kHz via Madagascar, operating five days a week (except Monday and Tuesday) from 1800-1900 UTC. Its slogan appears to be "Inform, Engage, Empower". You can find its website here: <www.erisat.org>.

~ Something still seems amiss with the Colombian Fuerza de Paz on 4940 kHz. A late word from Don Moore on "Slack" indicates that 4940 kHz might well be in Venezuela after all, as the station continues to give GMT-4 time checks as a Venezuelan station would. The World Radio TV Handbook (WRTH-2022) shows 4940 kHz in Arauca; there's even a P.O. box number and the name of the gentleman to whom you should send reports.

~ Trouble in the Solomons. The Japanese-manufactured transmitters on 5020 and 9545 kHz are on the fritz. Work is proceeding as they try to get them back on the air, according to the SIBC.

~ ...but better news from Vanuatu. The station there has returned to the air. Now being heard on 5040 kHz around the 0700-0800 UTC time period.

~ Radio Exterior de España has apparently reinstated its DX program which has had a very "iffy" life so far. REE broadcasts the "Radio Waves" program at 2300 UTC following the news in English. It's best heard on 9690 kHz.

Erisat Radio (Erisat Satellite Television) is a new opposition broadcaster using 11690 kHz from 1800-1900 UTC via Madagascar.

Listener Logs

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

Here are this month's logs. All times are in UTC. If no language is mentioned English is assumed.

ALASKA—KNLS via Anchor Point on 6110 at 1410 on religion, marriage and pop music. Strong at my local sunrise. (Barton, AZ)

ALGERIA—Radio Algerienne on 6040 via France at 2227-2300 with a mix of Arabic and recitations ending the broadcast at 2355. (D'Angelo, PA) On 9655 with Qur'an at 2032. (Brossell, WI)

AUSTRIA—Radio Austria International on 6155 via Moosbrunn at 0600 with talk in German as man opens program, then man and woman reading the news. (D'Angelo, PA) On 9610 in Dyula at 1317. (Brossell, WI)

Adventist World Radio on 11955 via Moosbrunn at 1512 with man and woman talking in Turkish and mellow instrumental music. (Taylor, WI) At 1530 with man speaking in Punjabi, then into Urdu at 1600. (Barton, AZ)

AUSTRALIA—Reach Beyond on 11900 via Kununurra in Tamil at 1317. (Brossell, WI)

BOTSWANA—VOA Relay on 12075 via Mopeng Hill in French at 2111 with an English lesson. (Sellers, BC)

BRAZIL—(*All in Portuguese – GLD*)

Radio Clube do Para via Belem on 4885 at 0512 with lively Brazilian vocals, a full station ID and frequency announcement at 0521. (D'Angelo, PA)

**c/o CQ magazine*

Radio Educacao Rural via Tefe on 4925 at 1047 with a woman with a ballad and man with a similar ballad. (Taylor, WI)

Voz Missionaria via Comboriu on 5940 at 2318 with a hymn in English, Christian message then another hymn. (Sellers, BC) On 9665 with an apparent sermon at 2327. (Brossell, WI)

CHINA—China Radio International on 9600 via Kashi at 2103 with news in English; on 11640 via Mali in English at 2124 on Confucius, society, and civilization in China; on 13630 via Madagascar at 2043 with a discussion between a man and woman. (Sellers, BC) On 11725 via Xi'an in German at 1724; on 11935 via Shijazhuang in Russian at 1236; on 11955 via Kunming in Malay at 1238; on 15125 via Madagascar in Arabic at 1616. (Brossell, WI) On 13645 via Madagascar at 1730 with a talk in Hausa, tasty local music, off with a closing announcement at 1757 then back in Swahili at 1800. (Barton, AZ)

CNR-1 jammer on 6865 at 1354 in Mandarin with mellow contemporary music vs. Sound of Hope via Taiwan, //7280. (Taylor, WI)

CNR-1 on 11720 via Shijiazhuang at 2337 with man speaking in Mandarin. (D'Angelo, PA)

COLOMBIA—Fuerza de Paz via Arauca on 4940 at 0534-0626 with Spanish religious talk, WRTH lists it as the Colombian so I guess this might not be La Montana in Maicao. (*As I've had it – GLD*) (D'Angelo, PA)

EGYPT—Radio Cairo on 9899 via Abis at 2112-2145 close? Had local vocals and man hosting, but the modulation was so poor it was nearly impossible to decipher even the English. There were four short plus one long time pips every 15 minutes. (D'Angelo, PA)

ENGLAND—BBC on 9410 via Wootferton at 0600 with news headlines, switched to Sao Tome at 0700 with about the same signal strength. (Barton, AZ) On 11825 via Philippines with news at 2301. (Sellers, BC) On 12065 via Madagascar at 2117 with man reading the news in Somali. (Taylor, WI)

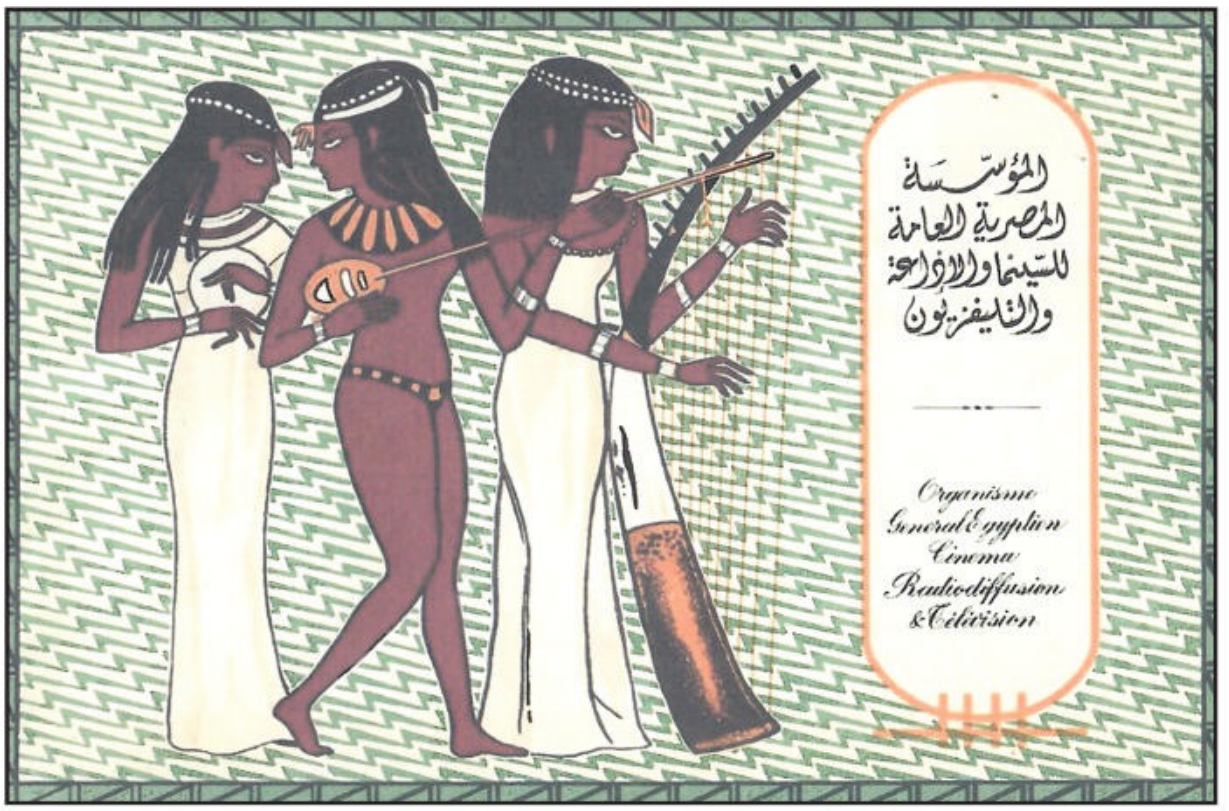
FRANCE—Radio France Intl on 13760 via Issoudun at 1913 with two men in French discussion. (D'Angelo, PA)

GERMANY—Deutsche Welle on 15215 via France in Hausa at 1317. (Brossell, WI)

GUAM—Adventist World Radio on 11620 in Cantonese at 1406 with woman maybe telling a story. (Taylor, WI) On 11955 via Agat in Ngaju at 2256, closing announcements at 2228, dead air, then back on in Indonesian with an English station ID; on 12040 in Javanese at 2256 with a gospel song, English station ID at 2259 and closed. (Sellers, BC)

INDIA—All India Radio on 11560 via Bengaluru at 1323 in Dari. (Brossell, WI)

Trans World Radio India on 13690 via Armenia at 1331 in Nagpuri. (Brossell, WI)



Radio Cairo 9900, continues to still have severe modulation problems with its Abis transmitter.

IRAN—VOIRI on 9530 via Zehedan at 1312 with Qur'an, but just barely audible. (Taylor, WI)

JAPAN—Radio Japan on 6105 via France at 0430 with Japanese pop music; on 13650 at 2225 with tuning signal and OTH radar bursts, woman with bottom of the hour sign on. (Barton, AZ) On 6165 via France at 0609 with woman talking in Arabic. (D'Angelo, PA) On 15130 via France in Japanese at 2024. (Brossell, WI)

Radio Nikkei-1 on 6055 via Nagara at 1324 in Japanese with local contemporary pop, woman speaking in Japanese for several minutes, then a bit of jazz piano before an interview, probably with the piano player, then more piano. (Taylor, WI)

MADAGSCAR—African Pathways Radio on 11965 via Mahaganga at 2031 with an interview. (Brossell, WI)

Radio Mazer Semey on 11705 via Talata-Antananarivo at 1513 in Tigray with man and a sermon for Eritrea. (Taylor, WI)

MALI—RTV du Mali via Bamako on 5995 at 2254 with man hosting hilife vocals and some French between numbers. (D'Angelo, PA) At 2349 with woman speaking in French, and a brief announcement by woman before carrier termination. (D'Angelo, PA)

MEXICO—Radio Educacion via Mexico D.F. on 6185 at 0554 with man in Spanish alternating with guitar instrumental music. (D'Angelo, PA) On 0830 with avant-garde jazz. (Barton, AZ)

NEW ZEALAND—RNZ Pacific on 7245 via Rangitaiki with Pacific news at 1231. (Brossell, WI) 11725 at 1803 with news by W. (Barton, AZ)

NIGERIA—Voice of Nigeria via Abuja on 11770 in Fulfulde at 1937, followed by flute, station ID, carrier termination. (D'Angelo, PA) In Hausa at 2030 with a woman making announcements interspersed with traditional music. (Sellers, BC)

NORTH KOREA—Voice of Korea on 11680 via Kanggye in Korean at 2040 with typical music and classical vocals. (Sellers, BC)

KCBS on 15180 via Kanggye with talks in Korean at 1255. (Brossell, WI)

OPPOSITION—Radio Ndarason International (via Ascension to Chad) on 12050 in Kanuri at 2052 and indigenous music, even stronger over WERN in Spanish. (Sellers, BC)

Voice of Tibet (via Tajikistan to China) on 9885 at 1332 with men talking, perhaps from a script. Jumped to 9876 at 1335. (Taylor, WI)

Radiynni Diree Shaggar (via France to Eritrea) on 15330 in Oromo at 1515 with Middle Eastern music, woman who was cut off in mid-sentence at 1630. (Barton, AZ)

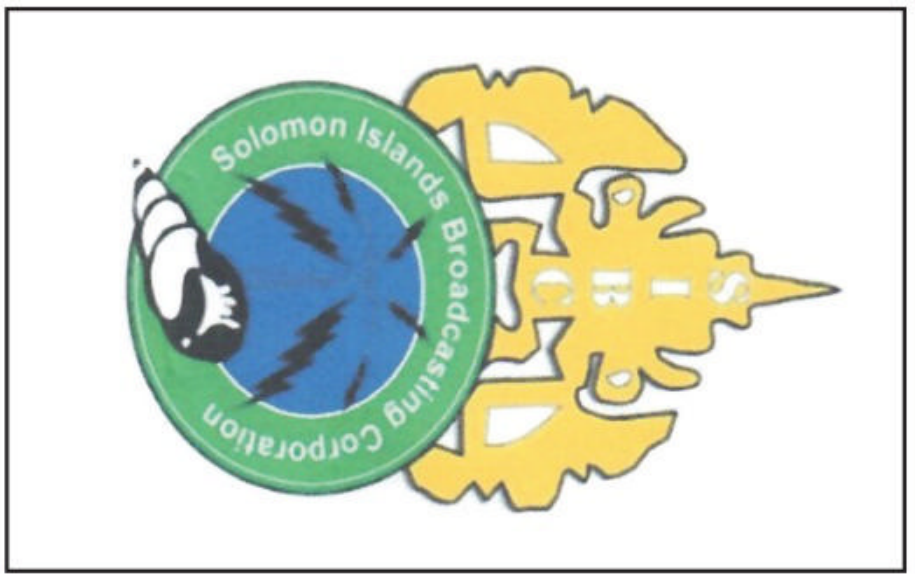
Dmiste Weyane (via France to Eritrea) on 15150 in Tigrinya at 1452 with man and woman and HOA bridge, another man gave an announcement, station ID, and off at 1558. (Taylor, WI)

Manara Radio Intl (via France to Nigeria) on 15285 in Hausa at 1621. (Brossell, WI)

Shiokaze (via Japan to North Korea) on 5930 at 1312 and woman talking slowly in Japanese with 20 second breaks in between. (Taylor, W)

Echo of Hope (South Korea to North) on 4885 at 1230 with woman speaking in Korean, man with what seemed to be news. (Taylor, WI)

Nippon No Kaze (Japan to North Korea) on 9800 at 1545 with woman speaking in Korean over closing music at the top of the hour, then off. (Barton, AZ)



Solomon Islands Broadcasting (5020 and 9545 kHz) continues to have transmitter troubles on each frequency.

Al Azm is the Saudi broadcast to Saudi troops in Yemen.

Furusato No Kaze (via Taiwan to North Korea) on 7295 in Japanese at 1335 with woman and station ID sequence, man continues briefly, then man with a morose ballad. (Taylor, WI)

Voice of Freedom (South Korea to North) on 6045 in Korean at 1320 with a man and woman hosting contemporary Korean vocals. (Taylor, WI)

Radio Tamazuj (via Madagascar to South Sudan) in (l) Sudanese Arabic at 1517. (Brossell, WI)

Radio Denge Welat (via France to Turkey) on 11530 with vocals, talks in Kurdish / Turkish at 1405 with the jammer "Erogan" mixing with it, then dropping away. (D'Angelo, PA) At 1721. (Brossell, WI)

Republic of Yemen Radio (Saudi Arabia to Yemen) on 11860 at 1354 with woman speaking in Arabic and man with Middle Eastern vocals, a "honk" DPRK-type jammer not unlike that from North Korea and not noted until recently. (Taylor, WI) At 2338 in Arabic. (Brossell, WI)

PERU—Radio Tarma via Tarma on 4775 at 1030 with man and woman speaking in Spanish, station ID by man at 1100 and 1104. (Barton, AZ) At 1057 with man speaking in Spanish and Andean music, ads, a bit of chat, clear station ID at 1102, and more music. (Taylor, WI)

PHILIPPINES—Far East Broadcasting on 9540 at 1444 in Hindi with South Asian music, woman and man talking back and forth. (Taylor, WI)

PIRATES—Yeah Man Radio on 6924 at 2213 very poor, barely audible music, station ID from HF Underground. KIPM on 6925 upper sideband (u) at 2115 with Alan Maxwell's take on the Adam / Eve story, station ID, Elkhorn maildrop address. High Frequency Radio Church with a station ID at 2153 and off. Pandemic Radio on 6930 at 2248 with a barely audible Tennessee Ernie Ford song, station ID, another ID, into "Ring of Fire". Small Dog Radio on 6925u at 0017 including OTHR blasts, slow-scan TV (SSTV), "fuzz" numbers, off after woman gave station ID. Lucky 13 on 6925u at 0137 with Meat Loaf things, periodic digital blasts erupting just above and right on the frequency. (Taylor, WI)

Clear Talk Radio on 6900 lower sideband (lsb) at 0017 with an old Beatles number, some reggae thing, much dead air, neighborhood noise, clear station ID by woman at 0041. Small Dog Radio on 6950u at 0034 alt rock from the 1970s, SSTV/FAX at 0045. WEZL on 6925u at 2256 with dramatic orchestra, electronic music, SSTV/FAX, more Morse, Westminster chimes at 0005, off at 0011. Wasteland Radio on 6955u at 2325 with apparent electronic music, male vocals. WFDR on 6940u at 2227 with an FDR speech. (Hassig, IL)

REPORTED IN PAST COLUMNS: Two Dog Radio, Outhouse Radio, Screaming Man Radio, Radio Free Whatever, Ballsmacker Radio, Wolverine Radio, Sycko Radio, Captain Morgan Shortwave.

ROMANIA—RRI on 9620 via Tiganeti at 2308 in English on Romanian culture. (Sellers, BC) On 11975 via Galbeni at 1443 in Romanian, man hosting music program, nice station IDs and time pips at 1456. (D'Angelo, PA)

SAO TOME—VOA Relay on 11850 via Pinheira in Hausa at 2046 on Nigeria, //13750. (Sellers, BC) On 12040 via Pinheira opening at 1700 in Amharic, signal dropped at the bottom of the hour as they switched to Lampertheim and began in Oromo. (Barton, AZ)

SAUDI ARABIA—Al Azm Radio on 11745 at 1432 with lively Arabic music, man in rapid talk, two announcements, theme like music, man with paced like talk. (Taylor, WI) At 1600 with Middle Eastern music, man talking in Arabic for Saudi troops in Yemen. (Barton, AZ)

SINGAPORE—BBC Far East Relay on 9580 via Kranji at 1100 with man on the turmoil in Afghanistan. (Barton, AZ)

SOUTH KOREA—KBS World Radio on 9630 via Kimjae at 1435 in English with pop music, best reception in a long time. (Barton, AZ)

TAIWAN—Radio Taiwan Intl on 9555 via Paochung in Mandarin at 1209. (Brossell, WI)

TURKEY—Voice of Turkey on 5960 via Emirler at 2324 with man speaking in English hosting music, nice station ID at 2330 alternating with instrumental music, several more IDs, 6+1-time pips at 0000 then into an unlisted language. (D'Angelo, PA) On 11815 via Emirler at 1630 with Middle Eastern sounding music to sudden close at top of the hour. (Barton, AZ)

UNITED STATES—Voice of America on 11660 via the Thailand Relay at 1436-1500* with Mandarin language program, brief instrumental music and woman with talk features. (D'Angelo, PA) On 11720 via Greenville with pop program in English at 2120. (Sellers, BC)

Radio Free Asia on 15275 via Tajikistan in Tibetan at 1321. (Brossell, WI)

Radio Liberty (RFE/RL) on 15450 via Lampertheim at 1256 in Tajik. (Brossell, WI)

Radio Farda on 12005 via Woofferton at 1312 in Farsi. (Brossell, WI)

Adventist World Radio on 9805 via Nauen, Germany, in Twi language at 2150 with woman giving contact information, preacher at 2125, contact information again, hymn and off; on 11985 via Madagascar at 2115 in Nigerian Pidgin with AWR postal address and texting instructions. (Sellers, BC) On 11755 via Sri Lanka in Urdu at 1605. (Brossell, WI)

VATICAN—Vatican Radio on 13830 via S.M. Galeria in Amharic at 1530 with man and indigenous music, then several short articles. (Taylor, WI) On 15565 in French at 1716. (Brossell, WI)

VIETNAM—Voice of Vietnam on 9840 via Sontay in Indonesian at 1247 in English with Vietnamese ballads, woman talking about the music, she had such a mushy sound only snatches were intelligible, quick station ID at 1257 and off but carrier didn't drop, at 1300 on in clear Indonesian. (Taylor, WI) At 1323 with contemporary Vietnamese pop music, station ID at 1327 and off. (Taylor WI)

Quien Sabe (Who goes there?)

~ 9510 kHz via Woofferton? Encompass (Digital Media Services) with a minute of their typical test music, but off at 1320 UTC. No other programming.

~ I don't usually include pirates in this section, but I couldn't resist this one. This unidentified station had all Jimmy Dorsey big band music at 0204 UTC on 6925 upper sideband. Mark says he had to leave for a few minutes and when he returned the signal was gone. (Taylor, WI)

QSL Quests

Radio Cairo gave Rich D'Angelo an email QSL in just one day recently via <freqmeg@yahoo.com>, the Egyptian Broadcasting Propagation Department.

As Time Goes By

Radio Clube do Liboto via Lobito, Angola on 4707 kHz at 2156 UTC, November 26, 1966 with local programming in Portuguese using 1 kilowatt.

Just Sayin'

Now that the script is on the wall for World Radio Publications (WRTH) we are in dire need of a replacement next year.

You know what? There isn't one!

But there are frequency lists that are frequently updated, namely EiBi <www.eibispace.de/> and aoki <https://tinyurl.com/2nw87kej>. Both have sites that are very handy to download (or not), print out, and place in three-ring binders as I used to do. But both stumble over a lack of schedules, not to mention missing addresses, historical notes, and other miscellaneous information.

Thanks for Your Logs

Thank you to the good guys this month, which include: William Hassig, Mt. Pleasant, IL; Harold Sellers, Vernon, BC; Rich D'Angelo, Wyomissing, PA; Mark Taylor, Madison, WI; Rick Barton, El Mirage, AZ; and Bob Brossell, Pewaukee, WI.

Until next month ... Keep on keepin' on, and ... be sure to Celebrate Shortwave!

KIT BUILDING

BY JOE EISENBERG,* K0NEB

Four Times the Fun!

The Penntek TR-35 4-Band CW Transceiver Kit

When choosing a kit radio to take into the field, having multiple bands in one unit makes a lot of sense, especially with the variability of propagation as Cycle 25 progresses. When choosing a kit to assemble, some builders balk at the idea of winding toroids as well as working with surface-mount parts. Both of these obstacles are checked off on this month's kit.

John Dillon, WA3RNC, has developed the new Penntek TR-35 4-band CW transceiver kit, building upon the success of his TR-25 kit that covers 20 and 40 meters. The TR-35 covers 40, 30, 20, and 17 meters. With the addition of many new features, the TR-35 improves on the TR-25 and makes for a great portable QRP CW transceiver. The Penntek instructions are very thorough, and include a section marked to read before beginning assembly. In this section, there are special procedures presented that need to be followed during assembly as well as reinforcing things the builder needs to be aware of during that phase of construction.

Like the TR-25, this kit has all the parts pre-sorted in the order they are called for and packaged into clear plastic strips. All static-sensitive parts are also packed in ESD packaging within the strips. There are three clear parts strips, one for the upper board, one for the lower board, and one for final assembly. As you progress through the steps, you simply

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email: <k0neb@cq-amateur-radio.com>
Hamfest Hotline #5855

The parts for the Penntek TR-35 are pre-sorted and packaged in the order in which they are used, making the kit ready to assemble right out of the box.

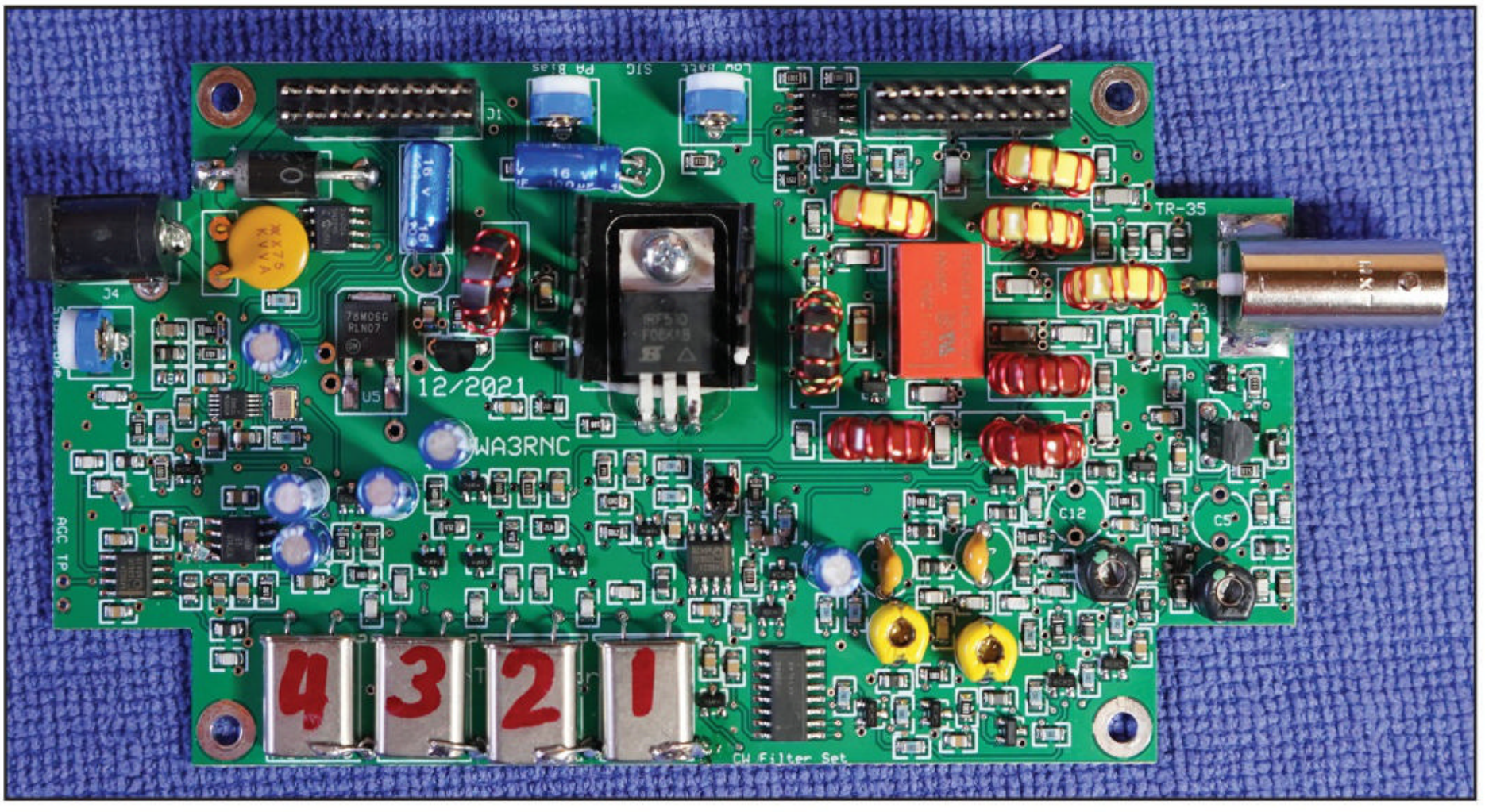
The toroids are already wound and prepared for mounting, and are packaged in the order in which they are placed on the board.

use scissors to cut open each segment of the clear strip one at a time, releasing the part or parts needed to complete that step. There are surface-mount parts on both boards, but they are already mounted for you as is the practice on many newer kits. The bonus for the TR-35 is that the toroids are also already wound and prepared, so all you need to do is mount them according to the manual. The toroid leads are already stripped and tinned for easy mounting.

Read the Instructions!

There are a few things mentioned in the manuals and notes that really need to be heeded. For example, some of the trimpots need to be mounted on the bottom of the board. This is necessary so the upper and lower boards fit together and the controls can be accessed during alignment. It is possible to mount them on top due to the pin configuration, but make sure to follow the instructions that specify which pots are mounted on the top and which mount to the bottom of the boards. There are also some jacks that need to be mounted under the board. These are also easy to spot as the pins on the bottom of the jacks won't all go into place if mounted on the top. The pattern of the pins on the jacks matches the holes on the bottom of the board only.

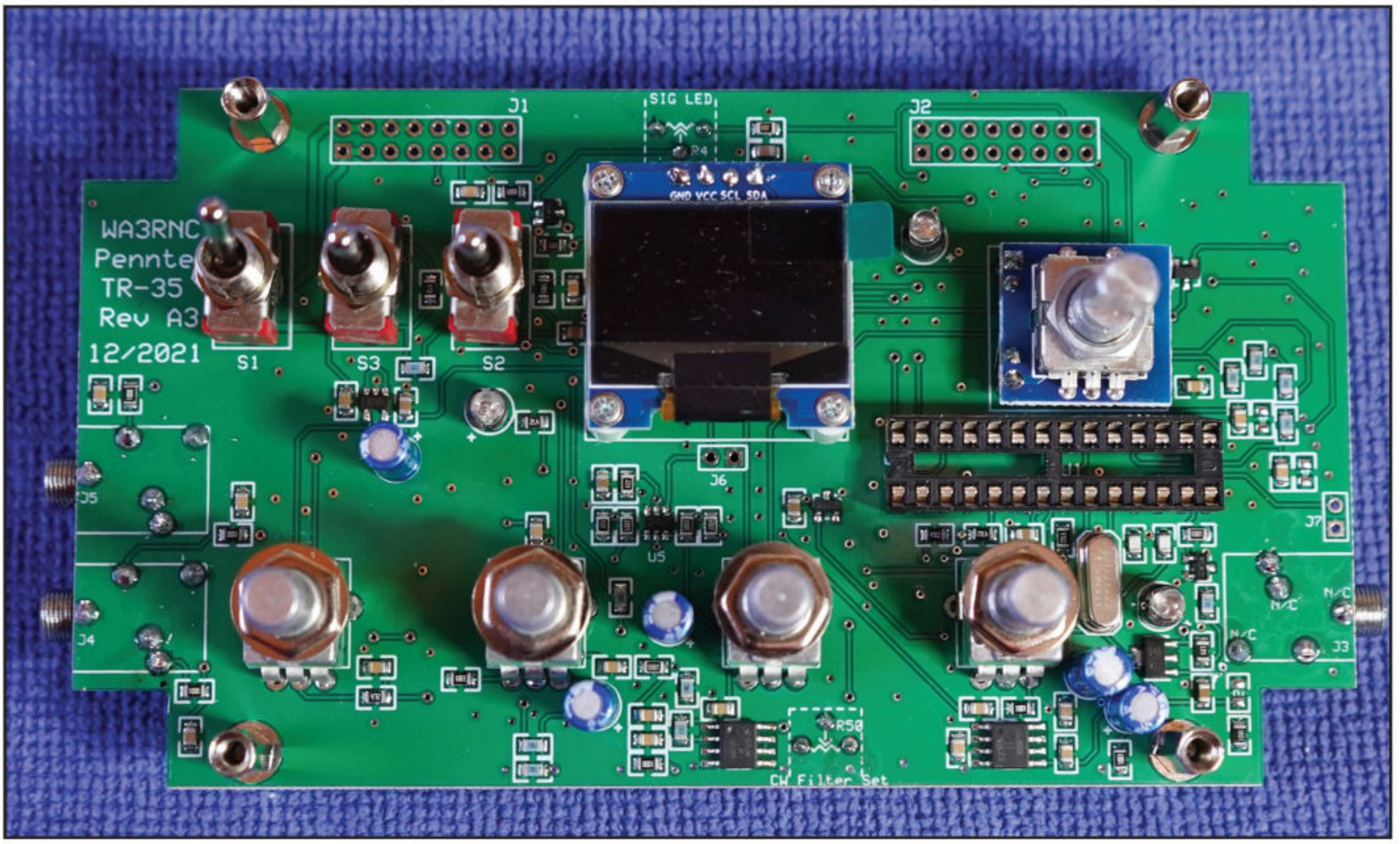
Another area to be aware of is the mounting of the male and female pin connectors. Be sure to follow the directions explicitly to be sure they are straight and aligned correctly. There are some parts, like some electrolytic capacitors that need to be laid down on their sides to fit and many others need to be mounted vertically, but flush to the board with no extra space between them and the board. The way I handled this is to place the capacitor on the board and spread the leads out to make it snug, then I solder one lead only. I hold the board with my finger on top of the capacitor and reheat that lead while pressing down on the capacitor. This



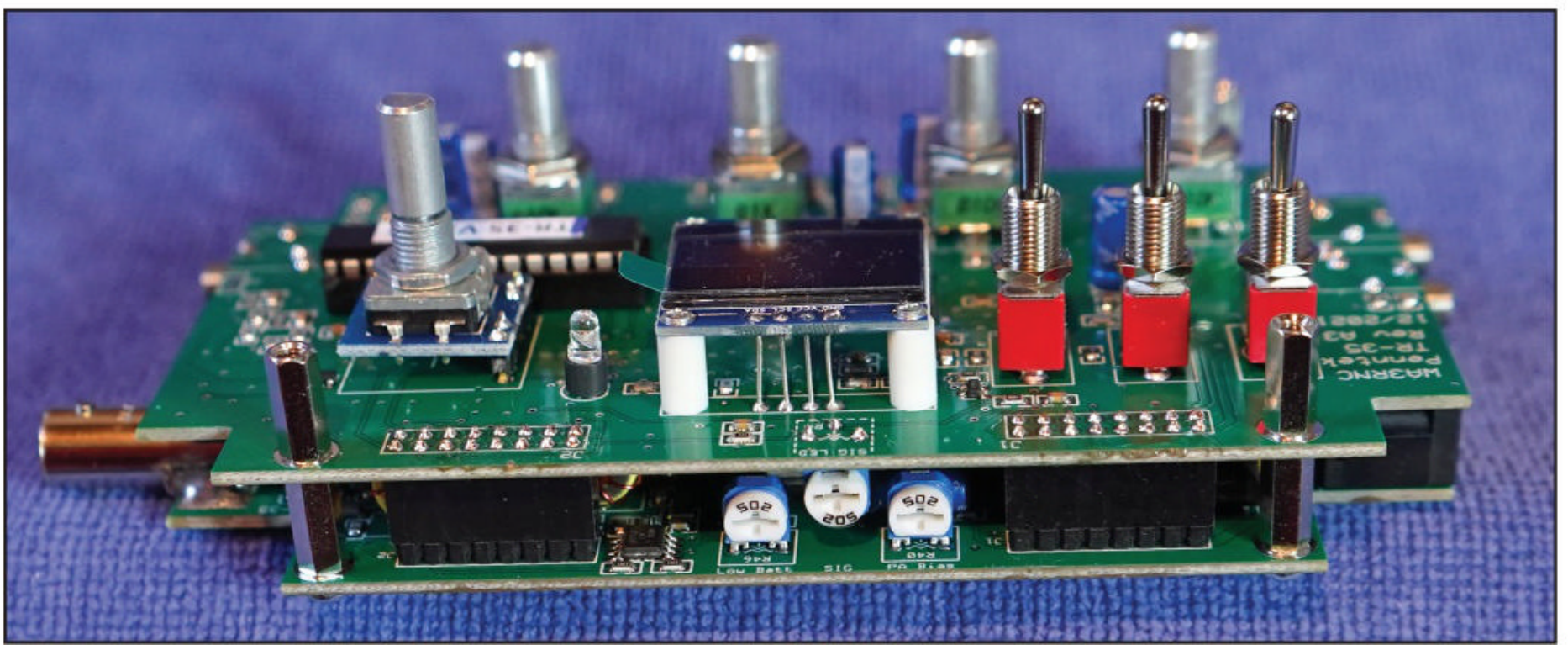
The lower board is assembled first and contains the final output transistor. The manual says heatsink grease is not required, nor is it supplied, but I used a tiny dab of it on the board and transistor just enough to spread out and not show outside the heat sink.

makes it occupy the lowest possible vertical position to give the maximum headroom between it and the board or case above it.

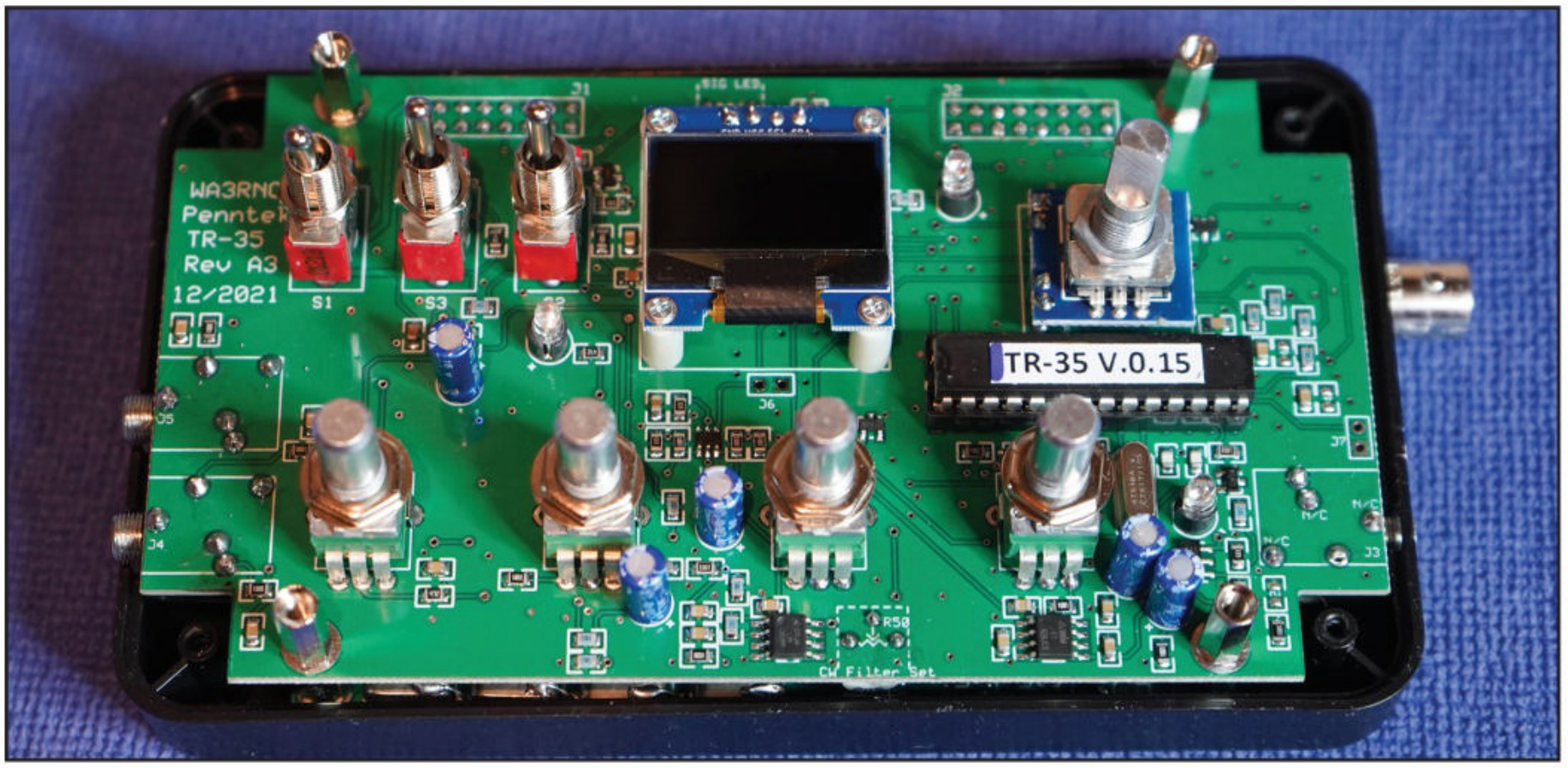
The adjustments during final assembly include needing to be able to measure current draw that is near 100 milliamps. A good digital multimeter works great for this. If you have not used your meter to measure current, be sure to follow its directions on how to do it. It is very important to be able to measure the current precisely to set the PA bias. This makes sure the final amplifier is working at its best efficiency and not overheating. Your meter will be connected in series with one of your power supply leads. Clip leads can help with this task. Most common multimeters display current in four digits. In my case, my idling current was 89.0 ma, and key down with the RF power control turned down all the way and the RF output connected to a dummy load was 105.6 ma. The directions have you turning the PA bias pot very slowly until the current draw begins to move up and stopping when only 4 to 5 ma above your initial key down value. In my case I stopped when it said 110.5 ma.



The upper board is the next to be assembled and contains the front panel controls and switches, and the OLED display. Treat the display with caution as it is made with thin glass.



An edgewise view of the two boards joined together showing the two different ways the trimpots are mounted. Pay close attention to which trimpots go above and which below the board when assembling them.



Once assembled, both boards fit nicely in the bottom half of the case before the top is put in place.

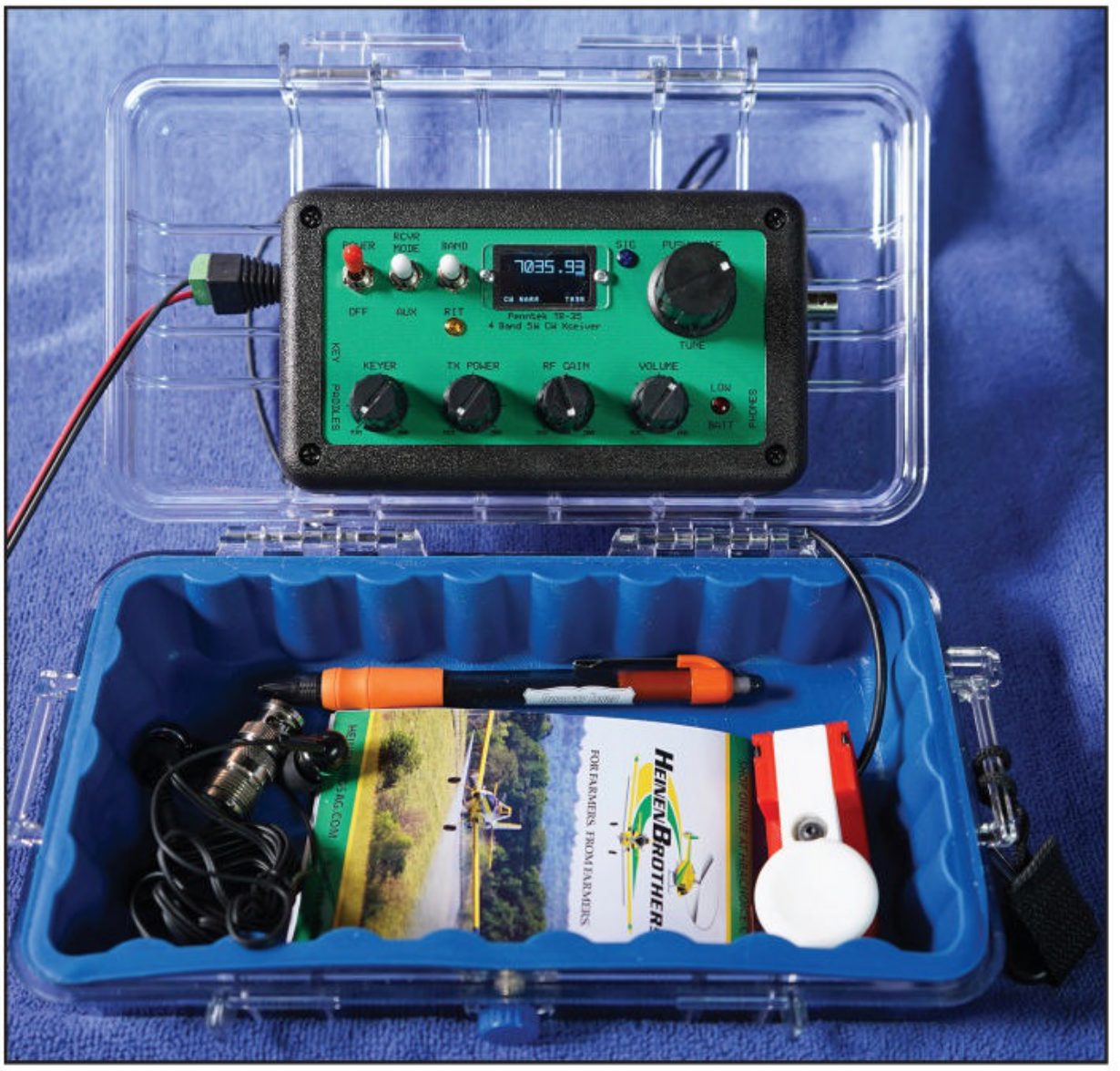
The other adjustments are easy, like setting the sidetone loudness, the CW filter center frequency and low power warning LED threshold. I set mine for 9.5-volts DC as that is the factory suggested level. The radio requires 9- to 14.5-volts DC, so this setting gives you adequate warning before needing to change batteries.

The new features incorporated into this kit include three different receive filter settings. One is CW narrow bandwidth for most CW QSOs. There is also a CW wide setting as well as an SSB receive setting. The TR-35 allows you to tune outside of the amateur bands while automatically inhibiting transmitting out of the band. Using the SSB receiving mode, I was able to easily tune into SSB QSOs within the ham bands as well as WWV on 10 and 15 MHz and numerous shortwave broadcasters. There is also the ability to save a frequency on each band and return to that frequency whenever you select that band. In addition, there is the ability to lock the dial, so it doesn't accidentally get bumped when you are operating. When in the locked mode, turning the dial will not change the operating frequency.

There are no confusing menus as all the functions are controlled by the switches and pots. When operating, either a straight key or a paddle can be used. Both types of keys can be connected at the same time and used interchangeably. The keyer speed is adjusted by a front panel control and does not affect the operation of the straight key.

You can order the Penntek TR-35 from WA3RNC for $279 at <www.wa3rnc.com/store>. I am really looking forward to the "Great Reunion" at the Dayton Hamvention® in May and seeing everybody in person. Three years is an awfully long time to wait in between Hamventions. I plan on being at other hamfests as well, including the Huntsville Hamfest, so be sure to say hi when you see me at an upcoming hamfest.

– Until next time, 73 de KØNEB



I packaged the finished TR-35 in a "go kit" ready for operation in the field! Be sure to always include a notepad and pen or pencils for logging and copying CW. Golf pencils are a great idea as they fit in a very small space.

LEARNING CURVE

BY RON OCHU, KOØZ*

Winter Field Day

This month I am going to take a chance and bet that Spring has sprung, putting Old Man Winter's frigid grasp in the rearview mirroe. I'm also betting outdoor ham radio plans are beginning to be made such as antenna projects, hamfests, and the granddaddy of them all — Field Day in late June. Field Day is an annual ham radio tradition. It is a fun event that at its core tests our ability to communicate on the air for 24 hours in the event of an emergency. In general, late June offers warmer temps along with higher humidity, sunshine, insects, and the possibility of thunderstorms. However, emergencies also occur during winter months, offering their own outdoor operating challenges.

Winter Field Day

It's true, emergency communications know no seasons. Winter poses additional challenges like frigid temps, excessive wind chill, frozen precipitation, and the need for piping-hot coffee. In general, it's safe to point out wintertime is less hospitable than summer. Yet, the need for emergency communications in wintertime is just as great as in summertime. Hence, the genesis and purpose of Winter Field Day (*Figure 1*). According to the Winter Field Day Association's website <www.winterfieldday.com>, "Winter Field Day Association (WFDA) is a dedicated group of amateur radio operators who

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Figure 1. Winter Field Day Association's logo. (Courtesy of Wikimedia Commons)

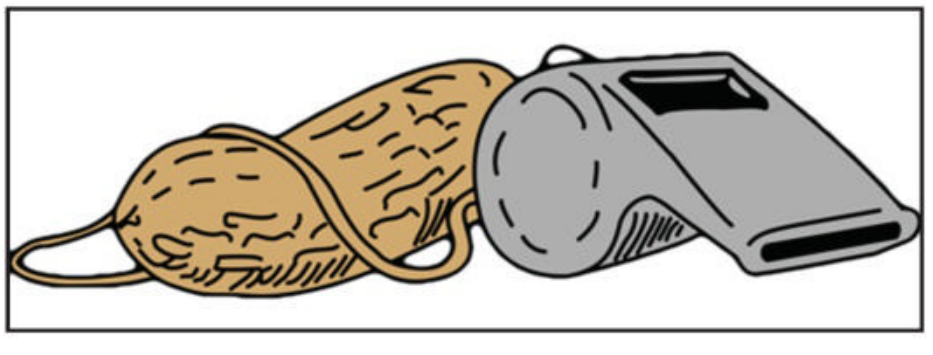

Figure 2. St. Louis QRP Society's logo is the peanut whistle. (Courtesy of Wikimedia Commons)

Photo A: Jeff Logullo, NØMMI, St. Louis QRP Society (SLQS) member operating his Elecraft KX3 QRP rig on Winter Field Day. (All photos by KOØZ except as noted)

Photo B: Long time SLQS member Dave Gauding, NF0R , taking a short break from Winter Field Day operating.

believe that emergency communications in a winter environment is just as important as the preparations and practice that is done each summer but with some additional unique operational concerns.

"We believe, as do the ARES & RACES organizations, that maintaining your operational skills should not be limited to fair weather scenarios. The addition of Winter Field Day will enhance those already important skills of those that who generously volunteer their time and equipment to these organizations. This is why WFD is open to all licensed amateur radio operators worldwide."

Nothing Ventured, Nothing Gained

I acknowledge the importance of prepping for a winter communications event, but to be perfectly honest, I've become a creature of comfort and the idea of venturing out into winter elements isn't that appealing. I rationalize these events are better suited for "younger hams." My rationale is akin to why jump out of a perfectly good airplane with a parachute when you don't have to? Kudos to the folks who do, but I'll stay home where it is warmer. On the other hand, at the forefront of my mind, I know these rationalizations do nothing toward expanding my communications skills. After all, nothing ventured, nothing gained, n'est-ce pas?

Photo C. The Emerald Ash Borer is harming forests by burrowing into trees. (Courtesy of Wikimedia Commons)

SLQS

Fortunately, there are ham radio groups willing to embrace a new challenge, willing to get out of their comfort zone. The St. Louis QRP Society (SLQS) is a dedicated and enthusiastic club that has decided to take on the challenges of Winter Field Day (*Figure 2*) is one such group. I followed the society's email thread, and I could see more and more members willing to participate. Voilá, a ham radio human interest story unfolding before me. For the uninitiated, QRP means low power. QRPers enjoy the challenge of making QSOs (radio contacts) with 5 watts or less, often using milliwatt power levels. Now, that is something to brag about.

SLQS decided to operate from Dr. Edmund Babler Memorial State Park, located in St. Louis county, Missouri on Saturday, January 29, 2022. The park closes at sunset

Photo D. Barely detectable above the roofline is the German-made Aerial 51 antenna.

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Photo E. Ground radials from the Aerial 51 off-center-fed dipole (OFCD) used by SLQS.

Photo F. Note the safety "flags" placed along guy wires to make them more visible to passersby.

Photo G. TransWorld Basic antenna used by SLQS Winter Field Day. It covers 10, 12, 15, 17, and 20 meters.

and the event starts at 1 p.m., so there would only be about 4.5 hours of operating time. SLQS member Jeff Logullo, NØMII, scouted out a suitable location within the park and notified park rangers that ham radio operators would be "descending upon" the outdoor picnic shelter (*Photo B*). The shelter is located on a park ridge, and more importantly, it has a fireplace to assist with warding off winter chill. The only restriction being firewood needed to be purchased from the park camp store and no other firewood brought into the park.

Photo H. ICOM 705 used by SLQS at Winter Field Day.

The Emerald Ash Borer (*Photo C*) can easily spread to healthy trees from firewood imported into the park and this measure is an attempt to restrict the borer's spread.

Operation – Babler

Once the picnic shelter was procured at the park, NØMII erected his German made Aerial 51 404-UL OCFD (off center-fed dipole), multi-band dipole <www.aerial-51.com/model-404-ul>. It performed very well (*Photos D, E, and F*). I spotted another antenna used by SLQS during Winter Field Day, a Trans-World Basic antenna for 10, 12, 15, 17, and 20 meters <https://tinyurl.com/yhu99kzf> (*Photo F*). Always keeping safety in mind, guy wires and tie-downs are clearly marked with colorful flags (*Photo G*). Rigs used included an Elecraft KX3, a Yaesu FT-817, and an ICOM IC-705 (*Photo H*). Of course, no Field Day event is complete without

Photo I. Headphones and CW paddles are Field Day necessities in any season of the year.

Photo J. A most welcome addition to Winter Field Day – a toasty, warm fire to ward off winter's chill as Keith Arns, KCØPP, watches Derek Cohn, WBØTUA, continue to pound CW Qs on a Yaesu FT-817.

Photo K. Delicious hot dogs courtesy of chef Keith Arns, KCØPP.

Photo L. SLQS members gathering around the fireplace, swapping tales.

headphones and CW paddles (*Photo I*). These ops came prepared and ready for bear. Although the outside temperature was in the 40s, it was still plenty cold with wind chill. When I arrived on site, Keith Arns, KCØPP, had a nice fire going in the picnic pavilion fireplace — a most welcome Winter Field Day necessity (*Photo J*). Besides a welcome source of heat, the fireplace also served double duty as a BBQ for hot dogs (*Photo K*). Hot dogs never tasted better than outside on a cold winter's day! A number of SLQS members dropped by during the afternoon to visit and to operate (*Photo L*).

Ops and Attitude

Operators (ops) and attitude count for a lot with any successful activity. When I arrived onsite at Babler State Park, I saw Gib Van Cleve, KEØPRK, with his dual-band, low-earth orbiting satellite Yagi waiting to hear a signal from the ISS (International Space Station) (*Photo M*). Erected antennas, hams chatting, operating, along with amplified dits and dahs greeting my eyes and ears in the dense, cold, winter air immediately made me feel welcomed and at home. Especially so, considering the past two years spent physically isolating from Covid-19, severely limited club gatherings to Zoom meetings. Of course, reconnecting with old buddies in-person and making new ones is icing on the cake. I was impressed and so glad that I made the trek out to the state park to experience a little bit of Winter Field Day. Inside the picnic pavilion, I sensed a relaxed, competitive air, but not so competitive as to not invite others to sit down to operate or, if they chose, to simply visit.

Photo M. GibVan Cleve, KEØPRK, getting ready to attempt a QSO with astronauts aboard the ISS.

SLQS WFD Stats

SLQS spent four and a half hours operating from the park. WFD commenced at 1 p.m. local time, but the park closed at sunset; thereby, limiting club operating time. Besides, the idea was to see if SLQS could meet the challenges of winter operating. However, the side benefits are also to beat cabin fever, get outside to operate, and to have fun. Every goal was met. SLQS operated on 15, 20, 40, and 80 meters, mostly on CW (continuous wave, a.k.a. Morse Code) and SSB (single sideband) making 100 QRP QSOs with a claimed score of 5,560 points.

Not a bad way at all to spend a chilly January Saturday! Thank you for reading *CQ* magazine!

– 73, Ron, KOØZ

QRP: Low-Power Communications

BY R. SCOTT ROUGHT,* KA8SMA

A QRPer's Approach to Winter Field Day

Each year following the hustle and bustle of the holidays, I look forward to Winter Field Day (WFD), a wintertime emergency communications preparedness event that occurs the last full weekend in January. WFD provides an opportunity for hams to set up a remote operation away from their QTH and enjoy 24 hours of on-the-air fun with fellow hams. The idea is to practice setup/operation skills during less-than-ideal conditions. I began operating this event several years ago and have participated from a variety of locations including the comfort of my travel trailer, my pickup truck, and one time from a picnic table next to a roaring campfire at a nearby state park.

This year I wanted to push the envelope and do something different and a little daring. Like many readers, my office is still shuttered due to the pandemic, and I am working from home. Most workdays I am "handcuffed" to my desk and seldom leave the house. I was looking forward to WFD as this would provide a much-needed change in environment. Staying in line with my "keep it simple" minimalistic attitude (I *am* a QRP operator, after all), I decided to work WFD from a makeshift shelter constructed from common household items with the goal of spending 24 hours outdoors in a true winter climate (*Photo A*). For me, this would be the ultimate WFD experience and allow me to unwind and have a little fun on the air, QRP-style, of course.

Photo A. KA8SMA at his Winter Field Day (WFD) operation

Finding the Right Location

In mid-January I traveled about 45 minutes south of my QTH to the Manistee National Forest to scout a location for WFD. The forest comprises more than 500,000 acres in Michigan's northwest lower peninsula and contains numerous two-track trails and roads providing access to streams, rustic campgrounds, and scenic overlooks. Once within the boundaries of the forest, it did not take me long to identify an open location off a two-track trail that was easily accessible and not too far from a county road that is regularly plowed. Although I have a 4-wheel drive pickup truck, I wanted to be sure I could still access this location on foot in the event a heavy snowfall prohibited access by vehicle.

Since I had decided on setting up operation in the Manistee National Forest, this operation would double as a Parks on the Air (POTA) operation. For those not familiar with POTA (<www.parksontheair.com>), it is a program that promotes portable amateur radio operation, emergency awareness and communications from state and national parks as well as other designated locations. Over the next couple of weeks, I carefully planned my trip, which included some lost sleep thinking about which QRP rig I would take, antennas, batteries, solar power, and the big question: what bare necessities would I need to survive a 24-hour northern Michigan campout in the dead of winter?

Keeping It Simple

My main objectives were to keep costs low and use items already on hand for constructing the shelter. I decided that I would construct a tarp shelter using rope, a 14' x 25' tarp, Visqueen™ (clear plastic sheeting) left from a forgotten project, and a slew of binder clips that I had in my work desk. The only other items needed for my shelter design were trees for stringing my rope between, which would not pose a problem in the Manistee National Forest.

Now to solve the problem of heat. I placed a call to my brother who loaned me his Mr. Heater®, a propane-fueled radiant heater that is safe for use in indoor environments. The heater runs on one-pound propane cylinders which can provide between two and five hours of heat depending on its output setting (ranging between 4,000 and 9,000 BTUs). My brother also gave me four full one-pound propane cylinders. When combined with the propane I already had on hand, I had more than 24 hours of heat as long as I was mindful of the setting. It is important to note that with any propane heater, proper ventilation is a necessity. A lack of ventilation will lead to improper combustion, which in turn produces carbon monoxide. Since I knew I would have a drafty shelter, a lack of ventilation for the heater was not a major concern.

Just before WFD, I rounded up the last few items I needed for setting up camp (portable table, camp chair, sleeping

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Photo B. My makeshift WFD shelter strung between two trees.

bag, blankets and a battery-operated LED lantern). I also packed an inexpensive inflatable raft to use as a barrier between the frozen ground and my sleeping bag. A snow shovel also made the list to remove as much snow as possible from the location where I was planning to erect my shelter.

My desire to keep this trip as simple as possible was partially foiled when my wife learned I was planning to eat nothing but salt bagels and scallion cream cheese for 24 hours. I still took my bagels and cream cheese (a bagel toasted in front of a propane heater is tasty) but per my wife's request, I also took a few eggs, sausage links and some bread to make toast for breakfast. This meant I also had to pack my camp stove, a fry pan, and a plate and utensils – ouch!

QRP Gear and Antennas

Deciding which radio equipment to pack was not difficult in the end. For this operation, I decided on my Lab599 Discovery TX-500 transceiver, an MFJ-971 portable antenna tuner, and a Bioenno 20Ah Lithium Iron Phosphate (LifePO4) battery. All this fits snugly into a backpack along with a Buddipole Powermini solar charge controller, a 30-watt Powerfilm foldable solar panel, paper and pencil. Everything I needed in one neat package.

For antennas, I decided on my 40-meter dipole (fed with 300-ohm twin-lead) which I planned to orient in an inverted-V fashion and a roll of 16-gauge wire for stringing a longwire antenna for use on 80 meters. I also took my slingshot and a bottle of water to deploy the antennas. The slingshot allowed me to get the longwire high into the treetops, and the bottle of water, when about one-third full, can be flung into tree branches at heights up to 40 feet which works well for deploying the inverted-V.

A few days before WFD, I received a delivery from Icom that added a second QRP transceiver to my arsenal, the IC-705. The IC-705 is Icom's new all-mode QRP transceiver that covers the HF bands, 50/144/430 MHz, and is equipped with Digital Smart Technologies for Amateur Radio (D-STAR). Icom is loaning me this transceiver for a product review which will appear in an upcoming edition, so stay tuned. The timing in receiving this transceiver could not have been better as WFD presented the perfect opportunity to test it out.

The Big Day

On WFD morning I loaded my pickup with all my gear and supplies and left for the woods around 10:00 am. This left me four hours to travel to the site, set up my tarp shelter and radio gear, hang antennas and fire up the propane heater before the start of WFD at 2:00 p.m. When I arrived at the site, I realized that someone had been there earlier in the week and had plowed a portion of the area. I was happy to see this as there was less risk of getting stuck, especially since 4-inches of snow had fallen the night before. Total snow cover on the ground was around 8 inches and the temperature was 18 degrees when I arrived.

I wasted no time and immediately began constructing the shelter (*Photo B*). The first step was to take the end of my rope (a 100-foot-long piece of one-quarter inch poly rope) and wrap it around a tree at a height of six feet above the ground. After securing the rope to the tree, I strung it to a second tree about 30 feet away. I stretched the rope so it was taut and then wrapped it around the second tree several times (at a height of six feet above the ground), then strung it back to the first tree where I wrapped it and tied a knot to secure the rope. After setting the rope, I set the tarp over it "A-frame" style and secured the bottom of each side with a few pieces of firewood I luckily had in the back of the truck. I shoveled snow over the tarp to further hold it in place and prevent it from moving. I had originally planned to stake the edges of the tarp down, but the firewood came in handy. Before buttoning up the open ends of the shelter with Visqueen, I removed as much snow as possible from the area beneath the tarp to create a bare surface. I chose Visqueen for the ends of the shelter because it is clear and would allow light inside. I used binder clips to attach the Visqueen to ends of the shelter (*Photo C*). Access in/out of the shelter was accomplished by unclipping the Visqueen from the tarp.

Immediately after setting up the shelter, I fired up the propane heater and placed it inside. I also set up my portable table and camp chair. I placed the table against one wall of the shelter for added stability and pushed the back of my camp chair against the opposite wall. While the shelter was heating up, I hung my Inverted-V antenna (*Photo D*) and strung about 150 feet of 16-gauge insulated stranded wire up into the trees for use as a long wire. After deploying the antennas, I moved the rigs and other gear (sleeping bag, blankets, etc.) into the shelter. Total setup time took just less than 1.5 hours.

It took about 30 minutes for the temperature to rise above freezing inside the shelter. As the temperature climbed, I set up my radio gear. I was not sure how my operating environment would turn out inside a makeshift shelter, so I did not take a laptop (err, my compa-

Photo C. One end of my shelter. Note the binder clips used to attach Visqueen™ to the tarp.

Photo D. Up and away! My 40-meter inverted-V antenna being readied for deployment.

ny's laptop) for this event. Instead, I logged the old-fashioned way with paper and pen.

Fun Time on the Air

Since I had two rigs with me and was planning to operate both SSB and CW, I decided to primarily use my TX-500 for SSB operation and the IC-705 for CW. I set up both rigs on the table with my 20Ah LifePO4 battery and antenna tuner in the middle of the table, which separated both stations (*Photo E*). This layout worked well and left lots of room for recording contacts on paper (and snacks!).

A few minutes after the start of WFD, I flipped on the TX-500 to find that 40 meters was a solid wall of stations across most of the phone band. QRM was heavy which made it difficult to find a slot to call CQ, much less hold a frequency. After making several SSB contacts I decided to switch to CW with the IC-705. This offered a little relief as the CW portion of the 40-meter band was not as crowded. The temperature in the shelter was 41 degrees and still climbing (*Photo F*).

As I began to operate CW, I realized I had forgotten to pack a pair of cotton gloves to help keep my hands warm. My fingers were able to operate my paddle for sending dits and dahs; the issue was a very cold table that the side of my hand rested upon to operate the paddle. I fixed this problem by moving the heater beneath the table. About an hour later, the tabletop was like a warming plate!

For the duration of the day, I switched between SSB and CW and spent time on 15 and 20 meters as well; however, QSB in the upper bands kept me primarily on 40. After sundown, I put my longwire to use on 80 meters. The shelter was a cozy 51 degrees against a chilly 23 outside. Around 11:00 p.m., I called it a night and inflated the rubber raft, placed a blanket on top for an extra layer of insulation, and rolled out my sleeping bag. Just before crawling inside the bag, I grabbed the IC-705 for some nighttime shortwave listening. I had a difficult time putting this radio down and spent at least two hours listening to a variety of broadcasts, including some rather exotic music that I'm sure made the critters outside think twice about wanting to come in – hi.

Up With the Sun

I woke up Sunday morning when the sun started peeking through the Visqueen just before 8:00 a.m. Inside the shelter, it was 38 degrees against a temperature of 22 degrees outside. I had reloaded the heater with a new canister of propane before going to bed, but it ran out of fuel a couple of hours before sunrise. It did not take long after I inserted a new can to get the chill out of the air. Around 8:30 a.m., I set up my camp stove on the tailgate of my truck and made eggs, sausage and a piece of toast (*Photo G*). I have to admit, this was a good start to the day.

Later that morning, I made a few WFD contacts and spent time doing POTA. Since I was in the Manistee National Forest (K-4583), I could not bear the thought of not activating this location. I alternated between my TX-500 and the IC-705 and made a slew of SSB POTA contacts. About noon, I was begin-

Photo E. Inside the shelter. My Discovery TX-500 is on the left; 20Ah LifePO4 battery/Buddipole solar controller and antenna tuner in the middle; and the IC-705 (on loan from Icom) and paddle on the right.

Photo F. Working CW with the IC-705 atop a cold table.

Photo G. Sunday's breakfast – nothing beats camp cooking!

ning to feel the toll of being outdoors for 24 hours and started taking down camp, which took about 40 minutes. The outdoor temperature during takedown was 25 degrees.

In total, I made 152 contacts, the vast majority of which were on 40 meters (as expected), followed by 80, 20 and 15. The inverted-V was my workhorse antenna; however, I cannot scoff at the longwire I strung through the trees. This antenna did a great job on 80 meters and served me well for shortwave listening.

Lessons Learned

A few thoughts for the next time I do something a bit crazy: I was impressed with how much heat my brother's Mr. Heater® generated and told my wife this is the top item on my Christmas wish list. The only change I would make is the purchase of a hose adapter to connect a 20-pound propane tank to the heater so I would not need to rely on 1-pound cylinders. I used six canisters in total (current cost is around $6 per canister). A 20-pound propane cylinder would be less expensive (around $20 to fill the tank) and provide more propane, if needed. Also, I am going to dedicate a laptop for operations outside the ham shack – no more paper logging! The logging software available today makes it easy to log and create .ADIF files for submittal to contest entities, POTA, etc. Besides, I will save myself time since I will not need to log these contacts again (on the computer) when I return home. Finally, pack cotton gloves!

One last thought. I wanted to make this WFD a true adventure to test my outdoor survival and emergency communication skills in the dead of winter. Winter camping in a northern climate can be hazardous, especially when using a homebrew shelter. If you take on an adventure such as mine, spend a good amount of time planning your trip and most importantly, know your location (latitude, longitude, and nearby landmarks) in the event you need to call for help (with your radio, of course). At my location, cell phone connectivity was poor to nonexistent, depending on where I stood on the site. However, I could easily connect to area repeaters with the IC-705 in the event I had an emergency. One item that sets the IC-705 apart from other QRP radios is that it's equipped with GPS. With the push of a couple of buttons, my exact position (latitude and longitude) is displayed on the IC-705's screen. This option alone makes it a good choice for outdoor adventurists. As indicated above, a full review of this little gem is coming soon.

Until June, 73

ANALOG ADVENTURES

BY ERIC P. NICHOLS,* KL7AJ

The RTTY Ditty

Although radioteletype, or RTTY, officially qualifies as a digital mode, in fact the oldest digital mode other than Morse code, it is also very much an analog mode, which makes it fair game for my column. Let me 'splain.

I discovered RTTY not long after obtaining my General Class ticket, back in 1974. One of my many Elmers, WB6QXZ# (what a hideous callsign for CW!), had a couple of Model 28 teleprinters residing on a confetti-covered basement floor. Why the confetti, you ask? Because of the REPERFORATOR, an obnoxious device invented by the Prince of Darkness himself. A reperforator was a primitive *store-and-forward* system using punched paper tapes for memory, for subsequent transmission by a Model 28 "locomotive." These produced piles of minuscule static-charged paper dots that were SUPPOSED to be safely contained in a bin, but never were. If you used a "reperf," you were certain to be covered with the stuff, which defied removal by brush, vacuum cleaner, or exorcism ritual.

If I had a callsign like WB6QXZ, I'd resort to RTTY too, despite the confetti. But we digress.

If you EVER get a chance to look under the hood of a Model 28, please do so; it is a mechanical engineering marvel. (I have a complete 3-inch-thick technical manual for the things, because many years later, I ended up maintaining them for various radio newsrooms, as they were still the mainstay of news services until the 1990s). Landline teletype had a set of its own unique quirks, which I might explore in a future column, but today, I'd like to concentrate on the radio aspect of RTTY.

A frequency-shifted signal (FSK) has some of the characteristics of an FM signal, some of an AM signal, and some of a CW signal. There is really some interesting physics at play. When hams, for the most part, built their own FSK demodulators (terminal units), there was really a fine art involved. There was also a raging debate on the merits of wide-shift vs narrow-shift RTTY. Detractors of wide-shift RTTY (shifts of a few kilocycles ... er, kilohertz), claimed that wide-shift RTTY occupied too much bandwidth. Well, yes ... and no. Well, actually, just NO. A wide frequency-shifted signal does not occupy the entire bandwidth between the mark and space frequencies. There is a big hole in between the mark and space signals, into which several narrow-band RTTY signals (or any other narrow signals, like CW) could easily fit. This argument against wide-shift RTTY is the same specious argument folks have when they say "working split" uses up too much band. Say what?!

Actually, what made narrow-shift RTTY eventually "win" was that it was less subject (but not entirely so) to selective fading. Wide-shift RTTY is still used widely (pun intended) on commercial and military HF circuits, where selective fading is remediated by space diversity receivers (still a very neat idea, but not convenient to implement for most hams).

If we ignore the selective fading aspect, we can revisit the advantages of a wide shift. At wide shifts, the RTTY signal takes on some of the characteristics of FM, most notably the *capture effect.* This is the property of FM in which a receiver will only detect the stronger of two signals on the same frequency. This does wonders for interference reduction.

If one uses a hard limiter in the reception of a wide-shift RTTY signal, one also gains the same noise-reduction capability of any FM system. Actually, hard limiting works well on narrow-shift RTTY signals too, but it is more noticeable on wide signals. Wide-shift RTTY signals can be more effectively "squelched." This prevents the RTTY terminal from spewing out gobbledygook (or confetti) when there is nothing of interest to decode. My old KAM all mode TNC (the state of the art before sound-card RTTY arrived on the scene) had a hard limiting option, which was actually pretty effective in this regard.

As far as the FCC rules are concerned, you can use a shift of up to 1 kHz, which allows for some experimentation with (relatively) wide-shift RTTY … nearly six times the normal 170-Hz shift.

General Coverage

I spend a lot of time cruising the utility bands at 4, 6, 8, 12, and 16 MHz. There's still a lot of interesting radio happen-

The iconic Teletype® Model 28 teleprinter (Photo courtesy of Ethan Blanton, KB8OJH <kb8ojh.net>)

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#SK (Name withheld to protect the innocent)

For lots of folks "brung up" on text messaging, RTTY operators seem to always be yelling at each other.

ing there, including a lot of encrypted wideband RTTY stuff. One interesting thing you'll see (even if you can't decipher it) is three-level shifting, with a center "idle" frequency, an upshifted mark frequency, and a downshifted space frequency. This allows a certain degree of error correction to be simply implemented. If there aren't as many upshifts as downshifts detected, an error will be generated, and dealt with appropriately.

Yelling

For lots of folks "brung up" on text messaging, RTTY operators seem to always be yelling at each other. This is not because RTTY operators are rude (despite having to deal with the aforementioned reperf confetti), but rather because capital letters are all that's available with the 5-bit Baudot code. With five bits, you only have 32 symbols available: The 26 letters of the English alphabet, a few punctuation symbols, and the all-important SHIFT command, which brings you all your numerals and such, as well as the even *more* all-important UNSHIFT command, which brings you back to your normal alphabet keyboard. (I can tell you *many* horror stories about missing the UNSHIFT command in the middle of a red-hot news item coming into the radio newsroom!)

Now

Of course, except for a few diehard "locomotive" RTTY operators, your RTTY operation today will not be spewing as much oil or confetti as in days of yore. Even a mediocre sound card with modern HF digital software will run rings around the best hot-rodded analog RTTY terminal units of a generation ago.

Both

I've done just about every HF digital mode there is in my half-century ham adventure, but I always come back to "plain vanilla" RTTY. (I really had a lot of fun with AMTOR in the early '90s [that's *1990s* ... I'm not *that* old!], and I thought it would be around forever, but AMTOR operators are as scarce as lips on chickens these days). Unlike that *other* not-to-be-mentioned HF digital mode, RTTY is real operating. It takes skill, patience, and an ear. It is the best of both the analog and digital universes ... simple, effective, and most of all, FUN!

Next Up

I trust you've enjoyed this slight departure from my usual train of thought, but it's nice to take an interesting detour once in a while. That's why this is Analog *Adventures,* not Analog Again. Next time, we'll get back into some more Spice modeling, so as not to lose any momentum. Also, if I can be forgiven a shameless commercial plug, please check out our updated website at <www.alaskit.net>.

We got a whole new stash of surplus parts in. And we still have our popular Popourri o' Parts, to get you started on your parts bin ... or just to refresh it a bit. You can order one directly from our web store link.

– 73! Eric, KL7AJ

MAGIC IN THE SKY

BY JEFF REINHARDT,* AA6JR

Does Our Future Lie In The Stars?

Just in time for the April edition of *CQ* comes a totally irreverent, irrelevant and unreliable projection of your ham radio future. We're not talking about propagation prognostications, which are assembled by heliocentric scientists of significant renown (seen elsewhere in this issue). Nope! These projections have been assembled using interpretations from crystal balls, cloud formations, tea leaves, the ancient Roman method of seeing what the birds are up to each morning and whether or not the coin landed showing heads or tails. Think that doesn't matter? Ask the Buffalo Bills how their last coin toss worked out!

So after a great deal of useless research and internal arm-wrestling, and consulting with the renowned fortune-teller Madam Triode, *CQ* ~~proudly~~, uh, ~~boldly~~ um, ~~humbly~~ (aw, c'mon Rich!), abashedly (*and hopefully not regretfully -ed.*) presents the first ever Hamiscope™ that links the cosmos to your radio future!

Aquarius (*Jan 20 – Feb 18*)

Besides having a nifty show tune named after your star sign, your ham future this year represents opportunity galore. Go ahead and buy that new rig! Don't forget the matching speaker and desk microphone. While you're at it, get a new 80-foot tower supporting beams on all the popular bands. Yes, opportunity runs deep – not so much for you but for the ham store of your choosing and your credit card issuer! (And beware of your UPS delivery person – he or she may not be fond of you!)

Pisces (*Feb 19 – March 20*)

Don't take the bait of trying to bust a pileup on rare DX with your tuna can QRP transmitter.(Unlike a friend who tried this until he realized he also needed a receiver.) Nevertheless, you are the type committed to worthy pursuits, impossible dreams, like the creation of a desktop 160-meter antenna and fusion-powered HTs. Keep at it! Remember in the fable, Daedalus did fly, he just got too carried away with the mission. Does that analogy make sense? If so, you may need some outside assistance.

Aries (*March 21 – April 19*)

Look for times when the planets are in misalignment, as everyone else thinks it's great when they align. When things are messed up, opportunity presents itself to the prepared mind, which isn't so much a cosmic reading as it is a quote from a faded motivational poster in the CQ lunch room. When Mercury is in retrograde, your northeast to southwest propagation windows are open, which will likely be a good time to ram your signals around the planet. However, closing those windows may reduce your air conditioning expenses, especially if you reside in Alabama in August.

Taurus (*April 20 – May 20*)

This year your signals will be as strong as the bull that signifies your star sign! Feel free to unleash those dits and dahs, blast away those digital exchanges and dazzle your competitors with record-breaking contest scores that rival today's fuel prices. And with regard to DX, if you hear it, go for it! You're almost a cinch to charge through the worst pileups like your pals who race through the streets of Pamplona. However, if you should relocate, avoid taking a mixed-use residence coupled with a china shop.

Gemini (*May 21-June 21*)

It's time to acknowledge the "other" you, that cosmic twin who dominates your sign. Got a good home shack? Good! Then it's time to mount one in your vehicle! Have a nice dipole? Okay, get going on that vertical you've always secretly wanted. Who knows how many signals have been hiding due to your unspoken, unfulfilled dreams? Is SSB your mode of choice? Branch out into a new mode, be it digital or CW. Remember for you, good things come in twos. So get to work on getting your spouse licensed!

Cancer (*June 22-July 22*)

Children of the Moon will enjoy a year of charm, serenity, romance, enlightening QSOs, gratifying hamfests, socially fulfilling ham club meetings, perfect Field Day operating conditions, flawless equipment operations and QSL responses from every contact. You will be happier than a Tesla owner driving by a gas station. While those born under this sign seem particularly gifted and fortunate, don't be angry or envious if you're not among them. If, however, you are a member of this select group, how lucky you are that so is the person who wrote this!

Leo (*July 23 – Aug 21*)

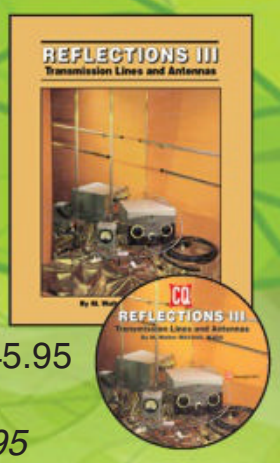
Like the Lion from Oz, you bring the gift of courage to carry you through the year's challenges and you're more than their equal! Determination will solve the vexing problem, open the door to new

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

Spring is in the Air...

Reflections III

by Walt Maxwell, W2DU



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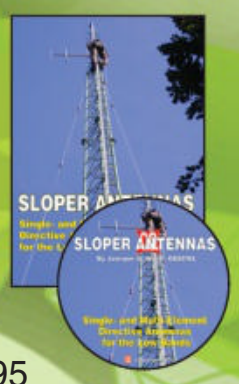
Sloper Antennas

by Juergen A. Weigl, OE5CWL



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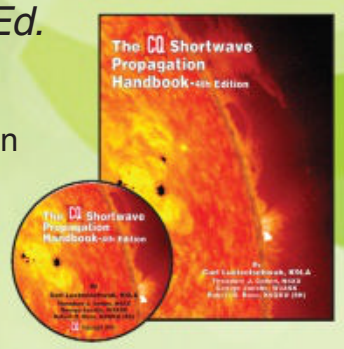
by Carl Luetzelschwab, K9LA



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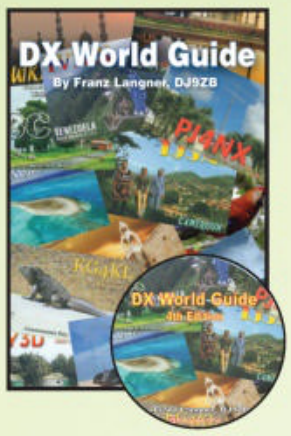
By Franz Langner, DJ9ZB



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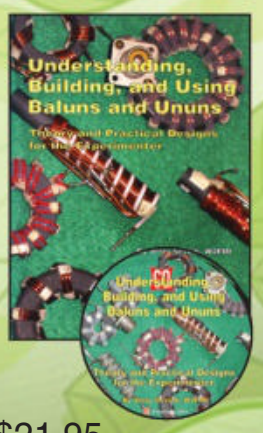
by Jerry Sevick, W2FMI



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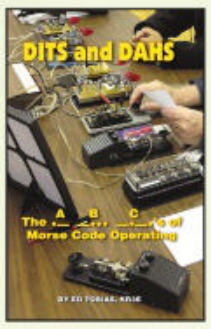

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ideas and maybe even help you nail that elusive meteor contact during the annual Perseid Meteor Shower on August 11-12. But like a meteor, your blazing signals will fade quickly, so let your courage carry you through while your light shines its brightest. Then be sure to turn off that dazzling new LED flashlight you bought in response to an infomercial.

Virgo (*Aug 23-Sept 22*)

This is a year of transition, so who knows what that means? The stars hint at travel, perhaps a DXpedition. It could be to a rare island or a walk to the local convenience store with an HT. Consider different operating venues, like a cabin in the woods, bicycle mobile, an igloo (let us know how you mount the antenna) or a hot air balloon. So be open to change and new adventures. Just be sure to fit them in before that crazy time of year where all the major sports are on TV at the same time.

SPURIOUS SIGNALS By Jason Togyer W3MCK
spuriouscomic.blogspot.com

Libra (*Sept 23 – Oct 23*)

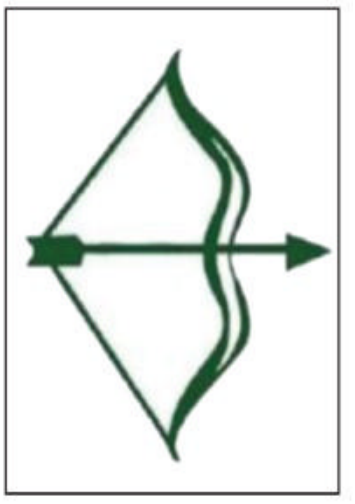
For Libras, this is the year of the antenna upgrade. As the old ham bromide goes, "a dime spent on antenna is worth a dollar spent on a transceiver." Beside wanting to know what ham radio vendor offers items in those price ranges, the ham Libra must strike the balance between horizontal or vertical, omnidirectional versus beam, and where on earth where one may find the elusive isotropic?? Avoid unbalanced skyhooks and may your efforts result in that 1:1 SWR!

Scorpio (*Oct 24-Nov 21*)

Like the scorpion's sting, hams under this sign will enjoy power, power and more power!

It's time for that "full gallon"! Get connected to a "footwarmer" that will blast your signals through eight-foot walls made of lead. Once you're hooked up, when you key down, lights will dim in Las Vegas, after which your power company will dedicate a generator just for your shack. They will also frame the check that pays your electric bill. Nevertheless, power up, cuz there's two types of hams: those who have the juice and those who wish they did!

Sagittarius (*Nov 22-Dec 2*)



A special time is coming, when much-desired signals simply fall in your lap. Even though you have a modest antenna and a basic rig, be ready to receive that rare DX, the contact that fills in the remaining blank for an award, the grey line QSO half a world away, the YL with the voice of an angel and an Extra Class ticket who's been waiting to meet you. You get the idea, for a brief period, you will be "in the zone" where it all comes together, but for a very brief time. Enjoy!!

Capricorn (*Dec 22 – Jan 19*)

It's your year to team up with another ham. Maybe you mentor, maybe you're the mentee. Teamwork is the key to your happy ham radio future. Travel to a hamfest is better with an amigo. When stringing new cables or tuning an antenna a compatriot is a must, so if you have a ham buddy, how lucky you are, and if you don't have one, get one. And given the span of your sign's dates, try to get Santa – he's a good ham pal to have! And remember – there's no point to ham radio without someone on the other end.

So there you have it – ham radio's first Hamiscope™ reading for the coming year. Not to sound redundant but it's a first to invoke the *Magic In The Sky* to project some *Magic In The Sky!*

ANTENNAS

BY KENT BRITAIN, WA5VJB

Antenna Magnets

Will adding a bar magnet at the base of your antenna help your signal get out better? Apparently, it all depends on the direction in which it's pointing! Read below for more…

Yes, yes, I know, this is the April column, but this is not an April first joke. You should agree, though, that April is the best month to run it. Some years ago, I had a guy approach me wanting to buy *antenna magnets*.

You see, if you put the magnet along the base of the antenna, North Pole down, South Pole up, that magnet just sucks the radio waves out of the coax and shoves them up the antenna! Your mobile gets out like a base station! But if you reverse the magnet, you hear real good, but the radio doesn't get out.

Now to those of you with a bit more RF background, there are ferrite circulators and ferrite isolators, but this ain't one of them!

"Sorry, don't have any magnets in stock at this time."

Uhhh, not exactly an antenna topic but circulators just might make a good future column. Any feedback?

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

VHF PLUS

BY TRENT FLEMING,* N4DTF

Springtime on Six

As I write this, it is mid-March and still sort of rainy, dreary, and occasionally cold. We even had about 4 inches of snow last Friday night. Spring has not yet sprung here in the mid-south (EM55). By April 1, many are hoping that the Sporadic E season will be in full swing. Some activity has already been noted (see On the Air, below) so I'm going to take that as a good sign. So far this year, in addition to Es, we have seen TEP (Trans-Equatorial Propagation) activity across the equator into South America (Photo A), and even some aurora this last weekend; see reports below. So far, solar flux has been good for HF but has not yet reached the point where F_2 is possible on 6 meters. As Cycle 25 strengthens, we might see that, too.

I've had a couple of good 6-meter seasons in a row, in terms of days active, and adding new grids. I am hopeful for another good season this year. Of course, you want to have an adequate station, but you certainly don't need a "superstation" to work a lot of grids. A horizontally-polarized antenna (loop, dipole, or beam) will be enough, and while height helps to some extent, generally if you are 20 feet or more off the ground, you will have some success. The more power, the better, but when the band is open, even 10 or 20 watts will let you have fun. Many modern transceivers feature 100 watts on 6 meters, so you may already have that available. Listening is important. I like to follow the "two ears and one mouth rule" to balance listening and calling, but both are important. If everyone listens and no one calls CQ, we may not know the band is open. While I spend most of my time on voice, always parked near 50.125 MHz to start, other modes are very popular on 6, including CW and FT8. Below 50.100 is technically the CW portion of the band, but you will sometimes hear CW on the voice portion if it becomes obvious that a contact can't be completed by phone. Don't hesitate to give it a try, you might lose a station in the time it takes to move them to the CW portion due to Es shifting. FT8 has become wildly popular on 6 meters, and I'd suggest you give it a try, just to see what you think. While 50.313 is the traditional FT8 frequency, there has been an effort – somewhat successful – to move DX contacts to 50.323, so don't hesitate to monitor there as well.

Finally, remember the VHF and above contests coming this summer: ARRL in June, CQ in July, and a couple of higher VHF/UHF band contests in August and September. Take advantage of any nice weather to check out antennas, maybe consider adding a band like 222 MHz or 1296 MHz this year, etc. Please write and let me know of any station improvements (fixed or rover) that you are making or considering.

