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ADS#43412

Cushcraft R8 8-Band Vertical
Covers 6, 10, 12, 15, 17, 20, 30, and 40 Meters!

The Cushcraft R8 is recognized as the industry gold

standard for multi-band verticals, with thousands in use worldwide. Efficient, rugged, and built to withstand the test of time, the R8's unique ground-independent design has a well-earned reputation for delivering top DX results under tough conditions. Best of all, the R8 is easy to assemble, installs just about anywhere, and blends inconspicuously with urban and country settings alike.

> Automatic Band Switching: The R8's famous "black box" matching network combines with traps and parallel resonators to cover 8 bands. You QSY instantly, without a tuner!

Rugged Construction: Thick fiberglass insulators, all-stainless hardware, and 6063 aircraft-aluminum tubing that is double or triple walled at key stress points handle anything Mother Nature can dish out.

Compact Footprint: Installs in an area about the size of a child's sandbox -- no ground radials to bury and all RF-energized surfaces safely out of reach.

Legal-Limit Power: Heavy-duty components are contest-proven to handle all the power your amplifier can legally deliver and radiating it as RF rather than heat.

The sunspot count is climbing and long-awaited band openings are finally becoming a reality. Now is the perfect time to discover why Cushcraft's R8 multi-band vertical is the premier choice of DX-wise hams everywhere! R-8GK, \$56.95. R-8 three-point guy kit for high winds.

R8 Matching Network vely DC VSWR at feed keep RF off fro

The R-8 provides

coverage of the horizon

radiation angle in the vertical

plane for better DX



MA-5B 5-Band Beam Small Footprint -- Big Signal



The MA-5B is one of Cushcraft's most popular HF antennas, delivering solid signal-boosting directivity in a bantam-weight package. Mounts on roof using standard TV hardware. Perfect for exploring exciting DX without the high cost and heavy lifting of installing a large tower and full-sized array. Its foot 3-inch boom has less than 9 feet of turning radius. Contest tough -- handles 1500 Watts.

The unique MA-5B gives you 5-bands, automatic band switching and easy installation in a compact 26-pound package. On 10, 15 and 20 Meters the end elements become a two-element Yagi that delivers solid power-multiplying gain over a dipole on all three bands. On 12 and 17 Meters, the middle element is a highly efficient trap dipole. When working DX, what really matters are the interfering signals and noise you don't hear. That's where the MA-5B's impressive side rejection and front-to-back ratio really shines. See cushcraftamateur.com for gain figures.

10, 15 Cushcraft & 20 Meter Tribander Beams

Only the best tri-band antennas become DX classics, which is why the Cushcraft World-Ranger A4S, A3S, and A3WS go to the head of the class. For more than 30 years, these pace-setting performers have taken on the world's most demanding operating conditions and proven themselves every time. The key to success comes

from attention to basics. For example, element length and spacing has been carefully refined over time, and high-power traps are still hand-made and individually tuned using laboratory-grade instruments. All this



It goes without saving that the World-Ranger lineup is also famous for its rugged construction. In fact, the majority of these antennas sold years ago are still in service today! Conservative mechanical design, rugged over-sized components,

stainless-steel hardware, and aircraft-grade 6063 make all the difference.

The 3-element A3S/A3WS and 4-element A4S are world-famous for powerhouse gain and super performance. A-3WS, \$499.95, 12/17 M. 30/40 Meter add-on kits available.

Cushcraft Dual Band Yagis

One Yagi for Dual-Band FM Radios



Dual-bander VHF rigs are the norm these days, so why not compliment your FM base station with a dual-band Yagi? Not only will you eliminate a costly feed

line, you'll realize extra gain for digital modes like high-speed packet and D-Star! Cushcraft's A270-6S provides three elements per band and the A270-

10S provides five for solid point-to-point performance. They're both pre-tuned and assembly is a snap using the fully illustrated manual.

attention to detail means low SWR, wide bandwidth, optimum directivity, and high efficiency -- important performance characteristics you rely on to maintain regular schedules, rack up impressive contest scores, and grow your collection of rare QSLs!

Cushcraft Famous *Ringos* Compact FM Verticals



W1BX's famous Ringo antenna has been around for a long time and remains unbeaten for solid reliability. The Ringo is broad-banded, lighting protected, extremely rugged, economical, electrically bullet-proof, low-angle, and more -- but mainly, it just plain works! To discover why hams and commercial two-way installers around the world still love this antenna, order yours now!

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CQ Highlighted on "Conan"

There's an old saying in politics: "I don't care what they say about me as long as they spell my name right." The same sentiment applies here as well. ... At the end of October, comedian and talk show host Conan O'Brien did a segment on his TBS show "Conan" called "Real Magazines that Outlasted 'Newsweek' " ... and guess which magazine was featured first? Yes! CO!

Of course he was making fun of us (that's his job), but our October cover was still splashed across national television! And the serious point of the whole segment (that he probably didn't realize he was making) was that even though general-interest magazines such as Newsweek are in trouble, niche magazines—such as this one and the others he featured—are still going strong. There is a future for print magazines and niche magazines are that future. The entire segment may be viewed on YouTube at https://bit.ly/RsXRpV.



Talk show host Conan O'Brien holds up the October issue of CQ to lead off a segment on "Real Magazines that Outlasted 'Newsweek' " on his program "Conan," which airs weeknights at 10 PM eastern on TBS. (Internet screen grab)

One Ham Killed, Another Rescued, in Sinking of HMS Bounty

One of the first casualties of Superstorm Sandy was the tall ship *HMS Bounty*, a replica of the British sailing vessel made famous when a band of crew members mutinied on a 1789 voyage to the South Pacific. Fourteen of the 16 crew members were rescued safely. However, the captain—Robin Walbridge, KD4OHZ—was never found and is presumed to have gone down with the ship. The second casualty was Claudene Christian, a descendent of mutineer Fletcher Christian.

A second ham on the crew, Ship's Electrician Doug Faunt, N6TQS, was rescued. He told the *ARRL Letter* that the ship's crew used various methods, including HF amateur radio, to try to get help but met with little success. Finally, they were able to use *Winlink* to e-mail a distress message to the Coast Guard. Faunt told the *Letter* that "ham radio got me into my position on the *Bounty*, and ham radio got me out alive!"

There was also a closer-than-comfortable link between the *Bounty* and the CQ "family." Former CQ Youth Editor Brittany Decker, KB1OGL, crewed aboard the ship last summer. Her father, Paul Decker, KG7HF, told CQ she had considered staying on through the fall, but thankfully decided to head off to college instead.

Post Office Wants to Phase Out IRCs

If the U.S. Postal Service has its way, International Reply Coupons (IRCs) will no longer be available for sale after January 27. According to the *ARRL Letter*, the postal service

published a notice of its plans in the *Federal Register* on October 28, citing insufficient demand to continue providing the service. Comments were being accepted through November 23. Even if IRCs are no longer offered for sale by the postal service, Universal Postal Union (UPU) regulations require that post offices honor and redeem IRCs that have been purchased in other countries. IRCs are a form of prepaid postage, redeemable for a single unit of airmail postage in any UPU member country. Hams have long used them to provide return postage for QSL cards from DX countries.

W7EQI Re-Elected to Congress

Oregon Congressman Greg Walden, W7EQI, easily won re-election in the 2012 election. *Newsline* reports that Walden, who was chairman of the Communications Subcommittee of the House Energy and Commerce Committee in the 112th Congress, polled nearly 70% of the vote in his district. At press time, the 113th Congress had not yet convened, so it is not yet certain whether Walden, a Republican, will retain his subcommittee chairmanship or move up in the House hierarchy.

China Revamping Amateur Radio Regulations

Revised regulations on amateur radio are working their way through the bureaucracy of China's government and are expected to open the door for widespread licensing of individuals and clubs in the world's most populous nation. The new rules are also expected to expand recognition of amateur radio organizations in China from only the Chinese Radio Sports Association (CRSA) to include the relatively new Chinese Radio Amateurs Club (CRAC). [See PY2QI's article, "Inside a Chinese Contest Station—B1Z in the WPX SSB Contest," on page 13 of this issue.] According to Newsline, the CRAC is expected to become China's official representative to the International Amateur Radio Union.

New Data Mode Uses Chinese Characters

As the use of amateur radio grows in China, a new digital mode has been developed that uses Chinese characters rather than the Western European/American alphabet. Southgate Amateur Radio News reports that the new mode is called CP-16 and is based on the 16x16 dot-matrix display used to generate Chinese characters on computer screens. It uses 16 on-off keyed audio characters spaced at 17-Hz intervals, resulting in a total signal bandwidth of less than 400 Hz. Transmission speed is two-to-five characters per second and it can be received on any software defined radio (SDR) receiver or SSB receiver/computer combination running waterfall-display software. The characters will appear directly on the waterfall display. More information is available at <www.iaru-r3.org/15r3c/docs/056.doc>.

DX to be 2013 Hamvention® Theme

The Dayton Amateur Radio Association has decided on DX and DXing as the theme for the 2013 Hamvention®, calling this year's show "DX Hamvention." According to the ARRL Letter, General Chairman Charles Kaiser, KD8JZR, noted that Dayton "is often an important DX destination for amateurs from all over the world," adding in a message on the Hamvention website that "possibly nowhere on Earth can one experience first-hand the incredible diversity and worldwide reach of amateur radio as during this event." This year's Hamvention will be held May 17–19 at Hara Arena in Dayton, Ohio.

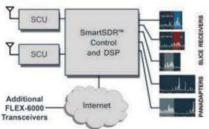
Additional and updated news is available on the Ham Radio News page of the CQ website at http://www.cq-amateur-radio.com. For breaking news stories, plus info on additional items of interest, sign up for CQ's free online newsletter service. Just click on "CQ Newsletter" on the home page of our website.



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- Native remote capability
- Multi-user capable

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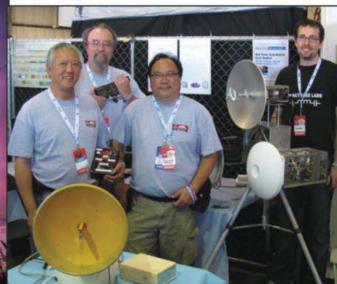
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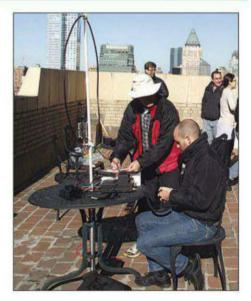
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Ameritron 1200 Watts Solid State Amplifier 1200 Watts PEP SSB/CW Output, 1.5-30 MHz. No Tune, Instant-On, Instant Bandswitching,

Super Reliable, Whisper Quiet, Remote Controllable, QSK, Fully Protected, Fully Metered ...



Just select the band and transmit! Ameritron's new solid state no-tune, instant-on, instant bandswitching ALS-1300 desktop linear amplifier gives you 1200 Watts PEP SSB/CW with less than 100 Watts drive. Covers 1.5 to 22 MHz (10/12 Meters with optional MOD-10MK). You'll bust through weak band conditions, heavy ORM and ORN because the ALS-1300 is less than I dB down from a full legal limit 1500 Watt amplifier.

Super Reliable!

Eight conservatively rated MRF-150 FETs mounted on two huge heat sinks spreads heat evenly. Four whisper quiet temperature controlled fans keep the FETs at a safe temperature. You get unparalleled Ameritron reliability and trouble-free service. Competing amplifiers using a single expensive device concentrate heat at a single hotspot that greatly reduces reliability.

50-Volt operation gives you highly linear operation with a superbly clean signal. Put out-of-the-way and Remote Control

The ALS-1300 amplifier and its matching power supply can be placed out-of-theway and controlled remotely. Remote Control Head, ALS-500RC, \$49.95, lets you monitor data and manually switch bands. Radio Interface, ARI-500, \$119.95, reads band data from your transceiver and

Suggested Retail

automatically bandswitches the ALS-1300 as you change bands on your transceiver.

Features Galore!

An Operate/Standby switch lets you run "barefoot" and instantly switch to full power when you need it.

Fast 5 millisecond T/R relays (10 million operation lifetime specs) give you full QSK operation. The T/R relay sub-board is easily replaced if the relays ever fail.

Ameritron's exclusive front-panel ALC control prevents overdriving your transceiver.

The ALS-1300 can be keyed by any transceiver that can sink 15 mA at 12 VDC without requiring a special interface.

Super-clean modular construction makes service quick and easy.

Fully Protected!

The ALS-1300 is fully protected to prevent amplifier damage if you: switch to a band different from your transceiver, use the wrong antenna or have overly high SWR, if the heat sink temperature exceeds a safe level, if the dual 600 Watt modules are significantly RF unbalanced. Whenever the amplifier faults, it is automatically bypassed.

If output forward or reflected power exceeds a safe level, output power is automatically reduced to prevent amplifier damage by controlling ALC to the transmitter. Fully Metered!

Two accurate Cross-Needle meters use LEDs with adjustable brightness for backlighting -- no more burned-out meter lamps.

The left meter continuously monitors DC current of both 600 watt amplifier modules.

The right meter is a multi-meter. Read antenna SWR, forward, reflected output power simultaneously (has adjustable PEP meter hold time) . . . amplifier balance . . . ALC between amplifier and transceiver . . . DC drain voltage of each power amplifier.

LEDs show which band is selected (manually bandswitched or automatically with optional ARI-500 Radio Interface) . . ALC activity . . . when the amplifier is keyed high SWR ... power amplifier fault.

The desktop size amplifier is a compact 101/2Wx63/4Hx19D in. Weighs just 23 lbs. Hash-Free Switching Power Supply!

The hash-free fully regulated 50 VDC, 50 Amp switching power supply is wired for 220 VAC but can be rewired for 110

VAC. Includes six foot cable to ALS-1300. Draws 12 Amps at 220 VAC, 25 Amps at 110 VAC. Has inrush current protection, current-limited outputs, exceptional filtering and RFI suppression. Works on 50-400 Hz, 200-260/100-135 VAC making it ideal for remote DX-peditions. 10Wx6¹/₂Hx9¹/₂D inches. 12 pounds.

Options

MOD-10MK \$39.95, low-pass filter assembly gives you 12 and 10 Meter operation. Requires FCC ham license.

OSK-5, \$359.95, pin-diode T/R switch gives lightning fast silent QSK operation.

Here's what they say .

I have had my amp now for a few days and WOW! I picked the amp up at the factory and Mike was very helpful in showing me the ins & outs of the amp. Mine is S/N 8 and these amps are in high demand. It will truly talk 1200 watts all night long and never get warm. Thanks to Ameritron for the way they treat their customers and taking time that I was satisfied. N5SBZ

I've been using SN3 for about six weeks now. No processors or digital read-outs, but very easy to use and it puts out 1200 watts on most bands with no problem. I have been operating QSK as the internal relays are plenty fast enough. AD5X

I have had this fine amp now for a week and have made a number of OSO's (20). It can make the difference, and has in a number of occasions, getting thru the QRN and making a contact. Some of my QSO's have lasted up to I hour and there has not been a single problem...runs cool and gives me excellent results. KB4KKX

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Inside the ALS-1300 Solid State Amplifier



Introducing the Yaesu FT-950 transceiver for DX enthusiasts Superb receiver performance Direct lineage from the legendary FT Dx 9000 and FT-2000



- Triple-conversion super-heterodyne receiver architecture, using 69.450 MHz 1st IF
- Eight narrow, band-pass filters in the RF stage eliminate out of band interference and protect the powerful 1st IF
- 1st IF 3 kHz Roofing filter included
- High-speed Direct Digital Synthesizer (DDS) and high-spec
 Digital PLL for outstanding Local Oscillator performance
- Original YAESU IF DSP advanced design, provides comfortable and effective reception. IF SHIFT / IF WIDTH / CONTOUR / NOTCH / DNR
- DSP enhancement of Transmit SSB/AM signal quality with Parametric Microphone Equalizer and Speech Processor

FT-950

- Built-in high stability TCXO (±0.5 ppm after 1 minute@77 ° F)
- Built-in automatic antenna tuner ATU, with 100 memories
- Powerful CW operating capabilities for CW enthusiasts
- Five Voice Message memories, with the optional DVS-6 unit
- Large Multi-color VFD (Vacuum Fluorescent Display)
- Optional Data Management Unit (DMU-2000) permits display of various operating conditions, transceiver status and station logging.
- Optional RF μ -Tune Units for 160 m, 80/40 m and 30/20 m Bands

Optional, YAESU Exclusive, Fully-Automatic µ -Tuning Preselector System!

Fully automatic, Ultra-sharp, External μ -Tuning Preselector (optional) features a 1.1" (28 mm) Coil for High Q

On the lower Amateur bands, strong signal voltages impinge on a receiver and create noise and intermod that can cover up the weak signals you're trying to pull through. YAESU engineers developed the μ (Mu) Tuning system for the FT px 9000/FT-2000, and it is now

available as an option for the FT-950. Three modules are available (MTU-160, MTU-80/40, MTU-30/20); these may be connected externally with no internal modification required! When μ -Tuning is engaged, the VRF system is bypassed, but the fixed Bandpass Filters are still in the received signal path.



Optional External Data Management Unit (DMU-2000) Provides Many Display Capabilities

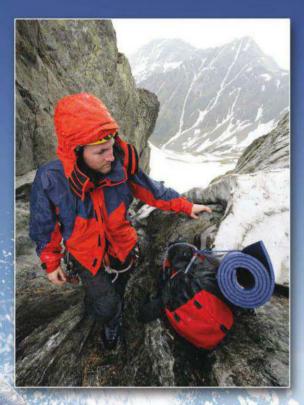
Enjoy the ultimate in operating ease by adding the DMU-2000! Enjoy the same displays available with the FT ox 9000 and FT-2000: Band Scope, Audio Scope, X-Y Oscilloscope, World Clock, Rotator Control, Extensive Transceiver Status Displays, and Station Logging Capability. These extensive functions are displayed on your user-supplied computer monitor.



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Of Power and Propagation

ife is beginning to return to normal in most parts of New York and New Jersey affected last October by Hurricane Sandy. I am writing the first draft of this column on a train to New York City from my home in New Jersey—the first day of normal operations for my train line—three weeks to the day after the storm struck.

CQ's offices are right in the middle of the storm zone and all of us here were affected to one degree or another. All of our Long Island-based staff members were without power in their homes, some for as long as two weeks. Our office was closed for three days after the storm, knocking everything off schedule. Even when power began to return, though, things were hardly normal. First, there were long lines for gasoline, with many stations offline due to lack of power, closed ports for bringing oil and gas into the region, closed roads making it difficult for delivery trucks to reach gas stations, long lines of people with gas cans for their generators, and panic buying for cars wherever fuel was available.

The lines have disappeared now, thanks to a combination of more power coming back and odd/even rationing. Mail delivery continues to be erratic, even three weeks out. At home, we had no mail at all last Wednesday, then a ton on Thursday. My November issue of CQ arrived on November 17, as we were preparing to close this January issue. And these disruptions and inconveniences are absolutely nothing compared with the total devastation faced by families and businesses on the Jersey Shore, Staten Island, and many other parts of New York City and Long Island. Our prayers are with those families as they try to rebuild their homes, businesses, and lives. (Among those suffering considerable flooding damage was CQ Contesting Editor George Tranos, N2GA. He hopes to be able to resume his column next month.)

When All Else Failed (Yet Again)...

From our perspective as hams, all of this again points up the frailty of our society's wired and wireless lifestyle, as well as the resilience of the ham radio network. Without power, Wi-Fi didn't work, cell phones couldn't be charged. Cell sites that did work were often overloaded during the peak of the storm or ran out of battery backup power as the electrical outages dragged on.

For the first time in my memory, businesses that did have power offered "emergency charging stations" for cell phones and laptops. A society that is increasingly dependent on "mobile devices" grinds to a halt when none of those devices, be they electronic or mechanical, are able to function. (See AA6JR's "Magic in the Sky" column on page 62 of this issue for Jeff's take on our society's "addiction" to electrons in motion.)

But as always, that "old-fashioned" ham radio with its "outdated" analog transceivers kept on working, providing backup communications throughout the areas hit by the storm. As we prepared this issue, many of those support nets were still operating, so we haven't yet received detailed reports on activity in the New York-New Jersey area. Public Service

Editor Richard Fisher, KI6SN, begins our coverage this month (page 54) with a report from Massachusetts. We hope to have reports from New Jersey and New York by the next issue.

The Joys of Unpredictability

One of the signs of returning normalcy was that I was able to spend much of this past Sunday afternoon and evening on the radio, operating Sweepstakes. As a casual contester, one of the things I most enjoy about contest operating is a high enough level of activity on multiple bands to actually observe differences and changes in propagation.

It was a delight to hear 10 meters open across the country (with a little bit of DX thrown in for good measure), and 15 meters accounted for more of my contacts than any other band. What surprised me, though, was how short the skip was on 20 meters in the middle of the afternoon, allowing me to work states I'd expect to hear on 40 at that time of day. I couldn't work California on 20 that afternoon, but I could (and did) work Ohio and Tennessee. I haven't checked yet, but I'm sure I picked up at least a few new, close-in states on 20 meters if I ever decide to pursue single-band states awards.

To me, this unpredictability of propagation is one of the most enduring appeals of ham radio. Propagation Editor Tomas Hood, NW7US, says to expect good conditions this year (see page 98), but predictions by their nature are general and a matter of percentages. About as precise as you can get is that, for example, there's a 60% chance that this band will be open to this location on this day, with the best chance at this time of day. But the bottom line is that you cannot know with certainty which band will be open to where from your location at a specific time until you turn on the radio. And you never know when Mother Nature will throw a curveball and present you with a delightful propagation surprise.

In This Issue

In addition to our Hurricane Sandy coverage, this issue begins our transition to the new contest reporting schedule that we announced in October (see full schedule on page 96 of this issue). The SSB results of last year's CQ WPX Contest appear in this issue (p. 18), along with a report (p. 13) by the editor and publisher of our Brazilian edition on operating the WPX Contest from China at B1Z.

In addition, Riley Hollingsworth, K4ZDH, takes a close look at the FCC's recent proposal to, among other things, allow former hams to be relicensed without retesting. We've also got a preview of this year's "Take it to the Field" special with articles on operating from Route 66 as well as the middle of New York City, a project to update a vintage Heathkit VTVM (Vacuum Tube Volt Meter), and the intriguing topic of "Marshmallows and DX."

Happy New Year

Best wishes from all of us at CQ to all of our readers for a very happy and healthy 2013. And may the weather this year be less exciting than the propagation.

*e-mail: <w2vu@cg-amateur-radio.com>

73, W2VU

hygain. HF BEAMS.