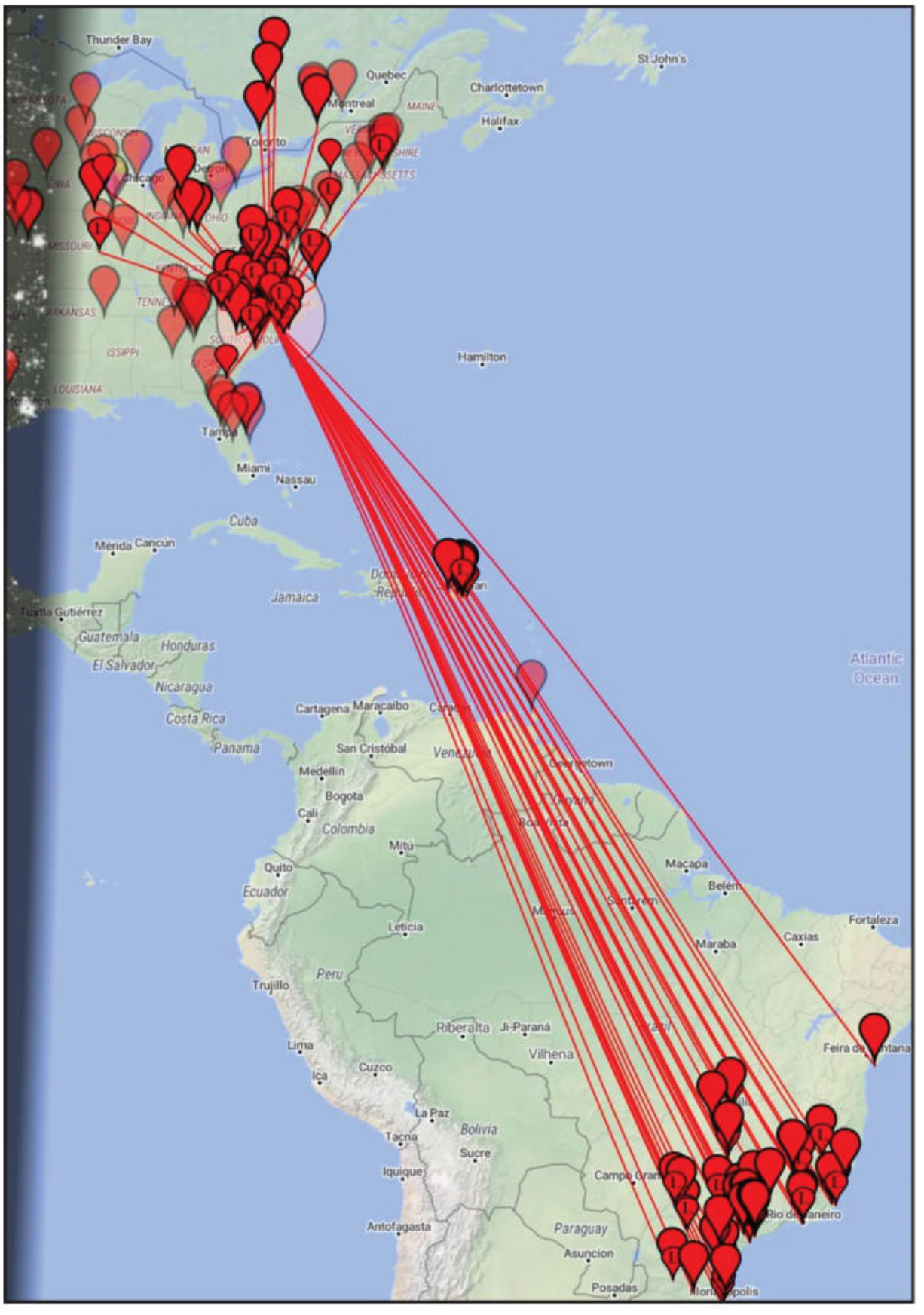


Photo A. Graphic representation of the big 6-meter Trans-Equatorial Propagation (TEP) opening on March 14, 2022, between much of the eastern U.S. and central South America. (Image courtesy DXmaps)

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

Report from Amateur Radio Station N4DTF

I've been very active recently, thanks to a minimum of travel. I've made a number of local 2-meter SSB contacts, and of course have kept my schedule for our daily FM simplex net on 146.52 here in EM55. Haven't had any significant VHF band openings, but HF has been very good to me. Conditions were good for the ARRL International DX Contest, and in a limited effort I logged 86 countries over the weekend, including two new ones, plus some new band/countries.

Projects: Recently, I resolved to get set for digital modes, so I dusted off my Signalink, did a little configuration, and now have my IC-7700 running on WSJT-X. Because I've never been on the band, I decided to pursue DXCC on 30 meters, and have made significant progress. Next project includes troubleshooting my 6-meter beam. I am hopeful it is a cable issue and fairly easily resolved. Just need some decent weather to work in. Looking forward to seeing what all the fuss is about on 6-meter FT8, among other things. (I also repaired a dryer, not necessarily VHF related, LOL.) Feel free to update us on your projects.

Sidenote: Pat, W5THT, writes that he is interested in the Fred Fish Memorial Award (FFMA). This award goes to those who make contacts with all 488 grids in the lower 48 states on 6 meters. Only 23 of these awards have been issued in the nearly 15 years since the award's inception, an indication of the dedication and perseverance required to earn it. For more info, visit <http://www.arrl.org/ffma>.

On the Air

~ Dennis, NE6I, writes from DM12, near San Diego: The band opened in pipeline fashion last evening, March 13 about 5pm local time, into Texas. I logged seven stations during that hour before the band faded out. Today, March 14, in the 1pm hour local time, I started copying South America for only the second time since getting on the band several years ago. I have a modest station so hearing DX is always exciting on the magic band! I logged HC2FG, CX6DRA and five Chilean stations before the band tapered off. Fun stuff!

~ From the Florida Gulf Coast, Charlie, NF4A reports: Nice 6 meter opening tonight around 0100z (March 14) to South America. Many PY stations plus LU and ZP. ZP was a new one for me on 6.

~ Chris, N4SIX, is in FM04. He made contacts with LU, PY, & CX, during an opening to South America at 0100z on March 14. Chris reports he worked many PY stations plus LU and ZP, with ZP being a new one for him on 6 meters.

~ N7BUG, Paul, reports a nice but short-lived aurora event on the evening of March 13. On 50 MHz CW, he worked W1GF, VE3DS, K1RO, VE2XK, K8ZR, W9JN AND WZ8D. On 144 MHz, he worked K9MRI and WZ8D. Paul says "that was exciting" and mentions that he used to work "a lot" of aurora but it has been several years since the last time.

~ According to spaceweather.com and other sources, an earthbound CME was seen on March 10 and was expected to arrive on the evening of March 13. This contributed to N7BUG's aurora experience as well as others. Briefly, enhanced auroras create denser ion fields and provide reflection. Most seasoned operators will point to the nearest pole, depending on their hemisphere, and work reflected stations on CW, digital, even voice. On voice, you will notice a distinct fluctuating or "watery" sounding signal due to the changing intensity of the aurora.

As always, I am grateful for the operating reports, and encourage you to let me know anytime you have an opening on the VHF and above bands! In addition, your thoughts, comments, and ideas for topics are also quite welcome at any time.

AWARDS

BY STEVE MOLO,* KI4KWR

DX Awards from Ecuador

This month I give you a set of awards from a great group of operators, the Ecuador DX Club. These folks were introduced to me at the Orlando Hamcation and what a great group. If you have worked them and have not claimed any of these awards…why are you still waiting??

They provided the following information about the club's award program:

Since 2017, the Ecuador DX Club has been developing multiple activities related to amateur radio that have been unique in our environment, although very common in other latitudes. We are convinced that although amateur radio is an eminently technical activity, it is possible to combine it with knowledge of other cultures, as well as world history and geography. The intention of this initiative is that through amateur radio, people from all over the world can get to know Ecuador, its natural resources and tourist attractions, using prizes, certificates or diplomas for this purpose.

We have organized several activations on important commemorative dates for Ecuador, where thousands of certificates have been delivered free of charge to radio amateurs all over the world and can be downloaded automatically from our website at <https://ecuadordxclub.org>.

Currently, we offer four awards with delivery of diplomas in JPG format without any cost for applicants. The instructions for each of them are clearly described in English and Spanish on our website in the Diplomas (Awards) section. Many colleagues worldwide already have our diplomas in their collections and we have received in all cases the best comments.

All activation contacts are valid for DXCC and registered through LoTW and QRZ.com.

Ecuador DX Club Award

This award is available for hams and SWLs who have made contacts with stations in Ecuador with the prefix HC or HD. The award has three categories: GOLD, SILVER & BRONZE, according to the number of unique contacts realized. Is not required to send any QSLs, only the logbook data for the respective contacts, to <awards@ecuadordxclub.org>. In no more than a few days, you will receive the diploma in the corresponding digital format. The Ecuador DX Club Award (Photo A) contains the image of the Chimborazo volcano, the highest volcano in Ecuador, located in the center of the country in the Andes mountain region, with the snowy summit of 6,264 meters (20,546 feet), having the highest altitude in the world, taken from the center of the Earth.

Galapagos Islands Award

The Galapagos Islands, declared a Natural World Heritage Site by UNESCO in 1978, is one of the 24 provinces that constitute the Republic of Ecuador. They are located in the Pacific Ocean, 1,000 kilometers (620 miles) off the coast of the Ecuadorian mainland and crossed by the Equator. This volcanic archipelago of more than 100 islands and islets was the inspiration for Charles Darwin's theories and represents the biggest tourist attraction in Ecuador. It is also one of the largest and most important ecological reserves on the planet.

Photo A. The Ecuador DX Club Award, earned by contacting a specified number of stations with an HC or HD prefix.

Photo B. This award for working the Galapagos Islands requires making only one contact with an HC8 or HD8 station.

To obtain this diploma (Photo B), it is only required that any radio amateur in the world or SWL, has made at least one contact with a radio amateur HC8 or HD8 in any mode or frequency, without any limitation of date. Like the other awards, you must send to the email indicated, the data of the corresponding contact.

Ecuador FT8 Award

In the era of digital amateur radio, the FT8 and FT4 modes have gained enormous importance since they have been permitting the possibility to continue making radio contacts with relative ease and in minimum infrastructure requirements, in spite of the very bad propagation conditions, especially for the Southern Hemisphere due to the beginning of the recent solar cycle.

**Email: <KI4KWR@cq-amateur-radio.com>*

Photo C. The EDXC FT8 Award requires just one FT8 or FT4 contact with an Ecuadorian station. The certificate shows a park along the Equator in the capital city of Quito.

The image of this diploma (Photo C) shows the tourist attraction known as "Middle of the World" a few minutes from the center of the city of Quito, capital of the Republic of Ecuador, which shows the crossing of the parallel of zero latitude that marks the middle of our planet in the northern and southern hemisphere.

To obtain this diploma, like the previous one, it is only required to send by e-mail the contact log data in FT8 mode, in any authorized band and with the prefixes HC1/HD1 to HC8/HD8.

WAHC Award

Ecuador is a mega-diverse country and the image of the Worked All Ecuador (WAHC) award (Photo D) tries to present the different natural regions of the country. The Andes Mountains have divided the region and the territory into important zones with geography, climate, natural resources and people with particular characteristics in each case.

~ In the Pacific Ocean is located the Galapagos Archipelago, constituting the insular region, which is full of ecological wealth and considered one of the most important reserves of marine fauna in the world.

~ The Coastal region with its tropical climate and the main resources of fishing and agriculture for export.

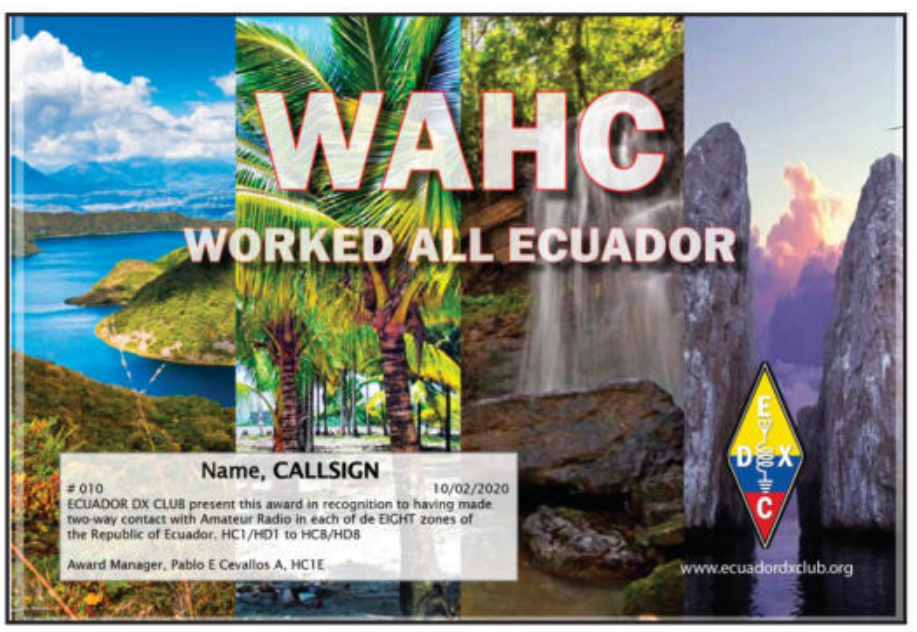


Photo D. The WAHC, or Worked All Ecuador, award is earned by contacting at least one station in each of Ecuador's eight call areas.

~ The Ecuadorian Sierra, with great agricultural wealth and great tourist potential, is home to the largest number of active volcanoes in the world.

~ And no less important is the Amazon region, an area of Amazonian jungle with a wealth of fauna and flora reserves, part of the Amazon River basin and a great exotic tourist potential, which also contains great natural resources, mineral and oil reserves that are currently the basis of the Ecuadorian economy.

This award reminds us that Ecuador is divided into eight different districts for the operation of amateur radio, some of them: numbers 1, 2 and 5 which include the largest cities of Ecuador and where the largest number of radio amateurs are located. However, stations in districts 7 and 8 are very attractive due to the few colleagues operating from those latitudes. We pose the challenge of getting at least one contact from each of the 8 districts on any date, mode, or frequency authorized, like the other awards, you must send the data of the respective log by email to receive the certificate in high quality digital JPG format.

For the members of the Ecuador DX Club, it is and has been very pleasant to contribute with an incentive to stimulate world amateur radio activity so that, during the last two years related to the world pandemic, the requests for awards have had an unusual demand which has allowed us to award hundreds of diplomas, especially for Europe and in particular for Germany. Our main objective in the short and medium term is to continue offering these types of incentives, which are appreciated by important associations around the world and reflecting that amateur radio is not just a hobby, it' s our way of life.

Thank you to the members of the EDXC for their informative introduction to the club's award program. - KI4KWR

BY BOB SCHENCK, N2OO

Winners of the Second Annual Intrepid DX Group Youth "Dream Rig" Essay Contest

This month we will be introducing you to the winners of the 2021 Intrepid DX Group Youth "Dream Rig" Essay Contest. I want to thank Paul Ewing, N6PSE, for initiating this worthwhile award that focuses on our youth from a DX-oriented organization's standpoint... de N2OO

The Intrepid DX Group, working with ARDC (Amateur Radio Digital Communications), recently announced the winners of its annual "Dream Rig" essay contest for young hams. The topic was keeping ham radio relevant in the age of the internet and the winner was 10-year-old (now 11) Silas Davis, W3SED, of Hanover, Pennsylvania, who won the first prize of an ICOM IC-7300 HF/6-meter transceiver. Silas wrote that ham radio will always be relevant because it "inspires and creates community," can help save lives and … it's fun!

Second and third place recognition went, respectively, to Olivia Lee, KD2UYX, of Manahawkin, New Jersey, and Isaac Schmidt, K6IAS, of Long Beach, California. Each of them earned a new Yaesu FT-65 dual-band VHF/UHF FM handheld. We share their essays with you here.

How can amateur radio evolve to remain relevant in the age of the Internet?

Silas Davis, W3SED (First Place)

At nine years old, I was first exposed to ham radio at the home of a family friend. Little did I know that "Mr. Brian" was an Amateur Extra Class ham radio technician, an Elmer and fluent in CW for over five decades. Buttons, lights, gadgets, cords plugged everywhere and the ability to communicate to people in so many places and areas around the world was very exciting. Asking questions brought to light more about the intriguing programs, applications, and ability to communicate even if one does not have phone connection or internet access. Every visit to N3IQ's home with my family, our visits would be peppered with more questions, and new exciting information I was eager to learn. After taking a few classes and much mentoring from N3IQ and other experts, I was able at age nine to successfully pass my Technician ham radio license exam. Now age 10, I am working hard studying and preparing to take my General Class test. This essay desires to state why ham radio will continue to remain relevant in the age of the internet because first, it inspires and creates community; second, it can help those in danger, emergency, or conflict, and finally, it is fun!

Olivia Lee, KD2UYX (Second Place)

Ham radio is a hobby I never expected I would appreciate but now I do immensely. Before joining my school's radio club, the only time I heard about it was when the TV show "Stranger Things" mentioned it in an episode.

In my freshman year of high school, I wanted to join a new club after school and I noticed a sign for the amateur radio club in the hallway. I decided that it looked interesting and that I would try it out. After going to the first meeting, I realized there was much more meaning to be found in it than I previously thought. I got to connect with people from other countries, learn about the science behind it, and get more people involved at my school. Ham radio is a unique hobby that deserves to continue but it is getting less popular because people do not see a need for it in the age of the internet. People wonder what the point of using it is if they communicate so easily with more modern technology. Ham

Olivia Lee, KD2UYX, was the second-place winner in the 2021 Intrepid DX Group "Dream Rig" essay contest for young hams, with support from ARDC, Amateur Radio Digital Communications. (Photos courtesy Intrepid DX Group)

*email: <n2oo@comcast.net>

radio can evolve to stay relevant in a multitude of ways. People involved can use the internet to raise awareness about ham radio, and people can realize why sometimes ham radio is better than the internet.

Ham radio helps to implement unity and community within the world that is not always available with the internet. Even though it seems like the whole world is connected through the internet, this is mostly an illusion. There is much division in the world because of social media and many people do not want to listen to different opinions. The internet amplifies extreme views and hatred through posting and sharing in a never-ending loop. This is where ham radio could come in. A huge aspect of ham radio is making contacts with people and trying to find unique ones from other states and countries. You can talk directly to people from other countries and hear what they have to say. You can find out what their culture is like and what they are like as a person. This allows for a much better understanding of people who are different from you and you can share your own perspective as well. Furthermore, even though the people you talk to are different from you, there is the common ground of being a member of the ham radio community. Ham radio has an instant connection to people all over the world like the internet without the negative repercussions. With this being said, the internet can still be used to raise awareness of ham radio.

Most teenagers nowadays know about TikTok and are excited to try all of the latest trends. If ham radio had more of an internet presence, I think that more young people would want to get involved. Say there was a ham radio TikTok account that made ham radio look cool and trending. The account could show videos of people talking to other states or countries. If it was popular on social media, people might be more inclined to join it in school or even start their own club because they see the benefits of it. On social media, there could also be explanation videos about the technology in a bite-sized, accessible way. This would help people be more open to the sometimes-difficult technology of it. Once they get down the basics, they can move on to more advanced topics through books and ham radio websites.

I think it is extremely important that ham radio continues for generations. It is a hobby that provides a sense of community, skills, friendships, and learning opportunities. Ham Radio may not be able to compete with the internet's technology and communication but I think if people find ways to integrate and use the internet to its advantage instead, people will see its own uniqueness and it can stay relevant in the age of the internet.

Isaac Schmidt, K6IAS (Third Place)

Hi, I'm Isaac, K6IAS. I have been fascinated by radio communication my whole life but the only way that I had heard of it was in the form of FRS (Family Radio Service) radios and never really knew anything about how they worked or what made one radio transmit farther than another. During a trip last summer, I was exposed to off-roading for the first time. Upon arriving home, I dug deeper into off-roading and I heard a guy mention how he used ham radio to communicate with his off-roading friends and that it could transmit a

5 Band WAZ

As of March 13, 2022
2361 stations have attained at least the 150 Zone level, and 1098 stations have attained the 200 Zone level.

As of March 13, 2022
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
HA0HW	199	1
HA5AGS	199	1
I5REA	199	31
IK0XBX	199	19 on 10M
IK1AOD	199	1
IZ3ZNR	199	1
JA1CMD	199	2
JA5IU	199	2
JA7XBG	199	2
JH7CFX	199	2
JI4POR	199	2
JK1AJX	199	2 on 10M
JK1BSM	199	2
JK1EXO	199	2
K1LI	199	24
K4HB	199	26
K5TR	199	22
K7UR	199	34
K9KU	199	22 on 15M
KZ4V	199	26
N3UN	199	18
N4NX	199	26
N4WW	199	26
N4XR	199	27
N6PF	199	23 on 10M
N8AA	199	23
N8DX	199	23
N8TR	199	23 on 10M
RA6AX	199	6 on 10M
RU3DX	199	6
RW0LT	199	2 on 40M
RX4HZ	199	13
RZ3EC	199	1 on 40M
S58Q	199	31
SM7BIP	199	31
SP9JZU	199	19 on 10M
US0SY	199	1 on 15M
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
EA5BCX	198	27, 39
F5NBU	198	19, 31
F6DAY	198	2 on 10M & 15M
G3KDG	198	1, 12
G3KMQ	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
JH1EEB	198	2, 33
K0DEQ	198	22, 26
K1BD	198	23, 26
K2EP	198	23, 24
K2TK	198	23, 24
K3JGJ	198	24, 26
K3LR	198	22, 23
K3WA	198	23,26
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
NX0I	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
W2IRT	198	28, 28
W5CWQ	198	17, 18
W6RW	198	2 & 22 on 10M
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
RL3BZ	2356	2022-02-16	187
JA4FCV	2357	2022-02-17	182
R1AV	2358	2022-02-19	150
JA4IXI	2359	2022-02-20	161
IZ8EYN	2360	2022-02-27	150
KI5BU	2361	2022-03-13	187

Updates to the 5BWAZ list of stations:

Callsign	5BWAZ #	Date	# Zones
VK3HJ	2227	2022-02-21	199
IK2GOQ	2309	2022-02-23	160
N7MB	2255	2022-03-10	183
LA3MHA	2103	2022-03-13	200

New recipients of 5 Band WAZ with all 200 Zones confirmed:

5BWAZ #	Callsign	Date	All 200 #
2103	LA3MHA	2022-03-13	1099

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, John Bergman, KC5LK, 125 Deer Trail, Brandon, MS 39042-9409. The processing fee for the 5BWAZ award is $10.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $15.00 for nonsubscribers. An endorsement fee of $2.00 for subscribers and $5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to John Bergman. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. KC5LK may also be reaced via email: <kc5lk@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).

The WPX Program

CW

3933 .....SMØFPR
3934 .....JA4VNE
3935 .....YL2FD
3936 .....IZ4AYB
3937 .....N4RRR
3938 .....KB4DE
3939 .....OH3KAV

SSB

4255 .....KD4CB
4256 .....DL7USM
4257 .....K1BIF
4258 .....K1TA
4259 .....K9RHJ

Mixed

3938 .....K6DJ
3939 .....K5MWR
3940 .....N2FBV
3941 .....KB2BK
3942 .....W6NCB
3943 .....W2YR
3944 .....P4/NN5E
3945 .....V31CC
3946 .....PJ4/NN5E
3947 .....9A3QY
3948 .....DL7USM
3949 .....NYØJ
3950 .....K1BIF
3951 .....UA4HAD
3952 .....OH3KAV
3953 .....JG6SRL
3954 .....WHØ/KØBC

Digital

1169 .....AE4FQ
1170 .....AK5DA
1171 .....K1KQC
1172 .....K5MWR
1173 .....YL2FD
1174 .....JP7TQO
1175 .....N7HQ
1176 .....KB2BK
1177 .....W6NCB
1178 .....P4/NN5E
1179 .....V31CC
1180 .....PJ4/NN5E
1181 .....PU2XSK
1182 .....9A3QY
1183 .....CX1FK
1184 .....K1BIF
1185 .....WQ2H
1186 .....W1EQ
1187 .....LZ1JER
1188 .....KN4WOJ
1189 .....F5VHQ
1190 .....IK2IGQ
1191 .....K8FAM
1192 .....WV5L
1193 .....LA7EIA
1194 .....NY4P

CW: 350: YL2FD, IZØFUW, G8GHD. **400:** IZ4AYB, IWØEFA. **550:** JQ1CIV, OK1UU. **600:** K1TA. **650:** JA4VNE. **750:** AB4KJ. **1000:** N1XS, OH3KAV. **1100:** SMØFPR. **1200:** DL6JZ. **1800:** WA6KHK. **1900:** LB5WB.

SSB: 350: KD4CB, IW2JBB, CX1FK, K1TA. **400:** DL7USM. **450:** K4HDW. **500:** WHØ/KØBBC. **800:** IWØEFA. **900:** K1BIF. **1050:** YO3HOT. **1800:** WA6KHK.

Mixed: 450: V31CC. **500:** K5MWR, KB2BK, F6JSZ, WHØ/KØBBC. **550:** JM1CMA. **600:** K6DJ, NYØJ, CX1FK. **650:** KG6BXW. **700:** LA7EIA. **750:** IW2JBB, NA5WH. **800:** K1TA, NA5WH. **900:** K1KQC. **950:** IWØEFA, UA6HAD. **1000:** W5BR, W1KE. **1050:** N1XS, WR7X, AB4KJ. **1100:** K4HDW. **1150:** YO3HOT. **1200:** OK1UU, N1TCH. **1300:** JQ1CIV, JA6JYM. **1350:** JK1EXO, K1BIF. **1400:** G8GHD. **1450:** F5VHQ. **1500:** OH3KAV. **1650:** W2YR. **2000:** IZØFUW. **2350:** WA6KHK. **2500:** DL6JZ. **2900:** K1PL. **3000:** HB9BIN.

Digital: 350: K1KQC, CX1FK, LZ1JER, KN4WOJ. **400:** AB4KJ. P4/NN5E, PJ4/NN5E. **450:** K5MWR, YL2FD, V31CC, LA7EIA. **500:** KB2BK, IW2JBB, WV5L. **550:** OK1UU. **650:** KG6BXW. **700:** AK5DA. **750:** NA5WH. **800:** K1BIF, NA5WH. **850:** K4HDW. **900:** N1TCH, WR7X, W5BR, F5VHQ. **1000:** G8GHD. **1100:** JQ1CIV. **1150:** IZØFUW. **1200:** DL6JZ. **1700:** W1EQ. **1950:** HB9BIN.

160 Meters: OK1UU, AB4KJ, K1BIF, K1TA, K4HDW
80 Meters: SMØFPR, AB4KJ, K1BIF, OH3KAV, K4KDW
60 Meters: W6XK
40 Meters: AK5DA, K5MWR, SMØFPR, OK1UU, IW2JBB, LB5WB, IWØEFA, K1BIF, K1TA, OH3KAV
30 Meters: AK5DA, OK1UU, N1TCH, K1BIF, OH3KAV
20 Meters: AK5DA, SMØFPR, N1TCH, N2FBV, W2YR, F6JSZ, K1BIF. YO3HOT, DL6JZ, W1EQ, KG6BXW, OH3KAV
17 Meters: G8GHD
15 Meters: W2YR, IWØEFA, CX1FK, K1BIF, OH3KAV
10 Meters: YO3HOT, WHØ/KØBBC

Africa: W2YR, LB5WB, IWØEFA, DL6JZ
Asia: SMØFPR, JA4VNE, W2YR, V31CC, IWØEFA, CX1FK, DL6JZ, W1EQ, UA6HAD, LA7EIA, OH3KAV, JG6SRL
Europe: K6DJ, SMØFPR, JA4VNE, YL2FD, KB2BK, IZ4AYB, P4/NN5E, V31CC, 9A3QY, DL7USM, IWØEFA, K1BIF, W1EQ, LZ1JER, UA6HAD, IK2IGQ, LA7EIA, K1TA, OH3KAV, K4HDW
Oceania: K6DJ, JA4VNE, W2YR, WHØ/KØBBC
North America: AE4FQ, AK5DA, K5MWR, N7HQ, AB4KJ, N2FBV, W6NCB, KB2BK, KD4CB, W2YR, N4RRR, P4/NN5E, V31CC, PJ4/NN5E, KB4DE, K1BIF, WQ2H, DL6JZ, W1EQ, KN4WOJ, K8FAM. WV5L, K1TA, K9RJH, OH3KAV, K4HDW, NY4P, WHØ/KØBBC
South America: WA6KHK, JK1EXO, AB4KJ, W2YR, W1EQ, K4HDW

Award of Excellence: RZ1O, JK1EXO
60M Bar: W6XK
30M Bar: JK1EXO
17M Bar: JK1EXO
12M Bar: W6XK
Digital Bar: JK1EXO

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.

lot farther than the CB radio that was more commonly used. Having never heard of CB radio or ham radio, I chose to dig deeper into the one that he said was better and I was hooked. I went on to study for my technician license and took the test and got my license a week later. Looking back, I wish that I had dug deeper into radio communication or that someone had told me about it at an earlier age, and that's what I think needs to change about amateur radio to keep it relevant in the age of the internet. We need more young people so that the hobby can stay around for the future generations to enjoy.

I am fortunate to be at a wonderful engineering high school that has an awesome radio club, and that has been fun for

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.

The WAZ Program

SINGLE BAND WAZ

6 Meter

186 .....F4BKV, 186 Zones

10 Meter Digital

3 .....N4BAA

12 Meter Digital

3 .....F4BKV
4 .....N4BAA

15 Meter CW

377.....RL3BZ

15 Meter Digital

7 .....N1NK

17 Meter Digital

16 .....F4BKV

20 Meter Digital

42 .....F4BKV

40 Meter Digital

23 .....N6PAT
24 .....KI5BU

ALL BAND WAZ

CW

1180.....YU6DX

Digital

330 .....WA3PTF
331 .....JO4JDU
332 .....DJ6HR
333 .....JS6SCC
334 .....NF1G
335 .....KD4S

Mixed

10155 .....DL6RA
10156.....KF4AF
10157.....RL3BZ
10158 .....W1REP
10159 .....NF1G
10160.....JQ1PCX
10161 .....AI1W
10162 .....KI0HA
10163.....IZ2MHT
10164.....IK8PGE
10165.....JA1FVE
10166.....K0MU
10167.....DL5JH

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, John Bergman, KC5LK, 125 Deer Trail, Brandon, MS 39042-9409. The processing fee for all *CQ* awards is $6.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $12.00 for nonsubscribers. Please make all checks payable to John Bergman. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. KC5LK may also be reached via e-mail: <kc5lk@cq-amateur-radio.com>.

me and has done a great job of introducing so many people to this fun hobby. These clubs are an awesome opportunity, and they are fun, too. It is an awesome time to hang out with your friends and get to know new people while talking about radio. I always look forwards to Wednesday morning when we meet, and it is often the highlight of my week. It's just a shame that there aren't more of these clubs in more high schools and middle schools. I think that a great step to getting more people interested in ham radio is to have it as accessible as possible to people, and what better place to have it then school.

Another problem is even if you are fortunate enough to learn about ham radio and get you license it can be a quite expensive hobby to get into especially for a high schooler with a tight budget, and that can drive someone away from the hobby when they find out that they need an expensive radio to get on the air. For that reason, I think that a all in 1 affordable starter kit for ham radio would be an awesome thing. Something not like a handheld but something that could get out there. Something that could spark someone's interest in the magic of how a radio wave that is basically just another color of light that we can't see can bounce of the atmosphere allowing them to contact people far away. Now I know that this wouldn't be the best radio, but it doesn't have to be. It just needs to be something accessible, something purely to get someone hooked on amateur radio that can lead to deeper interests later in life. A devise like this would also do a great job competing with the internet. With the internet being such a large thing, it is quite cheep and that makes it more accessible but who knows maybe a nice cheap radio would do good competing against the internet

Another thing that would be great for getting new young hams would be more opportunities to get on the air. Now this could come in the form of someone with a radio set up in the park just showing it to people, or someone at an event like a camp out or something just with a lot of people that can talk to people about how it works and let them experience it for themselves. I've had my general license for a few weeks now,

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
W7IIT 337
K8ME 336
W1DF.....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
OZ5UR.....328
W2OR 320
HB9DAX/ QRPp 319
W6YQ 319
HA1ZH 318
N6PEQ.....318
CT1YH 316
EA3ALV 315
RA1AOB ...313
WA4DOU ..312
YO9HP.....312
W6WF.....309
ON4CAS ...321
K7CU 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
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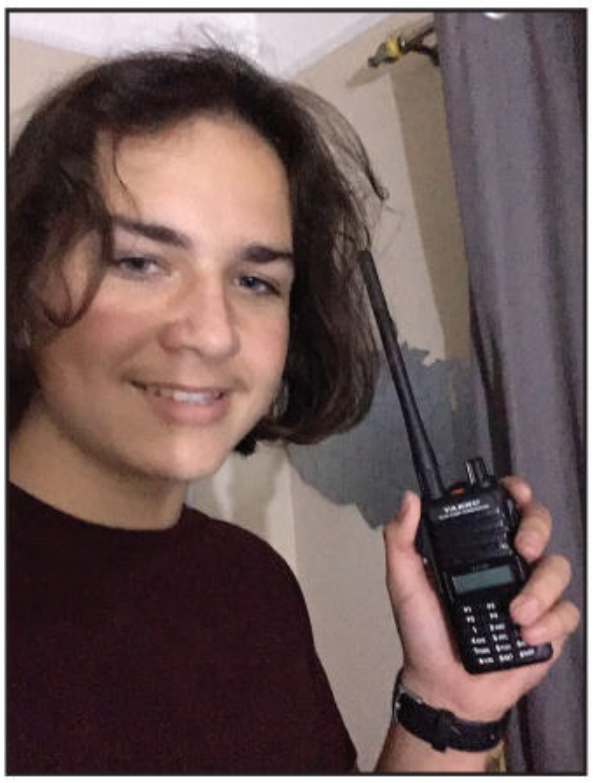
On the Cover

Sometimes you buy a new radio because you've upgraded your license. But sometimes, you upgrade because you bought a new radio! That's what happened with Gilbert "Gib" Van Cleve, KEØPRK, of Ballwin, Missouri, outside St. Louis. He purchased an ICOM IC-705 largely because its waterfall display works on the VHF/UHF bands as well as HF and he thought that would be useful for his satellite work (that's a handheld Arrow dual-band satellite Yagi he's holding in the cover photo). But once he started exploring the radio's many other features, Gib decided it was time to upgrade his Technician license to General so he could make full use of the 705. He achieved that goal last year.

In addition to his interest in amateur satellites, Gib has become a dedicated QRPer. He says he's had hundreds of contacts on HF since upgrading his license, none with more than 10 watts of power. Gib notes that some of his most interesting experiences have come unexpectedly, such as when he forgot that he'd turned the power way down to tune up his antenna during a Parks On The Air outing … and made several contacts with just 1 watt before realizing his "error."

Gib also enjoys operating FT8 — he runs the WSJT-X software on a Raspberry Pi microcomputer— and his favorite FT8 QSO so far has been to Japan on 20 meters with just 10 watts. Off the air, Gib holds an IT leadership position at a manufacturer of electromechanical devices.

Final note: Gib's attempt to make a contact via the International Space Station's orbiting repeater during Winter Field Day was not successful … but it wasn't for lack of trying! (*Cover photo by Ron Ochu, KOØZ*)



"Dream Rig" Essay Contest third-place winner Isaac Schmidt, K6IAS. He and Olivia each won a new Yaesu handheld, while first-place winner W3SED took home an ICOM IC-7300.

but I haven't been able to get on the HF bands due to not being able to afford an expensive radio. I think that more frequent opportunities to get on the air would do a wonderful job of helping new hams to stay interested in the hobby. And that is what would do a good job of keeping ham radio relevant for future generations to enjoy.

As a new ham myself, I know that it can be quite scary to get on the air. In a lot of the nets that I have listened in on, everyone seems to know what to do and there isn't much instruction on what to do if you don't know. I think that more nets that are focused on giving new hams a safe space to get on the air and talk to people like themselves would be awesome. I think that this would be great for getting those that are new to the hobby more comfortable with it and keeping them around.

Another way that we can make ham radio more accessible to new hams and people who aren't yet hams is just making the information about the hobby more apparent. A lot of the things that I have learned about radio have come from me digging around on the internet and coming across them. And even once you do come across them, these resources can be confusing and hard to look at. So, I think that putting more time and effort into the recourses that we put out about ham radio would go a long way for teaching new people about it. Just a lot of information that is in one spot on a well-designed website that gets the idea across without being too wordy.

In the end, I think that the only way for ham radio to stay relevant in the age of the internet is to get more young people interested in the hobby. And I know that my response seems awfully like last year's question, but I truly believe that the best way to keep ham radio around is to get more young people interested in it. Because after all, the young people of today will be running the world in 50 years and we need them to keep this wonderful hobby going for future generations to enjoy.

Congrats to New Nurse EL2EF!

Recently, Eric Forkpa, EL2EF, received his diploma as a "Graduate Nurse" from the Stella Maris Polytechnic University (Mother Patern College of Health Sciences) in Monrovia, Liberia. His next step will be to sit for the state board exam for his full nursing certificate! *CQ* wishes Eric the best of luck on his path to becoming a fully-certified nurse! Eric is often on the air from his home station. He is also the nephew of Dickson, EL2DT. QSL EL2EF and EL2DT via N2OO.

Eric Forkpa, EL2EF just graduated from nursing school! (Photo courtesy EL2EF)

BY TIM SHOPPA,* N3QE

Covid and Contesting – A Two-Year Lookback

Amateur radio contesters keep careful track of their scores as they compete with other hams worldwide in contests every weekend. Contesters also carefully look at their own scores improving over time to measure improvements in their stations and skills. Let's use these detailed contesting statistics to measure the increase in on-air activity that we've seen in the past two years as hams responded to the Covid-19 pandemic and restrictions. Some of these changes — especially those due to travel restrictions — may be temporary. Others, related to a shift to telecommuting in many workplaces, may be more permanent.

In the first week of March 2020, any quarantines and travel restrictions were still regional and it was not yet obvious there was a global pandemic, nor what the effects on amateur radio contesting would be. Discussions at the time on the WRTC2022 (World Radiosport Team Championship) mailing list spoke of regional travel restrictions in Italy and their effects on multi-operator contesting in the February and early March ARRL DX contests. Luca Babolin, IK2PFL, wrote, "In Italy, everyone is stuck at home by law, most likely until the beginning of April," and started a discussion of the effect that Covid-19 lockdowns would have on contesting. Ken Widelitz, K6LA/VY2TT, on March 14th made the astute prediction: "Should be A LOT of additional activity from all the housebound." Jeff Clarke, KU8E, established an important relationship between weekend athletic sports and weekend radiosport, writing: "Very true, Ken, considering there are no sports to watch on TV because it's all been postponed!"

By mid-March it was obvious that lockdowns were not going to be just regional or national, but international in scope. Rich DiDonna, NN3W, was the first to look beyond the week-by-week shifts in pandemic restrictions when he wrote, "I'm willing to bet that few countries will have 'turned the corner' in the next 14 days. The next 60 days will be more interesting to assess."

The weekly Wednesday CWT hour-long sessions held by CWOPS, the CW Operators' Club, were the first on-air events to show the uptick in folks getting on the air as some hams suddenly found themselves working from home and able to take a 1-hour break for the mid-day CWTs. John Laney, K4BAI, wrote of his March 18th 1300Z CWT entry, "Working from home today […] Good opportunity to do the CWTs since I am caught up with work." The 3830scores.com score reporting site recorded 1900Z session activity increasing from 296 entries on March 4, 2020, to 424 entries on March 25th, an increase of 43%.

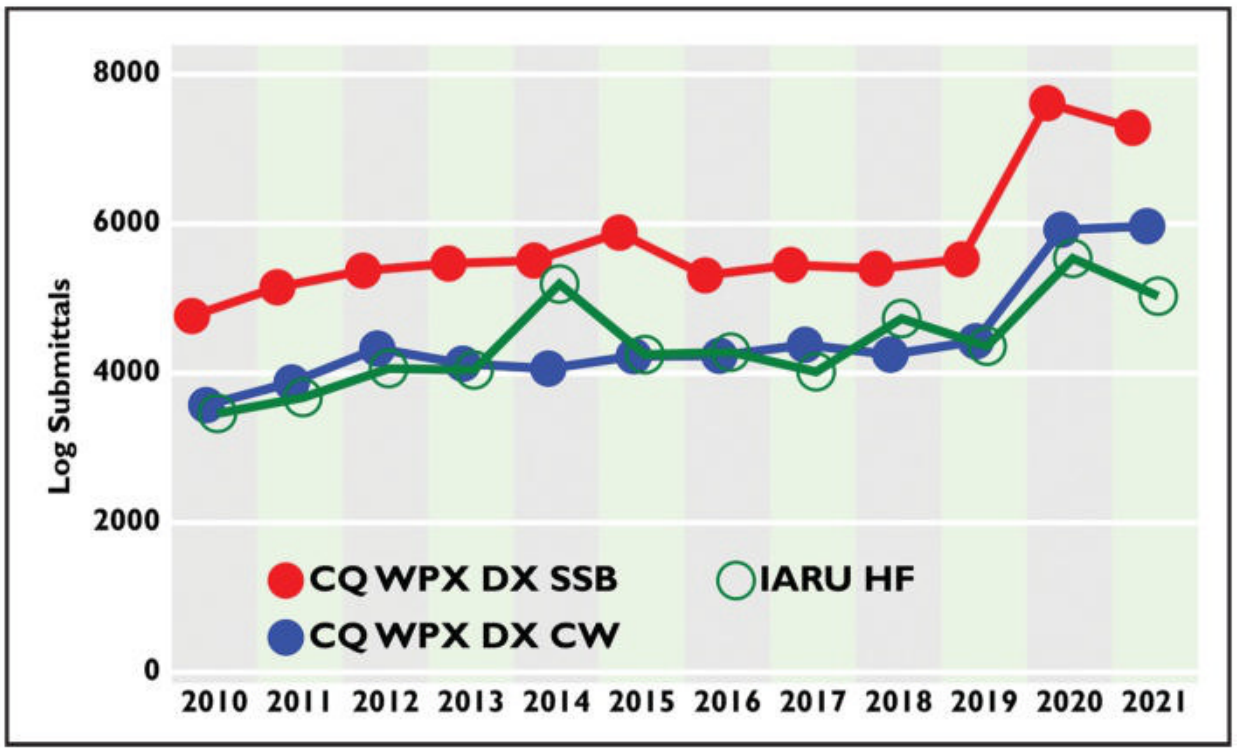


Figure 1. WPX CW, WPX SSB, and IARU HF entry statistics 2010-2021

The impact of Covid-19 on our lives, and the associated enhancement in contest activity, would last much longer than the few weeks we initially thought. Here we are, two years later, having gone through several waves of successive Covid-19 variants, and on-air contest participation is still up substantially over 2019 levels. Let's go through several major groupings of contests and measure the changes in participation as hams chose to get on the air increasingly in 2020 and 2021.

The first large weekend contest after hams worldwide were encouraged to stay safe time at home, was the CQ WPX SSB contest held on March 28-29, 2020. Chas Estabrooks, K1ECU, noted that he would normally be, "busy with robotics competitions this weekend but … Thanks, Covid 19!" as he plugged in a microphone for his first-ever CQ WPX SSB entry. Chas was far from the only ham who suddenly found delayed or canceled in-person events allowed some weekend time to get on the air for this contest. Participation in CQ WPX SSB rose astonishingly from 5,516 entries in 2019 to 7,605 entries in 2020.

The WPX contests are "everybody works everybody for points and multipliers" contests, and entry statistics by year for WPX CW and SSB are grouped in *Figure 1* with the IARU HF contest held each summer that has some similar characteristics. (One feature to note in the IARU HF participation levels is spikes in 2014 and 2018 as the World Radiosport Team Championship organizers promoted IARU HF participation in their overlapping event). The sharp rise in 2020 activity in these three events is reflected in the graph, showing sudden rises in events that had been fairly stable in participation over the previous decade. CQ WPX SSB participation between 2019 and 2020 was up 38%; WPX CW in May was up 33%; and IARU HF participation in June was up 26%. Participation numbers remained comparable in 2021 for these three contests.

Entry statistics for the two largest VHF contests — also everyone-works-everyone — are displayed in

email: <n3qe@cq-amateur-radio.com>

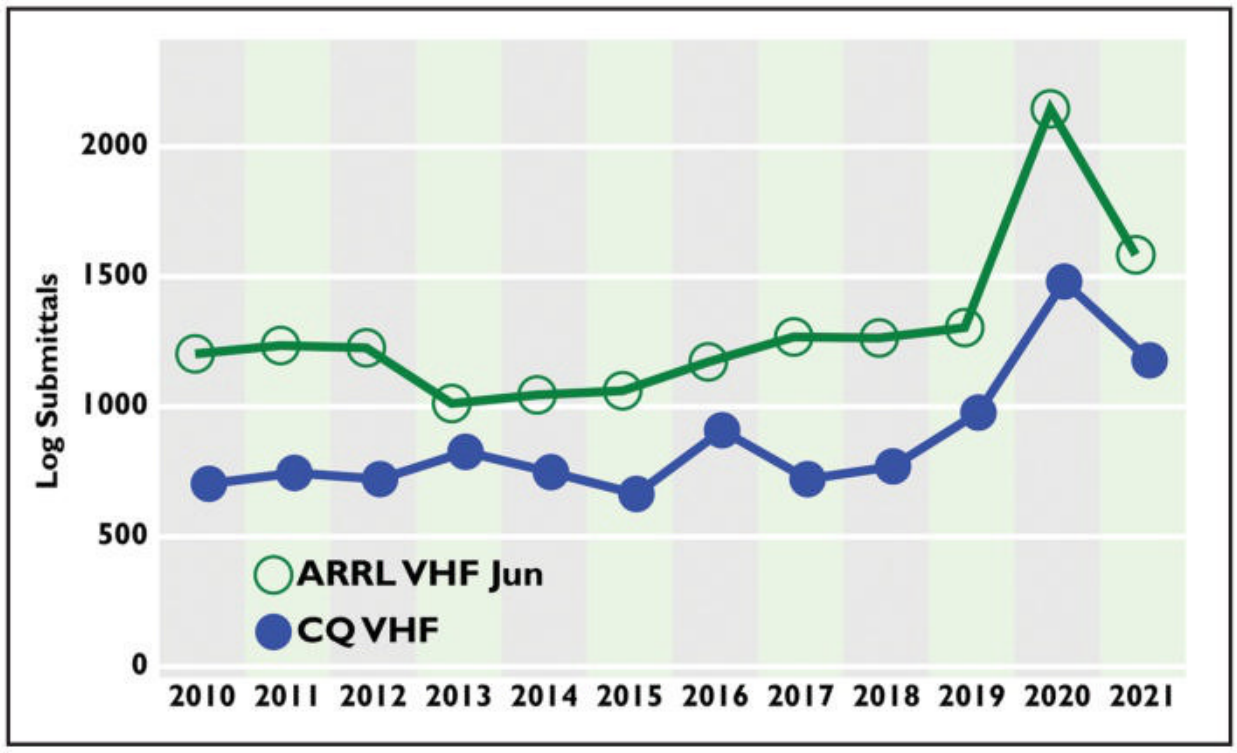


Figure 2. The gently rising baselines of activity from 2010-2019 take a steep jump in 2020, as ARRL June VHF entries spiked by 65%, and July's CQ VHF contest entries rose by 51%. Participation numbers in both contests relaxed considerably in the 2021 running, leading me to conclude the sharp 2020 spike to be due not just due to hams staying safe at home in the first months of the pandemic, but also due to the amazing DX propagation conditions on the 6-meter band in the summer of 2020.

Figure 2. ARRL June VHF and CQ VHF contest entry statistics 2010-2021

Calendar of Events

All year	**CQ DX Marathon**	**http://bit.ly/vEKMWD**
Apr. 2	RSGB FT4 International Activity Day	https://bit.ly/31qpcJl
Apr. 2-3	EA RTTY Contest	http://concursos.ure.es/en/eartty/bases
Apr. 2-3	Florida State Parks on the Air	http://flspota.org
Apr. 2-3	Louisiana QSO Party	http://laqp.org
Apr. 2-3	Mississippi QSO Party	www.arrlmiss.org
Apr. 2-3	Missouri QSO Party	https://bit.ly/3rkAl87
Apr. 2-3	PODXS 070 Club 31 Flavors Contest	http://bit.ly/2SESbDg
Apr. 4	RSGB 80m Club Championship, CW	https://bit.ly/31qpcJl
Apr. 6	UKEICC 80m Contests SSB	https://ukeicc.com/80m-rules.php
Apr. 6	VHF-UHF FT8 Activity	www.ft8activity.eu/index.php/en
Apr. 7	SARL 80m QSO Party	http://bit.ly/H0IqQf
April 9	QRP Spring QSO Party	www.qrparci.org/contests
Apr. 9-10	FT8 DX Contest 2022	https://europeanft8club.wordpress.com
Apr. 9-10	Georgia QSO Party	https://gaqsoparty.com/
Apr. 9-10	IG-RY World Wide RTTY Contest	www.ig-ry.de/ig-ry-ww-contest
Apr. 9-10	JIDX CW Contest	www.jidx.org
Apr. 9-10	New Mexico QSO Party	www.newmexicoqsoparty.org/wp
Apr. 9-10	North Dakota QSO Party	https://bit.ly/3n8xMob
Apr. 9-10	OK-OM DX SSB Contest	http://bit.ly/3ioS3Cl
Apr. 9-10	Texas State Parks on the Air	www.tspota.org
Apr. 9-10	Yuri Gagarin International DX Contest	http://gc.qst.ru/en/section/32
Apr. 10	ARRL Rookie Roundup, SSB	www.arrl.org/rookie-roundup
Apr. 10	Hungarian Straight Key Contest	http://hskc.ha8kux.com
Apr. 10	International Vintage Contest HF	www.iv3ehh.it/vintage.htm
Apr. 10	RSGB RoLo SSB Contest	https://bit.ly/31qpcJl
Apr. 10	WAB 3.5/7/14 MHz Data Modes	http://bit.ly/31yE4kT
Apr. 11	RSGB FT4 Contest Series	https://bit.ly/31qpcJl
Apr. 11	144 MHz Spring Sprint	https://bit.ly/3Fazrjf
Apr. 13	VHF-UHF FT8 Activity	www.ft8activity.eu/index.php/en
Apr. 15-16	Holyland DX Contest	www.iarc.org/iarc/#HolylandContest
Apr. 16	ES Open HF Championship	https://esopen.eu/
Apr. 16-17	CQ Manchester Mineira DX Contest	www.cqmmdx.com/rules
Apr. 16-17	Michigan QSO Party	www.miqp.org/index.html
Apr. 16-17	Ontario QSO Party	www.va3cco.com/oqp/rules.htm
Apr. 16-17	Worked All Provinces of China DX Contest	https://bit.ly/3sDGs72
Apr. 16-17	YU DX Contest	http://yudx.yu1srs.org.rs
Apr. 18	DARC Easter Contest	http://bit.ly/3bOk9pd
Apr. 19	222 MHz Spring Sprint	https://bit.ly/3Fazrjf
Apr. 20	RSGB 80m Club Championship, SSB	https://bit.ly/31qpcJl
Apr. 20	VHF-UHF FT8 Activity	www.ft8activity.eu/index.php/en
Apr. 23-24	10-10 Spring Digital Contest	http://bit.ly/1FrFeBc
Apr. 23-24	Helvetia Contest	www.uska.ch
Apr. 23-24	SP DX RTTY Contest	www.pkrvg.org/strona,spdxrttyen.html

Figure 3 shows yearly entry statistics for the three largest RTTY contests, which like the previously discussed contests, allow points for working both DX and domestic contests. The February 2020 CQ WPX RTTY contest preceded widespread COVID-19 restrictions; the 2021 edition of this contest rose by 25%. The September CQWW RTTY DX contest had its entries increase by 18% between 2019 and 2020 to new record high levels. Log entries in the January 2021 ARRL RTTY Roundup

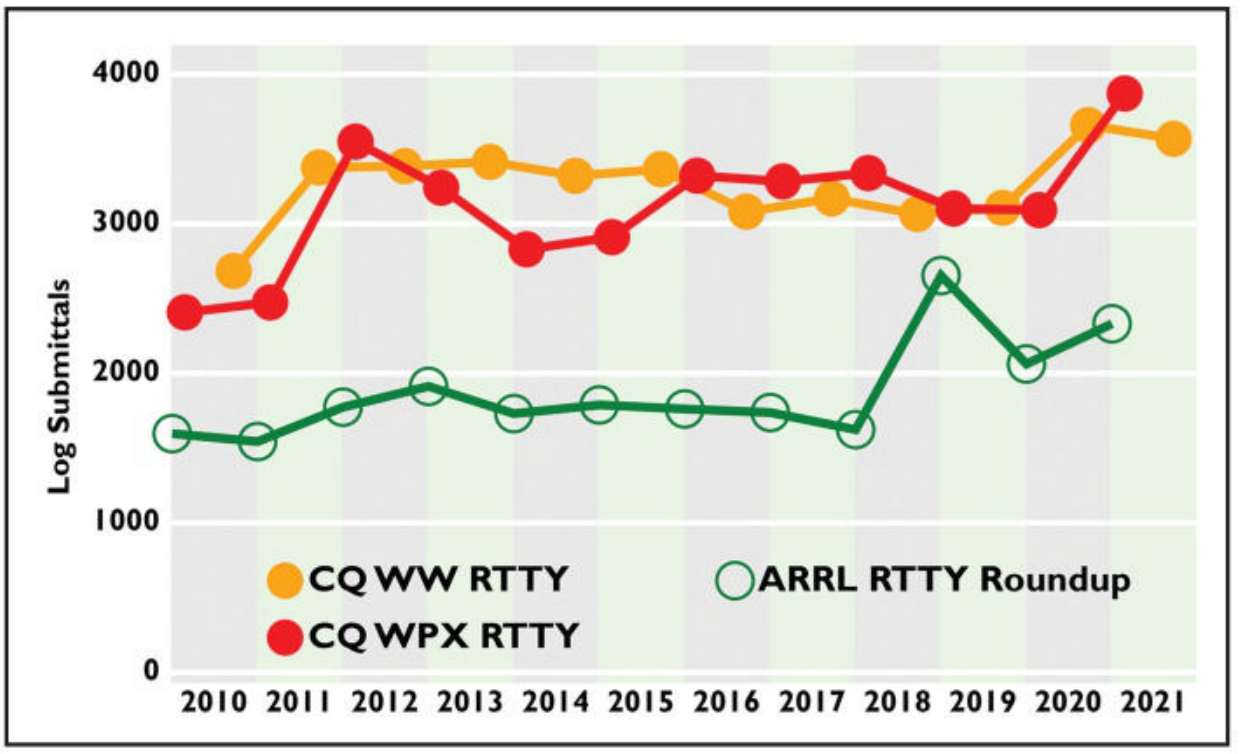


Figure 3. CQWW DX RTTY, CQ WPX RTTY, and ARRL RTTY Roundup entry statistics 2010-2021

Apr. 24	Bartg Sprint75 Contest	http://bartg.org.uk/wp/contests
Apr. 24	North American SSB Sprint	https://ssbsprint.com/rules
Apr. 27	432 MHz Spring Sprint	https://bit.ly/3Fazrjf
Apr. 27	UKEICC 80m Contests CW	https://ukeicc.com/80m-rules.php
Apr. 28	RSGB 80m Club Championship, Data	https://bit.ly/31qpcJl
Apr. 30-May 1	Florida QSO Party	www.floridaqsoparty.org
Apr. 30-May 1	UK/EI DX Contest, CW	www.ukeicc.com/dx-contest-rules.php
May 1	AGCW QRP/QRP Party	http://bit.ly/3bwH1aZ
May 4	VHF-UHF FT8 Activity	www.ft8activity.eu/index.php/en
May 4-5	MIE 33 Contest	www.ztv.ne.jp/isoda/33/index-e.html
May 7	Microwave Spring Sprint	https://bit.ly/3Fazrjf
May 7	RCC Cup	http://bit.ly/3rH8ttL
May 7-8	7th Area QSO Party	https://tinyurl.com/2p9cx67k
May 7-8	10-10 Spring CW Contest	http://bit.ly/1FrFeBc
May 7-8	ARI DX Contest	www.ari.it
May 7-8	Delaware QSO Party	www.fsarc.org/qsoparty/rules.htm
May 7-8	F9AA Cup, Digi	https://bit.ly/3JkNipO
May 7-8	Indiana QSO Party	www.hdxcc.org/inqp/index.html
May 7-8	New England QSO Party	www.neqp.org/rules
May 7-8	SBMS 2.3 GHz and Up Contest and Club Challenge	www.n6nb.com/sbmsrules.htm
May 8	WAB 7 MHz Phone	http://bit.ly/31yE4kT
May 9	RSGB 80m Club Championship, SSB	https://bit.ly/31qpcJl
May 11	VHF-UHF FT8 Activity	www.ft8activity.eu/index.php/en
May 14-15	Canadian Prairies QSO Party	https://cpqp.ve6hams.ca
May 14-15	**CQWW Foxhunting Weekend**	**www.homingin.com/joek0ov/nfw.html**
May 14-15	CQ-M International DX Contest	http://cqm.srr.ru/en-rules
May 14-15	Veron SLP Contest	http://bit.ly/2L9eT1L
May 14-15	Volta WW RTTY Contest	www.contestvolta.it
May 14-15	50 MHz Spring Sprint	https://bit.ly/3Fazrjf
May 18	RSGB 80m Club Championship, Data	https://bit.ly/31qpcJl
May 18	VHF-UHF FT8 Activity	www.ft8activity.eu/index.php/en
May 21	Arkansas QSO Party	https://arkqp.com/arkansas-qso-party-rules
May 21-22	Baltic Contest	www.lrsf.lt/en
May 21-22	His Majesty King of Spain CW Contest	http://concursos.ure.es/en
May 21-22	NZART Sangster Shield Contest	http://bit.ly/3aviX6h
May 21-22	SARL VHF/UHF Digital Contest	http://bit.ly/H0lqQf
May 23	QRP ARCI Hoot Owl Sprint	www.qrparci.org/contests
May 26	RSGB 80m Club Championship, CW	https://bit.ly/31qpcJl
May 26	QRP Minimal Art Session	https://tinyurl.com/4s9evnbj
May 28-29	**CQWW WPX CW Contest**	**www.cqwpx.com**
May 30	RSGB FT4 Contest Series	https://bit.ly/31qpcJl

were up by a modest 13% from its previous pre-pandemic running in January 2020.

Also evident in *Figure 3* is that the high-water mark of participation in the ARRL RTTY Roundup contest precedes the pandemic. The 2019 running of ARRL RTTY Roundup is a special case: After the WSJT-X developers adapted their software to send the special RTTY Roundup exchanges in the FT8 exchange, the ARRL RTTY Roundup had a substantial boost in log submittals, largely because of 944 entries that were entirely FT8. Purely non-RTTY participation fell in 2020 (to 508 logs) and again in 2021 to 440 purely FT8 logs. Starting in June 2022, the ARRL will sponsor an all-digital (non-RTTY) contest on the first weekend of June, with some similarities to the WW Digi contest that has been held at the end of August since 2019, and it seems likely the ARRL RTTY Roundup rules for 2022 will eliminate non-RTTY activity entirely. As a result of the rapidly shifting digital contest modes and ARRL RTTY Roundup rules, it seems likely that the 2019-2022 era of participation will always be a special case.

Participation in the four largest DX contests can be followed in *Figure 4*. The Fall 2020 CQWW CW and SSB contests showed steep increases of 19% and 16% respectively from the 2019 log submittals. This increased activity continued into 2021. The ARRL DX contests showed more modest increases; ARRL DX CW participation increased by 10% between February 2020 and February 2021. The ARRL DX SSB participation was up by 13% between March 2019 and March 2021. Perhaps because so many active hams already plan their years around these large contests, they showed smaller headroom for growth.

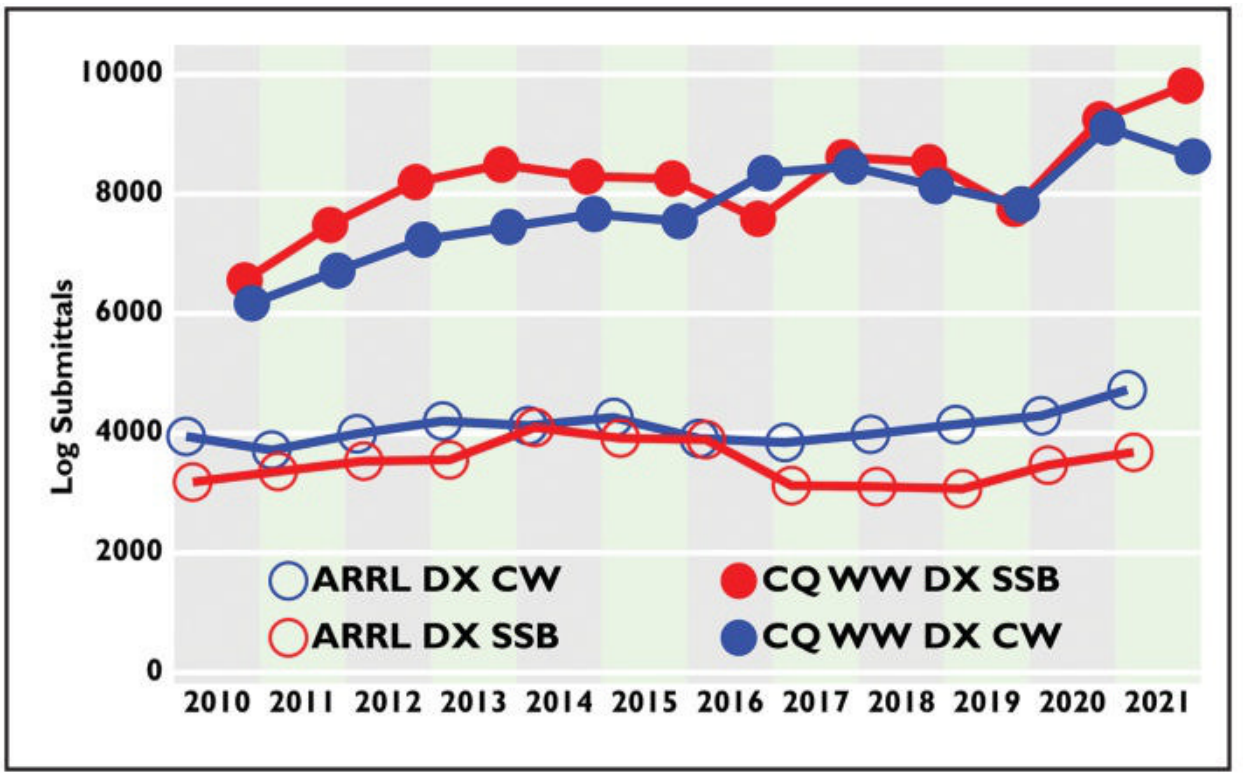


Figure 4. ARRL DX CW, ARRL DX SSB, CQWW DX CW, and CQWW DX SSB entry statistics 2010-2021

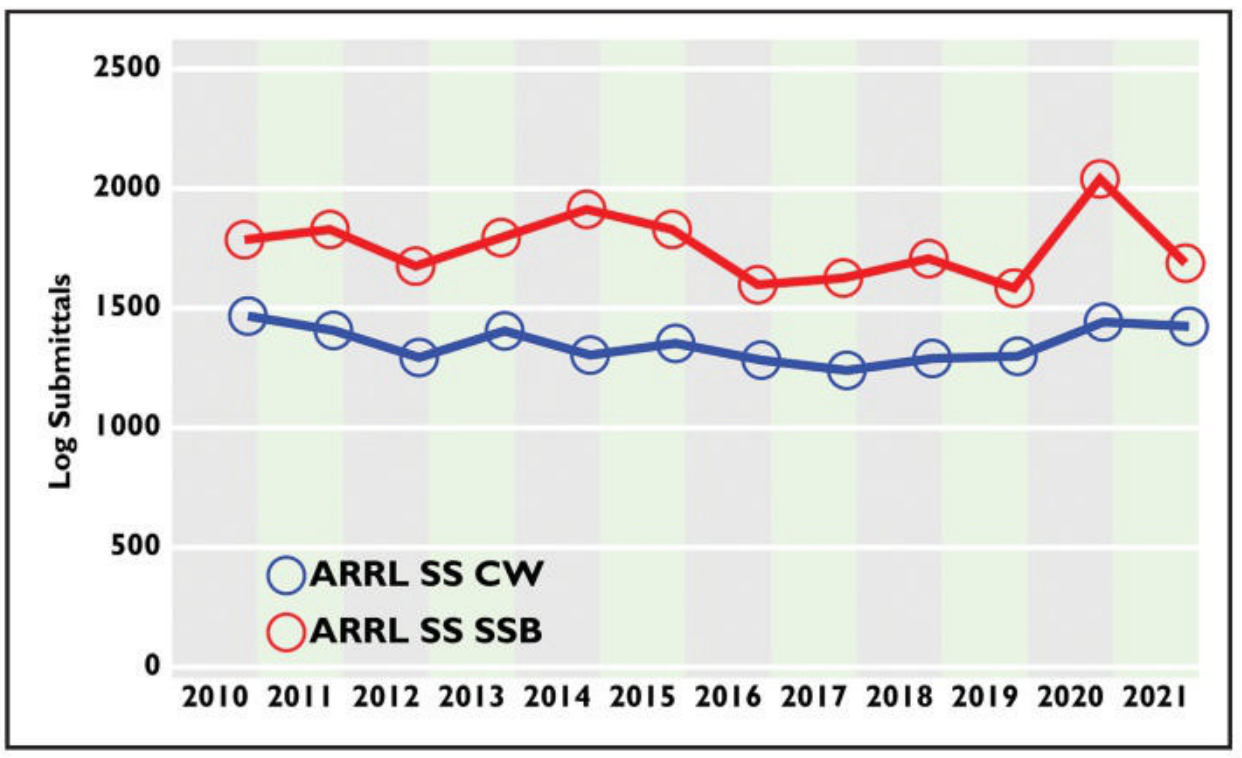


Figure 5. CQ 160-Meter CW, CQ 160-Meter SSB, ARRL 160-Meter entry statistics 2010-2021

Figure 5 tracks yearly participation in the three largest 160-meter contests. All had been modestly increasing in participation in the late 2010s while the sunspot numbers were low and top-band propagation was at its best. It's not at all obvious that post-pandemic numbers represent an unusual increase in participation due to Covid-19. The 2021 rise in CQ 160-meter CW participation looks to follow a steady trend in increases that began in 2019. Additionally, log submittal numbers for the December 2021 ARRL 160-meter contest are down from the 2019 pre-pandemic entries. Given that these 160-meter contests all take place primarily in winter evenings, perhaps the disruption to daytime schedules caused by Covid-19 events are minimized.

Figure 6 tracks ARRL Sweepstakes participation in both CW and SSB modes across the past 13 years. Entries had been largely flat throughout the 2010s, and November 2019 SSB Sweepstakes entries were at their lowest in a decade, with only 1,582 logs submitted. A year later, SSB entries rose to 2038, a boost of 28%, and it was evident from the "check" numbers being used by 2x3 callsigns in their exchanges that many had been recently licensed or upgraded hams. The 1,442 entries in November 2019 CW Sweepstakes represented not just an 11% boost in CW entries, but also the highest level of participation in SS CW since 2010.

The single set of points in *Figure 7* is the sum of the previously discussed 17 contest entries across each calendar year, 2010-2021. Many of the year-to-year variations we see in the individual contests disappear in the yearly log submission totals, and we see a very steady rate of overall contest participation up through 2019, with many consecutive years of 56,000-58,000 log submittals. In 2020 the sum rises to 67,060 entries for the same 17 contests, and slightly more to 67,164 entries in 2021, a consistent increase in 2020 and 2021 yearly participation of 20% over pre pandemic levels.

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This fourth edition was spearheaded by propagation authority Carl Luetzelschwab, K9LA, merging his updates with the earlier work of the previous editions' authors, Dr. Theodore Cohen, N4XX, George Jacobs, W3ASK, and Robert Rose, K6GKU (SK).

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Robert B. Rose, K6GKU (SK)

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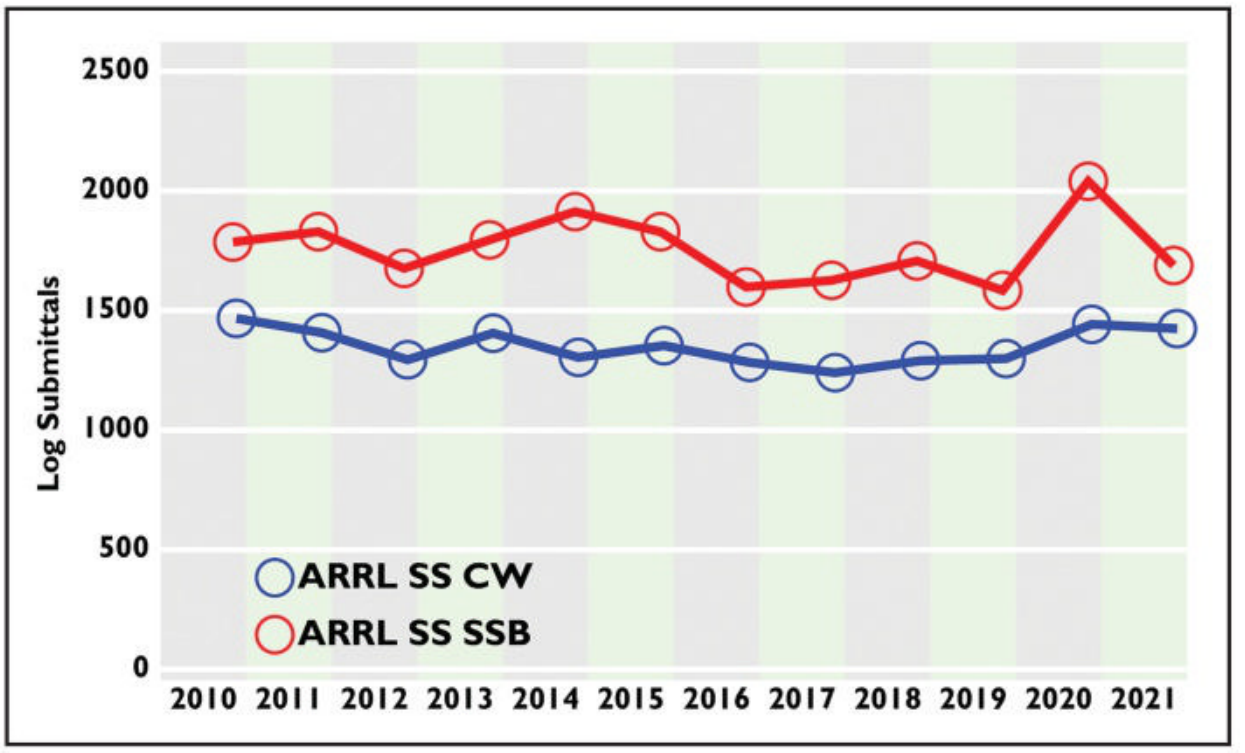

Figure 6. ARRL Sweepstakes CW and SSB entry statistics, 2010-2021

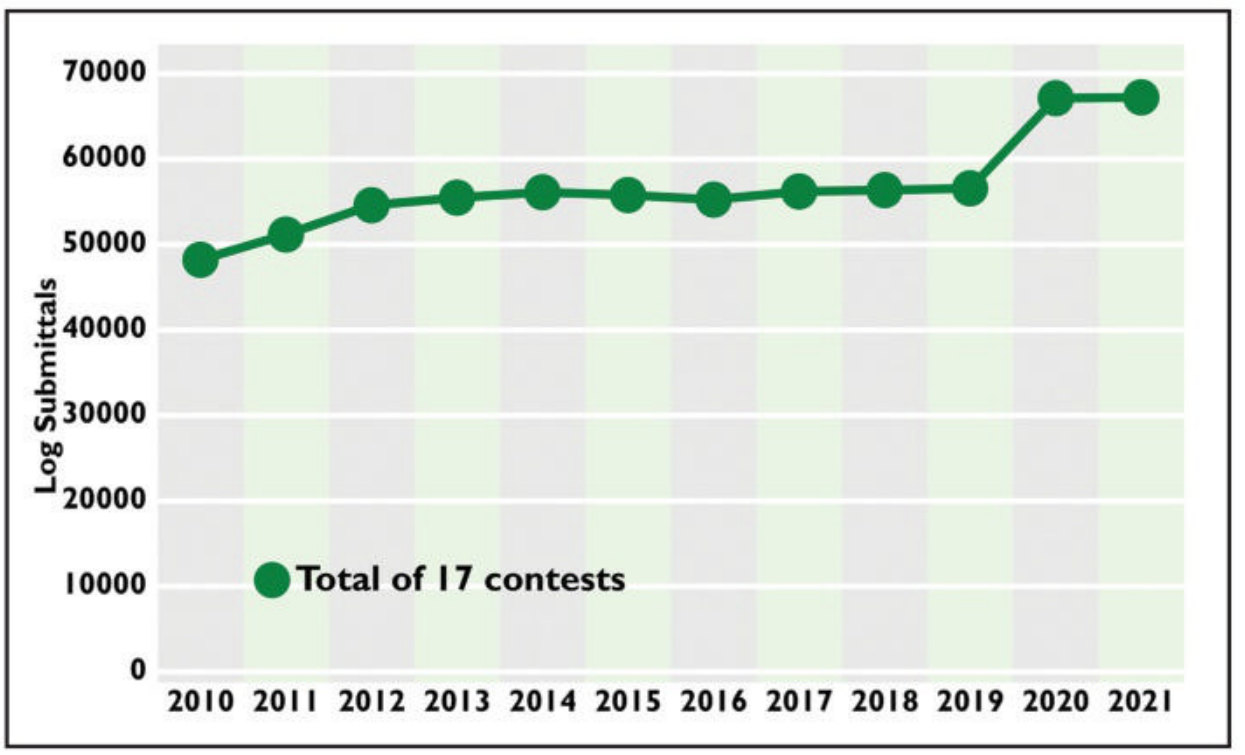

Figure 7. Sum of the 17 contest entry statistics by calendar year, 2010-2021

Not everything in contesting was increased as a result of the pandemic. Cancellation of many DXpeditions starting in Spring 2020 sharply limited the number of exotic locations activated by hams during contests. For example, logs were received from 199 DXCC entities (countries) in the 2019 CQWW CW and SSB contests. Across the 2020 runnings of these contests, there was a sharp decrease to only 166 countries submitting logs.

The DXpedition cancellations showed in everyone's logs as a decline in 20 to 30 country multipliers across each active band in 2020 compared to 2019. Looking at my single-operator entry as N3QE, I see that totaled across all six HF bands, my claimed country multiplier total fell from 504 in CQWW CW 2019, to just 393 in the 2020 edition.

In the fall 2021 CQWW CW and SSB contests, there was a slight recovery in DXpedition activiations, with 176 countries submitting logs. In my CQWW CW logs, this is reflected as a slight uptick to 433 country multipliers summed across the six bands.

Multi-operator entries in CQWW 2020 took a deep dive compared to past years. There were 860 multi-operator entries in CQWW CW and SSB in 2019, but only 636 multi-operator entries in 2020 as multi-operator gatherings were canceled. The CQWW 2021 logs received pages shows 832 multi-operator entries, so multi-operator entries have largely but not completely recovered as hams

learned how to safely gather at large stations (*along with growth in multi-site remote operations – ed.)*.

Will the Covid-19 contesting bump continue into 2022? Several large HF contests in the first months of the new year show participation increasing slightly over 2021. The February 2022 ARRL DX CW Contest had 4,819 logs submitted, up from 4,718 in 2021. The January 2022 ARRL RTTY Roundup contest had 2,351 entries, also an incremental increase over 2021's 2,328 logs.

Other early 2022 contests show a slight decline in entries from their pandemic highs. The 2022 CQ 160-Meter CW contest, held the last weekend of January, had 2,953 logs submitted, a 10% decline from the 2021 running which set the high-water mark at 3,260 log submittals. The February 2022 CQ WPX RTTY Contest has 3,486 entries, a slight decline from the record high 3,868 logs submitted for the 2021 edition.

At the extreme top level of radiosport competition, the 2022 WRTC in Italy has been delayed until 2023 because of the impact of Covid-19 restrictions. Special callsigns in the IIØWRTC-II9WRTC range, as well as IR1WRTC and IOØWRTC, have been activated both inside and outside of contests in 2022 as WRTC organizers promote awareness of the 2023 events. These activations will continue through July 10, 2022. Information about the "WRTC 2022 – Award" for working these special callsigns, as well as more about preparations for WRTC 2022, are at <www.wrtc2022.it>.

April and May Contest Highlights

State QSO parties kick into high gear this spring with **Louisiana**, **Mississippi**, and **Missouri** all holding their state QSO parties the weekend of April 2-3rd. **Nebraska**, **New Mexico**, **Georgia**, and **North Dakota** follow on April 9-10th. **Michigan**, **Ontario**, and **Quebec** become the focus on April 16-17th. The **Florida QSO Party** begins on April 30th and finishes May 1st.

The first full weekend of May is packed with state QSO party activity, as the eight western U.S. states are activated for the **7th Call Area QSO Party** and six states in the northeast gear up for the **New England QSO Party** on May 7-8th. The states of **Indiana** and **Delaware** also hold their QSO parties this weekend. If you are using the popular N1MM+ contest logging software, the "IN7QPNE" module allows all you to log all the activity in one place; details of this usage are on the N1MM+ website <https://bit.ly/36BYyjh>.

The first-ever **Canadian Prairies QSO Party** will be held on May 14th and May 15th. Stations in VE4 (**Manitoba**), VE5 (**Saskatchewan**), and VE6 (**Alberta**) are called by each other and stations around the world in this new event. The Canadian Prairies stations give their 3-letter electoral district abbreviation as their exchange, which counts as a multiplier per band. You can find the rules and a list of multipliers at <https://cpqp.ve6hams.ca>.

If you are considering a trip to the 2022 Dayton Hamvention, put **Contest University** in your plans. It is held on Thursday, May 19th, the day before Hamvention opens. This year the Contest Super Suite, Contest University, the Top Band Dinner, the Contest Dinner, and the KC DX Club CW copying competition are all being held at the Hope Hotel. Find full details at <www.contestuniversity.com>.

CQ WPX CW this year is held May 29-30th. This is the first year of a new Youth Overlay category for this event, in which you work both DX and domestic callers for points and prefix multipliers. Find full details at <https://cqwpx.com>.

PROPAGATION

BY TOMAS HOOD,* NW7US

April Propagation

Quick Look at Current Cycle 25 Conditions:
(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**

One Year Ago:
(Data rounded to nearest whole number)

Sunspots:
Observed Monthly, January 2021: **11**
12-month smoothed, July 2020: **8**

10.7-cm Flux:
Observed Monthly, January 2021: **76**
12-month smoothed, July 2020: **74**

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 the high frequencies (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, 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 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

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LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for April 2022

	Expected Signal Quality			
Propagation Index	**(4)**	**(3)**	**(2)**	**(1)**
Above Normal: 6, 13, 15-16, 18, 22, 26-27	A	A	B	C
High Normal: 4-5, 12, 14, 17, 19-21, 24-25	A	B	C	C-D
	A			
Low Normal: 1, 7, 9, 11, 23, 28	B	C-B	C-D	D-E
Below Normal: 3, 30	C	C-D	D-E	E
Disturbed: 2, 8, 10, 29	C-D	D	E	E

Where expected signal quality is:
A--Excellent opening, exceptionally strong, steady signals greater than S9
B--Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.
C--Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.
D--Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.
E--No opening expected.

HOW TO USE THIS FORECAST

1. Using the **Propagation Charts** appearing in "The CQ Shortwave Propagation Handbook, 4th Edition," by Carl Luetzelschwab, George Jacobs, Theodore J. Cohen, and R. B. Rose.

a. Find the *Propagation Index* associated with the particular path opening from the **Propagation Charts**.

b. With the *Propagation Index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the **Propagation Charts** with a *Propagation Index* of 2 will be fair to poor on April 1, fair from April 2 through 5, and good on April 7, and so forth.

2. Alternatively, you may use the *Last-Minute Forecast* as a general guide to space weather and geomagnetic conditions throughout the month. When conditions are Above Normal, for example, the geomagnetic field should be quiet, and space weather should be mild. On the other hand, days marked as Disturbed will be riddled with geomagnetic storms. Propagation of radio signals in the HF spectrum will be affected by these geomagnetic conditions. In general, when conditions are High Normal to Above Normal, signals will be more reliable on a given path, when the ionosphere supports the path that is in consideration. This chart is updated daily at <http://SunSpotWatch.com> provided by NW7US.

17 meters is more stable at night, with propagation following grey-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 April 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 E_s 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.

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

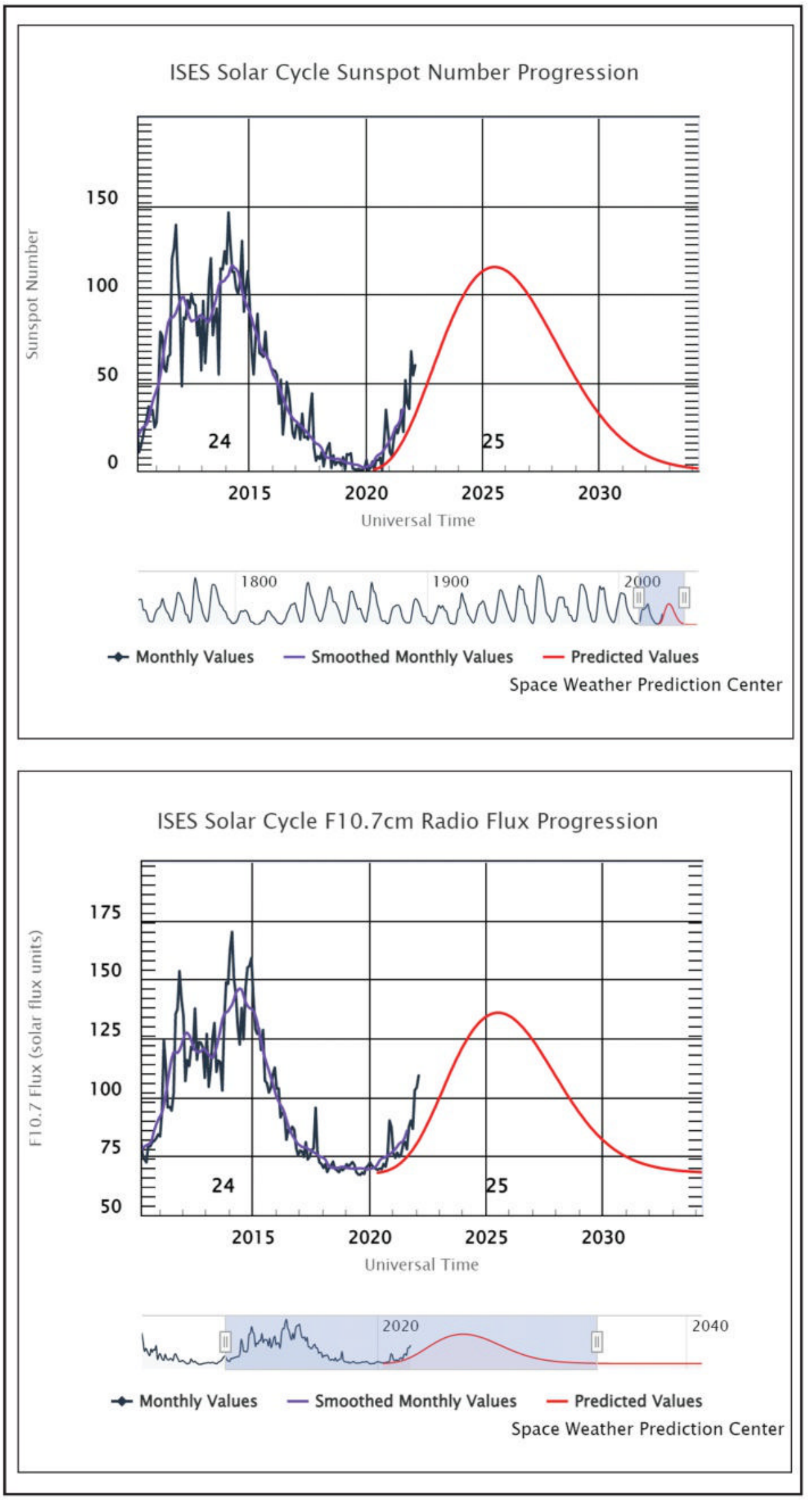

Figure 1. It is clear so far that this cycle may outperform the forecast! The increase in each plot shows a faster rise in overall solar activity and resulting solar flux each month of this cycle, Sunspot Cycle 25. Even the 10-meter band is showing signs of East / West DX over 3,000 kilometers or greater paths. Could this cycle prove to be stronger than expected? (Courtesy of SWPC/NOAA)

radio storminess on the HF bands. Check the Last-Minute Forecast at the beginning of this column for the days in April that are expected to be Below Normal or Disturbed.

For a detailed list of meteor showers, check out <https://tinyurl.com/f9v7fj2u> for a complete calendar of meteor showers in 2022.

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

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for January 2022 is 56.97, down from 69.42 in December 2021, yet still up from significantly up from November's 36.03. The 12-month running smoothed sunspot number centered on July 2021 is 31.8, up from 28.0 in June. A smoothed sunspot count of 47, give or take about 6 points is expected for April 2022.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 104.05 for January 2022, up from 102.94 for December 2021. The 12-month smoothed 10.7-cm flux centered on July 2021 is 83.10, up from 81.30 for June. The predicted smoothed 10.7-cm solar flux for April 2022 is 92, give or take 8 points.

Geomagnetic activity level this month is expected to range from quiet to stormy, resulting in occasional degraded propagation this month. Remember that you can get an up-to-the-day ***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 email me, write me a letter, or catch me on the HF amateur bands. If you are on Facebook, check out <https://fb.me/spacewx.hfradio> and <https://fb.me/NW7US> — speaking of Facebook — check out the *CQ Amateur Radio* magazine fan page at <https://fb.me/CQMag>. Also, please check out the new alternative social networking ham radio group at <https://amateurhamradio.locals.com> and please share this with your amateur radio friends and clubs.

– 73, Tomas, NW7US

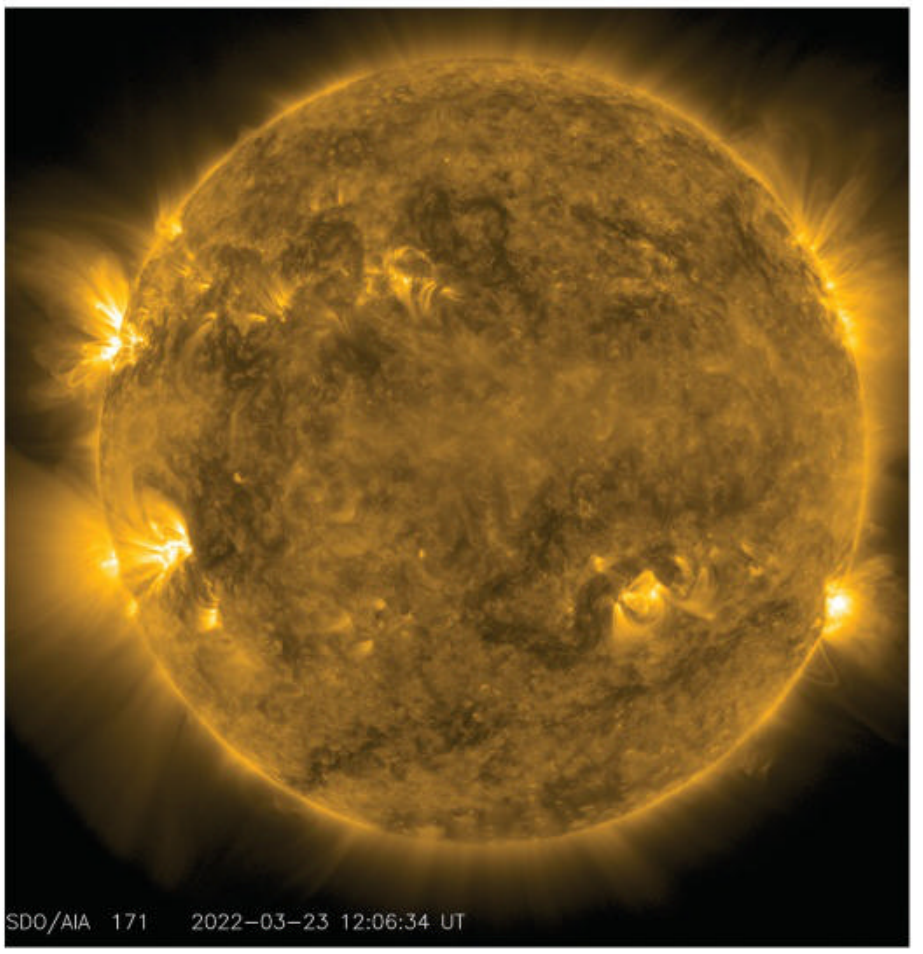

Figure 2. This is an artificially colored view of the Sun by SDO AIA at 171 Å (angstroms), on March 23, 2022, which shows the upper solar transition region. The light is emitted by iron-9 (Fe IX) at around 600,000 Kelvin. This wavelength shows the quiet corona and coronal loops, and is typically colorized in gold. It is encouraging to see multiple active regions as the Sun moves away from solar cycle minimum to solar cycle maximum (the peak of the cycle). HF propagation is improving, so if you are not on the HF bands making contact, this is a good time to start. (Courtesy of NASA/SDO)

BEHIND THE BYLINES...