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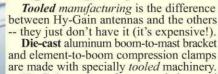
Model No.	No. of elements	avg gain avg F/B	MaxPwr watts PEP		Wind sq.ft, area	Wind (mph) Survival	boom feet	Longest Elem. (ft)	Turning radius(ft)	Weight (lbs.)	Mast dia O.D.(in.)		Sugg. Retail
TH-11DX	11	For Gain and	4000	10,12,15,17,20		100	24	37	22	88	1.9-2.5	T2X	\$1159.95
TH-7DX	7	F/B ratioSee	1500	10, 15, 20	9.4	100	24	31	20	75	1.5-2.5	HAM-IV	\$869.95
TH-5MK2	5		1500	10, 15, 20	7.4	100	19	31.5	18.42	57	1.5-2.5	HAM-IV	\$759.95
TH-3MK4	3	• www.hy-gain.com	1500	10, 15, 20	4.6	95	14	27.42	15.33	35	1.9-2.5	CD-45II	\$469.95
TH-3JRS	3	• Hy-Gain catalog	600	10, 15, 20	3.35	80	12	27.25	14.75	21	1.25-2.0	CD-45II	\$359.95
TH-2MK3	2	Call toll-free	1500	10, 15, 20	3.25	80	6	27.3	14.25	20	1.9-2.5	CD-45II	\$369.95
EXP-14	4	800-973-6572	1500	10,15,20 30/40	7.5	100	14	31.5	17.25	45	1.9-2.5	HAM IV	\$599.95

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WAUKESHA WISCONSIN - West Allis Radio Amateur Club. Inc. 41st Annual Midwinter Waukesha Swapfest, Saturday, January 5, Waukesha County Expo Center. Contact: WARAC Swapfest, P.O. Box 1072, Milwaukee, WI 53201. Phil, W9NAW, (414) 425-3649. Website: http://www.warac.org. (VE examsthe AMF Waukesha Lanes 9 to 11:15 a.m.)

LOCUST FORK, ALABAMA — Blount County Amateur Radio Club FreezeFest 2013, Saturday, January 5, Locust Fork High School. Contact: Bill Pond, AE4IE, (205) 647-5705. Website: http://freezefest.w4blt.org/. (Talk-in 146.700- [PL 91.5; exams t10 a.m.)

SPRINGFIELD, MISSOURI — Ozark Mountain Amateur Radio Ozark Mountain Hamfest, Saturday, January 5, Faith Lutheran Church. Contact: James, KCØTQD, (417) 425-9962; e-mail: <kc0tqd@gmail.com>; http://www.w0omd.org, (Talk-in: 147.015– [PL 162.2]; exams 10 a.m.)

WHITE PINE, TENNESSEE — Lakeway Amateur Radio Club 2013 Winter

Hamfest, Saturday, January 5, Smoky Mountain Expo Center. Contact: Lakeway ARC, P.O. Box 1138, Morristown, TN 37887-1138. Website: http://

lakewayarc.org/2013-hamfest>.

GREENWOOD, SOUTH CAROLINA — Greenwood Amateur Radio Society Greenwood South Carolina Hamfest, Saturday, January 12, Piedmont Technical College Multipurpose Building. Contact: GARS, P.O. Box 2404, Greenwood, SC 29646 or Tedd Davison, Al4WN, phone: (864) 377-1872; <ai4wn@arrl.net>; <http://www.w4gwd.org>. (Talk-in 147.165+ or 443.900+ (PL

107.2); exams 10:30 a.m.)

MARATHON, NEW YORK — Skyline Amateur Radio Club January
Winterfest 2013, Saturday, January 12 at the Lovell Field Civic Center. Indoor
flea market, prizes. Contact: SARC, P.O. Box 5221, Cortland, NY 13045. E-mail: <k2iwr@arrl.net>. Website: http://www.skylineradioclub.org. (Talk-in 147.180

+0.600; exams 9 a.m.)

PHOENIX, ARIZONA — Thunderbird Amateur Radio Club & Amateur Radio Council of Arizona Thunderbird Hamfest 2013, Saturday, January 12 at the Northwest Community Church. E-mail: <hamfest@w7tbc.org>. Website: <http://www.w7tbc.org/>. (Talk-in 146.700 –600 [PL 162.2] or 446.150 –5 [PL 100]; exams 10 to 11:30 a.m.)

QUARTZSITE, ARIZONA — Annual RV Campout Quartzfest, January 15–25

at the Bureau of Land Management campsite located 10 miles south of Quartzsite on US 95 at La Paz Valley Road. Contact: Steve Weed, KO4QT, organizer@quartzfest.org>; website: ">http://www.qu

W5SJZ Radio Club Cowtown Hamfest 2013, January 18 and 19 at the Lockheed Recreation Area. Contact: David Forbes, KC5UYR, <KC5UYR@compuserve.com>. Website:<http://www.cowtownhamfest.com>. (Talk-in 147.28 [PL 110.9]; exams).
FORT MYERS, FLORIDA — Fort Myers Amateur Radio Club Southwest

Florida Hamfest & Computer Show 2013, January 19, Southwest Florida Public Service Academy. Contact: FMARC, P.O. Box 061183, Fort Myers, FL 33906. Drexel Turner, W4DHT, 7670 Eaglet Court, Fort Myers, FL 33912-1828. Phone: (239) 225-0826 or (239) 464-1350. E-mail: <dturner@embargmail.com>. Website: http://www.fmarc.net/hamfest.htm. (Talk-in 147.345 [PL 136.5]).

HAMMOND, LOUISIANA — Southeast Louisiana Amateur Radio Club 32nd Annual Hammond Hamfest, January 19 at the Quality Inn & Conference Center. Contact: SELARC, P.O. Box 1324, Hammond, LA 70404. E-mail: wb5net@arrl.net. Website: https://www.selarc.org/selarchamfest.htm. (Talkin 147.000 -600 [PL 107.2] or 145.130 -600 [PL 107.2] or 444.250 +5 [PL 107.2]; exams)

KANSAS CITY, MISSOURI — North Kansas City Hamfest & Emergency Communications Expo, January 19, Hillside Christian Church. Website: http://www.northkchamfest.com. (Exams)

ST. CHARLES, ILLINOIS — Wheaton Community Radio Amateurs Mid-Winter Hamfest, January 20, Kane County Fairgrounds. Contact: WCRA, P.O. Box QSL, Wheaton, IL 60187-1055. Phone: (630) 604-0157. E-mail: <info@w9ccu.org>. Website: http://www.w9ccu.org. (Talk-in 145.31– [PL 107.2] or 146.52.; exams)

JACKSON, MISSISSIPPI — Jackson Amateur Radio Club 2013 Capital City Hamfest & Mississippi State ARRL Convention, January 25 and 26 at the Trade Mart Building, Mississippi State Fairgrounds. Website: http://hamfest.msham.org/, (Exams Saturday 8 a.m.)

COLINSVILLE, ILLINOIS — The St. Louis & Suburban Radio Club, Inc. Winterfest 2013, Saturday, January 26 at the Gateway Convention Center. Contact: Jim Glasscock, WØFF, (636) 584-888 or Bill Coby, KBØMWG, (314) 504-1104. E-mail: kocby@sbcglobal.net>. Website: kttp://slsrc.org. (Talk-in

PALM SPRINGS, CALIFORNIA — Desert RATS Palm Springs Hamfest, January 26 at KD6QLT's ranch. Contact: Peter Reinzuch, VE7REZ/W6, (760) 318-0186. E-mail: <palmsprings.hamfest@gmail.com>. Website: <http:// desertrats.x.am>

STRASBURG, OHIO — Tusco Amateur Radio Club 23rd Annual Tusco A.R.C. Hamfest, Sunday, January 27 at 965 North Wooster Avenue. Contact: Janice Green, KB8YDK, (740) 922-4454. E-mail: <k8wfn@ tusco.net>. Website: http://www.tuscoarc.org. (Talk-in 146.730-)

Please submit hamfest and special event announcements at least three months in advance by e-mail to <hamfest@cq-amateur-radio.com> or <specialevent@cq-amateurradio.com>, or by postal mail to: CQ Magazine, Attn: Hamfests (or Special Events), 25 Newbridge Rd., Hicksville, NY 11801. In addition, CQ's sister publication World Radio Online has extensive information on hamfests and special event stations months in advance of the events; go to <www.worldradioonline.com>.

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This article originally appeared in the March/April 2012 issue of CQ Radioamadorismo, the Portuguese-language edition of CQ, published in Brazil.

n my childhood, licensed as PY2RNJ, I remember that making and confirming a contact with a ham radio station in China was very difficult. The few who could confirm a QSO with this mysterious and closed country were treated as real amateur heroes. That's because until the beginning of the 1990s, amateur radio activity was tightly controlled by the government, which would not allow free access by its citizens to the rest of the world. This is a little bit like what the Chinese government currently does with websites such as YouTube, Google, and Facebook, which are censored and blocked.

In my trip to China last March with my business partner Martins, I had the opportunity to verify that at least regarding amateur radio activity the situation is completely different today in that giant and prosperous country. After visiting many cities in China and Taiwan, I couldn't contain my excitement over meeting members of the CRAC—Chinese Radio Amateurs Club. I had made some earlier contacts with Chen, BA1HAM, and we agreed to meet on Saturday, March 24th, in a rural area about 18 miles east of Beijing. Many Chinese hams would be there on that weekend at the B1Z station to operate the 2012 CQ WPX SSB Contest.

There could not have been a better time to visit these ham buddies. We arrived in Beijing on a flight from Taipei (Taiwan) at about 12 pm. I called Chen, BA1HAM, to inform him we were on our way to meet him. He told me that the B1Z station was out of town and it wouldn't be so easy to get there. We spoke with a lot of taxi drivers in front of the hotel, but

none wanted to drive us there. Because of the difficulty of the different language, without understanding the reason, we started to be a little bit suspicious that the place was unsecured, just as we see in Brazil.

A Scary Ride

After several tries, an old and badly preserved private car driven by a Chinese man wearing sunglasses stopped by.



Photo A– Author Erwin Hübsch Neto, PY2QI/KK4CGD, with his business partner, Jose Martins Da Rocha, outside the B1Z contest station in China. (All photos courtesy of the author)

^{*}Editor/Publisher, CQ Brazil e-mail: <erwin@cqmagazine.com.br>



Photo B— Author PY2QI with his Chinese ham hosts, Fan, BA1RB (left) and Chen, BA1HAM (center), at the 40-meter "run" station.



Photo C- Hams from around China were invited to B1Z to observe as well as participate in the WPX Contest.

The man read the B1Z address that had been written in Chinese on a little piece of paper and started to gesticulate frantically telling us to get into the car. He would charge 150 Renminbis, something like \$25.00 US, to take us there. After we closed the deal with the driver, we realized we were in an old car, driven by a stranger who couldn't speak anything in a language other than his own.

Without knowing where we were going, we tried to situate ourselves using a map (written in Chinese) that Mr. Chen had sent by e-mail, and looking at some reference points such as rivers, bridges, and roads. Everything indicated that the driver was taking us to the right place. After ten minutes, on a kind of sinister and lonesome road, he called someone and then sharply stopped the car and quickly opened the glove



Photo D- One of five towers at B1Z. The station is located outside Beijing, on the grounds of a business owned by Mr. Lee, BG1BYV.



Photo E- Another one of B1Z's five towers. Each tower supports one or more monband Yagis.

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Photo F— If you've ever been to the ARRL Headquarters Station, W1AW, this should look familiar. Each operating position at B1Z is in a separate glass room, to minimize interference between stations. This is the 20-meter station.

compartment. We immediately thought that he was going to pull a gun and we were going to be kidnapped or robbed.

With our hearts beating quickly (something like 200 wpm in CW...) we breathed a sigh of relief when we saw that all our driver took from the glove compartment was a GPS. Martins calmed down when he realized that he wouldn't have to use his "martial arts techniques." After another hour, I saw one of the big B1Z towers.

A Warm Reception

I couldn't hide how happy I was in that situation, seeing a ham radio station in China, especially on a special day: the 2012 WPX SSB Contest day (photo A). After a warm reception by Mr. Chen and Fan, BA1RB, we started our visit to the contest station (photo B).

At the moment we arrived there were more than 30 hams there (photo C), all curious about meeting a PY buddy from so far away. I gave them some *CQ Radioamadorismo* magazines (the Brazilian version of *CQ* magazine) and said that I was there not only as a ham, but also with the goal of writing a special article about amateur radio in China. I received a beautiful CRAC pin, a key holder from B1Z, and a VIP badge with my callsign.

The Station at B1Z

The station has an antenna farm for 160–10 meters and is set up a big rural area in space provided by the company of Mr. Lee, BG1BYV. This station has five big towers, each with monoband beams (photos D and E). One of the hams in the group coordinated each station that was operating during the WPX, working in a closed studio with glass to isolate each group (photo F). There are four studios: Three share one room, and the fourth is in a bigger room inside the company. The station can be used by many hams on weekends and was used as a special event station during the Olympic Games in 2008. It is also prepared to be used in emergency



Photo G- Operators at the 80-meter run station. Note that most of the ops at B1Z were considerably younger than typical contesters in other parts of the world.



Photo H– Another group of young ops at the 40-meter run station.

situations. For the contest, each studio contained a "run" station and crew for a specific band. (In a large contest operation, a "run" station spends a good deal of time on one frequency, calls CQ, and works stations that answer, as opposed to a "search-and-pounce" station that tunes the bands in search of "run" stations calling CQ.—ed.)

Ham Radio in China

Our Chinese buddies gave me a real lesson in organization and partnership. According to Chen's information, amateur radio activity appeared in China in the 1920s, and in 1947 there were around 400 ham stations. In 1949, ham activity was prohibited, and in 1958, only BY1PK was allowed to



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Photo I— The 20-meter ops were intently focused on pulling copyable signals of the cacophony of the pileups.

operate. In 1966, all stations were suspended and amateur radio activity was again prohibited. In the 1970s, 30 ham stations controlled by government entities and schools were allowed and kept active until 1992. At the end of 1992, the government authorized individual amateur stations, and since then more than 40,000 hams have become licensed and active.

There are currently four license classes in China, each with different privileges:

Class 1: All bands (1kW HF); Class 2: All bands (100W HF); Class 3: VHF/UHF and part of the 10 meter band; and Class 4: VHF/UHF only.

Officially, amateur radio activity is represented by CRSA (Chinese Radio Sports Association), but as it is becoming more popular, it was necessary to have a new association, the CRAC. The Ministry of Industry and Information is the leading authority that regulates amateur radio activity in China, and it's working on the formulation of a new regulation in order to give more power to CRAC.

There are a lot of DX groups as well, such as B1Z, B4R, and B7P. The DX club B1Z started in 1997 and its organizer is Fan, BA1RB, who works for IBM in China. The club has two stations in Beijing, BY1TX and BY1RX (the one we visited). The contest group invited ham radio operators from all Chinese provinces to visit the WPX operation. According to Mr. Chen, the goal is to motivate more operators (of any class) to get active in DXing and contesting (photos G through I). The hams at B1Z did very well, finishing #2 in Asia in the multi-operator/multi-transmitter (multi/multi) category with more than 7.5-million points (see contest report elsewhere in this issue for details—ed.).

We left feeling satisfied because of this completely new experience, and feeling that we can still find some honest people in the world... We ended up contracting with the same mysterious driver to take us back to the hotel.

Gordon West, WB6NOA & the W5YI Group



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Results of the 2012 CQ WW WPX SSB Contest

BY RANDY THOMPSON,* K5ZD

Expanded Results on the Web

As usual, QRM and operator lists accompany this article on the WPX Contest page of the CQ website <www.cq-amateur-radio.com>. In addition, this year the top scores for the U.S. and Europe are also on the web in order that we can once again provide you with a full "top-ten" list of world high scores in each category. —W2VU

fter a few weeks of disappointing conditions, expectations were hopeful for the 54th running of the CQ WPX SSB Contest in March 2012. Entrants watched the solar forecasts, plotted their strategies, and tried to anticipate which category would produce the most fun, highest score, or a new all-time record.

At the starting gun, the rates were excellent. Many stations reported more than 400 QSOs in the opening hours. Fifteen meters was best from the western USA, while 20 and 40 were the hot bands back east and in Europe. Something happened to the sun on Saturday, though, and the spell was broken. Conditions dropped to only fair, and squeezing most of the activity into 40, 20, and 15 meters made for a rough-and-tumble experience.

QRM was a popular topic in the chatter after the contest. Scott, K7ZO, said, "I am not sure I have ever heard 15 as packed as I heard it this weekend. It sounded like 20 at the bottom of the solar cycle." From Matija, S53MM, "QRM was killing me almost all of the time." Ed, K6CTA, enjoyed his experience: "Heavy rain on Saturday kept me inside, and what better way to spend the day than on the radio fighting QRM on SSB!"

Those who stuck it out saw conditions improve on Sunday. More than one entrant commented on having their best rates at the end of the contest! You just never know how a contest will play out, so it is important to stay in the chair all the way to the end, or maybe, like Dave, K6LL, you just can't resist: "I didn't plan to put in much time in this contest, but I had fun on Friday night and kept coming back to the radio like a moth to the flame."

In the end, much of the enjoyment of contesting is about the experience. Bill, K2PO, described it this way: "It's always fun to have an exotic station come back to a CQ when you're working US stations. 5X1D was the highlight in that category this time." Roberto, CE4CT, had some memorable moments, too: "...in the middle of the contest there were two earthquakes, 5.9 and 7.2, but in neither stop transmitting for no lose the rate."

"WPX is like a worldwide costume ball. You never know who may be behind the mask!"—Jim, AD1C

The WPX Contest counts prefixes as multipliers. This encourages activation of interesting special callsigns and some stations "borrowing" callsigns that have a less common prefix. The result is more fun, but never knowing to whom the voice behind the microphone belongs. Many Croatian stations added "20" to their prefix to celebrate the 20-year anniversary of the 9A prefix. LY22A was in honor of the 22nd anniversary of independence of Lithuania. The team at EI7M used EI100T to commemorate the 100th anniversary of the last (and first!) sailing of the S.S. Titanic. IY4FGM was the Marconi Memorial Station operating from the villa where young Guglielmo Marconi made his first experiments in wireless communications.

*e-mail: <k5< th=""><th>zd@cqww.com></th></k5<>	zd@cqww.com>
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Solar Indices During WPX SSB Contest 2009-2012 Year Solar Flux Index A Index K Index 2012 103 10 2 2011 114 1 0 7 2 2010 88 2009



Steve, GW4BLE, operated single band 75 meters. You can listen to your QSO with him at <www.gw4ble.dxlixt.co.uk>.

The top prefix count among all entries was once again achieved by the big German multi-multi station DR1A, with 1841. This is 68 fewer prefixes than their record set one year ago. The best prefix total by a single-operator was CN2R with 1424. Special thanks to those stations who provided some of the more interesting prefix multipliers, including: 4GØLD, 5P12EU, 8J10SAI, 9A22P, HUØA, L59D, L60S, LZ12FDAY, LZ1784SIB, LZ40YE, SZ6P, TM22P, TM38O, TO7BC, UE85DRK, V55V, VP52V, YB8Y, and YE3J. Harley, K8BI, commented, "Some of these calls were so weird I had no idea what I was working and where to point the beam!"

Single-Operator All Band

The race for top Single-Operator All Band score was once again between perennial champions Jim, W7EJ, at CN2R, and Tom, W2SC, at 8P5A. Jim used his proximity to Europe to gain double QSO points on the low bands and set a new all-time record. Tom made 800 more contacts, mostly on 20 and 40, but it just wasn't enough. Andy, AE6Y, was close behind from P49Y. After wrestling with pulling QSO numbers out of the QRM all weekend, Andy suggested a new way of saying numbers: "...we should all use: zero, uno, due, tres, quattro, cinco, six, siete, otto or ocho, nova or nueve ... doing so would lessen necessary repeats and up the scores considerably." Should contesters create their own set of phonetic numbers?