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

Martin Butera, PT2ZDX / LU9EFO ["Smoke (But No Mirrors): The Cigar Box QRP Transmitter," p. 27] is an Argentine ham currently living in Brazil's capital city of Brasilia. Before moving to Brazil, he was a founding member of Radio Atomika 106.1 MHz, a station that is part of the second generation of alternative, countercultural, illegal, free, self-managed, pirate radio stations born in the heat of the Argentinazo 2001 (the great Argentine economic crisis).

Dave Ahlgren, K1BUK ["Predicting Balun Performance Using 3D Models," p. 34] started in ham radio at age 14 with the Novice Class callsign KN1BUK and later upgraded to K1BUK. While a graduate student at the University of Michigan in the 1970s he operated as W8IXX. After more than 40 years away from the hobby, he returned in 2015 after retiring from Trinity College, where he taught courses in electronics, computer-aided design, and robotics. Since returning to ham radio, Dave has enjoyed designing antenna systems using computer-based modeling and optimization tools, including 4nec2 and EMCoS Studio. He is active on all bands from 160-6 meters. In his second ham radio life, Dave has earned the WAS and DXCC awards and especially enjoys operating in CW and FT-8 modes.

Rich Stiebel, W6APZ ["My Most Challenging Assignment," p. 42] is a retired electrical engineer who got his start designing CB rigs for Knight-Kit (the subject of this issue's article). This is his second article for *CQ.* The first was in 2016, "Using a Drone to Track Down Repeater Interference." Rich's first-ever radio article, "Put Maximum Power Into Your CB Antenna," featuring an SWR / power meter he designed for Knight-Kit, was published by *Radio-Electronics* magazine in 1963.

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.)

2021 CQWW DX SSB RESULTS

SINGLE OPERATOR NORTH AMERICA

United States

District 1

KQ2M	**A**	**6,729,076**	**4476**	**134**	**444**
K5ZD	"	6,311,403	3819	128	453
N1UR	"	5,410,820	3374	131	449
K1DG	"	4,665,320	3349	118	388
N1PGA	"	2,233,425	1645	105	380
W1JQ	"	1,114,560	989	100	305
K1RM	"	984,718	1330	60	199
W1WEF	"	932,180	966	93	274
NG1M	"	445,250	604	66	208
AE1P	"	421,523	555	71	198
W1HNZ	"	395,773	503	73	214
K1OFO	"	388,652	549	80	212
ND1X	"	246,749	416	59	168
N1SEP	"	183,396	342	48	156
W2TT	"	162,435	296	59	162
NE1RD	"	146,510	295	46	136
N1TA	"	122,400	254	41	129
WZ1V	"	113,230	248	44	125
N1DFD	"	111,864	253	53	124
K1BIF	"	81,672	198	47	117
W1TRK	"	77,520	210	42	110
W1IS	"	63,873	160	50	101
W1OHM	"	56,341	198	22	81
K1WZC	"	54,180	201	23	82
N1RPS	"	39,184	124	39	85
NF1L	"	38,646	136	42	72
W1AST	"	34,580	115	38	92
KB1YO	"	32,810	138	19	66
K1DVL	"	20,124	98	27	51
K3IU	"	12,773	95	14	39
NA1VT	"	7,956	59	16	35
ND1L	"	6,900	63	12	34
W1GXZ	"	5,720	40	24	31
K1WR	"	4,680	44	11	25
KC1DQH	"	3,762	46	18	39
W1JS	"	1,798	22	10	19
K1WHS	**28**	**138,516**	**588**	**18**	**66**
NT1O	**21**	**3,977**	**42**	**14**	**27**
W1FQ	**3.7**	**18,368**	**108**	**16**	**48**
W1HI	"	14,224	95	13	43
***K1HT**	**A**	**616,641**	**673**	**83**	**238**
*N1DD	"	592,812	734	70	227
*N1DC	"	204,670	384	49	145
*KR1A	"	104,960	239	44	120
			(OP: KL7JT)		
*K1LK	"	82,782	202	52	110
*K1TR	"	59,004	160	40	92
*KG1V	"	48,990	147	50	88
*W2PMC	"	39,528	138	31	77
*N1HTS	"	37,840	126	34	76
*NW1Q	"	33,966	125	30	72
*AB1XQ	"	28,028	124	25	66
*N1ADX	"	20,648	92	32	57
*W1EDX	"	17,544	85	30	56
*N1XXU	"	14,553	76	25	52
*W1HMM	"	12,848	61	23	50
*W1FWS	"	10,773	64	19	44
*WA1HXH	"	10,296	58	29	49
*KB1LRL	"	9,798	58	25	44
*K1ALA	"	9,198	85	10	32
*AE1D	"	7,140	62	26	42
*N1NIS	"	6,350	57	17	33
*W1EAA	"	3,552	35	20	28
*NP2GG	"	3,154	29	11	27
*N1IBQ	"	2,480	29	10	21
*KC1IEB	"	2,387	27	9	22
*KC1NGS	"	1,674	22	9	18
*K1LHO	"	1,456	48	21	31
*KM1NDY	"	1,419	30	15	18
*W1LAG	"	1,287	25	10	23
*WMØG	"	759	22	7	16
*N1CEO	"	682	21	11	11
*AF1R	"	72	5	3	5
***N1WRK**	**28**	**44,354**	**229**	**16**	**51**
*N1SFE	"	4,312	48	14	30
*K1MEP	"	4,128	50	11	21
*K1PET	"	2,030	44	8	21
***WA1N**	**21**	**216**	**8**	**5**	**7**
***K1EP**	**14**	**159,936**	**492**	**30**	**89**
***NY1E**	**7**	**33,040**	**153**	**19**	**61**
W1GD	**AA**	**2,815,020**	**1709**	**126**	**459**
WK1O	"	2,332,155	1724	110	391
KA1IS	"	2,148,065	1603	113	372
WX1S	"	1,866,465	1201	124	431
N1IXF	"	1,438,302	1081	112	366
N1SV	"	1,424,137	1201	94	339
AK1MD	"	1,420,393	1123	111	370
N8RA	"	1,283,500	1057	98	327
K1KA	"	1,237,005	1015	101	340
N1RP	"	1,230,744	972	103	353
AB1JV	"	1,000,370	847	98	336
WT1A	"	863,580	816	91	298
KA1IOR	"	803,010	673	96	330
W1FJ	"	787,176	623	99	369
AC1EV	"	772,717	788	85	268
WB1DX	"	722,262	859	66	225
KX1X	"	720,900	722	77	279
K1VMT	"	688,554	865	78	233
NB1N	"	607,959	727	63	234
W1TC	"	569,373	506	82	317
KB1W	"	562,164	634	69	247
NN1SS	"	543,400	517	94	286
W2DAN	"	540,735	650	66	229
W1RM	"	463,821	394	112	331
NT1N	"	458,803	605	64	207
W1OO	"	410,454	516	79	218
			(OP: K1ESE)		
W1KM	"	405,648	451	76	248
NE1B	"	389,784	436	83	244
N9NC	"	358,488	423	75	237
WK1J	"	337,620	501	68	187
N1GF	"	336,864	492	66	198
NF1O	"	331,158	417	70	221
K2RB	"	318,539	520	49	180
KC1GTK	"	306,078	404	74	204
W1NG	"	305,641	339	82	247
W1UE	"	286,518	344	91	227
W3SM	"	228,939	401	48	153
K1SM	"	221,270	384	46	157
K1RV	"	211,731	299	62	205
NE1F	"	195,360	320	53	167
N1KWG	"	184,527	266	67	194
K1TW	"	164,892	315	47	135
WA1ZYX	"	162,800	326	43	133
KV1J	"	161,582	334	40	133
AA1SU	"	148,000	283	63	137
WJ1B	"	144,870	310	40	125
N1SNB	"	90,522	225	37	104
K1DBO	"	82,597	206	45	106
W1UK	"	78,546	177	42	117
AG2K	"	71,769	190	42	99
WV1M	"	66,002	196	31	91
K1VW	"	51,328	153	34	94
KE1VT	"	51,051	145	47	96
NB1U	"	50,995	126	46	109
K1GMM	"	47,460	189	17	67
N1MGO	"	41,769	172	21	70
W1DSC	"	31,598	102	45	77
AE1T	"	30,268	118	26	68
W1BNC	"	18,352	107	24	50
K1DT	"	16,340	62	41	54
NU1T	"	8,900	66	15	35
W1PEF	"	8,265	56	19	38
NF1A	"	4,484	41	11	27
AB1GS	"	4,224	38	18	30
WX1X	"	2,340	29	14	22
W1DQ	"	1,638	20	20	19
WW4LL	**21A**	**479,100**	**1146**	**30**	**120**
W1NK	"	24,108	103	19	63
W2JU	"	2,730	37	6	20
K1JB	**14A**	**302,784**	**717**	**34**	**118**
N1KWF	"	135,876	384	29	105
WM1G	"	49,020	195	25	70
K2LE	**7A**	**14,694**	**92**	**15**	**47**
***KS1J**	**AA**	**1,832,124**	**1382**	**104**	**372**
*W1NT	"	1,169,299	1085	84	299
*WO1N	"	515,520	531	89	269
*KC1SQ	"	429,275	554	67	208
*KA2KON	"	394,305	513	61	210
*N1API	"	387,296	467	74	230
*W1DYJ	"	315,090	424	72	198
*W1JGM	"	293,250	468	69	181
*N1IBM	"	184,144	250	67	205
*W1JIM	"	78,925	184	55	120
*AE1EZ	"	76,616	192	47	110
*KB1RVU	"	66,776	196	44	92
*W1ARY	"	58,960	163	42	92
*N1ZN	"	44,936	120	54	83
*WE1SAX	"	24,480	105	29	61
*N1MM	"	23,051	100	30	59
*W1ER	"	20,502	76	33	69
*NT1K	"	19,404	88	17	60
*W1NSK	"	10,350	62	25	44
*K1AFC	"	10,286	58	28	46
*AI1G	"	7,020	60	26	39
*NR1T	"	6,780	45	19	41
*K1THE	"	4,453	44	27	34
*KC1ELF	"	2,484	29	15	21
*WA2TNX	"	2,160	26	14	22
*N1UNH	"	1,736	24	11	20
*KA1VMG	"	528	12	6	10
*K1VU	"	396	10	8	10
			(OP: N1EN)		
***KC1MEB**	**28A**	**560**	**29**	**10**	**18**
***AB1J**	**21A**	**7,956**	**60**	**15**	**36**
***KC1G**	**14A**	**3,564**	**41**	**9**	**24**

District 2

N2RRA	**A**	**879,340**	**1215**	**73**	**235**
N2HMM	"	800,120	713	102	313
N2MF	"	725,580	847	89	259
WS9M	"	647,900	721	86	255
KD2TT	"	436,536	574	69	213
W2OIB	"	431,460	543	79	227
N2QV	"	361,580	647	55	147
W2XL	"	336,036	499	55	191
WB2NFL	"	334,628	467	68	198
NS2N	"	255,000	369	73	177
W2LU	"	249,428	416	74	180
KC2MBV	"	136,864	263	55	133
N2ZN	"	131,208	318	40	102
AD2BO	"	116,441	247	45	124
N2YG	"	111,517	235	50	129
AB2RA	"	102,102	247	53	134
W2AXR	"	94,080	261	42	105
K2AF	"	70,686	182	46	108
KC2G	"	47,916	151	41	80
W2CN	"	32,076	126	37	62
KD2RPX	"	17,512	75	35	53
KR2Q	"	15,190	80	25	45
KB2DX	"	13,197	63	31	52
NM2O	"	9,211	59	19	42
KM2B	"	6,028	55	14	30
W3PR	"	3,198	28	13	26
K2RYD	"	425	9	8	9
WA2VIU	"	32	6	4	4
KU2M	**21**	**705,962**	**1699**	**31**	**118**
K2SSS	"	391,007	1021	30	109
K2QB	"	38,458	181	20	62
KC2O	**14**	**1,694**	**26**	**6**	**16**
WA2BCK	**3.7**	**33,810**	**220**	**15**	**55**
***N1NQD**	**A**	**290,420**	**420**	**82**	**178**
*KD2P	"	257,580	390	60	183
*AB2TC	"	142,379	305	49	124
*N2DSW	"	139,308	277	51	137
*N2MTG	"	133,749	278	57	136
*WB2KLD	"	123,000	270	46	118
*WA2QAU	"	114,751	243	44	125
*W2AAB	"	98,124	236	42	114
*N2OMD	"	94,287	216	49	110
*N2CU	"	80,520	214	36	96
*WA2CNV	"	76,744	204	62	119
*N2LDV	"	74,682	192	49	113
*K2AL	"	47,520	150	31	79
*N2DD	"	38,564	118	42	82
*K2YG	"	31,460	89	43	87
*W2CLA	"	30,910	109	38	72
*AC2ZZ	"	26,180	112	26	59
*KX1W	"	22,500	98	27	63
*W2YW	"	21,271	120	26	63
*N2BZD	"	14,842	81	25	57
*N2LEB	"	14,525	69	30	53
*KC2PDO	"	12,264	67	26	47
*KC2VPE	"	11,280	74	17	43
*K3WHD	"	9,504	60	24	48
*KD2VSD	"	9,316	64	28	40
*N2PRD	"	7,740	48	22	38
*KD2SSE	"	7,375	54	20	39
*KG2AF	"	6,765	50	17	38
*W2MSA	"	5,628	50	13	29
*KD2REH	"	5,618	48	17	36
*W2BEW	"	5,500	39	21	34
*KD2TOW	"	4,815	39	18	27
*KC2JRQ	"	3,081	31	16	23
*W2VTV	"	2,960	40	16	24
*KD2WDN	"	2,673	30	10	23
*K2AN	"	2,592	29	10	22
*N2PTF	"	2,340	30	14	22
*WM2Y	"	1,980	30	13	23
*K2IRK	"	1,870	31	13	21
*W2UDT	"	1,508	24	10	16
*KD2QGP	"	616	12	11	11
*KF2UJ	"	529	17	8	15
*NB2L	"	399	11	9	10
*N2EHL	"	96	5	3	5
*WA2WZT	"	40	5	4	4
*WB2KWC	"	24	2	2	2
***W2VU**	**28**	**738**	**15**	**7**	**11**
*W2FTL	"	30	5	3	3
*WA2YYL	"	0	3	1	1
***NU2A**	**21**	**50,731**	**192**	**23**	**74**
			(OP: N2GM)		
*W2AW	"	47,712	202	21	63
			(OP: N2GM)		
*W3EH	"	5,456	53	16	28
***WB2KHO**	**14**	**35,721**	**172**	**20**	**61**
*NG2S	"	1,612	27	6	20
*K2JF	"	0	2	2	1
***KS3F**	**3.7**	**4,550**	**52**	**10**	**25**
AB3CX	**AA**	**4,703,658**	**2597**	**140**	**501**
N2SR	"	3,772,240	2275	135	475
W2MKM	"	3,462,674	2090	131	455
KA2K	"	2,531,750	1728	119	414
NY6DX	"	2,292,921	1723	117	404
WA2CP	"	2,279,688	1633	115	401
			(OP: KC2GOW)		
N2MM	"	2,207,030	1454	129	445
W2RD	"	1,917,825	1304	122	403
K2CJ	"	1,618,210	1106	113	404
KF2O	"	1,559,040	1006	127	453
WR2G	"	1,497,144	1253	99	329
N2RC	"	1,321,402	1001	109	354
WO2T	"	1,215,504	1047	99	315
K3TS	"	1,214,976	971	104	344
KC2TN	"	1,194,260	1015	96	326
W2TV	"	1,137,720	914	103	353
N2TK	"	1,133,319	753	133	430
K2RET	"	1,097,817	929	100	327
AB2E	"	1,049,260	846	102	358
K2NV	"	1,006,808	978	92	282
N2SQW	"	995,670	900	87	303
KE1IH	"	925,980	922	86	280
W2GDJ	"	850,520	706	108	332
KM2O	"	774,805	670	105	310
NTØK	"	760,767	794	84	273
			(OP: K6BFL)		
W2CCC	"	724,003	742	93	260
			(OP: K2CS)		
K2EP	"	709,992	716	86	260
AG2J	"	673,296	778	85	247
N1JP	"	616,110	692	72	258
WA2DNI	"	587,124	665	75	272
WA2OAX	"	548,067	680	78	221
K2QMF	"	526,537	590	67	250
WO2X	"	478,410	484	95	275
WB2NVR	"	396,336	523	69	207
N2JJ	"	372,072	452	78	218
K2ANZ	"	363,902	505	74	204
N2NI	"	357,786	458	78	208
AC2RL	"	344,817	418	77	220
WA2MCR	"	342,375	481	75	200
K2BX	"	328,467	396	82	227
N2KHH	"	300,612	393	64	218
W2XK	"	268,032	375	61	195
W2MV	"	266,994	402	61	173
W2JV	"	253,575	453	53	154
K3IB	"	247,320	341	67	203
N2NKX	"	234,612	340	73	179
WA2UBK	"	200,860	322	57	163
NN2NN	"	199,350	329	65	160
W3MR	"	186,866	303	62	171
WB2WGH	"	179,401	367	47	126
KF2E	"	166,656	276	46	171
AK2S	"	158,015	303	51	136
WA3AFS	"	144,232	247	74	168
K2QPN	"	137,238	269	45	133
W2OSR	"	114,218	231	55	136
W2KA	"	110,004	228	56	122
N2ZX	"	93,313	180	44	143
KA2ISM	"	57,200	190	44	99
NE2V	"	49,200	147	36	87
N2KA	"	26,656	99	45	67
KC2IEB	"	6,615	51	14	35
WN2X	"	5,885	41	22	33
AI2N	"	3,400	26	25	25
WA2DE	"	2,838	31	12	21
WF2B	"	1,749	23	13	20
NO2C	"	1,014	14	12	14
K2PAL	**28A**	**6,764**	**70**	**12**	**26**
AH2O	**21A**	**164,208**	**468**	**27**	**105**
WO2Y	**14A**	**82,264**	**292**	**23**	**81**
KN2M	**3.7A**	**13,862**	**91**	**14**	**44**
N2RJ	"	1,323	22	6	15
***W2YR**	**AA**	**476,392**	**463**	**88**	**288**
*KD2JOE	"	412,671	498	76	225
*N2FF	"	300,990	448	54	183
*KC2WUF	"	269,544	375	63	201
*K2ZR	"	261,193	442	68	165
*KS2G	"	257,488	399	70	172
*KA2D	"	220,536	354	48	168
*WB2WPM	"	180,873	357	53	136
*KZ2I	"	176,148	282	72	161
*NY2A	"	142,839	308	50	127
*W2FDJ	"	104,746	236	53	113
*KI2D	"	51,136	146	45	91
*N2BEG	"	50,193	148	52	91
*KA2FIR	"	46,970	146	42	80
*WW2P	"	46,920	130	48	90
*KA2ENE	"	29,488	132	34	63
*WU2M	"	22,149	116	21	48
*NC1A	"	19,580	87	30	59
*KD2UBH	"	14,280	76	34	51
*KD2PTX	"	10,140	69	13	39
*KF2FK	"	5,665	50	23	32
*W5JBL	"	5,610	46	20	35
*KD2KEH	"	4,731	50	22	35
*KB2URI	"	2,520	29	8	22
*AE2DB	"	1,952	26	12	20
*N2VM	"	1,221	23	13	20
*KB2GD	"	966	20	11	12
*K2IW	"	954	19	4	14
*K2SI	"	108	5	5	4
*W2VDZ	"	88	4	4	4
***NM2K**	**28A**	**18,038**	**118**	**18**	**40**
*N2OO	"	16,864	99	16	46
***K2SQS**	**21A**	**40,474**	**149**	**21**	**77**
*K1NY	"	17,360	99	19	61
*N9YNG	"	0	0	0	0

District 3

K3ZO	**A**	**3,718,080**	**2801**	**117**	**363**
K3AJ	"	1,569,067	1386	105	316
K3UL	"	1,433,728	1173	119	368
K3TC	"	1,026,432	955	97	299
W3KL	"	996,130	1158	76	229
N3FCP	"	567,600	631	82	248
N1EK	"	488,988	649	75	214
N3CB	"	410,019	509	78	213
N3XZ	"	195,360	334	64	158
WB3CJU	"	156,294	323	45	126
K3EFS	"	139,860	276	52	137
KD4IZ	"	134,160	248	56	152
W3TMS	"	130,726	296	41	122
KC3JPP	"	100,398	226	56	118
N3MWQ	"	96,496	246	45	103
K3CWF	"	91,760	211	37	118
4U1WB	"	80,514	798	49	93
			(OP: AJ3M)		
KD3H	"	56,712	185	45	91
KC3RDV	"	38,280	148	34	76
WR1B	"	24,102	99	37	66
NY3A	"	15,895	99	11	44
WA3GM	"	11,736	70	26	46
NC3Y	"	9,200	69	13	37
KB3RKM	"	8,880	56	18	42
W3AZT	"	2,340	27	15	21
W3DF	**28**	**11,685**	**79**	**16**	**41**
K3WGR	"	8,541	83	9	30
WN3I	"	1,520	31	6	14
***KS3D**	**A**	**160,218**	**275**	**57**	**150**
			(OP: KJ3N)		
*K3KDX	"	134,568	280	43	135
*W2MC	"	94,215	226	48	117
*KQ3W	"	81,252	197	51	97
*WA4GUD	"	62,880	173	37	94
*N3VOP	"	54,389	165	50	87
*N3KBF	"	46,098	152	35	82
*KA3FZN	"	32,107	125	30	67
*W3WHK	"	29,290	117	35	66
*W3AVP	"	22,320	99	28	52
*K3SU	"	21,484	101	24	58
*W3IPA	"	21,321	94	39	64
*K2LNS	"	18,270	97	17	53
*WB3J	"	17,712	86	27	55
*KØBAK	"	16,206	89	26	47
*K3VZ	"	13,446	80	24	59
*KC3HMY	"	13,038	66	32	50
*KC3DLL	"	10,112	63	23	41
*N3DRL	"	9,728	65	24	40
*KR3L	"	9,063	65	17	36
*WB3LGC	"	8,712	61	25	47
*NH7TV/3	"	8,253	47	27	36
*N3VFK	"	6,760	54	30	35
*KD3CR	"	5,170	48	23	32
*WA3YDZ	"	5,148	44	14	30
*N3ACP	"	4,042	35	15	28
*NE3I	"	3,045	32	15	20
*N3WAS	"	2,516	29	15	22
*AC3MB	"	960	20	14	16
*KA3KSP	"	736	12	11	12
*KC3LOY	"	576	31	15	21
*N3JNX	"	462	12	5	9
*AJ3DI	"	425	10	7	10
*K3YR	"	180	9	6	9
*KC3SIL	"	126	6	4	5
*W3LWM	"	72	5	4	4
			(OP: KB3VBL)		
*N3RMC	"	40	5	3	5
***N3RW**	**28**	**1,422**	**34**	**7**	**11**
***K3HW**	**14**	**11,856**	**87**	**17**	**40**
*KA3UIH	"	2,430	30	11	19
*W3RLO	"	345	10	7	8
*KB3SQV	"	6	1	1	1
***W3LL**	**3.7**	**49,329**	**238**	**16**	**65**
K3WW	**AA**	**5,592,496**	**3190**	**135**	**509**
W3PP	"	5,073,630	2808	148	507
			(OP: AA1K)		
AA3B	"	4,950,540	2823	133	497
N3RS	"	3,999,816	2183	147	510
NW3Y	"	3,426,947	2068	137	456
K3PP	"	2,592,920	1645	129	439
WY3A	"	2,560,529	1642	122	435
W3GM	"	2,467,992	1614	122	430
			(OP: W3FV)		
W3FIZ	"	2,221,508	1549	112	402
K3ND	"	1,978,308	1440	127	410
			(OP: N3AD)		
K3SW	"	1,845,564	1305	118	401
K3WJV	"	1,782,900	1224	124	401
K1RH	"	1,718,142	1320	96	370
NF3R	"	1,685,600	1367	111	379
KU2C	"	1,681,325	1149	124	421
NN3Q	"	1,681,248	1195	114	384
WB2ZAB	"	1,626,696	1296	111	332
W8FJ	"	1,579,587	1067	120	423
NT3U	"	1,347,018	1119	104	350
W3JX	"	1,345,408	1114	102	355
N3NR	"	1,297,880	1020	110	347
K3NM	"	1,205,385	922	111	378
N3FJP	"	1,165,384	998	100	318
K3ZU	"	1,131,824	785	129	428
NT2DR	"	1,077,089	1115	96	281
WC3N	"	1,033,904	1007	87	274
K3WU	"	941,200	879	104	296
K3ATO	"	865,200	843	100	300
N3AM	"	846,963	796	86	295
AA3K	"	822,426	797	91	283
K3FMQ	"	808,344	663	103	333
W3SO	"	764,568	840	72	261
			(OP: W3XOX)		
KD3TB	"	755,040	746	97	293
K2XR	"	742,212	561	114	363
KB3Z	"	740,976	765	80	264
W3FOX	"	738,815	743	83	302
N3XF	"	660,009	645	95	276
K3RL	"	614,259	577	99	294
W3ICM	"	607,950	604	92	294
N3RJ	"	578,646	713	64	242
K3TEF	"	567,782	648	78	235
N3YUG	"	564,376	639	80	236
W3MA	"	549,072	488	97	335
K3FT	"	511,086	630	79	230
W3UM	"	502,200	520	86	274
N3FM	"	487,428	600	74	228
AC3LZ	"	468,666	577	82	215
W3OU	"	414,725	473	78	235
NY3C	"	400,843	450	85	238
K3ZA	"	389,890	537	66	188
AK3B	"	383,964	495	77	217
K3OO	"	364,266	394	87	256
KE3GK	"	346,480	819	81	274
K3RON	"	341,015	504	54	187
KA3YJM	"	340,538	494	61	192
K2CD	"	331,486	539	56	158
K1BZ	"	318,860	405	79	219
KC3HXF	"	313,090	466	60	179
KW3Z	"	302,760	420	70	191
N4ZR	"	276,375	477	50	151
K3BHX	"	271,607	419	47	194
W3MAM	"	246,280	392	65	170
WA3AAN	"	244,320	390	61	179
N3FZ	"	240,924	422	51	153
WØBR	"	240,381	337	72	189
W3MLK	"	237,930	275	89	241
W3MM	"	218,622	309	65	184
			(OP: W3EA)		
AG3I	"	206,544	360	60	148
W2DLT	"	205,155	338	65	170
KG4USN	"	204,930	264	79	218
AA3S	"	194,028	317	65	163
K2EJ	"	176,640	335	44	140
KE3KU	"	165,165	362	55	140
N3ST	"	156,416	296	53	135
WB3IWC	"	151,620	388	29	111
WW3S	"	147,408	216	72	177
N3OZT	"	145,628	277	56	140
NO3U	"	133,104	269	55	133
W3UL	"	131,835	260	64	123
K3TN	"	123,432	220	74	148
W3IZ	"	107,500	226	54	118
W3FLH	"	99,940	193	53	137
N3DUE	"	99,370	225	66	124
K3AU	"	85,312	196	58	114
			(OP: K2YWE)		
NN3RP	"	82,099	206	45	104
K3UW	"	75,625	214	27	98
W3NRJ	"	71,208	180	55	129
W2QFV	"	69,154	196	40	102
N3RM	"	52,089	137	59	120

N4FP	"	24,192	117	32	52
W4WCD	"	23,904	113	24	72
AF4T	"	16,984	80	31	57
KJ4ND	"	12,474	74	26	55
W8WZ	"	11,023	65	26	47
WBØAOD	"	10,920	60	25	45
N2NYR	"	10,878	67	28	46
WC4Y	"	10,730	91	26	48
N8AID	"	10,065	67	17	38
N3FP	"	8,784	67	21	40
K4GHC	"	8,220	61	19	41
WB9KVD	"	7,524	66	18	39
W4IL	"	*7,236*	*39*	*28*	*39*
K1GU	"	7,056	51	16	33
W4RJA	"	6,897	51	23	34
KA3BZO	"	6,206	47	23	35
NX9T	"	6,191	52	10	31
KM4QE	"	4,750	39	18	32
KW4EE	"	4,608	48	11	25
K4OMD	"	4,136	37	16	28
N4DTF	"	3,956	32	22	24
NY9G	"	*3,604*	*38*	*14*	*20*
K4BGV	"	3,450	43	18	28
ND4G	"	2,990	26	21	25
NV4C	"	2,106	30	11	16
K4EAK	"	1,728	24	14	18
N4NT	"	1,025	15	10	15
W4DD	**28**	**252,416**	**768**	**28**	**88**
K4WI	"	89,664	342	25	71
W4SLT	"	31,920	142	22	58
KØEJ	**21**	**623,664**	**1594**	**31**	**111**
N4OX	"	556,308	1344	34	128
K4PP	"	7,850	55	15	35
N4LZ	"	4,074	42	14	28
KC4RD	**14**	**2,379**	**43**	**14**	**25**
KM4BBV	"	304	14	6	10
W2IKN	**7**	**1,250**	**23**	**12**	**13**
N4ZED	"	6	1	1	1
AG4W	**1.8**	**3,774**	**164**	**11**	**23**
***WW4XX**	**A**	**917,285**	**864**	**98**	**285**
			(OP: LZ4AX)		
*AC4G	"	536,568	633	91	225
*WA3LXD	"	348,096	488	68	191
*W6DVS	"	262,548	426	50	171
*W4YE	"	225,453	379	61	162
*KM4OZ	"	216,106	337	67	175
*K4DR	"	214,376	383	58	153
*KK4ADQ	"	194,439	370	54	143
*K4REB	"	188,739	336	51	150
*KF8N	"	148,779	292	49	134
*NN4DX	"	146,547	328	54	117
*K1MWH	"	135,744	306	50	118
*N4CWZ	"	128,318	287	50	116
*K4SBZ	"	120,978	255	68	130
*K4LEN	"	110,400	287	57	127
*WA4JA	"	106,972	220	63	125
*N4ARY	"	100,890	223	51	120
*WF7I	"	100,640	226	53	117
*N4JKO	"	100,035	209	56	115
*WD4PTJ	"	94,512	220	57	119
*W2WCM	"	93,600	227	51	105
*N4ARO	"	92,246	224	41	113
*W4HRL	"	88,910	200	48	122
*K4EJ	"	87,360	211	45	111
*K8RAR	"	80,613	207	43	116
*KK4RV	"	78,280	201	40	112
*K3GWK	"	74,074	207	42	101
*K8MR	"	72,063	180	45	112
*W1GWL	"	69,762	183	51	103
*K4TG	"	65,520	218	61	107
*KA4JRY	"	62,586	143	58	125
N4USB	"	*62,400*	*171*	*49*	*101*
*K1VX	"	61,570	209	41	90
*AJ4BH	"	55,183	175	46	93
*AA4HV	"	52,256	145	51	91
*KV4ZY	"	52,160	124	48	112
*KN4ZUJ	"	50,126	161	51	91
*NK4O	"	47,886	152	42	96
*KB4CG	"	45,184	146	45	83
*K4JSK	"	44,166	160	32	70
*N4RWH	"	43,920	140	37	85
*KC4TNQ	"	40,500	130	45	80
*KD4QMY	"	39,894	126	33	76
*WO4ROG	"	39,060	148	41	85
*K4KSV	"	38,570	142	51	82
*WA8IHW	"	38,010	140	28	77
*KM4SK	"	37,044	129	44	82
*KE4D	"	36,725	138	29	84
*K4KPL	"	36,160	122	42	71
*K4MI	"	31,360	108	44	68
*K4GOP	"	31,310	123	32	69
*KJ4GNR	"	29,925	125	35	70
*KE4QCM	"	27,702	95	42	72
*W4SPR	"	26,394	99	36	70
*KC4OBX	"	25,300	111	45	70
*KD4NEM	"	25,149	108	21	62
*KB4FUW	"	22,374	89	37	62
*NQ4K	"	21,584	109	24	52
*N8CWU	"	21,320	112	26	56
*KC8LUB	"	19,530	92	35	55
WA2LMC	"	*18,387*	*94*	*27*	*54*
*W4LID	"	18,063	91	29	52
*K4ZMF	"	17,927	93	31	60
*W9NWY	"	17,840	92	29	51
*KZ4TN	"	17,204	98	22	46
*K8LBQ	"	17,010	77	33	57
*KJ4KKD	"	16,960	89	40	66
*KO4GGA	"	16,200	81	26	55
*KW4LU	"	15,862	81	28	49
*K4YDE	"	15,477	75	29	48
*N4TPT	"	14,964	72	31	55
*KG2E	"	14,832	87	26	46
*W4KAZ	"	14,365	82	18	47
*KB6QPI/4	"	14,070	70	24	46
*KO4EQR	"	12,006	61	34	53
*AK4D	"	11,448	100	23	49
*KK4PJ	"	10,950	68	28	45
*WD4KTF	"	10,578	65	33	49
*WA3RGH	"	9,590	95	16	54
*AI4QQ	"	9,280	58	23	41
*W2ECK	"	8,928	52	23	49
*K4WSD	"	8,908	68	27	41
*KN4YKB	"	8,250	55	27	39
*N4LKB	"	8,064	55	20	36
*K4BWM	"	7,392	55	24	42
*W4MTM	"	7,056	54	35	37
*NB4F	"	6,885	50	21	30
*KN4KL	"	6,708	68	14	29
*K4AVX	"	6,188	57	27	41
*AE4VT	"	5,940	40	21	34
*W4BTA	"	5,670	42	29	41
*KC8YRK	"	5,643	38	22	35
*W4KLS	"	5,555	44	23	32
*AI4DB	"	5,194	40	18	31
*N2YF	"	5,151	43	21	30
KD4ZDQ	"	*4,921*	*49*	*11*	*26*
*K4SXT	"	3,185	26	25	24
*KK4CS	"	3,172	31	23	29
*K4EES	"	3,060	35	12	22
*KO4FYC	"	2,828	34	7	21
*W4TWR	"	2,765	27	14	21
*N4KXO	"	2,739	87	29	54
WB4E	"	*2,698*	*28*	*14*	*24*
*K6FNV	"	2,520	35	13	27
*K4LBL	"	2,442	33	12	21
*AI8O	"	2,345	27	14	21
*W4GFY	"	2,301	25	17	22
*K4VBM	"	2,074	25	13	21
*K4GNE	"	2,072	30	12	25
*KT4DW	"	2,030	24	16	19
*N4MCC	"	1,968	33	17	24
*KJ4PJU	"	1,947	28	11	22
*N1YZ	"	1,914	24	13	20
*W4WWV	"	1,836	34	14	22
*KG4WZZ	"	1,716	29	16	17
*K4RSA	"	1,704	25	6	18
*KE4CQE	"	1,680	24	14	21
*N7GFB	"	1,632	21	14	18
KB4MG	"	*1,512*	*33*	*8*	*19*
*NJ8J	"	1,290	20	13	17
*WA2OMT	"	1,288	21	7	16
*KJ4UBM	"	1,280	20	13	19
*KN4ADM	"	1,200	21	7	18
*KM4IYW	"	1,200	26	15	15
*N4NVG	"	1,160	27	14	15
KG4DBM	"	*1,092*	*18*	*11*	*15*
*NG4DX	"	1,080	15	13	14
*AC3D	"	1,078	19	7	15
*KJ4GTI	"	1,054	24	14	17
*KA4DMV	"	1,012	20	8	15
*W4QYV	"	960	17	9	15
*KO4AWC	"	814	15	10	12
*KN4RXT	"	700	16	9	11
W5APO	"	*640*	*15*	*10*	*10*
*N3FNE	"	580	12	9	11
*N4YHC	"	480	14	8	8
*WB4MM	"	475	11	8	11
*W4WNT	"	238	9	6	8
*KC9LC	"	180	7	7	5
*KA4DSH	"	140	9	7	7
*N4BBG	"	36	3	3	3
*W1BBU	"	20	2	2	2
*AE2V	"	0	4	4	4
***K3TW**	**28**	**12,950**	**91**	**14**	**36**
*KC4WQ	"	3,250	48	10	16
*KO4HUL	"	3,150	34	11	24
*KO4DJG	"	3,080	47	12	16
*WO4X	"	1,121	20	7	12
*N3GB	"	912	21	6	13
*KA1RRX	"	400	10	7	9
*KO4SGC	"	231	11	6	5
*N4LDB	"	56	4	3	4
*KK6OKU	"	36	4	2	4
***K3YDX**	**21**	**14,892**	**86**	**18**	**50**
*WB2DX	"	13,230	92	17	46
*W4DL	"	4,158	38	12	30
*WF3T	"	3,708	40	13	23
*KC1DWP	"	1,288	19	12	16
*AA4LR	"	16	2	2	2
*KR4EZ	"	12	3	3	3
***K4TMC**	**14**	**31,916**	**151**	**21**	**58**
*W2QU	"	6,622	77	13	30
*N4PCC	"	5,488	43	13	36
*KN4ETD	"	1,890	31	9	18
*WB7RAV	"	325	11	4	9
*KO4NLJ	"	266	9	5	9
*KM4PIH	"	90	6	5	5
*KW4GF	"	36	3	2	2
***W4GDV**	**7**	**2,052**	**37**	**12**	**24**
W7FZY	"	*30*	*3*	*3*	*3*
*K4ME	"	6	1	1	1
*WD4ETU	"	0	0	0	0
***N3HEE**	**1.8**	**190**	**14**	**4**	**6**
K4AB	**AA**	**4,046,868**	**2558**	**143**	**463**
K4RO	"	2,874,940	1765	148	472
N6AR	"	2,756,994	1652	145	462
AD4EB	"	2,719,176	1837	126	422
N4UU	"	2,705,479	2129	116	407
NO9E	"	2,334,766	1520	128	425
W4NF	"	2,039,925	1604	108	353
K4PI	"	1,998,151	1261	132	445
W4TTY	"	1,989,350	1284	122	428
W4RM	"	1,969,245	1467	114	389
KX2T	"	1,810,896	1340	115	381
WX4G	"	1,784,369	1166	143	458
K3DNE	"	1,430,574	1177	111	342
K3IE	"	1,407,140	1118	111	349
ND4Y	"	1,328,917	1121	110	327
N1RM	"	1,239,540	1032	101	337
NX3A	"	1,151,540	975	100	330
N3MN	"	1,121,523	914	107	340
K4XL	"	1,009,620	853	102	324
N2NL	"	983,554	715	128	366
K5VIP	"	887,023	763	102	317
N4ZZ	"	868,644	974	75	249
N4LA	"	778,800	633	103	337
W4OX	"	719,576	662	100	307
W3GQ	"	690,300	688	93	261
K4QQG	"	686,092	739	90	251
NE8P	"	641,820	788	67	218
W1MD	"	581,490	511	99	327
NS4X	"	532,650	610	90	228
N4QS	"	512,672	617	74	222
AA5JF	"	503,956	502	90	271
KX4TT	"	500,038	488	94	288
K2LS	"	473,955	617	76	209
AC4MC	"	462,301	552	84	229
NF4A	"	444,444	526	87	221
N4PD	"	422,910	437	103	267
W4WWQ	"	418,748	511	93	214
W3IP	"	404,820	387	106	284
KT4Q	"	401,925	409	85	260
NR4O	"	394,010	472	82	228
N2YO	"	346,610	463	67	207
AJ4A	"	345,506	318	110	296
KB4S	"	317,750	382	84	226
N4TL	"	292,600	397	73	193
W4JVN	"	256,179	399	61	170
K3SV	"	253,178	336	79	198
AC6ZM	"	234,588	405	68	158
K4MV	"	234,528	260	86	250
NZ4N	"	234,000	337	79	181
N4CF	"	229,392	366	67	176
K8AC	"	216,448	265	79	225
K2SD	"	203,975	385	54	145
K4KR	"	202,275	329	63	162
W4SSF	"	200,910	338	62	160
N4DW	"	197,600	302	68	179
W4MY	"	189,744	348	50	151
KF7RO	"	182,771	352	54	139
AA4TI	"	173,169	300	58	155
K2TE	"	163,836	301	58	164
K4VTE	"	158,107	271	71	152
K1BDC	"	148,512	212	83	190
W4RN	"	144,670	291	50	135
W4VIC	"	135,256	253	58	154
N4PSE	"	132,239	235	77	146
KA4CDN	"	131,570	223	64	159
K5KG	"	130,788	257	60	129
K3JWI	"	126,914	255	52	126
W7HU	"	124,074	321	57	126
AD8J	"	122,607	268	53	118
AA4DD	"	122,512	211	62	146
KJ4BIX	"	122,176	253	74	110
KT4O	"	116,948	242	46	127
W3TB	"	111,696	235	61	118
WA4AH	"	105,545	187	55	154
KT4ZB	"	104,166	234	42	120
KZ1O	"	102,720	238	44	116
N4HB	"	97,900	199	44	134
W1EG	"	97,722	218	56	122
K6ES	"	97,194	232	50	117
KS4X	"	75,600	167	53	115
K4MDI	"	74,580	168	51	114
K4AFE	"	72,332	173	60	109
WB4EHG	"	66,816	168	53	121
N6DW	"	59,829	155	45	102
K4FW	"	56,049	136	54	103
NX4O	"	46,968	125	50	102
NU4E	"	45,500	136	46	94
K4SHW	"	44,023	129	49	84
WB3D	"	38,674	125	38	84
W4GHV	"	31,440	111	41	79
W4UT	"	27,135	122	22	59
K3WR	"	26,832	104	35	69
KQ4KK	"	25,755	97	34	67
KØZR	"	25,600	101	37	63
N3JT	"	25,200	97	30	70
N4DJ	"	*25,098*	*107*	*23*	*66*
WD4OHD	"	24,849	97	36	63
WC4H	"	22,154	84	39	67
K8LF	"	21,663	107	25	62
KC4D	"	20,880	91	31	56
K4IDD	"	19,656	73	35	69
W4RQ	"	16,000	87	28	52
K3WA	"	15,677	96	14	47
K1ZW	"	10,790	57	21	44
N4JOW	"	10,368	67	21	43
NC8N	"	10,366	61	22	51
KB4QZH	"	*9,861*	*67*	*17*	*40*
KN4NVU	"	8,192	51	26	38
K4XG	"	7,770	46	25	45
AA8R	"	7,316	49	23	36
N4ZY	"	5,891	47	16	27
W4QK	"	4,275	34	13	32
KD4LEM	"	2,448	30	13	21
K2YJ	"	40	4	4	4
K1MM	**28A**	**475,344**	**1251**	**31**	**113**
WV4P	"	191,352	515	29	105
WO4O	"	177,480	555	26	90
N4BP	"	158,500	558	24	76
N7BU	"	8,232	63	15	34
KØLUZ	"	6,660	78	4	26
NR4L	**21A**	**259,992**	**633**	**35**	**122**
KM4HI	"	214,176	550	28	110
KR4F	"	153,690	391	32	109
KV4T	"	109,980	276	34	122
NØSMX	"	59,225	205	23	80
W4WF	"	37,125	175	20	55
			(OP: @N4WW)		
KEØL	"	34,578	127	26	76
N4EEB	"	912	20	7	9
KK4ODQ	"	493	11	7	10
WJ2D	**14A**	**239,440**	**591**	**36**	**110**
AB4B	"	207,036	537	35	107
W4EEY	"	41,516	138	26	81
W1IE	"	10,788	79	20	42
W4ATL	"	656	14	5	11
N4XL	**AA**	**1,191,265**	**967**	**113**	**332**
*W3OA	"	381,080	480	74	206
*AA4R	"	250,410	361	68	187
*K2ZBA	"	179,775	259	67	188
*N3CKI	"	155,034	327	41	133
*K4DZR	"	126,732	251	54	125
*WB4MSG	"	122,912	249	47	137
*W9TCV	"	101,598	229	49	128
*W4LT	"	89,096	207	48	124
*N2OG	"	81,312	210	55	121
*WN8Y	"	80,290	238	53	102
*KD4ACG	"	75,140	166	50	120
*AA4NP	"	73,950	173	55	119
*W4EE	"	67,500	190	45	90
*KN4MIV	"	66,101	192	38	95
*WA8AHZ	"	61,440	159	51	109
*KB9RKK	"	58,590	148	53	102
*KK4WDP	"	55,626	170	35	92
*WN4AFP	"	52,824	168	39	85
*KA3PCX	"	51,666	149	46	112
N4SAX	"	*49,875*	*159*	*43*	*82*
*W4TM	"	47,816	135	50	89
*WD4FMG	"	44,849	115	53	96
*WW4LS	"	44,118	146	43	86
*K4FJW	"	43,032	139	51	81
*N4NTO	"	43,028	138	38	86
*KM4IAJ	"	42,380	139	46	84
*KN8F	"	42,280	121	52	88
*AA5NT	"	42,164	124	40	87
*KQ3K	"	41,760	110	47	98
*K4FTO	"	38,874	149	37	77
*KD2SXD	"	37,631	128	47	74
*KZ4A	"	33,579	113	39	78
*K4VOZ	"	30,597	118	33	60
*N5VX	"	29,925	123	36	69
*AC2N	"	28,314	110	34	65
*KE4YOG	"	25,755	100	32	69
*KN4TCF	"	23,937	89	37	64
*KO4HMB	"	23,072	102	43	69
*AD4YQ	"	22,454	91	42	67
*KX4BI	"	21,462	81	37	61
*W4GKA	"	19,035	87	23	58
*W4BTW	"	18,236	73	39	58
*WA4VGZ	"	18,144	76	40	56
*N4BQQ	"	17,430	75	39	66
*N4CN	"	16,614	79	26	52
*KC4LZN	"	13,122	61	30	51
*KF4AV	"	11,319	60	31	46
*AC4MG	"	10,160	64	33	47
*AJØIM	"	8,970	51	25	44
*KC5CMX	"	8,255	50	21	44
*KS4L	"	8,190	57	24	41
*N4GG	"	7,424	46	28	36
*K5EEE	"	6,496	54	18	40
*KK4BZ	"	6,136	48	26	33
*K4MVM	"	5,610	38	20	31
*KJ4RDF	"	4,704	37	19	30
*N3GTG	"	4,644	40	15	28
*K4LDC	"	4,590	39	14	31
*W1JKU	"	3,948	50	12	35
*K4IDT	"	3,000	31	21	19
*K4TTU	"	2,574	30	18	21
*K3MZ	"	2,560	28	16	24
*K1JEA	"	2,301	24	18	21
*N4JN	"	2,214	24	19	22
*KS4S	"	2,211	26	11	22
*W4TG	"	1,500	22	6	19
*N4SJJ	"	992	21	13	18
*N4NP	"	968	16	6	16
*K2KW	"	912	14	12	12
W4LSM	"	*768*	*13*	*12*	*12*
*NØYY	"	476	11	8	9
*W4CMG	"	418	10	10	9
*K5LD	"	286	8	5	8
*K9RDU	"	54	7	4	5
*KO4ISG	"	42	12	9	12
***N3UA**	**28A**	**195,939**	**584**	**25**	**98**
*N4IJ	"	86,456	306	24	83
*KO4TPN	"	285	9	7	8
*K4KIM	"	20	2	2	2
***W6NCB**	**21A**	**48,685**	**206**	**23**	**68**
*N4NM	"	12,712	92	18	38
*KO4JKO	"	18	2	1	2
***W4LC**	**14A**	**70,252**	**294**	**21**	**70**
*KN4UOW	"	1,612	31	9	17
***K7LU**	**3.7A**	**1,638**	**26**	**8**	**18**
		District 5			
K5TR	**A**	**5,006,144**	**4231**	**149**	**398**
K5GN	"	2,978,531	2674	138	361
N2IC	"	1,911,429	1858	127	276
K5RX	"	553,419	673	94	215
K5XS	"	490,144	613	80	209
WQ5L	"	415,896	564	73	185
N5VU	"	213,624	392	58	149
K5LAD	"	181,152	356	63	141
N5KWD	"	146,949	290	73	146
KD5QHV	"	121,110	279	56	109
WA2VYA	"	116,866	312	45	97
N5QJ	"	113,364	223	66	135
K5GKC	"	*91,872*	*242*	*44*	*100*
W5DLP	"	65,985	175	61	98
W5ZZ	"	58,873	209	38	75
AE5P	"	39,237	117	39	84
W5ORC	"	37,392	137	48	75
KG5EIU	"	30,564	127	41	67
AD5CQ	"	24,960	106	42	62
K5TBA	"	24,849	98	44	55
W5JWP	"	19,747	119	37	54
N4OGW	"	13,420	86	16	39
AG5MS	"	4,600	48	22	24
W5ZN	"	*2,336*	*27*	*10*	*22*
KG5RXE	"	832	13	13	13
KG5IPA	"	299	8	5	8
AE5X	"	*252*	*9*	*6*	*6*
KF5TWJ	"	162	6	3	6
K5CCC	"	140	5	5	5
W5PR	**28**	**219,744**	**823**	**26**	**83**
N5MT	"	6,384	66	14	24
KD5J	"	2,060	38	7	13
NG5R	"	1,992	35	10	14
N5AW	**21**	**433,960**	**1149**	**33**	**119**
WE6EZ	"	106,212	470	28	78
KZ5J	"	57,684	237	23	69
W5XNA	**14**	**3,528**	**39**	**13**	**23**
W5WE	*7*	*810*	*18*	*7*	*11*
***K5FUV**	**A**	**574,128**	**663**	**97**	**227**
*K5XU	"	270,963	394	76	177
*W5TMC	"	258,060	421	61	169
*W5RAW	"	152,352	297	69	138
*KE5LQ	"	101,135	219	63	116
*NN5T	"	99,532	218	63	104
*NW5Q	"	91,044	211	58	104
*KC7QY	"	80,937	199	53	100
*AA3C	"	70,224	201	48	84
*KD2KW	"	57,240	219	43	65
*NZ6N	"	45,012	135	46	86
*N5HD	"	38,192	140	47	65
*KIØR	"	37,845	148	56	89
*WA5LFD	"	36,942	155	39	55
*N5DTT	"	36,297	126	44	65
*AE5LQ	"	29,304	111	37	62
*AB5TH	"	27,104	97	40	72
*W5PKK	"	26,950	111	48	62
*K5DHY	"	26,884	110	31	63
*AA5GJ	"	25,764	94	49	65
*WB5BHS	"	24,598	215	42	56
*KD5WT	"	17,520	103	30	43
*KD5FBA	"	14,875	74	35	50
*KJ6DQ	"	13,455	70	27	42
*WB5JJJ	"	9,976	55	38	48
*KA5D	"	8,976	59	29	37
*KF5BCN	"	7,812	57	25	37
*KG5TKF	"	7,493	57	25	34
*KD5AFS	"	6,235	58	15	28
*AA5AH	"	6,020	67	34	36
*K5MAY	"	3,410	45	25	30
*KF5OMH	"	2,257	33	15	22
*N5CWA	"	2,130	29	9	21
*KB5GI	"	1,140	17	14	16
*K2ZP	"	1,104	22	10	14
*K5MPD	"	1,075	17	11	14
*KJ5CF	"	640	13	8	12
*KF5RUW	"	450	11	10	8
*N5FEE	"	270	9	6	9
*K5TY	"	255	15	8	9
*K5NJM	"	192	7	5	7
***W5RJJ**	**28**	**21,952**	**160**	**22**	**34**
*KD5ILA	"	7,308	66	14	28
*W5JHC	"	352	13	6	10
*K5IX	"	60	5	2	2
*W5TJS	"	24	2	2	2
*W5CJM	"	15	8	7	8
***WA5SOG**	**21**	**70,785**	**274**	**25**	**74**
*NK5G	"	16,988	110	18	44
*AF5CC	"	2,888	31	15	23
*W5KY	"	2,618	45	12	22
***KB8VND**	**14**	**15,936**	**99**	**19**	**45**
*WD5BHS	"	324	9	3	9
*KF5TXU	"	216	8	6	6
***KG5STP**	**7**	**12**	**2**	**2**	**2**
N5RZ	**AA**	**2,327,028**	**1590**	**137**	**424**
N5YT	"	1,281,280	1035	116	332
W5GN	"	1,161,897	1149	105	306
N5OT	"	1,062,732	782	126	372
N5HC	"	878,560	859	114	266
WZ5M	"	865,032	830	108	291
K5PAR	"	723,232	699	109	279
NT5V	"	698,368	785	95	246
W5TN	"	592,704	676	87	249
WBØTEV	"	450,754	364	138	340
KT5C	"	421,208	581	87	209
N5EE	"	410,750	571	80	185
NR5T	"	344,983	469	69	202
N5TJ	"	323,885	397	82	225
AC4CA	"	311,669	473	65	164
N5XJ	"	266,370	496	58	137
K5LJ	"	238,795	296	85	208
K5UA	"	227,948	405	58	138
N5GI	"	207,788	282	78	209
K5HTE	"	199,752	368	80	152
N5WNG	"	186,902	296	66	160
W2GS	"	177,560	344	59	134
AA5H	"	140,400	262	67	141
K5CKS	"	78,744	223	33	103
K5NZ	"	76,048	151	73	123
K5BG	"	74,648	216	41	83
KG5VK	"	67,425	183	52	93
KC5DI	"	62,640	178	68	112
W5THT	"	33,534	100	48	90
K5EC	"

*WA6FWN	"	5,217	46	22	25
*W6MSN	"	4,747	56	22	25
*NI6P	"	4,380	62	29	31
*AJ6QH	"	3,010	36	18	17
*ADØL	"	3,003	36	20	19
*KN6IUW	"	2,745	34	19	26
*W6KME	"	2,220	33	16	21
*K6OWS	"	2,074	26	16	18
*K6CES	"	2,016	25	22	20
*N6ERL	"	1,989	28	20	19
*KE6LB	"	1,682	28	15	14
*KQ6DI	"	1,652	26	14	14
*K6ESS	"	1,598	30	18	16
*KD6NFD	"	1,377	21	14	13
*KG6TYB	"	1,333	24	16	15
*K6DWD	"	1,326	29	12	14
*K9BGC	"	1,242	30	12	11
*N6UNH	"	855	15	9	10
*W6RGS	"	627	12	9	10
*W6RPM	"	414	13	9	9
*AE6YB	"	160	7	4	4
*N6AKO	"	156	9	7	6
*KF6JS	"	154	7	5	6
*K6AVS	"	90	6	4	6
*KM6VXO	"	66	8	6	5
*AE6VX	"	29	32	15	14
*KE6MT	"	14	5	4	3
*KC8J	"	8	2	2	2
***KN6EVH**	**28**	**3,045**	**33**	**15**	**20**
*N6RVI	"	1,848	29	12	16
*KJ6YQV	"	80	4	4	4
*WA6OUD	"	70	5	5	5
***NP4IW/W6**	**21**	**49,640**	**294**	**24**	**44**
*N6RM	"	24,696	150	25	38
*K7XE	"	14,820	108	23	34
*NG6X	"	10,920	84	21	31
*KN6EWM	"	3,420	34	18	27
*N6BHX	"	1,292	29	8	9
*AD6GE	"	18	3	3	3
***WA7BNM**	**14**	**59,843**	**213**	**30**	**73**
*K6GHA	"	23,030	140	24	46
*K6BBQ	"	2,883	41	15	16
*W6JLV	"	1,664	28	12	14
*K6MUG	"	136	13	8	9
*WY6R	"	77	6	3	4
*AD6AD	"	30	4	2	3
***KN6ECE**	**7**	**30**	**3**	**2**	**3**
*K6BCB	"	21	5	3	4
***WZ6ZZ**	**3.7**	**72**	**7**	**3**	**3**
KK6P	**AA**	**3,271,334**	**2598**	**138**	**344**
			(OP: W7IV)		
W6YI	"	2,113,741	1593	145	352
N6RV	"	2,003,075	1587	137	338
NT6X	"	1,576,596	1493	131	280
KI6RRN	"	1,409,580	1298	131	279
W1SRD	"	777,700	794	111	239
W4EF	"	526,212	617	111	200
N6JV	"	500,388	698	67	192
WC6H	"	490,730	640	103	207
W6DR	"	478,166	572	118	229
W1PR	"	335,654	513	80	162
K6RIM	"	221,130	358	81	153
N6QQ	"	215,991	354	73	160
WA6KHK	"	172,431	326	76	131
K6TQ	"	167,280	375	54	116
NC6R	"	137,837	282	75	128
N6GP	"	102,714	235	62	97
WE6Z	"	93,888	377	47	97
KG6AO	"	91,360	213	63	97
N6WS	"	89,552	170	70	123
K6MM	"	77,672	203	49	103
N6GEO	"	77,400	248	58	71
W6MOB	"	62,061	198	53	84
W1RH	"	57,070	170	44	86
W6SX	"	36,400	125	46	66
K6GFJ	"	35,445	145	35	50
K7GK	"	34,200	113	48	66
W6EU	"	30,847	106	40	69
KF6NCX	"	30,135	112	48	57
K6NV	"	29,798	134	36	58
N6ZT	"	27,710	123	29	56
N6WT	"	26,784	92	50	58
K6MI	"	16,898	98	32	39
N6GWH	"	16,132	94	30	44
W6KC	"	15,906	96	24	42
AF6SA	"	11,055	63	28	39
K8TR	"	9,381	70	27	32
W6IA	"	7,480	50	26	29
W6APH	"	7,089	56	25	26
AI6MC	"	7,040	67	26	29
NZ6G	"	6,308	50	34	49
K6ZP	"	4,655	48	22	27
K6XC	"	1,032	20	12	12
W6DPM	"	144	8	5	7
WQ6X	**28A**	**48,412**	**395**	**19**	**30**
W6PH	**21A**	**214,650**	**577**	**33**	**102**
W6SR	"	64,200	223	28	79
NK6A	"	36,408	194	23	51
N6IC	"	19,824	137	19	37
AI6Z	**3.7A**	**2,139**	**34**	**13**	**18**
***W7TR**	**AA**	**147,730**	**313**	**73**	**114**
			(OP: KH2TJ)		
*AI6DR	"	67,596	202	52	77
*N6ORB	"	53,856	202	40	59
*K6RC	"	51,030	156	50	76
*W6AAE	"	28,885	123	44	65
*AG6JA	"	10,858	77	30	31
*KN6NSK	"	7,128	53	25	29
*KS6F	"	4,945	48	22	21
*W6DMW	"	4,784	42	25	27
*KE6PLA	"	3,990	46	26	31
*K6EI	"	2,698	29	17	21
*AJ6IY	"	2,442	33	17	16
*AE6PL	"	1,908	27	16	20
*N9DK	"	1,584	27	17	16
*W6JWP	"	352	10	6	10
*W6RQ	"	345	12	8	7
***W6ZL**	**28A**	**35,154**	**203**	**20**	**42**
*K6ICS	"	6,120	60	16	24
*NE6I	"	1,121	20	8	11
*K6LIZ	"	96	5	3	5
		District 7			
ND7K	**A**	**3,036,215**	**2979**	**146**	**309**
			(OP: W4IX@N6WIN)		
W7YAQ	"	685,170	738	109	236
W7XQ	"	583,914	706	100	217
K7SS	"	402,996	596	95	163
K9RZ	"	231,231	391	80	151
KT6VV	"	187,775	358	78	125
K9JF	"	185,328	345	82	126
N7WS	"	174,919	333	75	136
AB7YQ	"	162,575	338	57	118
AD7XG	"	125,624	289	55	109
AC7GL	"	114,872	270	62	104
KS7T	"	111,188	323	53	101
N7RK	"	103,140	213	74	117
KK7DS	"	49,077	159	48	75
K6NR	"	43,585	142	50	65
WB6JJJ	"	43,290	142	52	65
W7PV	"	42,600	133	39	81
KE7F	"	36,708	123	53	85
WD7E	"	35,504	120	48	64
N7LR	"	30,450	110	47	58
WG7X	"	27,336	112	41	61
N7TU	"	23,862	115	35	47
W7TX	"	20,526	106	31	35
WA7TV	"	19,339	115	32	51
KE2VB	"	18,957	100	32	39
N7RBL	"	18,564	98	37	54
AG7KO	"	16,275	82	28	47
K9JDV	"	15,958	93	36	43
N3EG	"	15,642	78	35	44
KJ7YYI	"	12,665	71	36	49
N7DWW	"	12,512	78	26	42
N7TCO	"	12,150	87	34	41
KX7TL	"	11,900	68	35	35
KT7P	"	11,076	66	35	43
K9QJS/7	"	8,940	64	26	34
NZ2S	"	6,612	59	28	29
W7AUM	"	6,348	62	24	22
WA7NE	"	5,405	45	22	25
NW7M	"	4,300	36	19	24
W7FD	"	3,534	70	30	32
KH6VM	"	2,535	30	18	21
WY7KY	"	2,318	35	17	21
W4WAC	"	2,160	28	14	16
KI7Y	"	2,112	26	16	16
W7QL	"	1,457	18	14	17
KØXA	"	1,333	28	14	17
K7EZQ	"	900	20	15	15
AF7LZ	"	529	18	12	11
N2DEJ	"	180	7	6	6
NØVD	**28**	**10,246**	**78**	**19**	**28**
W7WR	"	198	11	5	6
N7RQ	**21**	**364,882**	**1075**	**34**	**100**
AA6AA	"	286,130	858	33	97
NX1P	"	140,679	581	29	70
K7JQ	"	44,382	212	23	55
NX7Q	"	17,880	120	21	39
K7MY	"	9,666	80	19	35
KI7DG	"	4,699	43	12	25
N5CR	**14**	**146,388**	**447**	**35**	**97**
W7PEB	"	1,485	34	13	14
W7WA	**7**	**442,382**	**1344**	**32**	**86**
N6LB	"	336	18	9	15
N7GP	**3.7**	**6,486**	**125**	**17**	**29**
***N7IR**	**A**	**442,260**	**594**	**88**	**182**
*AK6A	"	210,304	363	75	137
*KK7AC	"	126,498	283	59	115
*K7CAR	"	111,475	250	69	106
*W6US	"	110,000	255	71	105
*N7VZU	"	77,035	195	55	100
*N6ITY	"	59,220	173	47	94
*N7ESU	"	49,491	174	41	76
*KK7RR	"	39,200	140	42	70
*N7MZW	"	39,160	145	47	63
*W1DGL	"	37,083	119	59	82
*KNØW	"	32,660	122	51	64
*K7STU	"	30,805	140	42	59
*K7CW	"	24,882	115	35	43
*W7SY	"	19,352	93	36	46
*N7SF	"	14,080	70	33	47
*WB7EUJ	"	13,746	97	40	47
*N7AME	"	13,608	88	36	48
*N7XCZ	"	13,032	77	30	42
*N7VS	"	12,596	80	29	38
*KB7AK	"	11,480	67	38	44
*W7MTL	"	9,454	70	30	28
*AC7AF	"	8,710	56	28	39
*NE7TS	"	8,658	67	35	39
*KE7ZAC	"	8,094	56	35	36
*AF7VC	"	8,000	63	24	26
*AA7DK	"	7,632	60	32	40
*KI7WGA	"	7,614	68	22	25
*AG7KU	"	7,344	59	32	36
*KC7ITP	"	6,350	45	25	25
*W7TMT	"	5,670	50	21	21
*WB6OEE	"	5,664	52	22	26
*KJ7WRB	"	5,655	52	19	20
*AG7EM	"	4,816	38	27	29
*KI7IOC	"	4,224	38	19	25
*AE7AP	"	4,200	38	17	23
*WA7JNJ	"	3,782	46	16	15
*W7TMD	"	3,200	34	20	20
*K7TTK	"	3,168	50	12	12
*AC7MX	"	2,822	48	18	16
*KI7MZH	"	2,728	37	22	22
*K7YL	"	2,232	28	19	17
*W7LRM	"	1,890	24	15	15
*KDØBSY	"	1,566	28	13	14
*W7RCS	"	1,530	23	15	15
*K7ACZ	"	1,479	18	14	15
*KE7X	"	1,377	19	13	14
*KI7PBR	"	1,150	18	12	13
*K1AUS	"	1,012	19	11	11
*K2AES	"	952	22	13	15
*N7MJL	"	744	28	16	15
*N7VGO	"	676	17	14	12
*K7JSG	"	377	11	5	8
*KK7AGH	"	374	19	11	11
*N7WA	"	338	11	6	7
*W6DSG	"	320	11	8	8
*KF7ZZ	"	110	8	5	5
*K7UWQ	"	90	7	3	3
*W6ABM	"	88	4	4	4
*WØFLZ	"	77	10	6	5
*KG7VQ	"	42	3	3	3
*N7TCV	"	36	5	5	4
***KF7KTC**	**28**	**3,696**	**68**	**11**	**17**
*KC7STK	"	3,193	37	13	18
*WA8ZNC	"	2,117	36	13	16
*K7ULS	"	216	9	6	6
*KG6HMC	"	12	4	2	2
***NF7E**	**21**	**64,647**	**266**	**28**	**71**
*KI7MJU	"	1,920	39	16	16
***N7SVI**	**14**	**4,277**	**69**	**18**	**29**
*K9PY	"	3,108	40	15	22
*KJ7PRW	"	465	34	8	7
*KG7WFQ	"	351	18	7	6
*W6AGZ	"	280	14	5	5
*K7MSO	"	120	5	5	5
*W7FCL	"	72	11	5	4
*KJ7KJA	"	40	6	4	4
*KF7OJA	"	30	5	3	3
***K7BWC**	**7**	**2,040**	**24**	**13**	**21**
*KX6X	"	36	3	2	2
*KJ7MEB	"	0	2	2	1
KA6BIM	**AA**	**1,334,500**	**1235**	**135**	**290**
NA2U	"	1,170,552	1199	135	318
K2PO	"	1,146,132	1195	120	252
K7IU	"	513,590	708	102	188
NG7M	"	504,680	609	87	223
WA7AN	"	406,290	520	87	203
KD7PCE	"	377,142	519	80	183
WU9B	"	338,672	516	79	165
N7ZUF	"	334,110	504	93	166
K7WP	"	300,578	402	90	184
KH7X/W7	"	284,406	389	96	225
			(OP: KH6ND)		
KB7RJ	"	270,144	439	92	176
W7CL	"	262,965	447	83	152
W7GES	"	237,200	468	59	141
K7STO	"	225,720	343	96	168
N7GCO	"	206,797	345	74	153
W7RIS	"	185,464	334	80	159
KØSN	"	163,866	327	52	134
KE6GFI	"	152,190	331	68	122
KØIP	"	145,110	261	68	142
AK8E	"	144,727	261	72	151
NC7M	"	144,157	321	59	110
K7GS	"	130,130	273	73	109
NU7J	"	120,888	218	76	131
KB7HDX	"	119,875	302	60	115
AA7V	"	111,752	184	79	150
KN7K	"	109,792	266	73	115
KF7U	"	107,250	237	57	108
KC7V	"	95,632	223	65	107
K7VIT	"	94,377	222	65	98
N7RVD	"	93,456	238	53	91
K7EDX	"	88,880	161	66	136
K7WXB	"	81,450	204	53	97
N9NA	"	80,609	211	60	89
WA7DUH	"	74,536	189	54	100
K7QA	"	56,068	193	47	60
KE7W	"	48,222	151	50	64
W6KGP	"	47,376	147	40	86
KD7VIK	"	46,291	158	41	78
KY7M	"	42,955	132	42	79
WX7P	"	40,273	157	43	60
KB7AZ	"	36,120	131	43	62
K6DTT	"	31,416	128	52	80
K7EKD	"	26,568	116	48	60
K7BVT	"	25,232	140	33	50
N7PHY	"	18,620	106	30	40
W7DBA	"	15,600	81	36	42
KG7QXE	"	14,214	88	34	35
N7EPD	"	14,112	62	37	47
NN7M	"	13,718	126	17	21
W7SS	"	13,600	75	32	48
W6OAT	"	13,041	69	31	38
WA7BAM	"	9,030	53	23	47
W7JHR	"	8,909	77	27	32
N3CMI	"	7,936	49	24	38
KA6RWL	"	3,999	36	20	23
N7GND	"	3,204	34	17	19
K7EG	"	1,876	26	13	15
K7UT	"	1,224	24	16	18
W7CO	"	396	11	6	6
W7SLS	"	240	8	7	8
N6SS	**28A**	**145,015**	**578**	**30**	**67**
WA7CPA	"	2,624	35	13	19
K7AR	**21A**	**102,378**	**323**	**29**	**84**
W7ZR	"	81,744	309	29	75
N7DD	**14A**	**263,835**	**733**	**37**	**106**
W7IL	"	134,625	441	33	92
KK7PW	"	14,694	92	23	39
W7VM	"	280	9	7	7
***WZ8T**	**AA**	**282,600**	**485**	**78**	**147**
*WAØWWW	"	196,443	356	71	136
*W7OM	"	139,008	300	75	117
*K6VHF	"	132,112	285	67	117
*NW7E	"	127,551	250	72	111
*K7VAP	"	105,968	263	64	84
*WN6W	"	66,187	202	50	71
*KJ7NEL	"	35,055	114	46	77
*WA7YXY	"	31,992	137	39	54
*N7UJJ	"	26,857	101	44	63
*K7HV	"	25,585	91	47	72
*K7TQ	"	21,170	111	36	37
*KK7GO	"	19,264	68	48	64
*K7KB	"	14,580	68	28	53
*W7YTF	"	11,760	73	33	37
*KG6ECW	"	10,773	87	28	35
*KR2E	"	8,636	52	29	39
*KI7TT	"	7,424	53	32	32
*KD7WNV	"	4,232	43	24	22
*WA7SHP	"	3,840	58	15	15
*KI7N	"	2,808	34	18	18
*K7JKM	"	1,920	26	16	16
*KK7A	"	910	16	12	14
*N6XT	"	294	14	11	10
*NG2G	"	264	9	6	6
*KM6DYO	"	170	7	5	5
*KD7GHZ	"	54	4	3	3
***WV7S**	**28A**	**252**	**7**	**6**	**6**
***WØBF**	**21A**	**22,940**	**116**	**25**	**49**
***N7EEL**	**14A**	**420**	**13**	**10**	**11**
*NB7B	"	60	7	3	2
		District 8			
NA8V	**A**	**1,831,296**	**1519**	**116**	**340**
W8MET	"	526,621	590	99	232
K8GL	"	500,816	646	74	203
KM8AM	"	474,744	615	90	212
KE8NBC	"	219,209	367	70	153
N8DE	"	198,414	323	56	163
KJ8H	"	171,051	332	64	137
N8SBE	"	108,477	260	44	109
KM8R	"	104,082	259	45	121
			(OP: K8CMR)		
WA8RCN	"	87,262	235	48	113
KE8E	"	64,032	198	43	95
AA8KY	"	61,612	170	46	100
K8ZR	"	43,068	166	27	70
KT8Y	"	36,312	131	36	66
WB8AXK	"	32,500	128	36	64
N8HHG	"	28,875	109	38	67
W8YV	"	28,620	120	29	61
AD8DM	"	18,720	96	26	52
KD8DNS	"	11,736	66	22	50
WF8D	"	9,152	64	21	43
W8KEN	"	8,804	59	27	35
K8DO	"	8,700	64	19	39
W8GNT	"	7,772	58	19	39
K8SAS	"	1,856	28	14	18
K8EAW	"	442	21	11	15
K8ALH	"	152	12	8	11
K8GU	**28**	**6,640**	**58**	**11**	**29**
K8AO	**21**	**95,702**	**313**	**27**	**82**
KC8ZMN	"	49,217	208	22	67
W8GOC	**14**	**22,620**	**130**	**18**	**47**
KD8JAM	"	14,850	101	22	44
KT8D	**7**	**4,600**	**44**	**13**	**33**
***K8ZM**	**A**	**624,325**	**690**	**85**	**240**
*KM6Z	"	277,112	431	78	190
*W8ASA	"	255,588	394	70	166
*K3DMG	"	141,624	307	43	125
*N8BAP	"	129,816	248	66	150
*N8WCP	"	127,980	311	42	116
*KD8LDS	"	97,526	262	36	107
*N6JRL	"	80,976	232	57	111
*KB8TL	"	73,304	205	41	95
*AD8AL	"	70,550	202	56	110
*N8CUB	"	70,470	174	44	101
*WB8JUI	"	69,088	202	40	87
*W8UA	"	61,087	178	38	89
*KW8KW	"	60,417	204	41	96
*N8PPF	"	57,084	156	50	92
*N8CWX	"	55,900	165	43	87
*W8KSC	"	49,792	149	44	84
*W8LYO	"	47,399	133	46	93
*WA3JAT	"	44,145	155	38	71
*K7DR	"	41,199	163	25	68
*N8BZN	"	36,332	141	44	80
*KE8RJU	"	35,258	114	43	79
*W8TB	"	34,720	110	44	80
*AB8OU	"	34,086	123	47	67
*WA8RD	"	27,960	112	42	78
*KE8SIQ	"	24,347	103	30	67
*K2SY	"	21,631	96	30	67
*AD8BV	"	21,631	102	38	59
*N9KOP	"	21,504	101	30	54
*W8UD	"	21,328	97	35	51
*NR8N	"	18,690	89	31	58
*KE8XH	"	12,560	75	32	48
*N8AJM	"	12,551	62	31	46
*N5MKY	"	12,450	68	31	52
*N5WCS	"	11,310	67	33	45
*K8NW	"	7,866	52	29	40
*NF8M	"	4,770	38	22	31
*W8TVO	"	4,410	38	15	27
*AD8HN	"	4,080	38	20	28
*WJ8B	"	4,032	48	24	32
*N8MRS	"	3,723	36	20	31
*KD8ORN	"	3,600	35	21	27
*WF8C	"	3,182	33	15	28
*KBØUPC	"	3,124	32	19	25
*W8MTB	"	2,345	27	13	22
*AD8Y	"	1,634	30	19	24
*K8CVM	"	1,395	23	15	16
*AC7JN	"	405	9	7	8
*W8NRX	"	221	9	6	7
*AD8WA	"	144	7	5	7
*KC8LWW	"	0	11	9	10
***N8II**	**28**	**170,558**	**563**	**25**	**82**
*W8TWA	"	63,440	294	20	60
*W8DN	"	5,358	51	11	27
*W8EH	"	931	19	6	13
*KB8MXE	"	714	22	4	10
*KC8JX	"	336	14	3	5
***W8JGU**	**21**	**62,208**	**242**	**27**	**69**
*WB8JAY	"	3,811	37	11	26
***KO4HPP**	**14**	**720**	**22**	**5**	**15**
*N8FYL	"	150	7	5	5
***N8VW**	**7**	**18,088**	**110**	**20**	**48**
*KG9Z	"	893	20	7	12
K8CX	**AA**	**2,318,160**	**1619**	**125**	**395**
WA3C	"	2,234,305	1486	121	430
N4RA	"	1,974,176	1326	126	418
W8MJ	"	1,965,512	1378	128	408
KG8CW	"	1,264,523	1053	118	343
KC8QDQ	"	790,230	677	103	323
WA8MCD	"	783,485	790	87	268
NX8T	"	537,251	649	78	211
K8VG	"	432,456	568	78	218
WA8Y	"	362,103	447	81	220
K4YJ	"	343,360	416	77	213
W3HKK	"	309,673	416	85	202
K8PK	"	229,864	363	71	165
W8GNM	"	218,828	339	71	156
AD8FD	"	175,625	233	82	199
N8AA	"	168,525	278	61	164
WB8AKW	"	162,876	311	56	140
N8BJQ	"	161,370	296	58	140
N9RC	"	116,160	199	66	154
W8RID	"	111,074	261	47	111
AC8RJ	"	108,570	173	67	168
WZ8P	"	96,866	202	64	123
WD8S	"	89,082	236	40	107
N8LLC	"	84,937	209	53	104
WA8LRW	"	75,210	209	43	95
W8UF	"	70,794	171	48	114
N5JED	"	67,200	197	47	93
K8AJJ	"	63,838	200	27	91
W8LRJ	"	56,472	137	68	113
W8HPJ	"	53,708	181	35	81
NR8Z	"	53,268	151	47	91
KC8ZKI	"	39,243	120	47	80
KD8FS	"	38,646	131	31	83
KE9L	"	34,290	111	47	80
AC8G	"	19,176	114	19	49
WB8ASI	"	11,096	61	34	39
K8YE	"	2,542	21	20	21
KF8MZ	"	2,457	30	18	21
K8ALM	"	770	13	10	12
W8WJC	"	480	11	9	11
K8RO	"	420	13	8	13
K8TS	**21A**	**56,910**	**242**	**25**	**80**
W8CZN	**14A**	**192,128**	**487**	**37**	**115**
***K8LY**	**AA**	**246,750**	**434**	**62**	**148**
*W8GX	"	195,833	338	56	153
*KC8YDS	"	103,224	194	64	140
*KE8HBV	"	97,865	216	56	129
*WT8WV	"	83,486	195	55	114
*K8LN	"	65,100	174	43	97
*N8UI	"	55,739	155	43	96
*N4LSJ	"	40,150	132	34	76
*W4YPW	"	15,708	75	27	50
*KD8VRX	"	12,480	63	25	55
*AC8NP	"	10,730	73	20	38
*WS6K	"	10,241	64	36	41
*KE8RCI	"	8,125	49	22	43
*WR8F	"	5,236	43	15	29
*KB8DX	"	4,860	39	27	33
*K8GT	"	2,132	28	19	22
*AB8AC	"	2,028	28	19	20
*N8EV	"	1,815	21	13	20
*N8EI	"	1,665	22	15	22
*K8AJS	"	1,500	20	15	15
*AB8SF	"	1,000	17	12	13
*WU1N	"	275	9	4	7
***W8AIT**	**28A**	**2,325**	**39**	**11**	**20**
		District 9			
W9RE	**A**	**4,845,002**	**3110**	**141**	**421**
K9BGL	"	2,384,256	1913	124	324
W9GT	"	665,226	839	75	216
KD9MS	"	496,836	545	96	237
WE9V	"	433,302	566	77	204
W9DZ	"	406,288	542	71	197
NF9Z	"	209,090	390	58	148
KJ9B	"	170,184	359	42	126
K9LA	"	143,375	288	56	129
K9UC	"	117,192	279	41	111
NN1N	"	103,950	235	50	115
WB9VGO	"	103,284	224	57	114
K9AWS	"	102,284	218	59	123
KE9UA	"	72,419	198	50	89
W9TC	"	68,609	175	61	96
N9GH	"	55,664	149	47	95
K9XN	"	52,520	184	29	75
AK9PL	"	46,690	120	47	114
KB9S	"	26,956	114	34	58
W9FFA	"	17,892	97	18	53
K9TY	"	12,460	66	25	45
AD5PR	"	11,753	64	21	52
KC9WIB	"	11,700	77	30	45
N9TO	"	9,734	59	19	43
K9IDQ	"	7,296	46	25	39
K9MA	"	6,055	62	8	27
WI9Z	"	5,883	40	19	34
N9TR	"	3,560	33	16	24
WD9AZB	"	1,100	21	6	16
K9AWM	"	495	16	8

W9YK	"	117,754	248	57	125
K9CI	"	110,110	232	54	128
K9DUR	"	105,570	243	48	122
W9VW	"	95,976	205	51	135
					(OP: K9SG)
KC9K	"	92,442	166	68	149
WI9WI	"	83,000	149	53	147
W9ZV	"	73,790	196	48	109
N9SB	"	72,645	180	45	100
WG9L	"	72,450	181	47	103
N9GUN	"	63,096	169	38	94
KA9GDW	"	45,966	128	48	93
KC9EOQ	"	34,771	120	38	71
K9TI	"	33,491	110	33	74
N9RMB	"	33,480	123	33	75
KC9WAV	"	32,844	139	23	61
WB9TFH	"	31,527	112	40	73
KJ9C	"	27,000	82	43	82
W9RCJ	"	23,166	88	40	77
W9PDS	"	17,577	99	16	47
KØTQ	"	10,010	56	22	43
WB9TFF	"	9,563	54	29	44
K9STM	"	7,502	55	22	40
N9LQ	**28A**	**37,884**	**203**	**18**	**48**
WA9LT	**21A**	**26,228**	**136**	**23**	**60**
AJ9C	"	10,830	68	18	39
W9PA	**7A**	**88,206**	**282**	**30**	**92**
N9LR	"	15,833	106	18	53
***WE9R**	**AA**	**1,493,796**	**1213**	**114**	**329**
*K9PG	"	233,966	331	79	183
*KC9JML	"	187,950	337	66	144
*N9UA	"	169,916	291	68	146
*W9VQ	"	157,941	277	55	152
*KD9CLH	"	126,492	281	49	117
*K9PW	"	59,280	186	36	84
*AA9JS	"	45,936	160	49	83
*N9VPV	"	42,625	130	48	77
*WA9PND	"	42,624	112	51	97
*WD9IDS	"	37,440	123	41	79
*WU9D	"	36,934	131	44	74
*K9QA	"	32,292	110	43	74
*WA9LEY	"	25,900	107	33	67
*KØPLC	"	23,166	89	35	64
*KD9NYE	"	23,040	97	35	61
*W9PI	"	21,112	95	30	61
*WT9Q	"	19,488	84	33	54
*W9LW	"	17,864	79	31	57
*K9MCK	"	17,862	91	29	49
*AE9LL	"	12,948	67	32	46
*KD9OIN	"	11,607	69	29	44
*WO9B	"	9,741	69	15	36
*N9TCA	"	9,010	44	42	43
*KYØQ	"	8,760	60	25	35
*WB4ZUT	"	8,192	56	24	40
*N9UPU	"	6,270	49	23	32
*KD9EFO	"	5,992	50	24	32
*K9LC	"	4,300	42	18	32
*KZ9V	"	2,997	33	16	21
***W9XT**	**28A**	**49,998**	**233**	**22**	**56**
***W9QL**	**21A**	**30,108**	**146**	**21**	**57**
*KD9REA	"	8,109	62	16	35
***N9TGR**	**14A**	**132,258**	**368**	**32**	**102**

District Ø

WØEWD	**A**	**1,546,098**	**1643**	**102**	**279**
NCØB	"	740,826	874	95	211
N7WY	"	661,760	761	85	235
KQØC	"	483,912	666	99	183
KØJJR	"	348,492	509	75	182
WDØT	"	342,095	525	82	165
K9MWM	"	235,524	447	77	151
WØETT	"	234,373	434	75	148
NØGN	"	227,925	420	73	152
KJØI	"	194,040	329	72	148
NØYO	"	167,049	320	69	138
ADØH	"	115,584	298	59	113
KA9OZP	"	92,414	221	60	101
KAØLDG	"	91,657	226	48	103
NØKQ	"	82,476	212	64	94
WA7NPX	"	61,880	196	36	83
NØTEK	"	27,664	109	33	58
N6RSH	"	15,753	75	40	49
AG7O	"	15,554	99	29	48
KDØJLE	"	12,168	81	34	38
KØDME	"	11,664	75	28	44
KFØGV	"	5,198	40	15	31
KCØUUT	"	1,518	26	7	16
AIØM	"	828	29	12	11
KØBBB	**21**	**127,889**	**395**	**32**	**95**
NØOK	"	115,168	351	32	90
NØWRK	"	19,430	118	25	42
KDØOYC	"	16,986	120	18	39
K8MCN	**14**	**4,600**	**46**	**15**	**25**
WDØBGZ	**7**	**24,273**	**121**	**25**	**62**
***NGØC**	**A**	**392,042**	**570**	**86**	**201**
*NØUR	"	315,100	525	68	162
*ACØW	"	309,920	467	77	183
*WØYJT	"	121,632	281	58	123
*KAØPQW	"	115,056	252	70	134
*WZØW	"	91,045	250	37	102
*KØSV	"	79,750	208	48	97
*KNØL	"	77,472	248	45	99
*NGØT	"	68,707	205	42	85
*WØPI	"	59,202	183	37	80
*KØJP	"	53,998	162	54	79
*WØZF	"	39,330	129	40	75
*WØCOE	"	28,362	121	30	57
*KBØNES	"	26,400	104	38	62
*KBØARZ	"	23,826	88	47	67
*NØUJJ	"	21,680	111	31	49
*AI6O	"	20,995	95	27	58
*KØJJM	"	20,064	93	35	61
*WØJMW	"	17,958	84	32	50
*KØSCO	"	17,298	90	39	54
*WØWLA/M	"	17,040	88	36	44
*AAØCW	"	13,160	73	29	41
*N1CCC	"	11,316	64	29	40
*NØZIB	"	11,088	69	21	42
*KEØUNV	"	8,892	58	32	44
*NØUK	"	8,687	50	31	42
*KØXF	"	7,809	57	23	34
*KØJM	"	7,595	53	13	36
*KØDVP	"	7,020	59	24	36
*N7SE	"	6,156	53	25	29
*WBØHHM	"	6,110	49	22	25
*KØALT	"	5,252	39	23	29
*NØVRM	"	5,040	45	20	28
*NØHDR	"	4,756	38	23	35
*WAØLIF	"	4,576	42	20	32
*KFØDCY	"	4,240	44	25	28
*AEØEE	"	3,956	36	21	22
*NØMDC	"	3,570	43	17	34
*KØVG	"	3,555	35	21	24
*KYØO	"	3,465	32	18	27
*ADØYL	"	2,982	33	18	24
*NØTXW	"	2,970	37	20	25
*KØROD	"	2,600	25	18	22
*W7KAM	"	2,550	36	13	21
*KEØNHQ	"	2,542	33	17	24
*KØKWH	"	2,304	31	18	18
*KBØSNI	"	2,262	27	19	20
*KFØAIT	"	1,960	21	16	19
*KBØHP	"	1,800	26	8	16
*KD5RXP	"	1,705	26	15	16
*KØOP	"	1,683	27	16	17
*KØVH	"	1,566	22	12	17
*WA2JQZ	"	1,248	20	12	12
*KEØME	"	841	22	13	16
*KDØWUQ	"	396	15	10	8
*KDØFED	"	224	9	7	7
*WØNFS	"	208	8	6	7
*NØUM	"	200	9	5	5
*NØLRB	"	84	17	6	6
***K7BG**	**28**	**300**	**11**	**5**	**7**
*AEØFY	"	4	1	1	1
***KBØKFH**	**14**	**6,672**	**58**	**16**	**32**
*N9CI	"	2,880	37	11	21
*WØPP	"	1,643	29	11	20
*WBØMLI	"	702	15	9	9
*KEØRIZ	"	391	20	7	10
*KD5FQF	"	96	14	3	3
*ACØM	"	24	4	2	2
***NØMMA**	**7**	**1,702**	**30**	**9**	**14**
*KEØQKF	"	54	4	2	4
K3PA	**AA**	**2,462,524**	**1681**	**138**	**418**
KØMD	"	1,930,058	1474	127	367
WØGJ	"	1,586,316	1271	132	357
KØAP	"	815,608	780	99	280
KØYR	"	782,635	789	110	269
WAØMHJ	"	695,780	675	96	284
NIØK	"	544,488	699	88	206
KØTRL	"	512,958	682	70	212
AAØAI	"	321,594	431	70	203
WØPSY	"	319,800	494	79	167
WØPR	"	316,800	454	89	186
KØAD	"	292,825	428	78	187
NSØR	"	283,860	459	66	162
K4IU	"	256,536	398	83	169
WØBM	"	246,648	370	64	175
W7II	"	237,656	358	72	172
KVØI	"	223,344	448	63	153
KBØEO	"	221,312	276	96	208
KIØF	"	218,064	344	61	175
WØRX	"	217,588	297	80	186
NØBUI	"	207,192	392	51	143
N5KB	"	184,338	337	67	142
KØARY	"	170,624	249	56	192
KØRJW	"	167,698	317	59	132
NØIRM	"	165,319	285	64	145
NØAT	"	160,130	258	72	167
KØVXU	"	153,720	262	79	173
WØOR	"	126,205	230	67	148
NØNZG	"	124,317	316	46	125
AEØA	"	120,234	250	55	119
WØERP	"	109,250	185	64	166
K1KD	"	105,096	219	58	116
KEØJRS	"	99,034	211	46	123
KØHMZ	"	94,300	220	51	113
WXØZ	"	88,033	217	54	97
AKØBC	"	84,400	153	72	139
KØPC	"	78,894	175	48	114
NWØM	"	61,087	172	42	85
KDØUN	"	42,344	137	47	87
WBØWIV	"	41,382	127	43	78
K5ZG	"	40,460	133	37	82
KSØAA	"	36,716	114	47	90
N5TU	"	34,000	128	47	78
KØIR	"	27,168	112	38	58
K2KR	"	24,732	86	45	63
NEØU	"	23,114	98	30	61
ADØAB	"	19,847	95	35	54
KØWPM	"	15,916	75	44	48
KØHB	"	10,332	64	32	52
K9TWW	"	8,066	44	32	42
N9CD	"	8,000	47	24	40
KØTG	"	5,143	53	12	25
KEØJYU	"	2,331	26	16	21
KØZX	"	1,104	17	10	13
N9GB	"	961	18	14	17
WDØREW	"	40	4	4	4
WØCP	**21A**	**96,192**	**372**	**28**	**68**
NØRN	"	85,490	294	27	76
K7TD	"	41,496	144	28	76
KØEU	"	20,560	202	18	22
KFØIQ	"	294	8	6	8
KVØQ	**14A**	**454,905**	**1251**	**38**	**127**
***AD1C**	**AA**	**421,940**	**549**	**84**	**205**
*NØHJZ	"	401,380	475	99	230
*NØEO	"	239,094	396	72	150
				(OP: AAØAW)	
*KØEA	"	217,511	423	57	136
*KØKX	"	164,615	302	62	143
*AEØLR	"	58,982	210	58	96
*KEØITC	"	58,557	172	40	91
*KØMPH	"	36,330	138	41	64
*KØLAF	"	33,440	144	39	71
*KF9MT	"	23,793	112	40	63
*KØIL	"	20,240	97	33	55
*KCØDWZ	"	12,844	72	31	45
*NDØTS	"	9,944	57	40	48
*KEØOR	"	5,300	41	16	34
*KØRC	"	2,496	25	18	21
*NØMTC	"	2,340	27	20	25
*KØWOI	"	1,764	31	8	13
*NØRMJ	"	1,204	17	13	15
*N2DEE	"	250	15	5	5
***KØMKL**	**28A**	**48**	**3**	**3**	**3**
***AKØM**	**21A**	**2,310**	**28**	**11**	**24**
*ABØVZ	14A	0	2	2	1

Alaska

AL7LO	**A**	**177,792**	**648**	**54**	**74**
AL1G	"	83,640	582	29	39
NL7V	"	38,380	156	32	63
NL8F	**7**	**5,202**	**79**	**16**	**18**
***KL1IN**	**A**	**1,596**	**38**	**11**	**10**
KL7KK	**AA**	**338,457**	**541**	**90**	**137**
AL7AF	"	199,595	357	66	143
AL7A	"	40,920	200	39	49
AL7KC	**14A**	**35,047**	**126**	**32**	**69**
***KL4OB**	**AA**	**6,448**	**102**	**17**	**14**
***KL1JP**	**21A**	**3,893**	**112**	**9**	**8**

Bahamas

C6AHB	**AA**	**78,387**	**452**	**28**	**59**

Barbados

***8P1W**	**A**	**452,956**	**1062**	**61**	**135**

Belize

V31XX	**7**	**936,258**	**3005**	**29**	**108**
					(OP: K4XS)

Bermuda

***VP9I**	**A**	**3,585,504**	**3529**	**103**	**339**
					(OP: N6GQ)
*VP9NR	"	3,280	30	14	26
VP9AD	**AA**	**120,594**	**233**	**54**	**148**

Canada

District 1

VY2TT	**A**	**5,704,800**	**4444**	**105**	**375**
					(OP: K6LA)
VA1XH	"	232,744	460	46	142
VA1MM	"	100,788	287	41	107
VE1JS	"	78,625	247	35	90
VE9AA	**21**	**687,554**	**1992**	**28**	**106**
VA1MC	"	34,788	164	19	59
***VE1ZA**	**A**	**126,290**	**269**	**49**	**124**
*VY2GF	"	118,261	299	40	103
*VE9RLW	"	32,966	129	41	65
*VY2LI	"	23,902	121	19	55
*VE9WRS	"	13,464	74	29	43
*VA1JON	"	8,745	70	19	34
*VE1BSD	"	5,635	50	18	31
*VY2DF	"	2,485	38	17	18
*VA1UAV	"	168	9	7	7
***VE1SQ**	**21**	**50,405**	**213**	**20**	**65**
***VE9JKK**	**14**	**20**	**2**	**2**	**2**
VO2AC	**AA**	**828,075**	**1112**	**73**	**232**
VO1CH	"	659,230	866	69	217
VO2NS	"	540,000	1395	55	125
VE1RSM	"	183,516	272	69	177
VE9CB	**3.7A**	**253,240**	**1127**	**20**	**84**
***VA1CC**	**AA**	**73,513**	**171**	**34**	**129**
***VE9ML**	**1.8A**	**6,885**	**133**	**7**	**20**

District 2

VE2IM	**A**	**9,717,785**	**6425**	**132**	**455**
					(OP: VE3DZ)
VE2GSO	"	995,379	1927	53	164
VA2OBW	"	72,062	204	45	92
VE2TSM	"	64,130	215	33	88
VE2VIA	"	25,050	139	19	56
***VE2BVV**	**A**	**128,936**	**325**	**34**	**108**
*VE2OWL	"	100,296	222	48	120
*VA2CF	"	93,760	251	50	110
*VA2KD	"	45,150	161	45	84
*VE2SMS	"	36,915	148	35	80
*VA2GRU	"	15,225	93	27	48
*VE2IRF	"	660	14	10	10
*VA2IG	"	336	16	10	11
*VE2PGI	"	96	7	5	7
***VA2CO**	**21**	**32,960**	**151**	**23**	**57**
VE2AED	**AA**	**1,151,150**	**1166**	**97**	**288**
VA2AM	"	930,860	809	99	337
VA2QR	"	330,948	466	76	185
VE2HIT	"	322,392	466	74	192
VE2CSM	"	158,256	393	54	114
VE2OV	"	114,332	214	61	141
VA2HKR	"	13,124	75	24	44
VA2CSP	"	783	22	10	17
VA2EBI	**21A**	**237,456**	**608**	**26**	**110**
VE2WAT	"	86,219	320	26	87
VA2WA	**14A**	**1,447,055**	**3241**	**37**	**130**
VE2SG	**7A**	**5,734**	**51**	**14**	**33**
***VE2HEW**	**AA**	**81,212**	**215**	**57**	**101**
*VA2VT	"	29,900	111	47	83
*VE2IAA	"	21,000	139	31	53
*VA2YLB	"	12,628	93	32	45
*VE2YUC	"	12,626	80	17	42
*VE2ZWA	"	238	13	8	9
***VE2IDX**	**7A**	**359,840**	**1184**	**28**	**102**
					(OP: VE3ZF)

District 3

CF3A	**A**	**7,994,096**	**5387**	**133**	**450**
					(OP: VE3AT)
VC3X	"	2,464,398	2311	108	315
					(OP: VE7VR)
VA3MW	"	1,289,926	1545	104	270
VE3CKO	"	963,215	964	100	315
VE3TW	"	576,534	712	80	214
VE3KP	"	275,688	412	74	178
VA3CQG	"	200,512	341	62	179
VE3GYL	"	161,116	341	55	133
VA3LUK	"	93,879	207	61	122
VE3BR	"	93,094	206	55	123
VE3HNA	"	40,320	164	26	64
VE3ETE	"	38,586	149	39	79
VA3EPM	"	11,005	74	27	44
VE3MDX	"	7,722	53	21	33
VA3AR	**21**	**24,510**	**201**	**7**	**36**
VE3PN	**14**	**291,324**	**864**	**30**	**102**
VA3RD	3.7	1,340	80	5	5
***VA3NW**	**A**	**199,815**	**541**	**52**	**121**
*VE3EPS	"	169,050	424	45	105
*VA3OKG	"	140,616	334	49	113
*VA3RTG	"	138,646	298	54	127
*VA3KRT	"	114,752	264	46	117
*VA3SB	"	110,345	282	41	104
*VE3FH	"	107,950	245	50	120
*VE3NFN	"	97,681	284	34	103
*VE3EL	"	96,869	246	49	108
*VE3VY	"	86,268	221	49	107
*VE3RVZ	"	84,500	219	57	112
*VA3TPS	"	82,938	254	43	95
*VE3IDT	"	80,995	197	56	111
*VE3GRA	"	54,636	199	37	79
*VA3NGE	"	36,960	204	30	54
*VE3LVW	"	31,992	124	29	64
*VA3HES	"	30,738	118	28	66
*VA3CK	"	25,802	123	37	60
*VA3DBT	"	21,070	104	29	57
*VA3QB	"	17,484	88	32	62
*VA3CME	"	14,766	97	26	43
*VE3KBI	"	13,284	65	30	52
*VE3NQM	"	12,627	67	29	40
*VE3LMS	"	11,736	64	24	48
*VA3FUZ	"	4,500	49	18	27
*VA3IJK	"	4,171	54	17	26
*VA3JFZ	"	3,240	59	17	19
*VA3UG	"	2,170	26	12	19
*VE3AC	"	1,056	17	7	15
*VE3JZT	"	1,025	23	11	14
*VE3UGT	"	972	19	14	13
*VE3QEE	"	896	19	14	14
*VA3GMO	"	396	17	10	12
*VE3ROR	"	228	10	10	9
***VE3TM**	**21**	**70,472**	**283**	**22**	**70**
*VE3TG	"	67,104	246	21	75
*VE3OMV	"	16,296	106	16	40
*VE3JGO	"	10,670	77	16	39
***VE3ZW**	**14**	**2,052**	**34**	**8**	**19**
*VA3TTZ	"	152	12	4	4
VE3JM	**AA**	**5,188,082**	**3146**	**134**	**497**
VA3DF	"	2,554,665	1647	127	428
VE3YT	"	294,300	494	57	161
VA3WW	"	270,903	494	59	160
VE3ZZ	"	250,096	398	55	177
VE3RZ	"	210,897	244	84	237
VE3LRL	"	157,528	267	70	162
VE3EY	"	137,020	227	65	156
VA3CW	"	107,912	222	58	130
VE3DZP	"	92,232	181	57	159
VA3LR	"	53,460	173	26	82
VE3MZD	"	35,466	105	62	76
VE3BK	"	28,783	127	42	65
VA3TNM	"	17,563	75	35	56
VE3JS	"	15,120	83	17	46
VE3RIA	"	10,200	80	23	37
VE3VN	**21A**	**840,123**	**1805**	**34**	**137**
***VE3PJ**	**AA**	**875,320**	**814**	**94**	**301**
*VA3PDX	"	695,114	751	86	260
*VA3SWG	"	530,862	1082	54	152
*VA3WB	"	489,100	685	73	219
*VE3CWU	"	327,264	528	61	163
*VE3BX	"	286,957	650	68	141
*VA3IDD	"	186,245	395	56	137
*VA3DKL	"	113,220	308	44	104
*VE3MV	"	85,995	222	48	99
*VA3WU	"	84,252	184	51	126
*VE3HG	"	60,732	173	34	92
*VA3JXP	"	49,742	139	58	96
*VE3HZ	"	43,010	163	40	75
*VE3FZ	"	38,512	137	40	76
*VE3VMJ	"	34,272	118	42	84
*VA3OOL	"	19,440	87	32	58
*VA3RSX	"	18,912	84	33	63
*VA3PAF	"	17,313	94	27	60
*VA3JHQ	"	15,394	79	33	53
*VA3ONO	"	9,324	60	23	40
*VA3AMX	"	8,768	58	24	40
*VA3MQS	"	6,161	61	24	37
*VE3OU	"	168	7	5	7
*VA3IPG	21A	16,443	104	17	46
***VE3BFU**	**7A**	**23,400**	**127**	**19**	**56**

District 4

VE4SG	**14**	**68,524**	**484**	**21**	**53**
***VA4HZ**	**A**	**44,733**	**189**	**35**	**76**
					(OP: VE4HAZ)
*VE4GKM	"	38,070	193	34	56
VE4VT	**AA**	**2,936,540**	**3343**	**114**	**301**
***VE4DL**	**AA**	**16,642**	**163**	**21**	**32**

District 5

VE5CPU	**A**	**227,052**	**646**	**55**	**104**
***VE5SF**	**A**	**594,080**	**1143**	**76**	**159**
*VE5DLC	"	36,216	257	34	38
*VE5WD	"	6,720	47	28	36
*VE5YAK	"	4,361	45	24	25
*VE5DLD	"	1,045	27	10	9
***VE5GC**	**14**	**2,668**	**47**	**12**	**17**
*VE5ZC	"	403	19	7	6

District 6

VE6JEM	**A**	**209,900**	**1078**	**43**	**57**
VE6FT	"	48,090	189	41	64
VA6EPC	"	40,828	365	21	38
VE6KD	"	34,100	152	45	55
VE6CA	**14**	**29,400**	**376**	**17**	**23**
VE6ALC	"	0	0	0	0
VE6DDD	1.8	16	2	2	2
***VE6TN**	**A**	**502,758**	**740**	**86**	**193**
*VA6RCN	"	37,170	201	43	47
*VE6SPS	"	21,120	165	26	34
*VE6CLG	"	15,023	76	35	48
*VE6SK	"	3,737	50	19	18
*VE6TD	"	3,193	56	16	15
*VA6TVA	"	1,760	25	17	15
VA6MA	**AA**	**254,552**	**661**	**72**	**116**
VE6IVN	"	138,996	287	65	133
VE6SVN	"	71,416	202	59	99
VE6CSX	"	18,300	117	36	39
VE6IKR	"	6,864	73	20	28
VE6WQ	**21A**	**267,132**	**1064**	**31**	**82**
***VA6AGR**	**AA**	**1,380**	**38**	**12**	**11**
*VE6WMS	"	330	15	6	4

District 7

VA7DX	**A**	**744,504**	**1305**	**98**	**170**
VE7FE	"	440,622	1088	72	110
VA7ST	"	330,848	742	64	132
VA7GI	"	24,104	131	44	48
VA7JC	"	3,364	65	14	15
VA7RYL	"	165	7	6	5
VA7RR	**14**	**858,108**	**3057**	**32**	**97**
***VE7BC**	**A**	**66,568**	**236**	**49**	**57**
*VA7DBJ	"	34,391	123	48	71
*VE7RSV	"	20,400	105	39	41
*VA7EGZ	"	17,457	102	31	38
*VA7CTG	"	16,730	106	31	39
*VE7SFW	"	12,960	108	33	27
*VE7WJ	"	11,385	66	25	44
*VE7BGP	"	9,072	64	31	32
*VE7EMI	"	8,127	89	33	30
*VE7XFA	"	6,576	58	24	24
*VA7RN	"	5,280	68	17	16
*VA7OTC	"	3,872	41	21	23
*VE7BLW	"	2,884	41	15	13
*VE7CLX	"	1,560	41	13	11
*VA7KBM	"	495	18	8	7
*VE7YAH	"	380	22	11	9
VE7DX	**AA**	**1,063,231**	**1758**	**105**	**184**
VE7WNK	"	275,744	477	82	142
VA7QD	"	214,368	570	56	112
VA7OM	**14A**	**502,600**	**1650**	**33**	**107**
VE7GL	**7A**	**174,174**	**1021**	**28**	**59**
***VE7JMN**	**AA**	**186,550**	**354**	**76**	**129**
*VA7BEC	"	115,137	580	38	61
*VA7DXC	"	35,700	186	41	43
*VE7AX	"	24,514	92	43	60
*VE7AHT	"	11,475	66	33	42
*VE7KAJ	"	2,670	38	15	15
*VE7VIB	28A	66	4	3	3

Cayman Islands

ZF5T	**AA**	**7,533,535**	**5646**	**139**	**462**
					(OP: K5GO/ZF9CW)

Costa Rica

TI2OY	**A**	**1,110,912**	**1916**	**72**	**191**
***TI2JS**	**A**	**699,489**	**1799**	**65**	**124**
*TI5GCO	"	296,450	947	39	115
*TI3WTI	"	1,377	19	12	15
***TI3ATS**	**28**	**4,216**	**63**	**11**	**23**
*TI3IES	"	18	2	1	2
***TI3DK**	**21**	**40,128**	**268**	**18**	**48**
TI1T	**21A**	**1,092,384**	**3416**	**31**	**113**
					(OP: TI2CC)
***TI2WMP**	**AA**	**242,165**	**591**	**56**	**131**

Cuba

***CO8NMN**	**A**	**482,349**	**1015**	**68**	**155**
*CO6HZ	"	377,504	955	54	134
*CO2VDD	"	318,742	708	50	144
*CO8BYT	"	88,578	356	42	84
*CL6AW	"	26,316	193	24	62
*CO7HH	"	9,936	75	24	30
***CO6EC**	**28**	**16,464**	**110**	**18**	**38**
*CO6WD	"	7,378	91	15	19
***CO8NDZ**	**21**	**57,368**	**336**	**15**	**56**
*CO8AW	"	24,644	213	18	43
***CO8RH**	**14**	**88,160**	**420**	**24**	**71**
***CO6SRS**	**7**	**22,400**	**158**	**15**	**49**
*CL2JR	"	15,219	125	15	42
*CM2CHR	"	8,413	69	10	37
***CO2JD**	**3.7**	**82,709**	**540**	**17**	**56**
CM2XN	**21A**	**881,424**	**2634**	**30**	**114**
***CM2RSV**	**28A**	**141,081**	**718**	**25**	**68**

Dominican Republic

| | |

St. Martin

FS4WBS	**AA**	**88,941**	**601**	**20**	**49**

St. Pierre & Miquelon

FP5AC	**A**	**39,744**	**190**	**34**	**74**

US Virgin Islands

KP2M	**A**	**1,760,458**	**2928**	**83**	**204**
			(OP: KT3Y)		
NP2J	**1.8**	**41,796**	**375**	**12**	**42**
			(OP: K8RF)		
***KJØD/KP2**	**28**	**5,627**	**163**	**9**	**8**
*NP2SA	"	4	1	1	1
NP2X	**AA**	**3,760,302**	**3467**	**124**	**373**
			(OP: K9VV)		
***NP2KW**	**AA**	**146,499**	**503**	**52**	**89**

Maritime Mobile (No. America)

***RAØLQ/MMAA**		**134,936**	**343**	**54**	**113**

AFRICA

African Italy

***IH9/OK1M**	**3.7A**	**233,910**	**893**	**17**	**73**

Algeria

***7X2GK**	**AA**	**194,535**	**505**	**30**	**105**

Canary Islands

EA8RM	**A**	**13,431,245**	**8173**	**127**	**442**
EA8ZS	"	144,768	279	50	142
EA8DKA	"	378	21	7	14
EA8DGO	**28**	**91,800**	**372**	**22**	**68**
***EA8BQM**	**A**	**604,560**	**955**	**62**	**158**
*EA8AQV	"	222,552	403	62	136
*EC8AZE	"	212,868	500	39	123
***EA8TX**	**28**	**728,218**	**2092**	**27**	**95**
*EA8CZK	"	15,840	132	11	34
***EA8DGC**	**14**	**18,265**	**107**	**16**	**49**
*EA8AUW	"	6,045	61	12	27
***EA8BPX**	**3.7**	**3,502**	**37**	**12**	**22**
EF8K	**28A**	**62,181**	**344**	**16**	**47**
			(OP: EA8DET)		
***EC8AQQ**	**AA**	**225,610**	**507**	**38**	**116**
*EA8CQW	"	134,596	297	43	118
***EA8DED**	**21A**	**297,000**	**791**	**31**	**104**
			(OP: OH2BP)		

Cape Verde

D4F	**28**	**2,356,029**	**4884**	**36**	**133**
			(OP: IZ4DPV)		
D4Z	**21**	**2,414,968**	**5088**	**35**	**131**
			(OP: SQ9D)		
D4L	**14**	**2,023,580**	**4028**	**36**	**136**
			(OP: IK2NCJ)		
***D44PM**	**A**	**263,160**	**580**	**43**	**137**

Ceuta & Melilla

EA9KB	**21A**	**204,192**	**749**	**21**	**75**
***EA9ABC**	**28A**	**316,250**	**1019**	**27**	**83**

Gabon

TR8CA	*AA*	*33,592*	*162*	*18*	*58*

Lesotho

7P8RU	**28**	**240,546**	**895**	**18**	**76**
			(OP: RA1ZZ)		

Madeira Islands

CT9ABY	**28**	**1,148,189**	**2986**	**31**	**102**
			(OP: OM2KW)		
CR3DX	**21**	**2,296,170**	**5047**	**36**	**119**
			(OP: OM3RM)		
CR3A	**14**	**2,175,460**	**4568**	**37**	**127**
			(OP: OM3BH)		
CQ3J	**3.7**	**287,768**	**1006**	**20**	**84**
			(OP: CT3MD)		
***CT3KU**	**A**	**35,020**	**166**	**23**	**62**
***CS9/PD3EM**	**28**	**465,500**	**1670**	**21**	**74**
*CT3IQ	"	330,786	1166	22	80
CQ3W	**21A**	**1,488,792**	**3154**	**35**	**129**
			(OP: DF7EE)		
CR3N	**7A**	**406,800**	**1261**	**27**	**86**
			(OP: CT3EN)		

Mauritius

***3B8BAP**	**A**	**24**	**2**	**2**	**2**
3B8CW	**AA**	**105,398**	**250**	**44**	**107**

Namibia

V51JP	**AA**	**1,082,568**	**1478**	**66**	**192**

Reunion Island

***FR4TS**	**A**	**210**	**9**	**5**	**9**
***FR4TT**	**14**	**1,363**	**23**	**14**	**15**

Senegal

6W1QL	**21**	**17,480**	**140**	**11**	**35**

Seychelles

S77HQ	**AA**	**30,318**	**127**	**30**	**63**
			(OP: S79VU)		

South Africa

ZS2ABE	**A**	**156,706**	**300**	**60**	**127**
ZS2MAC	"	1,404	18	12	14
ZS6TVB	**21**	**627,380**	**1726**	**34**	**96**
***ZS6HI**	**A**	**34,238**	**116**	**33**	**73**
*ZS6ELI	"	21,948	88	28	65
*ZS1S	"	6,500	46	20	32
***ZS9Z**	**28**	**59,598**	**287**	**21**	**56**
			(OP: ZS1OIN)		
*ZS6KVZ	"	8,540	88	6	29
*ZS1CDG	"	928	21	7	9
***ZS6RKE**	**21**	**2,697**	**31**	**12**	**19**
*ZS6CR	"	1,690	23	9	17
ZS1C	**AA**	**76,501**	**241**	**33**	**80**
***ZS2EC**	**AA**	**33,792**	**138**	**28**	**60**

St. Helena

ZD7BG	**A**	**508,900**	**986**	**40**	**135**

Tanzania

***5H3MB**	**AA**	**159,692**	**377**	**41**	**107**
			(OP: IK2GZU)		

ASIA

Asiatic Russia

District 9

RM9I	**A**	**5,994,040**	**4524**	**126**	**394**
RG9A	"	4,162,044	2973	120	388
UA9MA	"	3,806,075	3033	118	337
R8WF	"	3,043,425	2581	85	340
RA9P	"	2,354,360	2512	77	278
RK9AX	"	1,422,272	1951	73	211
R9LY	"	1,105,923	1501	66	207
R9YBW	"	677,082	952	69	213
RW9TA	"	629,052	1073	55	173
R8UT	"	252,960	499	41	145
RZ9WU	"	214,839	393	57	162
R9UA	"	38,870	162	33	82
RL8C	"	7,546	54	29	48
RM8A	**28**	**180,668**	**748**	**22**	**72**
RW9LL	"	173,283	747	18	71
RW9QA	"	1,995	98	8	11
UA9AU	**21**	**48,075**	**271**	**18**	**57**
RA9AU	**14**	**243,066**	**851**	**23**	**79**
RZ9OQ	"	229,560	693	30	90
UA8J	"	194,076	716	28	80
RX9CM	"	4,719	64	10	23
RA9UAD	"	1,416	24	6	18
***UB8A**	**A**	**352,762**	**606**	**56**	**177**
*RT9YA	"	304,071	528	69	168
*RK9DC	"	275,600	497	44	156
*UB8AAT	"	215,270	431	53	156
*R8KAY	"	167,700	433	42	130
*RV9CM	"	157,066	322	44	138
*RM8Y	"	153,850	360	42	128
*RT9YT	"	101,376	362	48	96
*UA9MQN	"	83,904	241	41	111
*RA9YE	"	83,844	270	44	93
*UA9JNT	"	77,376	248	30	94
*R9MBY	"	28,890	185	28	62
*UA9JNG	"	24,244	134	16	60
*R9QQ	"	20,368	94	22	54
*R9UTW	"	10,332	97	20	43
*RA9AQU	"	8,745	84	21	34
*RA9YC	"	4,590	61	19	35
R8QAN	*"*	*2,210*	*48*	*12*	*22*
*UA9CHL	"	910	21	12	14
***R9VA**	**28**	**95,710**	**437**	**21**	**64**
*RZ9UF	"	33,276	287	19	40
*RA9SF	"	26,082	195	11	43
*RV9UCN	"	13,570	102	12	34
***RZ9P**	**21**	**134,212**	**625**	**23**	**66**
*RW9DX	"	80,182	314	23	71
*RX9CCJ	"	58,905	311	16	61
*RZ9AD	"	43,788	229	21	61
*R8CAX	"	6,815	89	12	35
***RA9AP**	**14**	**64,988**	**299**	**17**	**60**
*RZ8U	"	53,792	264	21	61
*RZ9YN	"	13,182	72	26	52
*RU9AC	"	4,719	51	6	27
*UA9KBC	"	1,150	30	9	14
*RA8AI	"	483	22	7	14
***UA9SMU**	**7**	**40,535**	**230**	**13**	**54**
*RC9AR	"	14,787	111	12	41
*UA9URI	"	4,928	60	11	33
RA9V	**AA**	**3,277,577**	**2878**	**109**	**354**
UA9TF	"	1,773,296	1488	109	337
RO9A	"	843,885	1012	72	243
UA9CTT	"	653,795	1017	52	177
R9YC	"	499,995	791	70	201
UA9CDC	"	322,480	517	59	173
UA9AX	"	183,024	304	75	171
RM8L	"	149,526	424	38	104
			(OP: RA9LT)		
UB8S	"	122,026	287	52	142
RJ9J	"	60,775	162	39	104
RY9C	*"*	*1,085*	*19*	*17*	*18*
			(OP: UA8DX)		
RX9WN	**28A**	**257,165**	**1002**	**21**	**74**
UA9LAO	"	174,476	709	24	82
UA9YE	"	52,920	269	20	64
R8LA	**21A**	**315,469**	**986**	**27**	**92**
RW9W	"	183,388	560	28	99
***UA9R**	**AA**	**1,287,072**	**1354**	**86**	**283**
*R9RA	"	1,272,804	1242	98	300
*RC9A	"	327,360	515	78	186
*UI8C	"	299,691	526	46	167
*R9CX	"	119,160	257	54	126
*RZ9UO	"	64,372	298	16	61
*UA9CUA	"	58,240	186	41	89
*RX9UK	"	54,758	192	45	86
*RG8U	"	17,404	110	30	46
*R9AM	"	9,690	64	18	39
***RV9UP**	**21A**	**202,150**	**659**	**30**	**100**
***R2ET/9**	**14A**	**55,944**	**300**	**19**	**55**
*UF8C	"	51,745	240	17	62
*UA9AGX	"	21,744	117	16	56

District Ø

RØAA	**A**	**397,761**	**599**	**75**	**198**
RAØACM	"	187,005	435	69	126
RØWC	"	140,220	330	62	128
UAØDAR	"	100,440	376	45	75
RAØLMO	"	94,608	273	58	88
RØQAF	"	42,642	234	46	57
RØCDO	"	36,040	214	41	65
RAØOU	"	13,600	74	28	52
UAØSR	**21**	**461,619**	**1602**	**29**	**94**
RWØUM	"	176,890	1052	26	72
RNØCT	**14**	**208,453**	**955**	**29**	**68**
RØDX	**7**	**58,460**	**501**	**28**	**51**
RTØF	**1.8**	**3,096**	**164**	**10**	**8**
***UAØSE**	**A**	**115,752**	**322**	**46**	**110**
*RØMZ	"	74,360	304	61	82
*UBØAZR	"	32,850	198	22	51
*UIØA	"	23,674	116	30	59
*RAØWHE	"	19,448	110	17	51
*UAØA	"	17,466	91	26	56
*UAØIHY	"	11,160	131	32	30
*UAØAD	"	7,599	57	16	35
*RCØAJ	"	5,824	55	22	34
RUØSN	*"*	*1,950*	*23*	*14*	*16*
*UAØCDO	"	300	8	7	8
***UAØUY**	**21**	**32,760**	**210**	**20**	**64**
*RUØL	"	858	22	7	6
***RØUT**	**14**	**35,770**	**233**	**23**	**50**
*UCØC	"	18,275	233	16	27
*RØCW	"	15,416	246	13	28
RAØQD	**AA**	**1,206,436**	**2062**	**93**	**215**
RAØR	"	459,762	785	62	160
RØAGY	"	315,948	567	62	164
RAØAM	"	49,595	191	36	73
RVØAR	*"*	*13,632*	*61*	*43*	*53*
RNØC	"	4,726	63	13	21
UAØWG	"	154	6	5	6
RYØA	**28A**	**102,060**	**543**	**14**	**56**
RNØA	**21A**	**153,015**	**648**	**26**	**75**
UCØA	"	115,995	488	23	72
RAØSMS	"	29,601	165	18	51
UDØW	**14A**	**96,574**	**371**	**29**	**80**
UAØUV	"	13,720	117	17	39
RAØAY	*"*	*6*	*1*	*1*	*1*
UAØSU	**7A**	**128,480**	**492**	**28**	**82**
RMØF	**3.7A**	**10,842**	**156**	**19**	**20**
***RDØA**	**AA**	**1,057,680**	**1231**	**92**	**268**
*RUØLL	"	218,751	422	73	140
*UAØQNV	"	46,509	203	33	78
*RZØL	"	42,640	169	36	68
***RMØW**	**28A**	**26,657**	**172**	**15**	**46**

Asiatic Turkey

TA2ANL	**A**	**129,648**	**354**	**26**	**120**
TA2BS	"	10,638	75	12	42
TAØAS	"	8,109	61	14	39
TA2SN	"	2,624	34	15	26
TA2DE	**14**	**54,285**	**262**	**16**	**61**
***TA3DE**	**A**	**691,824**	**1114**	**66**	**166**
*TA2MN	"	70,478	229	30	101
*TA2UCT	"	53,352	196	29	88
*TA2SUA	"	6,314	56	12	29
*TA3OER	"	6,063	45	15	32
*TA3SRD	"	3,015	35	15	30
*TA3GO	"	2,040	26	11	19
*YM3KB	"	416	12	6	10
			(OP: TA3LCK)		
***TA4AU**	**14**	**17,061**	**131**	**8**	**39**
*TA2IAZ	"	10,750	85	12	38
***TA2L**	**7**	**3,780**	**41**	**11**	**25**
*TA3BJK	"	6	1	1	1
TA7OM	**AA**	**4,458,597**	**3752**	**104**	**325**
TA2DM	"	41,088	166	19	77
TA3AWB	"	6,223	50	16	33
TC3T	**14A**	**2,184**	**32**	**5**	**21**
			(OP: TA3E)		
***TA4/OH2KW**	**AA**	**146,772**	**347**	**41**	**121**
*TAØACL	"	145,800	367	41	121
*TC4A	"	140,895	335	39	116
			(OP: TA4CS)		
*TA4ORZ	"	66,220	179	42	112
*TA4RC	"	47,553	148	47	84
*TA2SE	"	17,460	107	13	47
*TA4SO	"	14,555	85	22	49
*TA2MAE	"	9,612	98	10	44
*TA3P	"	7,220	83	8	30
*TA2FT	"	2,436	32	15	27
***TA2NC**	**28A**	**32,844**	**242**	**15**	**36**
***TA7SSB**	**7A**	**8,055**	**90**	**9**	**36**
*TA7AIZ	"	1,775	39	7	18

Azerbaijan

***4K6FO**	**14**	**99,330**	**425**	**21**	**65**
***4J3DJ**	**14A**	**30,566**	**199**	**13**	**49**

Bahrain

***A92FQ**	**AA**	**2,013**	**29**	**13**	**20**

Cambodia

***XU7AEY**	**7**	**2,970**	**43**	**11**	**19**

China

BA3MM	**A**	**494,900**	**923**	**80**	**165**
BG6SNJ	"	277,076	568	74	152
B4O	"	273,768	642	59	145
BA4DL	"	102,300	491	51	81
BA3MC	"	19,908	132	28	51
BG9NJY	"	6,174	57	19	30
BI4SDT	**28**	**10,368**	**91**	**19**	**35**
BY4SZ	**14**	**247,595**	**1057**	**33**	**82**
BH4BFS	"	3,956	129	9	14
BD3PXM	**7**	**1,064**	**42**	**9**	**10**
***BH4AAD**	**A**	**621,236**	**925**	**93**	**215**
BD9AC	*"*	*85,920*	*314*	*57*	*103*
*BH8ASZ	"	66,495	243	48	95
*BD5IQ	"	57,959	245	48	73
*BG8SXC	"	46,725	212	34	71
*BD7OYA	"	43,173	259	41	82
			(OP: BI7NEJ)		
*BG1II	"	27,169	183	48	53
*BG8JMO	"	20,584	150	38	45
*BA6KC	"	17,380	111	39	40
*BH1HWF	"	15,288	106	37	54
*BI1JPC	"	13,140	76	31	42
*BI8FYD	"	12,450	97	29	46
*BA4IT	"	10,281	93	28	41
*BD2IAQ	"	9,291	118	26	31
*BH9DSS	"	8,844	85	31	35
*BH4AHC	"	8,690	82	25	30
*BH4BFY	"	6,177	96	33	38
*BH3WNL	"	5,456	51	16	28
*BD3OD	"	5,253	74	22	29
*BG6QAL	"	5,217	67	22	25
*BG7SPN	"	4,488	45	22	29
*BH3PLA	"	4,400	51	17	33
*BA7LAC	"	3,510	56	13	17
BH5HQQ	*"*	*3,465*	*53*	*21*	*24*
*BH4ESK	"	3,344	46	19	25
*BG3IKF	"	2,820	65	18	29
*BH4WHA	"	2,784	44	22	26
*BH3NUG	"	1,428	23	12	16
*BI1EIH	"	1,155	43	17	16
*BH7ACO	"	1,085	24	14	17
*BY1TL	"	1,054	42	16	18
*BI1JBV	"	875	28	12	13
*BG2KSI	"	784	37	14	14
*BD9CJH	"	629	13	7	10
*BG5GLD	"	560	14	10	10
*BG2KAJ	"	540	15	10	10
*BG7FLV	"	484	16	10	12
*BG6SZD	"	432	15	8	8
*BA2BA	"	363	29	5	6
*BD9ATY	"	360	10	7	8
*BD7BW	"	322	12	7	7
*BH3DAX	"	182	15	6	8
*BH2RF	"	133	32	10	9
*BA4SCP	"	128	22	8	8
*BH1XEC	"	85	22	8	9
*BD3MSK	"	72	12	6	6
BH3UZY	*"*	*60*	*8*	*6*	*6*
*BG9FQP	"	60	22	9	11
*BG5VAR	"	54	23	8	10
*BG9DAW	"	21	5	3	4
BI1JOT	*"*	*8*	*2*	*2*	*2*
*BG9CKF	"	0	2	1	2
***BD6JN**	**28**	**7,320**	**90**	**14**	**26**
*BY1SK	"	6,300	97	13	22
			(OP: BG1UW)		
*BG7XWF	"	3,960	61	14	26
*BG7GRE	"	575	26	13	12
*BG8PM	"	6	1	1	1
***BH7PCT**	**21**	**71,995**	**448**	**25**	**60**
*BG7TWJ	"	52,632	408	25	47
*BH8MDV	"	46,718	214	25	69
*BD1VIU	"	43,470	422	20	49
*BD4STG	"	27,200	187	22	46
*BD4KM	"	22,165	137	19	46
*BG1JT	"	18,205	172	17	38
*BG6AHD	"	6,384	68	14	28
*BA3AX	"	3,828	96	13	20
*BG8INK	"	3,658	48	10	21
*BG8IL	"	3,090	43	10	20
*BG8KCQ	"	2,520	40	9	19
*BI1MCZ	"	2,368	101	16	21
*BG5UZW	"	192	7	6	6
*BH5HYB	"	6	1	1	1
***BI7JMD**	**14**	**19,893**	**166**	**16**	**41**
*BY2WL	"	10,868	97	18	34
*BH8OCW	"	650	19	11	15
*BD4RDU	"	496	23	7	9
BG8BXM	*"*	*493*	*30*	*9*	*8*
*BI4VKA	"	451	23	5	6
*BH8SBY	"	152	7	4	4
*BD4TZY	"	91	5	3	4
*BH4EQC	"	56	12	4	4
***BD2SHV**	**7**	**486**	**17**	**9**	**9**
***BH1HUK**	**3.7**	**140**	**20**	**5**	**5**
***BG3ODZ**	**1.8**	**4**	**3**	**2**	**2**
BG4WOM	**AA**	**593,250**	**1175**	**69**	**157**
BH1MCB	"	196,560	516	62	120
BG2AUE	"	164,496	441	51	98
BA7QT	"	76,105	219	52	103
BH1NGG	"	21,660	110	36	59
BD7IS	**21A**	**434,700**	**1356**	**35**	**105**
BG5TOX	"	357,540	1314	31	87
BD7NN	"	339,682	1117	34	99
			(OP: BA7NO)		
BI4WRI	"	34,875	234	21	54
BG9QM	**7A**	**1,885**	**37**	**12**	**17**
***BD7LNE**	**AA**	**193,466**	**545**	**57**	**125**
BG5BAA	*"*	*131,058*	*347*	*56*	*106*
*BH4AYG	"	104,972	324	59	104
*BG7XVX	"	58,806	300	38	61
*BG6TOE	"	44,368	184	50	68
*BD3QT	"	42,619	190	37	72
*BD7LQM	"	34,162	288	24	38
*BG6HJZ	"	29,190	142	41	64
*BG8FZU	"	19,352	137	32	50
*BG9OF	"	16,848	99	27	54
*BG5FCH	"	13,601	107	28	39
*BH1CXR	"	11,948	103	20	38
*BA3NHK	"	11,929	114	29	50
*BG5GLV	"	11,584	95	30	34
BG1URZ	*"*	*5,060*	*70*	*27*	*28*
*BD5II	"	4,864	89	29	35
*BG5JND	"	1,848	38	10	18
*BG4HUL	"	1,656	35	18	18
*BH7CSA	"	700	24	14	14
*BH6AIK	"	693	15	10	11
*BD4QXR	"	624	21	12	14
*BD7OB	"	616	12	10	12
*BI4MPH	"	234	13	8	10
***BH7JUO**	**28A**	**104,104**	**468**	**26**	**65**
*BG7IEJ	"	25,477	163	20	53
*BI8DHZ	"	9,180	99	15	30
*BA5AB	"	8,648	66	16	30
*BG8NG	"	6	1	1	1
***BG4UQX**	**21A**	**52,416**	**255**	**24**	**72**
*BD5FFK	"	23,479	221	21	32
*BD1RCR	"	17,880	166	18	42
*BD7LMB	"	15,012	130	18	36
*BD4RHV	"	11,492	110	20	32
*BG6RJN	"	2,262	41	8	21
***BYØAB**	**14A**	**9,504**	**94**	**14**	**34**
			(OP: BGØBWG)		
*BA4SE	"	1,944	34	9	18
*BH4TVU	"	136	16	3	5
*BG2ENW	"	56	19	3	4
*BH2SWB	"	24	2	2	2
*BH4WPN	"	6	1	1	1
***BD4RQ**	**3.7A**	**2,160**	**122**	**11**	**9**

Cyprus

C4W	**A**	**5,883,312**	**4555**	**103**	**353**
			(OP: 5B4WN)		
5B4AOZ	"	90,428	230	39	109
5B4AJV	*A*	*42,570*	*161*	*34*	*76*
***5B4AHZ**	**28**	**46,860**	**370**	**12**	**32**
C44C	**28A**	**164,800**	**599**	**29**	**71**
			(OP: 5B4AHJ)		
P3Z	**21A**	**853,812**	**2109**	**35**	**113**
			(OP: 5B4AFM)		
5B4KH	"	551,100	1339	35	115
P3C	**14A**	**376,870**	**1064**	**30**	**100**
			(OP: 5B4AOF)		

Georgia

4L8A	**21**	**418,656**	**1374**	**26**	**86**
***4L2M**	**14**	**565,508**	**1425**	**36**	**112**

Hong Kong

VR2XAN	**28**	**826,014**	**2375**	**35**	**107**
***VR2WKL**	**A**	**9,540**	**104**	**21**	**32**
VR2XYL	**AA**	**10,922**	**186**	**21**	**22**
***VR2XMT**	**28A**	**832**	**100**	**4**	**4**
***VR2YDC**	**21A**	**4,515**	**57**	**11**	**24**

India

VU2IBI	**A**	**96,748**	**290**	**36**	**98**
VU2ZKC	"	68,911	204	36	101
VU2RCT	"	66,734	234	39	83
VU2IVV	"	50,736	177	43	108
VU2LOC	"	23,256	104	33	69
VU2CWB	"	17,184	94	34	62
VU2BOT	"	10,260	79	32	63
VU2JF	"	0	5	3	3
VU2BR	**28**	**48**	**4**	**4**	**4**
VU2YVK	**7**	**1,298**	**25**	**9**	**13**
***VU2BGG**	**A**	**66,861**	**175**	**47**	**106**
*VU2SMS	"	66,314	204	42	100
*VU2GRM	"	64,236	197	57	102
*VU3TPW	"	37,524	157	38	68
*VU2JRO	"	24,534	109	33	61
*VU3RGP	"	22,352	113	27	61
*VU2RBI	"	21,228	121	29	58
*VU2BGC	"	13,024	75	29	45
*VU2KPH	"	9,438	59	22	44
*VU2NXM	"	9,039	61	25	44
*VU2KIB	"	6,111	51	24	39
*VU3RGB	"	4,655	47	16	33
*VU2DCC	"	4,452	40	12	30
*VU2YQ	"	3,212	40	20	24
*VU3YFD	"	2,196	33	15	21
*VU3SIO	"	2,006	23	12	22
*VU2ACK	"	1,794	28	16	23
*VU3NPI	"	1,708	60	24	37
*VU2KDS	"	1,665	24	15	22
*VU2MCW	"	713	15	10	13
*VU2CWO	"	210	8	7	8
*VU2BRT	"	100	7	5	5
*VU3XIO	"	81	5	4	5
*VU3IYE	"	18	3	3	3
***VU2OO**	**21**	**13,275**	**121**	**16**	**43**
***VU2JOS**	**14**	**320**	**15**	**8**	**8**
*VU3LMS	"	30	3	3	3
*VU3CZF	"	2	1	1	1
VU2DED	**AA**	**706,563**	**926**	**79**	**218**
VU2ZMK	"	353,828	628	52	160
***VU2MIB**	**AA**	**31,200**	**132**	**33**	**71**
VU2GPE	*"*	*496*	*24*	*12*	*19*
***VU3LWE**	**21A**	**1,610**	**27**	**8**	**15**

Iraq

***YI1WWA**	**A**	**387,453**	**831**	**38**	**139**

Israel

4X1BQ	**A**	**54,579**	**193**	**28**	**85**
4Z4AK	**21**	**946,810**	**2369**	**36**	**110**
4X1MM	"	830,109	2061	35	112
4Z5LY	**3.7**	**51,900**	**336**	**11**	**49**
***4Z5MV**	**A**	**58,101**	**199**	**24**	**83**
*4X5KE/M	"	10,496	62	17	47
*4X6FB	"	2,556	28	14	22
*4Z1JJ	"	722	14	8	11
***4Z5UN**	**7**	**259,787**	**814**	**28**	**93**
4X1IM	**AA**	**408,498**	**733**	**49**	**157**
4X1VF	**28A**	**171,450**	**671**	**24**	**66**
4Z5LA	**21A**	**379,088**	**1230**	**32**	**84**
4XØT	**3.7A**	**41,910**	**235**	**10**	**56**
				(OP: 4Z5FI)	
***4X1ST**	**AA**	**267,030**	**454**	**53**	**162**
*4Z5OI	"	124,848	232	61	143
*4Z4KX	"	60,702	164	48	103
***4Z5MU**	**28A**	**16,416**	**121**	**19**	**38**
***4X6DK**	**21A**	**129,376**	**465**	**27**	**77**

Japan

District 1

JR1GSE	**A**	**1,090,144**	**1379**	**113**	**191**
JH1QDB	"	364,617	546	93	168
JR1IJV	"	234,395	487	68	117
JH1OLB	"	225,575	504	56	119
JK1HIX	"	179,780	338

*JA1STY	"	1,015	23	14	15
*7M4CFW	"	946	27	10	12
*JR1JRW	"	779	15	9	10
*JH1HMC	"	728	18	13	13
*JF1OPO	"	602	15	5	9
*JL1JJD	"	420	11	9	11
*JQ1PCT	"	406	11	7	7
*JA1ATM	"	247	9	6	7
*JH1GTU	"	152	9	5	3
*JN1GNL	"	24	2	2	2
*JL1XGA	"	8	2	2	2
JJ1LBJ	**28**	**53,867**	**260**	**26**	**57**
*7N2UQC	"	37,575	203	24	51
*JF1TEU	"	21,982	156	20	38
*JM1SMY	"	15,246	101	22	44
*JA1QIF	"	13,888	82	22	40
*JJ1VJQ	"	13,515	103	18	33
*JA1MYW	"	9,400	77	18	32
*JA8KSW/1	"	5,544	74	16	20
*JH1KLE	"	3,008	40	7	25
*JG1SWV	"	407	17	5	6
*JP1PEA	"	6	1	1	1
7K4XNN	**21**	**92,004**	**355**	**32**	**70**
*JP1IXV	"	58,044	260	29	55
*JR1AKD	"	40,425	209	24	51
*JA1RYC	"	40,356	237	24	52
*JP1LRT	"	22,144	127	21	43
*JA1SCE	"	19,765	143	22	37
*JF1VVR	"	19,032	128	23	38
*JG1UKW	"	18,724	132	23	39
*7K1VKU	"	16,762	114	22	36
*JE1GZB	"	13,328	110	19	30
*JE1RRK	"	11,711	95	16	33
*JA1DBG	"	3,293	62	16	21
*JO1VRK	"	2,112	32	14	19
*JA1GZK	"	1,066	30	7	6
*JI1CAZ	"	665	19	9	10
*7M3RFZ	"	585	20	7	6
*JK1AUY	"	408	16	6	6
*JA1LKY	"	405	19	7	8
*JO1KTD	"	209	13	9	10
*JK1MLY	"	132	11	6	6
*JH1HHP	"	81	5	5	4
*JK1DAS	"	0	4	3	4
*JJ1YAF	"	0	0	0	0
JH1WHA	**14**	**319**	**12**	**5**	**6**
*JA1UOA	"	308	10	4	7
*JG1GCO	"	30	4	1	2
JA1CCH	**7**	**4,140**	**70**	**14**	**16**
*JH1RDU	"	243	9	5	4
JE1SPY	**1.8**	**64**	**56**	**4**	**4**
JE1LFX	**AA**	**1,157,975**	**1340**	**107**	**218**
JH1NBN	"	915,255	893	124	263
JM1XCW	"	749,070	1085	84	162
JE1FQV	"	542,493	643	106	221
JE1BMJ	"	287,790	438	104	161
JA1XRA	"	230,603	361	84	145
JN1THL	"	193,320	411	59	121
JL1CNY	"	181,263	332	86	127
JM1GDA	"	138,243	289	73	130
JA1WWO	"	105,763	205	76	127
JJ1XBQ	"	94,122	219	69	97
JJ1DJW	"	31,078	147	27	55
JH1OAI	"	18,476	102	24	38
JA1UXV	"	9,752	62	23	30
JH1BNC	"	4,956	42	12	30
JA1ILA	"	4,324	34	22	25
JS1KQQ	"	2,975	33	15	20
7M4CLF	"	1,890	25	15	15
JK1WSH	"	810	15	9	9
JR1BAS	"	408	10	9	8
JA1GVM	"	96	4	4	4
JH1SJN	**28A**	**23,205**	**152**	**25**	**40**
JE1CKA	**21A**	**523,614**	**1372**	**36**	**111**
JA1XEC	"	382,743	1076	34	95
7K4VPV	"	76,760	302	28	67
JH1APK	**7A**	**4,995**	**54**	**17**	**20**
JF1UVJ	"	1,888	27	13	19
***JG1LFR**	**AA**	**395,080**	**569**	**101**	**179**
*7J1ADJ	"	271,446	403	93	188
*JG1XIO	"	54,735	191	50	73
*JJ1MBU	"	49,923	149	54	75
*JA1UII	"	29,640	112	34	61
*JK1AKP	"	24,640	128	35	42
*JK1TCV	"	16,330	84	35	36
*7L4SCQ	"	874	16	10	13
***JL1EEI**	**28A**	**34,410**	**182**	**24**	**50**
*JH1RFM	"	29,648	187	22	46
*JF1RYU	"	23,465	154	22	43
*JF1OVA	"	14,421	101	21	36
*JI1HFJ	"	8,304	69	15	33
***JA1BPA**	**21A**	**248,454**	**730**	**35**	**94**
*JA1JLP	"	4,884	60	14	23
***JK1BQC**	**14A**	**684**	**14**	**9**	**10**
***JJ1AEB**	**7A**	**3,597**	**50**	**16**	**17**
***JM1NKT**	**3.7A**	**1,083**	**31**	**9**	**10**
***JA1KJC**	**"**	**666**	**20**	**9**	**9**

District 2

JF2QNM	**A**	**2,400,000**	**2373**	**134**	**250**
JA2AXB	"	914,373	1274	98	185
JR2PMT	"	576,270	764	100	185
JF2FIU	"	440,674	782	85	136
JA2VHO	"	285,360	470	83	157
JG2CNZ	"	233,260	432	89	125
JE2DJC	"	157,182	324	69	132
JE2PCY	"	114,234	299	63	95
JE2BOM	"	80,088	214	56	85
JA2JWH	"	65,794	237	53	81
JA2HOL	"	63,116	183	37	87
JH2BTM	"	48,000	176	29	67
JA2XLV	"	28,119	105	42	61
JR2BCF	"	25,680	115	28	52
JR2PAU	"	270	10	5	4
JE2OTM	**28**	**60,544**	**282**	**26**	**60**
JH2KKW	"	34,632	183	25	53
JA2PAC	**21**	**4,950**	**42**	**19**	**26**
JH2DFJ	**14**	**18,792**	**137**	**24**	**48**
JA2PFO	**7**	**13,496**	**98**	**24**	**32**
***JG2RFJ**	**A**	**173,530**	**386**	**68**	**117**
*JA2GHP	"	91,356	272	57	81
*JA2KPW	"	39,776	144	48	65
*JR2KQE	"	23,904	122	33	50
*JR2TTS	"	11,570	86	29	36
*JA2NKD	"	4,018	37	18	23
*JJ2TKX	"	2,130	35	14	16
			(OP: JI1DGW)		
*JE2EVX	"	1,587	25	8	15
*JI2TKX	"	630	17	7	7
*JH2JYN	"	288	8	8	8
*JL2XMW	"	136	7	4	4
***JR2TRC**	**28**	**3,626**	**50**	**12**	**25**
*JR1BFZ/2	"	693	19	9	12
*JH2GZY	"	312	10	6	7
*JG2VSF	"	6	1	1	1
***7K1MAG/2**	**21**	**26,944**	**173**	**23**	**41**
*JH2UVB	"	13,515	147	20	31
*JF2KWM	"	5,412	49	18	23
*JA2KKA	"	576	14	9	9
*JG2CNS	"	56	5	3	5
*JR2EUE	"	42	3	3	3
***JR2MIO**	**14**	**6,191**	**59**	**17**	**24**
*JH2JNU	"	96	4	4	4
***JF2WXS**	**7**	**216**	**6**	**6**	**6**
JE2YRB	**AA**	**1,788,830**	**1712**	**136**	**274**
			(OP: JL8XSO)		
JA2XCR	"	553,644	628	110	228
JJ2CJB	"	434,943	655	85	182
JA2HYD	"	62,618	194	53	78
JF2OZH	"	49,170	179	46	64
JH2XQY	"	34,561	128	42	65
JE2LPC	"	2,736	38	17	19
JA2FSM	**28A**	**83,700**	**353**	**27**	**63**
JA2KQE	**21A**	**52,893**	**251**	**25**	**56**
JQ2GYU	"	50,996	318	24	37
JJ2VLY	"	7,738	62	14	39
JF2BDK	**14A**	**27,690**	**146**	**20**	**51**
JR2GRX	**7A**	**295,320**	**974**	**33**	**87**
JA2GTW	"	37,076	149	29	63
***JF2VAX**	**AA**	**463,848**	**726**	**84**	**167**
*JR2KHB	"	48	4	3	3
***JE2HXL**	**21A**	**57,440**	**293**	**26**	**54**
***JM2RUV**	**14A**	**209**	**7**	**5**	**6**

District 3

JH3CUL	**A**	**533,656**	**688**	**113**	**215**
JR3NZC	"	436,638	895	69	114
JH3OXM	"	335,616	655	84	144
JR3RIU	"	252,195	465	78	137
JE3RMQ	"	155,584	351	62	114
JF3DCH	"	129,360	302	70	98
JA3LIL	"	79,464	248	45	84
JA3KKE	"	22,800	109	36	44
JA3FRI	"	16,766	92	37	46
JR3UIC	"	10,430	67	29	41
JP3UBR	"	7,480	54	28	27
7J3AOZ	"	2,418	31	18	21
JA3QOS	**28**	**54,199**	**274**	**25**	**58**
JA3XOG	"	47,840	223	26	54
JR3RIY	**21**	**296,670**	**1003**	**32**	**78**
JA3IKG	"	60,726	254	26	61
JA3LEZ	"	47,232	218	26	56
JF3NDW	"	16,464	119	21	35
JF3QJR	"	4,788	44	15	27
JH3DJN	**14**	**4,180**	**49**	**15**	**29**
JE3VRJ	**7**	**9,706**	**99**	**20**	**26**
***JE3EDJ**	**A**	**356,420**	**518**	**81**	**170**
*JA3EBT	"	46,870	182	46	63
*JA3KDJ	"	11,456	91	28	36
*JH3GMI	"	7,888	74	29	29
*JS3EOE	"	7,860	63	26	34
*JP3JUV	"	6,716	72	24	22
*JP3MFV	"	5,043	41	15	26
*JQ3BVC	"	4,956	68	21	21
*JA3PFY	"	4,180	55	21	23
*JR3JRI	"	966	22	9	12
*JI3XOK	"	902	23	11	11
***JI3XOM**	**28**	**2,146**	**32**	**11**	**18**
***JF3BFS**	**21**	**225,456**	**699**	**34**	**88**
*JA3JRI	"	20,984	147	22	39
*7L3ETZ/3	"	4,576	57	14	18
*JA3BBG	"	360	14	8	10
*JA3RAZ	"	72	5	4	4
***JA3UWB**	**14**	**24,254**	**158**	**24**	**43**
*JG3XDR	"	3,588	34	16	23
*JH3JSJ	"	1,947	31	15	18
*JG3DHN	"	112	6	4	4
***JA3YVI**	**7**	**12**	**2**	**2**	**2**
JN3TMW	**AA**	**541,080**	**660**	**112**	**222**
			(OP: JF1RPZ)		
JG3RPL	"	420,000	679	77	163
JA3HBF	"	65,685	187	49	96
JK3NSD	**28A**	**2,250**	**30**	**10**	**15**
JO3DDD	**21A**	**181,735**	**792**	**29**	**66**
JA3VOV	"	8,756	99	18	26
JL3DQX	**7A**	**20**	**3**	**2**	**2**
JF3LOP	**3.7A**	**10,192**	**127**	**22**	**30**
***JI3DST**	**AA**	**180,306**	**376**	**68**	**121**
*JF3EIG	"	118,917	247	70	111
*JH4PUL/3	"	14,700	86	32	38
*JN3WPH	"	4,949	37	17	32
*JF3LGC	"	672	14	7	9
***JL3MCM**	**28A**	**63,252**	**312**	**25**	**59**
***JL3RNZ**	**21A**	**237,062**	**762**	**35**	**83**
*JF3DRI	"	1,725	25	9	14
***JN3DSH**	**14A**	**16,560**	**107**	**23**	**37**
***JF3KQA**	**7A**	**275**	**11**	**6**	**5**

District 4

JH4UYB	**A**	**3,599,750**	**3225**	**133**	**292**
JG4AKL	"	433,048	603	106	190
JI4WHS	"	129,961	314	68	101
JA4GXS	"	88,704	240	59	85
JE4ADO	"	1,566	22	11	18
JA4BKE	"	1,296	20	11	16
JA4BEV	"	1,058	22	11	12
JH4UTP	**28**	**228,042**	**882**	**27**	**76**
JA4KTG	**21**	**4,140**	**36**	**20**	**26**
***JE4MHL**	**A**	**435,240**	**619**	**87**	**183**
*JN4ESD	"	27,324	121	37	55
***JE4URN**	**28**	**10,230**	**72**	**19**	**36**
*JH1MTR/4	"	128	8	4	4
***JR4BYH**	**21**	**2,800**	**28**	**17**	**23**
*JR4LRY	"	2,145	38	15	18
*JH4FUF	"	273	12	7	6
***JH4CES**	**3.7**	**741**	**21**	**10**	**9**
JE4USZ	**AA**	**304,395**	**601**	**64**	**131**
JA4CZM	"	227,808	378	80	144
JR4VEV	"	190,750	370	78	140
JO4IPQ	"	107,916	215	83	121
JH4CPC	"	29,541	93	52	77
JA4AFT	**14A**	**7,968**	**75**	**21**	**27**

District 5

JA5SUD	**A**	**216,590**	**365**	**82**	**160**
JE5JHZ	**7**	**5,986**	**58**	**17**	**24**
***JJ5PXO**	**A**	**200**	**10**	**5**	**5**
JH5MXB	**AA**	**247,104**	**431**	**68**	**148**
JA5FBZ	"	54	3	3	3
***JH5HDA**	**AA**	**3,196**	**40**	**15**	**19**
***JH5FTY**	**28A**	**3,900**	**43**	**16**	**23**

District 6

JA6BZI	**A**	**893,380**	**883**	**123**	**257**
JA6EML	"	293,148	542	65	139
JA6BWH	"	215,250	414	68	137
JA6FFO	"	24,564	110	36	53
JA6CNX	"	14,212	113	26	50
JA6FEG	"	2,460	30	16	14
JE6WOQ	"	1,960	36	13	15
JH6AUS	**28**	**208,104**	**796**	**28**	**76**
JR6CSY	"	63,840	295	23	61
JH6WDG	"	22,880	150	20	45
JE6CMG	**21**	**37,224**	**213**	**21**	**51**
JG6SRB	**14**	**68,094**	**318**	**28**	**69**
JA6LCJ	"	1,680	33	12	12
***JH6OPP**	**A**	**223,014**	**404**	**80**	**138**
*JH6FTJ	"	64,896	207	51	77
*JA6CVR	"	59,048	212	56	65
*JA6ONQ	"	52,116	228	36	65
*JA6PTH/6	"	16,500	88	31	44
*JE6KFN	"	10,647	63	23	40
*JH6TNH	"	6,450	53	19	31
*JS6UGC	"	2,484	34	16	20
*JA6CDC	"	1,000	14	13	12
***JA6WFM**	**21**	**167,688**	**607**	**29**	**73**
*JG6VMO	"	6,751	77	16	27
*JM6URL	"	4,556	56	17	17
*JE6ETZ	"	72	6	2	2
*JE6PVG	"	12	2	1	1
***JF6ABL**	**14**	**5,040**	**49**	**17**	**25**
*JH6SCA	"	2,040	26	13	17
***JE6JZP**	**7**	**4**	**2**	**1**	**1**
JA6MWW	**AA**	**310,890**	**506**	**72**	**169**
JA6GMC	**"**	**109,025**	**261**	**65**	**110**
JA6ZPR	**14A**	**436,020**	**1315**	**34**	**95**
			(OP: JR6CKX)		
***JH6QIL**	**AA**	**90,400**	**213**	**62**	**98**
***JH6WHN**	**28A**	**99,594**	**406**	**26**	**73**
***JE6PJP**	**21A**	**416**	**14**	**6**	**7**

District 7

JH7QXJ	**A**	**1,422,949**	**1872**	**99**	**178**
JM7SKE	"	185,180	372	73	124
JA7OWB	"	87,759	234	55	92
JH7FUI	"	48,924	169	34	74
JA7UES	"	29,202	116	38	55
JR7IWL	"	3,666	34	22	25
JN7TAN	"	80	4	4	4
JO7KMB	**28**	**836**	**26**	**10**	**12**
JA7QVI	**21**	**402,498**	**1266**	**33**	**85**
JA7DNO	"	2,262	31	10	16
JA7LLL	**14**	**20,976**	**129**	**22**	**47**
JJ7PMS	**7**	**336**	**10**	**6**	**6**
***JA7HYS**	**A**	**250,668**	**454**	**73**	**138**
*JA7BEW	"	197,005	383	83	122
*JA7KED	"	18,750	132	33	42
*JH7IHT	"	13,398	87	27	31
*JP7GRU	"	3,740	44	22	22
*JA7FAS	"	1,334	22	11	12
*JE7SRK	"	798	20	9	10
***JE7KJG**	**21**	**52,500**	**253**	**26**	**58**
*JA7RPC	"	29,328	140	25	53
*JH7USU	"	13,780	110	21	31
*JA7KHQ	"	266	7	7	7
*JR7ASO	"	6	1	1	1
***JH7IQQ**	**14**	**20,502**	**142**	**24**	**43**
*JI7EMD	"	3,536	48	13	21
JA7NVF	**AA**	**1,509,090**	**1880**	**116**	**214**
JF7PHE	"	675,444	881	106	195
JH7CUO	"	201,366	462	56	106
JA7OWD	**28A**	**209,708**	**821**	**29**	**74**
JA7GYP	**14A**	**720**	**12**	**9**	**11**
JH7MQD	**7A**	**124,236**	**431**	**33**	**86**
***JH7VTE**	**AA**	**23,460**	**107**	**39**	**53**
*JA7ZP	"	23,265	99	44	55

District 8

JA8RUZ	**A**	**306,187**	**606**	**80**	**137**
JA8IJI	"	110,079	279	62	89
JA8TGD	"	27,141	115	33	50
JG8TDZ	**28**	**54,431**	**278**	**26**	**53**
JA8DNV	**3.7**	**1,080**	**19**	**11**	**13**
***JA8RWU**	**A**	**342,342**	**554**	**92**	**155**
*JK8CEE	"	13,300	67	33	43
*JA8CXY	"	10,557	71	24	27
*JR8NOD	"	9,840	64	23	37
*JE8URC	"	3,538	44	13	16
*JA8HBO	"	2,108	32	17	17
*JH8SST	"	224	12	4	4
***JM8LND**	**21**	**22,560**	**151**	**21**	**39**
*JH8DHV	"	18,900	143	21	33
*JR8QFG	"	3,930	50	13	17
***JH8RXM**	**14**	**26,151**	**157**	**24**	**45**
JA8COE	**AA**	**1,165,571**	**1605**	**95**	**176**
JH8SLS	"	80,848	182	56	107
JA8DKJ	"	51,102	211	35	67
JA8KSF	"	42,333	149	36	67
JH8SGR	"	1,922	24	9	22

District 9

JH9CEN	**A**	**187,259**	**390**	**73**	**126**
JH9FCP	"	91,540	304	37	78
JA9CCG	"	79,920	222	47	88
JA9BCV	"	73,700	204	52	82
JA9FFS	**28**	**30,310**	**167**	**24**	**46**
***JA9LX**	**A**	**6,762**	**63**	**15**	**31**
***JA9GEW**	**21**	**41,070**	**225**	**25**	**49**
*JA9EJG	"	3,276	41	9	19
JF9JTS	**AA**	**785,400**	**1028**	**88**	**187**
			(OP: JAØTEA)		
JH9DRL	"	277,240	499	84	148
JR9GMS	"	24,543	107	32	49
JH9URT	**7A**	**14,150**	**119**	**20**	**30**

District Ø

JAØQNJ	**A**	**63,960**	**442**	**27**	**25**
JHØMXV	"	61,336	177	53	83
JAØCLB	"	10,260	66	29	28
JAØGCY	"	9,360	68	27	33
JAØBZY	"	3,570	37	18	24
8NØJ	**28**	**39,846**	**196**	**26**	**61**
***JHØMUC**	**A**	**84,952**	**235**	**59**	**89**
*JHØKHR	"	36,566	143	34	60
*JGØGGI	"	18,130	103	34	40
*JHØDUG	"	15,120	105	32	38
*JRØDZH	"	11,859	65	32	35
*JAØBJY	"	10,659	73	21	30
*JRØBNF	"	8,978	66	29	38
*JAØNFP	"	7,975	57	23	32
*JJØJXO	"	7,785	73	20	25
*JAØRCK	"	4,399	33	21	32
*JRØGXA	"	130	5	5	5
***JJØNSL**	**28**	**15,960**	**112**	**20**	**37**
*JJØTUC	"	126	10	4	5
***JHØEPI**	**14**	**43,758**	**248**	**22**	**44**
***JAØVFN**	**7**	**54**	**7**	**3**	**3**
JAØFVU	**AA**	**369,538**	**594**	**80**	**153**
***JIØWVQ**	**AA**	**1,290**	**20**	**15**	**15**

Kazakhstan

UP4L	**7**	**952,055**	**2374**	**36**	**115**
			(OP: UN7LZ)		
UN3J	**3.7**	**77,499**	**450**	**17**	**62**
***UN7MBH**	**A**	**147,260**	**391**	**42**	**106**
*UN8PC	"	110,784	238	58	134
*UN7JX	"	43,962	173	27	75
*UN7FW	"	38,808	142	25	74
*UN7LDR	"	25,886	125	22	64
*UP2L	"	16,992	88	19	53
***UN2E**	**28**	**44,400**	**235**	**19**	**56**
*UN7JID	"	4,522	56	14	24
***UN9GD**	**21**	**82,998**	**359**	**20**	**67**
***UN6GSD**	**14**	**4,392**	**54**	**11**	**25**
UN9L	**AA**	**2,678,500**	**2014**	**114**	**386**
UP5B	"	1,685,222	1812	80	261
			(OP: UN7ZO)		
UN3G	**28A**	**52,430**	**307**	**13**	**57**
***UP7L**	**AA**	**1,571,253**	**1520**	**98**	**313**
			(OP: UN6LN)		
*UN7QF	"	53,235	195	31	86
***UN4L**	**28A**	**242,028**	**888**	**24**	**84**
*UN4PG	"	51,982	251	17	62
***UN7CN**	**14A**	**33,995**	**217**	**14**	**51**

Kuwait

9K2NO	**28**	**137,788**	**653**	**17**	**57**
9K2HN	**AA**	**4,142,362**	**2486**	**144**	**458**
9K9A	**14A**	**1,144,572**	**2687**	**36**	**120**
9K9C	**7A**	**162,196**	**727**	**18**	**68**

Kyrgyzstan

***EX8MK**	**A**	**4,136**	**46**	**12**	**32**
***EXØM**	**14**	**1,287**	**19**	**15**	**18**

Lebanon

OD5TX	**28**	**154,070**	**750**	**20**	**51**
***OD5UI**	**A**	**96,459**	**323**	**19**	**92**
*OD5OJ	21	1,554	41	3	11

Mongolia

***JT1BZ**	**14**	**4,050**	**87**	**11**	**19**

Ogasawara

***JD1BIA**	**21**	**2,552**	**42**	**13**	**16**
***JL1WFD/JD1**	**14**	**43,906**	**545**	**24**	**34**

Oman

A47RS	**A**	**2,168,544**	**2427**	**92**	**244**
			(OP: SV5DKL)		

Qatar

A71AE	**28**	**33,300**	**162**	**20**	**54**

Republic of Korea

HL2WA	**A**	**871,724**	**1193**	**99**	**227**
HL2AHL	"	58,800	216	55	85
HL2DBP	"	54,858	198	49	74
HL5BCH	"	8,190	58	27	38
HL2VXK	**21**	**30,426**	**209**	**24**	**42**
***DS3EXT**	**A**	**2,420**	**35**	**22**	**22**
*HL1TKF	"	1,836	53	15	19
*DS1ORJ	"	1,470	35	13	17
*HL2ASZ	"	391	11	8	9
***HL4CFN**	**14**	**2,409**	**35**	**11**	**22**
***6K2ILX**	**7**	**1,188**	**41**	**11**	**11**
*HL1OVG	"	793	27	7	6
HL2KV	**AA**	**68,805**	**293**	**61**	**78**
HL4CEL	"	22,176	181	30	47
HL3AMO	**21A**	**2,001**	**33**	**11**	**12**
***HL1VAU**	**AA**	**86,329**	**304**	**52**	**79**
*HL5YI	"	29,886	135	43	59

Saudi Arabia

***7Z1VD**	**A**	**32,078**	**156**	**28**	**58**
***HZ1SK**	**28**	**220,115**	**801**	**22**	**73**
HZ1HZ	**21A**	**354,288**	**1056**	**30**	**92**
***HZ1TT**	**AA**	**2,206,676**	**2492**	**81**	**256**

Singapore

9V1YC	**A**	**768,790**	**1177**	**91**	**199**
9V1CD	**7**	**30,785**	**286**	**14**	**33**
***9V1KG**	**A**	**29,848**	**175**	**36**	**46**
*9V1DE	"	5,282	64	17	21
*9V1HY	"	885	24	7	8
9V1PL	**7A**	**380**	**18**	**4**	**6**

Taiwan

BU2EQ	**A**	**89,010**	**419**	**50**	**65**
***BX2ABT**	**A**	**14,792**	**83**	**35**	**51**
*BV3DR	"	9,690	112	23	28
*BU2EF	"	9,180	92	23	28
*BV4VR	"	5,456	66	19	25
***BV1EP**	**21**	**32,686**	**284**	**17**	**42**
***BX2AHP**	**14**	**10,152**	**110**	**15**	**32**
BV2LA	**AA**	**163,254**	**387**	**65**	**117**
BV4VQ	**21A**	**4,172**	**77**	**13**	**15**
***BU2EV**	**AA**	**1,632**	**35**	**15**	**17**
***BV5OQ**	**28A**	**310**	**25**	**5**	**5**
***BU2EP**	**21A**	**28,408**	**206**	**22**	**45**

Tajikistan

EY8MM	**7**	**533,232**	**1439**	**31**	**107**

Thailand

E2ØWUE	**A**	**16,632**	**104**	**31**	**53**
HSØACS	"	8,190	58	21	42
E21YDP	**7**	**56,808**	**308**	**20**	**52**
***E2ØNGF**	**A**	**296,659**	**811**	**60**	**121**
*E25ETT	"	93,177	471	44	75
*HS8KAY	"	700	15	12	13
***E29AHU**	**21**	**4,650**	**85**	**14**	**16**
***HS5ZLD**	**"**	**3,816**	**52**	**15**	**21**
HS5NMF	**AA**	**928,356**	**1564**	**85**	**201**
HS3PIK	"	56,100	259	39	63
HS3NBR	**14A**	**27,260**	**204**	**14**	**44**
***HS8JWH**	**AA**	**21,330**	**106**	**35**	**55**
*E24OEE	"	9,870	99	21	26
*HSØZDX	"	4,600	46	16	30
*HS4MLV	"	1,407	37	8	13
***E2ØXMG**	**28A**	**13,965**	**150**	**23**	**34**
***HS3PJF**	**14A**	**6,930**	**98**	**10**	**23**

United Arab Emirates

A65BB	**28**	**404,460**	**1190**	**33**	**102**
			(OP: S53T)		
***A65DF**	**A**	**15,405**	**77**	**25**	**54**
***A61ZX**	**14**	**35,197**	**272**	**12**	**49**
*A65GT	"	16	2	2	2
			(OP: 4G1QAZ)		

Uzbekistan

***UK8IQ**	**14**	**65,816**	**354**	**18**	**58**
UK9AA	**3.7A**	**36,180**	**206**	**13**	**54**

Vietnam

***XV9NPS**	**21**	**588**	**22**	**11**	**10**

West Malaysia

9M2TDX	**A**	**363,312**	**908**	**50**	**124**
***9M2SAF**	**A**	**161,470**	**521**	**49**	**85**
*9M4CTO	"	26,376	198	24	32
*9M2GDX	"	4,830	66	12	18
*9M2JBH	"	3,886	63	12	17
*9M2DGA	"	2,590	58

EW1I	"	118,508	336	51	121
EW3LN	"	6,721	65	20	27
EU3AA	"	18	3	3	3
EW8OM	**28**	**9,246**	**99**	**17**	**29**
EW/R3XA	**14**	**163,020**	**902**	**32**	**98**
***EU3A**	**A**	**205,100**	**438**	**72**	**221**
*EW8MZ	"	83,424	383	40	118
*EV6Z	"	55,890	286	47	115
*EW1MY	"	22,080	159	31	65
***EW4DDC**	**28**	**377**	**11**	**7**	**6**
***EW1TZ**	**21**	**15,447**	**122**	**20**	**37**
***EU8R**	**1.8**	**1,792**	**65**	**5**	**23**
EV1R	**AA**	**1,460,234**	**1730**	**125**	**366**
EW3EO	"	8	2	2	2
EW1M	**14A**	**456,750**	**1929**	**35**	**115**
***EW1P**	**AA**	**348,964**	**713**	**77**	**231**
*EU2F	"	70,884	199	61	137
*EU1DX	"	7,935	48	30	39
***EW7DK**	**21A**	**6,950**	**73**	**17**	**33**
***EW4GL**	**7A**	**6,150**	**123**	**9**	**41**

Belgium

OT5K	**A**	**290,342**	**587**	**82**	**256**
ON7QC	"	56,156	215	41	98
OS7ET	"	31,979	119	41	72
ON8AH	"	12,411	78	26	37
OP1B	"	11,050	74	26	39
OR4T	**7**	**68,700**	**917**	**15**	**60**
***OS3AR**	**A**	**304,038**	**733**	**67**	**199**
*ON5UJ	"	296,730	535	83	231
*ON4CT	"	183,983	393	65	186
*ON8UK	"	183,521	437	70	177
*ON2WI	"	151,032	537	55	177
*OS6AT	"	91,630	319	56	131
			(OP: ON6AT)		
*ON4MAD	"	87,449	351	45	112
*ON9TT	"	71,012	328	34	130
*ON7DDG	"	56,416	230	45	119
*ON5IA	"	31,872	177	37	91
*ON8DX	"	30,504	215	30	94
*ON6LMJ	"	27,610	198	26	84
*ON4BEN	"	23,655	119	35	60
*ON3VS	"	20,000	154	27	73
*OR5Z	"	19,680	141	28	52
*ON3ZZT	"	5,070	74	16	49
*ON4JY	"	3,250	47	18	32
***ON5WL**	**28**	**4,860**	**60**	**10**	**26**
***ON3ND**	**14**	**11,948**	**188**	**11**	**47**
*ON2VHF	"	10,918	182	10	43
*ON6VOX	"	5,635	97	11	38
***OSØS**	**7**	**8,232**	**137**	**11**	**45**
*ON7ER	"	7,097	131	8	39
*ON6IO	"	4,482	51	14	40
*ON2EE	"	1,044	31	12	24
OR3A	**AA**	**1,727,160**	**1722**	**131**	**424**
			(OP: ON6CC)		
OQ5M	"	1,430,338	1736	103	303
			(OP: ON5ZO)		
OR1Z	"	758,581	1696	75	242
OP5T	"	474,705	992	72	243
ON4MW	"	328,790	631	81	224
OT3T	"	240,570	597	69	228
			(OP: ON7EQ)		
ON4VDV	"	165,440	347	61	159
ON8ZA	"	123,105	318	62	83
ON4EC	"	58,710	175	62	144
OR7G	"	30,740	233	32	84
OR2M	**28A**	**255,500**	**810**	**32**	**108**
			(OP: ON4IA)		
ON4TO	**21A**	**193,575**	**627**	**32**	**113**
OT5L	**3.7A**	**91,056**	**893**	**17**	**67**
***ON5RZ**	**AA**	**235,173**	**642**	**54**	**229**
*OT7E	"	203,008	603	58	186
*ON6FC	"	188,000	506	54	181
*ON7AH	"	121,464	269	73	168
*ON4AVJ	"	71,258	296	42	116
*ON4TTT	"	35,568	164	31	73
*OT1V	"	32,248	120	42	74
			(OP: ON8VM)		
*ON7BT	"	16,328	113	30	74
*ON5ZZ	"	11,573	99	24	47
*ON6EF	"	11,256	112	17	50
*ON3PVC	"	1,242	22	11	16
*ON3AT	"	1,066	17	13	13
***ON7BBR**	**14A**	**29,440**	**292**	**18**	**62**
*ON4BDC	"	4,520	107	7	33
***ON8PH**	**1.8A**	**2,117**	**74**	**3**	**26**

Bosnia-Herzegovina

E71A	**A**	**378,666**	**841**	**55**	**163**
E7AA	**28**	**827,827**	**2738**	**34**	**109**
			(OP: E77A)		
E75LR	**3.7**	**3,159**	**95**	**5**	**34**
***E74SL**	**A**	**83,448**	**387**	**37**	**134**
*E74HJ	"	29,400	171	33	87
*E73RB	"	13,446	144	16	67
***E78T**	**21**	**108**	**10**	**4**	**5**
***E75IO**	**14**	**3,720**	**78**	**9**	**31**
*E7ØBA	3.7	12	12	2	10
***E7ØE**	**1.8**	**3,680**	**134**	**5**	**35**
E74E	**AA**	**63,327**	**638**	**23**	**78**
E77CFG	"	8,736	70	20	28
E77X	**14A**	**186,060**	**1472**	**25**	**80**
*E77SH	AA	115,596	323	66	162
***E7ØAW**	**"**	**52,848**	**284**	**32**	**112**
*E74UK	"	26,390	131	43	102
***E7ØDX**	**7A**	**13,952**	**162**	**14**	**50**
***E73AA**	**3.7A**	**66,378**	**813**	**12**	**66**
***E79D**	**1.8A**	**28,556**	**500**	**6**	**53**

Bulgaria

LZ5E	**A**	**28,512**	**142**	**37**	**71**
LZ1GE	"	4,256	62	18	38
LZ1A	**7**	**203,685**	**1380**	**24**	**87**
			(OP: S55M)		
LZ6Y	**3.7**	**7,682**	**172**	**8**	**38**
			(OP: LZ3DP)		
***LZ3SD**	**A**	**158,460**	**503**	**61**	**167**
*LZ4DJ	"	43,440	259	32	88
*LZ1BY	"	20,520	144	31	64
*LZ5PL	"	17,664	144	25	71
*LZ7EA	"	5,940	82	16	44
*LZ2DF	"	3,784	60	12	32
*LZ1NYK	"	192	10	6	10
***LZ6E**	**28**	**35,630**	**200**	**23**	**47**
			(OP: LZ1GU)		
*LZ1GD	"	11,180	115	19	33
*LZ1ZP	"	7,144	59	18	29
*LZ1VL	"	987	21	8	13
***LZ1DQ**	**14**	**30,914**	**319**	**18**	**64**
*LZ1G	"	3,780	66	11	34
			(OP: LZ5RG)		
LZ1ND	**AA**	**247,220**	**933**	**54**	**134**
LZ1W	"	20,475	99	38	53
LZ1ST	"	4,095	71	18	45
LZ5DD	**21A**	**206,325**	**872**	**33**	**98**
LZ2ZG	"	1,239	21	10	11
LZ1QZ	**7A**	**11,448**	**120**	**15**	**57**
***LZ2ZY**	**AA**	**325,920**	**576**	**79**	**212**
*LZ2JE	"	231,525	438	83	232
*LZ6O	"	173,880	402	79	191
			(OP: LZ3DX)		
*LZ1AQ	"	60,435	201	54	99
*LZ7NW	"	26,076	197	24	82
*LZ1PJ	"	21,983	167	26	63
*LZ6M	"	11,900	115	20	65
***LZ3DJ**	**21A**	**6,665**	**106**	**13**	**30**
***LZ2JA**	**14A**	**155,135**	**1044**	**29**	**86**
***LZ1VCT**	**7A**	**2,310**	**61**	**7**	**28**

Corsica

TK4QL	**A**	**38,364**	**291**	**20**	**72**
***TK4TH**	**A**	**90,342**	**629**	**32**	**94**
*TK4RC	"	15,910	89	28	46

Crete

SX9X	**21**	**636,510**	**2964**	**36**	**111**
			(OP: SV9FBG)		
***SV9FBP**	**A**	**18,928**	**132**	**29**	**62**
SV9COL	**AA**	**341,412**	**812**	**77**	**199**
SV9JI	"	63,602	293	39	115
SV9IOI	**14A**	**10,450**	**215**	**10**	**40**
***SV9RGI**	**AA**	**28,427**	**98**	**53**	**78**
*SV9SMS	"	15,229	123	26	71
*SY9DOK	"	10,541	108	25	58
*SV9MBH	"	7,735	83	26	65
*SY9DIN	"	2,254	32	20	29

Croatia

9A1CVG	**A**	**51,834**	**285**	**40**	**123**
			(OP: 9A5OIA)		
9A5BWT	"	3,120	48	15	45
9A9R	**21**	**606,245**	**1831**	**36**	**109**
9A3XV	**14**	**215,895**	**992**	**33**	**78**
9A6RT	"	50,800	309	25	75
9A3YT	"	29,832	242	23	65
9A8M	**7**	**14,280**	**246**	**10**	**41**
			(OP: 9A7DM)		
9A2KD	"	2,550	88	5	25
9A1CMA	**3.7**	**23,580**	**325**	**11**	**49**
			(OP: 9A9EE)		
***9A2KI**	**A**	**191,808**	**728**	**51**	**171**
*9A6DF	"	161,616	482	65	157
*9A3QB	"	75,712	292	48	134
*9A2VX	"	38,285	175	38	117
*9A1AL	"	18,527	136	24	73
*9A1EA	"	15,379	119	22	69
*9A1EJ	"	12,684	116	21	63
*9A1BN	"	12,075	132	17	52
*9A5ADI	"	9,570	121	16	42
*9A3GX	"	9,170	127	17	53
*9A3BFP	"	780	40	7	23
***9A8A**	**28**	**66,504**	**295**	**30**	**72**
*9A9I	"	38,544	225	23	50
***9A6KZH**	**21**	**67,586**	**349**	**27**	**67**
***9A2EY**	**14**	**49,410**	**403**	**21**	**69**
*9A5CZK	"	6,110	112	11	36
***9A9J**	**3.7**	**2,886**	**71**	**7**	**32**
			(OP: 9A3BHN)		
9A2EU	**AA**	**2,389,884**	**1793**	**155**	**489**
9A2ZI	"	2,326,753	2151	138	445
9A6KX	"	1,524,036	1870	125	409
9A/F5SNJ	"	459,342	920	64	170
9A4M	"	373,760	658	81	211
9A7Y	"	81,585	200	70	115
9A7JCY	**28A**	**3,360**	**42**	**13**	**17**
9A5Y	**21A**	**1,258,920**	**3142**	**38**	**142**
			(OP: 9A7DX)		
9A1P	"	1,229,304	3008	40	144
			(OP: 9A1UN)		
9A4W	"	1,045,100	2849	39	136
9A7Z	"	600,108	1733	38	134
9A5ØY	**14A**	**958,300**	**2964**	**38**	**137**
			(OP: 9A3LG)		
9A2G	**1.8A**	**29,172**	**430**	**9**	**57**
***9A4BA**	**AA**	**106,196**	**330**	**54**	**137**
*9A6DJX	"	81,830	393	39	128
*9A2GA	"	61,828	304	34	130
*9A3UCA	"	45,717	218	39	108
*9A5CW	"	27,195	172	27	84
*9A1DR	"	27,084	167	32	79
*9A1RBZ	"	18,018	195	16	62
			(OP: 9A7AS)		
*9A5VS	"	10,790	70	32	51
*9A5BAA	"	10,530	97	27	63
*9A3AAW	"	8,547	82	22	55
***9A6A**	**28A**	**343,280**	**1229**	**32**	**108**
***9A7ZZ**	**7A**	**24,016**	**248**	**14**	**65**
*9A6ZZ	"	7,620	69	18	42
*9A2B	"	108	9	4	8
***9A6M**	**3.7A**	**21,505**	**388**	**8**	**47**
*9A4KJ	"	1,650	54	5	25
*9A5ØCCY	"	828	35	4	19