Who says the guys in New England win everything? There was a battle of superstations with super ops for the top USA score. Kevin,

2012 WPX SSB TROPHY WINNERS AND DONORS

SINGLE OPERATOR ALL BAND

WORLD: Stanley Cohen, W8QDQ Trophy. Won by: CN2R operated by James P Sullivan, W7EJ
WORLD Low Power: Caribbean Contesting Consortium Trophy. Won by: P40W operated by John Crovelli, W2GD
WORLD QRP: Phil Krichbaum, NØKE Trophy. Won by: T15N operated by Bill Parker, W8QZA

USA: Atilano de Oms, PY5EG Trophy. Won by: NN5J operated by Kevin Stockton, N5DX
USA Low Power: Terry Zivney, N4TZ Trophy. Won by: NV1N operated by Edward Sawyer, N1UR
USA QRP: Doug Zwiebel, KR2Q Trophy. Won by: Randy Shirbroun, NDØC
USA Zone 3 High Power: Lauri "Mac" McCreary, KG7C Trophy. Won by: KW7Y operated by Mitch Mason, K7RL
USA Zone 3 Low Power: Buz Reeves, K2GL Memorial Trophy. Won by: AD7JP operated by Bill Conwell, K2PO
USA Zone 4 High Power: Society of Midwest Contesters Trophy. Awarded to: George A. Demontrond III, NR5M
USA Zone 4 Low Power: Society of Midwest Contesters Trophy. Won by: Dave Cockrum, N5DO
USA Zone 5 High Power: Paul Obert, K8PO Trophy. Won by: K1LZ operated by Markovic Milovan, N8BO

EUROPE High Power: Jim Hoffman, N5FA Trophy. Won by: E7DX operated by Emir Memic, E77DX EUROPE Low Power: Ed Sawyer, N1UR Trophy. Won by: UU7J operated by Andy Kotovky, UU4JMG EUROPE QRP: Rick Williams, VE9HF Trophy. Won by: TM9K operated by Gerard Gendron, F5BEG

AFRICA: Peter Sprengel, PY5CC Trophy. Awarded to: TO7BC operated by Hartwig Kauschat, DL7BC ASIA: Chris Terkla, N1XS Trophy. Won by: Vladimir Vinichenko, UPØL NORTH AMERICA: Albert Crespo, F5VHJ Trophy. Won by: 8P5A operated by Tom Georgens, W2SC NORTH AMERICA QRP: Phil Krichbaum, NØKE Trophy. Won by: No entrant OCEANIA High Power: Phillip Frazier, K6ZM Memorial Trophy. Won by: WH7M operated by Lou Cohen, K1YR OCEANIA Low Power: YB Land DX Club Trophy. Awarded to: Holger Hanneamn, ZL3IO SOUTH AMERICA: Andrew Faber, AE6Y Trophy. Won by: P49Y operated by Andrew Faber, AE6Y SOUTHERN CONE (CE, CX, LU) Low Power: LU Contest Group Trophy. Won by: Esteban Asenjo, XQ7UP

CANADA High Power: Saskatchewan Contest Club Trophy. Won by: VY2ZM operated by Jeffrey T. Briggs, K1ZM CANADA Low Power: Paul Cassel, VE3SY Memorial Trophy. Won by: Dan M. Lazar, VE6EX JAPAN: Hamad Alnusif, 9K2HN Trophy. Won by: Masaki Okano, JH4UYB

SINGLE OPERATOR, SINGLE BAND

WORLD: Steve Merchant, K6AW Trophy. Won by: PX5E operated by Sergio Lima de Almeida, PP5JR
WORLD 28 MHz: Jorge Taboada, EA9LZ Trophy. Awarded to: CE3CT operated by Roberto Ramirez, CE4CT
WORLD 28 MHz Low Power: Six Stars Contest Station LS1D Trophy. Won by: Guilherme Vaz, PU2LEP
WORLD 21 MHz: Stuart Santelmann KC1F Memorial (W3UA/RA3AA sponsor) Trophy. Won by: D44AC operated by

WORLD 21 MHz: Stuart Sarteninarii No ir Meniciai (Woodchack Spotials) The Mill Schettino, MUFH
WORLD 14 MHz: Jorge Taboada, EA9LZ Trophy. Won by: Andreas Kretzschmar, 9Y4W
WORLD 7 MHz: Jorge Taboada, EA9LZ Trophy. Won by: Salim Gechem, HK1T
WORLD 7 MHz Low Power: Neal Campbell, K3NC Trophy. Won by: UZ7M operated by Yuri Prokhorov, UT9MZ
WORLD 3.7 MHz: D4C Contest Team Trophy. Won by: YT4A operated by Miroslav Vemic, YT1AA
WORLD 1.8 MHz: UA2 Contest Club Trophy. Won by: Tomislav Polak, 9A2AJ

USA 28 MHz: Maurice Schietecatte, N4LZ Trophy. Won by: WN1GIV/4 operated by Bob Patten, N4BP USA 21 MHz: Maurice Schietecatte, N4LZ Trophy. Won by: KJ3X/4 operated by Bill Kollenbaum, K4XS USA 14 MHz: Charles Wooten, NF4A Trophy. Won by: Carol Richards, N2MM USA 7 MHz: Yankee Clipper Contest Club Trophy. Won by: Fred Reed, KK1KW

USA 3.7 MHz: Bernie Welch, W8IMZ Memorial (WB8MRU sponsor) Trophy. Won by: Steven Sussman, W3BGN

EUROPE 28 MHz High Power: SKY Contest Club Trophy. Won by: CR2T operated by Eduardo M. F. S. Machado,

EUROPE 21 MHz High Power: SKY Contest Club Trophy. Won by: CS2C operated by Jiri Pesta, OK1RF EUROPE 14 MHz High Power: SKY Contest Club Trophy. Won by: OHØX operated by Pertti Simovaara, OH2PM EUROPE 7 MHz High Power: SKY Contest Club Trophy. Won by: YT8A operated by Dusan Ceha, YU1EA EUROPE 3.7 MHz High Power: SKY Contest Club Trophy. Awarded to: Mikael Reijer, SM3M EUROPE 1.8 MHz High Power: SKY Contest Club Trophy. Awarded to: Kurt Kawasch, OM7RU

SINGLE OPERATOR ASSISTED

WORLD: Emir-Braco Memic, OE1EMS Trophy. Won by: P41P operated by Helmut Mueller, DF7ZS USA: Alabama Contest Group Trophy. Won by: Rick Davenport, KI1G EUROPE: Martin Huml, OL5Y Trophy. Won by: YP9W operated by Tiberiu Tebeica, YO9GZU

OVERLAY CATEGORIES

WORLD Tribander/Single-Element: Helmut Mueller, DF7ZS Trophy. Won by: NXØX/4 operated by Paul H. Newberry,

USA Tribander/Single-Element: Paul Newberry, N4PN Trophy. Awarded to: Charles Wooten, NF4A USA Tribander/Single-Element Low Power: Al Josza, KG1E Trophy. Won by: NR3X/4 operated by Nate Moreschi, N4YDU

Europe Tribander/Single-Element: Roger Miner, K1DQV Trophy. Won by: Igor Vachevsky, RT4RO WORLD Rookie: Val Edwards W8KIC Memorial (K3LR sponsor) Trophy. Won by: UA5A operated by Oleg Prelovsky, **RA3AKT**

MULTI-OPERATOR, SINGLE-TRANSMITTER
WORLD: Latvian Contest Club Trophy. Won by: 505A operated by IK2QEI, IK2SCG
USA: Steve Bolia, N8BJQ Trophy. Won by: WW2DX operated by W2RE, WW2DX, KB2HZI, K2TR
AFRICA: Rhein Ruhr DX Association Trophy. Won by: 6V7Z operated by U39CDC, RA9FW, 6W7RV
ASIA: W2MIG Memorial (NX7TT Sponsor) Trophy. Won by: P33W operated by 5B4AIE, RV3BA, RG6G, R3DCX, RW4WR,
RA3AUU

EUROPE: Tonno Vahk, ES5TV Trophy. Won by: RL3A operated by RA3CO, UA3ASZ, RL3FT, RU3RQ, RT3DX, RN3DNM,

NORTH AMERICA: North Pole Contest Group Trophy. Won by: WP2Z operated by K8MJZ, KP2MC, K9VV, NQ6N

MULTI-OPERATOR, TWO-TRANSMITTER

WORLD: Ken Adams, K5KA Memorial Trophy. Won by: PJ4Z operated by K4BAI, WW4LL, N4OO, W4DXX USA: Florida Contest Group Trophy. Won by: KE3X operated by KE3X, K3RA, W2CDO, N8II, K2YWE AFRICA: Walter Skudlarek, DJ6QT Trophy. Won by: CR3A operated by CT3BD, CT3DL, CT3DZ, CT3EE, CT3EN, CT3IA, CT3KU, CT3KY, CT1EEB, CT1FFU, CT1FJ0

EUROPE: Bernd Och, DL6FBL Trophy. Won by: El100T operated by El8IR, El3JE, El3JZ, El3KD, El4HQ, G4CLA,

G3ZVW, G3TWC

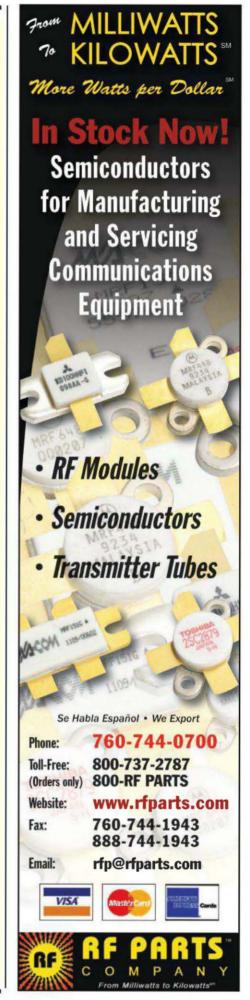
MULTI-OPERATOR, MULTI-TRANSMITTER
WORLD: Gail M. Sheehan, K2RED Trophy. Won by: EB8AH operated by EA4BQ, EA5DY, EA8AH, EA8CAC, EA8ZS, ES2RR, ES7GM, ES5RW, IK1HJS, OH1MA, OH6RX

USA: Dale Hoppe, K6UA Memorial Trophy. Won by: NX5M operated by NX5M, KU5B, N5XJ, KJ5T, K5RT, AB5K, K5END, W5SE

EUROPE: Rick Dougherty, NQ4I Trophy. Won by: DR1A operated by DB5JG, DF6JC, DJ7EO, DK2CX, DL1QQ, DL5LYM, DL6FBL, JF3GAD, PA1TX, PC5A

CONTEST EXPEDITION

WORLD: C6APR Memorial (PT7ZZ sponsor) Trophy. Won by: V55V operated by V51W, DH1TW, DJ2HD, DK6XZ, DK9IP, DL3DXX, DL9NDS



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N5DX, was operating as NN5J from the K5GO/N5DX hilltop in Arkansas, and George, NR5M, was blasting away from his big station outside Houston. Both had almost identical multiplier totals. Kevin had 184 fewer contacts, but made up for it with extra DX on 40 meters to take the win. Markovic, N8BO, drove the big station at K1LZ to a close third-place finish. Mitch, K7RL, posted a very impressive fourth-place score from the Pacific Northwest using the callsign KW7Y.

The top 100 single-operator all band entrants in the world averaged more than 33 hours of operating time. Their average score reduction was only 6.5% after the log checking. No doubt many of them were chasing qualifying points for WRTC 2014.

Single-Operator Single Band

After winning the 15-meter single band category four out of the last five years, Sergio, PP5JR, moved up to 10 meters this year. Instead of his usual ZX5J callsign, he used PX5E to earn the highest of any single-band score with 17.7-million points. Imagine over 4500 contacts just on 10 meters! Sergio's effort set a new all-time record for the band by breaking the 10-year-old record of D44AC (op 4L5A).

The D44AC callsign was also active this year. Fabio, I4UFH, visited the Cape Verde Islands to go for a new record on 15 meters. Murphy had other plans, as Fabio experienced a generator failure just before sunrise. It took three hours to get someone up the mountain to diagnose and fix the problem—dirty gasoline. That short outage probably cost him the record.

Twenty meters is always a challenge, but even more so this year. During the day, all of the activity was on the higher bands. At night, everyone was on the low bands looking for double points. The competition was from South America with Andreas, 9Y4W, getting the win over Fernando, PY2LED, at ZV2V.



Carlos, PT7ZT, enjoyed operating as PV7M during the contest.

The third highest single band score in the contest was by Sal, HK1T, operating from the "Jumaji" antenna farm with stacked full-size 3-element Yagis. Dusan, YT8A, did his usual fine job to win Europe. Averaging the highest miles per QSO was third-place finisher Laurie, VK7ZX, all the way from Tasmania.

With propagation so good on the high bands, it was difficult for the challengers on 75 and 160 meters. Vemic, YT1AA, used six different Beverage listening antennas to earn the high score over Mikael, SM3M. Tomislav, 9A2AJ, fought the QRN for over 27 hours to win 160 meters. Ouch.

Single-Operator Low Power

The winner for the low power all-band trophy always seems to come from Aruba. This time it was John, W2GD, operating barefoot from P40W with his sights set on setting a new category record. The solar disturbance

on Saturday was just enough to prevent that from happening, but still left him with a big lead. It was an intense competition for second place and top European score between UU7J, operated by Andy, UU4JMG, and IR4X, operated by Matteo, IZ3EYZ. Another perennial high scorer is Ed, N1UR, operating as NV1N. Ed's 5.4-million points pushed the USA all-time record up another 10%.

Single-Operator Assisted

With multipliers seemingly coming with each new QSO, there isn't as much advantage to using the DX Cluster in WPX compared to other contests. Even so, the competition in the Assisted category continues to increase as top operators enjoy the ability to run and still not miss anything that's happening on the bands.

After four years of operating from Madeira, Helmut, DF7ZS, headed to the magical WPX island of Aruba to chase the prize from the

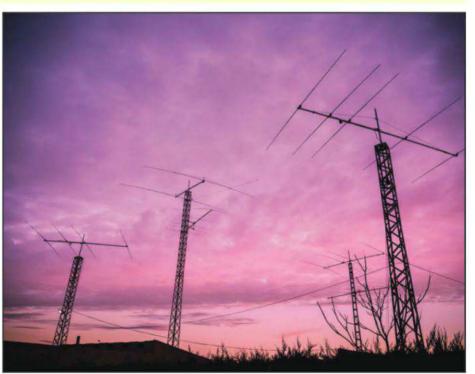
Log Checking Honor Roll

There were 2,866,408 total QSOs recorded in the 5,365 logs received for the 2012 edition of the WPX SSB Contest. More than 2.2 million, or 78%, of these contacts could be cross-checked against another log. An incredible 95.5% of the cross-checked QSOs were made without errors. That's rather amazing when you consider all of the QRM, QSB, and other distractions of a phone contest. The average score reduction for all logs was 11.6%. Score reductions usually are higher in WPX because many busted calls often have the added impact of being lost multipliers.

Everyone who submitted a log to the WPX Contest should have received an e-mail with a link to their log checking report. The report shows all errors found in the logs and how the final score was calculated. The report also shows how others may have miscopied your callsign or exchange. This is a great tool for learning how to improve your operating skills. If you did not receive the message with the link, send an e-mail to <director@cqwpx.com> to request your report.

There were 347 "Golden Logs" with no score reductions at all! Top golden logs (with QSOs made) includeVR2XLN (487), WN2O (341), KIØI (300), VA5LF (270), and G6NHU (244). Nice work!

Interestingly, there were 339 entries that were Golden on the transmitting side. They caused no busted calls, no exchange errors, and no Not-In-Log busts. This elite group included KT2G (100), W4EF/6 (66), OL7Y (56), AA4KD (54), and N3GJ (52).



Sunrise at the antenna farm of ED1R.

Introducing the CrankIR Antenna Series!

(International patent pending)

A lightweight, high performance, extremely portable vertical antenna rated at 2000 watts key-down with fully manual operation (no electrical power or controller required); Patented folded design allows for 40% reduction in size with only a 0.3dB reduction in performance compared to a full length vertical.

Imagine the possibilities!

- Lightweight and extremely portable, the CrankIR is also a great option for stealth installations (CC&R) or for the ham that is on a budget.
- · Install and break down in minutes!
- Continuous coverage on all frequencies within specified range.
- Simple operation change bands with a turn of the crank.
- · 2000 watt power rating.
- Patented folded design allows for 40% shorter element with only 0.3dB reduction in gain compared to a full length vertical.
- Ideal for DXpeditions, hiking, Field Day, boating or home OTH use.
- No controller or electric power required fully self contained manual operation.
- 20m 2m CrankIR weighs approximately 5.5 lb; telescoping support is 9 ft when fully extended, retracts to 26".
- 40m 2m CrankIR weighs approximately 8.5 lb; telescoping support is 18 ft when fully extended, retracts to 30".
- 80m 2m version will be available; more information as we develop it.

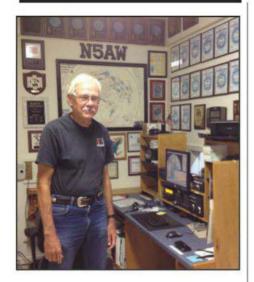
Why settle for compromises?
you can have high performance AND
portability with the CrankIR Series Vertical!