Czech Republic

OL5ØDJ	**A**	**672,885**	**1267**	**78**	**207**
			(OP: OK6DJ)		
OK1AMF	"	209,614	389	80	231
OK1LEV	"	149,160	430	51	169
OK2CSU	"	146,400	354	61	139
OK4RQ	"	69,000	351	38	100
OK1FU	"	29,106	141	36	62
OK1JFP	"	5,929	45	18	31
OL7M	**28**	**152,390**	**714**	**29**	**69**
			(OP: OK1NOR)		
OK1XC	"	36,624	192	28	56
OK1DOL	**14**	**5,544**	**98**	**9**	**12**
OK1FIA	"	2,176	44	9	25
OK5D	**3.7**	**159,796**	**1586**	**14**	**77**
			(OP: OK1DTP)		
OK7W	**1.8**	**118,548**	**1224**	**18**	**71**
			(OP: OK1CID)		
OK4U	"	19,920	450	6	42
			(OP: OK1TP)		
OK2EQ	"	6,390	147	5	40
OK1EP	"	3,239	82	6	35
***OK6T**	**A**	**2,121,010**	**2341**	**128**	**437**
			(OP: OK1WCF)		
*OK2MBP	"	740,484	1223	94	308
*OL5Y	"	631,350	911	91	275
*OK1TA	"	526,504	809	102	284
*OK2BRX	"	186,313	549	55	156
*OK1DKR	"	173,304	439	63	186
*OK7N	"	163,782	405	67	176
*OK1HEH	"	159,644	587	50	164
*OK2VK	"	157,728	418	68	180
*OK1MDK	"	151,404	436	61	161
*OL2A	"	145,345	534	43	162
*OK2TS	"	129,823	409	47	150
*OK2SGY	"	68,640	354	37	119
*OK2VV	"	63,395	400	26	129
*OL5R	"	57,669	300	37	104
*OK2IH	"	52,416	209	45	111
*OK1DVA	"	39,240	280	27	93
*OK1TK	"	38,171	282	28	105
*OK2DDS	"	32,058	228	27	90
*OK1WSL	"	27,417	197	27	84
*OK2BRS	"	21,850	182	23	72
*OK2TP	"	21,203	213	15	76
*OK1LST	"	16,867	155	20	81
*OK1BJ	"	14,058	144	19	80
*OK2MTB	"	11,058	85	30	67
*OK2AK	"	7,412	67	25	43
*OK2GU	"	6,272	90	17	47
*OL1D	"	5,742	78	21	45
			(OP: OK1DXW)		
*OK9UWU	"	5,049	91	14	37
*OK1PFM	"	4,067	59	14	35
*OK1JOC	"	3,645	40	22	23
*OK1MGA	"	3,127	94	13	40
*OK7SE	"	2,940	65	10	39
*OK1TVL	"	2,440	51	14	26
*OK2BND	"	420	19	6	14
***OK2ABU**	**28**	**954**	**25**	**8**	**10**
***OK2BZE**	**14**	**70,740**	**422**	**24**	**84**
*OK4D	"	53,010	348	23	72
			(OP: OK1MGJ)		
*OK1CLD	"	42,588	316	22	69
*OK2DIK	"	23,463	239	24	55
*OL9M	"	14,580	157	16	38
			(OP: OK1MMN)		
*OK1BR	"	13,847	194	13	48
*OL7ØOU	"	11,100	163	11	49
*OK2UGG	"	6,762	112	10	39
*OK1FUK	"	4,387	71	10	31
*OK3MAT	"	3,256	66	9	28
*OK5ET	"	896	26	8	20
***OK4AS**	**3.7**	**90**	**9**	**2**	**8**
***OK1LRD**	**1.8**	**23,618**	**534**	**4**	**45**
*OK1JOK	"	9,540	231	4	41
*OK5N	"	725	32	4	21
OK1VK	**AA**	**464,187**	**693**	**96**	**263**
OK1DOY	"	445,410	892	55	155
OK1DBE	"	349,800	634	76	224
OK1XV	"	171,252	296	79	189
OK1DO	"	164,736	352	65	133
OLØW	"	78,390	423	35	99
			(OP: OK1DSZ)		
OK1C	"	67,392	224	43	101
OK7WW	"	28,690	120	38	57
OK1BPN	"	16,000	130	27	73
OK2QA	"	9,577	69	24	37
OL5M	**28A**	**546,645**	**1491**	**36**	**129**
			(OP: OK1GI)		
OK7GU	"	18,468	103	25	56
OK1NP	**21A**	**787,555**	**2156**	**38**	**117**
OK1GK	"	45,400	197	32	68
OK7K	**14A**	**1,628,802**	**4068**	**39**	**150**
			(OP: OK1BN)		
OL9Z	"	934,032	2698	38	138
OL3R	"	293,400	1188	35	115
			(OP: OK1VWK)		
OL5W	"	148,400	624	32	108
OK1DUG	"	17,595	200	13	56
***OK4DZ**	**AA**	**190,532**	**414**	**71**	**147**
*OK5OK	"	180,109	518	57	176
*OK1BLU	"	101,490	430	45	154
*OK1ALX	"	57,728	223	48	128
*OK1UKY	"	47,952	271	31	113
*OLØM	"	41,310	162	47	88
			(OP: OK1CDJ)		
*OK6AB	"	35,014	159	40	82
*OK1DLX	"	4,104	49	19	38
*OK1TRJ	"	3,404	50	15	31
***OK1K**	**14A**	**103,572**	**493**	**29**	**97**
			(OP: OK1XOE)		
*OK1TD	"	58,938	271	27	87
***OL9R**	**7A**	**271,128**	**1600**	**30**	**102**
			(OP: OK6RA)		
***OK1AY**	**3.7A**	**53,208**	**709**	**11**	**61**
*OK1HMA	"	5,232	109	6	42
***OK6Y**	**1.8A**	**35,100**	**542**	**8**	**57**
			(OP: OK2PTZ)		
*OK1A	"	2,482	76	4	30

Denmark

OZ1KEF	**A**	**420,446**	**796**	**89**	**225**
OZ1T	"	74,620	306	49	156
OZ6AGX	"	14,355	101	27	72
OZ9ETOV	"	7,254	68	18	21
			(OP: OZ1D)		
OU1E	"	3,388	29	18	26
OZ3SM	"	1,800	48	10	26
OZ3BJ	**28**	**49,230**	**212**	**25**	**65**
OZ7JZ	**21**	**360**	**12**	**8**	**7**
***OZ4NA**	**A**	**384,864**	**901**	**66**	**238**
*OZ1KKH	"	91,312	274	49	159
*OZ1DYI	"	40,590	200	35	88
*OZ1RD	"	17,325	155	29	76
*OZ6MU	"	4,464	82	22	50
*OZ9KG	"	2,597	57	14	35
*5P9R	"	1,760	45	9	31
			(OP: OZ5XN)		
*OZ1THB	"	221	15	6	11
***OZ8ZS**	**28**	**8,694**	**94**	**14**	**32**
***OZ2LC**	**7**	**22,400**	**294**	**13**	**57**
*OZ9V	"	5,504	135	7	36
***OU8A**	**3.7**	**64,032**	**883**	**13**	**56**
			(OP: 5PØO)		
5Q2J	**AA**	**709,758**	**991**	**103**	**284**
OZ1FHU	"	345,610	738	71	252
OZ4VW	"	129,983	252	69	148
OZ2PBS	"	108,232	266	60	103
OZ5Q	"	43,180	297	23	104
			(OP: OZ5BD)		
OZ1KIH	"	18,513	135	30	69
OZ1AXG	"	6,929	59	19	22
OZ1DWK	"	6,006	71	24	42
OZ8AGB	"	357	13	8	13
OZØJ	"	224	8	8	8
OZ1AA	**21A**	**851**	**13**	**10**	**13**
OZ7DK	**7A**	**10,595**	**119**	**14**	**51**
***OZ1KVM**	**AA**	**244,720**	**646**	**57**	**209**
*OZ1CK	"	92,274	312	46	136
*OU2P	"	21,800	174	27	82
*OZ6TM	"	11,176	110	18	70
*OZ4MU	"	24	2	2	2
***5P1B**	**14A**	**181,700**	**643**	**36**	**122**

Dodecanese

***SV5SKD**	**A**	**44,409**	**355**	**21**	**92**
SX5P	**1.8A**	**3,608**	**86**	**5**	**39**
			(OP: SV5FRD)		

England

MØNPK	**A**	**395,505**	**738**	**67**	**188**
MØKPD	"	299,156	570	80	206
G1SCT	"	214,288	599	55	172
MØOIA	"	203,415	409	59	154
G5DXC	"	133,952	621	42	119
			(OP: MØCTP)		
MØYKS	"	113,552	325	51	137
G9D	"	87,300	347	39	111
			(OP: G6NHU)		
MØIRU	"	80,199	386	43	128
G3ZGC	"	68,103	201	49	92
MØKCV	"	64,584	235	47	109
G1EIX	"	61,513	259	39	98
M1DNC	"	55,372	298	32	95
MØNVK	"	38,920	204	40	99
G2B	"	37,323	176	33	84
MØHHG	"	31,372	281	20	72
MØJHV	"	19,012	148	26	72
MØCVO	"	13,795	174	19	70
MØNAM	"	3,375	76	12	33
MØNIE	"	88	8	4	7
M6O	**21**	**524,790**	**1597**	**37**	**116**
			(OP: G3WGN)		
G4FKA	"	127,270	543	30	100
G1W	**14**	**54,090**	**486**	**20**	**70**
			(OP: MØHAO)		
M1B	"	52,865	433	23	74
G4WWG	"	21,190	274	14	51
MØMCV	**7**	**112,617**	**1259**	**17**	**80**
G4L	"	31,208	301	18	65
			(OP: G4LDL)		
M5B	**3.7**	**3,145**	**101**	**5**	**32**
			(OP: G3WVG)		
***G4NBS**	**A**	**533,876**	**921**	**73**	**249**
*G9X	"	483,632	971	77	257
			(OP: M1LCR)		
*MØPLX/M	"	479,872	1117	70	256
*G4DDL	"	238,602	636	59	188
*M1VPN	"	136,912	616	40	159
*GØRAH	"	135,100	474	49	144
*G1K	"	131,922	568	42	147
			(OP: MØRTQ)		
*MØMPM	"	101,442	406	40	134
*G4POF	"	98,980	360	47	149
*2EØSPS	"	81,949	392	34	127
*MØKPW	"	79,800	379	37	113
*G2NV	"	67,080	287	40	116
*M5X	"	65,190	251	42	117
			(OP: G3RLE)		
*MØAQM	"	64,680	377	31	109
*MØRBE	"	62,883	289	38	99
*MØYTE	"	61,608	312	35	116
*MØLGW	"	61,446	318	39	115
*M1G	"	60,516	287	38	126
*G3MOT	"	59,494	275	39	112
*MØVSP	"	55,413	286	36	105
*MØVKU	"	55,132	224	51	103
*MØMNM	"	53,640	225	41	108
*M3ZZF	"	52,910	287	35	95
*GØJCC	"	52,503	248	38	91
*G1PCR	"	51,816	283	33	103
*G4ADJ	"	50,080	226	42	118
*G8ZRE	"	48,396	289	33	115
*G6DXY	"	45,504	301	28	116
*MØSDM	"	44,744	262	35	101
*GØATG	"	44,460	212	36	81
*2EØPLA	"	43,290	245	35	95
*GØVVM	"	40,848	233	36	112
*GØFEH	"	39,750	208	37	113
*GØJDL	"	39,325	243	32	89
*2EØWHQ	"	39,312	192	37	107
*MØAUG	"	37,629	205	33	78
*MØJND	"	37,026	176	36	85
*GØGLG	"	30,353	247	22	105
*2EØEVM	"	29,920	210	29	107
*M6WHH	"	29,718	191	27	90
*G5TM	"	27,544	177	24	64
*G3R	"	27,104	166	30	82
			(OP: GØCDA)		
*GB1OOH	"	24,347	198	24	73
			(OP: GØWJK)		
*G7NIB	"	21,600	168	25	65
*M1MLM	"	20,776	119	32	66
*G1ZHD	"	19,795	127	32	75
*G6NLW	"	19,511	169	25	84
*G6GLP	"	19,206	129	30	67
*M7MEK	"	18,954	185	28	89
*MØNST	"	18,600	146	26	74
*G3YZO	"	18,437	150	25	78
*G3XTZ	"	16,500	121	20	46
*G4FFN	"	16,482	111	31	92
*MØURB	"	16,284	166	20	72
*G7RTI	"	15,824	174	17	69
*M7EGD	"	14,469	131	23	68
*GØJOS	"	14,000	133	26	74
*G4WQG	"	12,470	92	30	56
*MØHMS	"	12,118	112	20	63
*GØCMQ	"	11,988	151	15	59
*2EØCVN	"	11,088	108	25	59
*G5STU	"	11,076	131	16	55
*GØXBU	"	10,988	81	29	53
*2EØTXE	"	10,764	115	21	57
*G4OED	"	10,440	105	20	70
*M7CDJ	"	8,625	105	20	55
*M7RSG	"	8,610	132	17	53
*G8FRS	"	8,330	105	19	51
*M7VCB	"	8,216	97	23	56
*2EØYZW	"	7,888	109	14	54
*M7MTC	"	7,800	110	21	54
*2E1LSI	"	6,867	77	16	47
*G3UQW	"	6,048	69	20	52
*MØNRD	"	5,723	95	12	47
*2EØLSJ	"	5,328	53	20	28
*2EØHEV	"	4,816	96	12	44
*M7SNG	"	4,081	59	14	39
*G1YOY	"	3,774	54	12	25
*MØYJB	"	3,422	62	16	42
*G1VXD	"	3,015	47	14	31
*MØHWO	"	2,967	53	13	30
*MØHZT	"	2,448	49	15	33
*2E1BRT	"	2,304	38	18	30
*MØTVZ	"	2,236	47	14	29
*MØJQQ	"	1,978	60	11	32
*MØRXO	"	1,974	45	13	29
*M7SPN	"	1,827	59	6	23
*MØKVX	"	1,782	50	9	24
*M7BCN	"	1,368	26	15	21
*M7CHB	"	1,248	39	9	23
*M7TAS	"	1,110	27	9	21
*MØPCR	"	1,088	34	9	25
*MØWTD	"	1,008	24	10	18
*M7GPX	"	736	18	8	8
*G8UEP	"	560	20	11	17
*MØPQA	"	418	27	5	14
*GØBNC	"	322	20	5	18
*G5AKB	"	294	16	6	15
*MØXTY	"	30	3	3	3
*G3SHF	"	7	7	3	4
***M4M**	**28**	**20,216**	**203**	**17**	**39**
			(OP: MØPNN)		
*G1FQD	"	12,122	81	19	39
*GØC	"	11,130	112	13	29
			(OP: GØCER)		
***G4OTU**	**21**	**14,742**	**207**	**15**	**48**
*M1TZR	"	13,272	115	15	41
*GØTKZ	"	8,601	109	14	33
*G8NVX	"	7,636	82	13	33
*GØMBA	"	6,324	86	15	36
***G3Y**	**14**	**37,284**	**348**	**19**	**59**
			(OP: G3YBY)		
*2EØVCC	"	34,200	330	17	59
*G3YRZ	"	21,798	251	12	51
*MØORY	"	18,048	225	12	52
*MØACM	"	13,000	178	11	39
*M/9A3ICE	"	3,432	94	6	27
*G4WGE	"	1,485	55	4

*MØWJG	"	16,128	140	29	67
*2EØIQI	"	15,416	191	17	65
*2EØEBM	"	14,039	102	29	72
*G3RTU	"	10,804	124	16	57
*MØXYG	"	10,556	111	23	68
*MØEAS	"	8,829	94	22	59
*MØOEB	"	6,667	74	17	42
*2EØGYI	"	5,985	75	14	43
*G4PNC	"	5,828	43	26	36
*G4JFS	"	5,290	45	23	23
*MØVQP	"	4,945	55	17	26
*MØHFY	"	3,168	34	16	17
*2EØGKW	"	2,769	55	13	26
*MØYOB	"	2,550	37	20	30
*MØTZO	"	1,749	43	12	21
*G4AYU	"	1,680	26	11	17
*M4J	"	1,599	35	12	29
			(OP: GØDVJ)		
*MØSPF	"	1,188	27	12	15
*MØJHN	"	1,147	44	10	27
*2EØXYR	"	266	15	6	13
*M7AQX	"	15	3	2	3
***G4AWA**	**28A**	**480**	**16**	**7**	**8**
***G4KIV**	**21A**	**40,095**	**276**	**19**	**62**
*MØYTT	"	35,245	168	23	72
*GØZ	"	23,664	220	16	52
			(OP: G1RVD)		
*G3MXH	"	20,790	176	17	53
***MØYDK**	**14A**	**1,891**	**61**	**5**	**26**
*MØWDK	"	484	26	4	18
***G8X**	**7A**	**161,920**	**1277**	**21**	**94**
			(OP: G4FJK)		
*MØVWK	"	12,540	215	12	45
*G7IBO	"	4,770	111	7	38
***M1U**	**3.7A**	**30,975**	**315**	**14**	**61**
			(OP: MØUTD)		

Estonia

ESØIA	**A**	**287,360**	**530**	**87**	**233**
ES5MG	"	194,334	421	75	219
ESØZ	"	4,545	44	16	29
ES4RD	**14**	**219,960**	**1155**	**32**	**98**
ES6RW	**3.7**	**140,058**	**1333**	**18**	**75**
***ES6RMR**	**A**	**52,854**	**297**	**29**	**109**
*ES1OX	"	4,221	57	20	47
ES1BBQ	*"*	*2,961*	*63*	*14*	*49*
***ES1TAR**	**14**	**46,774**	**362**	**20**	**71**
*ES5RIM	"	16,320	193	14	50
*ES1OV	"	2,960	70	9	28
ES1BH	**AA**	**183,148**	**777**	**49**	**168**
ES1CN	**21A**	**66,807**	**301**	**29**	**88**
ES3BM	**14A**	**18,174**	**132**	**29**	**49**
***ES1LL**	**AA**	**144,020**	**608**	**50**	**140**
ES5TF	*"*	*13,764*	*107*	*22*	*71*
*ES2TT	"	1,862	27	15	23
*ES3BH	"	161	17	6	17
***ES7GN**	**14A**	**18,564**	**202**	**21**	**63**

European Russia

District 1

R1IO	**A**	**994,455**	**1510**	**94**	**291**
R1BHN	"	1,377	25	12	15
R1NW	*"*	*456*	*13*	*11*	*13*
R1CAM	**21**	**3,071**	**69**	**10**	**27**
***UA1AOS**	**A**	**187,910**	**594**	**48**	**182**
*R1BAC	"	63,024	268	46	110
*RG1A	"	53,332	324	30	104
*R1BBL	"	33,232	180	36	98
RV1CB	*"*	*19,549*	*109*	*29*	*84*
*RT1I	"	11,880	103	21	51
*UA1D	"	11,400	135	17	59
*UA1WBV	"	2,090	25	19	19
*R1NO	"	434	12	7	7
***R1AT**	**14**	**10,200**	**169**	**11**	**39**
***UA1ABJ**	**3.7**	**168**	**17**	**3**	**11**
RW1CW	**AA**	**221,805**	**517**	**75**	**204**
R1FZ	"	95,914	255	67	154
UA1NFA	"	74,328	330	37	115
RC1W	"	73,359	250	50	121
R1AK	**14A**	**209,345**	**918**	**35**	**114**
			(OP: UA1ANA)		
UA1OMS	**1.8A**	**13,115**	**206**	**9**	**52**
***RZ1OK**	**AA**	**269,175**	**563**	**75**	**216**
*R1MJ	"	29,464	191	31	96
*RA1OHX	"	15,006	98	26	56
RU1AT	*"*	*14,994*	*119*	*26*	*72*

District 3

R2ARR	**A**	**1,440,193**	**2219**	**110**	**333**
RZ3B	"	913,086	2151	76	257
R3OM	"	735,000	1284	92	300
RC5Z	"	536,928	1163	76	253
RA3DSV	"	148,302	490	52	162
R3RZ	"	146,832	578	50	118
RL3QI	"	132,405	355	58	137
UC5C	"	106,276	325	42	121
RZ3DW	"	92,070	341	46	109
R3GZ	"	83,482	290	54	124
UA3YCZ	"	81,770	356	42	143
RA3NC	"	79,785	287	53	144
R5AK	"	77,568	299	44	158
UA3UBT	"	38,038	146	44	99
R3MBD	"	35,560	148	41	86
UA3R	"	22,496	144	27	47
			(OP: UA3RC)		
RK3IT	"	18,142	101	34	60
R3BC	"	11,592	150	17	46
UA5D	"	6,600	62	21	29
RT2H	"	5,696	78	14	50
RM5W	"	2,556	27	18	18
RU3SD	"	48	4	4	4
UA3EDQ	**28**	**45,198**	**293**	**25**	**56**
RA3XM	**21**	**431,648**	**1642**	**37**	**127**
RA3RCL	"	208,008	1151	27	81
RT5T	**14**	**194,461**	**1049**	**32**	**107**
RC3U	"	86,904	712	22	80
***UA3BL**	**A**	**541,310**	**1000**	**89**	**296**
*RA3DAD	"	524,560	994	77	239
*RW3FY	"	409,731	844	72	255
*R3AAA	"	154,160	469	58	177
*R3TKM	"	106,506	290	58	125
*RA3RLJ	"	93,093	541	33	110
*UA3YDI	"	76,591	339	44	147
*R2OFF	"	72,380	336	30	110
*UA3IVF	"	67,497	355	35	116
*R3WZ	"	61,628	247	42	100
*RY2A	"	58,870	293	35	110
*RZ5D	"	56,784	206	47	135
*R2DAW	"	34,884	246	28	86
*RZ3DOT	"	34,410	126	41	70
*RX3VF	"	30,997	204	27	112
*UA3WF	"	30,912	182	32	80
*RA3DQP	"	27,234	188	27	75
*RA5BB	"	23,800	127	36	83
*RY2B	"	22,800	193	25	89
*R2SAG	"	17,202	142	26	68
*R2AHS	"	15,300	120	21	69
R2RZ	*"*	*13,261*	*79*	*34*	*55*
RA3GAA	*"*	*10,842*	*115*	*20*	*58*
*R3PLN	"	6,699	81	19	58
*RA3RGQ	"	6,490	46	26	29
*R2UZ	"	6,003	69	20	49
*UA3EUW	"	4,836	68	18	44
*RW3DIA	"	4,416	50	18	28
*UA9QCP/3	"	3,468	53	14	37
*RA3VE	"	2,436	39	13	29
*UA3SDN	"	1,517	41	11	30
*RA3GFS	"	1,326	30	10	24
*RA3V	"	336	20	7	14
*UB3LBM	"	280	14	5	9
*R3TLH	"	68	14	6	11
*RC2SB	"	8	2	2	2
***RU3VV**	**28**	**51,273**	**432**	**21**	**60**
*RA3RA	"	29,200	193	24	49
*RZ3LC	"	22,555	169	20	45
*RA3EA	"	12,597	121	18	33
R3HD	*"*	*5,984*	*72*	*14*	*30*
***UA3ABJ**	**21**	**36,005**	**240**	**27**	**68**
*RY3F	"	26,640	222	19	55
*R5OE	"	11,948	125	16	42
*RA3DGH	"	4,340	104	4	31
*R3PIQ	"	3,612	98	12	30
*RN3P	"	1,100	34	6	16
*RN3Z	"	816	17	7	9
***RK3Y**	**14**	**31,820**	**384**	**15**	**59**
*RN3RQ	"	22,496	194	17	59
R5DF	*7*	*1,652*	*23*	*11*	*17*
***RA3UAG**	**"**	**1,144**	**35**	**6**	**20**
***R3LC**	**3.7**	**11,388**	**211**	**7**	**45**
***RK3E**	**1.8**	**9,360**	**198**	**6**	**42**
R2QA	**AA**	**6,182,145**	**5160**	**159**	**546**
RM3DA	"	2,281,240	2846	127	393
R5AJ	"	2,158,809	2695	123	378
RA3OA	"	1,305,062	1906	114	319
UI5R	*"*	*1,066,840*	*2167*	*94*	*264*
RM5F	"	822,050	1666	91	310
RG2Y	"	415,360	991	71	249
RU5A	*"*	*291,584*	*730*	*64*	*204*
RL3T	"	272,406	702	54	195
RG2A	"	155,415	349	64	131
RQ3M	"	79,566	199	63	115
RA3TT	"	66,566	297	41	125
UA3AGW	"	64,222	171	59	104
RT5Q	"	60,750	213	42	108
RV3ID	"	39,824	158	42	89
UA3AB	"	34,374	135	38	64
RC3FL	"	23,324	163	28	91
RN3B	"	18,870	89	34	40
RA3S	"	14,580	70	37	53
R2IN	"	5,544	65	20	43
R3MA	"	4,235	57	19	36
RC2A	"	2,030	26	16	19
RW3QM	"	2,025	27	13	14
R2AOQ	"	1,479	17	13	16
RL3FA	"	108	7	5	7
RC3W	**28A**	**53,208**	**320**	**24**	**48**
			(OP: RA5W)		
RL5A	"	34,182	300	22	59
RT2A	"	15,008	126	21	35
RM2E	"	4,524	65	12	27
UA3KW	**14A**	**182,265**	**949**	**35**	**110**
RM3F	"	98,415	373	30	105
			(OP: UA3DPX)		
RN3T	"	95,360	588	30	98
			(OP: R3TE)		
RA4LBS/3	"	41,876	461	16	60
RV3FT	**7A**	**630**	**14**	**7**	**8**
RT3G	**3.7A**	**3,225**	**54**	**8**	**35**
***R2AL**	**AA**	**806,400**	**1049**	**109**	**341**
*R3ST	"	296,424	445	91	267
*RN3YA	"	116,887	495	41	138
*RW3S	"	107,632	291	57	160
*R2ZCA	"	79,101	304	46	141
*RW3WX	"	53,703	224	40	113
*UB3DUV	"	28,072	163	42	74
*R3MAI	"	11,398	112	18	64
*UA5R	"	10,191	100	20	59
*UB3PEH	"	9,680	134	25	63
*RN3OG	"	6,767	68	21	46
*UA3YCX	"	4,278	63	17	45
*UA3X	"	3,500	36	20	30
*R3QX	"	2,142	40	15	27
*RX3AFE	"	120	10	7	8
***R5RC**	**21A**	**123,190**	**637**	**32**	**95**
*UA3PI	"	57,138	322	29	78
*UA3DUJ	"	9,035	75	21	44
*UB5MBA	"	8,050	123	10	40
***RZ3Z**	**14A**	**171,732**	**987**	**28**	**104**
*R3DAB	"	19,440	217	15	57
*RO3F	"	693	15	7	14
***RU3DNN**	**7A**	**8,791**	**114**	**11**	**48**
***UF5A**	**3.7A**	**25,690**	**346**	**12**	**58**

District 4

RM4HZ	**A**	**1,022,352**	**1969**	**83**	**271**
R4RT	"	396,775	1142	57	238
RA4PBE	"	353,438	1078	62	200
UA4PAN	"	349,632	945	74	214
R4IB	"	123,806	507	54	152
RA4CL	"	94,458	366	42	140
R4RM	"	73,577	284	45	116
RA4AR	"	40,662	370	21	60
RQ4F	"	28,448	160	30	97
RD4F	**28**	**86,873**	**483**	**28**	**81**
R4MM	**14**	**55,965**	**211**	**30**	**93**
R4SA	**7**	**150,590**	**1153**	**26**	**84**
***RK4FAO**	**A**	**310,960**	**995**	**58**	**172**
*UD4W	"	257,403	705	62	177
*RN4HAB	"	198,144	593	57	199
*R4FET	"	180,389	496	61	192
*UA4FDK	"	95,149	350	46	147
*UA4HBM	"	80,937	239	58	149
*RU4PN	"	37,488	225	31	101
*R4RB	"	35,568	190	42	102
*R4ADA	"	32,640	168	34	94
*R4AC	"	19,910	153	27	83
*RN4ACX	"	11,858	118	25	73
*RA4ADF	"	7,568	89	22	21
*R4AAR	"	6,804	104	25	56
*R4FCJ	"	3,400	64	13	37
*RV4CU	"	3,036	44	19	27
***R4WZ**	**28**	**17,344**	**221**	**13**	**51**
*RA4DR	"	11,045	142	14	33
*R4BZ	"	6,424	111	14	30
***RA4LAG**	**14**	**7,473**	**122**	**9**	**38**
*RA4L	"	1,092	43	4	24
***R4WDX**	**3.7**	**2,535**	**56**	**9**	**30**
RL4A	**AA**	**1,914,393**	**2250**	**130**	**443**
RW4W	"	1,399,995	1969	106	371
R4PBX	"	601,865	1250	86	267
UA4S	"	372,554	946	70	252
			(OP: UA5B)		
RK4FM	"	146,412	299	82	167
R4KO	"	131,370	420	51	123
R4ACY	"	112,464	407	52	146
UA4C	"	64,796	178	57	137
RA4WE	"	24,200	135	28	93
R4FCN	*"*	*16,268*	*136*	*24*	*74*
RA4W	"	9,702	115	31	68
R4HM	"	5,830	42	24	31
RG4A	**28A**	**63,296**	**464**	**25**	**67**
UA4CC	"	38,735	380	20	41
RD4A	**14A**	**29,007**	**166**	**24**	**75**
RU4PU	**7A**	**83,412**	**489**	**33**	**93**
RM4F	**1.8A**	**36,864**	**488**	**14**	**58**
***R4DI**	**AA**	**423,440**	**971**	**84**	**251**
*RN4SN	"	175,337	392	71	200
*RL4F	"	165,120	518	54	186
*R4WAS	"	43,005	200	41	100
*RK4K	"	15,770	114	28	67
			(OP: UA4HGL)		
*R4WT	"	7,952	119	14	57
*R4UAL	"	6,076	61	22	40
*UC4I	"	3,657	62	14	39
*UB4Y	"	2,480	26	16	24
***UA4WGM**	**28A**	**31,824**	**257**	**21**	**51**
R4FD	*"*	*7,425*	*110*	*13*	*32*
*RW4NH	"	80	8	3	5
***RU4SO**	**21A**	**49,680**	**229**	**28**	**92**
*RU4LM	"	2,184	36	10	29

District 6

RW6MJ	**A**	**148,518**	**379**	**71**	**152**
R7DI	"	78,566	263	44	119
R6CR	"	76,125	275	61	142
UA6CC	"	55,475	334	41	134
RC7B	**28**	**35,724**	**234**	**26**	**52**
RV6LN	"	7,014	97	12	30
RJ7M	*"*	*559*	*17*	*5*	*8*
R7GU	**21**	**15,750**	**193**	**13**	**50**
***RG5A/6**	**A**	**806,053**	**1748**	**82**	**291**
*RO6K	"	197,560	661	49	171
*R6DOP	"	139,300	496	49	150
*R6DBT	"	122,590	408	48	157
*RZ6BR	"	120,696	380	53	161
*R6KX	"	94,248	322	51	136
*RV7M	"	67,093	324	34	135
*UA6HML	"	62,160	302	42	126
*RM7C	"	48,888	298	27	99
*RA7R	"	41,272	232	41	93
*R2AY/6	"	37,875	245	29	96
*RA6LIS	"	30,067	210	25	82
*UD6M	"	26,499	173	30	91
*RZ6D	"	24,570	197	25	66
*R6FY	"	18,144	120	25	71
*UA6AUA	"	14,415	59	41	52
*RN6DR	"	9,768	92	17	57
*R6LBK	"	4,128	50	13	35
*UA6AAK	"	1,073	21	12	17
***R7NA**	**28**	**23,688**	**161**	**23**	**49**
*R7AM	"	16,732	167	16	31
*UA6AK	"	3,720	101	12	28
***RJ6N**	**14**	**121,990**	**882**	**27**	**83**
*R6DIP	"	6,072	90	8	36
***RU6YK**	**7**	**9,685**	**104**	**13**	**52**
*R6CW	"	2,146	56	7	30
***R7NP**	**1.8**	**1,598**	**77**	**7**	**27**
RV6AVU	**AA**	**243,721**	**716**	**58**	**193**
RX6AM	*"*	*92,258*	*358*	*56*	*107*
RO7A	"	73,920	230	54	111
RA6DT	"	1,292	18	16	18
R7LV	**28A**	**137,424**	**628**	**30**	**82**
UA6AA	**21A**	**1,215,882**	**3293**	**39**	**147**
RK7A	**14A**	**1,167,723**	**3612**	**37**	**146**
UA6LCN	"	253,982	1420	36	115
RZ6L	**7A**	**85,905**	**450**	**30**	**85**
RM6G	"	12,702	151	14	59
***R7MM**	**AA**	**511,797**	**748**	**105**	**324**
*UA6YN	"	155,000	443	63	187
*RV6LCT	"	43,992	138	57	99
*RN7A	"	15,035	114	23	74
*RA6AAW	"	7,056	60	25	47
*RM6LA	"	2,108	26	14	17
***RT6N**	**28A**	**2,790**	**54**	**9**	**22**
***R7CA**	**14A**	**23,850**	**274**	**16**	**59**
***R6NW**	**7A**	**6**	**1**	**1**	**1**

District 9

***R9FBT**	**A**	**123,692**	**378**	**49**	**165**
*RA9XSL	"	15,876	128	25	59
*UA9XK	"	8,160	94	17	63
*R9FCY	"	4,392	69	16	45
***UA9FGJ**	**28**	**9,362**	**109**	**12**	**50**
***RA9FEL**	**21**	**27,083**	**260**	**16**	**57**
*R8FT	"	17,745	113	22	43
***UD8F**	**14**	**6,000**	**82**	**11**	**39**
*RW9XU	"	2,135	74	6	29
UA8F	**AA**	**236,418**	**489**	**70**	**203**
			(OP: R9FDS)		
RC9F	**28A**	**13,090**	**206**	**14**	**41**
RG8G	**7A**	**1,428**	**31**	**8**	**26**
***UA9XX**	**AA**	**21,504**	**192**	**27**	**85**

European Turkey

TA1CQ	**A**	**70,560**	**300**	**44**	**124**
TA1API	"	49,880	244	35	110
***TA1BX**	**A**	**46,110**	**432**	**25**	**81**
*TA1UIG	"	6,580	111	19	51
*TA1MKD	"	1,960	37	14	26
***TA1MK**	**14**	**8,771**	**167**	**7**	**42**
***TA1ACX**	**7**	**20**	**4**	**1**	**4**
***TA1HF**	**AA**	**13,203**	**155**	**19**	**62**
*TA1SOR	"	770	35	7	15
***TA1ED**	**1.8A**	**2,856**	**96**	**5**	**29**

Faroe Islands

OY1CT	**28A**	**96**	**4**	**4**	**4**

Finland

OH2PQ	**A**	**1,277,772**	**1577**	**116**	**350**
OH2BA	"	536,176	1027	80	288
			(OP: JK3GAD)		
OH9GGY	"	309,333	636	70	221
OH4UI	"	41,600	160	37	93
OH1VR	"	27,480	137	32	88
OH3KX	"	18,810	168	24	71
OH2KI	*"*	*4,514*	*39*	*25*	*36*
OH5NS	*"*	*3,936*	*79*	*8*	*40*
OG7F	"	2,960	44	12	25
OH1XY	"	448	12	7	9
OH3XZ	*"*	*32*	*4*	*4*	*4*
OH6AC	**28**	**57,321**	**331**	**25**	**74**
			(OP: OH6CS)		
OH5NZ	"	15,194	94	22	49
OF4BCS	"	1,392	32	9	15
			(OP: OH1ZAA)		
OF5ZA	**21**	**4,017**	**74**	**9**	**30**
			(OP: OH1ZAA)		
OH8X	**14**	**1,051,280**	**3377**	**38**	**132**
			(OP: OH6UM)		
OH7JL	"	16,182	95	21	72
OG6B	"	2,130	49	7	23
			(OP: OH1ZAA)		
OH1QX	**7**	**1,972**	**56**	**6**	**28**
			(OP: OH1ZAA)		
***OH1SIC**	**A**	**164,280**	**603**	**42**	**180**
			(OP: SM5SIC)		
OH1TP	*"*	*114,972*	*374*	*54*	*147*
*OH1XFE	"	101,000	348	50	152
*OH6BQH	"	86,240	399	40	120
*OG16M	"	79,380	266	52	137
*OH8JIX	"	77,677	386	43	130
*OH3UAI	"	39,516	204	37	111
*OH5UQ	"	30,240	167	34	92
*OH6LW	"	29,510	221	32	98
*OH2LU	"	11,220	104	22	63
*OH1TS	"	6,384	140	18	66
*OF5MQ	"	4,180	72	15	40
*OH2AWL	"	72	6	6	6
			(OP: @OH2AW)		
***OH3MC**	**21**	**23,120**	**207**	**19**	**61**
*OH5C	"	1,066	16	12	14
			(OP: OH5CW)		
***OH3HS**	**14**	**3,212**	**47**	**10**	**34**
*OF5C	"	160	6	5	5
			(OP: OH5CW)		
***OH3MM**	**7**	**27,534**	**310**	**13**	**65**
*OH5CY	"	1,484	49	5	23
***OH6Z**	**3.7**	**4,879**	**124**	**5**	**36**
*OH7RX	"	176	16	3	8
OG6N	**AA**	**2,847,260**	**2882**	**128**	**483**
			(OP: OH6NIO)		
OG3B	"	773,850	1689	84	301
OH6RE	"	642,246	722	125	401
OH3EX	"	397,656	632	90	288
OH6DX	"	365,211	512	88	253
OH7KBF	"	344,736	748	71	265
OH1O	"	335,124	515	82	266
			(OP: OH1TV)		
OH6OS	"	322,800	471	83	317
OH3JR	"	217,875	304	94	281
OH2PM	"	168,961	255	91	226
OH7KC	"	116,178	461	44	157
			(OP: OH7MFO)		
OH1EB	"	108,297	305	51	140
OH6TN	"	69,160	180	53	80
OH1X	"	52,969	163	45	116
			(OP: OH3WW)		
OH5VT	"	51,376	194	47	105
OF5BQ	"	33,128	139	39	125
OH3UU	"	29,224	101	36	68
OH1MM	"	24,867	122	33	48
OH2BJ	"	16,821	101	29	60
OH3RF	"	16,368	90	35	89
OH4KA	"	2,850	53	17	33
OF1D	"	1,204	15	14	14
			(OP: OH1JD)		
OG5A	**21A**	**446,160**	**1367**	**38**	**127**
			(OP: OH5TS)		
OG7A	"	403,560	1041	39	132
			(OP: OH6MW)		
OH8WW	"	384,540	1563	37	119
OG2X	"	104,036	509	31	93
			(OP: OH2RM)		
OF1TD	"	33,746	171	24	70
OH2EF	"	480	14	7	13
OF8L	**14A**	**562,006**	**1965**	**37**	**121**
			(OP: OH8LQ)		
OH1Z	**7A**	**343,980**	**1894**	**35**	**121**
			(OP: OH1LEG)		
OH6RX	*1.8A*	*23,084*	*399*	*8*	*50*
OG5O	**"**	**11,550**	**261**	**6**	**44**
			(OP: OG55W)		
OH2BO	"	3,634	72	7	39
***OH7GGX**	**AA**	**581,777**	**991**	**83**	**300**
*OH8RX	"	121,155	441	50	155
*OH3BKN	"	65,565	291	38	117
*OH3NAQ	"	46,400	198	44	116
*OH3LJ	"	41,223	229	31	120
			(OP: OH2BRG)		
*OH8KVY	"	9,500	80	22	54
*OH1HB	"	5,356	55	17	35
*OH8CEH	"	675	24	7	18
*OH4EBD	"	18	3	3	3
***OG4W**	**7A**	**32,040**	**289**	**17**	**73**
			(OP: OH4KZM)		

France

TM2Y	**A**	**3,237,876**	**3347**	**119**	**358**
			(OP: N5ZO)		
F5OHM	"	2,062,071	2304	123	354
F4DXP	"	172,208	487	61	168
F4IDC	"	157,855	402	72	169
F1GRH	"	100,352	297	59	137
F4HTZ	"	71,071	228	49	94
F4FXH	"	53,534	254	39	103
F6FET	"	43,920	172	44	100
F4HNP	"	28,125	151	35	90
F1PNJ	"	21,344	185	24	68
F4HPX	"	16,465	152	22	67
F5MMF	"	13,176	101	23	38
F4IYB	"	8,892	126	24	54
F5KEQ	"	3,744	77	13	39
			(OP: F4EYQ)		
F4FDR	"	1,054	20	11	20
F2CT	**28**	**215,982**	**1033**	**30**	**87**
F5LIW	"	200,200	799	28	72
F1IOZ	"	1,131	16	14	15
F5PHY	**14**	**23,268**	**197**	**19**	**65**
***F4CDR**	**A**	**371,070**	**696**	**80**	**230**
*F4ETG	"	230,622	588	58	180
*F6DRP	"	217,953	580	51	132
*F5GKW	"	204,127	541	62	179
F4WBL	*"*	*192,325*	*396*	*68*	*177*
*F4CZV	"	188,000	479	67	183
*F4BIT	"	155,724	421	56	172
*F6FTB	"	150,290	430	58	168
*F6BQG	"	143,510	360	58	168
*F5TLZ	"	142,362	527	53	145
*F4AYI	"	122,960	430	50	162
*F5SGI	"	105,968	333	49	130
*F6FNA	"	102,663	312	54	133
*F4IAY	"	96,118	335	51	136
*F4IGV	"	87,885	338	52	137
*F4HGF	"	83,160	370	44	145
*F5TVG	"	68,688	188	43	116
*F4IDT	"	65,349	252	39	98
*F4IZI	"	63,162	282	47	127
*F4GDO	"	59,909	330	31	108
*F5OHH	"	55,014	237	45	114
*F4BHK	"	54,162	141	68	109
*F4ADZ	"	52,555	217	43	72
*F5JU	"	45,592	168	39	100
*F1GKS	"	40,299	254	30	103
*F4DBD	"	39,083	178	33	88
*F4IZH	"	38,313	232	32	97
*F4IZG	"	37,120	197	36	92
*F5KLE	"	30,702	198	32	87
*TMØISS	"	29,344	248	31	100
			(OP: F4AHN)		
*F6ICA	"	28,800	198	24	76
*F1HTU	"	27,280	177	28	82
*F4HQO	"	26,187	113	38	91
*F4HOT	"	21,945	153	32	63
*F6GTX	"	17,922	133	27	60
F4FMU	*"*	*13,325*	*99*	*21*	*44*
*F4HOD	"	13,015	91	31	64
*F2FZ	"	12,366	83	25	29
*F4EZH	"	12,150	95	29	61
*F4IRV	"	8,568	100	16	52
*F

DL8OBF	"	606,480	1082	83	253
DG1IU	"	395,086	914	73	208
DH1UK	"	295,800	628	72	218
DL4ZA	"	294,304	670	69	203
DJ4MO	"	292,760	592	66	194
DL2LBK	"	253,110	428	79	207
DK3GI	"	177,177	317	82	149
DL3AO	"	132,362	287	73	156
DH2RTW	"	116,109	419	50	121
DL5AWE	"	107,019	351	49	158
DL6MIG	"	100,845	253	67	182
DK6CQ	"	95,804	272	52	120
DK4BY	"	87,032	257	54	118
DL6HBQ	"	84,348	312	47	151
DG1YBN	"	82,243	225	57	160
DK4IO	"	69,231	267	40	101
DH2MI	"	63,384	238	37	77
DF1LON	"	57,462	256	45	112
DJ3ABC	"	51,847	185	51	88
DF6QE	"	51,189	206	47	104
DK1FW	"	49,750	176	43	82
DL7PIA	"	48,500	204	40	85
DC7DX	"	46,580	142	58	112
DK1IJ	"	38,940	202	39	79
DL9SCO	"	37,376	119	49	79
DL1YCF	"	30,058	199	28	105
DL5PIA	"	29,000	112	42	74
DK2NVA	"	26,574	183	36	93
DL4ABR	"	24,354	146	29	53
DJ2IA	"	24,276	123	37	82
DF6RI	"	23,230	147	31	84
DL6NAV	"	19,350	124	28	58
DKØSU	"	13,098	114	20	54
			(OP: DF7SA)		
DF5DK	"	10,880	88	29	51
DL2KBX	"	10,416	130	18	66
DL2DSA	"	10,028	86	24	68
DL3YAT	"	9,864	98	22	50
DK3AX	"	8,670	80	17	34
DL6SBD	"	7,830	61	22	36
DG7YEL	*"*	*3,654*	*73*	*16*	*47*
DB6LY	"	1,638	21	11	15
DL1FPG	"	1,598	67	7	27
DG5DH	"	250	9	5	5
DGØOAT	"	187	11	6	11
DD2AW	*"*	*128*	*8*	*4*	*4*
DL3LAB	**28**	**54,694**	**283**	**21**	**61**
DL7DZ	*"*	*20,900*	*130*	*21*	*55*
DKØUU	"	9,780	66	21	39
			(OP: DF2CD)		
DMØY	**21**	**616,352**	**1921**	**35**	**101**
			(OP: DL3BQA)		
DJ7WW	"	119,691	386	32	111
DF5RF	"	26,945	132	22	63
DL1DTL	"	21,750	133	21	54
DMØA	**14**	**954,944**	**2640**	**39**	**133**
			(OP: DK3DM)		
DL9NEI	"	31,974	238	17	56
DL9LM	"	15,939	216	13	50
DL1ALX	"	736	36	4	19
DK4DJ	**7**	**5,060**	**90**	**11**	**35**
DF1TB	**1.8**	**1,914**	**63**	**4**	**29**
***DP5P**	**A**	**548,954**	**983**	**84**	**263**
			(OP: DL1MHJ)		
*DJ3HW	"	540,592	848	91	277
*DF3IS	"	382,850	728	75	235
*DL8UV	"	325,725	674	75	228
*DR5W	"	263,934	560	70	209
			(OP: DL1RTL)		
*DL2NEA	"	195,104	498	62	162
*DB5DY	"	180,752	474	58	150
*DG5MLA	"	150,086	422	55	147
*DL4AX/P	"	143,640	408	49	140
*DL5ALW	"	135,394	318	65	201
*DF6QC	"	132,930	499	46	164
DL8ULO	*"*	*115,752*	*450*	*45*	*167*
*DLØNG	"	110,591	413	45	136
			(OP: DK8NC)		
*DL2RPN	"	108,843	330	58	161
*DJ4DN	"	107,262	345	54	148
*DL7VX	"	107,200	440	45	155
*DG7LAN	"	102,684	463	38	134
*DJ3GE	"	94,095	321	46	107
*DF2AK	"	91,924	305	56	140
*DL5JS	"	91,572	354	43	113
*DL1VO	"	89,310	339	47	148
*DK5FF	"	87,360	383	40	120
*DL1RTO	"	85,728	342	42	99
*DL7NV	"	76,840	366	40	130
*DL1CC	"	76,428	274	50	148
*DL8SDC	"	75,999	295	46	95
*DKØBM	"	72,369	518	32	121
			(OP: DK7CH)		
*DL4TL	"	69,738	294	43	134
*DO3UW	"	69,438	305	35	107
*DJ4WM	"	63,840	369	29	131
*DJ5NJ	"	59,898	200	54	95
*DK8CB	"	57,376	257	41	122
*DL1VJL	"	56,581	166	52	85
*DL3DRN	"	55,215	245	42	93
*DF2FM	"	54,384	208	45	87
*DO2QS	"	46,617	247	29	94
*DJ6TK	"	46,488	214	39	117
*DL1YEG	"	46,110	287	28	131
*DL9HB	"	45,570	190	39	108
*DL2GMI	"	45,047	205	35	72
*DL3ABY	"	44,640	271	37	107
*DH3SBB	"	44,384	172	47	105
*DKØTP	"	43,924	263	35	104
			(OP: DH1RZ)		
*DL5CK	"	43,053	187	37	90
*DL5RMH	"	39,500	207	35	90
*DO3LZ	"	39,412	235	27	91
*DL3TVI	"	36,039	161	40	83
*DK7MCX	"	34,989	173	39	68
*DJ3JD	"	34,596	196	34	90
*DM6EE	"	34,300	171	41	99
*DK3YD	"	33,915	156	37	82
*DO8JL	"	33,812	140	36	71
*DG2JA	"	32,770	153	32	81
*DL1KAS	"	31,780	207	39	101
*DD1OP	"	31,720	166	38	84
*DG6DAF	"	31,654	180	30	68
*DL2AL	"	30,916	167	36	82
*DD3JN	"	30,820	169	31	103
*DO4OD	"	30,186	175	29	100
*DF7LS	"	29,256	166	27	79
*DG1NPM	"	29,028	222	28	90
*DO1PE	"	27,371	242	25	76
*DF2WZ	"	27,370	153	34	81
*DK8CK	"	27,135	189	33	102
*DL1GZW	"	26,705	262	21	88
*DL1AWC	"	25,894	184	26	95
*DO3ME	"	25,662	163	30	64
*DO4MTB	"	24,672	155	29	67
*DO2SBS	"	24,486	174	29	77
*DL7DS	"	24,090	147	33	77
*DF1HPK	"	23,735	115	35	66
*DL9HCO	"	23,296	180	26	86
*DL7FUA	"	22,892	94	38	59
*DL5YT	"	22,428	194	26	100
DL3YL	*"*	*21,712*	*170*	*30*	*88*
*DJ1OJ	"	21,470	136	31	64
*DF9HC	"	21,060	185	23	85
*DF8TY	"	20,655	89	35	50
*DL7VRG	"	20,184	122	34	82
*DB5ZF	"	20,160	178	27	78
*DJ9SN	"	19,764	124	31	77
*DM2DLG	"	19,673	184	25	78
*DC8WPA	"	19,552	154	30	74
*DL9GK	"	19,521	129	29	52
*DL1JGG	"	18,758	159	25	88
*DD7KH	"	18,483	117	35	66
*DO6STY	"	18,183	128	26	61
*DL7JU	"	17,127	137	28	71
*DO9YY	"	16,037	118	26	53
*DL1EMA	"	16,032	116	33	63
*DL4JWU	"	15,246	140	23	76
*DL6AL	"	14,972	117	27	49
*DL8MV	"	14,872	112	30	74
*DL1MPR	"	14,608	101	26	57
*DK8NI	"	13,770	118	25	77
*DO1TOM	"	13,338	136	20	58
*DO6WW	"	13,320	124	22	50
*DL6RG	"	12,880	98	27	53
*DH9DX/P	"	12,749	126	18	43
*DO7EP	"	12,474	125	24	57
*DM3KC	"	12,070	90	29	56
*DD3WY	"	11,869	157	15	68
*DF2TH	"	11,770	80	23	32
*DO1YHJ	"	11,532	96	24	38
*DH4FAN	"	11,524	107	20	47
*DF6NI	"	11,502	94	25	56
*DG7DBR	"	11,392	173	16	73
*DL4AND	"	11,242	77	27	50
*DL1MA	"	11,218	111	21	58
*DO3NPM	"	11,060	111	21	58
*DL6CWM	"	10,899	89	24	39
*DK2WU	"	10,472	72	25	31
*DL6EZ	"	10,452	76	29	49
*DL1FKB	"	10,152	75	27	45
*DK3YB	"	10,125	87	21	54
*DL5CZ	"	10,074	97	21	48
*DO7OO	"	10,011	106	23	48
*DK7MV	"	9,990	113	22	68
*DL7UAI	"	8,880	83	20	54
*DO4DAN	"	8,512	142	12	64
DM3KP	*"*	*8,280*	*68*	*21*	*39*
*DB5SM	"	8,255	91	22	43
*DG3BZ	"	8,214	75	26	48
*DO6CH	"	7,904	98	16	36
*DH5KLI	"	7,220	114	28	67
*DL7TG	"	7,198	98	15	44
*DL9MDI	"	7,169	68	27	40
*DL4YAY	"	6,955	69	26	39
*DH2OS	"	6,720	116	13	47
*DF3BY	"	6,693	92	19	50
*DG6MDG	"	6,630	60	26	39
*DK3RN	"	6,534	63	21	45
*DO5LE	"	6,498	70	20	37
*DG6KBG	"	6,402	70	21	45
*DD1ZA	"	6,264	90	16	42
*DK6AC	"	6,232	60	22	54
*DL5QP	"	6,138	73	21	45
*DO8WM	"	5,900	55	22	37
*DG3IS	"	5,900	57	22	37
*DL7CU	"	5,824	75	18	38
*DK9ZE	"	5,695	61	24	43
*DL1NKB	"	5,432	59	21	35
*DL8ZU	"	5,301	53	21	36
*DO3REN	"	5,292	57	21	42
*DL9ZWG	"	5,270	58	22	40
*DG5LW	"	5,152	67	13	33
*DO5MN	"	5,074	69	18	41
*DK2MB	"	4,970	63	22	48
*DL6UXL	"	4,872	81	17	41
*DL1LSW	"	4,841	53	17	30
*DG1RPU	"	4,575	60	18	43
*DF4WO	"	4,543	75	16	43
DL/SP2RBA	*"*	*4,224*	*104*	*16*	*50*
*DD6FM	"	4,224	72	13	35
*DK8PL	"	4,020	76	17	50
*DO9HN	"	3,948	52	15	32
*DK4KH	"	3,692	47	18	34
*DL1FMG	"	3,480	47	17	23
*DM7HF	"	3,402	52	19	35
*DJØLM	"	3,395	47	12	23
*DB9JV	"	3,330	40	17	28
*DF7OA	"	3,328	63	12	40
*DO1RWM	"	3,240	55	11	16
*DG1RS	"	3,072	50	17	31
*DF2WR	"	3,055	48	13	34
*DH6BAI	"	3,009	58	19	40
*DL2FBG	"	2,958	49	15	36
*DL9FB	"	2,808	57	15	37
*DL4ZAA	"	2,744	46	22	34
*DH1DH	"	2,726	55	12	35
*DK8VD	"	2,650	61	14	36
*DL4APJ	"	2,496	49	14	34
*DF5BX	"	2,278	43	13	21
*DO1HGS	"	2,211	48	10	23
*DK4EF	"	2,187	33	12	15
*DG4MH	"	2,028	40	11	28
*DL7ED	"	1,998	48	14	40
*DG6MS	"	1,800	47	9	31
*DM1MC	"	1,722	42	14	27
*DK1VOK	"	1,716	54	9	35
*DK9TF	"	1,560	33	16	24
DF5FS	*"*	*1,560*	*36*	*11*	*19*
*DK2CW	"	1,428	24	12	22
*DG2ELK	"	1,376	48	7	25
*DO8ZB	"	1,350	46	9	18
*DM3AA	"	1,196	16	12	14
*DK2ZR	"	1,155	27	10	23
*DK2AM	"	1,080	35	14	26
*DL4VCV	"	1,073	26	10	19
*DO9UW	"	972	24	11	16
*DK2NB	"	875	28	14	21
*DG1VM	"	768	22	6	10
*DO1EP	"	728	34	12	16
*DF7CB	"	728	32	6	20
*DC1DB	"	697	20	7	10
*DO4NT	"	589	16	8	11
*DG3MCH	"	506	16	9	13
*DL5BL	"	468	12	8	10
*DL2AWA	"	432	18	9	15
*DL1YPF	"	414	11	8	10
*DD6TT	"	336	17	10	11
*DD2TC	"	264	21	6	18
*DO1MEW	"	224	10	5	9
*DO6GT	"	176	11	7	9
*DN4CQ	"	24	7	5	7
DJ9KH	**28**	**51,058**	**199**	**30**	**68**
*DO2CT	"	10,830	89	20	37
*DK1TBL	"	4,598	59	13	25
*DK2BO	"	2,024	32	10	12
*DL1SBF	"	705	20	5	10
*DB9RZ	"	510	15	7	8
*DO6TA	"	323	13	7	10
DO1OTW	**21**	**66,310**	**363**	**25**	**70**
*DO1IBJ	"	51,504	298	25	62
*DL5KUD	"	13,409	125	18	35
*DO1PCD	"	11,820	119	18	42
*DHØGDS	"	9,653	113	15	34
*DA9L	"	9,384	127	13	33
			(OP: DO1BEN)		
*DO4OS	"	6,272	62	18	31
*DL7AB	"	1,386	26	9	12
*DO7DH	"	308	12	6	8
*DO5AMV	"	285	21	7	12
*DO7ES	"	91	5	3	4
*DO7GM	"	84	11	5	7
*DH9BAJ	"	16	2	2	2
DL9ZP	**14**	**45,125**	**316**	**25**	**70**
*DK1GP	"	6,148	93	10	43
*DM7CW	"	4,773	87	9	34
*DL2QT	"	3,744	56	10	29
*DG4ACF	"	3,135	93	5	28
*DL9GWA	"	2,849	51	11	26
*DG6SBO	"	2,304	50	11	21
*DF9GH	"	2,176	40	8	24
*DL1STV	"	1,829	47	7	24
*DL1GRQ	"	864	40	4	20
*DL1YMS	"	504	24	4	17
*DL3MB	"	442	14	7	10
*DM3AW	"	323	13	6	11
*DG2NGS	"	323	15	5	12
*DG6SCP	"	238	14	4	13
*DF2ET	"	35	7	1	4
DL7ØTRS	**7**	**14,105**	**217**	**11**	**54**
*DL5RU	"	13,455	187	13	56
*DL2SKY	"	9,954	165	12	51
*DB1VQ	"	3,666	93	5	34
*DL4ZAN	"	1,290	49	5	25
*DJ3IV	"	1,026	36	5	22
*DK4RM	"	182	9	6	8
*DH1OL	"	90	11	2	7
DO6NI	**3.7**	**4,400**	**125**	**4**	**36**
*DL2RZG	"	4,100	103	6	35
DL1HSI	**1.8**	**1,380**	**56**	**5**	**25**
*DL2VIW	"	462	25	3	18
DF9XV	**AA**	**3,146,906**	**2096**	**154**	**520**
DL7ON	"	1,890,945	1441	153	514
DK7AM	"	1,673,664	1671	131	421
DK5TX	"	1,654,253	1419	123	404
DL9UP	"	1,476,680	1828	121	430
DL4VDA	"	1,438,179	1766	112	345
DK9IP	"	1,400,985	1072	136	437
DQ5T	"	1,239,758	1086	120	413
			(OP: DL4LAM)		
DL1NKS	"	1,233,584	1655	107	366
DK4VW	"	1,185,596	1300	116	336
DM6DX	"	1,183,985	995	149	366
DK7A	"	1,180,676	1042	119	447
			(OP: DJ8VH)		
DF2LH	"	1,106,173	1041	124	403
DL3ON	"	1,083,013	1578	119	320
DG9SEH	"	1,064,307	1214	109	338
DL1MRL	"	1,005,507	1327	116	385
DF2RG	"	985,101	1036	124	383
DL5GAC	"	893,472	1155	113	379
DL8AAE	"	766,488	981	110	326
DJ2TG	"	763,190	1035	112	345
DK1KC	"	737,450	1026	101	329
DL7CX	"	718,014	871	123	383
DFØGDX	"	675,190	747	124	414
			(OP: DL7VEE)		
DL1CG	*"*	*649,030*	*982*	*103*	*307*
DL4YAO	"	585,273	764	96	253
DK8ZZ	"	573,040	917	81	223
DL8RDL	"	526,071	1024	68	219
DJ2QV	"	518,204	706	93	260
DJ1SL	"	464,758	799	82	291
DL4SKF	"	457,232	766	80	248
DK2CC	"	437,552	701	83	285
DM5EM	"	418,037	573	96	283
DL4JLM	"	408,965	544	91	220
DL2OE	"	386,048	456	105	311
DH1TST	"	380,330	640	84	281
DJ9ZB	"	379,275	614	77	248
DC6O	"	368,104	607	85	271
			(OP: DL3DW)		
DP7X	"	358,295	559	98	255
			(OP: DL6IAK)		
DK8AX	"	336,420	480	103	253
DQ1P	"	336,383	476	99	260
			(OP: DK1IP)		
DL6ON	"	330,672	696	66	266
DL8QS	"	311,543	488	97	264
DH2PA	"	300,756	429	90	263
DL8MKG	"	296,724	689	68	245
DL1SEH	"	284,022	593	75	204
DK2TG	"	265,734	504	81	178
DL5ST	"	263,952	571	74	238
DG7NFX	"	263,268	451	81	228
DL3SKF	"	242,222	526	77	204
DH3FEN	"	240,499	485	73	228
DF8V	"	237,600	429	82	218
			(OP: DF8VO)		
DK2AT	"	231,394	591	62	192
DL5XJ	"	227,404	346	80	198
DL6MI	"	225,882	360	90	177
DK5AV	"	204,336	568	65	199
DK2LO	"	204,288	403	73	193
DJ9HX	"	199,392	389	72	196
DK1AX	"	194,997	318	97	214
DL1STG	"	192,888	373	80	202
DL7AUO	"	185,020	432	63	227
DL7ATR	"	175,788	442	68	189
DHØSP	"	171,487	557	51	172
DL1YM	"	170,068	369	62	102
DJ5IW	"	167,314	403	71	195
DL6AG	"	158,427	281	81	180
DHØMB	"	156,845	361	71	176
DJ6TB	"	156,384	358	71	145
DJ9MH	"	146,067	275	73	196
DK6QO	"	141,512	315	69	197
DL6NCY	"	141,360	340	70	170
DH6DAO	"	135,924	363	60	181
DD5VL	"	133,888	352	62	194
DL1BUG	"	133,196	293	79	189
DF8XC	"	132,678	283	63	126
DK2CX	"	128,140	271	67	148
DK5JM	"	127,904	289	64	160
DJ5MO	"	125,504	406	66	146
DF1LX	"	121,187	286	59	194
DL7UXG	"	111,045	329	51	114
DC1HR	"	110,192	278	58	136
DL2DQL	"	109,493	280	64	159
DM3M	"	103,790	318	58	136
DL1LOD	"	91,392	263	53	151
DK5IR	"	83,961	293	45	126
DL6HH	"	70,474	175	70	141
DL9NDW	"	64,468	191	58	84
DL2VK	"	50,600	169	43	72
DL6LAU	"	45,264	156	46	118
DK4RR	"	44,940	178	40	65
DL6ED	"	43,920	147	55	89
DM5TI	"	43,594	135	57	85
DB7BN	"	41,496	220	35	98
DR7Q	"	37,332	208	35	87
			(OP: DL4ALI)		
DJØIF	"	36,312	124	55	81
DL9GTB	"	32,046	106	50	97
DL1DBR	"	32,000	190	35	90
DK5DQ	"	30,438	121	29	60
DG2NMH	"	30,003	165	39	98
DM9EE	"	29,680	112	42	70
DL6MFK	"	28,348	131	32	44
DF1HF	"	25,650	110	40	95
DL5XAT	"	25,441	138	30	73
DM5DM	"	23,600	139	33	85
DL2FQ	"	22,204	105	33	58
DL8KX	"	22,092	105	38	46
DK3HV	"	20,976	111	34	58
DLØAH	"	18,247	113	27	44
			(OP: DG5YHE)		
DL7URH	"	17,608	106	23	101
DK4QT	"	15,840	99	32	48
DL2MM	"	15,477	98	31	46
DK1FY	"	14,212	99	25	43
DF3QG	"	6,630	46	26	39
DF6PB	"	5,424	40	21	27
DF6QV	"	4,756	87	9	49
DL3LJ	"	4,480	50	16	24
DLØFIS	"	3,555	29	17	28
			(OP: DL2KJ)		
DL9OHA	"	2,688	34	16	32
DL1WM	"	104	7	6	7
DJ7EO	**28A**	**444,750**	**1274**	**34**	**116**
DD2ML	"	421,372	1214	36	113
DH8BQA	"	355,605	1054	34	117
DL9YAJ	"	159,836	519	30	94
DL1QW	"	140,244	454	32	92
DF2SD	"	88,818	257	32	99
DJ1AA	"	51,896	222	28	76
DL5YM	"	39,732	223	25	61
DL6MRS	"	37,674	162	26	65
DF7AP	"	6,000	60	15	33
DL1PAN	"	1,344	21	10	14
DL2ARD	**21A**	**1,452,752**	**3014**	**39**	**157**
DR5N	"	421,986	1117	37	122
			(OP: DL2DBH)		
DH1TT	"	365,568	1088	35	101
DL1NEO	"	109,134	345	34	107
DJ5CT	"	22,555	250	21	44
DL5ZL	"	19,575	156	19	56
DL6FBL	**14A**	**1,774,600**	**4040**	**39**	**151**
DK6BA	"	125,952	546	31	97
DM3MM	*"*	*106,400*	*659*	*26*	*86*
DR1E	"	105,138	602	31	87
			(OP: DB1WA)		
DK5PD	**7A**	**272,034**	**1100**	**32**	**95**
DL2LDE	"	33,770	192	27	83
DJ9UN	"	26,980	246	21	74
DK9HN	**3.7A**	**13,632**	**173**	**10**	**54**
DL6MHW	**1.8A**	**31,168**	**553**	**9**	**55**
DK5NJ	"	7,695	188	5	40
DH8WR	"	2,196	69	5	31
DJ4MX	**AA**	**654,150**	**784**	**106**	**339**
*DL2NBU	"	580,346	619	108	334
*DL1GME	"	468,009	769	90	259
*DM5B	"	406,953	1000	71	238
			(OP: DG6IMR)		
*DK7TX	"	379,842	529	96	258
*DK5WO	"	259,845	609	55	200
*DJ2FL	"	252,830	699	57	205
*DR7T	"	249,100	492	68	197
			(OP: DF1DN)		
*DL3MLA	"	196,128	409	65	151
*DL1QQ	"	188,682	458	62	184
*DL5KBO	"	186,300	498	52	178
*DJ4WT	"	171,150	395	62	148
*DL2OHL	"	166,110	570	48	178
*DJ5AN	"	150,588	308	85	197
*DJ6HR	"	146,232	355	57	159
*DM4EAX	"	140,744	400	61	180
*DG8OBN	"	128,148	371	54	182
*DK6QW	"	124,136	277	69	167
*DL4MFR	"	121,024	340	63	185
*DJ6RN	"	112,360	385	56	156
*DL1ONI	"	111,375	269	61	164
*DK1IZ	"	109,590	394	45	150
*DR6R	"	98,835	343	48	117
			(OP: DL6RBO)		
*DL1JNA	"	97,008	260	53	135
*DL6RBH	"	91,932	336	47	141
*DO4TP	"	90,384	228	45	123
*DM4KA	"	90,168	287	63	158
*DL4AC	"	89,960	314	47	126
*DK9BM	"	86,278	312	48	131
*DO9SR	"	81,906	372	36	110
*DKØKG	"	78,657	440	32	125
			(OP: DL7ACN)		
*DL6RDE	"	77,182	220	52	97
*DL7YS	"	76,744	212	60	152
*DL1GRC	"	75,674	290	42	115
*DJ6DO	"	72,209	290	45	118
*DL2SWR	"	70,638	168	70	113
*DL5ANS	"	70,238	215	58	115
*DL8UI	"	69,825	193	53	122
*DM2HEY	"	65,860	274	41	137
*DM5CQ	"	64,128	289	46	121
*DL9DX	"	63,000	284	48	120
*DL9YJ	"	62,015	259	42	115
*DL8TG	"	59,500	261	39	131
*DO8ABS	"	59,015	336	32	113
*DL8RB	"	55,421	200	44	113
*DL6RAI	"	50,315	264	36	109
*DK9JC	"	49,617	219	44	105
*DL2LSM	"	45,436	199	44	104
*DL2ART	"	39,424	213	35	93
*DK3WE	"	38,642	165	45	94
*DL9NCR	"	37,392	229	33	90
*DK2YL	"	32,896	151	44	84
*DD9HK	"	32,880	139	47	90
*DL8ZAJ	"	31,752	164	36	90
*DL4KUG	"	30,326	138	34	84
*DL1EJD	"	30,208	202	31	87
*DL4DRW	"	29,890	151	39	83
*DB4LI	"	29,478	181	30	72
*DK7SM	"	28,892	185	34	90
*DL4EAX	"	26,786	142	36	82
*DHØDM	"	25,894	172	36	85
*DL9ECA	"	24,219	138	29	88
*DB5ABS	"	22,655	170	26	89
*DL4GBA	"	21,888	118	32	64
*DG9VH	"	20,868	205	20	74
*DK5MB	"	20,181	121	29	64
*DF7IH	"	19,776	163	17	79
*DJ3WE	"	16,830	118	28	82
*DO1SJF	"	16,826	110	27	67
*DD1UN	"	16,800	118	35	65
*DM3F	"	16,287	111	26	63

Guernsey

GU7DAI	**A**	**13,650**	**158**	**19**	**56**
***GUØBEZ**	**A**	**3,472**	**48**	**19**	**37**
*MUØFAL	"	130	5	5	5
***MUØGSY**	**AA**	**443,575**	**1114**	**59**	**216**

Hungary

HA5PP	**A**	**1,002,885**	**1368**	**104**	**313**
HA1BC	"	508,640	748	92	282
			(OP: DL1MAJ)		
HA3HK	"	46,610	241	35	83
HA8M	**14**	**119,198**	**803**	**30**	**77**
			(OP: HA8FM)		
***HA8WY**	**A**	**263,400**	**652**	**69**	**231**
*HA4FB	"	253,181	658	73	208
*HA3FHH	"	100,155	239	53	112
*HA5PL	"	75,360	330	43	117
*HA7AVU	"	44,556	249	35	106
*HA9MDN	"	32,634	158	39	72
*HG1VN	"	25,760	196	29	86
*HA5MIG	"	3,864	57	16	40
*HA7MS	"	832	18	10	16
***HA2MI**	**28**	**20,300**	**137**	**24**	**46**
*HA8YU	"	10,070	79	19	34
*HA5UA	"	1,323	28	9	12
***HA1WD**	**21**	**624**	**22**	**6**	**6**
***HA4BF**	**14**	**638**	**29**	**3**	**19**
***HA5TOP**	**7**	**1,305**	**41**	**6**	**23**
			(OP: HA5UA)		
HG8R	**AA**	**7,565,566**	**5129**	**168**	**550**
			(OP: HA8JV)		
HA8A	"	5,657,273	4342	145	472
			(OP: HA8DZ)		
HA2KMR	"	1,172,352	2012	102	324
HA6P	"	315,520	804	53	117
HA3OU	"	292,029	607	79	232
HG6Y	*"*	*175,248*	*614*	*48*	*96*
			(OP: HA6OI)		
HA7RY	"	164,405	339	74	177
HA7VK	"	119,274	289	62	144
HA5DDX	"	117,572	201	88	150
HA5JI	**28A**	**209,450**	**630**	**33**	**109**
HA5AQ	"	36,182	180	27	52
HA3NU	**21A**	**1,145,958**	**2808**	**38**	**141**
HG1S	"	686,070	1781	38	124
			(OP: HA1DAE)		
HA5YG	"	5,002	64	12	29
HG3N	**14A**	**987,651**	**2801**	**39**	**144**
			(OP: HA3LN)		
HA8TP	**7A**	**19,404**	**242**	**11**	**55**
HA1TJ	**3.7A**	**271,600**	**1704**	**22**	**90**
***HA5OT**	**AA**	**58,671**	**240**	**45**	**114**
*HA8AR	"	19,264	189	18	68
HA8BE	*"*	*18,193*	*129*	*29*	*84*
*HA8TKS	"	2,184	36	16	26
***HA2E**	**21A**	**79,695**	**383**	**27**	**78**
			(OP: HA2EAV)		
*HA3FMR	"	4,192	78	12	20
***HGØR**	**14A**	**441,842**	**1625**	**38**	**135**
			(OP: HAØNAR)		
*HA3HA	"	72,352	437	25	87
***HA1TIB**	**7A**	**9,150**	**162**	**9**	**41**

Iceland

TF2LL	**A**	**508,699**	**984**	**74**	**233**
TF8KY	"	79,580	392	42	131
TF2CT	"	12,789	111	23	64
***TF2MSN**	**A**	**151,409**	**453**	**54**	**173**
*TF3VS	"	11,005	120	18	53
TF3T	**AA**	**2,062,203**	**3317**	**89**	**340**
TF3AO	**28A**	**5,576**	**162**	**6**	**28**
***TF3DC**	**21A**	**2,128**	**46**	**8**	**30**
***TF3JB**	**14A**	**432**	**9**	**7**	**9**

Ireland

EI6JK	**21**	**458,893**	**1661**	**32**	**99**
EI5GUB	**1.8**	**17,249**	**400**	**5**	**42**
***EI4GNB**	**A**	**494,490**	**920**	**80**	**231**
*EI3ENB	"	154,375	464	55	192
*EI8GP	"	130,995	435	50	163
*EI4II	"	57,435	225	40	65
*EI5LA	"	5,880	96	15	45
*EI2HIB	"	2,640	38	13	27
*EI3FBB	"	676	20	9	17
*EI2KA	"	480	20	5	15
***EI3CTB**	**21**	**8,232**	**112**	**12**	**37**
EI4IZB	**AA**	**49,649**	**301**	**32**	**99**
EI5KO	"	12,936	128	21	63
***EI9ES**	**AA**	**18,360**	**159**	**24**	**78**
*EI8KV	"	10,368	81	25	56
*EI8KW	"	624	24	8	18
*EI7FRB	"	468	14	7	6
***EI6KW**	**14A**	**9,843**	**187**	**7**	**44**

Isle of Man

***GDØAMD**	**A**	**40,800**	**238**	**30**	**106**
MD2C	**AA**	**1,287,441**	**1362**	**95**	**274**
			(OP: MDØCCE)		

Italy

I5MXX	**A**	**967,260**	**1275**	**106**	**314**
IZ1OSP	"	812,364	1596	100	299
IØLYO	"	740,331	1224	94	293
IU1NKS	"	364,181	668	80	231
IR8O	"	223,412	959	51	151
			(OP: IZ8GCB)		
I4XNN	"	212,877	439	67	150
IZ1HHT	"	168,973	450	62	177
I3/OE6MBG	"	159,655	682	38	147
IZ2BVC	"	157,131	585	47	174
IZ2LTW	"	134,028	328	62	142
IZ5EKV	"	122,544	683	24	50
IZ6OUX	"	114,492	546	45	143
IU2IHM	"	110,240	349	51	157
I2OLV	"	96,304	218	66	142
IZ1SAI	"	92,130	396	40	145
IU7EDX	"	72,618	302	40	107
IZ2QZH	*"*	*72,039*	*256*	*54*	*123*
IU4LEC	"	71,668	262	58	106
IZ6ERS	"	64,782	252	51	126
IO4M	"	46,766	261	37	97
IU2EFB	"	44,250	149	44	74
IN3IIR	"	29,083	226	21	106
IZ1PLH	"	28,548	228	27	95
IU1FSL	"	28,152	207	28	110
I4JUQ	*"*	*27,072*	*163*	*29*	*65*
IWØBLW	"	26,838	152	26	45
IZ1MLS	"	23,002	119	33	73
IZ2QGB	"	22,568	133	30	61
I2IOJ	"	13,112	101	26	62
IV3IPA	"	11,097	113	22	59
IZ1GRH	"	11,072	63	28	36
IU4CSS	"	10,374	114	19	38
IZ1NBX	"	9,027	169	11	48
IZ5FDD	"	6,408	52	24	48
IZ8EYN	"	5,848	99	17	51
IU3KMF	"	3,384	101	8	39
IK2QIN	"	1,365	27	13	22
IW5DPF	"	1,344	16	12	16
IZ8QNS	"	1,230	18	13	17
IW3IOG	"	984	15	12	12
IW2JBB	"	621	33	5	22
IU2LVV	"	504	10	8	10
IZ4VTZ	"	270	10	6	9
I4JED	**28**	**104,797**	**550**	**25**	**52**
IZØPAU	**21**	**186,416**	**908**	**33**	**89**
IK8NSR	"	107,734	488	29	89
IK4POI	"	64,246	348	26	65
IK2AHB	"	21,672	163	19	44
IZ4UFG	**14**	**36,256**	**215**	**23**	**65**
IK6LBV	"	32,882	314	19	63
IK8SVQ	"	24,816	181	28	66
IK2UME	"	16,536	160	16	62
IZ8GUQ	"	7,560	94	12	48
IU2IGV	"	144	16	4	14
IU2LVS	"	6	1	1	1
IV3CNZ	**7**	**88,550**	**720**	**24**	**86**
IR7R	"	15,376	236	14	48
IK3ZAQ	*"*	*14,760*	*201*	*12*	*48*
IUØAPU	"	10,974	130	15	47
IU2JFG	"	1,530	55	7	27
IN3HEZ	**3.7**	**7,310**	**162**	**5**	**38**
***IV3ZYB**	**A**	**753,424**	**1053**	**102**	**290**
*IK1JJM	"	456,872	943	77	222
*IUØDUM	"	306,090	799	70	215
*IK1RGK	"	232,760	571	78	175
*IK4RQJ	"	205,176	344	79	230
*IK4MTF	"	204,345	510	57	182
*IK7RVY	"	160,050	620	44	121
*IK2FIR	"	159,808	427	70	157
*IK2QLX	"	149,408	419	55	148
*IK3SSJ	"	144,720	503	60	180
*IZ1RDQ	"	139,832	414	63	164
*IU2JWF	"	128,180	305	64	157
*IU1MRG	"	127,656	458	49	148
*IZ2OOS	"	122,016	420	48	138
*IK5AMB	"	108,624	249	61	125
*IWØHLZ	"	106,252	401	53	149
*IN3AHO	"	100,980	550	34	136
*IUØDHV	"	93,980	298	54	131
*IW1PNJ	"	85,184	310	52	124
*IU3OCN	"	85,140	346	53	145
*IZ6BXQ	"	79,316	266	48	110
*IZ2BKA	"	79,086	283	45	102
*IK7NXU	"	76,032	200	55	137
*IU3EDK	"	74,226	314	41	137
*IU7CUE	"	71,757	383	34	119
*IU3GJD	"	70,975	329	35	132
*IZ2SXZ	"	69,273	285	46	133
*IKØALT	"	67,968	245	50	127
*IZØVXY	"	67,360	327	38	122
*IU7IGI	"	66,700	193	50	95
*IU4HMY	"	62,624	250	43	109
*IW3SOA	"	62,015	249	40	117
*IK2OFS	"	54,366	204	46	77
*IZ8EQG	"	54,288	255	38	106
*IK2SAR	"	52,220	176	50	90
*IU2HEE	"	51,350	207	45	113
*IU8JPG	"	49,660	140	50	80
*IV3ZNK	"	49,374	214	36	81
*IZ8CLM	"	49,323	139	52	71
*IZ7GLL	"	47,256	189	45	87
*IQ2GM	"	46,041	190	44	105
			(OP: IK2WXQ)		
*IZ1XEE	"	45,864	149	58	98
*IZ4BKK	"	44,484	248	34	98
*IW5AB	"	42,744	169	55	101
*IN3MNS	"	41,013	163	40	149
*IZ3XNJ	"	39,984	191	39	73
*IW2CAM	"	39,083	138	45	76
*IZ2XCK	"	36,432	284	22	110
*IWØHNL	"	33,500	245	32	102
*IW5ECP	"	32,488	164	34	90
*IN3ADW	"	31,536	204	30	78
*IU3OJA	"	31,476	158	39	83
*IN3JRZ	"	30,504	242	30	94
*IUØDZA	"	30,444	156	41	88
*IN3HUU	"	28,928	179	30	83
*IK8SHL	"	28,435	202	29	92
*IU5KRE	"	26,460	163	38	88
*IZ7ZKV	"	26,240	219	25	55
*IK4QJF	"	24,840	137	38	70
*I1YGQ	"	24,610	151	35	80
*IW2ENA	"	24,089	129	39	70
*IW2MYG	"	24,000	136	35	85
*IK8ARF	"	21,900	97	40	60
*IZ3PYR	"	20,383	188	25	84
*IU2GGD	"	20,010	98	39	48
*IU1FIB	"	19,716	136	30	76
*IWØAEN	"	19,291	127	35	66
*IU1OQZ	"	18,615	135	29	56
*IK2AUK	"	17,340	134	27	75
*IWØGTA/5	"	17,098	101	26	77
*IU3FBL	"	16,910	72	40	55
*IK5LWE	"	16,268	129	24	59
*IZ7WEM	"	16,236	94	37	62
*IU1HGO	"	14,790	120	23	79
*IK2JTS	"	14,729	143	27	76
*IK7IWF	"	14,678	96	29	53
*IZ8YAA	"	13,552	109	24	53
*IZ2KWV	"	13,344	99	29	67
*IZ2ZQP	"	12,922	118	25	66
*IK2OLJ	"	12,699	87	30	53
*IUØMBJ	"	12,236	80	33	59
*IZ5HQB	"	12,110	97	22	48
*IØOSI	"	11,242	72	33	44
*IK8DYM	"	9,638	98	27	52
*IW3RPS	"	9,576	77	25	47
*IK4XQT	"	9,348	106	18	58
IX1CVF	*"*	*9,213*	*129*	*15*	*68*
*IKØUGC	"	9,100	69	22	30
*IK2SYI	"	8,364	80	19	63
IW5EHM	*"*	*7,968*	*93*	*16*	*32*
*IU4NYV	"	7,700	71	25	45
*IZ8FCA	"	7,371	105	18	45
*IZ2ZPT	"	7,227	71	20	53
*IK3XTT	"	6,596	60	28	40
*IN3FWK	"	6,525	112	17	58
*IN3RWF	"	5,382	71	20	49
*IWØEYT	"	5,307	69	20	41
*IK2YSJ	"	5,300	75	16	37
*IK1ZOE	"	5,148	101	16	50
*IK3XTV	"	5,000	45	21	29
*IK8IOZ	"	4,884	60	22	44
*IKØVSY	"	4,845	50	18	33
*IZ2YNB	"	4,588	59	19	43
*I2BZN	"	4,526	88	15	58
*IQ1EE	"	3,696	54	15	29
*IZ1NGW	"	3,591	45	20	37
*IN3PDI	"	3,400	38	19	31
*I2RBR	"	3,240	35	18	22
*IZ8PPI	"	2,124	27	14	22
*IWØDJC	"	2,109	41	15	22
*IN3EJM	"	2,090	43	11	27
*IZ1DXS	"	2,013	37	11	22
*IZ3ZOO	"	1,935	52	10	33
*IU8LUM	"	1,932	33	15	27
I1RB	*"*	*1,804*	*38*	*13*	*28*
*IU7GRA	"	1,650	24	13	20
*IU2LWE	"	1,554	43	11	26
*IU5BKR	"	1,360	28	11	23
*IK6SBW	"	1,292	32	12	22
*IU1IMC	"	1,215	21	13	14
*IZ3CTT	"	1,122	32	10	24
*IK3MLF	"	1,080	20	11	16
*I8VAX	"	960	20	14	18
*IU4LAU	"	957	26	9	20
*IZ1MHY	"	798	16	10	11
*IU2NIN	"	775	31	11	20
*IU2IQX	"	740	13	11	9
*IW1RFB	"	714	16	8	9
*IU3EIY	"	656	19	7	9
*IKØWMJ	"	651	13	11	10
*IZ3ZMF	"	576	44	8	28
*IU2NRC	"	540	25	9	18
*IWØEZW	"	504	16	11	13
*IU3GLW	"	374	10	8	9
*IV3DLW/P	"	288	12	7	11
*IU2LUI	"	280	10	10	10
*IK8RJS	"	266	11	6	8
*IZ1FRM	"	224	8	6	8
*IU3OUR	"	144	9	7	9
*IW1RLS	"	132	8	5	6
*IK6IHU	"	120	6	6	6
*IK6VNU	"	108	6	4	5
*IK7RWE	"	104	7	4	4
*IU4OAY	"	50	6	4	6
***IR4Q**	**28**	**37,012**	**235**	**23**	**53**
			(OP: IU4MRU)		
*IK4LFI	"	27,812	169	22	46
*IX1CKN	"	7,536	91	15	33
*IV3DDN	"	3,844	56	11	20
*IW2ODC	"	2,485	41	14	21
*IU7OUD	"	1,950	27	12	18
*I1GXV	"	1,152	24	9	9
***IU4DAF**	**21**	**32,186**	**214**	**23**	**54**
*I4VIL	"	28,413	167	21	56
*IO7A	"	26,384	268	21	47
*IZ1ERT	"	10,710	96	20	31
*IZ6DWH	"	6,300	65	16	34
*IW2NRI	"	5,074	60	17	26
*IW5ELA	"	4,743	37	19	32
*IK4VFB	"	4,290	57	10	23
***IO3M**	**14**	**76,670**	**464**	**27**	**83**
			(OP: IU3PMA)		
*IK8NBE	"	3,108	40	13	29
*IU1OLR	"	729	28	7	20
*IU1JFH	"	480	14	7	13
*IK7LVE	"	300	19	4	16
*IZ1GCN	"	195	9	6	9
IZ2GMT	*"*	*24*	*2*	*2*	*2*
*IZ4AGC	"	20	4	2	3
***IV3EAD**	**7**	**24,140**	**201**	**19**	**66**
*IZ1GQI	"	16,046	241	14	57
*IZ3GJL	"	10,248	184	9	47
*IK2ULV	"	3,444	75	7	34
*I/DG8MDN	"	24	7	3	5
***IU1FQV**	**1.8**	**5,490**	**128**	**6**	**39**
*IZ1NGZ	"	1,008	50	4	20
II1R	*"*	*10*	*4*	*2*	*3*
			(OP: IW1CBG)		
IR2Q	**AA**	**5,014,932**	**3351**	**156**	**507**
			(OP: IK2PFL)		
IBØL	"	4,209,590	4089	123	367
			(OP: IKØETA)		
IK3UNA	"	2,656,082	3347	123	379
IO6A	"	2,093,616	2859	117	379
			(OP: IK6QON)		
IK2LFF	"	1,456,245	2130	115	368
IK1XPK	"	1,323,882	1300	134	419
IUØOVB	"	1,147,500	1743	118	307
IR4B	"	843,660	943	118	318
			(OP: IK4AUY)		
IK7JNM	"	641,277	1213	88	263
IZ3NYG	"	575,432	1265	62	224
4U24OCT	"	575,300	1415	71	204
			(OP: 9A3A)		
I2WIJ	"	529,738	955	96	302
I2SVA	"	510,576	897	71	193
IK1PMR	"	464,864	611	107	291
IKØNMJ	"	464,088	1022	79	238
IK2XSL	"	436,815	769	78	177
IZ7AUE	"	337,666	636	78	193
IV3WMS	"	324,591	595	66	191
IK4VET	"	257,220	569	65	115
IV3KKW	"	253,275	557	67	208
IZ3XEF	"	251,940	405	84	171
I1NVU	"	204,168	322	95	187
IK5PWS	"	166,044	332	90	184
IK4RQF	"	161,938	354	80	189
IZØOTV	"	142,875	268	76	149
IV3DXW	"	99,220	200	73	169
IZ2JCD	"	97,000	252	57	143
IK3SSW	"	96,646	244	52	139
I5MPN	"	76,179	235	60	141
IK3SCB	"	38,584	175	38	66
IZ8DVD	"	28,396	101	48	76
IK2IKW	"	22,990	107	42	79
IR1G	"	18,846	136	22	32
			(OP: IZ1LBG)		
IW2ETR	"	18,786	91	32	69
IZ5NFD	"	14,194	99	34	60
IZ6BUV	"	7,930	136	10	55
IK2WSJ	*"*	*4,346*	*36*	*22*	*31*
IZ2CSX	"	3,294	35	22	32
IZ2ZOZ	"	2,976	41	18	30
IX1CLD	"	2,728	25	20	24
IK2UUJ	"	1,534	23	12	14
IK2GWH	"	1,218	20	11	18
IU2KMA	*"*	*510*	*27*	*9*	*25*
IWØHEX	"	81	5	4	5
IKØTIX	"	54	3	3	3
IO3X	**28A**	**207,495**	**608**	**34**	**111**
IK4MGP	"	153,135	534	30	93
IK2XDE	"	110,466	425	31	83
IZ5CML	"	78,960	302	32	73
IK2XYI	"	58,500	240	31	69
IWØBCF	"	58,100	246	31	69
IZ4GWE	"	28,812	230	17	32
IR4K	**21A**	**1,296,322**	**2997**	**40**	**141**
			(OP: IZ4ZZB)		
IR4E	"	314,578	842	36	122
			(OP: IK4ZHH)		
IZ8IEV	"	307,692	1094	36	118
IZ6JTZ	"	168,148	599	30	97
IU4FLO	"	94,068	368	35	82
I3FGX	"	31,374	108	33	93
IW2NOO	*"*	*24*	*2*	*2*	*2*
IB1A	**14A**	**669,375**	**2195**	**39**	**136**
			(OP: IK1HJS)		
IZ1GCV	"	611,754	2095	35	108
IR3Z	"	487,026	1586	38	136
			(OP: IN3XUG)		
IU8LMC	"	192,046	1054	34	97
IW1CHX	"	186,608	1193	27	82
IK5RLP	"	151,003	730	34	93
IZ3VTH	**7A**	**597,948**	**2082**	**36**	**120**
IW1FRU	"	483,952	2252	33	116
IX1HPN	"	73,435	816	18	77
IO3C	**3.7A**	**156,510**	**1117**	**20**	**91**
			(OP: IV3AZV)		
I1JTQ	"	104,226	969	14	73
IZ5ICH	**1.8A**	**78,120**	**845**	**16**	**68**
IK5TBK	"	5,289	131	5	38
***IK4ZIF**	**AA**	**358,092**	**481**	**111**	**232**
*IZ8IFL	"	244,512	563	75	208
*IW1RLC	"	240,513	624	60	213
*IZ4JMA	"	227,835	557	64	185
*IK1ZOF	"	206,832	512	62	186
*IK6OIN	"	205,920	515	61	173
*IK7LMX	"	142,200	364	63	174
*IZ5ILK	"	142,016	320	61	163
*IW2NEF	"	132,300	391	51	145
*I4ABG	"	122,544	367	53	154
*I2BRT	"	115,910	296	54	119
*IK4OMU	"	105,704	298	49	132
*IU3LYJ	"	99,450	313	49	146
*IZ2KPE	"	82,350	415	43	107
*IK2RLS	"	55,648	211	48	100
*IU1GNA	"	49,280	215	36	104
*I3MDU	"	44,820	194	40	95
*IU4MTO	"	37,395	167	41	94
*IU1KGS	"	31,369	171	31	96
*IU6FUB	"	28,340	135	39	91
*IK8TEM	"	19,840	144	32	96
*IK2ZJJ	"	19,032	121	31	73
*IN3IJC	"	17,900	155	24	76
*IU6LSJ	"	17,433	111	33	84
*IW5EIJ	"	17,266	98	32	57
IZ3NVE	*"*	*16,999*	*110*	*28*	*61*
*IU2CVS	"	15,334	89	33	49
IK5VQI	*"*	*15,264*	*107*	*29*	*77*
*IV3IDP	"	12,384	104	23	63
*IU5GBI	"	11,782	116	20	66
*IW3HV	"	8,618	103	18	44
*IU1OPQ	"	7,552	72	20	44
*IU4KET	"	7,254	105	22	56
*IZ6WSJ	"	6,993	49	30	33
*IZ3LCP	"	5,974	57	23	35
*IW1RGP	"	5,568	66	21	43
*IZ7JWW	"	5,429	67	18	43
*IU1LCK	"	4,680	52	16	49
*IK2MMM	"	4,278	40	23	23
*IZØTWS	"	3,654	39	20	38
*IZ1EOP	"	2,832	49	12	36
*IQØRM	"	2,184	39	20	32
*IU7MEZ	"	2,046	34	13	18
*IZ2ACF	"	1,632	23	14	18
*IZ2ZPM	"	570	12	9	10
*IZ3GOG	"	486	11	9	9
*IU2DXF	"	234	8	7	6
*IW5AKT	"	182	9	6	8
*IU7OTK	"	132	7	4	7
***IW4EGX**	**28A**	**128,104**	**401**	**33**	**101**
*IW7EBE	"	55,968	273	29	59
*IZ8GNR	"	47,067	246	27	60
*IZ8EFD	"	29,088	161	24	48
*IK3TPP	"	21,168	115	27	57
*IZ8BGY	"	13,833	133	16	37
*IC8FBU	"	2,639	48	13	16
***IK4LZH**	**21A**	**527,468**	**1480**	**38**	**125**
*IZ5HPQ	"	14,212	114	18	50
*IK1NEG	"	2,323	35	10	13
*IZ3QVB	"	779	21	9	10
***IZ4MAO**	**14A**	**14,091**	**99**	**22**	**55**
*IZ1PKV	"	13,860	193	14	52
***IW5EDI**	**7A**	**15,990**	**138**	**17**	**61**
*IC8/I8UZA	"	14,550	164	15	60
*IW2FUT	"	6,936	148	9	42
*IZ4KAN	"	35	5	2	5
***IZ4REF**	**1.8A**	**11,660**	**267**	**7**	**46**