The CrankIR will be available in Spring 2013

Stepp I www.steppir.com

	20)12 WF	X SSB WORL	D TOP S	SCORES			
SINGLE OPERATOR HIGH POWER	*HI3K	2.070.445	3.7 MHz		2	8 MHz	7 MHz	
ALL BANDS	*JR3RIY	1,203,184	SN2M (SP2XF)		LU3HFA	120,330	*F4GTD	
CN2R (W7EJ)27,280,992	*4M1F (YV1JGT)		IQ4RA (I4AVG)			92,105	*EA5HSI	
8P5A (W2SC)	*LZ2JA *R9RA	956 215	DM5ØUEA (DL3BQA) E73ESP (E72SIE)		15KAP	79,977	*Y02MJZ	150,332
VY2ZM (K1ZM)	*C02CW		YU1ARC (YU1YV)			27,730		
UPØL18,541,055	*UAØSOX	798,930	OH9W (OH2FPK)	966,264			TRIBANDER/SINGLE	ELEMENT
E7DX (E77DX)	*VE5ZX	634,920	UW5ZM YL6W	853,461		1 MHz 117,898	HIGH POWE ALL BANDS	
LT1F (LU1FAM)	14 MHz		9A2R	784.665		109,068	NXØX/4 (N4PN)	
PT5T (PP5XX)16,578,468	*PY1ZV		EA7EU	622,566	SP4LVK	92,571	RT4R0	7,517,104
CW5W (CX6VM)15,933,607	*SP5GRM* *EA8VD		1.8 MHz			91,455	KP2MM (N2TTA) NF4A	
28 MHz	*UA6LUQ	867.064	104C	688,170	OTIODIWIQ		LZ2DF	
PX5E (PP5JR)17,785,368	*YB9WZJ		LY7M			4 MHz	EE3A (EA3ATM)	
CE3CT (CE4CT)	*S52WW *LR1H		EU3AR IZ5MOQ		Y1105	131,108	OQ5M (ON5ZO) SV5DKL	4 178 160
PY5QW	*LY80	618,838	UA6AIW	35,916	ON3DI	50,220	UA4FEN	4,097,236
H2T (5B4XF)	*YL5W					43,792	EW2A	3,889,458
ZY5Y (PP5BS)	*IZ2ACD	559,035	SINGLE OPERATOR A	SSISTED	UAØA	38,350	28 MHz	
J03JIS1,540,045	7 MHz		LOW POWER			7 MHz	4XØA (4X1VF)	2,609,750
ZS6EE	*UZ7M (UT9MZ) *S57DX		*RV9UP	4 606 700	S57SU	609,329	WN1GIV/4 (N4BP) 9A2U (9A3ZA)	903,378
TW4W (F5HRT)	*UY2UQ	.1.214.292	*S5ØXX	3.156.849		180,576	KU8E/4	
21 MHz	*UU2CW	1,042,317	*RL6M	3,010,144	SP4GFG	172,125	WP4WW (KP4JRS)	339,756
D44AC (I4UFH)	*Z33F *UA6YE		*IB1B (IW1QN) *UN7MMM		HA8V	57,961	21 MHz	
KJ3X/4 (K4XS)	*EI6JK		*YTØZ (YU1ZZ)		3	.7 MHz	4X9A (4Z40Q)	3.505.614
CS2C (OK1RF)8,004,231	*F4GTD		*UA9AL	2,556,440	UX9Q (UR9QQ)	36,010	SV9GPV	2,878,092
YT5W (YT7AW)	*LY5I *PV2P (PY2DY)		*YV8AD		K9JWV/7	4,272	K6LL/7VY1EI	
TM1W (F1HAR)	FV2F (F12D1)	323,040	*RW4WA *LZ12FDAY (LZ1UK)	2.213.099	3	.8 MHz	KZ5J	
NH6P (KH7Y)4,121,650	3.7 MHz		2.58 57	16 (6		1,984		
XE1L	*DF2DJ *YT8WW		*PR3A	4 630 460		91	9A2Ø3B (9A1AA)	2 720 122
0,201,292	*YL2GUV		*LU8EOT		MULTI	-OPERATOR	RY3D	
14 MHz	*SP4SHD	274,920	*YV5JF	1,330,662	5D5A	TRANSMITTER 38,510,454	S51CK	1,913,330
9Y4W	*R3LC *S53N (S58G)	224,548	*PY3FJ* *PU8WWW		P33W	37,798,352	8SØC (SMØMPV) UP5P (UN7PL)	1,889,264
D4C (IZ4UEZ)	*OMØCS		*PU2STZ			29,872,318	UP3P (UN/PL)	1,207,324
VC7R (VA7RR)5,664,204	*US2IZ	169,596	*PY2HT	839,300		27,788,120	7 MHz	
OHØX (OH2PM)	*HK6P		*PY2TKB		3V8BB	26,263,647	9A8DXIK3UNA/1	
S5ØK	*HG8YK0	135,330	*HGØR (HAØNAR) *PU1KGG	396 198		22,523,280	RA30A	
EA5DFV3,898,378	1.8 MHz					21,845,680	LY2UU	485,000
UZØU (UY5ZZ)3,250,640	*EU2EU		21 MHz	0 140 400		21,335,538	IW5ELR	294,118
YL2BJ2,611,614	*0K1J0K *ER2RM		*HA4XH*PY9MM			-OPERATOR	3.7 MHz	
7 MHz	*SM6FJY	20,592	*N9TGR	1,001,616	TW0-TF	RANSMITTER	DM5ØUEA (DL3BQA)	1,358,934
HK1T14,512,230	*VE3EDY	8,140	*ED8D (EA8MT)			57,741,867	YT4A (YT1AA)	
YT8A (YU1EA)	SINGLE OPERATOR ASSI	ISTED	*R9MC *UAØWY			50,282,186	9A2R EA7EU	
YL3FT2,824,356	HIGH POWER		*IR8M (IZØEYP)	650,886	V55V	36,092,544	EA1EA	
KK1KW2,407,000	ALL BANDS	00 000 004	*UT5L0			33,721,072	3.8 MHz	
R8MC	P41P (DF7ZS)		*SP4DZT *YL3AGV			31,118,395	IZ5MOQ	253 968
9A8DX1,854,949	H22H (5B4MF)	13,617,600			A73A	28,885,818	SV1GRD	
0Q7T	ZZ2T (PY2MNL) KI1G	12,663,156	*VTECT	1 511 400		28,737,382		
IKSUNA/1730,700	YP9W (Y09GZU)		*YT5CT *YT8T			25,898,786	TRIBANDER/SINGLE	ELEMENT
3.7 MHz	HA8JV	9,654,390	*KG1E	1,036,630	MULII	-OPERATOR TRANSMITTER	LOW POWE	R
YT4A (YT1AA)	EG2DXIW2HAJ		*ZM3T (W3SE) *UT7Y (USØYW)	1,036,074		76,018,024	ALL BANDS	
S54K849,420	VE9HF		U1/1 (U3U1VV)			E4 000 7E0	*71.210	
10014110	VESHF	8,789,700	*Y08SSB	640,920	DR1A		*ZL3IO*RT9S	3,285,816
IC8WIC834,968		8,789,700	*Y08SSB *NP4G	497,377	LP1H	47,996,898	*RT9S *T07BC (DL7BC)	3,285,816
W3BGN808,920	28 MHz		*Y08SSB *NP4G *EF7W (EC7KW)	497,377	LP1H 9A1A 0T5A		*RT9S *T07BC (DL7BC) *IB1B (IW1QN)	3,285,816 3,172,628 2,966,194
W3BGN808,920 4M5W (YV5MSG)491,301 SP3GTS390,375	28 MHz LR2FLU3HS	7,746,093 4,503,842	*Y08SSB *NP4G	497,377 425,898 371,840	LP1H 9A1A 0T5A LZ9W		*RT9S *T07BC (DL7BC) *IB1B (IW1QN) *E21EIC *NR3X/4 (N4YDU)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596	LR2FLU3HSKG6DX	7,746,093 4,503,842 4,406,832	*Y08SSB* *NP4G *EF7W (EC7KW)* *OK6RA* *RA6GW*	497,377 425,898 371,840	LP1H 9A1A 0T5A LZ9W HG1S		*RT9S *T07BC (DL7BC) *IB1B (IW1QN) *E21EIC *NR3X/4 (N4YDU) *XQ7UP	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168	28 MHz LR2FKG6DX	7,746,093 4,503,842 4,406,832 2,609,750	*Y08SSB *NP4G *EF7W (EC7KW) *OK6RA *RA6GW	497,377 425,898 371,840 357,840	LP1H		*RT9S *T07BC (DL7BC) *IB1B (IW1QN) *E21EIC *NR3X/4 (N4YDU) *1022 (IK2DZN)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285
W3BGN 808,920 4M5W (YV5MSG) 491,301 \$P3GTS 390,375 RU48S 370,596 UX1VT 243,168 EA1AAW 199,867	28 MHz LR2F LU3HS KG6DX 4XØA (4X1VF) PPSJN CT3HF	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396	*Y08SSB. *NP4G *NP4G *EF7W (EC7KW) *OK6RA *RA6GW *T MHz *EI4CF *EN1C		LP1H		*RT9S *T07BC (DL7BC) *IB1B (IW1QN) *E21EIC *NR3X/4 (N4YDU) *XQ7UP	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935
W3BGM 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5.IN CT3HF II9X (IT9SPB)	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772	*Y08SSB *NP4G *EF7W (EC7KW)		LP1H 9A1A		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *1022 (IK2DZN) *KT4ZB *NX6T (K6AM)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935
W3BGM. 808,920 4M5W (YV5MSG). 491,301 SP3GTS. 390,375 RU4SS. 370,596 UX1VT. 243,168 EA1AAW. 199,867 1.8 MHz 9A2AJ. 465,864	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5.IN CT3HF II9X (IT9SPB) PYTEW	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 1,078,740	*Y08SSB. *NP4G. *NP4G. *EF7W (EC7KW) *OK6RA *RA6GW 7 MHz *EI4CF *EN1C *VY2MGY/3 (VE3MGY) *NY6DX/2		LP1H 9A1A 0T5A LZ9W HG1S VC6Z NX5M KL7RA		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *I022 (IK2DZN) *KT4ZB *NX6T (K6AM)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5.IN CT3HF II9X (IT9SPB)	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 1,078,740	*Y08SSB *\NP46 *\RP46 *\RP46 *\RFW (EC7KW) *\RA6GW 7 MHz *\RA6GW *\RA6GW *\Y2MGY/3 (VE3MGY) *\NY6DX/2 *\RY6DX/2 *\RY6DX/2 *\RY6DX/3 *\RY6DX/3 *\RY6DX/3 *\RY6DX/3 *\RY6DX/3		LP1H 9A1A 0T5A LZ9W HG1S VC6Z NX5M KL7RA R HIGH POW UA5A (RA3AKT)	47,996,888 38,960,724 34,489,028 34,413,120 26,861,948 19,953,621 19,565,898 19,449,164 IOOKIE JER ALL BANDS 11,307,639	*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *XQ7UP *IO2Z (IK2DZN) *K14ZB *NX6T (K6AM) *BMHZ *LU7EC *AY8A (LU8ADX)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU48S 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285	28 MHz LR2F LU3HS KG6DX 4XØA (4X1VF) PP5JN. CT3HF II9X (IT9SPB) PY1EW XV1X RXØAE	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 1,078,740	*Y08SSB. *NP4G. *NP4G. *EF7W (EC7KW) *OK6RA. *RA6GW 7 MHz *EI4CF. *EN1C. *VY2MGY/3 (VE3MGY) *NY6DX/2. *2E1FVS. *EA5HSI *VE9ML		LP1H 9A1A 0T5A LZ9W HG1S VC6Z NX5M KL7RA RHIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU	47,996,888 38,960,724 34,489,028 34,413,120 26,861,948 19,953,621 19,565,898 19,449,164 BOOKIE VER ALL BANDS 11,307,639 7,429,512 3,146,094	*RT9S *T07BC (DL7BC) *IB18 (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) *LUTEC *AY8A (LU8ADX) *LU8DCF	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 1,949,935 1,920,810 2,525,888 1,070,913 985,150
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 IR1A (IKTGPG) 97,709	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JN CT3HF II9X (IT9SPB) PY1EW XV1X RX0AE 21 MHz NS1L/4 (W4SVO)	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 1,078,740 957,190 833,316	*Y08SSB *NP4G *NP4G *OK6RA *RA6GW *E14CF *EN1C *VY2MGY/3 (VE3MGY) NY6DX/2 *2E1FVS *EA5HSI *VE9ML *UA2FT *Y10A		LP1H 9A1A. 0T5A. LZ9W. HG1S. VC6Z. NX5M. KL7RA. RHGHP0W UA5A (RA3AKT) S59ABC (S56AA). RN3DMU. HZ1TT.		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *XQ7UP *IO2Z (IK2DZN) *K14ZB *NX6T (K6AM) *BMHZ *LU7EC *AY8A (LU8ADX)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 IR14 (IK1GPG) 97,709 EA6SX 41,340	28 MHz LR2F LU3HS KG6DX 4XØA (4X1VF) PP5JN CT3HF II9X (IT9SPB) PY1EW XV1X RXØAE 21 MHz NS1L/4 (W4SVO) 5B4KH	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 1,078,740 957,190 833,316	*Y08SSB *NP4G *EF7W (EC7KW) *OKGRA *RA6GW *EI4CF EN1C *VY2MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HSI *VE9ML		LP1H 9A1A. 0T5A. LZ9W. HG1S. VC6Z. NX5M. KL7RA. RHGHP0W UA5A (RA3AKT) S59ABC (S56AA). RN3DMU. HZ1TT.	47,996,888 38,960,724 34,489,028 34,413,120 26,861,948 19,953,621 19,565,898 19,449,164 BOOKIE VER ALL BANDS 11,307,639 7,429,512 3,146,094	*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *1022 (IK2DZN) *KT4ZB *NX6T (K6AM) *LU7EC *AY9A (LU8ADX) *LU8DCF *LU3DGR *H02N (JA6WFM)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UT5UGR 299,882 LY2OU 228,285 SP4UGP 172,500 IR1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PPSJN CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE NS1L/4 (W4SVO) 584KH LY5E (LY2LI)	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 1,078,740 957,190 833,316	*Y08SSB *NP46 *EF7W (EC7KW) *OK6RA *RA6GW *E14CF *EN10 *VY2MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HSI *VE9ML *UA2FT *Y10A *DS5T0S		LP1H 9A1A OT5A LZ9W HG1S VC6Z NX5M KL7RA HIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU HZ1TT. UD3D (UB3DAY)		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *XQ7UP *I02Z (IK2DZN) *KT4ZB *NX6T (K6AM) *28 MHz *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR	3, 285, 816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 IR14 (IK1GPG) 97,709 EA6SX 41,340	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JN, CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LI) DF9ZP OQ4U	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 1,078,740 833,316 5,364,639 5,364,639 5,367,688 5,203,000 4,976,624 4,685,949	*Y08SSB *NP4G *EF7W (EC7KW)		LP1H 9A1A OT5A LZ9W HG1S VC6Z NX5M KL7RA HIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU HZ1TT. UD3D (UB3DAY)		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) 28 MHz *LU7EC *AY8A (LU8ADX) *LU8BCF *LU3DR *HQ2N (JA6WFM) 21 MHz *R9MC *LUAGSOX	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 2,92,608
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 EA1AAW 199,867 1.8 MHz 9A2AJ 455,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 RIA (RKIGPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JN CT3HF II9X (1T9SPB) PY1EW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF9ZP 004U VT7Z (VTSM)	7,746,093 .4,503,842 .4,406,832 .2,609,750 .1,398,132 .1,398,132 .1,351,396 .1,243,772 957,190 833,316 5,364,639 .5,336,788 .5,233,000 .4,976,624 .4,685,949 .4,608,128	*Y08SSB *\NP46 *\P746		LP1H 9A1A. 075A. LZ9W. HG1S. VC6Z. NX5M. KL7RA. HIGH PW HGH PW HGH PW HGH PW HGH PW HGH PW LA5A (RA3AKT). S59ABC (S56AA). RN3DMU HZ1TT. UD3D (UB3DAY).		*RT9S *T07BC (DL7BC) *1B1B (IW1QN) *E21EIC *NR3X/4 (N4YDU) *XQ7UP *1022 (IK2DZN) *KT4ZB *NX6T (K6AM) 28 MHz *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR *HQ2N (JA6WFM) *PH4X0	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UT5UGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,133 UT5ECZ 19,950 SINGLE OPERATOR LOW POWER	28 MHz LR2F LU3HS KG6DX 4XØA (4X1VF) PP5JN CT3HF II9X (IT9SPB) PY1EW XV1X RXØAE 21 MHz NS1L/4 (W4SVO) 5B4KH LY5E (LY2LJ) DF9ZP 004U YT7Z (YT5M)	7,746,093 4,503,842 4,406,832 2,609,750 1,398,133 1,243,772 1,078,740 ,957,190 ,833,316 ,5,364,639 ,5,364,639 ,5,364,639 ,966,639 ,976,639 ,976,639 ,976,639 ,976,639 ,976,639	*Y08SSB *NP4G *EF7W (EC7KW) *OKGRA *RA6GW *EI4CF *EN1C *VY2MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HSI *VE9ML *UA2FT *Y10A *DS5TOS 3.7 MHz *9A1JSB (9A7ZZ) *LY7Z *SS3NW		LP1H 9A1A. 015A. L29W. HG1S. VC6Z. NX5M. KL7RA. RHIGH POW UA5A (RA3AKT). S59ABC (S56AA). RN3DMU. H21TT. UD3D (UB3DAY). PY1EW. 2 AK3S.		*RT9S *T07BC (DL7BC) *IB18 (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *1022 (IK2DZN) *KT4ZB *NX6T (K6AM) *28 MHz *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR *HQ2N (JA6WFM) *R9MC *UAGSOX *RU4SO *KM4HI	3, 285, 816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IKIGPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UT5ECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P4ØW (W2GD) 13,062,600	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JN CT3HF II9X (IT9SPB) Y11EW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 5B4KH LY5E (LY2LI) DF9ZP 0Q4U Y17Z (Y15M) EI2CN YU5A (YU1EW) 9ASY (9ASMM)	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 ,957,190 ,833,316 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,936 ,936,936 ,936,936 ,936,936 	*Y08SSB *NP46 *EF7W (EC7KW) *OK6RA *RA6GW *EH4CF *EN1C *YY2MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HS1 *VE9MI *UA2FT *Y10A *DS5TOS *3.7 MHz *9A1JSB (9A7ZZ) *LY7Z *S53NW *DR2K (0L50CR) *ITSJOH		LP1H 9A1A. 015A. L29W. HG1S. VC6Z. NX5M. KL7RA. RHIGH POW UA5A (RA3AKT). S59ABC (S56AA). RN3DMU. H21TT. UD3D (UB3DAY). PY1EW. 2 AK3S.		*RT9S *T07BC (DL7BC) *IB1B (W1QN) *E21EIC *NR3X/4 (N4YDU) *XQTUP *1022 (IK2DZN) *KT4ZB *NX6T (K6AM) *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR *HQ2N (JA6WFM) *R9MC *UAGSOX *RU4SO *KM4H1 *EE1B (EATYB)	3, 285, 816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UT5UGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UT5ECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P40W (W2GD) 1,3062,600 *UUTJ (UU4JMG) 6,531,670	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PPSJN CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF9ZP OQ4U V17Z (VTSM) EI2CN YU5S (VU1EW)	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 ,957,190 ,833,316 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,936 ,936,936 ,936,936 ,936,936 	*Y08SSB *NP46 *EF7W (EC7KW)		LP1H 9A1A 015A L29W HG1S VC6Z NX5M KL7RA RHIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU HZ1TT UD3D (UB3DAY) PY1EW 2 AK3S BY1CW (BD1GXH)		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) *28 MHz *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR *HQ2N (JA6WFM) *PMC *UABSOX *RU4SO *KM4HI *EE1B (EATYB) *14 MHz	3, 285, 816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 2,92,608 925,688 798,930 602,922 425,632 387,045
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 RI1A (IKIGPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P4ØW (W2GD) 13,062,600 *UUTJ (UU4JMG) 6,531,670 *UR1X (IZSTZY) 6,328,036	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JM CT3HF II9X (IT9SPB) PY1EW XV1X RX0AE. 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF9ZP 004U YT7Z (YT5M) EI2CN YU5A (YU1EW) 9A5Y (9A3NM) OH1F (OH1NOA)	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 ,957,190 ,833,316 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,639 ,936,936 ,936,936 ,936,936 ,936,936 	*Y08SSB *NP46 *IP46 *EF7W (EC7KW) *OKBRA *RA6GW *EI4CF *EN1C *VY2MGY/3 (VE3MGY) *NY6DX/2 *EA5HSI *VE9MI *UA2FF *Y10A *DS5TOS 3.7 MHz *S3NW *DR2K (DL5OCR) *IT9JDH *EA3AKA *YB1AR		LP1H 9A1A. 075A. LZ9W. HG1S. VC6Z. NX5M. KL7RA. RIGHP POW UA5A (RA3AKT). S59ABC (S56AA). RN3DMU HZ1TT. UD3D (UB3DAY). PY1EW. 2 AK3S. BY1CW (BD1GXH)		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *IO2Z (IK2DZN) *KT4ZB *NX6T (K6AM) 28 MHz *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR *HQ2N (JA6WFM) 21 MHz *R9MC *UA0SOX *KM4HI *EE1B (EA1YB) *PY1ZV 14 MHz	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608 925,688 798,930 602,922 425,632 387,045
W3BGN 808,920 4M5W (V75MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHZ 9A2AJ 465,864 OM7RU 340,599 UT5UGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IKIGPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UT5ECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P40W (W2GD) 13,062,600 *UUTJ (UU4JMG) 6,531,670 *IR4X (IZ3EYZ) 6,328,036 *ZL310 6,182,904 *NY1N (N1UR) 5,451,950	28 MHz LR2F	7,746,093 4,503,842 4,406,832 2,609,750 1,388,132 1,351,396 1,243,772 1,078,740 957,190 833,316 5,364,639 5,364,639 5,364,639 4,976,624 4,685,949 4,081,128 4,331,998 4,178,944 4,054,290 3,683,488	*Y08SSB *NP46 *EF7W (EC7KW)		LP1H 9A1A. 015A. L29W. HG1S. VC6Z. NX5M. KL7RA. RHIGH POW UA5A (RA3AKT). SS9ABC (S56AA). RN3DMU HZ1TT. UD3D (UB3DAY) PY1EW. 2 AK3S. BY1CW (BD1GXH) D4C (IZ4UEZ) R		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) 28 MHz *LUTEC *AY8A (LU8ADX) *LU3DG *LU3DG *LU3DG *LU3DG *HQ2N (JA6WFM) 21 MHz *R9MC *VA6SOX *RU4SO *KM4H1 *EE1B (EATYB) 14 MHz *PY1ZV *KGIE *ZM3T (W3SE)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608 925,688 796,930 602,922 425,632 387,045 1,287,453 1,036,630 1,036,630 1,036,674
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UT5ECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS **P4ØW (W2GD) 13,062,600 **UUTJ (UU4JMG) 6,531,670 **UUTJ (UU4JMG) 6,531,670 **IR1AX (IZ3EYZ) 6,228,206 **ZL310 6,182,904 **NV1N (N1UR) 5,451,950 **RWOA (RAØAMM) 5,171,096	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JN CT3HF II9X (IT9SPB) PY1EW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2IJ) DF9ZP 004U Y17Z (YT5M) EI2CN YU5A (YU1EW) 9ASY (9A3MM) 0H1F (0H1NOA) 14 MHz SO2R (SP2FAX) GW9T (MW0ZZK)	7,746,093 4,503,842 4,406,832 2,609,750 1,398,132 1,351,396 1,243,772 ,957,190 ,833,316 ,957,190 ,95	*Y08SSB *NP4G *EF7W (EC7KW) *OK6RA *EF7W (EC7KW) *OK6RA *RA6GW *EI4CF *EN1C *VY2MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HS1 *VE9ML *UA2FT *Y10A *DS5TOS *3.7 MHz *9A1JSB (9A7ZZ) *2S3WW *DR2K (DL5CCR) *IT9JDH *EA3AKA *YB1AR *EA1GWM *UR8IDX.		LP1H 9A1A. 075A. LZ9W. HG1S. VC6Z. NX5M. KL7RA. RIGH POW UA5A (RA3AKT). S59ABC (S56AA). RN3DMU HZ1TT. UD3D (UB3DAY). PY1EW. 2 AK3S. BY1CW (BD1GXH) D4C (IZ4UEZ). R B LOW POW		*R19S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DGR *H02N (JA6WFM) *R9MC *UA0SOX *RU4SO *KM4H1 *EE1B (EA1YB) *PY1ZV *KG1E *ZM3T (W3SE) *S57U	3, 285, 816 3, 172, 628 2, 966, 194 2, 846, 340 2, 439, 441 2, 216, 865 1, 949, 935 1, 920, 810 2, 525, 888 1, 070, 913 985, 150 779, 833 292, 608 925, 688 798, 930 602, 922 425, 632 387, 045 1, 287, 453 1, 036, 630 1, 036
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IKTGPG) 97,709 EAGSX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P4ØW (W2GD) 13,062,600 *UUTJ (UU4JMG) 6,551,670 *UH7J (UU4JMG) 6,551,670 *UR4K (IZ3EYZ) 6,328,036 *ZL310 6,182,904 *NV1N (N1UR) 5,451,950 *RW0A (RAØANM) 5,171,096 *LY1R (LY9A) 4,803,825	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PPSJN CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF9ZP 004U VT7Z (YT5M) EI2CN YUSA (YU1EW) 9ASY (9A3MM) OH1F (OH1NOA) 14 MHz SO2R (SP2FAX) GW9T (MW0ZZK) US11 (UX2IO)	7,746,093 4,503,842 4,906,832 2,609,750 1,281,313 1,281,312 1,281,313 1,243,772 957,190 833,316 5,364,639 5,364,639 5,364,639 4,976,624 4,685,949 4,608,128 4,311,994 4,178,944 4,054,290 3,683,488	*Y08SSB *NP46 *EF7W (EC7KW) *OK6RA. *RA6GW. *EI4CF *EN1C *VY2MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS. *EA5HSI *VE9ML *UA2FT *Y10A *DS5TOS. 3.7 MHz *9A1JSB (9A7ZZ) *LY7Z *S53NW. *DR2K (DL50CR) *IT3JDH *EA3AKA *WB1AR *EA1GWM *UR8IDX.		LP1H		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) 28 MHz *LUTEC *AY8A (LU8ADX) *LU3DG *LU3DG *LU3DG *LU3DG *HQ2N (JA6WFM) 21 MHz *R9MC *VA6SOX *RU4SO *KM4H1 *EE1B (EATYB) 14 MHz *PY1ZV *KGIE *ZM3T (W3SE)	3, 285, 816 3, 172, 628 2, 966, 194 2, 846, 340 2, 439, 441 2, 216, 865 1, 949, 935 1, 920, 810 2, 525, 888 1, 070, 913 985, 150 779, 833 292, 608 925, 688 798, 930 602, 922 425, 632 387, 045 1, 287, 453 1, 036, 630 1, 036
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 IR1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P4PW (W2GD) 13,062,600 *UU7J (UU4JMG) 6,531,670 *IR4X (IZ3EYZ) 6,328,036 *ZL310 6,182,904 *NV1N (N1UR) 5,451,950 *LY1R (LY9A) 4,803,825 *S50A 4,732,052 *H18LAMM3 4,854,011	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JN CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LI) DF9ZP 004U YT7Z (YT5M) EI2CN YU5A (YU1EW) 9ASY (9ASNM) OH1F (OH1NOA) 14 MHz SOZR (SP2FAX) GW9T (MW0ZZK) US11 (IUX2IO) SS3F OL9Z		*Y08SSB *NP4G *EF7W (EC7KW) *OKGRA *RA6GW 7 MHz *EI4CF *EN1C *VY2MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HSI *VE9ML *UA2FT *Y10A *DS5TOS 3.7 MHz *9A1JSB (9A7ZZ) *LY7Z *S53MW *DR2K (DL5OCR) *IT9JDH *EA3AKA *YB1AR *EA1GWM *UR8IDX 1.8 MHz *E7CW (E74WN) *236N		LP1H 9A1A. 075A. LZ9W. HG15. VC6Z. NX5M KL7RA. HIGH PO UA5A (RA3AKT) S59ABC (S56AA). RN3DMU HZ1TT. UD3D (UB3DAY). 2 PY1EW. 2 AK3S. BY1CW (BD1GXH) D4G (IZ4UEZ). 1 D4G (IZ4UEZ). 8 LOW POW. *EA2LMI. *ED7R (EA7IZJ)* *0H3F0G		*RT9S *T07BC (DL7BC) *IB18 (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *1022 (IK2DZN) *KT4ZB *NX6T (K6AM) *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR *H02N (JA6WFM) *R9MC *UA6SOX *RU4SO *KM4HI *EE1B (EA1YB) *MHz *YR1I (CE1KR) *XR1I (CE1KR)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608 9925,688 798,930 602,922 425,632 387,045 1,287,453 1,036,630 1,036,074 453,840 445,284
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4UCP 172,500 RT1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P4ØW (W2GD) 13,062,600 **UUTJ (UU4JMG) 6,531,670 **UUTJ (UU4JMG) 6,531,670 **UR1A (IZ3EYZ) 6,328,036 **Z1310 6,182,904 **NY1N (N1UR) 5,451,950 **RWØA (RAØAM) 5,171,096 **LY1R (LY9A) 4,803,825 **S560A 4,732,052	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PPSJN. CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO). 584KH LY5E (LY2LJ) DF9ZP OQ4U VT7Z (YT5M) E12CN YU5A (YU1EW). 9ASY (9A3NM) OH1F (OH1NOA). 14 MHz SO2R (SP2FAX) GW9T (MW0ZZK) US11 (UX21O). SS3F OL92. PT2CM (PT2IC).	7,746,093 4,503,842 4,406,832 2,609,750 1,388,132 1,351,396 1,243,772 957,190 833,316 5,364,639 .5,336,788 .5,203,000 .4,976,624 .4,608,128 .4,431,938 .4,178,944 .4,054,290 .3,683,488	*Y08SSB *\NP46 *\NP46 *\SP46 *\S		LP1H 9A1A. 015A L29W HG1S VC6Z NX5M KL7RA R HIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU H211T UD3D (UB3DAY) PY1EW 2 AK3S BY1CW (BD1GXH) LOW POW *EAZLMI *ED7R (EA7IZJ) *OH3F0G *YOSLD		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) 28 MHz *LU7EC *AY8A (LU8ADX) *LU3DG *LU3DG *LU3DG *LU3DG *HQ2N (JA6WFM) 21 MHz *R9MC *VA9SOX *RU4SO *KM4H1 *EE1B (EATYB) 14 MHz *PY1ZV *KG1E *ZM3T (W3SE) *S57U *XR11 (GE1KR) 7 MHz *EN1C	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608 925,688 796,930 602,922 425,632 425,632 387,045
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 IR1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS **P40W (W2GD) 13,062,600 **UUTJ (UU4JMG) 6,531,670 **IR4X (IZ3EYZ) 6,328,036 **ZL31O 6,182,904 **NV1N (N1UR) 5,451,950 **NWOM (RAØAMM) 5,171,096 **LY1R (LY9A) 4,803,825 **S560A 4,732,052 **HIBLAM/3 4,354,011 **KUZM 4,318,160	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JN CT3HF II9X (IT9SPB) PY1EW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2IJ) DF9ZP 004U Y17Z (YT5M) EI2CN YU5A (YU1EW) 9ASY (9A3MM) 0H1F (0H1N0A) 14 MHz SO2R (SP2FAX) GW9T (MW0ZZK) US11 (UX2IO) S53F 0L9Z PT2CM (PT2IC) RJ3FF	7,746,093 4,503,842 4,406,832 2,609,750 1,381,392 1,351,396 1,243,772 1,078,740 957,190 833,316 5,203,000 833,316 5,203,000 4,976,624 4,681,28 4,31,998 4,178,944 4,054,290 5,363,683,488	*Y08SSB *NP4G *EF7W (EC7KW) *OK6RA *EF7W (EC7KW) *OK6RA *RA6GW *EI4CF *EN1C *VY2MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HS1 *VE9ML *UA2FT *Y10A *DS5TOS *3.7 MHz *9A1JSB (9A7ZZ) *1-Y7Z *553NW *DR2K (0L50CR) *1T9JDH *EA3AKA *YB1AR *EA1GWM *UR8IDX *1.8 MHz *E7CW (E74WN) *236N *SP8LBK *URSIFB		LP1H 9A1A. 015A L29W HG1S VC6Z NX5M KL7RA R HIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU H211T UD3D (UB3DAY) PY1EW 2 AK3S BY1CW (BD1GXH) LOW POW *EAZLMI *ED7R (EA7IZJ) *OH3F0G *YOSLD		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *I022 (IK2DZN) *KT4ZB *NX6T (K6AM) *LU7EC *AY9A (LU8ADX) *LU8DCF *LU3DR *H02N (JA6WFM) *R9MC *UA0SOX *RU4SO *KM4HI *EE1B (EA1YB) 14 MHz *PY1ZV *KG1E *S57U *XR1I (CE1KR) 7 MHz *ENIC *VY2MGY/3 (VE3MGY)	3, 285, 816 3, 172, 628 2, 966, 194 2, 846, 340 2, 439, 441 2, 216, 865 2, 028, 285 1, 949, 935 1, 920, 810 2, 525, 888 1, 070, 913 9, 955, 150 778, 833 2, 92, 608 798, 930 602, 922 425, 632 387, 045 1, 287, 453 1, 036, 630 1, 036, 630 1, 036, 630 445, 284 485, 840 485, 840 885, 840