Kaliningrad

RN2FQ	**A**	**36,125**	**205**	**33**	**92**
UA2FW	**14**	**1,236,576**	**3544**	**38**	**138**
			(OP: RW4WR)		
***RU2F**	**21**	**442**	**25**	**7**	**10**
***R2KT**	**1.8**	**3,589**	**100**	**5**	**32**
			(OP: RU2FJ)		
RT2F	*AA*	*675,025*	*1287*	*78*	*247*
UA2FZ	**"**	**335,170**	**675**	**73**	**204**
***UB2F**	**AA**	**32,495**	**226**	**24**	**73**

Latvia

YL3CW	*A*	*259,572*	*927*	*52*	*171*
YL2CI	**21**	**206,067**	**705**	**34**	**115**
YL5W	**14**	**126,155**	**884**	**26**	**89**
			(OP: YL2GN)		
***YL2NK**	**A**	**126,985**	**433**	**57**	**176**
*YL3AND	"	57,001	315	34	85
*YL3AMH	"	11,277	111	17	46
*YL3ALN	"	8,631	113	15	48
*YL3GAZ	"	6,180	100	10	50
*YL3ANC	"	2,100	60	11	24
***YL2LW**	**28**	**27,528**	**179**	**24**	**50**
***YL3LK**	**3.7**	**11,440**	**248**	**9**	**43**
YL3FT	**AA**	**183,840**	**437**	**69**	**171**
YL2EA	"	61,306	324	34	117
YL2VW	"	60,858	192	48	78
YL5T	"	29,100	118	40	60
YL9T	"	7,062	81	19	47
YL2GD	**21A**	**125,292**	**493**	**33**	**73**
YL2BJ	**14A**	**236,785**	**1028**	**32**	**113**
YL7X	**3.7A**	**177,320**	**1512**	**19**	**85**
			(OP: YL2LY)		
YL2PP	**1.8A**	**6,394**	**138**	**6**	**40**
***YL3GX**	**AA**	**12,015**	**107**	**20**	**69**
***YL2SM**	**28A**	**144,584**	**486**	**31**	**93**
*YL3JI	"	37,556	201	25	57
***YL2AG**	**21A**	**6,966**	**108**	**12**	**31**
*YL3IR	"	2,380	24	17	18
***YL1ZF**	**1.8A**	**16,371**	**333**	**7**	**44**

Lithuania

LY9Y	**A**	**969,655**	**1382**	**104**	**341**
LY4T	"	213,840	456	73	224
LY1CT	"	45,600	244	33	117
LY2BIS	**21**	**116,772**	**585**	**26**	**85**
LY1N	*14*	*2,520*	*52*	*9*	*27*
***LY4MP**	**A**	**37,905**	**245**	**36**	**97**
*LY2N	"	33,572	166	26	83
*LY1NDN	"	28,560	197	25	94
*LY1K	"	22,134	150	31	71
*LY2SQ	"	2,624	50	9	32
LY2PAD	*21*	*5,184*	*65*	*11*	*25

*PD3RFR	"	1,296	38	8	28
*PD3AK	"	1,295	40	11	26
*PA3NIK	"	1,230	64	11	30
PA3CVR	*"	*836*	*48*	*10*	*28*
*PA2A	"	756	24	10	17
*PD3NKR	"	484	32	6	16
*PA1EJO	"	475	29	6	13
*PA2ADX	"	406	30	9	20
*PC4Y	"	289	15	6	11
***PA3EKM**	**28**	**629**	**18**	**8**	**9**
***PDØMGX**	**14**	**21,504**	**262**	**12**	**52**
*PA1FNW	"	16,836	203	15	54
*PA1ZT	"	4,160	87	8	32
*PD1ANB	"	320	24	3	17
*PD3V	"	54	6	3	6
*PA1JN	"	2	1	1	1
***PA3BQP**	**7**	**8,352**	**170**	**8**	**40**
*PA9HR	"	3,572	97	6	32
PA4WM	**AA**	**2,814,548**	**2939**	**115**	**402**
PA3AAV	"	1,876,976	2016	134	450
PA1T	"	963,010	1333	94	301
PA2PKZ	"	819,108	1369	92	281
PC3T	"	812,592	664	138	489
PHØAS	"	622,915	1075	94	301
PC3M	"	622,188	987	95	283
PA2LO	"	620,928	901	100	296
PC2K	"	580,580	879	85	300
PA1LX	"	559,785	964	88	247
PA5KM	"	500,859	836	73	230
PA4O	"	490,433	1143	73	216
PA1BDO	"	439,770	906	88	233
PC2F	"	333,819	638	67	194
PA1BD	"	314,550	652	71	154
PA3EVY	"	276,427	487	79	162
PE1LUB	"	225,675	530	66	189
PA6AA	"	220,100	414	79	231
					(OP: PB7Z)
PA4EL	"	172,044	309	76	167
PA3GRM	"	162,830	345	62	128
PF1MO	"	142,747	448	49	160
PA1BX	"	80,776	302	46	138
PI4FL	"	73,080	284	50	118
					(OP: PA3HEB)
PC4H	"	52,593	250	36	105
PAØM	"	29,302	111	38	60
PE1HWO	"	8,804	67	25	46
PA5N	"	7,875	75	24	51
PE5TT	"	6,630	60	17	22
PE1KL	"	3,290	28	19	28
PE1PRB	"	2,940	64	15	34
PA3DDP	"	910	26	9	26
PA6B	"	480	14	10	10
PI4DX	**28A**	**441,711**	**1290**	**35**	**118**
					(OP: PD1DX)
PAØO	"	123,855	534	29	86
PA5WT	"	74,493	383	24	65
PA1CC	**21A**	**816,147**	**1939**	**40**	**137**
PE1GWX	"	8,586	109	17	37
PA1AW	**14A**	**1,017,396**	**2600**	**39**	**138**
PI4COM	**7A**	**626,560**	**2472**	**37**	**123**
					(OP: PA3EWP)
***PA9M**	**AA**	**1,530,397**	**1681**	**122**	**407**
*PH7A	"	521,510	699	106	325
*PA8KW	"	439,314	793	85	269
*PG7M	"	433,941	723	88	243
*PA1PE	"	357,500	599	93	232
*PC1PM	"	287,583	931	58	199
*PA3DAT	"	211,932	641	59	193
*PA3DNA	"	98,175	298	50	125
*PC9F	"	98,102	488	40	141
*PA2JCB	"	92,400	350	42	98
*PA3DTR	"	75,463	290	45	148
*PA2Z	"	74,698	349	43	126
*PDØME	"	67,200	340	44	106
*PEØCD	"	62,967	344	33	118
*PE1FTV	"	53,214	266	35	112
*PA1TO	"	53,130	323	32	106
*PA3DUU	"	50,388	196	42	72
*PAØRBL	"	49,149	311	27	102
*PD7K	"	44,660	320	23	93
*PA3HFJ	"	42,390	230	35	100
*PA7JWC	"	40,320	242	37	103
*PE1NBD	"	39,546	194	36	81
*PA8R	"	33,516	171	38	95
*PD4RD	"	31,930	240	22	81
*PDØJMH	"	31,527	222	25	88
*PD2TW	"	28,980	302	20	72
*PAØHPG	"	26,840	203	25	97
*PE1NCP	"	23,540	128	40	67
*PA3GEO	"	21,960	160	26	64
*PG6F	"	20,805	199	21	74
PE1OXP	*"	*18,824*	*153*	*25*	*79*
*PA2TA	"	18,321	148	27	66
*PA5W	"	17,017	105	33	58
*PDØWVD	"	14,204	112	20	47
*PD1KY	"	13,530	77	32	50
*PC7E	"	11,234	147	19	63
*PDØHRY	"	10,640	144	12	64
*PE5JW	"	10,527	95	23	64
*PDØJVB	"	9,240	125	17	60
*PD4RW	"	8,540	112	15	46
*PD5W	"	5,974	69	15	43
*PD1LG	"	4,845	96	10	41
*PE4KH	"	3,895	80	9	32
*PD1DRE	"	3,159	61	10	29
*PA1MAR	"	2,408	40	17	26
*PA1GS	"	2,240	59	10	30
*PD1AK	"	1,653	19	12	17
*PAØB	"	1,596	30	11	17
*PA4X	"	234	8	6	7
***PE4BAS**	**28A**	**79,674**	**320**	**29**	**69**
*PAØJED	"	9,030	100	15	28
*PA1TX	"	1,408	64	4	4
***PA5DX**	**14A**	**189,540**	**954**	**32**	**85**
*PDØYL	"	1,534	63	4	22
***PC5Z**	**7A**	**30,324**	**375**	**12**	**64**
*PF6X	"	26,828	349	14	62
PA3ADJ	*"	*3,096*	*85*	*7*	*36*
***PA2REH**	**3.7A**	**120**	**10**	**2**	**10**

North Macedonia

Z33B	**21**	**14,152**	**156**	**17**	**41**
Z35U	**7**	**52,360**	**482**	**19**	**69**
***Z35W**	**A**	**288,236**	**981**	**54**	**187**
*Z32ZP	"	182,515	574	58	153
*Z35K	"	40,086	228	33	98
*Z32ZZZ	"	31,964	222	28	94
*Z33F	"	23,345	166	26	89
*Z33KN	"	17,856	130	31	65
*Z33ST	"	2,881	45	13	30
*Z34PEC	"	2,584	66	8	26
Z35T	**AA**	**1,187,900**	**1770**	**88**	**262**
***Z32U**	**AA**	**8,692**	**86**	**22**	**60**
***Z36W**	**28A**	**25,190**	**200**	**17**	**38**

Northern Ireland

MI1A	**A**	**89,608**	**324**	**48**	**136**
					(OP: MIØULK)
MIØHOZ	"	29,280	174	33	89
MI5K	**3.7**	**153,888**	**1089**	**18**	**78**
					(OP: MIØSLE)
***MIØI**	**A**	**280,371**	**698**	**60**	**213**
*MIØDWE	"	71,967	277	45	104
***2IØWLZ**	**14**	**180**	**15**	**2**	**2**
*MIØKXX	"	108	6	3	3
***2IØWMN**	**7**	**1,250**	**46**	**5**	**20**
***MI4I**	**AA**	**142,100**	**379**	**55**	**141**
					(OP: GI4SJQ)

Norway

LC5C	**A**	**134,429**	**624**	**40**	**139**
					(OP: LA6KOA)
LA5PRA	"	9,801	73	32	49
LA7AZ	"	8,832	88	21	43
					(OP: LA7RRA)
LC9T	"	5,220	62	17	41
					(OP: LA9VKA)
LA5VK	"	2,442	28	18	19
LA7SI	"	768	24	9	15
LC8C	**14**	**129,720**	**910**	**26**	**89**
					(OP: LA8FTA)
LA6GHA	**3.7**	**120**	**10**	**2**	**10**
***LA2HFA**	**A**	**145,696**	**462**	**56**	**176**
*LB7PI	"	105,281	505	40	147
*LA7TN	"	58,520	387	28	112
*LA6OK	"	56,457	234	51	102
*LA4NL	"	31,034	206	33	85
*LC7D	"	30,600	223	28	92
					(OP: LA6PBA)
*LA3RNA	"	25,200	158	32	88
*LA8RTA	"	20,160	171	25	80
***LA2AB**	**7**	**184,080**	**1244**	**30**	**100**
					(OP: SP2ASJ)
***LC9X**	**1.8**	**1,975**	**83**	**3**	**22**
					(OP: LA9XGA)
LA9TY	**AA**	**742,599**	**1062**	**101**	**328**
LC1T	"	432,450	831	77	202
					(OP: LB7Q)
LB5GI	"	298,760	706	78	202
LA6ZP	"	278,528	750	61	195
LA8HGA	"	170,280	528	58	114
LA8CJ	"	78,560	220	49	111
LBØWI	*"	*16,362*	*116*	*27*	*74*
LA6SK	"	672	12	10	11
LB6KC	**21A**	**42,570**	**276**	**24**	**75**
***LA3BPA**	**AA**	**198,650**	**500**	**60**	**214**
*LA5LJA	"	183,044	395	75	193
*LC9A	"	145,520	525	52	162
					(OP: LB1TI)
*LA2GKA	"	46,240	293	29	107
*LC7W	"	17,201	102	34	69
					(OP: LB7UI)
*LA2XNA	"	15,840	141	26	64
*LA8WNA	"	10,368	86	27	54
*LB6UH	"	10,300	72	22	28

Poland

SP3H	**A**	**829,128**	**1494**	**91**	**267**
SN7R	"	371,622	1502	46	195
					(OP: SP7RFF)
SN5U	"	213,195	506	65	168
SP9ENV	"	176,834	491	53	185
SP6JZL	"	169,664	412	68	173
SP1JQJ	"	137,509	472	49	150
SP3HLM	"	116,632	195	99	145
SP1FRC	"	92,555	386	39	134
SP9CLO	"	70,192	317	40	124
SP9SMD	"	66,633	251	45	88
SP8BQL	"	41,910	183	39	71
SP8AB	*"	*11,049*	*114*	*23*	*64*
SP9HE	*"	*9,898*	*78*	*21*	*28*
SP6MAA	*"	*8,800*	*62*	*20*	*30*
SP3T	"	910	23	12	14
SP6ECA	"	16	2	2	2
SO7M	**28**	**83,200**	**356**	**30**	**74**
					(OP: SP8SIW)
SQ9V	"	6,660	75	14	23
SP9LAW	**21**	**34,943**	**193**	**26**	**57**
SP9JBE	"	8,478	65	18	36
SP9Z	"	6,680	64	15	25
SP3SLU	"	3,340	63	9	11
SP8HXN	"	96	4	4	4
SP9EML	**14**	**5,720**	**64**	**14**	**30**
SQ1W	**7**	**29,325**	**268**	**18**	**67**
SP9EJH	"	18,224	208	12	55
SQ5EXM	"	8,526	97	15	43
SP7MC	**3.7**	**98,901**	**984**	**15**	**66**
SN7D	**1.8**	**77,376**	**917**	**11**	**67**
					(OP: SQ7D)
***SP6VWX**	**A**	**319,216**	**811**	**59**	**225**
*SO5V	"	256,669	637	59	200
					(OP: SQ5PMB)
*SP3DAT	"	209,965	623	55	190
*SP5UFK	"	202,250	561	64	186
*SP6U	"	174,472	555	57	169
*SP5TE	"	169,416	522	53	181
SP5DRE	*"	*138,816*	*444*	*50*	*142*
*SQ5WH	"	128,785	447	53	162
*SQ6POC	"	109,568	391	49	165
*SQ3HLB	"	104,144	340	46	138
*SP2GCE	"	101,772	351	50	148
*SP5X	"	101,652	348	51	146
*SP6KNE	"	100,786	295	50	111
					(OP: SP6OUJ)
*SP2TMT	"	98,800	354	48	142
					(OP: SQ2BNM)
*SP9ODM	"	94,482	418	42	139
*SP2AWJ	"	93,964	348	48	121
*SO9B	"	91,332	368	41	136
					(OP: SQ9IUB)
*SP8KM	"	83,201	401	34	117
*SP9RTL	"	80,626	370	40	142
*SQ8MXE	"	75,768	307	44	110
*SP3GTP	"	72,954	323	44	145
*SQ5CZP	"	72,782	314	41	110
*SP9FMP	"	66,246	252	49	132
*SP4TB	"	61,004	236	39	112
*SQ7OVT	"	49,679	247	35	116
*SQ5CZN	"	48,015	231	40	125
*SO9PC	"	46,092	277	32	106
*SQ5SAA	"	45,954	193	41	97
*SP9R	"	45,360	258	34	92
					(OP: SP9BRP)
*SP4BAO	"	44,238	281	32	114
*SQ7LQJ	"	44,200	228	40	96
*SQ9KQS	"	44,183	254	33	80
*SQ9ANS	"	42,336	199	41	103
SQ9SEB	*"	*41,148*	*311*	*21*	*106*
*SQ5DTL	"	38,528	175	40	88
*SP4AAZ	"	38,088	170	41	97
*SQ5PJ	"	37,830	198	35	95
*SP9BJV	"	36,250	249	29	96
*SP1EG	"	36,176	261	28	105
*SP4SAF	"	35,912	219	32	102
*SQ8BGR	"	33,033	123	40	103
*SQ2ZE	"	27,945	181	27	88
*SP9HZW	"	27,724	150	29	87
*SQ2RH	"	27,183	145	38	85
*SQ9IAB	"	24,780	156	28	77
*SQ2TAC	"	24,500	175	28	70
*SP4DDS	"	24,089	162	27	82
*SQ6ILH	"	21,105	135	27	78
*SP6DHH	"	19,350	170	19	56
*SN1I	"	18,338	121	30	76
					(OP: SP9DTE)
*SP2JJD	"	17,670	153	31	83
*SQ9MR	"	17,510	186	22	81
*SP9JD	"	16,878	152	23	74
*SP9MKG	"	13,746	113	24	63
*SP8BOZ	"	13,013	117	30	61
*SQ8T	"	12,936	99	26	72
*SP5ETS	"	12,136	90	25	49
*SP3BVI	"	12,084	93	28	48
*SO6MZ	"	11,445	97	29	76
*SP9KJU	"	10,650	70	29	46
					(OP: SP9MDY)
*SP5TM	"	9,916	118	16	58
*SP5QNI	"	9,856	143	14	50
*SP2J	"	9,372	118	15	51
*SN7O	"	9,198	84	20	53
					(OP: SP7IVO)
*SP4SP	"	8,528	91	26	56
*SP6MI	"	8,442	46	31	36
*SQ3DQ	"	8,418	112	17	44
*SQ9CXC	"	8,400	106	17	53
*SQ5SUL	"	7,546	92	23	54
*SP3KX	"	6,208	85	15	49
*SP3OS	"	6,080	45	27	37
*SP2BP	"	5,915	101	11	54
*SP3BKR	"	5,310	90	15	44
*SQ2DYL	"	5,264	62	20	36
*SP3BAH	"	5,200	92	15	37
*SP4PD	"	4,968	92	12	34
*SP4RUD	"	4,675	86	11	44
*SP3UCW	"	4,543	55	20	39
*SQ9PUW	"	4,488	61	14	30
*SP5DJ	"	4,437	65	17	34
*SP4HXV	"	4,361	40	18	31
*SP9IHP	"	4,284	46	16	18
*SP3FSM	"	4,212	51	20	32
*SQ6PA	"	4,094	69	14	32
*SP5PZB	"	4,056	85	11	41
*SP3BES	"	3,696	52	16	26
*SQ3KNL	"	3,432	42	15	29
*SP2CBS	"	3,290	50	17	18
*SP3OLO	"	3,100	69	10	40
*SQ9RII	"	2,832	44	17	31
*HF7ST	"	2,688	53	16	32
*SP5XVL	"	2,480	30	16	24
*SQ8NQW	"	2,440	33	16	24
*SP9WZO	"	2,304	60	13	35
SP3RP	*"	*1,794*	*46*	*14*	*32*
*3Z7Z	"	1,590	29	12	18
					(OP: SQ9OZM)
*SP4IT	"	1,443	27	15	22
*SP4DIR	"	1,386	48	8	25
*SP7MB	"	1,360	50	11	29
*SP5JK	"	750	18	11	14
*SP8RAK	"	588	22	10	18
*SP3EMA	"	400	9	8	8
SP2UKG	*"	*114*	*7*	*3*	*3*
*SP7SUM	"	96	8	5	7
***SP6A**	**28**	**38,129**	**205**	**27**	**64**
*SP9W	"	10,094	101	16	33
*SP2IJ	"	5,698	62	15	22
*SP6FVP	"	3,741	31	19	24
*SP7CVW	"	3,293	33	16	21
*SP3CMX	"	2,937	45	11	22
*SQ6ELV	"	1,776	50	10	14
*SP3LWP	"	1,480	32	8	12
*SO9D	"	345	9	8	7
***SP3LD**	**21**	**39,072**	**174**	**30**	**66**
*SQ9BDB	"	28,152	220	20	48
*SP4MPA	"	17,640	141	21	51
*SP5LGN	"	15,708	104	21	47
*SQ8NGO	"	10,712	124	14	38
*SQ7NPA	"	4,902	51	13	25
***SN9B**	**14**	**170,040**	**1005**	**30**	**90**
*SP9MAT	"	47,472	341	24	68
*SQ5AAG	"	28,576	291	15	61
*SP3W	"	26,316	269	15	53
*SP2GTJ	"	18,624	219	14	50
*SP3LM	"	15,128	212	14	47
*SP2GR	"	13,284	194	12	42
*SP8CGU	"	12,992	172	15	43
*SP3QFZ	"	9,676	124	14	45
*SQ9MLZ	"	3,528	84	8	28
*SQ8M	"	3,040	58	9	29
*SP3DRM	"	1,872	38	11	13
*SN9S	"	121	7	5	6
*SP3DFB	7	9,152	164	9	43
*SP9NSJ	"	8,528	139	8	44
SP5Z	*"	*5,520*	*101*	*9*	*39*
*SP8KDE	"	4,242	98	6	36
*SQ5Q	"	3,680	44	12	34
*SP9TTT	"	3,640	82	7	33
*SP9DLS	"	2,135	68	6	29
*SP7PSD	"	1,196	48	4	22
*SQ5KWJ	"	1,053	37	5	22
*SP8GK	"	782	39	4	19
*SQ9JTI	"	360	20	4	14
*SP7MW	"	6	1	1	1
***SQ8NGV**	**3.7**	**25,515**	**436**	**10**	**53**
*SP4SHD	"	11,343	189	8	49
*SP6DZ	"	2,553	77	4	33
*SQ9EDZ	"	475	27	3	16
***SNØR**	**1.8**	**29,264**	**503**	**8**	**54**
					(OP: SQ9IAU)
*SP6LUV	"	27,528	462	8	54
*SO3O	"	4,914	140	4	35
*SQ3PMX	"	2,541	96	4	29
*SQ9PPT	"	357	28	3	14
SN7Q	**AA**	**6,870,082**	**4398**	**151**	**523**
					(OP: SP7GIQ)
SO9I	"	5,263,831	4005	148	465
					(OP: SQ9ORQ)
SP9N	"	2,048,449	2289	138	389
SQ8N	"	1,186,136	1337	123	349
SQ7BFC	"	921,500	1213	108	367
HF1K	"	574,212	889	101	335
SO5L	"	325,896	788	78	218
					(OP: SP5WIT)
SP3PWL	"	246,680	684	71	209
					(OP: SQ3JPV)
SP3A	"	206,500	398	73	163
SP5GNI	"	190,236	461	64	185
SP2GWH	"	182,706	483	59	163
SP8SN	"	134,754	393	59	163
SP9RQH	"	112,710	335	60	135
SP2JMR	"	102,820	308	68	144
SP9FUY	*"	*75,509*	*251*	*52*	*109*
SN6W	"	67,840	204	48	112
SP9DEM	"	36,179	117	50	71
SP9IVD	"	33,280	186	33	97
SP2XX	"	30,785	196	37	94
HF9R	"	25,080	136	32	78
SP4Z	"	24,516	99	38	70
SN6L	*"	*13,756*	*97*	*24*	*52*
SP6CES	"	13,248	90	32	60
SP7V	*"	*8,316*	*54*	*28*	*38*
SP3QDM	"	2,365	26	19	24
SP9KR	"	192	6	6	6
SQ5LTL	"	24	2	2	2
SP6NIN	"	24	2	2	2
SNØW	**28A**	**35,024**	**193**	**25**	**63**
					(OP: SQ9HQ)
SP7IIT	"	22,720	149	25	39
SN2B	**21A**	**963,888**	**2286**	**38**	**134**
					(OP: SP2WKB)
SP5AUY	"	298,447	824	34	115
SP4JTJ	*"	*45,024*	*222*	*27*	*57*
SN9J	*"	*6,888*	*66*	*15*	*27*
SP1KM	"	315	15	7	8
SQ2A	**14A**	**860,640**	**2585**	**39**	**137**
					(OP: SQ2RCM)
SO7O	"	238,944	1058	34	118
SP3P	"	150,480	763	30	90
SP7TEE	"	69,381	334	33	84
SN3A	**7A**	**930,411**	**3330**	**37**	**134**
					(OP: SP3GEM)
SN3R	*"	*19,363*	*245*	*13*	*54*
					(OP: SP1SR)
SQ2IHP	"	2,772	31	16	20
SQ2PHG	**3.7A**	**180,348**	**1419**	**21**	**92**
SP3GTS	"	59,375	565	17	78
SQ9NFC	**1.8A**	**4,284**	**131**	**4**	**30**
***SQ6H**	**AA**	**1,295,151**	**1827**	**107**	**322**
					(OP: SQ6PLH)
*SP5EWX	"	952,848	1349	126	342
*SP8ALT	"	590,040	950	81	217
*SP7TEX	"	292,804	621	73	211
*SP3CCT	"	283,346	516	76	183
*SO9P	"	213,312	537	62	202
*SQ9IWS	"	190,226	497	58	169
*SQ3WW	"	115,230	338	53	177
*SP8CHI	"	108,200	391	52	148
*SP9PD	"	85,212	418	38	124
*SP2JFY	"	80,925	295	52	143
*SP7SF	"	80,813	213	65	146
*SN4D	"	80,106	383	39	130
					(OP: SP4GAP)
*SP2WGB	"	70,104	293	47	137
*SP3BBS	"	56,677	213	47	110
*SQ5WAJ	"	55,335	226	36	83
*SP5BN	"	50,560	193	46	82
*SP8FB	"	42,632	205	41	105
*SQ3POS	"	41,412	199	38	78
*SQ3TGN	"	33,282	200	29	100
*SO5TC	"	28,840	196	37	103
*SP6TRH	"	27,104	138	35	86
*SN5WD	"	24,552	204	21	78
					(OP: SO5WD)
*SQ1BSY	"	23,856	129	37	75
*SN8K	"	23,300	133	32	68
					(OP: SQ8ERS)
*SP2AYC	"	19,285	89	39	56
*SP2R	"	16,330	104	31	84
*SQ6ELK	"	14,661	93	28	53
*SP9WPN	"	14,453	75	33	64
*SN3N	"	14,229	87	33	60
					(OP: SP3ATB)
*SP8BRT	"	14,193	125	23	60
*SP3SC	"	13,376	76	35	53
*SP5NZF	"	12,482	91	27	52
*SP5ELA	"	7,200	94	17	43
*SQ6BOR	"	6,804	56	28	53
*SQ3R	"	1,008	18	11	10
					(OP: SQ3HMM)
*SP5BUJ	"	240	9	7	9
***SO7YL**	**28A**	**10,395**	**82**	**22**	**41**
SP6IHE	*"	*1,456*	*21*	*11*	*15*
***SQ6PLD**	**21A**	**42,048**	**204**	**25**	**71**
***SP6DVP**	**14A**	**74,120**	**466**	**27**	**82**
*SP3SXB	"	21,016	206	18	56
*SQ8AL	"	11,368	142	15	43
*SP3WKW	"	6,850	157	12	38
*SQ1WO	"	2,888	44	13	25
***SP3AYA**	**7A**	**63,923**	**564**	**18**	**79**
*SP2FWC	"	713	23	6	17
***SP2N**	**3.7A**	**32,913**	**532**	**12**	**57**
*SP8ONB	"	11,165	190	8	47
*SP8GNF	"	7,436	139	7	45
SP6TRX	*"	*2*	*1*	*1*	*1*

Portugal

CT1EBM	**A**	**31,734**	**143**	**40**	**89**
CT7AIX	**28**	**27,000**	**202**	**15**	**35**
CR6T	**21**	**1,067,352**	**3303**	**37**	**119**
					(OP: CT1ESV)
CR5C	**14**	**1,177,183**	**3684**	**38**	**129**
					(OP: OK4PA)
CT2KNA	"	107,180	785	26	89
CT1AL	**7**	**3,225**	**66**	**9**	**34**
***CT2JBD**	**A**	**70,091**	**423**	**33**	**100**
*CR7AWL	"	68,856	260	41	110
*CS7AUJ	"	52,122	207	46	100
CT1KNL	*"	*5,520*	*85*	*16*	*44*
*CT7AKG	"	4,100	66	14	36
*CT7AHQ	"	2,360	45	21	38
*CT1FOQ	"	1,980	21	16	20
*CS7AUC	"	1,260	33	13	23
***CS7AUS**	**21**	**8,670**	**163**	**12**	**39**
CT1BOL	**AA**	**1,712,361**	**1774**	**124**	**387**
CT1DSV	"	411,008	665	90	248
CT1ENV	"	394,200	501	105	255
CT7AHV	"	168,635	514	40	105
CT7AKW	"	44,164	163	40	82
CT7AQS	**28A**	**92,274**	**504**	**21**	**70**
CT7ABP	**21A**	**26,465**	**189**	**20**	**59**
CT1ETX	**14A**	**35,908**	**257**	**20**	**74**
***CT1BOH**	**AA**	**17,120**	**72**	**44**	**63**
*CT1AGS	"	13,593	75	32	37
*CT1GVN	"	7,296	77	16	32
*CT7ANO	"	6,292	51	17	27
***CT5GOJ**	**28A**	**18,642**	**132**	**18**	**60**
*CT2IWW	"	11,730	97	17	34
CT1BWU	*"	*3,750*	*53*	*10*	*15*
***CT1EKD**	**14A**	**2,700**	**65**	**7**	**29**

Republic of Kosovo

***Z68XX**	**AA**	**138,600**	**570**	**44**	**166**
					(OP: DL2JRM)

Romania

YPØC	**A**	**2,572,453**	**3892**	**99**	**334**
					(OP: YO3CZW)
YO8BDW	"	831,448	1380	90	254
YO8SBQ	"	759,024	1449	96	282
YO3GNF	"	204,527	649	51	176
YO2AA	"	96,632	450	38	150
YO2LCP	**28**	**3,136**	**50**	**10**	**22**
YO9RIJ	**7**	**24,220**	**308**	**13**	**57**
YO5OHY	"	17,475	180	17	58
***YP1EX**	**A**	**232,427**	**678**	**63**	**184**
					(OP: YO9LIG)
*YO4RST	"	153,986	407

*2MØYTN	"	26,564	200	30	86
*GMØTKB	"	10,332	119	18	66
*2MØBEC	"	5,307	67	15	46
*MMØMMN	"	3,995	69	15	32
*GM5TDX	"	2,574	33	15	24
*GMØUKZ	"	483	21	7	14
*MM7DMW	"	150	12	5	10
***GM3TAL**	**28**	**21,681**	**142**	**21**	**52**
***MMØINH**	**21**	**15,498**	**153**	**15**	**48**
MM9I	**AA**	**2,575,392**	**2717**	**121**	**435**
			(OP: GMØOPS)		
GMØV	"	2,312,170	2899	109	360
			(OP: GMØOQV)		
GM4Z	"	234,311	510	58	121
			(OP: GM4ZUK)		
MMØTFU	**28A**	**42,924**	**188**	**28**	**70**
GM2V	"	32,396	217	19	72
			(OP: GM3WOJ)		
GM4AFF	**1.8A**	**64,425**	**772**	**13**	**62**
***2MØKIE**	**AA**	**66,466**	**326**	**38**	**129**
**GMØEGI*	*"*	*25,894*	*138*	*31*	*76*
*GMØAZC	"	6,468	59	20	29
*2MØYZT	"	110	6	5	6

Serbia

YTØW	**A**	**1,118,022**	**2011**	**80**	**211**
			(OP: YU1JW)		
YU7PEP	"	49,209	336	33	108
YT1RK	"	40,560	259	28	102
YU6TM	"	12,825	133	22	73
YT2MMP	"	6,210	112	13	56
YU1LD	**3.7**	**97,680**	**1003**	**16**	**72**
YT7B	**1.8**	**26,901**	**438**	**9**	**54**
***YT2VP**	**A**	**74,290**	**337**	**42**	**128**
*YT3KW	"	72,628	449	34	100
*YT3VLA	"	72,522	414	30	128
*YT4ZZ	"	50,605	317	33	112
*YU1EA	"	48,410	203	36	67
*YT2TNT	"	27,720	252	18	87
*YTØI	"	5,994	56	22	32
*YU3MPN	"	4,841	74	11	36
*YU2CWW	"	4,183	86	9	38
*YU1ML	"	1,080	44	8	22
***YU1VG**	**21**	**72,512**	**390**	**29**	**74**
*YU4VOX	"	1,872	44	6	20
*YU4SAX	"	77	5	3	4
***YT5LD**	**14**	**11,925**	**166**	**15**	**30**
*YU7AEC	"	6,223	97	11	38
			(OP: YU7XW)		
*YU7VBA	"	361	19	6	13
***YU5T**	**7**	**15,066**	**212**	**11**	**51**
*YT3TPS	"	12,238	198	9	49
*YU7OTT	"	6,850	127	9	41
*YU4PTL	"	2,800	92	7	33
*YU4URM	"	380	16	6	13
*YU4LUM	"	10	3	2	3
YU3DKO	**AA**	**1,708,137**	**2149**	**114**	**363**
YU3AWA	"	1,466,465	2178	109	346
YT6K	"	337,502	540	98	221
			(OP: YU7KW)		
YT2ZZ	"	67,691	493	24	103
			(OP: YT3ZZ)		
YU5A	"	32,310	266	28	62
			(OP: YU1EW)		
YT8WW	**28A**	**466,960**	**1630**	**34**	**96**
YTØC	"	269,568	1128	32	85
YU5W	"	108,455	467	31	78
YT9A	**21A**	**80,465**	**280**	**32**	**89**
YT7X	"	43,840	305	22	58
			(OP: YU7CF)		
YT7R	"	32,604	197	25	51
			(OP: YU7BW)		
YT3X	**14A**	**1,088,196**	**3438**	**38**	**136**
YT1A	"	732,051	2667	38	133
YT2ISM	"	158,596	983	33	91
YU7XX	**7A**	**734,240**	**2929**	**38**	**122**
			(OP: YT1X)		
YT5K	"	193,371	1214	28	101
			(OP: YT2SS)		
YU1UO	"	132,662	974	25	88
YT4A	**3.7A**	**18,300**	**253**	**12**	**48**
***YU7GMN**	**AA**	**30,583**	**152**	**34**	**85**
			(OP: YU7GM)		
*YU3ARP	"	7,050	113	14	33
YU7MW	*28A*	*169*	*13*	*7*	*6*
***YU5M**	**14A**	**218,736**	**1055**	**37**	**110**
*YT7E	"	95,634	686	22	77
*YT1BX	"	13,776	218	11	45
*YU3ABC	"	2,220	83	6	31
***YT7AA**	**7A**	**10,080**	**130**	**11**	**49**
*YU4VIK	"	3,444	75	7	34
***YT5ANA**	**3.7A**	**29,949**	**416**	**10**	**57**
*YU4BAH	"	8,856	176	8	46
***YT8A**	**1.8A**	**34,112**	**539**	**8**	**56**

Sicily

IT9BGE	**A**	**89,474**	**454**	**41**	**113**
IW9HHV	"	1,624	34	13	15
IT9BDW	**7**	**22,218**	**247**	**14**	**55**
IT9ZZO	**1.8**	**21,777**	**346**	**9**	**52**
***IT9FRX**	**A**	**382,580**	**1194**	**59**	**161**
*IT9FIQ	"	245,259	686	67	162
*IT9AJP	"	82,149	243	57	140
*IT9GSZ	"	62,350	249	43	102
*IT9EXH	"	25,900	169	28	72
*IT9QEI	"	24,576	147	32	96
*IW9BJP	"	23,324	148	28	91
*IT9CAR	"	21,952	189	25	73
*IT9IWU	"	14,406	133	26	72
*IT9NSM	"	3,741	39	19	24
*IT9CLY	"	1,950	82	21	44
***IT9JGX**	**28**	**4,026**	**64**	**13**	**20**
***IT9ATQ**	**21**	**41,820**	**271**	**24**	**61**
*IT9AXQ	"	4,444	64	12	32
***IT9IRM**	**14**	**825**	**21**	**10**	**15**
***IT9AZK**	**7**	**9,628**	**130**	**13**	**45**
IT9ESW	**AA**	**40,112**	**323**	**23**	**69**
IR9W	**28A**	**502,452**	**1335**	**36**	**117**
			(OP: IWØHBY)		
IT9BUN	"	216,518	637	36	110
IT9AEQ	"	30,324	176	24	52
IT9STX	**14A**	**337,108**	**1648**	**35**	**107**
IR9Z	"	111,079	722	25	88
			(OP: IT9VCE)		
***IT9IVU**	**AA**	**65,016**	**252**	**45**	**123**
*IT9OPR	"	64,561	243	57	104
*IT9IHB	"	25,080	100	46	74
*IW9GRL	"	20,313	98	34	77
*IT9FJM	"	15,660	107	27	63
*IT9HHL	"	9,120	79	24	52
*IT9BYS	"	5,220	68	17	28
***IT9ACN**	**28A**	**109,698**	**494**	**24**	**70**
*IT9KCD	"	45,080	237	21	49
*IT9RZU	"	32,160	207	24	43
***IT9WKU**	**21A**	**21,004**	**105**	**24**	**65**
*IT9IQN	"	11,016	88	19	49
IT9RKR	*"*	*6,912*	*108*	*14*	*34*
***IT9XTP**	**14A**	**369,120**	**1652**	**38**	**122**
*IT9DGG	"	73,616	499	26	81

Slovak Republic

OM7RU	**A**	**2,485,615**	**2948**	**112**	**361**
OM4M	"	554,400	1074	81	269
OM5WW	**7**	**353,568**	**2111**	**28**	**99**
***OM5NL**	**A**	**355,806**	**604**	**83**	**214**
*OM6DN	"	330,444	741	74	200
*OM2DT	"	91,959	325	52	151
*OM1EE	"	62,172	350	32	125
*OM8ST	"	53,196	308	33	110
*OM3ZU	"	49,300	282	35	110
*OM4IK	"	45,184	235	33	95
*OM3CDN	"	30,380	230	25	99
*OM7AHJ	"	17,200	137	32	68
*OM6AMI	"	16,340	137	23	63
*OM6APR	"	12,284	108	23	60
*OM/W6UZ	"	9,240	76	24	60
*OM7SR	"	8,170	102	24	62
*OM7AT	"	6,674	96	16	55
*OM5AST	"	4,848	63	15	33
*OM3ZAH	"	3,600	96	16	44
*OM5AVM	"	1,943	31	12	17
***OM8JP**	**14**	**31,837**	**297**	**18**	**61**
*OM2AGN	"	6,161	58	16	45
***OM6TX**	**3.7**	**36,432**	**478**	**11**	**61**
*OM8ATS	"	8,869	191	8	41
*OM6AMP	"	7,011	116	10	47
*OMØAD	"	6,188	103	9	43
OMØR	**AA**	**7,606,230**	**4962**	**168**	**542**
			(OP: OM3GI)		
OM1AVL	"	65,394	234	49	124
OM6MW	"	12,312	57	30	46
OM2VL	**21A**	**1,215,420**	**2689**	**40**	**148**
OMØM	"	398,480	1047	39	131
			(OP: OM3CGN)		
OM7JG	**14A**	**740,835**	**2350**	**36**	**127**
OM3CW	"	104,632	600	30	86
OMØWR	**7A**	**141,565**	**1005**	**28**	**87**
OM6NM	**3.7A**	**325,584**	**1958**	**24**	**102**
OM2XW	**1.8A**	**16,807**	**327**	**6**	**43**
***OM3CQ**	**AA**	**100,793**	**403**	**44**	**143**
*OM5CM	"	97,083	391	47	154
*OM1ST	"	96,950	385	42	133
*OM5UM	"	33,528	208	31	101
*OM1AKU	"	32,385	183	36	91
*OM1AVV	"	29,574	267	25	68
*OM4O	"	21,200	86	46	54
			(OP: OM3NI)		
***OM7ANT**	**21A**	**41,800**	**227**	**24**	**64**
***OM7LW**	**14A**	**97,008**	**472**	**32**	**97**
***OM7PY**	**7A**	**15,688**	**179**	**12**	**62**
***OM5KM**	**3.7A**	**39,201**	**482**	**12**	**61**
*OM4AQP	"	20,252	324	10	51

Slovenia

S53MM	**A**	**2,726,595**	**2597**	**132**	**381**
S57K	"	1,197,918	1791	93	273
S53F	"	723,600	1595	81	279
S53BB	"	457,164	961	84	248
S51SL	"	173,698	449	60	206
S51JQ	"	90,792	264	53	103
S58D	**28**	**587,105**	**1693**	**34**	**111**
S51DX	**14**	**224,030**	**1246**	**21**	**65**
S57AL	**7**	**861,606**	**3567**	**35**	**116**
S53JW	**3.7**	**15,810**	**247**	**8**	**54**
***S57NAW**	**A**	**428,904**	**737**	**82**	**251**
*S57YB	"	190,800	464	65	175
*S53DT	"	29,040	158	35	86
*S5ØPB	"	25,760	164	27	88
*S57WW	"	15,120	124	23	67
*S58MU	"	14,535	103	30	65
***S57ZM**	**14**	**11,446**	**133**	**14**	**45**
***S53MR**	**7**	**72,362**	**652**	**20**	**77**
*S56MH	"	72	24	4	14
S58N	**AA**	**1,732,475**	**1433**	**128**	**401**
S52WW	"	714,195	1540	69	200
S53K	"	291,465	816	64	191
S56P	"	162,533	357	69	148
S5ØXX	"	89,095	351	40	63
S56NE	"	57,104	473	21	65
S51A	"	47,328	245	31	56
			(OP: S5ØLD)		
S56K	"	41,580	267	32	78
			(OP: S55L)		
S58AT	"	5,995	41	23	32
S5ØK	**21A**	**1,240,320**	**2814**	**40**	**150**
S56B	"	562,950	1731	34	105
S57Q	"	525,722	1413	37	129
S5ØG	"	512,397	1328	37	116
			(OP: S56M)		
S51YI	**14A**	**711,392**	**2190**	**38**	**134**
S51CK	**7A**	**573,952**	**2572**	**34**	**118**
S57O	"	60,701	521	23	78
S56X	**1.8A**	**65,860**	**854**	**10**	**64**
***S55X**	**AA**	**934,407**	**1595**	**98**	**325**
*S55AL	"	399,966	1303	59	208
*S52BT	"	358,172	689	71	231
*S59MA	"	202,130	759	42	163
*S52AQ	"	174,798	457	58	176
*S52ON	"	116,388	440	47	165
*S56A	"	113,126	295	58	189
*S55KA	"	106,977	370	53	158
*S57ZT	"	73,678	229	53	134
*S59AA	"	69,560	235	54	134
*S51WU	"	60,273	198	52	129
*S52ZD	"	46,998	314	27	99
*S57KM	"	37,674	198	37	89
*S54KM	"	15,246	132	25	52
*S51Z	"	9,620	58	28	37
*S57FJ	"	4,708	61	14	30
***S51RH**	**28A**	**20,474**	**189**	**18**	**40**
***S58Y**	**21A**	**55,944**	**309**	**24**	**50**
***S52OT**	**14A**	**289,864**	**1161**	**35**	**117**
***S53NW**	**7A**	**44,156**	**462**	**17**	**66**
*S55BA	"	17,118	325	7	47
*S57PKT	"	16,434	210	12	54
S53OQ	*3.7A*	*95,718*	*897*	*15*	*71*
***S5ØSL**	**"**	**11,914**	**289**	**5**	**41**
***S54ZZ**	**1.8A**	**46,926**	**696**	**9**	**57**
*S56VHR	"	1,638	71	4	22

Spain

EA3QP	**A**	**4,419,236**	**4916**	**117**	**337**
EA4KD	"	2,414,192	2455	116	368
EA4D	"	396,906	1725	45	121
EA2XR	"	349,680	865	62	173
EA1OL	"	272,935	649	64	183
EA1FDJ	*"*	*222,640*	*507*	*72*	*148*
ED4W	"	171,097	492	51	122
EA3HJO	"	113,071	412	52	151
EA5FHC	"	84,456	355	44	140
EA4HKV	"	13,161	130	26	81
EA3BS	"	11,502	71	33	48
EB3JT	"	11,220	56	36	49
EA4LU	"	2,976	40	15	33
EA3IND	"	2,464	43	17	27
EA7IIW	"	1,517	31	15	26
EA1DA	**28**	**3,144**	**45**	**10**	**14**
EA5DFV	**21**	**327,313**	**1480**	**30**	**77**
EA2DMH	*"*	*305,030*	*1266*	*31*	*87*
EC4TR	"	276,818	1233	29	93
ED3B	"	212,441	997	30	79
			(OP: EA3BOX)		
EA2ELS	"	126,755	830	29	72
EC1RS	"	8,232	130	14	35
EA3OH	**14**	**14,940**	**173**	**12**	**48**
EA4FTA	**7**	**9,450**	**109**	**15**	**48**
EC5APA	"	7,625	153	15	46
EE3M	**3.7**	**192,351**	**1418**	**17**	**80**
EE7L	"	173,600	1340	18	82
EA3MR	*"*	*27,432*	*300*	*13*	*59*
EA5B	"	3,384	50	10	37
EA1HV	*1.8*	*1,312*	*51*	*4*	*28*
***EA7BD**	**A**	**355,240**	**661**	**78**	**254**
*EE2A	"	270,760	580	67	213
			(OP: EA2SN)		
*EA3FZT	"	248,880	517	74	198
*EA3ODC	"	198,480	519	69	171
*EA7JF	"	181,473	503	66	185
*EA3ICJ	"	165,760	350	66	214
*EA4FQO	"	160,312	520	52	180
*EA2QU	"	147,000	366	67	178
*EC5EA	"	120,472	392	49	99
*EA4DGZ	"	101,703	313	42	125
*EA5UJ	"	96,900	301	57	147
*EB3GIF	"	96,104	450	41	123
*EA3DJL	"	92,130	297	45	121
*EA7CVF	"	81,144	283	46	115
*EA1JO	"	76,670	246	46	124
*EA2EWL	"	76,630	371	45	149
*EA7VJ	"	41,202	157	39	87
*EA3W	"	40,524	193	42	90
*EA2T	"	38,940	200	30	88
*EA1DBX	"	33,012	164	37	89
*EA5KE	"	32,100	181	41	109
*EA1FW	"	30,098	171	55	94
*EC1ALT	"	26,112	190	37	91
*EA2AVM	"	25,970	127	33	65
*EB5CS	"	25,110	152	27	63
*EA1FHQ	"	24,304	130	34	90
*EA3TJ	"	18,720	109	33	57
*EA5/RV2A	"	16,218	115	32	74
*EA4WW	"	13,932	96	27	54
*EC5P	"	9,657	80	29	58
*EA3EAN	"	8,132	87	24	52
*EA2AR	"	7,524	105	16	41
EA1HTF	*"*	*7,215*	*73*	*23*	*42*
*EA2DDE	"	6,784	65	26	38
*EA3IKT	"	6,450	100	18	57
*EA5DB	"	6,413	71	19	34
*EA3IW	"	6,298	69	17	50
*EA5D	"	5,472	48	21	36
*EA2WD	"	5,382	60	20	26
*EA5JAX	"	4,544	60	19	45
*EA3AMI	"	4,216	71	22	46
*EA4FMF	"	3,968	63	20	42
*EA4LG	"	3,956	39	18	28
*EA3NA	"	3,599	53	20	39
*EA7BF	"	3,420	32	19	26
*EA3BRL	"	3,216	53	14	34
*EA3HWC	"	3,045	35	13	16
*EA3DNC	"	2,900	46	16	34
EA7BW	*"*	*2,560*	*34*	*14*	*18*
*EC1ABR	"	1,711	21	14	15
*EA7JTP	"	140	10	5	9
***EA7AAF**	**28**	**70,688**	**351**	**25**	**69**
*EA5EOR	"	67,239	319	26	67
*EC7R	"	52,955	310	26	63
*EA4EJR	"	16,794	126	17	37
*EA3NO	"	11,960	106	17	29
***EA5BCQ**	**21**	**51,282**	**279**	**24**	**75**
*EA1JCZ	"	44,394	258	24	74
*EA3KT	"	41,002	272	22	61
*EA1BDX	"	16,616	130	19	48
*EA3HKY	"	7,140	90	15	36
*EA3HLM	"	6,987	89	15	36
*EA4GJT	"	4,840	74	11	29
*EA4RY	"	1,536	33	11	21
***EE1B**	**14**	**53,544**	**394**	**22**	**70**
			(OP: EA1Y)		
*EA2BNU	"	21,681	228	16	57
EA4RR	*"*	*14,430*	*160*	*13*	*52*
*EB3TR	"	8,450	127	9	41
*EA2PLN	"	7,038	98	10	41
*EA2XG	"	2,176	55	7	27
*EB5EWM	"	1,734	51	7	27
*EA3IHF	"	63	11	2	7
***EA4BIN**	**7**	**1,260**	**26**	**8**	**20**
*EA4FIT	"	8	2	2	2
***EB3A**	**1.8**	**714**	**34**	**3**	**18**
EA2W	**AA**	**8,470,308**	**5692**	**166**	**555**
EA1L	"	2,543,856	2745	106	363
EA1BLI	"	991,116	1657	87	291
EA1BNF	"	835,266	909	103	335
EA3C	"	773,015	1267	99	296
ED4T	"	538,985	868	72	217
			(OP: EA4R)		
EC3AIT	"	514,764	755	91	271
EF1X	"	391,392	731	77	211
			(OP: EA1M)		
EA4UV	"	328,485	492	83	222
EF2O	"	288,365	576	67	178
			(OP: EA2AOO)		
EF1A	"	277,300	642	55	133
ED2B	"	263,822	684	62	216
			(OP: EA2ESB)		
EA1S	"	241,528	519	62	165
EA4K	"	212,058	467	69	228
EA1FCR	"	110,210	397	51	155
EC4T	"	98,262	328	56	103
EB2RA	"	94,668	315	42	96
EA7A	"	82,192	219	50	126
EA5JDN	"	59,730	220	51	130
EA4GOY	"	56,110	217	39	116
EA5J	"	28,712	198	32	65
EA1UR	"	17,200	118	29	71
EA3PT	"	4,032	40	16	26
EA2A	"	1,920	20	14	18
EA3B	"	1,480	27	17	23
EA7Q	**28A**	**192,812**	**706**	**31**	**87**
EA5TS	"	55,328	219	26	78
EA4M	"	47,775	305	26	65
EA5O	"	39,715	302	19	46
EA7JXZ	"	37,202	161	27	62
EC5K	**21A**	**629,136**	**2059**	**36**	**117**
ED3M	"	339,584	1370	32	96
			(OP: EA3AQ)		
EA7I	"	305,620	1208	34	114
EA2KV	"	268,736	1142	32	104
EE7P	"	241,200	1026	30	90
			(OP: EA7ATX)		
EA4EER	"	202,280	807	33	97
EA3KN	*"*	*30,100*	*131*	*26*	*74*
EF5U	"	15,376	218	13	49
			(OP: EA5U)		
EA1B	"	13,936	89	17	50
EA2CCG	"	8,234	131	11	35
EA1U	**14A**	**119,952**	**527**	**34**	**113**
EA3AR	**7A**	**132,355**	**1151**	**23**	**80**
***EA4EUI**	**AA**	**732,828**	**1020**	**86**	**267**
*EF7K	"	572,064	1426	61	175
			(OP: EA7GX)		
*EA7K	"	431,640	680	85	275
*EA3XR	"	363,688	694	75	194
*EA4AW	"	313,500	693	69	206
*EA4HKF	"	294,690	675	71	214
*EA1IXQ	"	292,314	569	67	191
*EA4NI	"	253,164	582	67	222
*EA4EF	"	241,485	588	70	185
*EA5IXO	"	231,594	496	63	179
*EA5W	"	227,584	498	66	190
*EA1Z	"	207,000	632	51	149
*EA5IUN	"	166,878	376	67	152
*EA1OT	"	165,946	598	48	161
*EA1ITX	"	74,620	285	48	134
*EA4FJX	"	67,671	182	59	160
*EA2GP	"	62,648	257	46	118
*EA5FCW	"	52,116	203	50	122
*EF1E	"	42,450	238	20	55
*EA3CWT	"	41,470	191	39	104
EA7AQR	*"*	*34,080*	*147*	*36*	*60*
*EA4GF	"	28,854	306	33	93
*EA2ECA	"	28,500	186	27	87
*EA1T	"	19,136	80	43	61
*EA2EWB	"	18,297	141	28	79
*EA3IFV	"	18,232	98	37	69
EA5JEG	*"*	*14,640*	*91*	*25*	*55*
*EA5JBG	"	14,065	120	29	68
*EA2PA	"	12,383	89	21	40
*EA1G	"	11,008	144	13	19
*EA3EZD	"	10,512	98	20	53
EA1JAI	*"*	*9,306*	*55*	*29*	*37*
*EA7GZQ	"	8,777	68	25	42
*EA4EZ	"	8,480	64	32	48
*EA4EUW	"	6,936	72	21	47
*EA1AW	"	5,115	55	17	16
*EA4DT	"	4,200	65	13	29
*EC2AHS	"	2,916	40	20	34
EA4ZQ	*"*	*960*	*21*	*12*	*18*
*EA2BEE	"	80	4	4	4
*EA2BJM	"	24	2	2	2
***EA7Z**	**28A**	**237,816**	**991**	**27**	**81**
*EA4AA	"	87,785	436	26	71
*EA3OW	"	81,480	433	29	68
*EA4IE	"	30,956	173	19	52
*EA5GJ	"	22,425	132	24	51
*EA5HJO	"	17,892	126	19	44
*EA5XA	"	15,620	130	18	37
*EB5GC	"	5,400	64	16	29
*EA7MT	"	4,797	51	15	24
*EA2GR	"	1,056	31	7	17
*EA1FIN	"	42	4	3	4
***EA1R**	**21A**	**278,346**	**1022**	**31**	**107**
*EA2LMI	"	112,752	691	28	80
*EA5JDC	"	20,930	232	17	53
*EA4HBG	"	16,629	124	18	51
*EA1CS	"	15,336	113	22	50
*EA1HWD	"	11,151	111	15	44
*EA7TS	"	7,500	120	13	37
*EA5HAY	"	588	18	7	14
***EA2VE**	**14A**	**245,488**	**1298**	**33**	**101**
*EA5JN	"	60,610	508	19	76
*EA1DHB	"	19,637	176	16	57
*EA2R	"	17,176	133	21	55
*EA7JWT	"	6,095	101	12	41
*EA7J	"	399	20	4	17
***EA3GYT**	**7A**	**12,096**	**163**	**12**	**51**
*EA2CE	"	5,724	91	14	40
***EA5S**	**3.7A**	**7,434**	**105**	**11**	**48**
*EB3AM	"	7,261	123	8	45

Sweden

SM5Q	**A**	**584,584**	**892**	**88**	**276**
SF6U	"	78,698	252	41	68
			(OP: SM6CMU)		
SM6NT	"	78,480	448	38	106
SM1JKM	"	70,200	186	67	133
SE6C	"	57,624	258	41	106
SA6SKA	"	48,233	283	34	105
SA6P	"	45,750	228	39	111
SE3T	*"*	*2,835*	*29*	*17*	*18*
SA5HUB	"	2,520	50	18	27
SMØT	"	1,728	42	8	19
SM2CEW	**21**	**93,318**	**662**	**26**	**77**
SD1A	"	7,990	98	14	33
			(OP: SM1TDE)		
SM5COP	"	1,562	25	10	12
SF4D	**14**	**186,878**	**1269**	**25**	**81**
			(OP: SM4LMV)		
SM6GYB	"	12,760	175	12	46
***SM5JVF**	**A**	**101,062**	**454**	**42**	**127**
*SM5DXR	"	91,368	494	36	126
*SB5X	"	83,538	315	48	134
*SE4L	"	73,839	322	41	122
			(OP: SAØFIA)		
*SM5ACQ	"	42,076	292	30	104
*SE4E	"	37,488	211	30	112
			(OP: SM4DQE)		
*SA6RTD	"	31,720	180	40	90
*SM6C	"	24,390	148	29	61
*SD6W	"	9,280	100	23	57
			(OP: SM6PVB)		
*SA6OHM	"	5,406	94	12	41
*SA6FAX	"	2,695	53	14	35
*SA7J	"	2,464	85	9	35
			(OP: SM7XGG)		
*SM5LSM	"	1,066	41	6	20
*SM6LRR	"	616	22	8	20
			(OP: RM2D)		
***SM6USS**	**28**	**77**	**7**	**4**	**3**
***SM6TOL**	**21**	**16,740**	**134**	**18**	**44**
***SE6J**	**7**	**17,640**	**247**	**11**	**52**
			(OP: SM6XHM)		
***7S2A**	**1.8**	**4,500**	**136**	**5**	**31**
			(OP: SA2SAA)		
8SØC	**AA**	**952,798**	**1113**	**120**	**386**
			(OP: SMØMPV)		
SEØX	"	935,542	1130	122	387
			(OP: SMØMDG)		
SM5EPO	"	416,130	670	82	248
SGØX	"	410,592	769	79	233
			(OP: SMØMLZ)		
SM6MVE	"	238,392	641	59	205
SMØN	"	170,100	345	88	212
			(OP: SMØJCA)		
SE5E	"	135,256	275	73	159
			(OP: SM5AJV)		
SA6U	"	121,716	365	54	142
			(OP: SM6LJU)		
SM2A	"	109,182	370	53	133
SE5N	"	96,258	298	53	130
			(OP: SM5ISM)		
SM5X	"	44,114	144	48	89
			(OP: SM5GMZ)		
SM2U	"	8,362	51	30	44
SM7IUN

*UT3SO	"	171,756	605	52	182
*UR5WEB	"	111,755	347	54	163
*UR2LX	"	110,400	348	56	144
*UV3QF	"	84,656	353	44	132
*UT1AM	"	81,618	363	36	147
*UT3UNE	"	75,600	314	42	133
*UY5TE	"	72,063	342	39	118
*UTØCK	"	69,600	338	40	134
*UY5VA	"	61,595	197	53	74
*UZ1U	"	60,579	294	35	92
			(OP: US7UU)		
*UR5AMJ	"	56,695	195	46	99
*UX2QL	"	52,305	261	38	127
*UR7AL	"	42,408	176	38	86
*UT4USA	"	37,632	225	28	84
*UR6LF	"	34,713	212	32	101
*UX7QG	"	31,654	199	34	99
*UT8AS	"	27,140	191	29	89
*UR4MS	"	26,780	172	30	100
*UY2ZZ	"	25,308	198	26	88
*UT2AA	"	21,252	203	20	72
*UT4MW	"	18,860	135	31	61
*UR3QTN	"	17,613	147	24	79
*UR4MF	"	15,470	147	24	61
*UR5VAA	"	14,536	135	22	70
*UR7HN	"	14,319	82	30	81
*UX2HB	"	13,524	134	18	74
*UR5UJ	"	13,433	126	24	77
*UT5ZL	"	11,680	136	18	55
*UT5UHX	"	11,132	91	30	62
*US5WBJ	"	10,787	81	25	42
*UZ5U	"	5,916	60	20	38
			(OP: UT4UO)		
*US3WO	"	5,916	51	22	46
*UR7IWW	"	4,420	75	11	41
			(OP: UR3PHG)		
*UW1WU	"	4,180	48	18	26
*US5IIM	"	3,363	45	13	44
*US5EEK	"	3,168	40	14	30
*UT4UB	"	2,310	41	16	26
*USØYA	"	2,090	21	17	21
*UR4LIN	"	1,665	43	14	31
*USØSY	"	816	16	12	12
*UT5Q	"	408	17	7	17
*UT1AS	"	343	17	4	3
*USØUB	"	156	10	5	8
*UT9UO	"	140	13	5	9
*UR5EH	"	108	7	5	7
***US5AT**	**28**	**22,940**	**167**	**24**	**50**
*UX2HH	"	10,300	108	16	34
*UT4Q	"	8,510	123	13	33
			(OP: UR5QRB)		
*UT5CB	"	4,294	62	15	23
*USØVA	"	640	18	7	9
***USØHZ**	**21**	**70,490**	**359**	**29**	**77**
*UT7QL	"	65,520	316	32	85
*UW7EF	"	53,640	339	25	65
*UT1AA	"	37,184	284	24	59
*UR4EI	"	375	19	5	10
*UX5UN	"	99	5	4	5
***US5D**	**14**	**70,970**	**622**	**21**	**73**
			(OP: UT7DX)		
*UX1CL	"	31,768	302	14	62
*UT9NL	"	6,854	111	9	37
*UR5XOV	"	5,194	80	9	40
*UX9ZA	"	4,255	61	9	28
***UT3UOR**	**7**	**128,810**	**981**	**23**	**87**
*UV2IZ	"	40,416	331	21	75
*UT3QD	"	26,883	237	20	67
*UX4CR	"	13,952	193	12	52
*UR5WQ	"	12,460	123	12	58
*UT5KL	"	8,694	174	9	45
*UT3EK	"	320	14	7	13
***UT5PY**	**3.7**	**15,060**	**244**	**8**	**52**
*UT1WW	"	8,003	149	7	46
***UT8IK**	**1.8**	**3,002**	**83**	**5**	**33**
*UR6LRC	"	1,080	46	5	19
UW5ZM	**AA**	**3,348,862**	**3477**	**145**	**493**
UT7CR	"	2,877,818	3144	141	473
UW1M	"	2,179,329	2020	141	436
EO5ØFF	"	1,091,200	1621	104	336
			(OP: UXØFF)		
UV5U	"	1,016,056	1151	117	365
			(OP: UX1UA)		
UTØRS	"	765,510	1034	122	352
UY1HY	"	447,051	722	96	245
US5QUB	"	102,612	347	46	158
UR5EDX	"	53,521	162	56	123
UR5R	"	17,226	101	27	31
			(OP: UTØRM)		
UR5ECW	"	17,108	98	30	61
US6IKT	"	13,440	140	16	64
US8QQ	"	13,320	60	38	52
UT5UT	"	5,785	57	15	50
UR7EZ	"	24	2	2	2
UT7E	**28A**	**90,624**	**512**	**28**	**68**
			(OP: UR3EZ)		
UR4LRG	"	5,960	73	13	27
UW4E	**21A**	**523,411**	**1837**	**37**	**124**
			(OP: UT5EDX)		
UT5LO	"	158,046	601	36	106
UT1AN	"	137,600	599	34	94
UR4QRH	"	35,904	176	23	65
UT7NY	"	23,177	134	23	54
UT4U	**14A**	**640,965**	**2112**	**38**	**135**
			(OP: UT5UJO)		
UY5ZZ	"	376,830	1501	36	122
US1Q	**7A**	**1,096,979**	**3777**	**37**	**132**
			(OP: UW2QU)		
UT9EZ	"	8,611	83	16	63
UT7HA	**3.7A**	**57,128**	**788**	**14**	**60**
***UR4QFP**	**AA**	**490,100**	**1049**	**71**	**254**
*US7IY	"	386,631	866	69	254
*UR5RP	"	372,980	694	90	250
*UR5QU	"	168,572	275	80	188
*UR7HCX	"	154,170	359	74	196
*UT8IM	"	141,705	502	45	190
*UR5WIF	"	98,496	416	35	136
*UT1XU	"	80,360	380	38	126
*US7IID	"	74,214	329	37	149
*UY2IG	"	73,776	261	48	126
*US6IKF	"	59,697	226	62	139
*UY5QZ	"	50,974	200	49	105
*UT6UZ	"	48,300	160	41	120
*UW3HM	"	26,040	153	29	91
*UR5XMM	"	24,973	104	43	70
*UT3WM	"	19,950	121	36	78
*UTØEM	"	19,620	151	27	82
*UT8LN	"	11,680	58	30	43
*UR5IQG	"	1,188	23	14	22
***EM9Q**	**28A**	**6,804**	**80**	**15**	**21**
			(OP: UR9QQ)		
***UT8EL**	**21A**	**97,477**	**594**	**30**	**77**

*UR6IJ	"	1,830	35	9	21
***UR3GU**	**14A**	**477,318**	**2154**	**36**	**122**
*UR2Y	"	58,760	441	27	77
			(OP: USØYW)		
*UT7AT	"	52,500	361	29	71
*UY3U	"	22,800	163	25	70
			(OP: UT8UF)		
*UX7U	"	17,204	197	17	51
			(OP: UX7UA)		
*UW5U	"	7,097	117	8	39
			(OP: UY2UA)		
***US7UW**	**7A**	**27,000**	**330**	**14**	**61**

Wales

MWØYVK	**A**	**860,541**	**1327**	**74**	**219**
MWØJKU	"	200,070	490	53	137
GW4J	"	30,532	245	16	52
			(OP: GWØETF)		
GW9T	**28**	**134,784**	**513**	**31**	**97**
			(OP: MWØZZK)		
MWØKMS	*14*	*24,320*	*120*	*25*	*70*
***MW6M**	**A**	**99,144**	**287**	**50**	**154**
			(OP: GW4BVJ)		
*GW4HBK	"	71,280	264	46	134
*MW1MDH	"	52,264	304	33	106
*GW1PJP	"	43,840	190	44	93
*MW1DCF	"	35,742	264	31	107
*GW8KBO	"	34,846	176	33	98
*MW7KJC	"	33,915	245	28	91
*MW7EJH	"	8,280	106	17	52
*MWØGWG	"	6,771	85	18	43
***MW8R**	**28**	**114,192**	**563**	**27**	**77**
			(OP: GW4SHF)		
***GW4W**	**21**	**47,058**	**252**	**22**	**71**
			(OP: GW4EVX)		
***GW5L**	**14**	**84,444**	**727**	**20**	**73**
			(OP: GW4ZAR)		
***GW4TSG**	**7**	**660**	**25**	**5**	**17**
*MW7WYN	"	36	9	1	5
***GW9J**	**3.7**	**16,352**	**251**	**8**	**48**
			(OP: GWØGEI)		
MWØSAW	**AA**	**8,449**	**57**	**30**	**41**
GW4BKG	**7A**	**48,472**	**588**	**15**	**58**
***2WØLKX**	**AA**	**271,152**	**785**	**54**	**198**
*GWØARK	"	206,701	429	68	185
***MWØCRI**	**21A**	**107,973**	**557**	**31**	**98**

Maritime Mobile (Europe)

***UW5EJX/**					
MM	**21**	**38,394**	**362**	**19**	**62**

OCEANIA

Australia

VL2A	**A**	**1,004,328**	**1467**	**91**	**170**
			(OP: VK2IM)		
VK2P	"	880,500	1174	99	201
VJ4M	"	312,150	773	45	105
VL5L	"	286,944	551	61	135
VK2YI	"	266,705	510	69	136
VK7C	"	218,575	517	67	108
			(OP: VK7GH)		
VJ3A	"	209,622	463	53	108
VJ2Z	"	120,870	311	62	96
VK2LX	"	97,548	264	43	89
VL2B	"	45,080	137	40	75
			(OP: VK2BJ)		
VL5Q	"	25,009	116	33	56
			(OP: VK5SA)		
VL2G	"	12,449	91	29	30
			(OP: VK2GR)		
VL2N	"	10,200	88	23	28
			(OP: VK2PN)		
VL2W	"	9,060	77	24	36
*VK6TKR	"	1,833	27	16	23
VJ2G	"	132	8	6	6
VK4A	**28**	**275,544**	**1109**	**25**	**64**
			(OP: VK4NM)		
VK4I	"	47,709	305	21	36
			(OP: VK4CZ)		
VL2V	"	15,394	130	18	25
VK4SDD	**21**	**251,800**	**984**	**32**	**68**
VK2COW	"	11,472	94	22	26
			(OP: VK1SV)		
VL2R	"	2,291	42	14	15
VL4U	**14**	**121,582**	**463**	**31**	**75**
VJ2J	"	92,000	316	31	84
			(OP: VK2CZ)		
VJ2D	"	30,295	144	24	59
VL4Y	"	26,411	125	21	56
			(OP: VK4BRT)		
VK3Y	"	48	4	2	2
VL3E	**7**	**63,423**	**340**	**24**	**57**
			(OP: VK3TZ)		
***VK2PAA**	**A**	**90,350**	**281**	**46**	**84**
*VK4Y	"	80,738	235	63	95
*VK4B	"	27,846	118	41	61
*VK4SP	"	22,704	97	33	55
*VK2W	"	19,106	98	33	49
			(OP: VK2GZ)		
*VJ5Z	"	15,540	87	30	44
			(OP: VK5LA)		
*VK2WTT	"	9,856	74	23	33
*VK8D	"	9,840	65	21	39
			(OP: VK8MC)		
*VK3LF	"	8,215	62	18	35
*VK3O	"	6,394	56	20	26
			(OP: VK3OT)		
*VJ3O	"	5,876	56	17	35
			(OP: VK3TX)		
*VJ3D	"	4,275	40	21	24
*VK4HDY	"	3,515	35	15	22
*VK6WE	"	1,736	35	15	16
*VK4MWL	"	1,632	26	11	21
*VK6WR	"	1,392	39	14	15
*VK3OM	"	1,104	24	12	12
*VK1DD	"	1,035	23	12	11
*VJ3L	"	868	23	14	14
*VL3A	"	540	20	10	10
			(OP: VK3FN)		
*VK6NT	"	450	9	9	9
*VK6NDX	"	440	11	10	10
*VK5MAV	"	350	9	7	7
*VK2KJJ	"	252	10	9	9
*VK5XB	"	242	20	12	10
*VK6MIL	"	120	5	5	5
*VK4PDG	"	90	7	5	5
*VK6NCB	"	84	8	6	6
*VK7KW	"	56	10	5	3
*VK6HNM	"	16	5	4	4
*VK2EAH	"	0	4	3	2
***VL3O**	**28**	**5,460**	**66**	**11**	**19**
***VK3VDX**	**21**	**1,580**	**39**	**11**	**9**
***VK2BAM**	**14**	**2,838**	**36**	**10**	**23**

*VK3V	"	640	14	5	11
			(OP: VK3ZPF)		
*VK3Z	"	160	6	5	5
*VK5MVR	"	156	9	5	7
*VK4DRK	"	56	4	3	4
*VL3Q	7	300	14	8	7
*VL3B	"	0	1	1	1
			(OP: VK3BQ)		
*VK6DAV	"	0	2	1	1
*VK3D	"	0	1	1	1
			(OP: VK3DNS)		
VJ4T	**AA**	**2,029,888**	**2261**	**102**	**220**
VJ2W	"	450,918	673	74	172
VK2BY	"	316,107	453	100	179
VK4L	"	144,109	309	61	112
VK2K	"	115,836	306	51	96
			(OP: VK2DG)		
VL6W	"	33,488	166	32	60
			(OP: VK6DW)		
VK2M	"	23,564	112	33	53
			(OP: VK2KDP)		
VK4DX	"	16,184	87	21	47
VJ3K	"	11,424	63	27	41
VK3KE	"	10,500	82	26	44
VL3V	"	2,772	36	17	19
			(OP: VK3VT)		
VL6C	**28A**	**188,672**	**769**	**19**	**69**
			(OP: VK6IR)		
VK3X	**21A**	**3,525**	**52**	**13**	**12**
			(OP: VK3GK)		
VK2AXX	**14A**	**12,789**	**97**	**11**	**38**
***VK6OZ**	**AA**	**118,800**	**288**	**53**	**123**
*VK2NSS	"	80,070	198	61	96
*VJ4G	"	814	27	11	11
*VL3I	"	56	6	3	4
			(OP: VK3VB)		
*VL2L	"	32	6	4	4
***VK2BNG**	**7A**	**507**	**17**	**7**	**6**
*VK4JJ	"	4	2	2	2

Brunei Darussalam

V85AHV	**A**	**120,840**	**502**	**36**	**70**
***V85T**	**A**	**37,300**	**237**	**44**	**56**
*V85AVE	7A	2,703	104	7	10

East Malaysia

9M6RHM	**A**	**2,448**	**83**	**11**	**13**
***9M8DEN**	**A**	**121,990**	**584**	**38**	**72**
*9W6JNR	"	3,458	105	11	15
***9W6DVY**	**28**	**1,188**	**28**	**13**	**14**
***9M6ZAE**	**21**	**33,552**	**264**	**18**	**30**
***9W8ZZK**	**7**	**16,920**	**325**	**15**	**25**
*9W6HMI	"	6,984	204	9	15
*9W6MOZ	"	2,928	92	10	14
*9W8LAR	"	1,064	46	5	9
*9W6MM	"	1,054	60	6	11
***9W6EZ**	**28A**	**4,760**	**65**	**17**	**18**

Fiji

3D2USU	**14A**	**50,160**	**282**	**24**	**52**

Guam

KH2JU	**28**	**125,542**	**544**	**26**	**56**
***KH2INC**	**A**	**134,960**	**560**	**48**	**64**
			(OP: KH2ZZ)		
NH2DX	**AA**	**977,130**	**1225**	**90**	**192**
			(OP: KG6DX)		

Hawaii

KH7M	**A**	**4,188,657**	**4069**	**134**	**229**
			(OP: N6TJ)		
WH7T	"	3,739,392	4442	106	182
			(OP: WH7W)		
KH6PE	"	382,356	797	76	96
KH6DH	"	17,018	105	31	36
***KH6CJJ**	**A**	**438,265**	**828**	**80**	**105**
*KH6HT	"	24,651	114	41	42
*WH6GKW	"	646	14	10	9
***KH6XX**	**21**	**26,999**	**209**	**20**	**29**
KH7Q	**AA**	**7,925,904**	**5499**	**158**	**346**
			(OP: KU1CW)		
KH6TU	"	244,016	578	61	90
			(OP: AD6E)		
WH6R	"	99,750	310	57	68

Indonesia

YB1AR	**A**	**848,403**	**1020**	**88**	**233**
YB2MM	"	286,657	494	65	152
YB4FIK	"	188,102	453	51	112
YB2HAF	"	133,037	307	62	111
YE1BON	"	107,540	442	32	63
YCØSCZ	"	46,763	175	35	66
YC5TEB	"	33,840	156	31	59
YF8TAC	"	26,832	134	37	49
YB1ACC	"	25,380	156	36	58
YC5DDE	"	24,424	157	32	54
YB2UFM	"	22,185	109	32	55
YB3DXG	"	20,250	118	30	45
YB9YSS	"	19,669	101	37	52
YB5ELS	"	15,288	114	28	50
YC1DNR	"	15,264	105	27	45
YB7KE	"	11,222	81	28	34
YC1JBV	"	10,349	108	31	48
YBØDRV	"	8,624	72	24	32
YC5KLQ	"	7,009	86	18	25
YCØSPC	"	5,831	81	22	27
YC1FFH	"	5,566	56	19	27
YCØAFS	"	5,040	56	15	21
YB2SPP	"	1,886	66	18	28
YF9EAO	"	1,584	51	10	14
YB7BAE	"	986	79	13	16
YB1DUU	"	651	35	10	11
YB7FQA	"	555	15	7	8
YC3GFN	**28**	**330**	**27**	**12**	**18**
YCØAGW	**21**	**175,746**	**652**	**32**	**70**
YF8DJ	"	20,935	159	19	34
YC5KXI	"	2,295	38	12	15
YBØECT	**14**	**111,384**	**412**	**30**	**72**
YB4NY	"	15,052	124	15	38
YC8MJG	**7**	**40,535**	**313**	**22**	**33**
YB7MYS	"	24,915	216	22	33
YC7EVA	"	18,816	138	18	38
YF7RIX	"	3,510	63	12	18
YC8DUL	"	2,756	52	11	15
YC8SGY	"	2,046	52	13	18
YC3CQY	"	1,780	41	8	12
YF3EQM	"	1,400	23	10	15
YB7FLW	"	1,037	46	6	11
YB8UTI	"	1,026	29	7	12
YF3CYS	"	912	25	10	14
YC7DDU	"	492	32	4	8

YF3GDE	"	437	15	9	10
YF9BBO	"	99	7	5	6
YC1RYJ	"	0	17	1	1
YB4IR	**3.7**	**918**	**19**	**8**	**10**
YB1BLW	"	306	13	8	9
***YB9ELS**	**A**	**237,754**	**443**	**67**	**147**
*YB1LUE	"	199,600	396	60	140
*YB2GV	"	167,454	349	55	134
*YB7OO	"	146,559	432	56	91
*YC9LCM	"	144,348	416	48	90
*YB2CPO	"	138,876	347	52	111
*YB1DMK	"	135,468	341	53	106
*YB7WR	"	117,594	330	49	90
*YB9DE	"	87,172	331	45	79
*YB9MX	"	80,465	291	45	88
*YB7NUS	"	79,808	308	44	72
*YB3BBF	"	69,154	217	49	93
*YB1BTJ	"	56,550	160	50	80
*YB3BGM	"	53,277	161	48	81
*YB1MW	"	50,570	194	41	89
*YF4ICC	"	50,485	187	45	70
*YC1CQU	"	35,310	154	44	63
*YB6UAK	"	34,711	182	37	66
*YB9GDP	"	22,512	150	32	52
*YB8JEC	"	22,464	127	34	44
*YB1ABY	"	20,514	126	31	47
*YC9DPO	"	20,382	137	34	45
*YB6UAF	"	19,856	120	25	48
*YB8RVI	"	18,648	140	29	43
*YC7YCP	"	16,960	157	27	37
*YC2CQO	"	16,000	106	26	38
*YBØOHG	"	15,428	95	26	50
*YC9KNX	"	15,150	147	32	43
*YC1DFE	"	14,820	81	22	43
*YC2KEJ	"	14,784	98	22	42
*YC2CLH	"	14,775	94	32	43
*YB1MIG	"	14,697	87	30	41
*YC9BAJ	"	14,504	93	28	46
*YC1BIQ	"	13,943	87	32	41
*YC1GAL	"	13,475	115	26	51
*YCØNIU	"	13,206	98	23	48
*YB8RW	"	13,145	105	25	30
*YCØSCV	"	12,780	88	28	43
*YC2KDU	"	12,288	83	25	39
*YE9CZY	"	12,258	110	23	31
*YB1SNS	"	11,712	94	27	37
*YD2ULK	"	11,532	76	23	39
*YB4KRZ	"	10,740	76	23	37
*YC1FDF	"	9,912	92	22	37
*YC2CRN	"	9,792	78	25	39
*YC3RBI	"	8,517	77	21	30
*YC9KFW	"	7,987	77	20	29
*YC9BVB	"	7,884	81	22	32
*YB4HPI	"	6,600	66	23	27
*YF3CZW	"	6,517	59	21	28
*YB9IPY	"	6,109	93	18	23
*YD5NBY	"	5,808	65	16	28
*YBØPTR	"	5,123	63	22	25
*YC1KAJ	"	4,972	51	19	25
*YC9AOS	"	4,784	52	23	29
*YCØNAN	"	4,545	41	19	26
*YC9UAB	"	4,455	49	20	25
*YE3CIF	"	4,290	78	18	21
*YB2MDU	"	4,214	38	14	29
*YB1MAE	"	4,012	98	11	23
*YB1SKR	"	3,996	59	24	30
*YBØGOF	"	3,870	54	20	23
*YB5MB	"	3,828	112	13	20
*YC1AMI	"	3,772	38	19	27
*YC1WOZ	"	3,680	46	17	23
*YB4IWS	"	3,649	46	19	22
*YC1OWI	"	3,440	42	17	26
*YC3AJO	"	3,270	47	13	17
*YC5YDD	"	3,050	50	21	29
*YB3ATK	"	3,008	55	14	18
*YB7WBC	"	2,952	47	16	20
*YC2TTG	"	2,928	47	20	28
*YD2DBW	"	2,904	36	17	27
*YB4PE	"	2,856	38	17	25
*YB2TDP	"	2,838	52	19	24
*YD9BIJ	"	2,727	48	11	16
*YC1FNY	"	2,720	34	16	24
*YD7UQU	"	2,697	61	12	17
*YB7WW	"	2,590	54	18	17
*YD2BIU	"	2,268	59	17	19
*YC1BCH	"	2,028	39	18	21
*YF2BMJ	"	2,010	62	13	17
*YC1HA	"	1,943	79	28	39
*YD9VHU	"	1,860	33	14	17
*YDØRCH	"	1,740	38	14	16
*YC1BY	"	1,674	33	13	18
*YC1CBY	"	1,586	39	12	14
*YC7VGB	"	1,394	43	17	17
*YC1KFQ	"	1,333	38	15	16
*YD1BTG	"	1,128	25	12	12
*YC1KQV	"	1,050	24	12	18
*YC1JVE	"	986	34	13	16
*YB1MII	"	902	29	9	13
*YD3YGY	"	861	28	9	12
*YB8XOB	"	810	20	13	14
*YD3TSJ	"	775	18	11	14
*YDØAUI	"	667	23	10	13
*YB1BRS	"	480	10	8	8
*YC9UBG	"	420	20	7	8
*YB8RSE	"	372	24	6	6
*YB1GIP	"	345	11	6	9
*YD1BTK	"	336	11	7	9
*YC1LHQ	"	294	17	6	8
*YD3RDW	"	288	16	6	10
*YE5SX	"	276	11	5	7
*YC1CAR	"	252	19	6	8
*YC5NAU	"	243	13	4	5
*YDØADI	"	182	15	6	8
*YC1JVY	"	156	18	5	8
*YC9AUY	"	100	5	5	5
*YG1AGB	"	90	15	4	5
***YD1CHM**	**28**	**2,528**	**38**	**11**	**21**
*YB7SKM	"	1,056	28	12	12
*YD3ASV	"	1,012	23	8	15
*YC7UDD	"	465	21	8	7
*YD7NQW	"	77	7	4	3
*YCØSJA	"	39	8	6	7
***YB9GV**	**21**	**75,088**	**398**	**21**	**55**
*YC9FAR	"	53,947	281	24	49
*YC2XCD	"	32,092	206	25	46
*YB9BAC	"	31,650	200	24	51
*YCØBAS	"	22,912	133	24	40
*YB2VYY	"	21,648	136	19	47
*YBØANJ	"	15,840	96	19	41
			(OP: 4F3JX)		
*YB1APD	"	12,934	100	20	38
*YB9VED	"	11,825	123	20	23
*YC4SIZ	"	10,846	90	18	40
*YC2OQR	"	7,502	79	23	39

*YF3FBV	"	6,636	70	18	24
*YF3EKS	"	4,445	48	13	22
*YCØSJK	"	4,370	45	13	25
*YB4KAR	"	4,250	51	12	22
*YC1IFR	"	2,244	36	15	19
*YB3EDD	"	1,740	36	10	10
*YCØKBE	"	345	11	5	10
***YB7MP**	**14**	**24,433**	**188**	**15**	**38**
*YB1HDR	"	21,516	132	19	47
*YE4IJ	"	11,502	81	16	38
*YB1RIF	"	11,385	89	17	38
*YB1BGI	"	10,241	81	13	36
*YB1AM	"	6,864	68	14	30
*YB2AYA	"	693	26	9	12
***YD2ELT**	**7**	**38,454**	**189**	**26**	**61**
*YDØNHG	"	32,263	173	23	54
*YD9VE	"	29,216	288	20	24
*YD9AAI	"	18,360	125	20	40
*YC5LCZ	"	14,522	107	15	38
*YD1RYX	"	11,128	98	18	34
*YC1NVX	"	9,310	94	17	32
*YD9WFT	"	9,246	105	20	26
*YD8MUZ	"	8,930	135	14	24
*YD5AKH	"	8,778	98	14	28
*YDØASO	"	7,298	118	16	25
*YC7JZ	"	6,419	85	19	30
*YD5ACA	"	6,039	116	13	20
*YCØARK	"	4,719	126	14	19
*YD9MBM	"	4,590	74	14	16
*YG1AJC	"	4,165	56	14	21
*YF4IDW	"	3,836	60	10	18
*YC7CPZ	"	3,706	79	13	21
*YD1JEE	"	3,696	59	11	17
*YB8UF/7	"	3,689	54	15	16
*YC7CNU	"	3,321	57

*YDØSRA	"	200	9	3	5
*YD3BQO	"	195	23	5	8
*YC7WHE	"	192	18	5	7
*YC2PST	"	190	10	3	7
*YD3CYO	"	180	10	4	5
*YD9BSX	"	121	8	5	6
*YC9CYN	"	110	13	5	6
*YCØDMS	"	96	11	2	4
*YC7WHV	"	91	18	6	7
*YD3CQX	"	72	8	3	5
*YD3BFV	"	72	9	4	8
*YC1IYV	"	64	33	3	5
*YD2RTG	"	60	23	1	4
*YC1BRG	"	60	69	6	9
*YD3AHC	"	48	5	3	5
*YCØEDY	"	24	2	2	2
*YCØNDB	"	18	4	1	2
*YF3CXB	"	8	3	2	2
*YD1LNE	"	0	24	1	1
***YF8HYV**	**3.7**	**1,311**	**31**	**11**	**12**
YBØNSI	**AA**	**296,960**	**538**	**77**	**155**
YC1AYO	"	163,493	393	56	111
YBØJVZ	"	117,820	254	57	115
YC2GBS	"	90,855	288	52	83
YB2IQ	"	90,600	291	34	86
YB1TQL	"	70,704	197	54	90
YBØPJF	"	32,046	121	34	64
YB2TS	"	31,320	132	35	73
YBØET	"	15,330	83	27	43
YB1RUS	"	11,461	71	30	43
YC1DIU	"	8,911	66	27	40
YC1CRR	"	5,720	58	14	26
YC9CGM	"	4,554	52	19	27
YE7LTN	"	1,404	39	11	16
YCØSAS	"	200	10	5	5
YB1WCK	**28A**	**2,640**	**31**	**14**	**19**
YC9XYP	**21A**	**77,265**	**385**	**27**	**58**
YB9UA	"	5,952	89	20	28
YE3AA	**14A**	**78**	**5**	**2**	**4**
YBØBAC	**7A**	**55,955**	**281**	**28**	**67**
YB8ROP	"	8,326	89	19	27
YC7OCS	"	3,354	63	12	14
YF3CYT	"	1,107	21	11	16
YC3FTY	"	416	17	5	8
YG8AHJ	"	147	80	9	12
YC3NHW	"	80	8	4	4
YB7CTN	"	45	17	4	5
YB2URA	"	42	35	2	4
***YC3DOC**	**AA**	**148,920**	**329**	**53**	**117**
*YF9PBZ	"	121,830	345	51	104
*YBØISE	"	32,100	123	42	65
*YF3ESW	"	21,294	110	27	51
*YC7OIQ	"	10,075	117	25	40
*YC1RIK	"	8,268	95	22	30
*YE8RAF	"	6,102	75	27	27
*YCØJOY	"	5,289	54	18	23
*YC1HLT	"	4,512	42	19	28
*YB7XYO	"	4,370	65	19	27
*YB1IM	"	3,150	38	11	24
*YC9IPJ	"	2,698	45	17	21
*YE8DWC	"	1,054	30	14	20
*YE3FAX	"	544	19	7	10
*YC2CKY	"	414	12	8	10
*YF8FOR	"	162	11	5	4
*YC2MPF	"	90	52	4	5
*YG2AJH	"	7	19	3	4
***YD2UWF**	**28A**	**49,776**	**259**	**16**	**52**
*YB1HR	"	5,360	53	14	26
***YB9GWR**	**21A**	**64,848**	**287**	**25**	**59**
*YC1LJT	"	61,317	275	21	60
*YC2KJC	"	3,973	63	12	17
*YC2USI	"	760	24	10	9
***YB1GBN**	**14A**	**20,296**	**138**	**17**	**42**
*YB1DOL	"	1,932	25	11	17
*YB3FTD	"	187	7	5	6
***YD8RAG**	**7A**	**14,100**	**154**	**17**	**30**
*YC5SLA	"	3,294	61	10	17
*YB3PIN	"	2,430	39	11	19
*YD3BUE	"	1,950	50	11	14
*YC8UDV	"	1,612	42	11	15
*YC9BIH	"	1,500	76	11	14
*YC2DOP	"	1,216	23	9	10
*YG2ACP	"	1,015	41	11	18
*YF9DCH	"	880	37	9	11
*YD4GAS	"	768	36	7	9
*YC2ANN	"	528	18	9	13
*YC7HPF	"	522	27	7	11
*YC1LGO	"	462	46	9	12
*YD1CUN	"	374	33	4	7
*YD7AAE	"	341	19	5	6
*YG3EOY	"	304	14	7	9
*YB2FCE	"	128	33	3	5
*YC1JZK	"	91	10	3	4
*YD3RAN	"	70	10	4	6
*YB2LGF	"	60	6	4	6
*YD3BFW	"	18	3	1	2
*YD8USA	"	16	6	3	5
*YG1ALO	"	12	19	1	3

New Caledonia

FK8IK	**A**	**1,735,344**	**2053**	**100**	**212**
FK4QX	**28**	**118,680**	**509**	**27**	**59**

New Zealand

ZM1X	**A**	**239,616**	**463**	**76**	**132**
			(OP: ZL2MF)		
ZL1XS	"	103,887	259	54	99
ZL2UO	"	67,600	191	40	90
ZL4RMF	"	29,925	126	40	65
ZL3CW	**28**	**3,975**	**58**	**13**	**12**
ZM1A	**7**	**391,878**	**1234**	**32**	**91**
			(OP: ZL3CW)		
***ZL1MTO**	**A**	**3,300**	**34**	**21**	**29**
ZL4NR	**AA**	**29,574**	**116**	**30**	**63**
ZL1T	"	25,986	148	29	42
ZL4NY	"	25,123	91	37	60
ZL3GA	"	17,710	94	25	52
ZL1BBW	**14A**	**26,386**	**133**	**24**	**55**
ZL2RVW	"	22,876	115	25	51
***ZL4YY**	**AA**	**8,235**	**61**	**22**	**39**
*ZL2IFB	"	4,361	39	17	32
*ZL3GK	"	4,182	45	19	32
*ZL2MM	"	1,403	25	7	16
*ZL1CAP	"	864	21	11	16

Philippines

DY1T	**A**	**971,848**	**1498**	**80**	**156**
			(OP: DU1IVT)		
DU1EG	"	502,467	978	79	134
DU7JAY	"	406,850	1039	69	89
DV1SCO	"	401,760	1013	62	93
4I1EAY	**21**	**88,111**	**504**	**24**	**49**
4GØT	**14**	**113,850**	**669**	**23**	**46**
			(OP: DU1RB)		
DV1DLX	"	34,335	243	20	43
DU1NA	"	14,100	162	14	36
DU1R	**7**	**132,264**	**679**	**30**	**58**
			(OP: DU1UGZ)		
DZ1Z	"	16,920	320	16	31
***4I1LCP**	**A**	**262,524**	**731**	**61**	**106**
*DU1JM	"	244,644	585	66	108
*DX4EVM	"	141,205	428	62	93
			(OP: DV4ZAR)		
*DW7NDM	"	28,350	181	35	40
*DU6/N1MYM	"	26,574	135	45	58
*DU1VGX	"	23,177	128	33	44
*DV6XDS	"	18,673	144	29	42
*4E9VVN	"	13,632	206	19	29
*DV1PCX	"	13,039	102	30	29
*DU4XM	"	11,968	169	19	25
*4G1FKH	"	9,126	108	19	20
*DU9BZT	"	8,869	81	16	33
*DU1/N6HPX	"	8,493	97	25	32
*4E1RA	"	6,862	63	20	27
*DU4RER	"	6,510	69	29	33
*DU3AW	"	5,436	86	13	23
*DU8WP	"	4,005	40	22	23
*DU7PH	"	2,920	89	17	23
*DU1/KEØBRZ	"	1,472	28	15	17
*DV1XJT	"	338	15	6	7
*4I7RAZ	"	304	32	9	10
			(OP: 4G7RAZ)		
***DW7EVQ**	**28**	**13,890**	**184**	**14**	**16**
*DW2ZQB	"	950	22	10	9
***DV9IHK**	**21**	**35,623**	**347**	**22**	**27**
*DU8RAM	"	10,725	117	16	23
*DV1UCX	"	10,291	109	16	25
*DV7MIS	"	7,990	137	15	19
*4I1BNC	"	5,220	82	13	16
***DV1IIW**	**14**	**27,872**	**189**	**20**	**47**
*DU1JI	"	7,152	129	10	14
*DU1AVC	"	5,440	62	10	24
*DU7XD	"	2,976	49	11	20
*DV2ZNW	"	340	16	4	6
***DU1VNA**	**7**	**5,775**	**97**	**14**	**21**
*DU9BX	"	5,568	163	12	17
*DW2ASC	"	1,830	89	6	9
*DV1UUU	"	1,804	43	9	13
*DW6XIR	"	1,536	62	11	13
*DW2FCR	"	784	47	6	8
*DV1VVA	"	520	28	5	8
*DX6EVM	"	24	27	3	5
			(OP: DV6VAU)		
*4E1AGW	3.7	0	3	2	2
DU3TW	**AA**	**947,784**	**1247**	**90**	**186**
DU3T	"	882,767	1284	86	165
DU1AV	"	681,054	1454	77	110
DU4DXT	**21A**	**29,768**	**184**	**24**	**37**
***DV1MM**	**21A**	**15,795**	**159**	**17**	**28**
***4I1EBD**	**14A**	**193,000**	**786**	**29**	**71**
*DU7X	"	1,940	34	8	12

Samoa

***5W1SA**	**21**	**75,600**	**492**	**21**	**35**

SOUTH AMERICA

Argentina

LW1D	**A**	**608,384**	**1218**	**65**	**131**
			(OP: LW1EUD)		
LQ5A	"	287,100	676	63	117
LU2EGI	"	51,136	200	46	90
LU8DY	"	17,908	107	26	48
LW7DX	**28**	**680,760**	**2094**	**27**	**95**
L55D	"	41,713	313	19	40
			(OP: LU5DF)		
L21F	**21**	**1,233,045**	**3147**	**33**	**108**
			(OP: LU5FC)		
LT1E	"	298,958	1213	27	80
LU9MBY	**14**	**294,292**	**998**	**32**	**84**
LU2DVI	**3.7**	**2,976**	**53**	**14**	**17**
***LT2HH**	**A**	**223,924**	**612**	**58**	**120**
*LU3DK	"	221,375	538	47	114
*LT1K	"	45,396	271	49	68
			(OP: LU6KA)		
*LU3HIP	"	33,777	167	38	43
*LW3DBW	"	31,428	192	24	57
*LU1JHF	"	28,404	95	43	65
*LU4EN	"	25,220	173	26	39
*LU4JEA	"	19,504	140	41	51
*LU7DLS	"	18,720	162	39	51
*LU1COP	"	17,775	192	35	44
*LU1EXR	"	17,430	92	30	53
*LU7ADC	"	13,172	150	33	41
*LU4DTL	"	10,858	96	21	40
*LU1QR	"	5,500	52	26	29
*LU9DD	"	4,940	80	22	30
*LU1DW	"	1,972	20	14	20
*LU3DOU	"	1,872	47	18	18
*LU9LZR	"	1,258	22	17	17
*LU5FYD	"	697	17	7	10
*LW8DLF	"	598	25	13	13
*LW6DGR	"	506	17	11	12
*LU6RAN	"	128	20	7	9
*LU9CSM	"	78	16	6	7
***LQ5H**	**28**	**217,460**	**1022**	**25**	**58**
*LW3DN	"	44,268	287	21	47
*LU1RAF	"	40,432	317	19	37
*LU4DPL	"	22,491	180	20	43
*LU9VYY	"	8,917	168	11	26
*LQ5D	"	7,860	128	12	18
			(OP: LU9DA)		
*LW7DQW	"	3,861	60	12	27
*LU5MGH	"	360	13	7	11
*LU1DLP	"	5	3	2	3
***LW6DW**	**21**	**1,014**	**34**	**7**	**6**
***LU1HHT**	**14**	**85,782**	**435**	**25**	**62**
*LU7DUE	"	63,572	335	29	63
*LW6EQG	"	12,642	119	21	28
***LV7H**	**7**	**1,110**	**100**	**16**	**21**
			(OP: LU1HO)		
*LU5MEC	"	660	35	8	12
*LQ3H	"	450	94	4	6
***LU5ILA**	**3.7**	**78**	**14**	**3**	**3**
LU7MT	**AA**	**1,773,392**	**1852**	**111**	**257**
L33M	"	917,676	1358	71	190
			(OP: LU3MAM)		
LT6M	"	913,384	1494	69	163
			(OP: LU8MHL)		
LU7MCJ	"	412,282	1019	56	101
LU1BJW	"	298,200	589	64	136
LT9H	"	219,870	661	42	84
			(OP: LU3HY)		
LU2MCX	"	119,952	356	51	96
AZ7H	"	18,000	101	28	47
			(OP: LW7HT)		
LU4DX	"	6,528	76	26	25
LU6ETB	**28A**	**923,868**	**2531**	**28**	**104**
			(OP: LU7DW)		
LR7D	"	847,177	2335	27	104
			(OP: LU9ESD)		
LT7F	"	562,479	1623	26	97
			(OP: LU6FOV)		
LU1DX	"	493,768	1582	28	96
LU5VV	"	246,620	981	19	76
LU3MO	"	173,130	795	22	65
LO5D	**21A**	**647,323**	**1718**	**33**	**106**
			(OP: LU8EOT)		
LR3M	"	355,608	999	31	101
LU3VED	"	51,492	279	22	62
LT5V	**7A**	**21,924**	**246**	**24**	**39**
			(OP: LU2JCW)		
LU8DPM	**1.8A**	**3,220**	**59**	**12**	**23**
***LW5HR**	**AA**	**1,042,017**	**1286**	**81**	**222**
*LW4EF	"	399,441	990	53	108
***LU1VYL**	**28A**	**54,436**	**388**	**18**	**44**
*LU3DDH	"	22,876	133	20	56
*LQ1D	"	13,585	132	19	36
			(OP: LU3DR)		
*LU9DDJ	"	4,719	59	11	22
*LU3DNT	"	4,056	54	17	22

Aruba

P43A	**21**	**1,422,745**	**3625**	**32**	**105**
P4ØW	**AA**	**11,959,017**	**6829**	**139**	**474**
			(OP: W2GD)		

Bolivia

CP5HK	**A**	**202,014**	**684**	**50**	**79**

Brazil

PY2SBY	**A**	**631,584**	**1033**	**77**	**181**
PY2LC	"	415,616	832	54	137
PY3PDR	"	130,801	418	40	81
PY1IR	"	126,940	423	30	80
PY2EU	"	88,570	216	57	113
PY2KP	"	47,952	156	53	91
PY3ZL	"	43,308	205	45	63
PS8RV	"	38,418	208	28	86
PY5DK	"	24,852	88	44	70
PY5AL	"	11,218	93	27	44
PY2YU	**28**	**1,764,828**	**3809**	**34**	**128**
PS2T	"	496,800	1512	24	91
			(OP: PY2ZEA)		
PY4ME	"	77,544	440	18	54
PP5KR	**21**	**377,224**	**1150**	**31**	**91**
PP5JN	"	60,140	352	20	42
PY3TD	"	33,454	163	23	63
PY4RP	"	3,990	59	12	18
PY2IG	**14**	**563,563**	**1583**	**35**	**108**
PP2DX	"	297,906	997	33	90
PY2YS	"	153,100	563	28	72
PY9MP	**7**	**17,404**	**114**	**22**	**54**
PY3WAK	"	408	14	8	9
***ZV2X**	**A**	**439,344**	**1080**	**50**	**112**
*PY5DD	"	296,362	615	71	138
*PY2AB	"	200,168	645	38	93
*PY2ANH	"	140,361	309	61	116
*PY1NS	"	130,680	356	56	109
*PY2OF	"	121,600	361	51	101
*PY4ARS	"	84,640	239	53	107
*PY2LPM	"	74,382	225	50	104
*PY2RE	"	73,292	288	50	96
*PY4IM	"	69,876	272	29	79
*PR7JM	"	60,610	272	28	67
*PR7RBA	"	58,194	197	34	88
*PY2FX	"	45,095	175	53	92
*PY2TEY	"	37,200	184	45	75
*PY5IF	"	27,977	127	38	63
*PY2RMY	"	25,702	148	23	48
*PR2V	"	25,010	175	35	47
			(OP: PY2MIA)		
*PY2VTR	"	20,824	125	29	47
*PY3CT	"	20,400	124	40	60
*PY2KG	"	18,920	128	36	50
*PY2MAM	"	18,096	122	34	53
*PY2OSD	"	15,015	114	31	46
*PY5PLL	"	14,760	88	39	51
*PY2XL	"	14,742	90	31	47
*PY2RPM	"	12,672	88	27	39
*PY2VCP	"	12,410	106	27	46
*PY2PIM	"	12,028	111	22	40
*PY1FJ	"	11,573	122	25	46
*PY2ERC	"	10,896	111	16	32
*PY2SRL	"	8,584	69	29	45
*PY2PM	"	7,314	77	27	42
*PP5TG	"	6,900	102	26	34
*PY1EZ	"	6,215	62	20	35
*PY2REC	"	5,724	54	24	30
*PT2ZDX	"	5,512	103	25	28
*PY2WSV	"	4,332	75	25	32
*PY1CH	"	4,088	53	23	33
*PY2MIG	"	3,880	68	17	23
*PY1FOG	"	3,723	133	27	46
*PT7PT	"	3,384	95	19	28
*PR7KSA	"	2,744	116	23	33
*PY1PM	"	2,730	40	17	25
*PY5AR	"	2,600	37	17	23
*PY2MIB	"	2,583	67	17	24
*PP5MZ	"	2,107	64	20	23
*PY7VI	"	1,665	32	15	22
*PY2NU	"	1,152	34	14	18
*PY5IQ	"	1,122	37	17	17
*PY1LT	"	1,089	39	13	20
*PY3KV	"	1,050	25	14	16
*PY2HZ	"	1,036	33	17	20
*PY2SG	"	399	23	10	11
*PU9PED	"	324	21	8	10
*PY5RKR	"	315	15	8	7
*PT7APM	"	288	8	8	8
*ZZ5DP	"	174	30	14	15
*PY5DV	"	88	7	5	6
*PQ2TO	"	8	9	3	5
***PU2SDX**	**28**	**306,072**	**995**	**29**	**88**
*PY2CP	"	267,680	946	25	87
*PU2UAF	"	247,776	900	28	88
*PU1JSV	"	91,504	461	21	55
*PU5SKW	"	89,896	495	21	47
*PU2USK	"	63,505	388	19	46
*PY4RR	"	61,040	440	17	39
*PU2VLI	"	59,772	316	20	48
*PY2SR	"	56,616	342	22	62
*PU2MST	"	36,036	208	19	58
*PU2MIW	"	26,937	190	20	53
*PY2MZM	"	25,350	166	24	51
*PY2BRP	"	24,486	172	17	49
*PU2LFU	"	23,541	176	17	42
*PU1VKG	"	16,995	146	17	38
*PR7AR	"	16,072	127	12	37
*PU2UBY	"	14,744	87	21	55
*PY2ZYV	"	14,592	139	21	36
*PY2MOR	"	14,213	149	16	45
*PU2YMH	"	13,298	113	19	42
*PU2SZK	"	12,480	161	18	30
*PY2AXH	"	10,557	116	17	34
*PY1XA	"	8,800	115	13	31
*PU5AGM	"	8,760	94	14	26
*PU2RDB	"	6,966	99	14	29
*PU2TOL	"	6,072	60	18	26
*PU2OXB	"	5,940	92	12	24
*PU2TBK	"	5,889	88	12	27
*PU3ELH	"	4,950	88	12	21
*PU2GLU	"	4,788	97	14	28
*PU3VON	"	3,750	80	11	19
*PU2VTC	"	3,069	46	12	19
*PY2TSM	"	2,754	71	10	17
*PU2FDD	"	2,622	93	14	24
*PY2RAF	"	1,898	31	10	16
*PU2NZV	"	1,794	37	12	14
*PU2KMM	"	1,782	28	11	16
*PU2MCY	"	1,752	43	11	13
*PU2GCV	"	1,265	62	9	14
*PU5BXB	"	1,260	39	10	11
*PU5DCM	"	1,134	27	10	17
*PU7ASP	"	975	24	12	13
*PU5LTI	"	945	29	8	13
*PU2LOD	"	935	27	8	9
*PU5AOF	"	855	31	8	11
*PU2YVA	"	812	34	12	17
*PU2OIG	"	752	36	9	7
*PU2YBW	"	638	21	9	13
*PU5RSL	"	414	20	9	9
*PU4FRC	"	375	16	6	9
*PU5SVE	"	350	17	5	5
*PU2OYH	"	330	20	5	6
*PU3DRM	"	252	19	6	6
*PU2PHQ	"	168	11	6	6
*PU1LEO	"	132	10	6	5
*PU3EBJ	"	64	5	4	4
*PU1WTW	"	35	7	2	3
*PU2WJM	"	24	8	4	4
*PY2MIA	"	16	2	2	2
*PU2KLD	"	12	3	3	3
*PU1SJL	"	4	2	1	1
***ZW2T**	**21**	**464,264**	**1282**	**31**	**100**
			(OP: PY2RKG)		
*PY2QT	"	344,487	1033	29	92
*PY2RSA	"	81,408	321	25	71
*PY2WOT	"	11,456	96	19	45
*PY2XC	"	6,936	65	18	33
***PY2NY**	**14**	**425,111**	**1162**	**35**	**102**
*PS8DX	"	33,292	174	24	58
*PP5IP	"	31,609	247	22	51
*PP5TI	"	7,696	69	21	31
*PY3LX	"	612	31	9	9
*PP5IN	"	506	29	11	12
*PT2EL	"	432	33	8	10
***PY1KW**	**7**	**5,580**	**102**	**13**	**32**
***PU2MKU**	**3.7**	**12**	**14**	**3**	**3**
*PU2XMY	"	4	7	2	2
PT5J	**AA**	**12,001,288**	**6231**	**166**	**525**
			(OP: PP5JR)		
PV2K	"	4,834,343	4143	109	312
			(OP: PY2KNK)		
ZZ2T	"	4,738,297	3716	111	338
			(OP: PY2MNL)		
PY7ZC	"	2,922,272	2752	89	287
PY5AMF	"	2,203,736	2170	104	272
PR1T	"	1,867,404	2167	91	238
			(OP: PY1ZV)		
PT1K	"	792,951	1180	87	216
			(OP: PP1KV)		
PS2M	"	610,316	826	81	203
			(OP: PY2OX)		
PV8DX	"	543,158	1244	51	103
PY3PA	"	506,106	1028	68	118
PY5IN	"	304,260	661	56	109
PY3DX	"	218,564	495	62	140
PT2AW	"	147,964	433	46	96
PY1RI	"	108,544	425	49	79
PY5JY	"	91,180	357	35	62
PY3EW	"	83,433	357	46	91
PT7BI	"	82,000	441	32	50
PY2TDX	"	79,786	376	35	47
PY4DK	"	76,589	229	40	99
PY2GZ	"	72,002	268	51	88
PY1FI	"	60,632	248	40	64
PY2GT	"	35,226	126	36	78
PY2TUA	"	28,665	111	43	74
PY6UN	"	22,325	112	39	56
PY1GAM	"	9,882	74	20	41
PY2IQ	"	4,305	51	16	25
PY1OD	"	3,999	56	19	24
PY4LI	"	3,132	44	22	32
PY5QW	**28A**	**768,015**	**1991**	**30**	**105**
ZZ5K	"	568,288	1976	24	88
			(OP: PP5RT)		
PY3PS	"	17,000	106	19	49
PP5BJF	"	9,666	101	20	34
PY2KJ	**21A**	**1,169,844**	**2575**	**35**	**121**
PY5FO	"	1,030,458	2546	33	110
PY4EK	"	675,540	1809	31	104
PY5ZHP	"	192,326	628	27	86
PY2NZ	"	159,698	488	29	93
PY2PPZ	"	17,416	165	19	37
PP4T	**14A**	**1,508,925**	**3194**	**37**	**128**
			(OP: PY4BZ)		
PY6HD	"	452,595	1152	36	107
PY6TS	"	64,974	348	28	63
PY5XH	"	1,638	26	11	15
PS7DX	"	558	17	7	11
PY3CB	**7A**	**5,704**	**85**	**17**	**29**
PW2F	**3.7A**	**720**	**21**	**6**	**14**
PY5DC	"	24	13	3	3
***PP2CC**	**AA**	**628,732**	**1055**	**78**	**148**
*PY2KC	"	587,664	853	73	191
*PY2AD	"	380,380	704	59	150
*PY2ZR	"	368,554	1067	42	85
*PY3OZ	"	223,850	477	71	114
*PP5FZ	"	195,088	545	48	89
*PY1SX	"	183,929	334	53	140
*PT7WM	"	175,959	356	58	131
*PT7ZT	"	172,206	433	48	114
*PY1AX	"	127,358	365	47	107
*PY1PDF	"	127,029	386	46	115
*PY2SGL	"	106,872	401	46	100
*ZZ1M	"	99,162	387	45	81
			(OP: PY1SAD)		
*PY2ZA	"	95,172	289	46	86
*PY2BBQ	"	65,512	210	53	99
*PY1RY	"	62,976	183	37	86
*PV8AAS	"	57,200	223	43	87
*PY2WND	"	53,760	207	35	85
*PP2CS	"	52,734	223	52	89
*PY6BK	"	51,537	158	35	88
*PY2DN	"	44,290	212	32	54
*PT2AZ	"	41,895	191	46	87
*PT9SS	"	41,652	260	46	71
*PP5WEB	"	38,512	173	43	73
*PY3FOX	"	34,105	177	41	54
*PP5DZ	"	33,499	115	54	85
*PY5AP	"	27,075	193	26	31
*PT2SR	"	26,520	156	32	46
*PY1VOY	"	25,370	114	22	64
*PY2WLM	"	22,356	172	28	64
*PY1XS	"	22,080	166	21	48
*PY2CAT	"	18,834	106	25	48
*PY2OKB	"	18,330	122	35	59
*PY3TAM	"	17,892	98	30	54
*PY1OR	"	15,225	95	38	49
*PY2DR	"	14,418	86	36	53
*PY2KS	"	13,260	133	30	48
*PY2BX	"	12,264	114	27	46
*PY8SL	"	10,098	71	23	43
*PR7KG	"	9,024	126	21	43
*PY2TOP	"	6,102	47	23	31
*PY6JP	"	4,662	96	22	41
*PY2VH	"	3,840	53	20	28
*PY5HR	"	3,408	31	21	27
*PY1ZB	"	3,330	67	21	24
*P

***CE5DSQ**	**A**	**580,308**	**1352**	**70**	**152**
*3G1D	"	560,028	976	69	167
			(OP: XQ1FM)		
*XQ3SK	"	219,356	706	53	69
*CE4CBJ	"	164,436	483	49	93
*CE3GRU	"	25,988	160	31	58
*CE3UVT	"	10,586	114	26	41
*CE5OS	"	10,582	92	32	42
*CE3KRM	"	5,088	53	25	28
*CE3GCA	"	1,824	56	18	20
*CE3BKN	"	957	38	16	13
*CE5WOW	"	18	5	3	3
**XQ5CIE*	*28*	*34,304*	*249*	*19*	*48*
***CA1NAK**	**"**	**25,730**	**194**	**17**	**45**
			(OP: XQ1CR)		
*CA5UBR	"	7,744	135	14	18
*CA2SLJ	"	6,820	136	12	19
*CE1LEW	"	5,148	109	13	23
*CD7CKU	"	64	6	4	4
***CB3R**	**21**	**23,856**	**155**	**21**	**50**
			(OP: XQ3SK)		
***CE3QY**	**14**	**156,793**	**664**	**27**	**64**
*CE5AUC	"	2,975	47	16	19
***CA2CFK**	**7**	**117**	**27**	**4**	**5**
*XQ5HGD	"	70	21	3	4
*CA7TWY	"	0	11	2	2
CE3WYZ	**AA**	**77,216**	**251**	**59**	**93**
CE3KH	"	4,503	52	26	31
XQ1KZ	**21A**	**621,140**	**1683**	**31**	**99**
CE1TT	"	481,656	1517	28	94
CE1KV	"	182,378	705	28	70
CE2DX	**14A**	**226,703**	**873**	**28**	**75**
CE5NK	"	134,435	453	31	84
CE3WW	**3.7A**	**77**	**22**	**3**	**4**
***XQ5ME**	**AA**	**312,747**	**682**	**60**	**123**
*CE2SCZ	"	130,154	502	43	75
*CE5MRA	"	21,437	171	39	58
*XR3Y	"	1,288	27	12	11
			(OP: XQ7UP)		
***CB6LR**	**28A**	**229,405**	**875**	**21**	**76**
			(OP: CE6GDR)		
*CA1FCS	"	31,990	191	22	48
***CE1PTT**	**21A**	**133,245**	**497**	**29**	**76**
*CE1RT	"	113,030	492	24	65
*CE1LTL	"	14,994	136	15	27

Colombia

HK3CFM	**A**	**126**	**8**	**7**	**7**
HK3EA	**21**	**4**	**2**	**2**	**2**
HK3C	**14**	**137,636**	**639**	**21**	**55**
HK1T	**7**	**845,375**	**2393**	**27**	**98**
***HK3X**	**A**	**107,506**	**407**	**37**	**61**
*HK4ZZ	"	26,145	153	40	65
*HK4CM	"	1,287	32	11	22
***HJ4AVG**	**7**	**375**	**11**	**5**	**10**
HK4W	**AA**	**68,524**	**252**	**38**	**110**

Ecuador

***HC1BI**	**A**	**3,240**	**34**	**15**	**30**
***HC5VF**	**28**	**73,073**	**360**	**20**	**53**
HC5DX	**3.7A**	**11,310**	**150**	**14**	**16**

Paraguay

ZP5VIA	**AA**	**79,704**	**208**	**60**	**102**

Peru

OA4SS	**A**	**1,134,300**	**2023**	**72**	**127**
***OA4DOS**	**A**	**43,197**	**226**	**43**	**78**
***OA4EA**	**21A**	**13,824**	**113**	**16**	**48**
			(OP: EA7TN)		

Suriname

PZ2YT	**21**	**1,069,488**	**2667**	**32**	**112**
***PZ5RA**	**A**	**530,145**	**993**	**48**	**141**

Trinidad & Tobago

9Y4D	**21A**	**1,454,184**	**3517**	**34**	**118**

Uruguay

CV7S	**21**	**1,315,560**	**3266**	**33**	**119**
			(OP: CX7SS)		
CX1AV	"	244,902	997	24	78
***CX7BBR**	**A**	**34,574**	**179**	**44**	**74**
*CX1CAN	"	1,260	45	14	14
***CX9ARH**	**28**	**160,107**	**740**	**20**	**63**
*CX8DS	"	155,040	673	21	64
*CX2BAH	"	123,851	577	22	69
*CX6DF	"	16,896	185	14	30
CX2CC	**AA**	**2,841,247**	**3242**	**92**	**245**
CX5UA	"	889,714	1570	58	148
CX3AT	"	339,087	686	61	140
CX7ACH	*"*	*874*	*20*	*11*	*12*
CX2DK	**28A**	**1,327,183**	**3274**	**28**	**115**
CX5ABM	"	56,592	352	18	54
CX4DI	**3.7A**	**2,349**	**58**	**12**	**17**
***CX1IB**	**AA**	**2,460**	**50**	**13**	**17**

Venezuela

YV5KG	**1.8**	**1,596**	**33**	**5**	**14**
***YV4EK**	**A**	**506,340**	**1027**	**53**	**127**
*YV2HCM	"	42,861	224	37	54
*YY5FBD	"	22,560	137	31	65
*YV5KAJ	"	12,324	60	25	54
*YV5RPE	"	7,770	160	16	21
*YV4BCD	"	3,024	36	19	23
*YY6LR	"	70	6	5	5
***4M1W**	**28**	**74,844**	**615**	**20**	**43**
			(OP: YV1SW)		
***YV5AEP**	**7**	**23,298**	**129**	**13**	**53**
YV6BXN	**AA**	**334,620**	**536**	**67**	**167**
***YV4ABR**	**AA**	**475,228**	**986**	**52**	**117**
*YV5RAB	"	358,464	675	66	126
***YV5LMW**	**14A**	**99,845**	**399**	**24**	**71**

Maritime Mobile (So. America)

***YO4RYU/ MM**	**A**	**160,162**	**417**	**45**	**101**

QRP

UA9BA	**A**	**1,151,712**	**1073**	**94**	**293**
LY5G	**"**	**426,408**	**958**	**71**	**256**
LZ1DM	**"**	**389,628**	**912**	**67**	**249**
JH1OGC	**"**	**241,824**	**419**	**88**	**141**
NDØC	**"**	**230,426**	**401**	**71**	**147**
K8ZT	**"**	**198,276**	**319**	**70**	**176**
UR5FEO	**"**	**190,938**	**573**	**55**	**208**
PY2BN	**"**	**181,470**	**517**	**49**	**89**
IZ4AIF	**"**	**168,525**	**436**	**61**	**164**
HG6C	**"**	**151,074**	**466**	**57**	**174**
			(OP: HA6IAM)		
JH7UJU	**"**	**140,303**	**313**	**74**	**99**
IZØFUW	"	138,316	334	70	159
CT1BXT	**"**	**123,624**	**342**	**50**	**154**
UT5EOX	"	119,658	354	60	162
SP4CUF	**"**	**119,040**	**477**	**41**	**151**
YU3LAX	**"**	**113,600**	**498**	**40**	**160**
W6QU	**"**	**113,373**	**249**	**66**	**105**
			(OP: W8QZA)		
MI5JYK	**"**	**109,052**	**389**	**47**	**152**
N4WLL	**"**	**100,646**	**207**	**58**	**124**
YCØVM	**"**	**94,248**	**272**	**56**	**97**
UA3OQ	**"**	**67,996**	**293**	**40**	**151**
DK8R	**"**	**59,428**	**248**	**49**	**117**
			(OP: DL8LR)		
NP2Q	**"**	**55,212**	**284**	**30**	**56**
M3RZO	**"**	**51,480**	**317**	**31**	**89**
US7UK	"	49,296	271	34	124
UX8IX	"	47,508	214	39	109
M7XTT	"	37,064	280	26	87
K4WY	"	36,570	123	47	91
N8LJ	"	35,200	133	32	68
YU5VUK	"	34,020	235	27	99
IK3BVD	"	30,976	158	35	86
LZ3RR	*"*	*28,980*	*194*	*28*	*98*
RZ4AZ	**"**	**28,314**	**185**	**24**	**93**
UG4P	"	27,135	192	37	98
HG7J	"	26,650	163	36	94
			(OP: HA7JQK)		
9A4OP	**"**	**23,199**	**194**	**26**	**85**
E77T	**"**	**22,140**	**148**	**29**	**61**
LA7WRA	**"**	**21,402**	**206**	**22**	**65**
MØJTL	"	20,988	163	27	79
YUØW	"	20,865	155	23	84
EA4U	**"**	**20,856**	**124**	**28**	**60**
W7FS	**"**	**20,384**	**99**	**39**	**52**
RA9W	"	19,152	102	18	54
DU1SH	**"**	**17,901**	**268**	**22**	**29**
EW8G	**"**	**17,266**	**169**	**17**	**80**
PAØAWH	**"**	**16,932**	**153**	**21**	**81**
RW3AI	"	16,835	151	20	71
BI4PDD	**"**	**16,212**	**118**	**38**	**46**
DF7XR	"	13,502	139	21	65
2MØTFP	**"**	**12,240**	**137**	**19**	**66**
MI7PGD	"	11,592	145	15	57
N3CI	**"**	**11,480**	**67**	**26**	**44**
MW7XRE	**"**	**11,036**	**102**	**25**	**64**
RZ3ARO/6	**"**	**10,508**	**123**	**16**	**58**
ON/SO2U	**"**	**10,379**	**119**	**23**	**74**
LX1GQ	**"**	**10,112**	**110**	**21**	**58**
VA3MYC	**"**	**8,721**	**64**	**19**	**38**
			(OP: VE3LJQ)		
W7LG	**"**	**7,750**	**51**	**25**	**37**
BH4FBB	"	7,680	81	27	33
BA7LFI	"	7,656	100	18	26
OH3KQ	**"**	**7,533**	**74**	**24**	**57**
DF5GO	"	7,107	86	23	46
RM4A	"	7,068	80	15	42
9M2VJP	**"**	**6,838**	**108**	**12**	**14**
N7JI	"	6,579	62	23	20
YB6IVW	"	5,964	67	14	28
DL5CV	"	5,742	79	17	49
M7ELC	"	5,605	59	19	40
GW9Z	"	5,185	53	20	41
OK8CX/P	**"**	**4,930**	**49**	**22**	**36**
			(OP: DL7CX)		
LYØNAS	"	3,920	59	16	40
JG6XYS	**"**	**3,920**	**46**	**18**	**22**
NA4CW	"	3,450	36	18	28
RA7A	"	3,354	30	17	26
YC2VOC	"	3,306	33	13	25
F6HHR	**"**	**3,150**	**58**	**12**	**38**
IZØZFK	"	2,646	38	19	30
DL1DXA	"	2,596	33	20	24
YB3BAR	"	2,210	37	16	18
DG1VS	"	2,183	41	14	23
YC1DGR	"	2,046	32	14	17
IK3XTY	"	1,849	44	13	30
N6HI	"	1,848	25	15	18
EA5JDG	"	1,794	38	13	26
DL3CB	"	1,672	44	12	32
WR4I	"	1,568	20	10	18
BG6VBM	"	1,197	32	9	12
HK4KM	**"**	**1,188**	**34**	**14**	**19**
PA1B	"	1,134	42	6	21
SP4KW	"	1,116	38	11	20
OK2MRJ	"	1,023	32	9	22
IU2DPM	"	1,023	29	10	21
YC8MGN	"	920	42	10	10
KEØWPA	"	918	17	5	13
VA3RKM	"	912	25	11	8
NH6O	**"**	**836**	**17**	**11**	**11**
DC7UP	**"**	**825**	**28**	**11**	**22**
G7PVZ	**"**	**750**	**25**	**10**	**20**
YO8DHD	"	684	18	7	11
DH7FFE	**"**	**588**	**14**	**9**	**12**
R4ZZ	"	570	19	12	18
YD6ROA	"	561	27	4	7
M7HJR	"	520	20	8	18
VA2MVR	**"**	**486**	**20**	**9**	**9**
UB3DDA	*"*	*475*	*21*	*5*	*14*
BH1KZQ	"	448	26	8	8
M7NCN	"	425	15	10	15
AA4GA	"	420	10	5	10
SP3DBM	"	391	20	8	15
M7CPT	"	374	21	7	15
SV3SPA	**"**	**342**	**17**	**8**	**11**
EI6GSB	**"**	**300**	**17**	**6**	**14**
JI1AEP	"	196	8	7	7
WA1LAD	**"**	**192**	**6**	**6**	**6**
KIØG	"	168	9	6	8
VR2YTL	**"**	**165**	**8**	**5**	**6**
DG2FDD	"	160	10	7	9
SM/OZ4PAT	**"**	**144**	**13**	**6**	**10**
K2EKM	"	143	7	6	7
RN1CW	*"*	*88*	*6*	*5*	*6*
BG5OA	"	30	5	5	5
EA3GYE	"	24	4	3	3
W9GPB	**"**	**20**	**5**	**5**	**5**
JS6UEY	"	8	2	1	1
CD3VJE	**"**	**4**	**2**	**2**	**2**
VR2T	**28**	**237,075**	**953**	**29**	**80**
			(OP: VR2ZQZ)		
4I1EBC	**"**	**60,610**	**429**	**21**	**34**
LZ2RS	**"**	**26,650**	**177**	**21**	**44**
A61FJ	**"**	**25,760**	**182**	**14**	**42**
JA2MWV	**"**	**21,125**	**133**	**22**	**43**
PY6GOE	**"**	**13,923**	**225**	**13**	**26**
LY3S	**"**	**7,605**	**78**	**16**	**29**
JA4XHF/3	**"**	**5,680**	**55**	**14**	**26**
UR7TV	**"**	**4,726**	**71**	**13**	**21**
I5KAP	**"**	**4,284**	**52**	**15**	**19**
US5VX	"	3,762	52	11	22
EC4AA	**"**	**3,420**	**77**	**9**	**27**
IT9NAN	**"**	**2,592**	**52**	**12**	**20**
JT1BV	*"*	*1,755*	*29*	*7*	*20*
PU2VOR	"	1,518	37	11	12
G4RGK	**"**	**1,232**	**26**	**10**	**12**
9W2UPI	**"**	**1,071**	**21**	**10**	**11**
PY5AS	"	864	38	10	8
DW2ZOL	"	572	18	7	6
WE9N	**"**	**448**	**11**	**8**	**8**
JH7BMF	**"**	**350**	**10**	**6**	**8**
R2FI	**"**	**297**	**13**	**4**	**5**
PY3FF	"	275	16	6	5
CA3FJK	**"**	**253**	**15**	**6**	**5**
UAØSBQ	**"**	**242**	**11**	**5**	**6**
VU3PUA	**"**	**200**	**9**	**3**	**5**
NØJK	**"**	**176**	**6**	**5**	**6**
EA8/OHØXX	**"**	**160**	**7**	**5**	**5**
ON3DI	**"**	**140**	**6**	**5**	**5**
JA5NSR	**"**	**135**	**5**	**4**	**5**
EA7KJG	*"*	*16*	*2*	*2*	*2*
XE2MWY	**"**	**12**	**6**	**2**	**1**
VK1MF	**"**	**12**	**2**	**1**	**1**
JG1NCL/6	**"**	**12**	**2**	**1**	**1**
YG3FAP	**"**	**6**	**1**	**1**	**1**
VK2R	"	6	1	1	1
			(OP: VK2IO)		
G1WSA/P	"	0	2	2	2
F8AKS	**21**	**102,276**	**403**	**28**	**80**
YBØSSF	**"**	**57,681**	**249**	**26**	**61**
TA2IB	**"**	**56,960**	**265**	**23**	**57**
JQ1NGT	**"**	**37,505**	**228**	**22**	**43**
SY1AEA	**"**	**37,291**	**295**	**24**	**65**
JL1UTS	"	25,976	167	22	46
JR2EKD	**"**	**23,100**	**164**	**19**	**36**
SP4NKJ	**"**	**13,915**	**148**	**15**	**40**
UX3IT	**"**	**13,035**	**176**	**12**	**43**
JR1NKN	"	12,710	129	19	22
MW8T	**"**	**8,428**	**114**	**11**	**32**
			(OP: MMØCWJ)		
F1ICR	"	5,632	80	12	32
JI1NZA/1	"	4,865	61	17	18
UTØNB	"	4,440	61	11	29
JS2ITI	"	2,842	40	12	17
OK1LV	**"**	**2,407**	**49**	**11**	**18**
JA1KPF	"	2,068	42	12	10
YB2CTE	"	1,770	35	11	19
UR3ABM	"	1,624	60	8	20
R7RAY	**"**	**1,296**	**45**	**7**	**17**
YC2CPQ	*"*	*1,144*	*25*	*11*	*11*
JI6NFX	**"**	**560**	**18**	**7**	**7**
7L1DST	"	476	16	6	8
YC5ACD	"	391	14	8	9
JI1IKC	"	384	13	8	8
YC8AO	"	341	18	5	6
VR2VRC	**"**	**285**	**11**	**7**	**8**
HS8MOM	**"**	**176**	**12**	**4**	**4**
UR5KP	"	130	10	5	8
JEØCBS/1	"	120	7	5	7
DU7OK	**"**	**81**	**7**	**4**	**5**
DO1HFS	**"**	**81**	**5**	**4**	**5**
VK4XQM	**"**	**54**	**3**	**3**	**3**
YC1DGG	"	42	8	4	3
TA1EAR	**"**	**21**	**5**	**2**	**5**
JJ1TQD	"	16	2	2	2
YU1NR	**14**	**44,700**	**329**	**23**	**77**
USØMS	**"**	**43,008**	**323**	**23**	**73**
HF5WIM	**"**	**31,428**	**252**	**20**	**61**
IZ5MMK	**"**	**24,300**	**209**	**19**	**62**
IZ8EWD	"	23,501	250	15	56
YO8RCN	**"**	**17,629**	**233**	**11**	**50**
HAØGK	**"**	**16,860**	**219**	**13**	**47**
CT4QB	**"**	**15,748**	**180**	**14**	**48**
I4PZP	"	10,132	162	16	52
OK7NV	**"**	**8,648**	**160**	**9**	**38**
ES7AAZ	**"**	**8,635**	**165**	**11**	**44**
EA4HIH	**"**	**8,313**	**157**	**8**	**43**
R1FW	**"**	**8,000**	**144**	**11**	**39**
CX7RL	**"**	**6,201**	**53**	**21**	**32**
SP7LK	"	4,360	103	8	32
MØJBA	**"**	**3,420**	**94**	**7**	**31**
RCØLAD	**"**	**2,850**	**74**	**12**	**13**
M6IGE	"	2,560	72	8	32
EA4HER	"	2,520	55	10	30
MIØTXM	**"**	**2,124**	**59**	**7**	**29**
M8C	"	1,856	62	6	23
			(OP: G4DBL)		
VU2NEP	**"**	**1,827**	**31**	**10**	**19**
TA2BDD	**"**	**1,634**	**32**	**4**	**15**
VR2ZRE	**"**	**1,344**	**42**	**6**	**10**
PD9YL	**"**	**1,064**	**29**	**7**	**12**
2EØHXS	"	720	32	5	15
BI4SQM	**"**	**440**	**20**	**9**	**11**
EA3FHP	"	408	24	3	14
ND2L	**"**	**272**	**13**	**8**	**9**
JK1CNL	**"**	**198**	**10**	**6**	**5**
MØXMB	"	196	14	3	11
SQ1NXO	"	132	10	4	7
VO1WEB	**"**	**108**	**8**	**3**	**3**
DJ9AS	**"**	**108**	**11**	**4**	**8**
ES5NHC	"	88	8	3	8
RV1CC	"	81	5	4	5
IV3SGJ	"	72	8	3	6
N3RC	**"**	**20**	**3**	**2**	**3**
R1BIA	"	12	3	3	3
AB1HD	**"**	**6**	**1**	**1**	**1**
LY2NK	**7**	**20,301**	**288**	**11**	**56**
DL1BAX	**"**	**16,491**	**198**	**13**	**56**
PG2AA	**"**	**11,183**	**200**	**9**	**44**
FM5FJ	**"**	**10,672**	**110**	**13**	**33**
R7RBE	**"**	**6,270**	**105**	**12**	**45**
OE3MDB	**"**	**5,734**	**108**	**7**	**40**
YC1BBW	**"**	**5,724**	**77**	**15**	**21**
G4Y	**"**	**4,590**	**98**	**10**	**41**
			(OP: M6OXO)		
OK1LO	**"**	**4,452**	**101**	**8**	**34**
S52CQ	**"**	**2,130**	**73**	**4**	**26**
EC5WW	**"**	**1,984**	**48**	**9**	**22**
YB1HBO	*"*	*1,690*	*28*	*10*	*16*
JH3DMQ	**"**	**1,615**	**34**	**10**	**9**
YD6IOV	*"*	*1,411*	*38*	*7*	*10*
MØPTO	"	1,363	25	11	18
TA9AAP	**"**	**1,092**	**38**	**5**	**21**
E78CB	**"**	**968**	**40**	**5**	**17**
ON4ANE	**"**	**779**	**44**	**3**	**16**
HS6OKJ	**"**	**708**	**42**	**4**	**8**
YD8NEH	"	432	30	5	7
DJ2MX	"	210	15	2	13
ON6EB	*"*	*143*	*16*	*2*	*11*
IZ4GJI	**"**	**35**	**13**	**2**	**5**
YD2NIR	"	24	3	2	2
WU3U	**"**	**24**	**3**	**2**	**2**
YD2UXA	"	9	19	1	2
YD3BGT	"	2	1	1	1
YD3BGF	"	2	1	1	1
OL4W	**3.7**	**13,248**	**280**	**6**	**42**
			(OP: OK1IF)		
UT4UBZ	**"**	**3,569**	**74**	**7**	**36**
IZ5OVP	**"**	**1,260**	**50**	**5**	**23**
SNØE	*"*	*825*	*34*	*4*	*21*
			(OP: SO8OO)		
DL7KP	**"**	**143**	**11**	**3**	**10**
JH1APZ	**"**	**126**	**6**	**5**	**4**
TA2TC	**"**	**120**	**6**	**2**	**6**
DL7AT	"	100	10	2	8
OM3IAG	**"**	**72**	**8**	**2**	**7**
OE6STD	**"**	**6**	**2**	**1**	**2**
UB4IIQ/ UA6L	**"**	**0**	**1**	**1**	**1**
HA1TI	**1.8**	**5,904**	**151**	**4**	**37**
HF7A	**"**	**4,104**	**124**	**4**	**32**
DL1AOB	**"**	**285**	**21**	**3**	**12**
ED5R	**AA**	**1,601,280**	**1491**	**122**	**434**
			(OP: EA5Z)		
UZ7M	**"**	**594,135**	**944**	**97**	**308**
			(OP: UT9MZ)		
ON6NL	**"**	**460,332**	**863**	**79**	**263**
JA6GCE	**"**	**334,508**	**568**	**82**	**159**
IZ3NVR	**"**	**320,117**	**602**	**81**	**248**
UN8PT	**"**	**237,986**	**496**	**51**	**140**
SP5PDA	**"**	**177,731**	**583**	**52**	**171**
YU1LM	**"**	**102,858**	**409**	**45**	**141**
IZ1ANK	"	95,520	409	54	145
OK1DMP	**"**	**81,620**	**236**	**57**	**155**
HA5BA	**"**	**62,828**	**331**	**34**	**105**
PE2K	**"**	**41,796**	**332**	**26**	**103**
MWØDNF	**"**	**37,816**	**207**	**33**	**83**
A61FK	**"**	**22,496**	**110**	**18**	**58**
EA3F	"	22,275	129	38	61
EA1AER	"	20,856	123	29	59
YB2NDX	**"**	**18,040**	**103**	**30**	**52**
SP9JZT	"	18,040	153	21	61
M5N	**"**	**12,104**	**130**	**21**	**68**
			(OP: GØGJV)		
DL9PN	**"**	**11,289**	**150**	**15**	**56**
NP3T	**"**	**7,991**	**74**	**26**	**35**
PY1II	**"**	**3,519**	**45**	**19**	**32**
WB4OMM	**"**	**3,150**	**31**	**14**	**28**
SP5GDX	"	2,640	34	18	26
WO7T	**"**	**2,596**	**25**	**19**	**25**
YE3WIL	"	1,750	25	15	20
N6AN	**"**	**1,680**	**29**	**14**	**16**
NO5V	**"**	**1,184**	**21**	**14**	**18**
BG5GDP	**"**	**966**	**23**	**10**	**11**
BG2DVL	"	665	21	10	9
HB9EHJ	**"**	**306**	**9**	**9**	**9**
BG3PYL	"	104	13	6	7
YP8A	**28A**	**59,558**	**283**	**31**	**66**
			(OP: YO8WW)		
BA7CK	**"**	**22,843**	**211**	**17**	**36**
SN5R	**"**	**9,882**	**80**	**19**	**35**
			(OP: SP5XMU)		
RU6YJ	**"**	**8,979**	**114**	**13**	**28**
CA1EBQ	**"**	**6,440**	**176**	**11**	**24**
LW9HZI	**"**	**5,220**	**79**	**15**	**21**
JA1NEZ	**"**	**4,641**	**56**	**18**	**21**
S59GS	**"**	**4,514**	**59**	**14**	**23**
JM4WUZ	**"**	**2,800**	**47**	**12**	**16**
PY1CMT	**"**	**2,366**	**46**	**11**	**15**
CO2KL	**"**	**1,482**	**22**	**10**	**16**
PU2MVA	"	897	42	11	12
HA2ZB	**"**	**714**	**19**	**7**	**10**
4Z4UO	**"**	**364**	**12**	**4**	**9**
PU2NBI	"	126	6	3	4
HG3C	**21A**	**36,582**	**251**	**22**	**56**
			(OP: HA3HX)		
SV1NK	**"**	**26,257**	**193**	**24**	**53**
KG1E	**"**	**14,022**	**117**	**6**	**35**
JK8VPQ	**"**	**12,090**	**124**	**18**	**21**
BA1RB	**"**	**9,646**	**76**	**14**	**39**
K2GMY	**"**	**8,084**	**67**	**19**	**24**
YT5DEY	**"**	**7,191**	**105**	**16**	**31**
VK4Z	**"**	**1,898**	**28**	**12**	**14**
AC5O	**"**	**6**	**1**	**1**	**1**
EA5HJV	**14A**	**265,392**	**1064**	**37**	**115**
EA3O	"	138,880	588	34	106
RT4W	**"**	**53,466**	**327**	**28**	**86**
F4GWM	**"**	**27,412**	**245**	**16**	**61**
OG3X	**"**	**26,720**	**249**	**16**	**64**
			(OP: OH3KRH)		
SQ5CW	**"**	**23,714**	**262**	**15**	**56**
MI1M	**"**	**20,942**	**169**	**16**	**58**
			(OP: MIØLLG)		
YO8TNB	**"**	**20,148**	**216**	**16**	**57**
UT1DX	**"**	**15,504**	**144**	**15**	**53**
LA3NGA	**"**	**10,675**	**143**	**14**	**47**
R3IBT	**"**	**3,780**	**86**	**8**	**28**
VE6EX	**"**	**3,640**	**76**	**13**	**13**
BH4TQX	**"**	**3,399**	**60**	**14**	**19**
VR2WTM	**"**	**414**	**22**	**4**	**5**
DU4JT	**"**	**304**	**12**	**8**	**8**
BH7QP	"	100	9	5	5
G3WW	**"**	**24**	**4**	**3**	**3**
YU7ZZ	*7A*	*14,446*	*210*	*9*	*53*
OT6M	**"**	**13,560**	**207**	**11**	**49**
			(OP: ON9CC)		
PD2JM	**"**	**5,856**	**121**	**8**	**40**
KP3ER	**"**	**2,541**	**29**	**10**	**23**
			(OP: NP3V)		
ISØAGY	**"**	**2,352**	**107**	**9**	**39**
TA3MTM	**"**	**559**	**17**	**4**	**9**
YD9UW	**"**	**40**	**4**	**4**	**4**
YD3BFX	"	2	1	1	1
YD3AVI	"	2	1	1	1
YE3DGO	"	0	49	1	1
OMØA	**3.7A**	**19,040**	**362**	**7**	**49**
			(OP: OMØAAO)		
HF9CW	**"**	**8,695**	**195**	**6**	**41**
SP5ES	"	5,588	136	6	38
JH4RUM	**"**	**4**	**2**	**2**	**2**
KT3Q	**"**	**0**	**1**	**1**	**1**
LY2OU	**1.8A**	**6,004**	**177**	**4**	**34**
YO8WW	**"**	**5,047**	**100**	**7**	**42**
OG4T	**"**	**56**	**7**	**2**	**6**
			(OP: OH4MFA)		

ROOKIE

NORTH AMERICA

United States

District 1

***K1THE**	**4,453**	**44**	**27**	**34**

District 2

***KI2D**	**51,136**	**146**	**45**	**91**
*KD2VSD	9,316	64	28	40
*W5JBL	5,610	46	20	35
*KD2TOW	4,815	39	18	27
*KD2WDN	2,673	30	10	23
*W2FTL	30	5	3	3

District 3

AC3LZ	**468,666**	**577**	**82**	**215**
W3MAM	246,280	392	65	170
KC3RDV	38,280	148	34	76
***N3GT**	**356,425**	**478**	**68**	**201**
*KC3QVQ	175,032	290	73	161
*K3KDX	134,568	280	43	135
*N3AML	111,384	213	59	145
*KR3L	9,063	65	17	36
*N3BAS	6,966	45	13	41
*NU3O	1,674	21	12	19
*AC3MB	960	20	14	16
*K3YR	180	9	6	9
*KC3SIL	126	6	4	5

District 4

K4QQG	**686,092**	**739**	**90**	**251**
W4SSF	200,910	338	62	160
K2YJ	40	4	4	4
***K1MWH**	**135,744**	**306**	**50**	**118**
*K4LEN	110,400	287	57	127
*W9TCV	101,598	229

US Virgin Islands

***NP2SA**	**4**	**1**	**1**	**1**

AFRICA

Reunion Island

***FR4TT**	**1,363**	**23**	**14**	**15**
*FR4TS	210	9	5	9

South Africa

***ZS6HI**	**34,238**	**116**	**33**	**73**
*ZS6KVZ	8,540	88	6	29

ASIA

Asiatic Russia

District 9

***R9MBY**	**28,890**	**185**	**28**	**62**

District Ø

***UBØAZR**	**32,850**	**198**	**22**	**51**

Asiatic Turkey

***TA4ORZ**	**66,220**	**179**	**42**	**112**
*TA7SSB	8,055	90	9	36
*TA2SUA	6,314	56	12	29
*TA3SRD	3,015	35	15	30
*TA7AIZ	1,775	39	7	18
*TA9AAP	1,092	38	5	21

China

***BG6HJZ**	**29,190**	**142**	**41**	**64**
*BI8FYD	12,450	97	29	46
*BH4ESK	3,344	46	19	25
*BD4QXR	624	21	12	14
*BI4VKA	451	23	5	6
*BH1XEC	85	22	8	9
*BG5VAR	54	23	8	10
**BI1JOT*	*8*	*2*	*2*	*2*
*BH4FBB	7,680	81	27	33

India

***VU3CZF**	**8**	**2**	**2**	**2**

Israel

***4X5KE/M**	**10,496**	**62**	**17**	**47**
*4X6FB	2,556	28	14	22

Japan

District 1

JK1BAB	**140**	**6**	**4**	**6**
***JJ1VJQ**	**78,105**	**241**	**43**	**80**

District 5

***JJ5PXO**	**200**	**10**	**5**	**5**

District 6

***JS6UGC**	**2,484**	**34**	**16**	**20**

Republic of Korea

***DS3EXT**	**2,420**	**35**	**22**	**22**

Singapore

9V1PL	**380**	**18**	**4**	**6**

Taiwan

***BX2AHP**	**10,152**	**110**	**15**	**32**

West Malaysia

9M2TDX	**363,312**	**908**	**50**	**124**
***9M2SAF**	**161,470**	**521**	**49**	**85**
*9M2JBH	3,886	63	12	17

EUROPE

Austria

OE8ACT	**20,400**	**106**	**34**	**66**
***OE3EDS**	**83,776**	**386**	**42**	**134**
*OE6TNO	42,673	244	36	103
*OE6FEF	41,730	206	36	94
*OE3KAR	2,914	46	15	32
**OE1KSG*	*2,415*	*35*	*15*	*20*

Belgium

***ON6LMJ**	**27,610**	**198**	**26**	**84**
*ON3ZZT	5,070	74	16	49

Corsica

***TK4TH**	**90,342**	**629**	**32**	**94**

Crete

***SV9SMS**	**15,229**	**123**	**26**	**71**
*SY9DOK	10,541	108	25	58
*SY9DIN	2,254	32	20	29

Croatia

***9A3AAW**	**8,547**	**82**	**22**	**55**
*9A3BFP	780	40	7	23

Czech Republic

OK1LEV	**149,160**	**430**	**51**	**169**
***OK2MTB**	**11,058**	**85**	**30**	**67**

Denmark

***OZ1THB**	**221**	**15**	**6**	**11**

Dodecanese

***SV5SKD**	**44,409**	**355**	**21**	**92**

England

MØNVK	**38,920**	**204**	**40**	**99**
***MØYTE**	**61,608**	**312**	**35**	**116**
*MØLGW	61,446	318	39	115
*2EØHKM	49,590	141	60	111
*M7TXR	47,250	250	30	96
*M7MEK	18,954	185	28	89
*2EØIQI	15,416	191	17	65
*M7EGD	14,469	131	23	68
*GØCMQ	11,988	151	15	59
**G5STU*	*11,076*	*131*	*16*	*55*
*M7MTC	7,800	110	21	54
*2E1LSI	6,867	77	16	47
*2EØLSJ	5,328	53	20	28
*2EØGKW	2,769	55	13	26
*MØRXO	1,974	45	13	29
*M7BCN	1,368	26	15	21
*M7TAS	1,110	27	9	21
*MØWDK	484	26	4	18
*M7APV	476	30	2	15
*M7WHP	56	7	3	5
*MØWTN	42	9	1	5
*M7XTT	37,064	280	26	87
*M7CPT	374	21	7	15
*MØXMB	196	14	3	11

Estonia

**ES1BBQ*	*2,961*	*63*	*14*	*49*

European Russia

District 3

***UB3DUV**	**28,072**	**163**	**42**	**74**
*R3DAB	19,440	217	15	57

District 6

***R7RAY**	**1,296**	**45**	**7**	**17**

Finland

***OH8RX**	**121,155**	**441**	**50**	**155**
*OH8CEH	675	24	7	18

France

F4IYB	**8,892**	**126**	**24**	**54**
***F4IGV**	**87,885**	**338**	**52**	**137**
*F4IZI	63,162	282	47	127
*F4DUZ	40,290	206	26	59
*F4IZH	38,313	232	32	97
*F4IZG	37,120	197	36	92
*F4IYU	13,494	100	26	52
*F4IYJ	3,068	49	16	36
*F4IXJ	936	29	10	14
*F4JAB	459	23	6	21
*F4IXM	63	7	2	7

Germany

DD5VL	**133,888**	**352**	**62**	**194**
DL7PIA	48,500	204	40	85
DL5PIA	29,000	112	42	74
***DL4AX/P**	**143,640**	**408**	**49**	**140**
*DO2QS	46,617	247	29	94
*DO3LZ	39,412	235	27	91
*DD7KH	18,483	117	35	66
*DO6WW	13,320	124	22	50
*DO7EP	12,474	125	24	57
*DO2CT	10,830	89	20	37
*DL5CZ	10,074	97	21	48
*DO7OO	10,011	106	23	48
*DO4DAN	8,512	142	12	64
*DO6CH	7,904	98	16	36
*DH2OS	6,720	116	13	47
*DO5LE	6,498	70	20	37
*DL4NHP	5,673	72	16	45
**DL/SP2RBA*	*4,224*	*104*	*16*	*50*
*DJØLM	3,395	47	12	23
*DH1DH	2,726	55	12	35
*DO3MNA	2,268	35	13	29
*DG6MS	1,800	47	9	31
*DM1MC	1,722	42	14	27
*DK2CW	1,428	24	12	22
*DL7AB	1,386	26	9	12
*DG1VM	768	22	6	10
*DO5AMV	285	21	7	12

Greece

SV3SPC	**5,768**	**93**	**12**	**44**
***SV2SIH**	**64,990**	**278**	**56**	**138**
*SV2SIG	8,360	97	26	62
*SY8DEV	1,064	36	12	26
*SV1SMX	330	25	6	16

Italy

IUØOVB	**1,147,500**	**1743**	**118**	**307**
IU1NKS	364,181	668	80	231
IN3IIR	29,083	226	21	106
IV3IPA	11,097	113	22	59
***IU1MRG**	**127,656**	**458**	**49**	**148**
*IU3LYJ	99,450	313	49	146
*IU3OCN	85,140	346	53	145
*IR4Q	56,232	264	34	65
			(OP: IU4MRU)	
*IU4MTO	37,395	167	41	94
*IU3OJA	31,476	158	39	83
*IU1OQZ	18,615	135	29	56
*IN3IJC	17,900	155	24	76
*IU1OPQ	7,552	72	20	44
*IU7OUD	1,950	27	12	18
*IU8LUM	1,932	33	15	27
*IU1OLR	729	28	7	20
*IU4OAY	50	6	4	6

Latvia

***YL3AND**	**57,001**	**315**	**34**	**85**
*YL3ALN	8,631	113	15	48

Lithuania

***LYØNAS**	**3,920**	**59**	**16**	**40**

Luxembourg

LX1LC	**233,264**	**704**	**65**	**174**

Netherlands

***PD4V**	**12,180**	**67**	**28**	**56**
*PA7TG	7,081	112	15	58
*PDØWRT	6,634	119	14	48
*PA1ZT	4,160	87	8	32
*PD7V	3,723	47	16	35

Northern Ireland

***2IØWLZ**	**180**	**15**	**2**	**2**
*MI7PGD	11,592	145	15	57

Norway

LBØWI	*16,362*	*116*	*27*	*74*
***LB7PI**	**105,281**	**505**	**40**	**147**

Poland

SP6MAA	*8,800*	*62*	*20*	*30*
***SP3DAT**	**209,965**	**623**	**55**	**190**
*SP9PD	85,212	418	38	124
*SP8KM	83,201	401	34	117
*SP7SF	80,813	213	65	146
*SP4BAO	44,238	281	32	114
*SQ9SEB	41,148	311	21	106
*SQ9MR	17,510	186	22	81
*SO7YL	10,395	82	22	41
*SP3WKW	6,850	157	12	38
*SP3BKR	5,310	90	15	44
*SP4PD	4,968	92	12	34
*SP5PZB	4,056	85	11	41
*SP3OLO	3,100	69	10	40
*SP8RAK	588	22	10	18
*SP7LK	4,360	103	8	32

Portugal

***CR7AWL**	**68,856**	**260**	**41**	**110**

Romania

***YO3HEX**	**146,520**	**479**	**53**	**167**
*YO7OWI	56,672	219	48	106
*YO3DAM	1,180	29	5	15
*YO3YKT	1,058	24	10	13
*YO3ANV	420	17	8	12

Scotland

***GM5BDX**	**98,556**	**439**	**40**	**132**
*GM5TDX	2,574	33	15	24
*MM7DMW	150	12	5	10
*2MØTFP	12,240	137	19	66

Serbia

YU3DKO	**1,708,137**	**2149**	**114**	**363**
***YT3VLA**	**72,522**	**414**	**30**	**128**
*YU4BAH	8,856	176	8	46
*YU3ARP	7,050	113	14	33
*YU3MPN	4,841	74	11	36
*YU3ABC	2,220	83	6	31
*YU4VOX	1,872	44	6	20
*YU4URM	380	16	6	13
*YU7VBA	361	19	6	13
*YU4SAX	77	5	3	4
*YU4LUM	10	3	2	3

Sicily

***IT9IVU**	**65,016**	**252**	**45**	**123**
*IT9IHB	25,080	100	46	74
*IT9IRM	825	21	10	15

Slovak Republic

***OM1EE**	**62,172**	**350**	**32**	**125**
*OM1AVV	29,574	267	25	68
*OM7AHJ	17,200	137	32	68

Slovenia

S56NE	**57,104**	**473**	**21**	**65**
***S55AL**	**399,966**	**1303**	**59**	**208**
*S57ZM	11,446	133	14	45

Spain

ED2B	**263,822**	**684**	**62**	**216**
		(OP: EA2ESB)		
EA1FDJ	*222,640*	*507*	*72*	*148*
EA5JDN	59,730	220	51	130
EA4HKV	13,161	130	26	81
EA3IND	2,464	43	17	27
***EA4HKF**	**294,690**	**675**	**71**	**214**
*EA5IXO	231,594	496	63	179
*EA2EWL	76,630	371	45	149
*EA1FHQ	24,304	130	34	90
*EA2EWB	18,297	141	28	79
*EA5JBG	14,065	120	29	68
*EA5JAX	4,544	60	19	45
*EA3IHF	63	11	2	7
*EA4HIH	8,313	157	8	43
*EA4HER	2,520	55	10	30
*EA7KJG	16	2	2	2

Sweden

***SE4L**	**73,839**	**322**	**41**	**122**
		(OP: SAØFIA)		
*SA6RTD	31,720	180	40	90
*SA6OHM	5,406	94	12	41
*SA6FAX	2,695	53	14	35

Switzerland

HB9HJI	**104,544**	**426**	**47**	**129**
HB9HHN	35,378	194	42	91
***HB9HID**	**50,320**	**257**	**33**	**103**
*HB9HBY	14,454	183	15	51
*HB9HEI	10,349	73	29	50

Ukraine

***UT3UOR**	**128,810**	**981**	**23**	**87**
*UT1XU	80,360	380	38	126
*US5WBJ	10,787	81	25	42
*UR6LRC	1,080	46	5	19

Wales

***2WØLKX**	**271,152**	**785**	**54**	**198**
*MW7EJH	8,280	106	17	52
*MW7XRE	11,036	102	25	64

OCEANIA

Australia

***VK4MWL**	**1,632**	**26**	**11**	**21**
*VK3OM	1,104	24	12	12
*VK6NT	450	9	9	9
*VK6NCB	84	8	6	6
*VK6DAV	0	2	1	1
*VK1MF	12	2	1	1

Indonesia

YF8DJ	**20,935**	**159**	**19**	**34**
***YD9AAI**	**18,360**	**125**	**20**	**40**
*YC9KNX	15,150	147	32	43
*YD1RYX	11,128	98	18	34
*YD8MUZ	8,930	135	14	24
*YDØASO	7,298	118	16	25
*YD5ACA	6,039	116	13	20
*YG1AJC	4,165	56	14	21
*YC5YDD	3,050	50	21	29
*YD2UFR	2,755	59	11	18
*YD9BIJ	2,727	48	11	16
*YD7UQU	2,697	61	12	17
*YD9BEK	2,444	60	11	15
*YC4SIO	2,013	36	13	20
*YD3BUE	1,950	50	11	14
*YD3CNE	1,241	33	8	9
*YD2CRO	1,180	43	8	12
*YD1BTG	1,128	25	12	12
*YD9BJX	1,110	30	6	9
*YB2AYA	693	26	9	12
*YD2BXX	675	20	6	9
*YG8RQV	510	29	7	10
*YC8BEE	377	23	6	7
*YD3AVN	374	16	8	14
*YD6HRI	350	18	3	4
*YDØAQN	247	13	5	8
*YG1AEQ	210	12	3	7
*YDØADI	182	15	6	8
*YD9BSX	121	8	5	6
*YD7NQW	77	7	4	3
*YD3BFV	72	9	4	8
*YD3BFW	18	3	1	2
*YD2UXA	9	19	1	2
*YD3BGT	2	1	1	1
*YD3BGF	2	1	1	1
*YD3BFX	2	1	1	1
*YD3AVI	2	1	1	1

Philippines

***4I1EBD**	**197,166**	**787**	**30**	**72**
*DU6/N1MYM	26,574	135	45	58
*4G1FKH	9,126	108	19	20
*DW2ASC	1,830	89	6	9

SOUTH AMERICA

Argentina

***LU1VYL**	**54,436**	**388**	**18**	**44**
*LU5MGH	420	14	8	12
*LU9CSM	78	16	6	7

Brazil

***PU5DPL**	**188,604**	**788**	**21**	**72**
*PU4MMZ	157,225	651	24	71
*PY4IM	69,876	272	29	79
*PU2VMD	62,568	316	26	62
*PU2PKL	45,524	261	21	55
*PU2MIW	26,937	190	20	53
*PY2MZM	25,350	166	24	51
*PY2VTR	20,824	125	29	47
*PU2TWZ	12,818	175	16	42
*PY2RPM	12,672	88	27	39
*PU2OKW	6,432	79	15	33
*PU1SKO	4,488	59	15	29
*PU9YCZ	3,168	107	10	22
*PU4BOT	3,075	63	10	15
*PU2MCY	1,752	43	11	13
*PU3YST	220	12	4	6

Chile

***CA3FJK**	**253**	**15**	**6**	**5**

CLASSIC

NORTH AMERICA

United States

District 1

K5ZD	**4,784,670**	**3121**	**121**	**416**
K1DG	3,392,264	2602	115	357
W1JQ	1,006,542	907	100	298
K1RM	984,718	1330	60	199
AE1P	421,523	555	71	198
W1HNZ	395,773	503	73	214
NE1RD	146,510	295	46	136
WZ1V	113,230	248	44	125
W1TRK	77,520	210	42	110
W1OHM	56,341	198	22	81
K1WZC	54,180	201	23	82
W1FQ	18,368	108	16	48
W1HI	14,224	95	13	43
W1JS	1,798	22	10	19
***K1HT**	**616,641**	**673**	**83**	**238**
*N1DC	204,670	384	49	145
*KR1A	104,960	239	44	120
			(OP: KL7JT)	
**W2PMC*	*39,528*	*138*	*31*	*77*
*NY1E	33,040	153	19	61
*N1ADX	20,648	92	32	57
*W1HMM	12,848	61	23	50
*W1FWS	10,773	64	19	44
*KB1LRL	9,798	58	25	44
*K1ALA	9,198	85	10	32
*N1NIS	6,350	57	17	33
*N1SFE	4,312	48	14	30
*K1MEP	4,128	50	11	21
*W1EAA	3,552	35	20	28
*N1IBQ	2,480	29	10	21
*WMØG	759	22	7	16
*AF1R	72	5	3	5

District 2

K2SSS	**1,108,282**	**1329**	**66**	**235**
N2MF	725,580	847	89	259
W2OIB	431,460	543	79	227
W2LU	249,428	416	74	180
AB2RA	102,102	247	53	134
W2AXR	94,080	261	42	105
KC2G	47,916	151	41	80
K2QB	38,458	181	20	62
WA2BCK	34,992	221	16	56
KC2O	1,694	26	6	16
***N2MTG**	**133,749**	**278**	**57**	**136**
*WB2KLD	123,000	270	46	118
*N2CU	80,520	214	36	96
*K2AL	47,520	150	31	79
*N2DD	38,564	118	42	82
*AC2ZZ	26,180	112	26	59
*K2IRK	1,870	31	13	21
*W2UDT	1,508	24	10	16
*W2VU	738	15	7	11

District 3

K3AJ	**1,569,067**	**1386**	**105**	**316**
W3KL	996,130	1158	76	229
N3FCP	567,600	631	82	248
N1EK	488,988	649	75	214
4U1WB	80,514	798	49	93
			(OP: AJ3M)	
KD3H	56,712	185	45	91
***W2MC**	**94,215**	**226**	**48**	**117**
*KQ3W	81,252	197	51	97
*WA4GUD	62,880	173	37	94
*W3LL	49,329	238	16	65
*W3IPA	21,321	94	39	64
*KC3HMY	13,038	66	32	50
*KC3DLL	10,112	63	23	41
*NH7TV/3	8,253	47	27	36
*KD3CR	5,170	48	23	32
*NE3I	3,045	32	15	20
*KA3UIH	2,430	30	11	19
*AJ3DI	425	10	7	10
*W3LWM	72	5	4	4
			(OP: KB3VBL)	
*N3RMC	40	5	3	5
*KB3SQV	6	1	1	1

District 4

KD7RF	**783,696**	**794**	**93**	**255**
W4KW	754,725	838	99	248
W1AJT	475,800	576	81	224
K4BAI	331,470	493	73	188
W3DQS	230,256	367	64	170
W4FNZ	148,240	278	62	156
W4CB	85,722	203	50	107
			(OP: W2RU)	
AA9ZI	76,406	196	48	103
KG9V	73,920	194	55	113
WX4US	72,120	235	37	83
K4NWX	37,800	136	33	72
N4GU	34,317	132	31	62
NN4RB	33,580	122	45	70
WK4LR	30,636	112	34	77
N4FP	24,192	117	32	52
WC4Y	10,730	91	26	48
N3FP	8,784	67	21	40
K1GU	7,056	51	16	33
W4RJA	6,897	51	23	34
KA3BZO	6,206	47	23	35
ND4G	2,990	26	21	25
KC4RD	2,379	43	14	25
K4EAK	1,728	24	14	18
***WW4XX**	**917,285**	**864**	**98**	**285**
			(OP: LZ4AX)	
*AC4G	536,568	633	91	225
*WA3LXD	348,096	488	68	191
*W6DVS	262,548	426	50	171
*K4DR	214,376	383	58	153
*KF8N	148,779	292	49	134
*WA4JA	106,972	220	63	125
*W2WCM	93,600	227	51	105
*N4ARO	92,246	224	41	113
*K3GWK	74,074	207	42	101
*K8MR	72,063	180	45	112
*K1VX	61,570	209	41	90
*AA4HV	52,256	145	51	91
*NK4O	47,886	152	42	96
*K4JSK	44,166	160	32	70
*KM4SK	37,044	129	44	82
*KE4D	36,725	138	29	84
*K4TMC	31,916	151	21	58
*K8LBQ	17,010	77	33	57
*KG2E	14,832	87	26	46
*KB6QPI/4	14,070	70	24	46
*KK4PJ	10,950	68	28	45
*WA3RGH	9,590	95	16	54
*N4LKB	8,064	55	20	36
*W4BTA	5,670	42	29	41
*KC8YRK	5,643	38	22	35
*K4SXT	3,185	26	25	24
*W4TWR	2,765	27	14	21
**WB4E*	*2,698*	*28*	*14*	*24*
*K4GNE	2,072	30	12	25
*N4MCC	1,968	33	17	24
*K4RSA	1,704	25	6	18
*KJ4GTI	1,054	24	14	17
**W5APO*	*640*	*15*	*10*	*10*
*WB7RAV	325	11	4	9
*KC9LC	180	7	7	5
*KA4DSH	140	9	7	7
*KK6OKU	36	4	2	4
*KR4EZ	12	3	3	3
*WD4ETU	0	0	0	0
*K4WY	36,570	123	47	91
*AA4GA	420	10	5	10

District 5

N2IC	**1,911,429**	**1858**	**127**	**276**
K5RX	553,419	673	94	215
WQ5L	415,896	564	73	185
N5KWD	146,949	290	73	146
KD5QHV	121,110	279	56	109
KZ5J	57,684	237	23	69
W5ORC	37,392	137	48	75
KG5EIU	30,564	127	41	67
NG5R	1,992	35	10	14
***NN5T**	**99,532**	**218**	**63**	**104**
*NW5Q	91,044	211	58	104
*KC7QY	80,937	199	53	100
*NZ6N	45,012	135	46	86
*WA5LFD	36,942	155	39	55
*N5DTT	36,297	126	44	65
*AA5GJ	25,764	94	49	65
*WB5BHS	24,598	215	42	56
*W5RJJ	23,880	162	24	36
*KF5BCN	7,812	57	25	37
*AF5CC	3,402	33	17	25
*W5KY	2,618	45	12	22
*K2ZP	1,104	22	10	14
*WD5BHS	324	9	3	9
*K5TY	255	15	8	9
*K5IX	60	5	2	2
*N3CI	11,480	67	26	44
*WE9N	448	11	8	8

District 6

W6TK	**443,940**	**694**	**90**	**155**
AJ6V	373,520	662	86	146
N5KO	268,846	432	80	149
K6YK	151,962	324	65	121
KE8FT	93,002	379	31	67
WA6MRK	63,574	175	56	77
WA6URY	54,538	157	57	77
K6VVK	25,288	92	47	69
KB6A	23,621	114	33	46
K6RO	20,839	92	41	50
KA6KEN	10,147	55	30	43
N6XI	7,802	60	19	28
W6RKC	1,056	21	10	14
KI6NAZ	*690*	*18*	*8*	*7*
***WN6K**	**175,994**	**367**	**72**	**110**
*WF6Q	41,124	166	32	60
*AJ6CE	28,480	119	41	48
*N6LL	26,162	99	37	66
*K6GHA	23,030	140	24	46
*N6REK	19,264	105	38	48
*NR7Z	14,820	73	35	43
*N4DLA	12,992	82	26	30
*AA6YV	11,786	72	31	40
*N3KA	5,880	50	28	32
*KO6RW	5,820	54	29	31
*WZ6ZZ	3,392	45	16	16
*K6ESS	1,598	30	18	16
*N6UNH	855	15	9	10
*KF6JS	154	7	5	6
*K6MUG	136	13	8	9
*KM6VXO	66	8	6	5

District 7

W7YAQ	**685,170**	**738**	**109**	**236**
K7SS	402,996	596	95	163
K9RZ	231,231	391	80	151
KT6VV	187,775	358	78	125
K9JF	*185,328*	*345*	*82*	*126*
AB7YQ	162,575	338	57	118
N7RK	103,140	213	74	117
K7JQ	44,382	212	23	55
K6NR	43,585

*KK7RR	39,200	140	42	70
*N7MZW	39,160	145	47	63
*KNØW	32,660	122	51	64
*WB7EUJ	13,746	97	40	47
*N7XCZ	13,032	77	30	42
*W7MTL	9,454	70	30	28
*AA7DK	7,632	60	32	40
*WB6OEE	5,664	52	22	26
*WA7JNJ	3,782	46	16	15
*KF7KTC	3,696	68	11	17
*AC7MX	2,822	48	18	16
*WA8ZNC	2,117	36	13	16
*K7BWC	2,040	24	13	21
*KDØBSY	1,566	28	13	14
*W7RCS	1,530	23	15	15
N7MJL	*744*	*28*	*16*	*15*
*N7VGO	676	17	14	12
*KF7ZZ	110	8	5	5
*KG7VQ	42	3	3	3
*W7FS	20,384	99	39	52
*N7JI	6,579	62	23	20
District 8				
N8SBE	**108,477**	**260**	**44**	**109**
KM8R	104,082	259	45	121
		(OP: K8CMR)		
KE8E	64,032	198	43	95
AA8KY	61,612	170	46	100
W8YV	28,620	120	29	61
***N8II**	**469,588**	**765**	**62**	**155**
*N8BAP	129,816	248	66	150
*KB8TL	73,304	205	41	95
*AD8AL	70,550	202	56	110
*N8CUB	70,470	174	44	101
*WB8JUI	69,088	202	40	87
*KW8KW	60,417	204	41	96
*N8PPF	57,084	156	50	92
*K7DR	41,199	163	25	68
*K2SY	21,631	96	30	67
*KE8XH	12,560	75	32	48
*WB8JAY	5,781	44	15	32
*NF8M	4,770	38	22	31
*WJ8B	4,032	48	24	32
*KBØUPC	3,124	32	19	25
*K8CVM	1,395	23	15	16
*KB8MXE	714	22	4	10
*N8FYL	150	7	5	5
*AD8WA	144	7	5	7
District 9				
W9GT	**665,226**	**839**	**75**	**216**
W9DZ	406,288	542	71	197
K9UC	117,192	279	41	111
W9TC	68,609	175	61	96
W9JOE	40,500	149	28	80
KB9S	26,956	114	34	58
K9CJ	26,492	138	21	53
K9TY	12,460	66	25	45
AD5PR	11,753	64	21	52
K9IDQ	7,296	46	25	39
WD9AZB	1,100	21	6	16
K9AWM	495	16	8	7
***WD9CIR**	**97,812**	**244**	**45**	**111**
*N9EAX	88,677	201	56	121
*W9WGN	51,708	141	50	89
*AC9TO	41,000	146	51	74
*W9IZ	29,998	109	39	67
*KD9JSA	14,013	91	30	51
*KD9KMK	11,220	74	27	41
*K9WPV	5,555	44	23	32
*KD9LVR	4,136	42	17	27
*W9GYK	3,996	46	10	27
*AJ9U	3,036	34	18	26
*AA9WP	2,993	29	19	22
*K9FRO	1,725	26	8	15
*W3ZAP	196	12	7	7
District Ø				
WDØT	**342,095**	**525**	**82**	**165**
WØETT	234,373	434	75	148
KJØI	194,040	329	72	148
NØYO	167,049	320	69	138
NØKQ	82,476	212	64	94
WA7NPX	61,880	196	36	83
WDØBGZ	24,273	121	25	62
NØWRK	19,430	118	25	42
KDØOYC	16,986	120	18	39
KDØJLE	12,168	81	34	38
AIØM	828	29	12	11
***NØUR**	**315,100**	**525**	**68**	**162**
*WØPI	59,202	183	37	80
*WØZF	39,330	129	40	75
*WØCOE	28,362	121	30	57
*KBØARZ	23,826	88	47	67
*AI6O	20,995	95	27	58
*WØJMW	17,958	84	32	50
*KØSCO	17,298	90	39	54
*NØZIB	11,088	69	21	42
*NØUK	8,687	50	31	42
*KØJM	7,595	53	13	36
*KØVG	3,555	35	21	24
*W7KAM	2,550	36	13	21
*KBØSNI	2,262	27	19	20
*KBØHP	1,800	26	8	16
*KØVH	1,566	22	12	17
*KD5FQF	96	14	3	3
*NØJK	176	6	5	6
Alaska				
AL7LO	**177,792**	**648**	**54**	**74**
NL8F	14,416	135	26	27
Canada				
District 1				
VA1XH	**232,744**	**460**	**46**	**142**
VE1JS	78,625	247	35	90
***VY2GF**	**118,261**	**299**	**40**	**103**
*VE9RLW	32,966	129	41	65
*VY2LI	23,902	121	19	55
District 2				
VE2IM	**5,264,064**	**4106**	**113**	**368**
		(OP: VE3DZ)		
VE2TSM	64,130	215	33	88
***VE2OWL**	**100,296**	**222**	**48**	**120**
*VA2MVR	486	20	9	9
District 3				
VA3MW	**1,289,926**	**1545**	**104**	**270**
VE3GYL	161,116	341	55	133
VA3AR	24,510	201	7	36
***VE3TM**	**171,028**	**372**	**49**	**120**
*VA3KRT	114,752	264	46	117
*VE3VY	86,268	221	49	107
*VA3CK	25,802	123	37	60
*VA3DBT	21,070	104	29	57
*VE3LMS	11,736	64	24	48
District 4				
VE4SG	**68,524**	**484**	**21**	**53**
***VA4HZ**	**44,733**	**189**	**35**	**76**
		(OP: VE4HAZ)		
*VE4GKM	38,070	193	34	56
District 5				
***VE5GC**	**2,668**	**47**	**12**	**17**
District 6				
VE6CA	**29,400**	**376**	**17**	**23**
VE6ALC	0	0	0	0
District 7				
VA7DX	**744,504**	**1305**	**98**	**170**
VA7ST	330,848	742	64	132
***VE7BC**	**66,568**	**236**	**49**	**57**
Costa Rica				
***TI3IES**	**18**	**2**	**1**	**2**
Cuba				
***CO8NMN**	**300,220**	**831**	**53**	**117**
*CO8NDZ	57,368	336	15	56
*CO6WD	8,436	93	17	21
Dominican Republic				
***HI8HRD**	**145,200**	**408**	**53**	**112**
Mexico				
XE1YD	**29,737**	**96**	**50**	**81**
***XE2YWB**	**29,070**	**133**	**36**	**59**
*XE2RV	252	8	5	7
*XE1CIC	100	7	5	5
*XE2MWY	12	6	2	1
Panama				
***HP1RIS**	**51,188**	**328**	**18**	**49**
Puerto Rico				
***WP4YR**	**15,246**	**84**	**31**	**46**
*KP4KJ	4,230	37	21	24
US Virgin Islands				
***KJØD/KP2**	**5,627**	**163**	**9**	**8**

AFRICA

Canary Islands

EA8ZS	**144,768**	**279**	**50**	**142**
***EA8TX**	**716,078**	**2075**	**27**	**94**

Lesotho

7P8RU	**770,904**	**1566**	**37**	**135**
		(OP: RA1ZZ)		

Madeira Islands

CT9ABY	**1,148,189**	**2986**	**31**	**102**
		(OP: OM2KW)		

Senegal

6W1QL	**21,060**	**144**	**15**	**39**

South Africa

ZS6TVB	**627,380**	**1726**	**34**	**96**
***ZS6ELI**	**21,948**	**88**	**28**	**65**

ASIA

Asiatic Russia

District 9

RG9A	**4,162,044**	**2973**	**120**	**388**
UA9MA	3,806,075	3033	118	337
RA9P	2,354,360	2512	77	278
RK9AX	1,422,272	1951	73	211
R9YBW	677,082	952	69	213
RA9AU	243,066	851	23	79
RZ9OQ	229,560	693	30	90
RX9CM	11,350	94	14	36
***UB8A**	**352,762**	**606**	**56**	**177**
*UA9MQN	83,904	241	41	111
*UA9JNT	77,376	248	30	94
*RA9AP	64,988	299	17	60
*RZ9AD	43,788	229	21	61
*RA9SF	26,082	195	11	43
*RC9AR	14,787	111	12	41
*R9UTW	10,332	97	20	43
*RU9AC	6,847	59	8	33
*R8CAX	6,815	89	12	35
R8QAN	*2,210*	*48*	*12*	*22*

District Ø

RØDX	**234,902**	**842**	**48**	**86**
RAØLMO	94,608	273	58	88
***RØUT**	**35,770**	**233**	**23**	**50**
*RAØWHE	19,448	110	17	51
*RCØAJ	5,824	55	22	34
*RUØL	858	22	7	6
*UAØCDO	300	8	7	8