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IK1GPG) 97,709 EAGSX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS "P4ØW (W2GD) 13,062,600 "UUTJ (UU4JMG) 6,531,670 "IR1X (IZ3EYZ) 6,328,036 "Z1,310 6,182,904 "NY1N (N1UR) 5,451,950 "NY1N (N1UR) 5,451,950 "NW0A (RAØAMM) 5,171,096 "LY1R (LY9A) 4,803,825 "S560A 4,732,052 "HIBLAM/3 4,354,011 "KU2M 4,318,160	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JM CT3HF II9X (IT9SPB) PY1EW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF9ZP 004U Y17Z (YT5M) EI2CN YU5A (YU1EW) 9ASY (9A3NM) OH1F (OH1NOA) 14 MHz SO2R (SP2FAX) GW9T (MW0ZZK) US11 (UX2IO) S53F CU92 PT2CM (PT2IC) RJ5FF CU93COM, DA2C (DK3DM) DA2C (DK3DM) DA2C (DK3DM) DA2C (DK3DM)	7,746,093 4,503,842 4,406,832 2,609,750 1,388,132 1,351,396 1,243,772 1,078,740 957,190 833,316 5,364,639 5,364,639 5,364,639 5,364,639 5,203,000 4,976,624 4,608,128 4,313,998 4,178,944 4,054,290 3,683,488 5,149,956 5,149,	*Y08SSB *\NP46 *\NP46 *\SP46 *\S		LP1H 9A1A. 015A. L79W. HG1S. VC6Z. NX5M. KL7RA. RHIGH POW UA5A (RA3AKT). S59ABC (S56AA). RN3DMU H21TT. UD3D (UB3DAY). PY1EW. 2 AK3S. BY1CW (BD1GXH) LOW POW. *EA2LMI. *ED7R (EA7IZJ). *OH3F0G. *Y05LD. *W4DTB.		*R19S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) *LU7EC *AY8A (LU8ADX) *LU8DF *LU8DF *H02N (JA6WFM) *R9MC *UA0SOX *RU4SO *KM4H1 *EE1B (EATYB) *MHZ *K9ME *Y1ZV *KG1E *XR1I (CE1KR) *T MHZ *EN1C *Y2MGY/3 (VE3MGY) *OK2ILD *OK2ILD *OK2ILD *IG1BO (IZ1DGG)	3, 285, 816 3, 172, 628 2, 966, 194 2, 846, 340 2, 439, 441 2, 216, 865 1, 949, 935 1, 920, 810 2, 525, 888 1, 070, 913 2, 925, 688 798, 930 602, 922 425, 632 387, 045 1, 287, 453 1, 036, 630 1, 036, 630 1, 036, 630 1, 036, 630 445, 284 845, 435 685, 640 312, 180 283, 976
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UT5UGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IKTGPG) 97,709 EAGSX 41,340 RN4HJO 40,125 RW3SY 30,193 UT5UCZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P4GW (W2GD) 13,062,600 *UU7J (UU4JMG) 6,531,670 *IR4X (IZ3EYZ) 6,328,036 *ZU310 6,182,904 *NV1N (N1UR) 5,451,950 *RW6A (RAØAM) 5,171,096 *LY1R (LY9A) 4803,825 *S56A 4,732,052 *HIBLAM/3 4,354,011 *KU2M 4,318,160 *PU2LEP 5,134,649 *PU2LEP 5,134,649 *LW8DQ (LW7DX) 3,011,602	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PPSJN CT3HF II9Y (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF9ZP 004U Y77Z (YT5M) EI2CN YUSA (YU1EW) 9ASY (9A3MM) OH1F (OH1NOA) 14 MHz SO2R (SP2FAX) GW9T (MW0ZZK) US11 (UX2IO) SS3F OL9Z PT2CM (PT2IC) RJ3FF E030 (UR3QCW)	7,746,093 4,503,842 4,406,832 2,609,750 1,388,132 1,351,396 1,243,772 1,078,740 957,190 833,316 5,364,639 5,364,639 5,364,639 5,364,639 5,203,000 4,976,624 4,608,128 4,313,998 4,178,944 4,054,290 3,683,488 5,149,956 5,149,	*Y08SSB *Y08SSB *NP4G *EF7W (EC7KW) *OKGRA *RA6GW 7 MHz *EI4CF *EN1C *YY2MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HSI *VE9ML *UA2FT *Y10A *DS5TOS 3.7 MHz *SS3NW *DR2K (DL5OCR) *IT9JDH *EA3AKA *Y81AR *EA1GWM *UR8IDX 1.8 MHz *E7CW (E74WN) *236N *SP8LBK *URSIFB *W2MF	497,377 425,898 371,840 357,840 892,012 845,435 685,645 685,645 632,818 419,692 345,779 255,387 128,554 112,658 110,522 521,968 243,837 163,226 139,200 15,386 4,988 4,988 4,988 320,458 205,905 121,208 96,114 54,730	LP1H 9A1A 0T5A LZ9W HG1S VC6Z NX5M KL7RA HIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU HZ1TT UD3D (UB3DAY) PY1EW 2 AK3S BY1CW (BD1GXH) *EOTR (EAT/LZI) *CD7R (EAT/LZI) *UB5PGG *YO5LD *W4DTB		*RT9S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DN) *K14ZB *NX6T (K6AM) 28 MHz *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR *HQ2N (JA6WFM) 21 MHz *R9MC *UAGSOX *RU4SO *KM4HI *EE1B (EATYB) *EE1B (EATYB) *YG1E *XG1E *ZM3T (W3SE) *S57U *XR1I (CE1KR) *T MHz *PY1ZV *KG1E *ZM3T (W3SE) *S57U *XR1I (CE1KR) *T MHz *PY1ZV *KG1E *ZM3T (W3SE) *S57U *XR1I (CE1KR)	3, 285, 816 3, 172, 628 2, 966, 194 2, 846, 340 2, 439, 441 2, 216, 865 1, 949, 935 1, 920, 810 2, 525, 888 1, 070, 913 2, 925, 688 798, 930 602, 922 425, 632 387, 045 1, 287, 453 1, 036, 630 1, 036, 630 1, 036, 630 1, 036, 630 445, 284 845, 435 685, 640 312, 180 283, 976
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 RI1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P4ØW (W2GD) 13,062,600 **UUTJ (UU4JMG) 6,531,670 **UTJ (UU4JMG) 6,531,670 **UTJ (UU4JMG) 6,531,670 **UR1X (123EYZ) 6,328,836 **Z1310 6,182,904 **NY1N (IN IUR) 5,451,950 **RWØA (RAØAM) 5,171,096 **LY1R (LY9A) 4,803,825 **RWØA (RAØAM) 5,171,096 **LY1R (LY9A) 4,803,825 **HIBLAM/3 4,354,011 **KUZM 4,318,160 **PUZLEP 5,134,649 **LWBDQ (LW7DX) 3,011,602 **LU4SDQ (LW7DX) 3,011,602 **LU6FOV 2,837,100	28 MHz LR2F. LU3HS KG6DX 4X0A (4X1VF) PPSJN. CT3HF. II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO). 584KH LY5E (LY2LJ) DF9ZP. 0Q4U. V17Z (YT5M) E12CN. YU5A (YU1EW). 9ASY (9A3MM). 0H1F (0H1NOA). 14 MHz S02R (SP2FAX). GW9T (MW0ZZK). US11 (UX210). S53F. 0L92. PT2CM (PT2IC). RJ3FF. E030 (UR3DCW). DA2C (DK3DM). S50G (S57AW).	7,746,093 4,503,842 4,406,832 2,609,750 1,388,132 1,351,396 1,243,772 1,078,740 957,190 833,316 5,364,639 5,364,639 5,364,639 5,364,639 5,203,000 4,976,624 4,608,128 4,313,998 4,178,944 4,054,290 3,683,488 5,149,956 5,149,	*Y08SSB *\NP46 *\NP46 *\SP46 *\SP41 *\S	497,377 425,898 371,840 357,840 892,012 845,435 685,645 685,645 632,818 419,692 345,779 255,387 128,554 112,658 110,522 521,968 243,837 163,226 139,200 15,386 4,988 4,988 4,988 320,458 205,905 121,208 96,114 54,730	LP1H 9A1A. 015A L29W HG1S VC6Z NX5M KL7RA HIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU H211T UD3D (UB3DAY) PY1EW 2 AK3S BY1CW (BD1GXH) LOW POW *EA2LMI *ED7R (EA7IZJ) *OH3F0G *YOSLD *W4DTB *CX1DP *PU8WWW		*R19S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) *LU7EC *AY8A (LU8ADX) *LU8DF *LU8DF *H02N (JA6WFM) *R9MC *UA0SOX *RU4SO *KM4H1 *EE1B (EATYB) *MHZ *K9ME *Y1ZV *KG1E *XR1I (CE1KR) *T MHZ *EN1C *Y2MGY/3 (VE3MGY) *OK2ILD *OK2ILD *OK2ILD *IG1BO (IZ1DGG)	3, 285, 816 3, 172, 628 2, 966, 194 2, 846, 340 2, 439, 441 2, 216, 865 1, 949, 935 1, 920, 810 2, 525, 888 1, 070, 913 2, 925, 688 798, 930 602, 922 425, 632 387, 045 1, 287, 453 1, 036, 630 1, 036, 630 1, 036, 630 1, 036, 630 445, 284 845, 435 685, 640 312, 180 283, 976
W3BGM 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IKTGPG) 97,709 EASSX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P46W (W2GD) 13,062,600 UUTJ (UU4JMG) 6,531,670 *IR4X (IZ3EYZ) 6,328,036 *Z1,310 6,182,904 *NV1N (N1UR) 5,451,950 *RW3K (RAGAMM) 5,171,096 *LY1R (LY9A) 4,803,825 *S50A 4,732,052 *HIBLAM/3 4,354,011 *KU2M 4,318,160 *PUZLEP 28 MHz *PUZLEP 5,134,649 *LWSDO (LW7DX) 3,011,602 *LU6FOV 2,837,100 *LUFC 2,525,888 *PY2MTS 2,242,880	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PPSJN CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF9ZP 004U Y77Z (YT5M) EI2CN YU5A (YU1EW) 9ASY (9A3MM) OH1F (OH1NOA) 14 MHz S02R (SP2FAX) GW9T (MW0ZZK) US1 (UX2IO) S53F 0L9Z PT2CM (PT2IC) RJ3FF E030 (UR3DCW) DA2C (DK3DM) S50G (S57AW) 7 MHz	7,746,093 4,503,84 4,503,832 2,609,750 1,381,335 1,381,336 1,243,7740 957,190 833,316 5,364,639 5,364,639 5,367,788 5,364,639 4,976,624 4,685,949 4,685,949 4,685,949 4,685,949 4,685,949 4,685,949 4,685,949 4,685,949 5,364,838 5,364,	*Y08SSB *\NP4G *\PY4G *\PY4G *\EFTW (EC7KW) *\OKRA *\RA6GW 7 MHz *\E14CF *\EN1G *\Y2MGY/3 (VE3MGY) *\NY6DX/2 *\Z2E1FVS *\EA5HSI *\VE9ML *\UA2FT *\Y10A *\DS5TOS 3.7 MHz *\S1MBLSB (9A7ZZ) *\LY7Z *\S53NW *\DR2K (DL5OCR) *\TI3JOH *\EA3HAR *\B13DH *\EA3HAR *\B13DH *\EA3HAR *\B13DH *\EA3HAR *\B13DH *\EA3HAR *\S1MBL *\S1MB		LP1H 9A1A 015A 015A 015A 015A 015A 015A 015A 0		*RT9S *T07BC (DL7BC)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 2,028,285 1,949,935 1,920,810 2,525,888 1,070,913 985,150 978,833 2,92,608 925,688 798,930 602,922 425,632 387,045 1,287,453 1,036,630 1,036,074 453,840 445,284 845,435 685,640 312,180 283,976 146,190
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UT5ECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS **P4ØW (W2GD) 13,062,600 **UUTJ (UU4JMG) 6,531,670 **IR3X (IZ3EYZ) 6,228,806 **UUTJ (UU4JMG) 6,531,670 **IR3X (IZ3EYZ) 6,328,206 **IR1X (IZ3EYZ) 6,328,206 **IR1X (IZ3EYZ) 6,328,206 **IR1X (IZ3EYZ) 7,400,200 **IR1X (IZ3EYZ) 1,400,200 **IR1X (IZ3EYZ) 1,	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JM CT3HF II9X (IT9SPB) PY1EW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF9ZP 004U YT7Z (YT5M) EI2CN YU5A (YU1EW) 9ASY (9A3NM) OH1F (OH1NOA) 14 MHz SO2R (SP2FAX) GW9T (MW0ZZK) US11 (UX2IO) S53F CL92 PT2CM (PT2IC) RJ5FF E030 (UR30CW) DA2C (DK3DM) S50G (S57AW) 7 MHz YW5T (YV5JBI) 4 WH2	7,746,093 4,503,842 4,406,832 2,609,750 1,388,132 1,351,396 1,243,772 1,078,740 957,190 833,316 5,364,639 5,364,639 5,364,639 5,364,639 5,203,000 4,976,624 4,608,128 4,361,998 4,178,944 4,054,290 3,683,488 5,149,956 5,149,	*Y08SSB *NP4G *EF7W (EC7KW) *OK6RA *RA6GW *T MHz *EI4CF *EN1C *VY2MGY/3 (VE3MGY) *NY6DX/2 *ZE1FVS *EA5HS1 *VE9ML *UA2FT *Y16A *OS5TOS *3.7 MHz *SS3NW *DR2K (DL5OCR) *IT3JOH *EA3KA *YB1AR *EA1GWM *UR8IDX *SPBLBK *UR5IFB *W2MF *SINGLE OPERATOR *ALL BANDS *ISN (W8QZA) *INSCRIPTION *INSCRIPTION *ISN (W8QZA) *INSCRIPTION *ISN (W8QZA) *INSCRIPTION *INSCRIPTION *ISN (W8QZA) *INSCRIPTION		LP1H 9A1A. 015A. L79W. HG1S. V66Z. NX5M. KL7RA. RIGH POW UASA (RA3AKT). S59ABC (S56AA). RN3DMU HZ1TT. UD3D (UB3DAY). PY1EW. 2 AK3S. BY1CW (BD1GXH) LOW POW. *ED7R (EA7IZJ). *0H3F0G. *Y05LD. *W4DTB. PU8WWW. *PU2STZ.		*R19S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) *LU7EC *AY9A (LU8ADX) *LU8DCF *LU3DR *H02N (JA6WFM) *R9MC *UA0SOX *RU4SO *KM4HI *EE1B (EA1YB) *MHZ *KGIE *XR1I (CE1KR) *T MHZ *ENIC *VY2MGY/3 (VE3MGY) *OXZILD *VE3SWS *3.7 MHZ *YL2GUV *S53NW	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 1,949,935 1,920,810 2,525,888 1,070,913 9,951,638 2,926,688 7,98,930 602,922 425,632 387,045 1,287,453 1,036,630 1,036,074 453,840 445,284 845,435 685,640 312,180 312,180 323,976 146,190
W3BGM 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IKTGPG) 97,709 EASSX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P46W (W2GD) 13,062,600 UUTJ (UU4JMG) 6,531,670 *IR4X (IZ3EYZ) 6,328,036 *Z1,310 6,182,904 *NV1N (N1UR) 5,451,950 *RW3K (RAGAMM) 5,171,096 *LY1R (LY9A) 4,803,825 *S50A 4,732,052 *HIBLAM/3 4,354,011 *KU2M 4,318,160 *PUZLEP 28 MHz *PUZLEP 5,134,649 *LWSDO (LW7DX) 3,011,602 *LU6FOV 2,837,100 *LUFC 2,525,888 *PY2MTS 2,242,880	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PPSJN CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF9ZP 004U Y77Z (YT5M) EI2CN YU5A (YU1EW) 9ASY (9A3MM) OH1F (OH1NOA) 14 MHz S02R (SP2FAX) GW9T (MW0ZZK) US1 (UX2IO) S53F 0L9Z PT2CM (PT2IC) RJ3FF E030 (UR3DCW) DA2C (DK3DM) S50G (S57AW) 7 MHz	7,746,093 4,503,842 4,906,832 2,609,750 1,381,132 1,381,132 1,381,132 1,243,772 833,316 957,190 833,316 5,364,639 5,364,639 5,364,639 5,364,639 4,625,949 4,625,949 4,628,949 4,628,949 4,628,949 4,628,949 4,628,948 4,31,984 4,054,290 3,683,488 4,31,984 4,178,944 4,054,290 3,683,488 4,31,984 4,31,984 4,31,984 4,31,984 4,31,984 4,31,984 3,31,9	*Y08SSB *\NP4G *\PY4G *\PY4G *\EFTW (EC7KW) *\OKRA *\RA6GW 7 MHz *\E14CF *\EN1G *\Y2MGY/3 (VE3MGY) *\NY6DX/2 *\Z2E1FVS *\EA5HSI *\VE9ML *\UA2FT *\Y10A *\DS5TOS 3.7 MHz *\S1MBLSB (9A7ZZ) *\LY7Z *\S53NW *\DR2K (DL5OCR) *\TI3JOH *\EA3HAR *\B13DH *\EA3HAR *\B13DH *\EA3HAR *\B13DH *\EA3HAR *\B13DH *\EA3HAR *\S1MBL *\S1MB		LP1H 9A1A 0T5A LZ9W HG15 VC6Z NX5M KL7RA HIGH PD HG4P QN UA5A (RA3AKT) S59ABC (S56AA) RN3DMU HZ1TT UD3D (UB3DAY) PY1EW AK3S BY1CW (BD1GXH) FR LOW POW *EA2LMI *ED7R (EA7IZJ) *OH3F0C *YQ5LD *W4DTB *CX1DP *PUBWWW *PU2STZ		*R19S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *K14ZB *NX6T (K6AM) *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR *H02N (JA6WFM) *R9MC *UAGSOX *RU4SO *KM4H1 *EE1B (EATYB) *MY1ZV *KG1E *ZM3T (W3SE) *S57U *XR11 (CE1KR) *T MHz *EN1C *VY2MGY/3 (VE3MGY) *O(ZILD *V12GUV *S53NW *S53NW *R3LC *S58G) *R3LC *S58G) *R3LC *S58G)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608 925,688 799,930 602,922 425,632 387,045 1,287,453 1,036,630 1,036,630 1,036,074 453,840 445,284 845,435 685,640 312,180 312,180 336,980 243,837 224,548 336,980 243,837
W3BGM 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 IR1A (IKTGPG) 97,709 EA6SX 41,340 RM4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS **P4PW (W2GD) 13,062,600 **UUTJ (UU4JMG) 6,531,670 **IR4X (IZ3EYZ) 6,328,036 **ZL310 6,182,904 **NV1N (N1UR) 5,451,950 **NW0A (RAØAM) 5,171,096 **LY1R (LY9A) 4,803,825 **S50A 4,732,052 **HIBLAM/3 4,554,011 **KUZM 4,318,160 **LU7EP 5,134,649 **LW8DQ (LW7DX) 3,011,602 **LUFEC 2,525,888 **PY2MTS 2,242,880 **PU2FLP 1,1510,083 **PUSFJR 1,463,405 **AV8A (LUBADX) 1,070,913 **CA3SOCC 1,056,608	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PP5JN CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LI) DF9ZP 004U YT7Z (YT5M) EI2CN YU5A (YU1EW) 9ASY (9ASNM) OH1F (OH1NOA) 14 MHz SOZR (SP2FAX) GW9T (MW0ZZK) US11 (UX2IO) SS3F OL9Z PTZCM (PTZICO DAZC (DK3DM) S50G (SS7AW) 7 MHz YW5T (YV5JBI) 4L5O S56X OK1UG R3KM		*Y08SSB *Y08SSB *NP4G *EF7W (EC7KW) *OKGRA *RA6GW 7 MHz *EI4CF *EN1C *Y2YMGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HS1 *VE9ML *UA2FT *Y10A *DS5TOS 3.7 MHz *9A1JSB (9A7ZZ) *LY7Z *S53MW *DR2K (DL5OCR) *ITSJ.DH *ITSJ.DH *EA3AKA *YB1AR *EA1GWM *UR8IDX *SP8LBK *UR5IFB *W2MF SINGLE OPERATOI ALL BANDS *TISK (W80ZA) *TMSK (F5BEG) *LUTHZ *SINGLE OPERATOI ALL BANDS *TISK (W80ZA) *TMSK (F5BEG) *LUTHZ *		LP1H 9A1A 0T5A LZ9W HG1S VC6Z NX5M KL7RA HIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU HZ1TT UD3D (UB3DAY) PY1EW 2 AK3S BY1CW (BD1GXH) LOW POW *EA2LMI *ED7R (EA7IZJ) *V95LD *W4DTB *CX1DP *PUBWWW *PU2STZ *YL3AGV *TO3AKMF		*R19S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) *LU7EC *AY9A (LU8ADX) *LU8DCF *LU3DR *H02N (JA6WFM) *R9MC *UA0SOX *RU4SO *KM4HI *EE1B (EA1YB) *MHZ *KGIE *XR1I (CE1KR) *T MHZ *ENIC *VY2MGY/3 (VE3MGY) *OXZILD *VE3SWS *3.7 MHZ *YL2GUV *S53NW	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608 925,688 799,930 602,922 425,632 387,045 1,287,453 1,036,630 1,036,630 1,036,074 453,840 445,284 845,435 685,640 312,180 312,180 336,980 243,837 224,548 336,980 243,837
W3BGM 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,828 LY2OU 228,285 SP4UCP 172,500 RI1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P4ØW (W2GD) 13,062,600 *UUTJ (UU4JMG) 6,531,670 *UTJ (UU4JMG) 6,531,670 *IR4X (IZ3EYZ) 6,328,806 *Z1310 6,182,904 *NV1N (IN IUR) 5,451,950 *RWØA (RAØAM) 5,171,096 *LY1R (LY9A) 4,803,825 *S560A 4,732,052 *HIBLAM/3 4,354,011 *KUZM 4,318,160 *PUZLEP 5,134,649 *LW8DQ (LW7DX) 3,011,602 *LU4FC 2,525,888 *PY2MTS 2,242,880 *CX1DP 1,510,083 *PU5FUR 1,463,4051 *PU5FUR 1,510,083 *PU5FUR 1,463,4051 *AY8A (LU8ADX) 1,070,913	28 MHz	7,746,093 4,503,843 4,503,843 4,406,832 2,609,750 1,381,332 1,351,396 1,243,7740 957,190 833,316 5,364,639 5,364,639 5,366,788 5,364,639 4,976,624 4,685,949 4,685,949 4,685,949 4,685,949 4,685,949 4,685,949 4,685,949 4,178,944 4,054,290 3,683,488 7,181,838 6,915,090 6,520,784 5,149,956 5,1014,483 5,149,956 5,14	*Y08SSB *\NP4G *\PY4G *\PY4G *\EFTW (EC7KW) *\OKRA *\RA6GW 7 MHz *\E14CF *\EN1G *\Y2MGY/3 (VE3MGY) *\NY6DX/2 *\Z2E1FVS *\EA5HSI *\VE9ML *\UA2FT *\Y10A *\DS5TOS 3.7 MHz *\S1MBLSB (9A7ZZ) *\LY7Z *\S53NW *\DR2K (DL5OCR) *\TISJOH *\EA3HSI *\UA3BC (E74WN) *\Z36N *\SP8LBK *\URSIFB *\URSIFB *\URSIFB *\UZMF *\UZMF *\UZMF *\URSIFB *\UZMF		LP1H 9A1A. 015A L29W HG1S VC6Z NX5M KL7RA RHIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU H211T UD3D (UB3DAY) PY1EW 2 AK3S BY1CW (BD1GXH) LOW POW *EA2LMI *ED7R (EA7IZJ) *OH3F0G *YOSLD *W4DTB *CX1DP *PUBWWW *PU2STZ *YL3AGV *D03KMF *UB6ACR		*R19S *T07BC (DL7BC)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 1,949,935 1,920,810 2,525,888 1,070,913 985,150 779,833 292,608 925,688 799,930 602,922 425,632 387,045 1,287,453 1,036,630 1,036,630 1,036,074 453,840 445,284 845,435 685,640 312,180 312,180 336,980 243,837 224,548 336,980 243,837
W3BGM 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 IR1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P4ØW (W2GD) 13,062,600 *UU7J (UU4JMG) 6,531,670 *IR1A (IC1GPC) 6,328,036 *UU7J (UU4JMG) 5,451,950 *VIN (N (1UR) 5,451,950 *VIN (N (1UR) 5,451,950 *VIN (N (1UR) 4,038,25 *S50A 4,732,052 *S50A 4,732,052 *HIBLAM/3 4,354,011 *KU2M 4,318,160 *PU2LEP 5,134,649 *LW8DQ (LW7DX) 3,011,602 *LUGFOV 2,837,100 *LUFC 2,525,888 *PY2MTS 2,242,880 *CXIDP 1,510,080 *RVBA (LUBADX) 1,070,913 *CASSOC 1,056,088 *RV9DC 1,016,880 *21 MHz	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PPSJN CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF92P 004U Y77Z (YT5M) EI2CN YU5A (YU1EW) 9ASY (9A3MM) OH1F (OH1NOA) 14 MHz SO2R (SP2FAX) GW9T (MW0ZZK) US11 (UX2IO) S53F OL9Z PT2CM (PT2IC) RJ3FF E03G (UR30GW) DA2C (DK3DM) S50G (S57AW) 7 MHz YW5T (YV5JBI) 4L5O S56X OK1UG R3KM LR3D (LU9ESD) RA6KV EC7ZK	7,746,093 4,503,842 4,906,832 2,609,750 1,281,391 1,381,132 1,381,132 1,381,132 1,381,139 1,243,772 833,316 5,364,639 5,364,639 5,364,639 5,364,639 4,976,624 4,685,949 4,685,949 4,681,128 4,311,998 4,178,984 4,081,289 4,178,984 4,178,984 4,178,984 4,178,984 4,178,984 4,178,984 4,178,984 4,178,984 4,178,986 5,144,986 3,768,488 3,768,488 3,484,290 3,768,488 4,189,966 5,196,966 3,486,968 3,48	*Y08SSB *Y08SSB *NP4G *EF7W (EC7KW) *OKGRA *RA6GW 7 MHz *EI4CF *EN1C *Y12MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HSI *VE9ML *UA2FT *Y10A *DS5TOS 3.7 MHz *9A1JSB (9A7ZZ) *LY7Z *S53NW *DR2K (DL5OCR) *IT3JDH *EA3AKA *Y81AR *EA1GWM *UR9IDX *1R4 NP4 NP4 NP4 NP4 NP4 NP4 NP4 NP4 NP4 NP		LP1H 9A1A 0T5A LZ9W HG15 VC6Z NX5M KL7RA HIGH PO UA5A (RA3AKT) S59ABC (S56AA) RN3DMU HZ1TT UD3D (UB3DAY) PY1EW AK3S BY1CW (BD1GXH) LOW POW *EA2LMI *ED7R (EA7LZI) *OH3FGG *Y05LD *W4DTB *CX1DP *PUBWWW *PU2STZ *YL3AGV *D03KMF *UB6ACR		*R19S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *K14ZB *NX6T (K6AM) *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR *H02N (JA6WFM) *R9MC *UAGSOX *RU4SO *KM4H1 *EE1B (EATYB) *MY1ZV *KG1E *ZM3T (W3SE) *S57U *XR11 (CE1KR) *T MHz *EN1C *VY2MGY/3 (VE3MGY) *O(ZILD *V12GUV *S53NW *S53NW *R3LC *S58G) *R3LC *S58G) *R3LC *S58G)	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 1,949,935 1,920,810 2,525,888 1,070,913 9,955,103 2,926,608 778,833 2,926,608 798,930 602,922 425,632 387,045 1,287,453 1,036,630 1,036,074 453,840 445,284 845,435 685,640 312,180 312,180 336,980 243,837 224,548 220,792 213,030
W3BGN 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 OM7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4UCP 172,500 IR1A (IK1GPG) 97,709 EAGSX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS **P4ØW (W2GD) 13,062,600 **UUTJ (UU4JMG) 6,531,670 **UR1A (IX1GSYZ) 6,328,036 **Z1,310 6,182,904 **NV1N (N1UR) 5,451,950 **NV1N (N1UR) 5,451,950 **NV1N (N1UR) 4,803,825 **L13U 4,803,825 **L13U 4,803,825 **L13U 4,803,825 **L13U 4,803,825 **L13U 4,803,825 **L14USAJ 4,803,825 **L15USAJ 4,803,825 **L15	28 MHz LR2F. LU3HS KG6DX 4X0A (4X1VF) PPSJM. CT3HF. II9X (IT9SPB) PY1EW XV1X RX0AE 21 MHz NS1L/4 (W4SVO). 584KH LY5E (LY2LJ) DF9ZP. 0Q4U. Y17Z (YT5M) EI2CN Y15A (YU1EW). 9A5Y (9A3NM). OHIF (OH1NOA). 14 MHz SO2R (SP2FAX) GW9T (MW0ZZK). US1I (UX2IO). S53F. CL92 (DR3DM). S59F. E03Q (UR3QCW). DA2C (DK3DM). S50G (S57AW). 7 MHz YW5T (YV5JBI) 4L50. S56X. OK1UG. R3KM LR9D (LU9ESD). RA6XV. EC7ZK. J4ZT (SV2DCD).	7,746,093 4,503,842 4,406,832 2,609,750 1,388,132 1,351,396 1,243,772 1,3771 957,190 833,316 5,364,639 5,364,639 5,364,639 5,367,88 5,203,000 4,976,624 4,608,128 4,608,128 4,311,998 4,178,944 4,04,290 3,683,488 5,149,956 5,207,956	*Y08SSB *NP46 *EF7W (EC7KW) *OK6RA *RA6GW *EH4CF *T MHz *EH1C *YV2MGY/3 (VE3MGY) *NY6DX/2 *ZE1FVS *EA5HS1 *VE9ML *UA2FT *Y10A *DS5TOS *3.7 MHz *S53NW *DR2K (DL5OCR) *ITSJDH *EA3AKA *VB1AR *EA1GWM *UR8IDX *ITSJDH *S78LB *UR9FB *VE9ML *UR9FB		LP1H 9A1A 0T5A LZ9W HG1S VC6Z NX5M KL7RA HIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU HZ1TT UD3D (UB3DAY) PY1EW 2 AK3S BY1CW (BD1GXH) LOW POW *EA2LMI *ED7R (EA7IZJ) *OH3F0G *YO5LD *W4DTB *CX1DP *PUBWWW *PU2STZ *YL3AGV *UB6ACR 1 *LR1H *IIBK (IZ0UME)		*R19S *T07BC (DL7BC) *IB1B (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *K14ZB *NX6T (K6AM) *LU7EC *AY8A (LU8ADX) *LU8DCF *LU3DR *H02N (JA6WFM) *R9MC *UAGSOX *RU4SO *KM4H1 *EE1B (EATYB) *MKM4H1 *EE1B (EATYB) *Y1ZV *KG1E *XR11 (CE1KR) *T MHz *EN1C *VY2MGY/3 (VE3MGY) *OK2ILD *V12GUV *S53NW *R3LC *R3LC *R3LC *NAMEZ *VE3EDY	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 1,949,935 1,920,810 2,525,888 1,070,913 9,955,103 2,926,608 778,833 2,926,608 798,930 602,922 425,632 387,045 1,287,453 1,036,630 1,036,074 453,840 445,284 845,435 685,640 312,180 312,180 336,980 243,837 224,548 220,792 213,030
W3BGM 808,920 4M5W (YV5MSG) 491,301 SP3GTS 390,375 RU4SS 370,596 UX1VT 243,168 EA1AAW 199,867 1.8 MHz 9A2AJ 465,864 0M7RU 340,599 UTSUGR 299,882 LY2OU 228,285 SP4JCP 172,500 IR1A (IK1GPG) 97,709 EA6SX 41,340 RN4HJO 40,125 RW3SY 30,193 UTSECZ 19,950 SINGLE OPERATOR LOW POWER ALL BANDS *P4ØW (W2GD) 13,062,600 *UU7J (UU4JMG) 6,531,670 *IR1A (IC1GPC) 6,328,036 *UU7J (UU4JMG) 5,451,950 *VIN (N (1UR) 5,451,950 *VIN (N (1UR) 5,451,950 *VIN (N (1UR) 4,038,25 *S50A 4,732,052 *S50A 4,732,052 *HIBLAM/3 4,354,011 *KU2M 4,318,160 *PU2LEP 5,134,649 *LW8DQ (LW7DX) 3,011,602 *LUGFOV 2,837,100 *LUFC 2,525,888 *PY2MTS 2,242,880 *CXIDP 1,510,080 *RVBA (LUBADX) 1,070,913 *CASSOC 1,056,088 *RV9DC 1,016,880 *21 MHz	28 MHz LR2F LU3HS KG6DX 4X0A (4X1VF) PPSJN CT3HF II9X (IT9SPB) PYTEW XV1X RX0AE 21 MHz NS1L/4 (W4SVO) 584KH LY5E (LY2LJ) DF92P 004U Y77Z (YT5M) EI2CN YU5A (YU1EW) 9ASY (9A3MM) OH1F (OH1NOA) 14 MHz SO2R (SP2FAX) GW9T (MW0ZZK) US11 (UX2IO) S53F OL9Z PT2CM (PT2IC) RJ3FF E03G (UR30GW) DA2C (DK3DM) S50G (S57AW) 7 MHz YW5T (YV5JBI) 4L5O S56X OK1UG R3KM LR3D (LU9ESD) RA6KV EC7ZK	7,746,093 4,503,842 4,406,832 2,609,750 1,388,132 1,351,396 1,243,772 1,3771 957,190 833,316 5,364,639 5,364,639 5,364,639 5,367,88 5,203,000 4,976,624 4,608,128 4,608,128 4,311,998 4,178,944 4,04,290 3,683,488 5,149,956 5,207,956	*Y08SSB *Y08SSB *NP4G *EF7W (EC7KW) *OKGRA *RA6GW 7 MHz *EI4CF *EN1C *Y12MGY/3 (VE3MGY) *NY6DX/2 *2E1FVS *EA5HSI *VE9ML *UA2FT *Y10A *DS5TOS 3.7 MHz *9A1JSB (9A7ZZ) *LY7Z *S53NW *DR2K (DL5OCR) *IT3JDH *EA3AKA *Y81AR *EA1GWM *UR9IDX *1R4 NP4 NP4 NP4 NP4 NP4 NP4 NP4 NP4 NP4 NP		LP1H 9A1A 0T5A LZ9W HG1S VC6Z NX5M KL7RA HIGH POW UA5A (RA3AKT) S59ABC (S56AA) RN3DMU HZ1TT UD3D (UB3DAY) PY1EW 2 AK3S BY1CW (BD1GXH) LOW POW *EA2LMI *ED7R (EA7IZJ) *OH3F0G *YO5LD *W4DTB *CX1DP *PUBWWW *PU2STZ *YL3AGV *UB6ACR 1 *LR1H *IIBK (IZ0UME)		*R19S *T07BC (DL7BC) *IB18 (IW10N) *E21EIC *NR3X/4 (N4YDU) *X07UP *102Z (IK2DZN) *KT4ZB *NX6T (K6AM) *LU7EC *AY9A (LU8ADX) *LU8DCF *LU3DR *H02N (JA6WFM) *R9MC *UA0SOX *RU4SO *KM4HI *EE1B (EA1YB) *MHZ *KGIE *ZM3T (W3SE) *S57U *XR11 (CE1KR) *T MHZ *VY2MGY/3 (VE3MGY) *OKZILD *V12GUV *S53NW *R3LC *S53NW *R3LC *S53NW *R3LC *S53N (S58G) *OMOCS	3,285,816 3,172,628 2,966,194 2,846,340 2,439,441 2,216,865 1,949,935 1,920,810 2,525,888 1,070,913 9,955,103 2,926,608 778,833 2,926,608 798,930 602,922 425,632 387,045 1,287,453 1,036,630 1,036,074 453,840 445,284 845,435 685,640 312,180 312,180 336,980 243,837 224,548 220,792 213,030

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N5AW at his operating station.

station of P40V. You can get a feel for the experience by watching Helmut's excellent video blog (see WPX Activity on the web). Rick, KI1G, continued his mastery of WPX and the Assisted category by dominating the competition in the USA.

One of the closest races was for world high on 15-meter single band assisted high power. Mark, W4SVO, operated as NS1L and got by George, 5B4KH, by just 0.5%. There was another competitive race on 75 meters between SN2M (operated by Mac, SP2XF) and Franco, I4AVG, at IQ4RA.

Things really tighten up on low power. Look at the 20-meter scores of KG1E and ZM3T—just 500 points apart for third place in the world. Niall, EI4CF, and Maxim, EN1C, had a spirited battle for tops on 40 meters. Niall was enjoying his new SteppIR DB36 antenna at 75 feet.

Single-Operator QRP

You have to admire the spirit and determination it takes to wade into heavy QRM with just 5 watts. It seems that Bill, W8QZA, does so every year with very good results. This year he visited TI5N to take the world high score for all bands. Gerard, F5BEG, did a very nice job from TM9K to finish second. Randy, NDØC, did a fantastic job to win the USA from his modest station in the propagation "black hole" of Minnesota.

Overlay Categories

We had 228 entries in the Rookie category (for operators who have been licensed less than three years). The entries are divided into high and low power. Oleg, RA3AKT, and Vito, S56AA, battled it out for the top spot in high power. The top two Rookies on low power were operating single band 10 meters with Fernando, CX1DP, coming out ahead of Fabio, PU8WWW. It is always great to see the Rookie operators improve their skills each year.

In the Tribander/Single-Element category, the top high power score went to Paul, N4PN, operating as NXØX from near Atlanta.



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WPX Activity on the Web

In addition to the cqwpx.com website, there are other places on the Internet where you can enjoy the contest. Join the nearly 3000 people who have "liked" the contest on the Facebook fan page at <www.facebook.com/cgwpx>; follow the latest announcements on Twitter at <www.twitter.com/cgwpx>.

Many operators and groups like to share their contest experiences on YouTube. Visit > and type "CQ WPX 2012 SSB" into the search box.

We asked Facebook fans to recommend some videos and received the following

EB8AH MULTI MULTI: right. Alto: //youtu.be/I_MzDkdRRxY>

DF7ZS at P41P: http://youtu.be/pSkxQHEnzrl

IY4FGM: http://youtu.be/YuD_vPlunY0 DP6T: http://youtu.be/xZ18-IFdDel

PQ5B by 12-year-old PU5DCB: http://youtu.be/eUnBUvkCxZ0

EI4GYB: http://youtu.be/jKFbyhms77M>

WORLD RECORD HOLDERS

Single Operator

CN2R('07).....1,613,955

LN8W contest audio: http://la8w.com/contestaudio/wpx-ssb-2012/

CQ WW WPX SSB CONTEST **ALL-TIME RECORDS**

The contest is held each year on the last full weekend of March. The All-Time Records will be updated and published annually. Data following the calls: year of operation, total score, and number of prefix multipliers.