Asiatic Turkey

TA2ANL	**108,976**	**313**	**24**	**115**
TA2SN	2,624	34	15	26
***TA4AU**	**17,061**	**131**	**8**	**39**
*TA2L	3,780	41	11	25

China

B4O	**232,951**	**590**	**57**	**136**
BD3PXM	1,064	42	9	10
***BG7TWJ**	**52,632**	**408**	**25**	**47**
*BD7OYA	43,173	259	41	82
		(OP: BI7NEJ)		
*BG1II	23,520	168	46	52
*BG8JMO	20,584	150	38	45
*BI7JMD	19,893	166	16	41
*BG7SPN	4,488	45	22	29
*BI1EIH	1,155	43	17	16
*BD9CJH	629	13	7	10
*BG7FLV	484	16	10	12
*BD9ATY	360	10	7	8
*BH1HUK	140	20	5	5
*BG9DAW	21	5	3	4
*BG9CKF	0	2	1	2
*BI4PDD	16,212	118	38	46

Cyprus

5B4AOZ	**84,680**	**221**	**39**	**106**

Hong Kong

***VR2YTL**	**165**	**8**	**5**	**6**

India

VU2IBI	**96,748**	**290**	**36**	**98**
VU2ZKC	68,911	204	36	101
***VU2OO**	**15,642**	**127**	**19**	**47**
*VU2DCC	4,452	40	12	30
*VU2YQ	3,212	40	20	24
*VU3SIO	2,006	23	12	22
*VU2MCW	713	15	10	13
*VU2JOS	320	15	8	8
*VU3LMS	30	3	3	3

Japan

District 1

7K4GUR	**154,326**	**320**	**58**	**120**
JE1RXJ	61,710	190	54	67
JA1CRJ	61,380	187	56	76
JH1CTV	36,900	151	41	59
JM1NZJ	8,967	55	29	32
JA1WIO	3,808	50	15	19
JK1UVL	210	7	7	7
***JS1KKY**	**314,100**	**564**	**79**	**146**
*JA1MZM	82,144	221	54	82
*7N2UQC	37,575	203	24	51
*JR1LEV	32,912	164	39	49
*JA1MYW	9,400	77	18	32
*JK1EXF	8,410	59	22	36
*JA1JNM	3,990	35	20	22
*JA1GZK	1,598	34	9	8
*JJ1ILX	1,368	25	12	12
*JH1VOR	1,175	19	12	13
*7M4CFW	946	27	10	12
*JI1CAZ	665	19	9	10
*JQ1PCT	406	11	7	7
*JO1KTD	294	14	10	11
*JA1ATM	247	9	6	7
*JH1RDU	243	9	5	4
*JK1MLY	132	11	6	6
*JH1HHP	81	5	5	4
*JE1SPY	64	56	4	4
JL1XGA	*8*	*2*	*2*	*2*
*JK1DAS	0	4	3	4
*7L1DST	476	16	6	8
*JEØCBS/1	120	7	5	7

District 2

JG2CNZ	**160,518**	**344**	**79**	**107**
JE2BOM	80,088	214	56	85
JA2JWH	65,794	237	53	81
JH2DFJ	18,792	137	24	48
***JG2RFJ**	**149,072**	**349**	**63**	**113**
*JA2NKD	4,018	37	18	23
*JA2KKA	912	18	12	12

District 3

JR3RIU	**252,195**	**465**	**78**	**137**
JA3QOS	63,240	283	28	65
JA3IKG	60,726	254	26	61
***JG3XDR**	**3,588**	**34**	**16**	**23**
*JI3XOK	902	23	11	11
*JA3YVI	180	6	6	6

District 4

***JH4FUF**	**273**	**12**	**7**	**6**
*JH1MTR/4	128	8	4	4

District 6

JA6BZI	**893,380**	**883**	**123**	**257**
JA6BWH	215,250	414	68	137
JH6WDG	22,880	150	20	45
***JH6FTJ**	**64,896**	**207**	**51**	**77**
*JA6CVR	59,048	212	56	65
*JF6ABL	15,440	84	34	46
*JH6TNH	6,450	53	19	31
*JH6SCA	2,040	26	13	17
*JE6ETZ	72	6	2	2
*JE6PVG	12	2	1	1

District 7

JH7QXJ	**996,740**	**1494**	**91**	**153**
JA7QVI	526,084	1291	47	104
JA7OWB	87,759	234	55	92
JH7FUI	48,924	169	34	74
JA7UES	29,202	116	38	55
***JA7HYS**	**250,668**	**454**	**73**	**138**
*JA7RPC	29,328	140	25	53
*JA7KHQ	266	7	7	7

District 8

JA8RUZ	**306,187**	**606**	**80**	**137**
***JA8RWU**	**335,160**	**548**	**91**	**154**
*JR8QFG	3,930	50	13	17
*JE8URC	3,538	44	13	16
*JA8HBO	2,108	32	17	17

District 9

***JA9EJG**	**4,032**	**44**	**10**	**22**

District Ø

***JHØDUG**	**15,120**	**105**	**32**	**38**

Kazakhstan

***UN7MBH**	**147,260**	**391**	**42**	**106**
*UN9GD	101,388	375	26	76
*UN7FW	38,808	142	25	74

Kyrgyzstan

***EX8MK**	**4,136**	**46**	**12**	**32**

Lebanon

***OD5UI**	**96,459**	**323**	**19**	**92**

Ogasawara

***JL1WFD/JD1**	**43,906**	**545**	**24**	**34**

Oman

A47RS	**2,168,544**	**2427**	**92**	**244**
		(OP: SV5DKL)		

Republic of Korea

***HL1OVG**	**793**	**27**	**7**	**6**

Saudi Arabia

***HZ1SK**	**220,115**	**801**	**22**	**73**

Singapore

***9V1KG**	**29,848**	**175**	**36**	**46**
*9V1HY	885	24	7	8

Taiwan

***BX2ABT**	**14,792**	**83**	**35**	**51**
*BU2EF	9,180	92	23	28

United Arab Emirates

***A65GT**	**16**	**2**	**2**	**2**
		(OP: 4G1QAZ)		

West Malaysia

***9W2AIX**	**28,944**	**304**	**13**	**23**
*9M4CTO	26,376	198	24	32
*9W2XTK	6,020	96	11	17
*9W2EJX	272	14	7	10

EUROPE

Andorra

C31LK	**399,500**	**1460**	**51**	**184**

Austria

OE5WHN	**43,788**	**208**	**33**	**90**
***OE2E**	**273,914**	**495**	**71**	**231**
		(OP: OE2GEN)		
*OE3MCS	64,320	299	43	117
*OE3TWA	57,462	306	35	122
*OE1ØØHLF	40,338	240	25	56
		(OP: OE6HLF)		
*OE3HLB	40,131	243	31	86
*OE5FDM	675	25	6	9

Balearic Islands

***EA6VY**	**5,978**	**80**	**15**	**46**
*EA6AMM	5,719	127	7	36

Belarus

EW2A	**1,808,733**	**1765**	**124**	**419**
EW1I	118,508	336	51	121
***EW8MZ**	**83,424**	**383**	**40**	**118**

Belgium

OR4T	**68,700**	**917**	**15**	**60**
OS7ET	31,979	119	41	72
***ON4CT**	**183,983**	**393**	**65**	**186**
*ON4MAD	87,449	351	45	112
*ON9TT	71,012	328	34	130
*ON7DDG	56,416	230	45	119
*ON8DX	30,504	215	30	94
*ON/SO2U	10,379	119	23	74

Bosnia-Herzegovina

E71A	**378,666**	**841**	**55**	**163**
E75LR	3,159	95	5	34
***E75IO**	**3,720**	**78**	**9**	**31**

Bulgaria

LZ1A	**203,685**	**1380**	**24**	**87**
		(OP: S55M)		
***LZ1DQ**	**30,914**	**319**	**18**	**64**

Crete

SX9X	**636,510**	**2964**	**36**	**111**
		(OP: SV9FBG)		

Croatia

9A3XV	**215,895**	**992**	**33**	**78**
9A1CMA	23,580	325	11	49
		(OP: 9A9EE)		
9A2KD	2,550	88	5	25
***9A2KI**	**191,808**	**728**	**51**	**171**
*9A2VX	38,285	175	38	117
*9A3GX	9,170	127	17	53
*9A4OP	23,199	194	26	85

Czech Republic

OL5ØDJ	**672,885**	**1267**	**78**	**207**
		(OP: OK6DJ)		
OK4RQ	69,000	351	38	100
OK1XC	36,624	192	28	56
OK2EQ	6,390	147	5	40
OK1JFP	5,929	45	18	31
***OL5Y**	**631,350**	**911**	**91**	**275**
*OK1TA	526,504	809	102	284
*OK2BRX	184,203	539	55	156
*OK7N	163,782	405	67	176
*OL2A	134,325	505	43	156
*OK2BZE	70,740	422	24	84
*OK2VV	63,395	400	26	129
*OK1TK	38,171	282	28	105
*OL9M	16,245	162	17	40
		(OP: OK1MMN)		
*OK1TVL	2,440	51	14	26
*OK7NV	8,648	160	9	38
*OK1LV	6,384	69	19	29
*OK1LO	4,452	101	8	34
*OK2MRJ	1,023	32	9	22

Denmark

OZ3BJ	**49,230**	**212**	**25**	**65**
OZ9ETOV	7,254	68	18	21
		(OP: OZ1D)		
OZ3SM	1,800	48	10	26
***OU8A**	**64,032**	**883**	**13**	**56**
		(OP: 5PØO)		
*OZ2LC	22,400	294	13	57
*OZ9V	5,504	135	7	36

England

M6O	**524,790**	**1597**	**37**	**116**
		(OP: G3WGN)		
MØKPD	299,156	570	80	206
MØOIA	203,415	409	59	154
G5DXC	133,952	621	42	119
		(OP: MØCTP)		
MØYKS	113,552	325	51	137
G9D	87,300	347	39	111
		(OP: G6NHU)		
MØIRU	80,199	386	43	128
G1EIX	61,513	259	39	98
G1W	54,090	486	20	70
		(OP: MØHAO)		
M1B	52,865	433	23	74
G2B	37,323	176	33	84
G4L	31,208	301	18	65
		(OP: G4LDL)		
MØJHV	19,012	148	26	72
***G9X**	**483,632**	**971**	**77**	**257**
		(OP: M1LCR)		
*G4DDL	238,602	636	59	188
*MØPLX/M	201,553	626	56	195
		(OP: MØPLX/M)		
*G1K	131,922	568	42	147
		(OP: MØRTQ)		
*GØRAH	126,920	446	47	143
*M1VPN	101,500	526	34	141
*2EØSPS	81,949	392	34	127
*MØKPW	79,800	379	37	113
*G2NV	67,080	287	40	116
*M5X	65,190	251	42	117
		(OP: G3RLE)		
*MØAQM	64,680	377	31	109
*M1G	60,516	287	38	126
MØMNM	*53,640*	*225*	*41*	*108*
*G8ZRE	48,396	289	33	115
*GØJDL	39,325	243	32	89
*G3Y	37,284	348	19	59
		(OP: G3YBY)		
*2EØEVM	29,920	210	29	107
*G5TM	27,544	177	24	64
*G3R	27,104	166	30	82
		(OP: GØCDA)		
*GB1OOH	24,347	198	24	73
		(OP: GØWJK)		
*G3YRZ	21,798	251	12	51
*M4M	20,216	203	17	39
		(OP: MØPNN)		
*G1ZHD	19,795	127	32	75
*G3YZO	18,437	150	25	78
*G4FFN	16,482	111	31	92
*MØURB	16,284	166	20	72
*G4OTU	14,742	207	15	48
*MØACM	13,000	178	11	39
*G4OED	10,440	105	20	70
*G3UQW	6,048	69	20	52
*MØNRD	5,723	95	12	47
*MØYJB	3,422	62	16	42
*M7GPX	736	18	8	8
*M3EMO	234	14	3	10
*G4Y	4,590	98	10	41
		(OP: M6OXO)		
*MØJBA	3,420	94	7	31
*M6IGE	2,560	72	8	32
*M8C	1,856	62	6	23
		(OP: G4DBL)		
*MØPTO	1,363	25	11	18
*G4RGK	1,232	26	10	12
*G7PVZ	750	25	10	20
*G1WSA/P	0	2	2	2

Estonia

ESØIA	**287,360**	**530**	**87**	**233**
***ES1TAR**	**45,227**	**349**	**20**	**71**
*ES5RIM	16,320	193	14	50

European Russia

District 1

***UA1AOS**	**187,910**	**594**	**48**	**182**
*R1BAC	63,024	268	46	110
*R1AT	10,200	169	11	39
*UA1ABJ	4,554	67	17	49
*UA1WBV	2,090	25	19	19

District 3

R3OM	**650,480**	**1171**	**89**	**287**
RA3RCL	235,950	1159	34	87
RZ3DW	92,070	341	46	109
R5AK	75,636	293	43	155
R3MBD	35,560	148	41	86
RK3IT	18,142	101	34	60
***UA3BL**	**541,310**	**1000**	**89**	**296**
*RA3DAD	524,560	994	77	239
*R3AAA	154,160	469	58	177
*RA3RLJ	93,093	541	33	110
*R2OFF	72,380	336	30	110
*UA3IVF	67,497	355	35	116
*UA3ABJ	36,005	240	27	68
*RX3VF	30,997	204	27	112
*UA3WF	30,912	182	32	80
*RA3RA	29,200	193	24	49
*RA5BB	23,800	127	36	83
*R2AHS	15,300	120	21	69
*R3LC	11,388	211	7	45
RA3GAA	*10,842*	*115*	*20*	*58*
*RN3P	10,032	108	19	57
*RK3E	9,168	192	6	42
*R3PLN	6,699	81	19	58
*RA3DGH	4,340	104	4	31
*UA3SDN	1,517	41	11	30
*RW3AI	16,835	151	20	71

District 4

RM4HZ	**1,022,352**	**1969**	**83**	**271**
R4RT	396,775	1142	57	238
RA4PBE	352,914	1076	62	200
R4IB	123,806	507	54	152
***R4WZ**	**118,272**	**436**	**48**	**144**
*UA4FDK	95,149	350	46	147
*RU4PN	37,488	225	31	101
*R4ADA	32,640	168	34	94
*RA4ADF	7,568	89	22	21
*R4AAR	6,804	104	25	56
*RV4CU	3,036	44	19	27
*UG4P	27,135	192	37	98

District 6

R6CR	**76,125**	**275**	**61**	**142**
R7GU	15,750	193	13	50
RJ7M	559	17	5	8
***RG5A/6**	**772,686**	**1715**	**81**	**288**
*R6DBT	122,590	408	48	157
*RZ6BR	120,696	380	53	161
*RV7M	67,093	324	34	135
*UA6HML	62,160	302	42	126
*RM7C	48,888	298	27	99
*RA6LIS	30,067	210	25	82

District 9

***R9FBT**	**123,692**	**378**	**49**	**165**
*RA9FEL	27,083	260	16	57
*UA9XK	8,160	94	17	63

Finland

OH2PQ	**1,277,772**	**1577**	**116**	**350**
OH2BA	516,936	1006	78	284
		(OP: JK3GAD)		
OH1VR	27,480	137	32	88
OF5ZA	4,017	74	9	30
		(OP: OH1ZAA)		
OG6B	2,130	49	7	23
		(OP: OH1ZAA)		
OH1QX	1,972	56	6	28
		(OP: OH1ZAA)		
OF4BCS	1,392	32	9	15
		(OP: OH1ZAA)		
***OH1SIC**	**164,280**	**603**	**42**	**180**
		(OP: SM5SIC)		

*OH6BQH	86,240	399	40	120
*OH2LU	11,220	104	22	63
*OH1TS	6,384	140	18	66
*OH6Z	4,879	124	5	36

France

F5LIW	**557,424**	**1020**	**68**	**169**
***F4ETG**	**219,490**	**555**	**58**	**177**
**F4WBL*	*192,325*	*396*	*68*	*177*
*F5GKW	151,580	437	62	158
*F4BIT	148,962	411	55	167
*F4IAY	96,118	335	51	136
*F5TVG	68,688	188	43	116
*F5OHH	55,014	237	45	114
*F4BHK	54,162	141	68	109
*F4ELJ	49,755	301	26	67
*F4EZH	12,150	95	29	61
*F8FLK	3,915	53	14	15
*F1IGY	3,483	69	11	32
*F5MDW	2,350	30	22	28
*F1ICR	5,632	80	12	32

Germany

DL2CC	**2,682,548**	**2559**	**112**	**339**
DK6WL	1,875,888	2028	125	379
DL2SAX	1,800,418	2344	108	301
DK5KK	636,720	1221	81	255
DL6ZBN	622,914	797	101	293
DL8OBF	606,480	1082	83	253
DH1UK	295,800	628	72	218
DJ4MO	292,760	592	66	194
DF1LON	57,462	256	45	112
DL3LAB	54,694	283	21	61
DK1FW	49,750	176	43	82
DK1IJ	38,940	202	39	79
DL9NEI	31,974	238	17	56
DL1DTL	24,948	138	25	59
DL4ABR	24,354	146	29	53
DF6RI	23,230	147	31	84
DKØSU	13,098	114	20	54
		(OP: DF7SA)		
DKØUU	9,780	66	21	39
		(OP: DF2CD)		
***DJ3HW**	**540,592**	**848**	**91**	**277**
*DP5P	321,542	711	74	224
		(OP: DL1MHJ)		
*DR5W	263,934	560	70	209
		(OP: DL1RTL)		
*DL2RPN	108,843	330	58	161
*DJ4DN	107,262	345	54	148
*DG7LAN	102,684	463	38	134
*DL5JS	91,572	354	43	113
*DL1VO	89,310	339	47	148
*DL1RTO	85,728	342	42	99
*DKØBM	72,369	518	32	121
		(OP: DK7CH)		
*DL9HB	45,570	190	39	108
*DL9ZP	45,125	316	25	70
*DKØTP	43,924	263	35	104
		(OP: DH1RZ)		
*DL5RMH	39,500	207	35	90
*DM6EE	34,300	171	41	99
*DL1KAS	31,780	207	39	101
*DD3JN	30,820	169	31	103
*DO4OD	30,186	175	29	100
*DO1PE	27,371	242	25	76
*DF2WZ	27,370	153	34	81
*DO2SBS	24,486	174	29	77
*DL7DS	24,090	147	33	77
*DL7FUA	22,892	94	38	59
*DJ1OJ	21,470	136	31	64
*DB5ZF	20,160	178	27	78
*DM2DLG	19,673	184	25	78
*DL7JU	17,127	137	28	71
*DO9YY	16,037	118	26	53
*DL4JWU	15,246	140	23	76
*DL6AL	14,972	117	27	49
*DL8MV	14,872	112	30	74
*DL7ØTRS	14,105	217	11	54
*DK8NI	13,770	118	25	77
*DL5KUD	13,409	125	18	35
*DO1TOM	13,338	136	20	58
*DH9DX/P	12,749	126	18	43
*DD3WY	11,869	157	15	68
*DL4AND	11,242	77	27	50
*DL6CWM	10,899	89	24	39
*DK2WU	10,472	72	25	31
*DK7MV	9,990	113	22	68
DM3KP	*8,280*	*68*	*21*	*39*
*DG6MDG	6,630	60	26	39
*DK6AC	6,232	60	22	54
*DL9ZWG	5,270	58	22	40
*DL1LSW	4,841	53	17	30
*DL2RZG	4,100	103	6	35
*DF2WR	3,055	48	13	34
*DL9GWA	2,849	51	11	26
*DK8VD	2,650	61	14	36
*DL7ED	1,998	48	14	40
*DK9TF	1,560	33	16	24
*DL1GRQ	864	40	4	20
*DO1EP	728	34	12	16
*DL1YMS	504	24	4	17
*DD6TT	336	17	10	11
*DM3AW	323	13	6	11
*DO6GT	176	11	7	9
*DL1BAX	16,491	198	13	56
*DF5GO	7,107	86	23	46
*DL1DXA	2,596	33	20	24
*DG2FDD	160	10	7	9
*DL7KP	143	11	3	10

Greece

***SV1RVI**	**8,120**	**100**	**16**	**42**
*SV7CUD	2,070	27	14	16

Guernsey

***GUØBEZ**	**3,472**	**48**	**19**	**37**

Hungary

HA5PP	**1,002,885**	**1368**	**104**	**313**
HA1BC	508,640	748	92	282
		(OP: DL1MAJ)		
***HA8WY**	**263,400**	**652**	**69**	**231**
*HA2MI	20,300	137	24	46
*HA5UA	1,323	28	9	12
*HA5TOP	1,305	41	6	23
		(OP: HA5UA)		
*HG7J	26,650	163	36	94
		(OP: HA7JQK)		
*HAØGK	16,860	219	13	47
*HA1TI	5,904	151	4	37

Ireland

***EI3ENB**	**154,375**	**464**	**55**	**192**
*EI3CTB	39,627	221	34	85
*EI6GSB	300	17	6	14

Isle of Man

***GDØAMD**	**40,800**	**238**	**30**	**106**

Italy

I5MXX	**967,260**	**1275**	**106**	**314**
IZ1OSP	346,970	884	79	235
IØLYO	343,023	682	84	243
IR8O	223,412	959	51	151
		(OP: IZ8GCB)		
IZ1HHT	168,973	450	62	177
I3/OE6MBG	159,655	682	38	147
IZ2BVC	157,131	585	47	174
IZ6OUX	114,492	546	45	143
IU2IHM	110,240	349	51	157
IZ1SAI	92,130	396	40	145
IU7EDX	72,618	302	40	107
IK6LBV	32,882	314	19	63
IZ1PLH	28,548	228	27	95
IU1FSL	28,152	207	28	110
IK2AHB	21,672	163	19	44
IU4CSS	10,374	114	19	38
IU3KMF	3,384	101	8	39
IU2JFG	1,530	55	7	27
IW3IOG	984	15	12	12
***IK1JJM**	**436,832**	**923**	**74**	**218**
*IV3ZYB	388,480	622	93	227
*IUØDUM	249,862	642	69	202
*IK1RGK	232,760	571	78	175
*IK4RQJ	205,176	344	79	230
*IK4MTF	204,345	510	57	182
*IZ1RDQ	114,490	361	59	155
*IWØHLZ	106,252	401	53	149
*IUØDHV	93,980	298	54	131
*IZ2BKA	79,086	283	45	102
*IK7NXU	76,032	200	55	137
*IU7CUE	71,757	383	34	119
*IU3GJD	70,975	329	35	132
*IKØALT	67,968	245	50	127
*IZØVXY	67,360	327	38	122
*IU7IGI	66,700	193	50	95
*IU4HMY	62,624	250	43	109
*IK2OFS	54,366	204	46	77
*IU2HEE	51,350	207	45	113
*IV3ZNK	49,374	214	36	81
*IZ8CLM	49,323	139	52	71
*IZ1XEE	45,864	149	58	98
*IZ4BKK	44,484	248	34	98
*IZ3XNJ	39,984	191	39	73
*IW5ECP	32,488	164	34	90
*IU4DAF	32,186	214	23	54
*IN3JRZ	30,504	242	30	94
*IUØDZA	30,444	156	41	88
*IK8SHL	28,435	202	29	92
*IU5KRE	26,460	163	38	88
*IZ7ZKV	26,240	219	25	55
*IW2ENA	24,089	129	39	70
*IW2MYG	24,000	136	35	85
*IK8ARF	21,900	97	40	60
*IU1FIB	19,716	136	30	76
*IWØGTA/5	17,098	101	26	77
*IU1HGO	14,790	120	23	79
*IK2JTS	14,729	143	27	76
*IK7IWF	14,678	96	29	53
*IZ2KWV	13,344	99	29	67
*IK2OLJ	12,699	87	30	53
*IUØMBJ	12,236	80	33	59
*IK8DYM	9,638	98	27	52
IX1CVF	*9,213*	*129*	*15*	*68*
*IK2SYI	8,364	80	19	63
*IU4NYV	7,700	71	25	45
*IZ8FCA	7,371	105	18	45
*IZ2ZPT	7,227	71	20	53
*IWØEYT	5,307	69	20	41
*IK2YSJ	5,300	75	16	37
*IK1ZOE	5,148	101	16	50
*IZ2YNB	4,588	59	19	43
*IN3PDI	3,400	38	19	31
*IN3EJM	2,090	43	11	27
*IZ3ZOO	1,935	52	10	33
*IU7GRA	1,650	24	13	20
*IU2LWE	1,554	43	11	26
*IU5BKR	1,360	28	11	23
*IK6SBW	1,292	32	12	22
*IWØEZW	504	16	11	13
*IZ1FRM	224	8	6	8
*IZ1GCN	195	9	6	9
*IK7RWE	104	7	4	4
II1R	*10*	*4*	*2*	*3*
		(OP: IW1CBG)		
*IZØFUW	138,316	334	70	159
*IZ8EWD	23,501	250	15	56
*IZØZFK	2,646	38	19	30
*IK3XTY	1,849	44	13	30
*IZ5OVP	1,260	50	5	23

Latvia

YL2CI	**206,067**	**705**	**34**	**115**
***YL2NK**	**126,985**	**433**	**57**	**176**
*YL3LK	11,440	248	9	43
*YL3ANC	2,100	60	11	24

Lithuania

LY9Y	**969,655**	**1382**	**104**	**341**
LY4T	213,840	456	73	224
***LY2N**	**33,572**	**166**	**26**	**83**
*LY1K	22,134	150	31	71
LY2PAD	*5,184*	*65*	*11*	*25*
*LY2NK	14,396	235	9	50

Luxembourg

***LX1GQ**	**10,112**	**110**	**21**	**58**

Netherlands

PAØMIR	**174,795**	**445**	**58**	**157**
PAØJNH	130,086	347	55	164
PA2CHM	5,609	90	20	59
***PA2TMS**	**529,320**	**1110**	**78**	**252**
*PG1R	74,800	350	40	130
*PC4AD	70,560	274	43	125
*PD1B	58,380	242	40	99
*PD1TV	27,692	198	27	65
*PA2VS	21,855	202	24	69
*PA2FA	15,470	122	24	61
*PAØLIE	10,530	97	25	65
*PE2KM	7,622	89	21	53
*PAØAWH	16,932	153	21	81
*PA1B	1,134	42	6	21

North Macedonia

***Z33F**	**23,345**	**166**	**26**	**89**
*Z34PEC	2,584	66	8	26

Northern Ireland

MI5K	**153,888**	**1089**	**18**	**78**
		(OP: MIØSLE)		
***MIØI**	**280,371**	**698**	**60**	**213**

Norway

***LA7TN**	**58,520**	**387**	**28**	**112**
*LA4NL	31,034	206	33	85

Poland

SP3H	**829,128**	**1494**	**91**	**267**
SP7MC	98,901	984	15	66
SQ1W	29,325	268	18	67
SQ5EXM	28,500	157	32	63
SP9Z	26,077	120	31	58
***SP5UFK**	**202,250**	**561**	**64**	**186**
SP5DRE	*136,947*	*438*	*50*	*141*
*SQ5WH	128,785	447	53	162
*SP2TMT	98,800	354	48	142
		(OP: SQ2BNM)		
*SP2AWJ	93,964	348	48	121
*SO9B	91,332	368	41	136
		(OP: SQ9IUB)		
*SQ8MXE	75,768	307	44	110
*SQ7OVT	49,679	247	35	116
*SQ5CZN	48,015	231	40	125
*SQ5SAA	45,954	193	41	97
*SQ5PJ	37,830	198	35	95
*SP4SAF	35,912	219	32	102
*SP9BJV	33,480	231	29	95
*SQ2TAC	24,500	175	28	70
*SP4MPA	17,640	141	21	51
*SP5LGN	15,708	104	21	47
*SP9W	13,110	109	20	37
*SP8CGU	12,992	172	15	43
*SQ8T	12,936	99	26	72
*SO6MZ	11,445	97	29	76
*SP9KJU	10,650	70	29	46
		(OP: SP9MDY)		
*SP2J	9,372	118	15	51
*SQ9CXC	8,400	106	17	53
*SP3CMX	6,840	63	22	38
*SQ2DYL	5,264	62	20	36
*SP4RUD	4,675	86	11	44
*SQ9PUW	4,488	61	14	30
*SQ3KNL	3,432	42	15	29
*SQ8M	3,040	58	9	29
*SQ5KWJ	1,053	37	5	22
*SQ9JTI	360	20	4	14
*SQ9PPT	357	28	3	14
*SP4NKJ	13,915	148	15	40

Portugal

CT2KNA	**107,180**	**785**	**26**	**89**
CT7AIX	27,000	202	15	35
***CS7AUS**	**8,670**	**163**	**12**	**39**
*CT7AHQ	2,360	45	21	38
*CT1FOQ	1,980	21	16	20

Romania

YO8BDW	**468,403**	**1003**	**75**	**188**
YO3GNF	204,527	649	51	176
YO2AA	96,632	450	38	150
YO9RIJ	24,220	308	13	57
***YO4RST**	**153,986**	**407**	**57**	**181**
*YO4SI	43,955	200	43	106
*YO3JW	33,798	347	19	67
*YO5PUV/P	33,072	212	27	79
*YO4BEX	19,176	219	12	56
*YO2MOO	15,840	157	23	67
*YO4CSL	4,655	63	20	29
*YO8RZJ	3,300	111	4	29
*YO2LXW	2,145	72	4	29
*YO2LIM	288	24	4	14
*YO8RCN	17,629	233	11	50
*YO8DHD	684	18	7	11

Scotland

GM2Y	**163,085**	**540**	**54**	**139**
		(OP: MMØDXH)		
GM5M	110,040	420	39	101
***MM4D**	**116,064**	**410**	**49**	**137**
		(OP: GM4ATA)		
*GMØHBF	53,130	279	32	122
*2MØYTN	26,564	200	30	86
*GMØUKZ	483	21	7	14

Serbia

YTØW	**956,243**	**1814**	**77**	**204**
		(OP: YU1JW)		
YU1LD	97,680	1003	16	72
***YT4ZZ**	**50,605**	**317**	**33**	**112**
*YU1EA	48,410	203	36	67
*YU7AEC	6,223	97	11	38
		(OP: YU7XW)		
*YU2CWW	4,183	86	9	38
*YUØW	20,865	155	23	84

Sicily

IT9BGE	**89,474**	**454**	**41**	**113**
***IT9FRX**	**382,580**	**1194**	**59**	**161**
*IT9FIQ	245,030	685	67	162
*IT9QEI	24,576	147	32	96
*IW9BJP	23,324	148	28	91
*IT9IWU	14,406	133	26	72
*IT9NSM	3,741	39	19	24
*IT9CLY	1,950	82	21	44

Slovak Republic

OM4M	**408,954**	**847**	**74**	**247**
***OM8ST**	**52,767**	**307**	**33**	**110**
*OM4IK	45,184	235	33	95
*OM3CDN	30,380	230	25	99
*OM6AMI	16,340	137	23	63
*OM/W6UZ	9,240	76	24	60
*OM7SR	8,170	102	24	62
*OM7AT	6,674	96	16	55
*OM2AGN	6,161	58	16	45
*OM5AVM	1,943	31	12	17

Slovenia

S53MM	**2,726,595**	**2597**	**132**	**381**
S53F	723,600	1595	81	279
S53BB	457,164	961	84	248
S51DX	224,030	1246	21	65
***S57NAW**	**301,464**	**593**	**81**	**235**
*S57WW	15,120	124	23	67

Spain

EA4KD	**2,414,192**	**2455**	**116**	**368**
EA4D	331,270	1492	41	116
EA5DFV	327,313	1480	30	77
EC4TR	276,818	1233	29	93
ED3B	212,441	997	30	79
		(OP: EA3BOX)		
ED4W	171,097	492	51	122
EC1RS	33,330	304	25	76
EA1DA	18,860	137	20	62
EA4FTA	9,450	109	15	48
EC5APA	7,625	153	15	46
***EA7BD**	**355,240**	**661**	**78**	**254**
*EE2A	270,760	580	67	213
		(OP: EA2SN)		
*EA7JF	181,473	503	66	185
*EA3ICJ	165,760	350	66	214
*EA4DGZ	101,703	313	42	125
*EA3DJL	92,130	297	45	121
*EE1B	53,544	394	22	70
		(OP: EA1Y)		
*EA1JCZ	44,394	258	24	74
*EA3W	40,524	193	42	90
*EA1FW	30,098	171	55	94
*EA2AVM	25,970	127	33	65
*EA2BNU	21,681	228	16	57
*EA5/RV2A	16,218	115	32	74
*EB3TR	8,450	127	9	41
*EA2AR	7,524	105	16	41
*EA5DB	6,413	71	19	34
*EA3AMI	4,216	71	22	46
*EA2XG	2,176	55	7	27
*EA4RY	1,536	33	11	21
*EA7JTP	140	10	5	9
*EA4FIT	8	2	2	2
*EA4U	20,856	124	28	60
*EC4AA	3,420	77	9	27

Sweden

SF4D	**177,424**	**1242**	**25**	**79**
		(OP: SM4LMV)		
SM2CEW	114,103	691	31	90
SM6GYB	12,760	175	12	46
SD1A	7,990	98	14	33
		(OP: SM1TDE)		
***SD6W**	**9,280**	**100**	**23**	**57**
		(OP: SM6PVB)		
*SM6LRR	616	22	8	20
		(OP: RM2D)		

Switzerland

HB9FEX	**54,249**	**243**	**39**	**130**
HB9JOE	19,894	109	34	64
***HB9TWU**	**36,330**	**523**	**13**	**57**
*HB9FLX	23,124	129	35	59

Ukraine

UT5EL	**1,575,520**	**1876**	**113**	**317**
UX2MF	529,948	954	87	274
UZ1WW	341,320	689	76	246
UR1HR	250,306	611	66	200
UT3QZ	110,682	399	48	150
UT2UB	34,210	199	28	82
UR5NLA	15,480	154	17	69
UT6UD	10,972	210	7	45
UT1QQ	2,812	88	6	32
***UT3HD**	**232,044**	**633**	**59**	**185**
*UW2U	218,304	494	65	223
		(OP: UR8UQ)		
*UT4EK	200,970	511	61	200
*UT3SO	171,756	605	52	182
*UT1AM	81,618	363	36	147
*UY5TE	72,063	342	39	118
*UX2QL	52,305	261	38	127
*UR7AL	42,408	176	38	86
*UX7QG	31,654	199	34	99
*UR5WQ	28,100	169	23	77
*UR4MS	26,780	172	30	100
*UY2ZZ	25,308	198	26	88
*UT5PY	15,060	244	8	52
*UR5UJ	13,433	126	24	77
*UT5UHX	11,132	91	30	62
*UT4Q	8,510	123	13	33
		(OP: UR5QRB)		
*UW1WU	4,180	48	18	26
*UT8IK	3,002	83	5	33
*UT4UB	2,310	41	16	26
*USØVA	1,152	22	11	13
*UR4EI	375	19	5	10
UT9UO	*140*	*13*	*5*	*9*
*UR5EH	108	7	5	7
*UR3ABM	2,048	62	10	22

Wales

GW4J	**30,532**	**245**	**16**	**52**
		(OP: GWØETF)		
***MW8R**	**114,192**	**563**	**27**	**77**
		(OP: GW4SHF)		
*MW6M	99,144	287	50	154
		(OP: GW4BVJ)		
*GW4HBK	71,280	264	46	134
*GW4W	47,058	252	22	71
		(OP: GW4EVX)		
*GW8KBO	34,846	176	33	98

OCEANIA

Australia

VL2A	**1,004,328**	**1467**	**91**	**170**
		(OP: VK2IM)		
VK2YI	266,705	510	69	136
VJ2Z	116,424	307	60	94
VL3E	63,423	340	24	57
		(OP: VK3TZ)		
VL2G	12,449	91	29	30
		(OP: VK2GR)		
VL2W	9,060	77	24	36
***VK2PAA**	**90,350**	**281**	**46**	**84**
*VK2WTT	9,856	74	23	33
*VK8D	9,840	65	21	39
		(OP: VK8MC)		
*VJ3O	5,876	56	17	35
		(OP: VK3TX)		
*VK4HDY	3,515	35	15	22
*VK1DD	1,035	23	12	11
*VL3A	540	20	10	10
		(OP: VK3FN)		
*VK3Z	160	6	5	5
*VK5MVR	156	9	5	7
VL3B	*0*	*1*	*1*	*1*
		(OP: VK3BQ)		
*VK4XQM	54	3	3	3

Hawaii

WH7T	**3,739,392**	**4442**	**106**	**182**
		(OP: WH7W)		
KH6DH	17,018	105	31	36
***KH6XX**	**26,999**	**209**	**20**	**29**
*NH6O	836	17	11	11

Indonesia

YB2MM	**286,657**	**494**	**65**	**152**
YB2HAF	133,037	307	62	111
YC8MJG	40,535	313	22	33
YC5DDE	24,424	157	32	54
YB9YSS	19,669	101	37	52
YB4NY	15,052	124	15	38
YB7KE	11,222	81	28	34
YF7RIX	3,510	63	12	18
YC8DUL	2,756	52	11	15
YC8SGY	2,046	52	13	18
YF3EQM	1,400	23	10	15
YB8UTI	1,026	29	7	12
YF3CYS	912	25	10	14
YF3GDE	437	15	9	10
YC3GFN	330	27	12	18
***YB3BBF**	**69,154**	**217**	**49**	**93**
*YB3BGM	53,277	161	48	81
*YF4ICC	50,485	187	45	70
*YB6UAK	34,711	182	37	66
*YC2XCD	32,092	206	25	46
*YD9VE	29,216	288	20	24
*YC9DPO	20,382	137	34	45
*YB6UAF	19,856	120	25	48
*YBØOHG	15,428	95	26	50
*YC5LCZ	14,522	107	15	38
*YB8RW	13,145	105	25	30
*YF3CZW	6,517	59	21	28
*YC7JZ	6,419	85	19	30
*YC9UAB	4,455	49	20	25
*YCØSJK	4,370	45	13	25
YB2MDU	*4,214*	*38*	*14*	*29*
*YB3ATK	3,008	55	14	18
*YG3DEA	2,862	55	10	17
*YB4PE	2,856	38	17	25
*YD9UAN	2,548	49	13	15
*YG8FX	2,352	67	11	13
*YD8SPY	2,088	50	10	14
*YC1HA	1,943	79	28	39
*YDØRCH	1,740	38	14	16
*YC1IUQ	1,612	31	9	17
*YC1CBY	1,586	39	12	14
*YC1GBR	1,368	46	7	12
*YD1FFB	420	15	6	6
*YD7AGF	351	14	5	8
*YD1DDO	319	13	4	7
*YD2KEN	289	21	7	10
*YG2ABP/1	288	14	5	7
*YD3RDW	288	16	6	10
*YG1AGB	90	15	4	5
*YC1BRG	60	69	6	9
*YCØSJA	39	8	6	7
*YB3BAR	2,210	37	16	18
*YB2CTE	1,770	35	11	19
*YC8MGN	920	42	10	10
*YD2NIR	24	3	2	2

New Zealand

ZM1A	**361,974**	**1150**	**32**	**90**
		(OP: ZL3CW)		
ZL3CW	3,975	58	13	12
***ZL1MTO**	**3,300**	**34**	**21**	**29**

Philippines

DY1T	**885,940**	**1463**	**75**	**145**
		(OP: DU1IVT)		
4I1EAY	80,869	476	23	48
DZ1Z	16,920	320	16	31
DU1NA	14,100	162	14	36
*DV9IHK	33,417	337	21	26
*DW7NDM	28,350	181	35	40
*DW7EVQ	14,912	185	15	17
*4E9VVN	13,632	206	19	29
*DU4XM	11,968	169	19	25
*DU4RER	6,510	69	29	33
*DU8WP	4,005	40	22	23
*DU7XD	2,976	49	11	20
*DU7PH	2,920	89	17	23
*DV1UUU	1,804	43	9	13
*DW6XIR	1,536	62	11	13
*DW2ZQB	950	22	10	9
*DV1VVA	520	28	5	8
*DV2ZNW	340	16	4	6
*DV1XJT	338	15	6	7
***4I1EBC**	**60,610**	**429**	**21**	**34**

SOUTH AMERICA

Argentina

***LW3DN**	**44,268**	**287**	**21**	**47**
*LU1RAF	40,432	317	19	37
LW6EQG	*22,152*	*143*	*29*	*42*
*LQ5D	7,860	128	12	18
		(OP: LU9DA)		
*LW6DW	1,185	35	8	7

Brazil

PS2T	**794,340**	**1549**	**46**

Chile

CE3CT	**2,372,210**	**2797**	**97**	**205**
CA4PSH	431,870	1648	22	73
CE4JZO	336,948	838	62	110
CE1BF	21,040	222	15	25
***3G1D**	**560,028**	**976**	**69**	**167**
		(OP: XQ1FM)		
*XQ3SK	219,356	706	53	69
XQ5CIE	*34,304*	*249*	*19*	*48*
*CB3R	23,856	155	21	50
		(OP: XQ3SK)		
*CE5OS	10,582	92	32	42
*CA2SLJ	6,820	136	12	19
*CE1LEW	5,148	109	13	23

Colombia

HK3C	**1,177,520**	**2002**	**53**	**152**
***HK4ZZ**	**26,145**	**153**	**40**	**65**
*HK4CM	1,287	32	11	22

Venezuela

***YV4EK**	**506,340**	**1027**	**53**	**127**
*4M1W	90,592	625	26	50
		(OP: YV1SW)		
*YV5AEP	23,298	129	13	53
*YY5FBD	22,560	137	31	65
*YV5KAJ	12,324	60	25	54
*YV5RPE	7,770	160	16	21

YOUTH

NORTH AMERICA

United States

District 2

NTØK	**760,767**	**794**	**84**	**273**
		(OP: K6BFL)		

District 4

*KO4SGC	231	11	6	5
***N4WLL**	**100,646**	**207**	**58**	**124**
*ND2L	272	13	8	9

District 6

KI6RRN	**1,409,580**	**1298**	**131**	**279**

District 8

***KE8HBV**	**97,865**	**216**	**56**	**129**
*W8UA	61,087	178	38	89
*KE8RJU	35,258	114	43	79
*N8AJM	12,551	62	31	46
*W8MTB	2,345	27	13	22

District 9

KD9V	**224,238**	**361**	**94**	**187**

District Ø

WDØREW	**40**	**4**	**4**	**4**
***KEØWPA**	**918**	**17**	**5**	**13**

Canada

District 3

***VE3OMV**	**49,088**	**168**	**43**	**75**

Cuba

***CM2CHR**	**8,413**	**69**	**10**	**37**

ASIA

Asiatic Turkey

***TA2BDD**	**1,634**	**32**	**4**	**15**

China

***BG6TOE**	**44,368**	**184**	**50**	**68**
*BH3WNL	5,456	51	16	28
*BA7LAC	3,510	56	13	17
*BG7GRE	754	29	15	14
*BH7CSA	700	24	14	14
*BG5GLD	560	14	10	10
*BH5HYB	6	1	1	1
*BA7LFI	7,656	100	18	26
*BG6VBM	1,197	32	9	12
*BG5GDP	966	23	10	11

India

***VU3XIO**	**81**	**5**	**4**	**5**
*VU3IYE	18	3	3	3

Japan

District 1

***JI1UPL**	**2,464**	**43**	**13**	**15**

District 2

JE2YRB	**1,788,830**	**1712**	**136**	**274**
		(OP: JL8XSO)		
***JR2KHB**	**48**	**4**	**3**	**3**

District 3

***JQ3BVC**	**4,956**	**68**	**21**	**21**

District Ø

***JJØTUC**	**126**	**10**	**4**	**5**

EUROPE

Austria

***OE9SEV**	**164,424**	**498**	**48**	**173**
*OE6NOA/P	42,864	201	42	110

Bosnia-Herzegovina

***E7ØAW**	**52,848**	**284**	**32**	**112**

Bulgaria

***LZ7NW**	**26,076**	**197**	**24**	**82**

Croatia

9A2ZI	**2,326,753**	**2151**	**138**	**445**
***9A3UCA**	**45,717**	**218**	**39**	**108**
*9A1RBZ	18,018	195	16	62
		(OP: 9A7AS)		

Czech Republic

***OK2DDS**	**32,058**	**228**	**27**	**90**
*OK9UWU	5,049	91	14	37

England

***2EØXYR**	**266**	**15**	**6**	**13**
*M7ELC	5,605	59	19	40
*2EØHXS	1,395	43	10	21
*M7HJR	520	20	8	18

European Russia

District 3

***R3MAI**	**11,398**	**112**	**18**	**64**

District 4

***R4WAS**	**43,005**	**200**	**41**	**100**

France

F4IDC	**157,855**	**402**	**72**	**169**

Germany

DL3ON	**1,083,013**	**1578**	**119**	**320**
DK5AV	204,336	568	65	199
***DJ4MX**	**654,150**	**784**	**106**	**339**
*DL3MLA	196,128	409	65	151
*DB5DY	180,752	474	58	150
*DO8JL	33,812	140	36	71
*DL9PKW	17,884	219	15	53
*DC2CL	12,540	103	30	65
*DN2HGM	1,932	30	18	24
*DN1MGF	182	23	9	17
*DH1OL	90	11	2	7
*DN4CQ	24	7	5	7

Greece

***SY8DQX**	**43,847**	**193**	**46**	**117**

Ireland

***EI5LA**	**5,880**	**96**	**15**	**45**
*EI8KW	624	24	8	18

Latvia

***YL3AMH**	**11,277**	**111**	**17**	**46**

Lithuania

***LY3LB**	**960**	**35**	**9**	**23**

Poland

SO9I	**5,263,831**	**4005**	**148**	**465**
		(OP: SQ9ORQ)		
***SP3GTP**	**72,954**	**323**	**44**	**145**
*SP3LM	15,128	212	14	47
*SP8BRT	14,193	125	23	60
*SP3KX	6,208	85	15	49
*SQ7NPA	6,072	54	16	28
*SP8KDE	4,242	98	6	36
*SP9DLS	2,135	68	6	29
*SP4DIR	1,386	48	8	25
*SP5JK	750	18	11	14
*SP5PDA	177,731	583	52	171

Portugal

***CT7AKG**	**4,100**	**66**	**14**	**36**

Romania

***YP1EX**	**232,427**	**678**	**63**	**184**
		(OP: YO9LIG)		
*YO8YNS	1,125	41	7	18
*YO8PUF	936	33	7	17
*YO8THR	255	15	5	10

Serbia

YU3AWA	**1,466,465**	**2178**	**109**	**346**
***YU3LAX**	**113,600**	**498**	**40**	**160**

Sicily

***IT9IQN**	**11,016**	**88**	**19**	**49**

Spain

***EA1FIN**	**42**	**4**	**3**	**4**

OCEANIA

Australia

VJ2G	**132**	**8**	**6**	**6**
***VK3D**	**0**	**1**	**1**	**1**
		(OP: VK3DNS)		

East Malaysia

***9W6JNR**	**3,458**	**105**	**11**	**15**

Indonesia

***YD2UWF**	**76,076**	**301**	**25**	**66**
*YC1LJT	61,317	275	21	60
*YD3RAN	70	10	4	6
YC2CPQ	*1,144*	*25*	*11*	*11*

New Zealand

***ZL1CAP**	**864**	**21**	**11**	**16**

Philippines

***DW2ZOL**	**572**	**18**	**7**	**6**

SOUTH AMERICA

Brazil

PY2IG	**563,563**	**1583**	**35**	**108**
***PU2VLI**	**59,772**	**316**	**20**	**48**
***PU2SZK**	**12,480**	**161**	**18**	**30**

MULTI-OPERATOR SINGLE TRANSMITTER

NORTH AMERICA

United States

District 1

KC1XX	**14,560,432**	**6548**	**161**	**635**
K1LZ	7,849,968	4023	154	578
K1KP	2,470,404	1768	116	392
K1WAS	108,058	223	55	139
W1YK	30,492	153	27	72
N7ECM	15,054	74	24	54
***W1QK**	**1,396,395**	**1099**	**100**	**355**
*W1FM	591,374	583	91	280

District 2

W2A	**4,345,230**	**2660**	**128**	**473**
WA2JQK	305,727	433	80	223
***K2ZV**	**40,120**	**157**	**33**	**85**

District 3

K9RS	**2,783,231**	**1722**	**138**	**463**
KC3R	2,729,090	2254	110	345
AD3C	1,299,178	1159	110	353
NS3L	226,632	324	76	190
ND3D	163,333	271	63	170
K3OQ	13,516	78	13	49
***W3ZGD**	**611,340**	**650**	**91**	**254**
*W3PIE	6,902	65	21	37

District 4

N4SS	**2,666,122**	**1919**	**119**	**383**
W4MLB	1,242,318	1130	112	350
K4RM	898,650	782	108	342
K3TD	390,920	497	67	223
***WA1F**	**483,218**	**579**	**72**	**235**
*KT4XA	177,822	307	71	151
*KT3T	149,079	258	69	160
*K4CBW	64,170	172	51	104
*AD4XT	56,168	174	43	93

District 5

KK4JI	**226,512**	**377**	**81**	**153**
KE5GL	117,047	298	54	107
***W5WX**	**3,380**	**45**	**24**	**28**

District 6

N6MDX	**382,590**	**765**	**83**	**135**
***NN6P**	**345,800**	**652**	**67**	**133**

District 7

W7VJ	**1,432,142**	**1299**	**127**	**292**
WW7E	595,188	678	111	223
W7YED	329,992	510	86	161
AB7HP	20,384	99	35	63
KC7ZZ	2,223	37	15	24
***WA7RJ**	**7,437**	**58**	**33**	**34**

District 8

K8AZ	**5,181,780**	**2818**	**147**	**523**
W8PR	2,805,115	1896	125	420
K8LX	2,087,568	1718	107	349
KA8YNW	168,800	320	63	148
***W8AJT**	**41,100**	**144**	**38**	**99**

District 9

NV9L	**5,978,412**	**3162**	**157**	**525**
K9YY	1,889,536	1450	126	358
***K9IU**	**31,680**	**123**	**35**	**61**
N9MT	*1,200*	*19*	*11*	*14*

District Ø

WØMB	**613,200**	**660**	**108**	**242**
NRØT	237,276	388	71	163
NØAX	11,656	76	24	38

Antigua & Barbuda

V26B	**6,572,664**	**5155**	**121**	**431**

Belize

***V3A**	**4,519,686**	**4923**	**99**	**303**

Canada

District 1

VO1GRC	**357,136**	**712**	**56**	**165**
VY2OM	220,780	470	53	137

District 2

VE2LOA	**335,520**	**553**	**57**	**176**
***VE2ZL**	**248,400**	**387**	**73**	**167**

District 3

VE3EJ	**13,214,691**	**6457**	**163**	**620**
***VE3WPZ**	**255,714**	**484**	**68**	**150**

District 6

VE6SV	**4,339,692**	**4467**	**134**	**342**
VE6AO	425,700	1507	57	93

District 7

VE7SAR	**232,512**	**652**	**61**	**107**

District 8

VYØERC	**483,759**	**1131**	**52**	**119**

Cayman Islands

ZF1A	**13,011,800**	**8442**	**152**	**528**

Costa Rica

TI1K	**3,875,868**	**4678**	**105**	**309**
***TIØRC**	**1,372,597**	**2323**	**91**	**216**

El Salvador

***YS1YS**	**269,152**	**561**	**56**	**152**

Greenland

OX7A	**2,639,340**	**3174**	**72**	**258**

Panama

HP3SS	**2,857,344**	**3167**	**91**	**293**

Puerto Rico

KP3Z	**12,514,080**	**7895**	**152**	**544**

St. Lucia

J68HZ	**7,056,638**	**7105**	**124**	**342**

Turks & Caicos Islands

***VP5DX**	**3,314,760**	**3225**	**109**	**351**

AFRICA

Kenya

5Z4VJ	**3,506,750**	**2959**	**100**	**315**

Madeira Islands

CQ9T	**7,108,233**	**4740**	**112**	**405**

Malawi

7Q6M	*593,481*	*1175*	*51*	*126*

Reunion Island

FR4KR	**7,101,384**	**5666**	**108**	**341**

South Africa

***ZS1CRG**	**1,152**	**20**	**11**	**13**

The Gambia

C5C	**56,048**	**204**	**32**	**81**

ASIA

Asiatic Russia

District 9

RA9Y	**6,071,826**	**4545**	**124**	**419**
RK9CYA	890,804	1130	69	247
RC9J	497,960	803	56	180
***RY9YAD**	**14,025**	**75**	**28**	**57**

District Ø

***RØMM**	**3,822**	**66**	**19**	**20**

Asiatic Turkey

TC3A	**3,536,652**	**3012**	**106**	**320**
***TC7G**	**1,682,730**	**1963**	**64**	**251**
*TC7TR	166,848	417	42	134
*TC2MARS	49,294	206	20	78
*YM2KCY	23,585	157	18	71
*YM7KG	3,060	52	8	22

China

BØA	**6,622,365**	**4455**	**129**	**436**
BA7LOK	1,850,304	2245	102	266
BY5EA	1,740,028	2026	120	284
BY8DX	1,351,100	1926	77	218
BG7JJW	654,420	1261	77	183
BY6QS	429,624	876	79	164
BY3CQ	380,148	902	71	166
BY1AS	376,428	906	69	159
BG5BWZ	171,770	477	66	112
BY6LY	162,324	585	56	106
BI4IV	81,383	544	36	61
***BD7DT**	**1,918,617**	**1978**	**117**	**300**
*BY8MA	120,848	330	57	125
*BA7LSX	93,294	340	51	95
*BI4IX	69,168	264	47	85
*BH2RO	50,292	260	55	77
*BA3RA	10,880	107	38	42
*BH4CAC	10,608	76	30	38
*BI1GK	3,773	64	23	26
*BH3BBJ	960	42	9	11

Cyprus

P33W	**22,422,596**	**9654**	**181**	**645**

Hong Kong

***VR2HK**	**86,043**	**344**	**42**	**87**
*VR2UNG	1,248	34	16	16

Israel

4X1DX	**8,626,680**	**4858**	**141**	**479**

Japan

District 1

JA1ZGP	**26,316**	**211**	**14**	**37**
***JA1YAD**	**6,552**	**78**	**23**	**29**
*JA1YQK	486	13	8	10

District 2

JI2ZJS	**3,177,600**	**2582**	**148**	**332**
JI2ZEY	1,022,176	1472	97	175
***JK2VOC**	**150,181**	**374**	**73**	**106**

District 3

JL3ZHU	**184,830**	**421**	**66**	**117**

District 7

JA7ZFN	**5,063,020**	**3126**	**165**	**431**

District 9

JA9YBA	**20,700**	**96**	**34**	**56**

Saudi Arabia

HZ1TL	**1,907,763**	**1614**	**106**	**323**
***HZ1LG**	**4,509,756**	**3768**	**111**	**338**

Thailand

E2A	**2,351,720**	**2320**	**122**	**332**
HS6VW	87,606	274	51	106
***HS2UPR**	**237,385**	**520**	**69**	**128**
*E21AK	12,736	99	27	37

United Arab Emirates

A61BR	**3,635,226**	**3272**	**87**	**326**

West Malaysia

9M2S	**157,563**	**688**	**48**	**75**
***9M4CKM**	**33,157**	**190**	**31**	**40**

EUROPE

Austria

OE1XTU	**169,642**	**526**	**52**	**190**
OE5XRL	49,200	182	49	74

Azores

CCQ8M	**3,431,232**	**3714**	**97**	**347**

Belarus

***EW8ZO**	**434,232**	**1028**	**66**	**260**

Belgium

OT5X	*787,642*	*1282*	*95*	*303*
***ON/PD5S**	**479,385**	**1282**	**78**	**257**
*ON3RC	13,104	163	16	68

Bosnia-Herzegovina

E7DX	**13,550,160**	**7660**	**181**	**679**
***E7CW**	**2,690,441**	**2887**	**135**	**458**
*E7GZ	642,330	957	95	295
*E7ØSIC	102,816	382	52	137

Bulgaria

LZ5R	**13,441,288**	**8241**	**180**	**653**

Croatia

9A2W	**1,179,216**	**1432**	**100**	**331**
***9A5G**	**54,096**	**260**	**36**	**125**
*9A9D	10,668	106	18	66
*9A1AAY	4,116	76	12	30

Czech Republic

OK5Z	**10,018,100**	**5539**	**178**	**652**
OL7T	2,358,696	2711	132	420
OL4D	757,096	1420	92	312
OK2KOJ	744,970	1097	95	300
OK1KQH	494,845	1008	85	246
OK1KKI	364,656	983	64	220
***OK1RPL**	**323,337**	**979**	**59**	**208**

Denmark

OV5TC	**866,124**	**997**	**124**	**367**

England

G4ANT	**3,887,268**	**3261**	**140**	**448**
M4A	3,673,275	3392	146	499
G3M	2,161,516	2308	107	371
G5O	1,081,509	1357	98	331
G3B	847,440	1167	104	336
***MX4Y**	**1,066,968**	**1506**	**110**	**401**
*GØGHK	393,908	667	73	219
*MØYRC	147,375	506	53	172
*G3RCM	118,116	485	45	159
G3WRS	*15,768*	*251*	*16*	*57*
*GX4MWS	5,332	88	15	47

European Russia

District 1

RU1A	**11,745,330**	**7719**	**176**	**654**
RM1Q	195,390	572	62	172
***R1ZM**	**28,737**	**199**	**31**	**72**

District 3

RT2C	**4,897,536**	**4965**	**147**	**525**
R3VR	*1,991,616*	*3112*	*97*	*354*
R5DC	792,084	1360	101	342
RM3A	215,337	892	43	136

District 4

UC4L	**2,316,492**	**2811**	**118**	**416**
***RK4HYT**	**172,640**	**549**	**52**	**208**
*UC4C	170,772	440	71	195

District 6

UA7K	**10,264,555**	**7359**	**179**	**626**
RT6A	9,419,228	7160	172	619

District 9

RC9X	**422,624**	**1267**	**68**	**213**

Finland

OF1F	**6,249,152**	**4854**	**160**	**594**
OF5Z	4,216,000	3320	168	607

France

TM6M	**14,606,216**	**7845**	**174**	**634**
TMØR	10,732,932	6572	165	591
TM3R	9,174,448	5423	167	605
TMØDX	7,634,669	5163	161	560
TM5DX	2,132,757	2162	113	360
F8KCF	2,066,112	2187	127	417
TM2F	1,171,853	1400	116	347
F4KJN	868,637	1316	84	235
TM2RJ	730,235	1512	89	266
F6KJS	708,470	1305	95	311
F8KGH	624,880	776	103	325
F4KLW	578,966	973	84	253
F5KSE	254,997	583	68	193
F4KKV	7,029	57	25	46
***F8KGS**	**1,245,024**	**1740**	**100**	**293**
*F8KHN	237,921	1112	45	168
*F6KGL	118,584	385	56	160
*F8KLY	45,750	196	40	85
*F6KVJ	30,057	179	39	90
*F6KMB	29,040	214	26	84
*F6KJG	15,364	99	30	62
*F5KGA	4,489	71	20	47

Germany

DRØW	**6,885,192**	**4679**	**162**	**570**
DP6T	5,684,406	3742	160	558
DP6A	5,242,328	3479	167	591
DA2X	4,904,543	3223	161	582
DLØWM	2,167,450	2173	147	500
DP9I	1,353,888	1910	92	340
DLØLK	735,360	1115	90	293
DR1C	658,735	1201	90	323
DLØWW	614,262	907	101	350
DP4G	534,963	1175	66	253
DLØHMK	412,902	835	79	260
DLØYFD	227,232	577	67	196
DN5HR	2,232	24	18	18
***DD4A**	**4,158,960**	**3098**	**151**	**537**
*DG4O	263,304	681	66	252
*DLØIFM	33,117	166	42	91
*DM6A	27,690	189	29	101
*DLØTN	15,925	122	28	63
*DFØEG	1,833	34	17	22
*DN1NE	192	13	4	12

Greece

J42L	**6,294,450**	**5112**	**160**	**565**
SZ1A	2,619,526	3453	130	388

Hungary

HG6N	**7,247,016**	**5064**	**169**	**587**
HG5A	6,169,122	4628	156	522
HA3DX	4,284,224	3957	133	451
HG4KID	269,730	724	63	207
HG5KID	255,316	1318	28	88
HA3PCF	30,625	154	33	92
***HG5P**	**10,126**	**95**	**20**	**63**

Ireland

EI9E	**5,184,244**	**4202**	**140**	**536**

Isle of Man

MD4K	**3,768,856**	**3330**	**142**	**526**

Italy

IR4X	**13,906,971**	**7031**	**176**	**667**
IR2C	9,559,715	5460	176	627
II8K	6,039,645	4981	148	537
IR2L	5,801,642	4241	158	549
IB1D	3,693,488	3013	144	448
IR7T	3,587,000	3037	156	524
IOØA	2,053,842	2209	131	422
IO7T	2,037,497	2497	140	423
IU3MDI	1,723,167	1673	126	387
IQ5PJ	1,353,216	1749	116	396
IQ8BB	912,870	1475	102	339
IQ2CJ	802,217	1134	83	216
IQ4SC	295,450	614	81	230
IR8W	251,008	1260	35	113
IQ3CO	243,180	632	62	190
IN3IKC	239,184	569	64	200
IZ4TNW	151,944	329	75	237
IZ8XMD	*92,400*	*339*	*46*	*122*
***IQ3RK**	**2,774,511**	**2515**	**141**	**516**
*IIØK	30,368	173	42	104

Liechtenstein

HBØA	**2,120,424**	**2835**	**90**	**334**

Lithuania

LY7T	**76,773**	**337**	**46**	**111**
***LY2WR**	**1,886,050**	**2121**	**134**	**429**
*LY2J	813,256	1125	111	361
*LY5BA	28,148	196	29	95

Netherlands

PA6X	**3,095,412**	**3296**	**141**	**487**
PI4RS	1,000,480	1682	91	325
PA6V	471,580	891	80	260
PI4MM	*80,100*	*295*	*48*	*130*
***PI4DLZ**	**62,700**	**314**	**41**	**124**

Northern Ireland

***MNØVFW**	**51,181**	**283**	**28**	**99**

Norway

LN1B	**1,486,072**	**2187**	**95**	**351**
LA3T	123,984	420	53	136
**LA1K/P*	*1,036*	*35*	*7*	*21*

Poland

SP8R	**11,746,990**	**6783**	**177**	**653**
SP5T	3,023,020	2593	141	463
SO7E	1,338,000	2487	80	320
SP8PAI	577,975	778	102	277
SN9AT	554,540	1103	88	252
SP9KUP	96,278	317	50	132
SN1M	67,938	205	56	78
SP8PDE	4,601	107	9	34
***3Z1K**	**942,144**	**1436**	**112**	**336**
*SN6E	572,292	945	89	289
*SN9H	119,544	494	43	161
*SN9A	114,270	399	48	147
*SP6ZHP	14,100	108	25	50

Portugal

***CR5K**	**162,120**	**385**	**60**	**150**

Romania

YR2X	**228,800**	**423**	**79**	**181**
*YO4KAK	56,885	240	45	110

Scotland

MM2N	**4,299,993**	**4197**	**137**	**466**
***GM5G**	**439,175**	**1022**	**65**	**210**
*GM4AGG	18,408	157	20	58

Serbia

YU5R	**3,288,096**	**3159**	**140**	**448**
YU1AFV	96,135	1193	17	68
***YT1Z**	**719,584**	**785**	**120**	**332**
*YTØB	42,952	264	35	83

Sicily

II9P	**9,832,407**	**6266**	**174**	**619**
IO9A	5,501,265	5219	137	468
IO9R	360,288	957	75	203
***IB9T**	**3,649,171**	**3077**	**152**	**539**
*IR9R	2,757,900	2677	139	495

Slovak Republic

OM7M	**10,882,032**	**6158**	**179**	**655**
OM5M	2,750,100	2576	144	474
***OM6H**	**163,618**	**565**	**53**	**164**

Slovenia

S53M	**9,194,175**	**5610**	**167**	**604**
S54K	1,658,385	2615	94	317
S52C	327,888	688	69	184

Spain

ED7R	**8,535,826**	**5397**	**149**	**554**
EC1T	1,435,434	1557	109	353
ED2W	17,289	239	26	87
***ED7O**	**4,509,773**	**3871**	**149**	**524**
*ED7B	3,410,676	3360	138	474
*ED3C	1,399,692	1569	111	421
*ED3D	217,200	753	58	182
*ED1N	157,398	677	52	170
*EA3URC	68,068	380	35	119
*EA3RCI	54,075	280	39	136
*EE2E	153	11	7	10
*EA5IPR	24	4	2	4

Sweden

SJ2W	**9,798,591**	**6550**	**169**	**620**
SB3W	1,557,220	2080	113	377
SKØQO	514,476	1006	93	279
SK6EE	289,956	592	93	238
SE3Y	23,533	139	31	70
***SK6L**	**60,060**	**279**	**41**	**99**

Switzerland

HB9NE	**7,131,807**	**4907**	**154**	**575**
HB9H	5,076,360	3576	158	559
HB9PUE	2,435,301	2559	124	437
HB9ZZ	89,984	251	53	95
HB2C	73,112	425	28	124

Ukraine

UR4NWW	**31,624**	**214**	**28**	**90**
UT7AXA	5,194	78	14	39
UR4PWC	3,800	66	14	36
***UW7W**	**1,276,248**	**1542**	**124**	**368**
*UZ5P	322,524	876	61	218
*UW6M	180,452	672	46	183
*UR7TWY	101,404	395	47	155
*UR4PWU	17,922	103	30	73

OCEANIA

Australia

VK6N	**1,993,524**	**2418**	**95**	**243**
VL4R	786,384	1193	93	165
***VL4A**	**162,976**	**411**	**68**	**108**

East Malaysia

9M4CRP	**16,352**	**194**	**24**	**32**
***9M4CKT**	**7,084**	**117**	**19**	**27**

Hawaii

NH6JC	**795,056**	**1825**	**65**	**93**

Indonesia

7AØC	**263,255**	**588**	**58**	**127**
***7AØD**	**97,512**	**291**	**43**	**93**
**7D1C*	*71,155*	*283*	*34*	*73*
*7A1B	59,130	212	49	97
*7I3I	5,760	108	14	26
*7E1T	5,500	80	22	33
*7E8E	2,508	52	10	9

New Zealand

ZM2K	**1,234,912**	**1574**	**96**	**200**

Philippines

DZ1REC	**19,648**	**231**	**26**	**38**
DX1EVM	684	62	17	19
***DX3A**	**104,800**	**422**	**39**	**61**
*DW2AFO	52,922	311	38	56
*DX3EVM	52,312	331	43	61
*DX9EVM	46,530	384	37	57
*DZ1PUP	24,705	253	35	46

SOUTH AMERICA

Argentina

LO7H	**2,852,345**	**2740**	**112**	**279**
LR3D	895,120	1158	104	231
LU1WUD	174,640	586	60	125
***LV4V**	**905,310**	**1315**	**85**	**185**

Bonaire

PJ4G	**13,111,480**	**6582**	**154**	**558**

Brazil

PY3MM	**85,320**	**433**	**26**	**46**
PY2VN	26,010	102	42	60
***ZW8T**	**2,378,250**	**2337**	**92**	**283**
*PP5EI	655,200	958	78	195
*PY1GQ	525,094	920	50	156

Chile

3G4K	**118,941**	**493**	**45**	**78**
***CB1C**	**882,895**	**1611**	**79**	**156**
*CB3W	352,451	847	55	124
*CB4T	218,370	529	55	119

Fernando de Noronha

PYØF	**8,075,454**	**5801**	**126**	**388**

French Guiana

***FY5KE**	**10,901,754**	**5651**	**150**	**516**

Paraguay

ZP5AA	**5,092,537**	**4076**	**114**	**349**
***ZP6RAI**	**1,316,094**	**1820**	**81**	**201**

Peru

OA4O	**1,570,464**	**1930**	**87**	**241**

Trinidad & Tobago

***9Z4A**	**31,341**	**138**	**36**	**57**

MULTI-OPERATOR TWO TRANSMITTER

UNITED STATES

W3LPL	**11,708,631**	**5601**	**162**	**611**
K1RX	**10,437,328**	**5776**	**143**	**539**
K9CT	**7,757,400**	**4590**	**165**	**535**
K1CC	7,533,834	3822	146	563
K2AX	**6,709,300**	**3619**	**147**	**529**
W2CG	6,017,270	3284	148	522
AA4VT	**4,324,023**	**2652**	**140**	**481**
W6YX	**2,986,284**	**2393**	**143**	**344**
NJ3I	2,496,945	1644	128	427
N7DX	**2,274,612**	**2009**	**124**	**312**
KQ3F	2,180,952	1443	127	425
NA4DA	1,916,000	1401	115	385
KT7E	1,624,455	1542	127	278
W8BI	**1,479,075**	**1210**	**123**	**358**
K3CCR	992,116	947	96	292
W1HS	884,768	924	75	269
W1SRG	457,881	601	69	208
K2DM	238,425	363	74	181
W2NPT	177,282	353	53	136
WC8VOA	98,735	247	42	113

NORTH AMERICA

VA2UR	**6,495,000**	**4382**	**131**	**469**
VE6FI	**786,148**	**1990**	**71**	**116**
VE9MWA	**649,368**	**1099**	**53**	**179**

AFRICA

ZS6MRK	**306,820**	**511**	**65**	**165**

ASIA

JR8VSE	**4,933,680**	**3901**	**155**	**333**
B4T	**3,927,570**	**3797**	**128**	**317**
JA7YRR	**3,879,835**	**3568**	**132**	**283**
JQ1YUF	**2,624,247**	**2611**	**125**	**262**
YM3VBR	**2,258,481**	**2675**	**71**	**238**
B1Z	1,524,386	1988	115	279
B4R	942,007	1573	97	222
VU2XE	**737,978**	**1039**	**58**	**205**
E2E	**667,314**	**1234**	**72**	**211**
TC3EC	297,984	598	50	142
HS8HEX	204,204	438	66	138
BI4XYS	158,175	620	60	111
BH3GIY	148,608	620	64	108
BVØTY	*46,800*	*402*	*31*	*49*
BV2A/3	**36,113**	**270**	**27**	**50**
9M2U	**35,600**	**191**	**33**	**56**
9M2R	22,780	195	29	38
JA6YBR	**9,798**	**70**	**31**	**38**
JA2YKA	**525**	**13**	**11**	**10**

EUROPE

ES9C	**18,602,780**	**11827**	**187**	**703**
EI7M	**18,472,050**	**11260**	**174**	**636**
CR6K	**17,546,958**	**10841**	**167**	**635**
II2S	**14,661,120**	**8613**	**179**	**651**
ED1R	**14,299,362**	**9405**	**175**	**623**
IR6T	14,214,200	8677	177	604
9A7A	**13,411,518**	**8309**	**169**	**617**
UA4M	**11,539,200**	**9519**	**175**	**625**
IB9A	**10,445,652**	**7458**	**165**	**591**
HG7T	**8,193,474**	**6285**	**165**	**568**
CR2M	**7,090,062**	**5604**	**136**	**533**
CR6P	6,756,121	6737	130	469
G6XX	**6,279,644**	**5198**	**148**	**538**
SO4R	**6,257,088**	**5779**	**141**	**498**
IB8A	6,256,572	5688	151	482
IQ4FA	5,962,044	4843	162	520
TM1O	**5,045,638**	**5665**	**139**	**472**
GM2T	**3,169,446**	**3542**	**129**	**450**
EE5T	3,058,104	2834	148	520
PI4M	**2,836,976**	**3329**	**130**	**432**
PAØAA	2,692,132	2868	129	467
CR5T	2,672,439	3060	109	394
IO1C	1,776,600	3111	108	342
OE5T	**1,733,424**	**1918**	**119**	**350**
OQ4Q	**1,595,664**	**1981**	**115**	**389**
LA4C	**1,431,294**	**2284**	**98**	**349**
SZ3P	**1,416,000**	**3034**	**83**	**292**
C37N	**1,300,520**	**2326**	**81**	**329**
R2VA	**862,524**	**1719**	**88**	**300**
ISØBWM	**796,688**	**1360**	**100**	**304**
JW5E	**693,342**	**1511**	**70**	**164**
ED2R	578,544	1219	69	203
IQ2LS	196,088	538	52	141
IQ2XI	154,077	407	54	199
M3P	152,568	425	59	175
F8KFZ	122,590	411	61	144
DK8ØZUSE	**12,560**	**101**	**25**	**55**
SM6XUZ	**2,288**	**57**	**9**	**35**
LA1UKA	*2,242*	*52*	*9*	*29*

OCEANIA

VJ4K	**6,998,388**	**5556**	**136**	**330**
7A2A	**3,006,042**	**2627**	**119**	**323**
VL5X	273,460	525	71	155
VK4DH	270,225	491	78	147
DX7HQ	**46,584**	**287**	**30**	**42**
DX2EVM	39,072	144	41	70

SOUTH AMERICA

PJ4K	**24,916,506**	**12462**	**160**	**538**
HD8R	**17,996,120**	**10352**	**153**	**467**
PX2A	**15,951,068**	**8556**	**159**	**520**
LT1F	**10,054,617**	**6574**	**136**	**427**
ZY2A	2,349,594	2517	89	262
PY5FNB	34,317	195	43	80

MULTI-OPERATOR MULTI-TRANSMITTER

UNITED STATES

K3LR	**27,941,270**	**12337**	**183**	**706**
K1TTT	**10,253,024**	**5956**	**155**	**591**
WX3B	10,232,750	5819	150	521
N1RR	5,289,424	3355	125	444
K3EST	**5,150,697**	**3907**	**163**	**410**
K1KI	3,117,994	1942	135	458
WA3EKL	2,699,880	1683	136	468
W3MF	2,258,308	1485	125	423
NE3F	2,106,473	1487	130	421
W1AW	1,327,435	1207	108	337
K2RD	**1,119,872**	**1006**	**125**	**291**
N5AA	**190,482**	**233**	**96**	**222**
W4CAR	**157,090**	**307**	**63**	**167**
N2OEF	151,145	298	47	138
K5LRW	70,074	190	57	96
W8EDU	**768**	**21**	**9**	**15**

NORTH AMERICA

KL7RA	**14,364,000**	**10941**	**159**	**401**
HI3LT	**7,142,109**	**6449**	**119**	**388**
VE5PV	**913,308**	**2070**	**71**	**151**

ASIA

A73A	**24,902,052**	**11720**	**173**	**613**
A44M	**7,375,396**	**4875**	**132**	**454**
JA3YBK	**7,008,380**	**4869**	**153**	**403**
BY1CY	**384,240**	**983**	**78**	**162**
9M2A	**127,920**	**498**	**48**	**72**
9M2N	35,242	242	30	37
9M2PPM	7,076	123	8	21
JA2YGP	**2,880**	**54**	**22**	**26**

EUROPE

M6T	**20,557,230**	**12771**	**180**	**690**
EW5A	**19,500,560**	**12706**	**186**	**679**
DFØHQ	**18,698,750**	**11786**	**184**	**691**
LZ9W	**18,465,060**	**12891**	**179**	**663**
YT5A	**17,055,180**	**12273**	**181**	**639**
DP7D	11,945,140	8622	166	598
OT5A	**11,710,660**	**9046**	**163**	**567**
LN8W	**11,501,880**	**8182**	**180**	**628**
F6KOP	**5,926,066**	**5216**	**149**	**545**
3A3A	**2,734,260**	**5046**	**104**	**354**
GM6NX	**2,204,352**	**2669**	**123**	**453**
ES3V	**1,859,426**	**2263**	**136**	**442**
LY2ZO	**1,847,445**	**3498**	**94**	**341**
LN2T	1,620,324	2417	107	379
SP9KAO	**1,243,012**	**1837**	**110**	**348**
MØHFC	1,099,332	2179	86	262
OZ4EDR	**1,043,375**	**1931**	**101**	**324**
SD6D	**876,022**	**2352**	**71**	**272**
PI4CC	**640,900**	**1026**	**77**	**263**
TM8AB	369,360	731	75	229
SZ8ERS	**333,154**	**883**	**82**	**232**
YT5L	44,280	270	32	103

OCEANIA

7B1B	**307,692**	**710**	**61**	**137**
DX1MK	**149,040**	**648**	**51**	**69**
7E3E	2,200	35	18	22

SOUTH AMERICA

PJ2T		**29,985,664**	**14534**	**164**	**575**
HC1QRC		**3,382,470**	**3387**	**103**	**287**
HC2GRC		1,197,592	1785	89	159

EXPLORER SINGLE-OPERATOR

9G5FI	**A**	**3,401,025**	**2859**	**93**	**318**
RL6M	**"**	**1,254,829**	**2006**	**105**	**362**
K7RB	**"**	**123,690**	**249**	**58**	**132**
OE6SWG/P	*"*	*75,255*	*355*	*36*	*137*
OE5CWO/P	*"*	*68,224*	*294*	*47*	*117*
W2MRD	"	3,483	33	20	23
PY2MD	**"**	**1,320**	**25**	**12**	**12**
W7AOF	**"**	**640**	**12**	**8**	**12**
PY2BND	"	368	12	8	8

EXPLORER MULTI-OPERATOR

SX2I	**A**	**5,937,680**	**6454**	**148**	**496**
Z6ØA	**"**	**4,110,700**	**5204**	**124**	**426**
9H6A	**"**	**3,611,520**	**4837**	**120**	**408**
IQ4RN	**"**	**2,236,416**	**2295**	**127**	**385**
EE7K	**"**	**1,113,315**	**1821**	**113**	**348**
IB2C	"	978,656	1322	110	366
KP2B	**"**	**648,324**	**1261**	**70**	**173**
ED3ST	*"*	*244,512*	*890*	*52*	*164*

Check Logs

3ZØX, 4U1A, 4X4LF, 9A1AA, 9A2R, 9A2WB, 9A5W, 9A6TT, 9K2YD, A62A, AA8SW, AA9RK, AE2W, BD4SDO, BD6AHP, BG2TAA, BG6GQE, BG8GAM, BG9HKP, BH8PHG, BU2FJ, CE2LR, CO2AME, CO2RQ, CS7AWB, CT1CDP, CT1EGW, CX1BBS, CX2AQ, CX4AD, CX5ACG, CX9AU, DF2AJ, DF9HI, DG2RON, DJ3CQ, DJ7UC, DJ8RS, DK3RA, DK5OCE, DK6VCO, DK6YA, DK8NC, DL1HUH, DL2DXA, DL2TOS, DL3KDP, DL4VBU, DL5MHK, DL5NO, DL5YL, DL6DH, DL6GV, DL7UGN, DL8FMA, DM1PL, DU7HF, E7/Z35M, E72NA, E72U, E74O, E7C, EA1GT, EA1W, EA3A, EA3CS, EA3FUJ, EA3GCV, EA3RR, EA3TA, EA3WD, EA4BAS, EA4FVT, EA4TX, EA5ITJ, EA5R, EA7JHC, EA7KFM, EA8DDS, EA8SR, EB1ADD, EB5A, EC1DJ, ED7G, ED8W, EI4KF, ER3DX, ES2RR, ES8TJM, EU1FQ, EU1KY, F1TIO, F4EPM, F4EUG, F4HJC, F4JAW, F6AGM, F6ARC, F6IRA, GØBIX, G4NXG, G7COU, G7IXU, HA2D, HA2EAV, HA5OV, HA8QZ, HB9AMO, HB9EYP, HB9GNL, HB9RB, HI8T, HK3TK, HK4L, IØIJ, I5JHW, IB1B, IH9/OK1WMR, II3R, IKØFUX, IK1BPL, IK2SAI, IK5BOH, IN3IKF, IU2BHI, IU2IDU, IU4FLP, IV3BCA, IV3HAX, IV3IPS, IV3OKO, IV3SKB, IZØGXM, IZ1KGK, IZ3GNG, JA1JPM, JA2KVD, JA5FNX, JA8AZN, JE1QHP, JH1FSB, JH1LEM, JH4JNG, JH7RTQ, JJ2QXI, JL3VUL, JN3TSY, JS6RTJ, JT1CS, KØBBC, K1DW, K2ZW, K3WWT, K5PS, K6OK, K8OZ, KB1GKN, KD6WW, KE5ES, KI4YY, KJ7HHG, KK4KWF, KK4OJV, KO4OL, KO4QCC, KQ7TJ, L77D, LA1U, LA9OI, LC4C, LC6C, LS2D, LU1DK, LU3WC, LU5FF, LW3DG, LW7EJP, LX/ON4EI, LX1EA, LX2AS, LY2CO, LY4OO, LY5PW, LY5T, LZ1KZ, LZ1MC, LZ1MS, LZ1QN, LZ1YF, MØEUK, MØLDW, MØPCZ, MØTRJ, M3M, M5ADL, M5W, M7GGY, M7LHG, MU2K, N6OS, N7MU, NH7PE, NIØG, NI2Q, OH1H, OH1NDA, OH1ZK, OH2IS, OH5BE, OH5XB, OH7K, OK1AYU, OK1MP, OK1RDO, OK2AP, OK2PAY, OK2QX, OK2SG, OK2SLS, OK4MM, OK6D, OL5G, OM2FY, OM5CD, ON/SQ2PRZ, ON4LDP, OY9JD, OZ1ADL, PAØVLY, PAØWBP, PA3DZA, PA4J, PB1RWZ, PDØFW, PDØGO, PDØSOT, PD7ED, PP2RON, PU1KGG, PU2VLW, PY2VM, PY7XC, R2AB, R2ZC, R4GM, R6DOB, R6KY, R6YY, R9AB, RA4AAT, RA5G, RA9DZ, RC7KY, RJ3AA, RKØUN, RK3MXT, RM2A, RN3FS, RN6L, RTØO, RT2D, RT4F, RT8U, RU3KO, RU3W, RV6ASU, RW3AG, RW3YB, RW5C, RX3ASQ, RX3DTN, RX3I, RX3XA, RZ1O, RZ1OA, RZ3F, S5ØE, S5ØU, S52W, S53WW, S57DX, S59MZ, SD3T, SMØDSF, SM5CZQ, SM6MSG, SM7LPY, SN2M, SN2W, SN5V, SP1LJO, SP2EWQ, SP2LQP, SP2MKT, SP2UKM, SP3BP, SP3FAR, SP3J, SP3L, SP5EAQ, SP5FKW, SP5GDY, SP5ICS, SP5OXJ, SP6CDP, SP6CIK, SP6JOE, SP6M, SP6OWY, SP7IFM, SP7JJE, SP7JLH, SP7JPN, SP8TZ, SP9DNO, SP9GMI, SP9LAS, SP9MDY, SP9NSA, SQ5AM, SQ5NRY, SQ5RTI, SQ7BFS, SQ8L, SQ9C, SQ9DEO, SQ9MZ, SQ9RNR, SQ9ZAX, SV1DPI, SV1ME, SV1PMH, SV1RK, SV1RVP, SV2KGA, SV6EBQ, SV9DJO, SV9GPV, TA7I, TF3IRA, TF3SG, TK5MH, UAØLHS, UA1NDX, UA6ACA, UA6JQ, UA9CEP, UA9JLL, UI3A, UI4F, UR3PHG, UR3QX, UR5FIL, UR8UX, US5ETV, UT3EV, UT3UCP, UT3UZ, UT5AX, UW5ENR, UW6E, UW7CN, UY7C, VE1XE, VE3GKT, VE3WG, VE9HF, VJ2A, VK9DX, VU2EOJ, VU2PTT, VU3GBZ, VU3JXF, VU3YDA, VY1KX, WØFAA, W3ACO, W3JJ, W4LDS, W6MVT, W7GTF, WA7YAZ, WE3J, WF3H, WP4NXI, YB3DY, YC1JGE, YL2TD, YL3FO, YL3GU, YO2MNZ, YO5IA, YO5PVZ, YO6CFB, YO7CW, YO7SR, YO8AAZ, YO9GDN, YR9F, YU3FMS, YU7OPQ, YV5EN, ZL1IF, ZL1JLA, ZL1TM, ZL2/LZ2SX, ZL2AYZ, ZL4AS.

Disqualified: **9Z4Y** (self-spotting), **BD3TE** (use of spotting as a single-op), **EA9ACD** (self-spotting) **EC6DX** (self-spotting), **IH9YMC** (self-spotting), **IU5ICR** (use of spotting as a single-op), **IZ0COG** (use of spotting as a single-op), **LZ6V** (self-spotting), **R3ZZ** (use of spotting as a single-op), **SP4AWE** (use of spotting as a single-op), **SQ8MFM** (use of spotting as a single-op), **UX7Q** (self-spotting), **ZM4T** (self-spotting).

Looking Ahead In

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

- CW Results, 2021 CQ World Wide DX Contest
- Who *Really* Invented Morse Code?
- Build a Potato Radio
- Automatic Battery Discharge Tester

Upcoming Special Issues

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

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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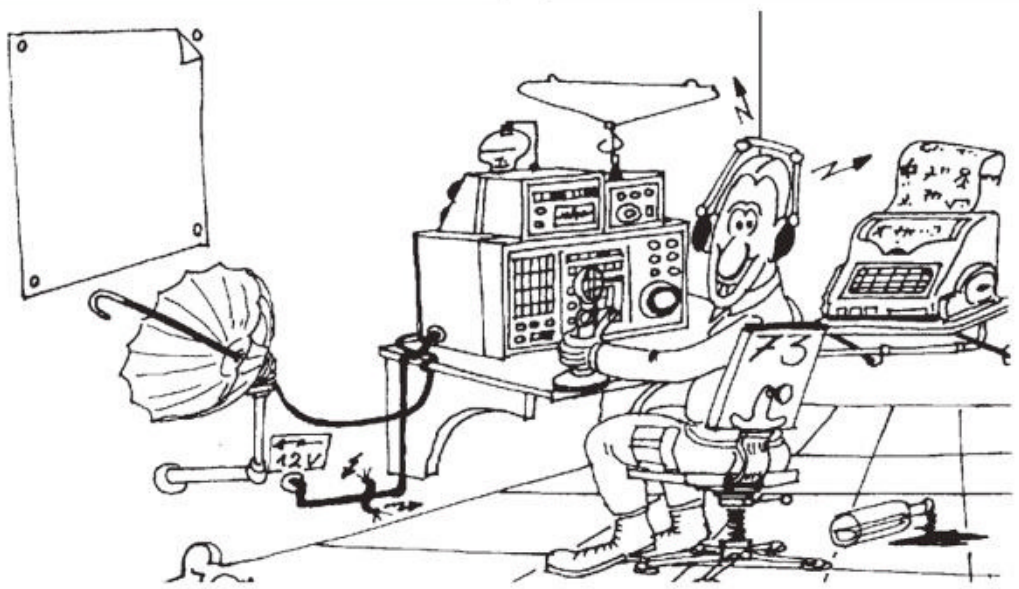

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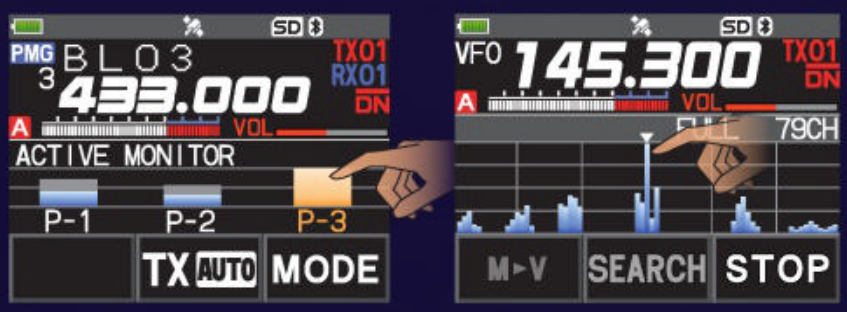

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