1.8

U.S.A. RECORD HOLDERS

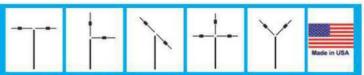
Single Operator

K1ZM('95)327,712

1.8	CN2R('07)1,613,955	399	1.8	K1ZM('95)		308
3.5	CN2R('06)11,849,076	894	3.5	K1UO('10)		602
7.0	CN2R('05)14,724,696	931	7.0	WU3A/1('11)		796
14	CN2R('08)15,778,840	1199	14	KQ2M('09)		1082
21	CN2R('11)20,704,164	1443	21	KQ2M/1('11)		1210
28	PX5E('12)17,785,368	1368	28	NY4A('00)		877
AB	CN2R('12)27,280,992	1424	AB	K1LZ('11)		1246
QRP/p	HC8A('94)7,520,562	714	QRPp	KR2Q('00)	2,688,158	649
Assisted	P41P('12)23,229,884	1303	Assisted	KI1G('11)	13,075,616	1268
10/	ulti-Operator Single Transmitter		8.0	ulti-Operator Sing	ale Transmitter	
	2)38,510,454	1601				1373
3D3A(12		1001	VVVVZDX	('12)	19, 107,000	13/3
1	Multi-Operator Two Transmitter		I	Multi-Operator Tw	o Transmitter	
EB8AH('	11)68,072,520	1765	K1LZ('10)	30,393,480	1560
	Multi-Operator Multi-Transmitter			Multi-Operator Mu	lti Transmitter	
	'12)76,018,024	1784		0)		1355
LDOAII (12)70,010,024	1704	KIVIS I (U	J)	29,330,400	1333
	CLUB RECORD		QRPp RE	CORD WE	X (Prefix) RECO	ORD
Contest	Club Finland ('00)250,320,14	1 HC			1A('11)	
Comoci	0100 1 1110110 (00) 111111200,020,11		o(o .)	,020,002 511	., .(,	
	CONTINE	NTAL F	RECORD HO	LDERS		
	AFRICA		7.0	ZL3A('08)		816
1.8	CN2R('07)1,613,955	399	14	KH6ND('03)	6,493,727	887
3.5	CN2R('06)11,849,076	894	21	AH7DX('00)		890
7.0	CN2R('05)14,724,696	931	28	TXØDX('00)		847
14	CN2R('08)15,778,840	1199	AB	KH7X('11)		1244
21	CN2R('11)20,704,164	1443		A CREATE STATE OF THE TRANSPORTER		
28	D44AC('02)15,707,401	1123		SOUTH A	MERICA	
AB	CN2R('12)27,280,992	1424	1.8	HK1KYR('10)		77
			3.5	P4ØA('96)		426
	ASIA		7.0	HK1T('12)		1062
1.8	*YMØT('05)486,846	222	14	HK1X('11)		12599
3.5	H2T('10)3,067,296	534	21	ZX5J('10)		1369
7.0	5B/KC2TIZ('10)6,761,872	754	28	PX5E('12)		1368
14	P33W('10)8,004,130	1030	AB	HC8A('01)		1199
21	JA6GCE('11)7,055,664	996		1100/1(01)		
28	H22H('00)9,092,146	931	84111.77	TI ODEDATOR CIL	IOLE TO ANOME	TTED
AB	UPØL('12)18,541,055	1235		II-OPERATOR SIN		
, i = i	01 22(12)	,	AF	5D5A('12)		1601
	EUROPE		AS	P33W('12)		1556
1.8	SN3R('07)835,884	434	EU	TM6M('11)		1541
3.5	EI7M('10)3,527,075	731	NA	VP2EC('92)		1115
7.0	EI7M('11)10,787,690	1054	oc	KH7X('12)		1180
14	TM77M('10)8,271,768	1046	SA	HC8A('93)	32,502,677	1107
21	CS2C('11)9,479,430	1245				
28	GM7V('00)8,305,756	982		_TI-OPERATOR T	WO TRANSMIT	TER
AB	E7DX('11)20,438,120	1322	AF	EB8AH('11)		1765
,,,,		1022	AS	A61AJ('04)		1255
	NORTH AMERICA		EU	El100T('12)		1616
1.8	VA1A('99)535,225	271	NA	K1LZ('10)		1560
3.5	ZF1A('08)2,269,344	462	OC	VK4KW('11)	26,528,482	1369
7.0	TI4CF('05)8,057,479	751	SA	PJ4Z('12)		1641
14	KP2A('95)7,088,976	912			eera varanteeraval (1) tulkoviilist.	
21	VP2EH('11)14,899,185	1305	MIII	TI-OPERATOR MI	II TI-TRANSMIT	TER
28	KP2A('00)11,385,710	1046	AF	EB8AH('12)		1784
AB	8P5A('12)24,809,505	1385	AS	P3A('00)		1456
AD	01 0/1 (12)24,009,505	1000	EU	DR1A('11)		1909
	OCEANIA		NA	WL7E('00)		1395
1.8	KH6ND('07)26,432	59	OC	KH7R('02)		1304
3.5	WH7Z('03)1,208,900	308	SA	HC8N('03)		1476
0.0	VVI 1/2(00)1,200,900	300	SA	110014(03)	00,703,432	14/0

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Jojo, DU1VHY, watches over Art, DV1SOV, and Rey, DV1SUT, as they make their first contest QSOs from DU1HR.



Helmut, DF7SZ (left), and Carl, Al6V/P49V, are showing the spirit of ham radio contesters worldwide.

Both Paul and Igor, RT4RO, managed over 3200 contacts with simple antennas. On low power it was Holger, ZL3IO, taking the t op spot.

Multi-Operator

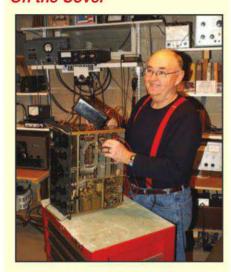
The Multi-Operator Single-Transmitter category continues to grow, with 249 entries, and this year offered one of the most exciting races. The team at P33W has developed a very sophisticated switching scheme that allows multiple stations to share the same band without transmitting at the same time. They are very effective at weav-

ing running QSOs and searching for QSOs at the same time. The two-operator team at 5D5A in Morocco pursued a more traditional operating style. P33W was way ahead at the halfway point, but it was extra 6-point contacts on 40 meters that ultimately earned the victory for 5D5A. 5D5A also had the extra satisfaction of taking the all-time record from P33W! RL3A had the highest score that wasn't from Africa or Asia. The WW2DX team in eastern New York completely demolished the USA record set in 2011.

The winning team in the Two-Transmitter category was PJ4Z in Bonaire. You can hear what a great signal this station has by searching for PJ4Z on YouTube and listening to some of the recordings!

www.cq-amateur-radio.com January 2013 • CQ • 25

On the Cover



Snowy Minnesota winters will soon be a thing of the past for Mike Warren, WØWG, of Eden Prairie. Since the passing of his wife last fall, Mike has decided to begin selling off his extensive collection of "boat-anchors"heavy tube-type radios from the mid-20th century—and prepare to move to Virginia to be closer to his daughter. Mike has lived in Minnesota since 1979, where he moved to begin a second career with Control Data after spending 20 years in the Navy repairing radios and other electronic gear and becoming a repair instructor for cryptography equipment. At Control Data Mike was a repair depot manager until his retirement at the end of 2000.

Repairing, restoring, and operating "boat-anchors" has been a longtime passion for Mike, who has kept his soldering gun warm even after retirement, working on old tube gear for himself and his friends. He keeps some of the old gear on the air, working locals on 75 meters most mornings and running AM phone on weekends. Most of Mike's on-the-air time, though, is devoted to DXing, mostly using single sideband. He also enjoys interfacing modern rigs with computers for logging and spotting. Mike says he'd also like to learn more about remote station control but says he "hasn't quite gotten (his) arms around it yet."

In our cover photo, Mike is in his front yard and over his shoulder is his 38-foot tower with a Tennadyne T6 log-periodic for 20–10 meters on the top, as well an off-center-fed dipole for both 80 and 40 meters. Anyone interested in knowing more about Mike's boat-anchor collection can find his contact information on his page on QRZ.com. (Cover photo by Larry Mulvehill, WB2ZPI)



The operating team of world high Multi-Multi entry EB8AH. Left to right: ES2RR Toivo; EA8EW (OH1MA) Jakko; EA8AH Pekka; EA8CAC Juan; ES5RW Rein; OH6DX Jusy Pekka; IK1HJS Carlo; EA8ZS Manolo; ES7GM Kristjan; and EA5DY Salva.



Anibal, 5K3R, operated single band 15 meters low power.

The group at EI100T set a new European record score.

The highest score in the history of the contest was accomplished by EB8AH in the Multi-Multi category. Over 11,000 QSOs and a final score over 76-million points will be hard to beat. DR1A outscored the other challengers from Europe. The third-place finish by LP1H was also very impressive, being so far from the major contesting population centers.

Final Thoughts

One interesting score was the single operator all band effort of CQ8X by Toni, OH2UA/CU2KI. Toni worked over 4300 contacts and 1200 prefixes from the Azores, but he did it from 4500 kilometers away while watching the Northern Lights outside of his operating position in Finland!

This is one of the top contest efforts ever using a remote station. It should be noted that regulations covering remote operation vary from country to country. The WPX accepts remote scores based on the location of the station. Please be sure that your operation meets the local regulations and the rules of the contest.

Once again there were plenty of comments about poor signals and splatter. One of the biggest threats to the health and future of contesting is the disrespect shown by certain high-power stations that do not follow the doctrine of fair play. Please use peer pressure to help these operators see how they are hurting our sport.

It takes a team to compile the results of so many logs. We could not have done it without the software development efforts of Ken, K1EA. The 48 paper logs received by mail were converted into Cabrillo format by AL1G, EA4KD, K1PX, K2DSL, K8PO, KN3A, N1XS, N2ZN, VA3UG, and W2JU. Log checking help was provided by Jim, WI9WI. Thanks to Barry, W5GN, for printing and mailing the nearly 1900 certificates that were earned. Doug, K1DG, coordinates the plaque sponsors and distribution.

The 2013 WPX SSB Contest will be held on March 30 and 31. The log deadline is now only **five days** after the contest, on **April 6**. Please read the rules carefully, as there are some changes. Rules can be found in the February issue of *CQ*, on the CQ website <www.cq-amateur-radio.com>, and on the CQ WPX Contest website <www.cqwpx.com>. Hoping to see everyone again in 2013!

(Continued on page 101)



HF VHF





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100 Watt Output (40W AM)

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32 Bit Floating Point DSP Unit

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100/100/100/75/101 Watt Output3

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A Close Look at the FCC's Newest Licensing Proposal

n this column I will summarize the Notice of Proposed Rule Making and Order (NPRM) released by the FCC, published in the Federal Register October 24, 2012. The date of Federal Register publication is crucial because comments were due December 24, 60 days later, and reply comments are due on January 22, 2013. If you did not file comments and still want to, you have the opportunity to reply to comments already filed. Please read the instruction for doing so starting on page 12 of the NPRM (WT Docket No. 12-283).

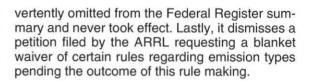
When you stand back and look objectively at the entirety of the rules applying to the Amateur Radio Service, the thing that stands out is how streamlined they are in comparison to all our privileges in frequency, power, modes, and activities. I think it's amazing that such a small number of rules can handle a service as broad as ours and last so long before amendment. Of course, the rules folks realize that stupid can never be regulated, and they don't even try to do that; but there are several reasons why we are gifted with such a practical set of rules.

One is the care and concern that the rule writers have for the service and the talent they have for writing sound rules that last such a long time. Another is the fact that they periodically tweak and update the rules, either on their own motion or pursuant to petitions asking for rule changes or additions. At the FCC I worked on a couple of rulemaking projects in the land mobile services, and I can tell you that such a job is far more difficult than most people realize.

I urge you to read the NPRM even if you didn't file comments and don't anticipate any reply comments. Countless hours go into these things. They are very well written and far more interesting than you might think. This NPRM, like most, in itself is a little history of amateur radio. At least read the introduction. I won't go over it in much detail since the comment period is over, but let's review what the NPRM proposes and why.

It proposes changes to the amateur rules in the areas of: (1) credit for examinations and validity of Certificates of Successful Completion of Examination (CSCEs); (2) credit for expired licenses; (3) grace period for license renewal; (4) waiting period for vanity callsigns; (5) administration of examinations—i.e., the required number of Volunteer Examiners (VEs) and remote testing; and 6) emission types. It also accomplishes a little housecleaning by amending the rules to eliminate the requirement for a Morse code examination. Those rule changes, or most of them, were adopted in the Morse code order but were inad-

*C/O CQ magazine e-mail: <k4zdh@cq-amateur-radio.com>



A Little Background

Why are these changes proposed? The Anchorage Volunteer Examiner Coordinator (Anchorage VEC) filed a petition for rule making to grant examination credit for expired licenses (instead of requiring former licensees to retest). The Anchorage VEC argued that it is unfair that after the grace period for renewal ends a licensee loses all credit for having passed an examination and would have to start over to get back in to amateur radio.

The Anchorage VEC argues that since a person who continuously renews his license is not required to take an examination, it cannot be argued that the passage of time invalidates the knowledge of that person. The Anchorage VEC therefore argues that the same reasoning should apply to people who just haven't renewed their licenses. Comments already make the point that allowing credit for old licenses would encourage former licensees to become involved in amateur radio again.

The NPRM goes a step further and proposes to extend the validity of CSCEs, which now expire after a year. Here, however, the FCC is concerned that since a CSCE provides temporary operating authority, it may be confusing to create a difference between the period during which a CSCE allows temporary operating authority and the period during which it is valid for examination credit. The FCC asks for comments on whether there should be a limit on how long an applicant should receive credit for a CSCE.

As a logical extension of that proposal, the FCC on its own proposes to shorten the grace period during which a license may be renewed and to revise the vanity call system accordingly. In addition the FCC seeks comments on amending the rules to allow remote testing administration. "Seeking comments" is different from proposing a rule. In this instance the FCC wants to gather information to determine if a rule making to allow remote testing administration may be a good idea.

The section of the NPRM about emission types is in response to a petition for rule making filed by the ARRL. The present rules do not appear to allow the transmission of single-slot TDMA (Time

Domain Multiple Access) emissions on amateur service frequencies above 30 MHz—i.e., Part 97 does not authorize any phone or data emission designators with X as the second symbol. Was all that on my test? I wish I could remember, but TDMA most likely hadn't been invented then!

Grace Period

The FCC reasons that since the principal purpose of a two-year grace period is to allow amateur licensees to restore their operating privileges without having to pass an examination, then the two-year grace period may no longer be necessary if an amateur gets permanent credit for having passed an examination. Thus, it proposes a six-month grace period, and since it is doing that, it proposes that the waiting period for a vanity callsign also be reduced from two years to six months. The FCC seeks comment on those proposals and on whether the grace period should be shorter than six months (such as sixty or thirty days) or even be eliminated altogether.

The NPRM also seeks comment on whether to simply extend the grace period for a much longer time, such as ten years, instead of amending the rules to allow examination credit for all expired licenses. Extending the grace period to a substantially longer period would provide the same relief, the FCC suggests, but points out that extending the grace period could also affect the vanity callsign system.

Examination Procedures

The NPRM also proposes to reduce the number of VEs required for a testing session from three to two and seeks comments on whether to permit remote testing administration. The FCC explains that the reason for the requirement of three VEs was to provide cross checking to assure correctness of answers, to ensure proper completion of applications and to minimize the likelihood of fraud.

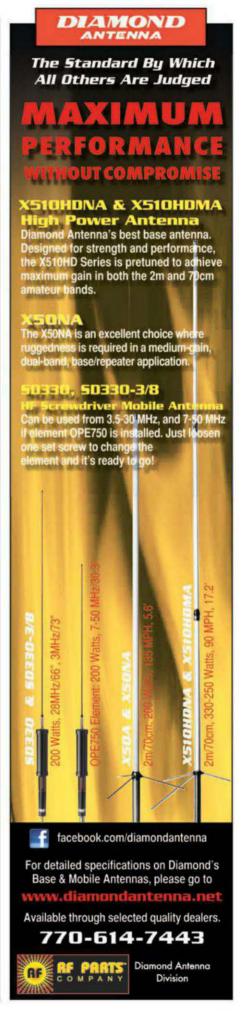
It further explains that since the VE system was established, VEs have developed procedures that have almost eliminated examination grading and application errors, and that fraud and abuse have been minimal. From an enforcement perspective, I would have to agree with that, although there were a couple of spectacular exceptions in my tenure. Overall, however, the VE system is splendid. Of course, those of us who took the examination in a federal building never forgot it and remem-

ber what the weather was, where we parked, and what we wore, but that is a thing of the past. It sure made a permanent impression, though, on those of us for whom the examination was our first experience in a federal building. However, all that went the way of rotary switches for TV channels and carbon paper. On the other hand, when I was last in the Carolinas I did go by the old federal building. The parking place I used when I took the Morse code exam was still there.

Dropping the requirement of three VEs to two would increase the availability of examination opportunities without compromising the examination process, the FCC says, as would allowing remote testing supervision. It seeks comments on whether VEs may comply with the rules by being "present and observing" through an audio and video system that can assure the necessary supervision. Such a system would provide more licensing opportunities for potential amateurs in remote locations. The FCC points out that in the years since the VE system was established, methods such as audio and video links-either hard wired, wireless, or through satellite-have been developed and are commonly used by colleges to provide courses and businesses for teleconferencina.

I have to admit that I'm concerned about expanding the universe of potential opportunities for fraud. Technology changes, operating habits change, and rules change, but does human nature change? Although I felt the VE system was great, I saw too many cases of fraudulent "former callsign" requests. Is it reasonable to assume that the VEs are equipped to help prevent or seriously suppress identity theft? Is enforcement ready to do it, either through random audits or on a case-bycase basis? Maybe those instances of fraud are so minimal that it would not be a factor in all this, but I hope someone is thinking about it. Every week in the news we see that rules don't enforce themselves.

I hope that if you filed comments you read the proposed rule making thoroughly, but regardless of that there is still time to review it and file replies to comments already sent if you want. It is difficult to do justice to the NPRM in the space allowed here. The main thing is to read the proposed rule making carefully and see both the petitioners' and the FCC's reasoning behind the proposed changes. At least read it to enhance your knowledge of the history of our amateur radio heritage. ... -- K4ZDH



www.cq-amateur-radio.com January 2013 • CQ • 29

Announcing:

The 2013 CQ World-Wide WPX RTTY Contest

February 9–10, 2013

Starts: 0000 UTC Saturday Ends: 2359 UTC Sunday

- I. Objective: For amateurs world wide to contact as many amateurs and prefixes as possible during the contest period.
- II. Period of Operation: 48 hours. Single Operator stations may operate 30 of the 48 hours—off times must be a minimum of 60 minutes during which no QSO is logged. Multi-operator stations may operate the full 48 hours.
- III. Bands: Only the 3.5, 7, 14, 21, and 28 MHz bands may be used. Observance of established band plans is strongly encouraged.
- IV. Terms of Competition for All Categories:
- (a) All entrants must operate within the limits of their chosen category when performing any activity that could affect their submitted score. Only the entrant's callsign may be used to aid the entrant's
- **(b)** A different callsign must be used for each entry.
- (c) Do not exceed the total output power limitation of your chosen category on any band. Total output power on any band at any time is measured at the output of the active amplifier(s).
- (d) Self-spotting or asking other stations to spot you is not allowed.
- (e) Use of QSO alerting assistance is permitted in all categories.
- (f) All operation must take place from one operating site. Transmitters and receivers must be located within a 500-meter diameter circle or within the property limits of the station licensee, whichever is greater. All antennas must be physically connected by wires to the transmitters and receivers used by the entrant. Use of any IP network for remote receiving, including web-controlled receivers, is not permitted.
- (g) The entry location of a remote station is determined by the physical location of the transmitters, receivers, and antennas. A remote station must obey all station and category limitations.
- (h) When two or more transmitters are present on a band, a hardware device MUST be used to prevent more than one

- signal at any one time. Using two or more transmitters on a band with alternating CQs (soliciting contacts) is not allowed.
- (i) Post-contest correcting of call signs by using any database, recordings or other method of confirming QSOs is not allowed.

V. Entry Categories:

- A. Single Operator Categories: All operating and logging functions are performed by one person (the operator). Only one transmitted signal is permitted at any time.
- (a) Single Operator High (All Band or Single Band): Total output power must not exceed 1500 watts.
- (b) Single Operator Low (All Band or Single Band): Total output power must not exceed 100 watts.
- (c) Single Operator QRP (All Band or Single Band): Total output power must not exceed 5 watts.
- B. Single Operator Overlay Categories: Single Operator entrants may also submit their log for one of the categories shown below by adding an additional line in the Cabrillo log file header called CATEGORY-OVERLAY. All Overlay entries are grouped into high power and low power in the results.
- (a) Tribander/Single Element (TB-WIRES): During the contest an entrant shall use only one (1) tribander (any type, with a single feed line from the transmitter to the antenna) for 10, 15, and 20 meters and single-element antennas on 40 and 80 meters.
- (b) Rookie (ROOKIE): To enter this category the operator must have been licensed as a radio amateur three (3) years or less on the date of the contest. Indicate the date first licensed in the SOAPBOX field.
- C. Multi-Operator Categories (All Band, High power only): More than one person can contribute to the final score during the official contest period. Select category based on number of transmitted signals. Total output power of each transmitted signal must not exceed 1500 watts.

- (a) Single-Transmitter (MULTI-ONE): Only one transmitted signal is permitted at any time. A maximum of ten (10) band changes may be made in any clock hour (00 through 59 minutes). For example, a change from 20 meters to 40 meters and then back to 20 meters counts as two band changes. Use a single serial number sequence for the entire log.
- (b) Two-Transmitter (MULTI-TWO): A maximum of two transmitted signals is permitted at any time on two different bands. Both transmitters may work any station. A station may only be worked once per band regardless of which transmitter is used. The log must indicate which transmitter made each QSO (column 81 of CABRILLO QSO template for CQ contests). Each transmitter may make a maximum of eight (8) band changes in any clock hour (00 through 59 minutes). Use a separate serial number sequence for each band.
- (c) Multi-Transmitter (MULTI-UNLIM-ITED): A maximum of five transmitted signals, one per band, at any one time. Five bands may be activated simultaneously. Use a separate serial number sequence for each band.
- VI. Exchange: RS(T) report plus a progressive contact serial number starting with 001 for the first contact. Note: Multi-Two and Multi-Unlimited entrants use separate serial number sequences on each band.

VII. Contact Points:

- (a) Contacts between stations on different continents are worth three (3) points on 28, 21, and 14 MHz and six (6) points on 7 and 3.5 MHz.
- **(b)** Contacts between stations on the same continent, but different countries, are worth two (2) points on 28, 21, and 14 MHz and four (4) points on 7 and 3.5 MHz.
- (c) Contacts between stations in the same country are worth 1 point on 28, 21, and 14 MHz and two (2) points on 7 and 3.5 MHz.

VIII. Prefix Multipliers: The prefix multiplier is the number of valid prefixes worked. Each PREFIX is counted only

MFJ Speech Intelligibility Enhancer

... makes barely understandable speech highly understandable!



"What did you say?" Can you hear but . . . just can't always understand everything people are saying?

As we get older, high frequency hearing loss reduces our ability to under-

stand speech. Here's why . . . Research shows that nearly half the speech intelligibility is contained in 1000 to 4000 Hz range, but contains a miniscule 4% of total speech energy.

On the other hand, the low frequencies, 125 to 500 Hz have most of the speech energy (55%) but contribute very little to intelligibility -- only 4%.

To dramatically improve your ability

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First, drastically increase the speech energy above 500 Hz, where 83% of the speech intelligibility is concentrated.

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A balance control and separate 21/2 Watt amplifiers let you equalize perceived loudness to each ear so both ears help.

By boosting high and cutting low frequencies and adjusting the balanced control, speech that you can barely understand become highly understandable!

Even if you don't have high frequency hearing loss, you'll dramatically improve your ability to understand speech. You'll get an edge in contesting and DXing and enjoy ragchewing more. **Here's** what *QST* for April, 2001 said

... "I expected a subtle effect at best, but I was astonished . . . The result was remarkably clean, understandable speech without hissing, ringing or other strange effects . . . made a dramatic improvement . .

Immuned to RFI. Has phone jack, on/off speaker switch, 2 inputs, bypass switch, 10Wx2½Hx6D". Needs 12 VDC. MFJ-1316, \$21.95. For 110 VAC operation. Provides 12 VDC/1.5 Amps.

MFJ-72, \$69.80. All-in-one MFJ-616 Accessory Pack. Includes MFJ-392 headphones, two MFJ-281 speakers and MFJ-1316 power supply. Save \$7!

Try it for 30 Days
Order from MFJ and try it -- No obligation. If not delighted, return it within 30 days for refund less shipping.

MFJ Contest Voice Keyer

Transformer-coupled -- No RFI, hum or feedback . . . 75 seconds total, 5-messages . . . Records received audio . . .



Let this *new* microprocessor controlled MFJ Contest Voice Keyer™ call CQ, send your call and do contest exchanges for you in your own natural voice!

Store frequently used phrases like "CQ Contest this is AA5MT". "You're 59" . . . "Qth is Mississippi"... Contest by pressing a few buttons and save your voice.

Record and playback 5 natural sounding messages in a total of 75 seconds. Uses eeprom -- no battery backup needed. Use your mic or its built-in mic for recording.

You can repeat messages continuously and vary the repeat delay from 3 to 500 seconds. Makes a great voice beacon and calling CQ is so easy.

You can also record and play back off-the-air signals -- great help if you didn't get it right the first time! No more "Please repeat".

A playing message can be

MFJ-434B

halted by the 9995 Stop Button, your micro-phone's PTT/VOX, remote control or computer.

Has jack for remote or computer control (using CT, NA or other program). Lets you select, play and cancel messages.

Your mic's audio characteristics do not change when your MFJ-434B is installed.

All audio lines are RF filtered to eliminate RFI, audio feedback and distortion. An audio isolation transformer totally eliminates hum and distortion caused by ground loops.

New! It's easy to use -- just plug in your 8 pin round or modular mic plug, set the internal jumpers for your transceiver and plug in the appropriate (included) cable for your rig.

Built-in speaker-amplifier. Speaker/phone jack. Use 9 Volt battery, 9-15 VDC or 110 VAC with optional MFJ-1312D. \$15.95. 61/2Wx21/2Hx61/2D in.

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60 dB Null wipes out noise and interference

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Wipe out noise and interference before it gets into your receiver with a 60 dB null!

Eliminate all types of noise -- severe power line noise from arcing transformers and insulators, fluorescent lamps, light dimmers, touch controlled lamps, computers, TV birdies, lightning crashes from distant thunderstorms, electric drills, motors, industrial processes.

It's more effective than a noise blanker! Interference much stronger than your desired signal can be completely removed

without affecting your signal.

It works on all modes -- SSB, AM, CW, FM -- and frequences from BCB to lower VHF

You can null out strong QRM on top of weak rare DX and then work him! You can null

out a strong local ham or AM broadcast station to prevent your receiver from overloading.

Use the MFJ-1026 as an adjustable phasing network. You can combine two antennas to give you various directional patterns. Null out a strong interfering signal or peak a weak signal at a push of a button.

Easy-to-use! Plugs between transmitting antenna and transceiver. To null, adjust amplitude and phase controls for minimum S-meter reading or lowest noise. To peak, push reverse button. Use built-in active antenna or an external one. MFJ's exclusive Constant Amplitude Phase Control™ makes nulling easy.

RF sense T/R switch automatically bypasses your transceiver when you transmit. Adjustable delay time. Uses 12 VDC or 110 VAC with MFJ-1312D, \$15.95. 6¹/₂x1¹/₂x6¹/₄ in.

MFJ-1025, \$179.95. Like MFJ-1026 less



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external noise antenna.

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Only MFJ gives you tunable and programmable "brick wall" DSP filters.

You can continuously tune low pass, high pass, notch and bandpass filters and continuously vary bandwidth to pinpoint and eliminate interference.

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can customize. Automatic notch filter searches for and eliminates multiple heterodynes. Advanced adaptive noise reduction silences background noise and QRM.

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once regardless of the band or number of times the same prefix is worked.

- (a) A PREFIX is the letter/numeral combination which forms the first part of the amateur call. Examples: N8, W8, WD8, HG1, HG19, KC2, OE2, OE25, LY1000, etc. Any difference in the numbering, lettering, or order of same shall count as a separate prefix. A station operating from a DXCC entity different from that indicated by its call sign is required to sign portable. The portable prefix must be an authorized prefix of the country/call area of operation. In cases of portable operation, the portable designator will then become the prefix. Example: N8BJQ operating from Wake Island would sign N8BJQ/KH9 or N8BJQ/NH9. KH6XXX operating from Ohio must use an authorized prefix for the U.S. 8th district (/W8, /AD8, etc.). Portable designators without numbers will be assigned a zero (Ø) after the second letter of the portable designator to form the prefix. Example: PA/N8BJQ would become PAØ. All calls without numbers will be assigned a zero (Ø) after the first two letters to form the prefix. Example: XEFTJW would count as XEØ. Maritime mobile, mobile, /A, /E, /J, /P, or other license class identifiers do not count as prefixes.
- (b) Special event, commemorative, and other unique prefix stations are encouraged to participate. Prefixes must be assigned by the licensing authority of the country of operation.
- **IX. Scoring:** A station may be worked once on each band for QSO point credit. Prefix credit may be taken only once.

(a) Single-Operator:

- (i) All-Band score is total contact points from all bands multiplied by the number of different prefixes worked.
- (ii) Single-Band score is total contact points on the band entered multiplied by the number of different prefixes worked on that band only.
- (b) Multi-Operator: Scoring is the same as Single-Operator, All-Band.
- X. Awards: Only logs submitted in electronic format are eligible for awards. A single-band log will be eligible for a single-band award only.

To be eligible for an award, a Single Operator station must show a minimum of 4 hours of operation. Multi-operator stations must operate a minimum of 8 hours.

(a) Plaques are awarded to recognize top performance in a number of categories. View the current list of plaques and sponsors at http://www.cqwpxrtty.com/plaques.htm.

Only one plaque will be awarded per entry. A station winning a World plaque will not be considered for a sub-area award. That award will be given to the runner-up for that area if the number of entries justifies the award.

(b) Certificates will be awarded to the

highest scoring station in each category listed under Section V . . .

- (i) In every participating country.
- (ii) In each call area of the United States, Canada, Russia and Japan.
- (iii) At the discretion of the contest director second- and third-place awards may be made.
- XI. Club Competition: A plaque will be awarded each year to the club that has the highest aggregate score from logs submitted by its members. To be listed in the results, a minimum of three logs must be received from a club.
- (a) The club must be a local group and not a national organization (e.g., ARRL or DARC).
- (b) Participation is limited to members residing in or operating from a local geographic area (except for DXpeditions conducted by members living within the defined club geographic area). Club contributions from DXpedition scores are a percentage of the number of club members on the DXpedition.
- (c) Single-operator entries can only contribute to one club. Multi-operator scores may be allocated to multiple clubs as a percentage of the number of club members participating in the operation. Please spell out the full club name in your entry.
- XII. Instructions for Submission of Logs: We would appreciate receiving all logs in electronic format. Electronic submission of logs is **required** for anyone competing for an award and for all who use a computer to log the contest or prepare contest logs.
- (a) The log MUST show the following for each contact: correct time in UTC, frequency (or band), call, exchange sent, and exchange received. A log without all required information may be reclassified to checklog.
- (b) Single band entrants are required to include all contacts made during the contest period, even if on other bands. Only contacts made on the band specified in the Cabrillo header or summary sheet will be considered for scoring purposes. Logs with contacts only on one band will be classified as single band entries.
- (c) The CABRILLO file format is the standard for logs. For detailed instructions on filling out the CABRILLO file header, see the WPX RTTY Contest Web site <www.cqwpxrtty.com>. Failure to fill out the header correctly may result in your entry being placed in the wrong category or reclassified as a checklog. Note: U.S. stations must indicate the location of where you operated from in the CABRILLO header (e.g., LOCATION: OH).
- (d) E-mail or Web upload is the expected method of log submission. Logs in CABRILLO format should be sent

- to <rtty@cqwpx.com>. Include only your call sign in the "Subject:" line of your e-mail. Web upload of logs is available on the CQ WPX RTTY Web site at <www.cqwpxrtty.com>. All logs received via e-mail will be confirmed via e-mail. A listing of logs received can be found on the CQ WPX RTTY Web Site.
- (e) Instructions for NON-CABRILLO electronic logs: If you are not able to submit a CABRILLO format log, please contact the Contest Director for assistance with submitting another format.
- (f) Instructions for paper logs: All paper logs should be sent to Paper Logs, P.O. Box 481, New Carlisle, OH 45344 USA. Each paper log entry must be accompanied by a Summary Sheet listing all scoring information, the category of competition, and the entrant's name and mailing address in BLOCK LETTERS.

XIII. Rule Violations: Violation of amateur radio regulations or the rules of the contest; unsportsmanlike conduct; taking credit for excessive unverifiable QSOs or multipliers; use of any non-amateur means of communication to SOLICIT, ARRANGE, or CONFIRM any contacts during or after the contest will be deemed sufficient cause for disqualification.

An entrant whose log is deemed by the Contest Committee to contain rule violations may be issued a Yellow or Red card depending on the seriousness of the infraction. If the entry is in a multi-operator category, all listed operators, the station owner, the station and the callsign are so affected.

YELLOW card: Any entrant or operator issued a yellow card is not eligible for an award and will be listed at the end of the published results.

RED card: Any entrant or operator issued a red card is not eligible for an award, will be listed at the end of the published results, and will be ineligible for any CQ-sponsored contest award for a period of one year beginning with the publication of the violation in *CQ* magazine.

- XIV. Declaration: By submitting an entry in the CQ WPX RTTY Contest you agree that: (1) you have read and understood the rules of the contest and agree to be bound by them, (2) you have operated according to all rules and regulations of your country that pertain to amateur radio, (3) your log entry may be made open to the public, and (4) all actions and decisions of the WPX RTTY Contest Committee are official and final.
- XV. Deadline: All entries must be emailed or postmarked NO LATER than February 15, 2013. Logs emailed or postmarked after the deadline may be ineligible for any awards.

Questions pertaining to the WPX Contest may be e-mailed to the CQ WPX RTTY Contest Director, Ed Muns, WØYK, at <w0yk@cqwpxrtty.com>.

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Z-817

The ultimate autotuner for QRP radios including the Yaesu FT-817(D). 2000 memories cover 160 through 6 meters. Also functions as a general purpose antenna tuner with other QRP radios. Powered by four AA internal Alkaline batteries (not included), so there are no additional cables required. Suggested Price \$129.99

IT-100

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Suggested Price \$179.99

AT-200Proll

The AT-200Proll now includes LEDs to show antenna position and if the tuner is in bypass. A two position antenna switch stores 2000 memories per switch. Handles up to 250 watts SSB or CW on 1.8 to 30 MHz and 100 watts on 54 MHz. Rugged and easy to read LED bar graphs simultaneously show RF power and SWR. Includes a six foot DC power cable. Suggested Price \$259.99



AT-1000Proll

LDG Electronics' new flagship 1KW tuner features: 5 to 1,000Watts PEP; RF Sensing; Auto and Semi Tuning Modes; 1.8 to 54 MHz range; 6 to 800 ohm range (15 to 150 on 6M); simplified operation; and an optional external 4.5"

analog meter. With the two position antenna switch, there are 2,000 memories that store tuning parameters for almost instantaneous memory recall whenever you transmit on or near a frequency you've used before. Includes six foot DC power cable.

Suggested Price \$539.99

Optional M-1000 external analog meter \$129.99



AT-897Plus for the Yaesu FT-897

If you own a Yaesu FT-897 and want a broad range automatic antenna tuner, look no further! The AT-897Plus Autotuner mounts on the side of your FT-897 just like the original equipment and takes power directly from the CAT port of the FT-897 and provides a second CAT port on the back of the tuner so hooking up another CAT device couldn't be easier. Suggested Price \$199.99



NEW! AT-600Proll

Building on the success of the AT-600Pro. we refined and expanded the model with an optional external 4.5" analog meter. The new AT-600Proll keeps many of the same features of the previous model, but simplifies the operation. With the two-position antenna switch, there are 2,000 memories that store tuning parameters for almost instantaneous memory recall whenever you transmit on or near a frequency you've used before. Includes six-foot DC power cable.

Suggested Price \$369.99

Optional M-600 external analog meter \$129.99



Z-100Plus

Small and simple to use, the Z-100Plus sports 2000 memories that store both frequency and tuning parameters. It will run on any voltage source from 7 to 18 volts; six AA batteries will run it for a year of normal use. Current draw while tuning is less than 100ma. The Z-100Plus now includes an internal frequency counter so the operating frequency is stored with tuning parameters to make memory tunes a blazingly fast 0.1 seconds; full tunes take an average of only 6 seconds. Includes six foot DC power cable. Suggested Price \$159.99

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Take It to The Field

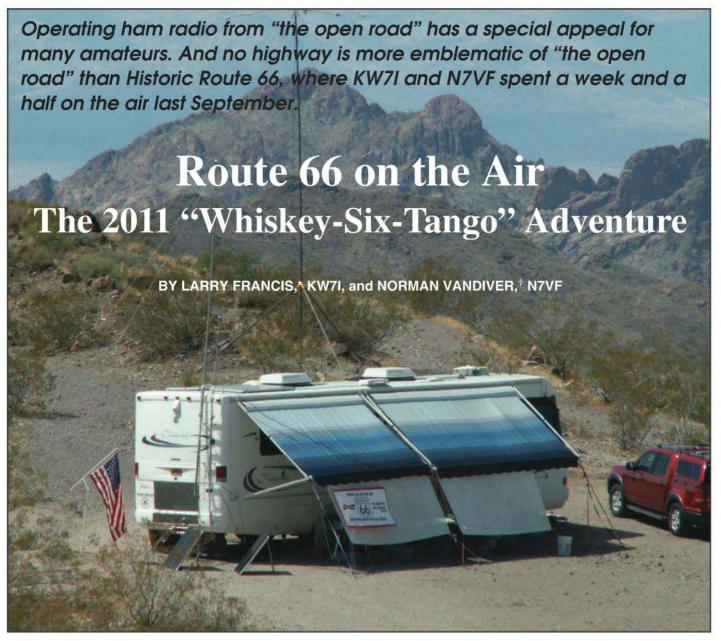


Photo A- KW7I's motor home all set up at Memorial Point on Old Route 66 in Arizona.

or the past dozen years, the Citrus Belt Amateur Radio Club of San Bernardino, California has been sponsoring an annual amateur radio event each September commemorating Historic Route 66, the iconic highway from Chicago to Los Angeles. In 2011, there were 18 stations operating along Route 66 between September 10 and 18, with 17 of them operated by members of various clubs along the route. The special event one-by-one callsigns began with Whiskey-Six-Alpha (W6A) in Santa Monica, California, and ran through Whiskey-Six-Quebec (W6Q) in Chicago, Illinois;

our assigned call was Whiskey-Six-Tango (W6T). We were the "Lone Rover" station, operating from a motor home in Arizona (photo A).

Our operating location was right on Old Route 66, about 25 miles west of Kingman and four miles east of the old mining town of Oatman. The place where we parked is called Memorial Point and is right at the summit of Sitgreaves Pass in the Black Mountains. About nine miles east of the pass is a tourist place named Cool Springs; in years gone by this was a service station stop (photo B).

In order to last the full ten days in moderate comfort, I (KW7I) brought my motor home down from Oregon. We made it up the steep grade, navigating the 10-mile-an-hour switchbacks from Cool Springs to Sitgreaves Pass by having Norman, N7VF, go ahead with our car and use the mobile radios to let me know of any oncoming traffic.

^{*1315} Joplin St. S., Salem, OR 97302

^{†1862} Arena Del Loma, Camp Verde, AZ 86322

A longer version of this article, with many more photos, can be found online at http://www.w6jbt.org/public_html/images/route66photos/2011/W6TStory.pdf>.

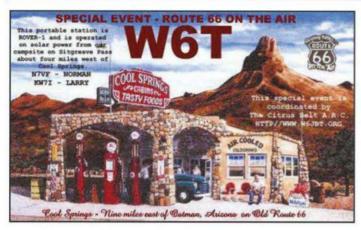
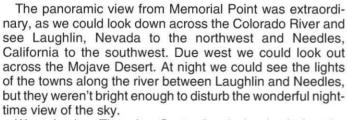


Photo B- The W6T QSL card. (Photos courtesy of the authors)



Photo C- Co-author Larry Francis, KW7I, adjusting the portable solar panels.



We arrived on Thursday, September 9, the day before the event officially began, and then set up the radio station under the awning to shade us from the sun. We basically ran the station on emergency power. Small arrays of solar panels (photo C) were used to charge our gel cell batteries, and with the solar panels on the motor home we had plenty of power for the radio, miscellaneous peripherals, and the computer. We called this our "Mini-DX Expedition and International Field Day."

On Friday we erected our little antenna farm which included Norman's homemade 20-meter directional antenna

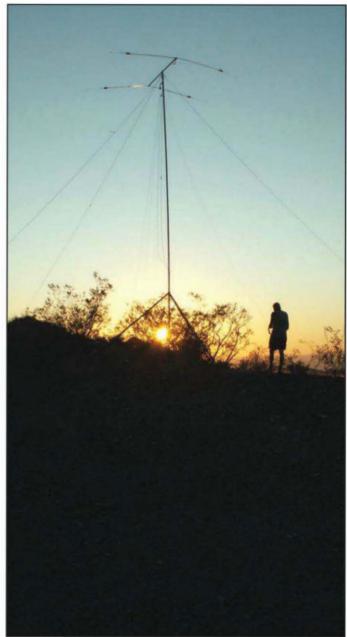


Photo D— Our main antenna mast with co-author Norman Vandiver, N7VF, doing a final visual inspection at sunset.

(photo D), and wire antennas for 10, 15, 17, 20, 40, and 80 meters. Everything seemed to be in order... or so we thought. During the night we had a strong wind storm that caused a couple of the wire antennas to come loose, twisting them together like we had run them through an eggbeater.

By 9 o'clock Saturday morning we were untangled and on the air, with our first contact being K6RPM in California on 80 meters. At this point we discovered that the computer and radio were not talking to one another, which forced us to use a paper log for several days. We had over 600 contacts on paper before I got the computer logger going. We never did determine the problem. Then on Sunday evening we had another logging problem: A strong wind gust came through just ahead of a big thunderstorm, ripping several pages out of our paper log! We thought those pages were gone forever, but several days later we spotted them scattered along the mountainside below us. Norman carefully worked his way down and retrieved the wrinkled, water-faded, but still usable pages.

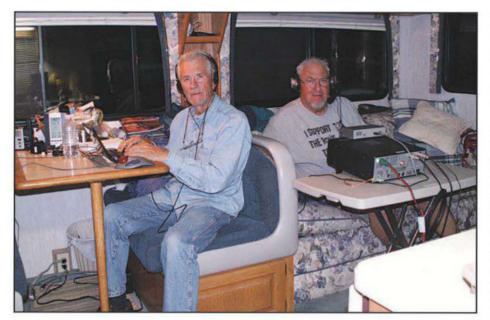


Photo E- Norman logs while Larry operates from inside the motor home during the heavy rainstorm. (The outlet under the table is connected to the inverter that runs off the batteries.)

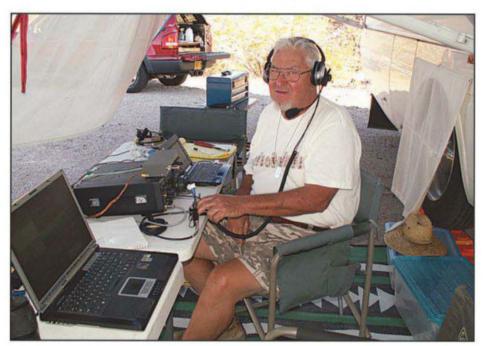


Photo F-Larry operating W6T outside under the awning after the weather cleared.

The thunderstorms were quite spectacular as seen from the mountaintop. They were very slow-moving and pounded us with lots of rain. It was good that we routinely brought all of the electronic equipment into the motor home at night, because by daylight everything outside was soaked, even leaving a small river running under the motor home.

All day Monday the rain came down, while wild winds rocked the motor home. By nightfall there were some pretty good ruts washed out in the parking area. The river under the motor

home was sometimes six inches deep and six feet wide as the water ran towards the road. Needless to say, we moved the radio station inside (photo E). Due to the lack of sun we ran the motor-home generator to keep the batteries charged.

The storm finally blew itself out overnight and Tuesday was a better day, although the 65°F temperature was much cooler than the 100° we had expected! As the week progressed, our outside temperatures climbed back to closer to normal for Arizona, and by

Saturday and Sunday it was near 95°F with clear blue skies.

We did lose nearly two full days while Norman was in the hospital at Kingman. Fortunately, it turned out to be nothing serious, but it kept us off the air for most of Thursday and Friday.

Saturday morning we had bright sun and full batteries, and we were raring to go on the radio (photo F). We had a good day, everything went well, and we logged over 180 contacts. The people playing the "Route 66 On The Air" had been looking for us, so for the remainder of the event we tried to be as available as we could, operating on the most productive bands. By Sunday evening our count totaled 1534, including 14 of the other "Whiskey-Six" 1x1 stations. Overall, we contacted all 50 states plus the District of Columbia, seven Canadian provinces, three Mexican states, and nine other DX countries.

Getting Personal

The "Mini International Field Day" part of this event included numerous visitors who stopped by. Many expressed great interest in our amateur radio adventure, and for these people we provided demonstrations such as the bands would allow (photo G). People from all over the world come to the United States to travel Route 66, and they found our location at Memorial Point a good viewing area. People stopped to look at the scenery and gave us a great opportunity to visit with them. Thankfully, most spoke English well enough that we could carry on an enjoyable conversation.

We also had many groups of motorcycles come through, ranging from a single bike to over forty bikes, most with pillion riders (passengers sitting behind the driver). Many of them had started at one end or the other of Route 66 and were riding the entire route. The larger groups were accompanied by support teams and were well organized. Some of the smaller groups were just a few folks out enjoying the world, such as the five hearty fellows from Finland who looked like they were from the creditcard advertisement on TV with the band of Vikings. At times we would hold up on radio contacts because of the noise made by passing motorcycles. There were also several car clubs driving their vintage cars through the area.

One young couple from Switzerland stopped by for a rest and very nice visit. They were doing the entire route *on their bicycles*! They were headed west to Santa Monica, having left Chicago

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651-489-5080 Fax 651-489-5066 two months earlier, enduring the summer heat as they traveled through the heartland of North America.

One of our more unusual visitors was Leon Zhang from Shanghai, China. He was involved with *AutoCar* magazine in China and was doing research for an article on Route 66. Leon's companion was the trip photographer. They spent an hour interviewing Norman about Route 66 and the amateur radio connection. Leon said he was amazed at the number of visitors from around the world who were here touring Route 66.

On Monday, after "Route 66 On The Air" was over, we had another couple

stop by to admire the view. Their vehicle (photo H) was very interesting; it was an off-road thing with tandem axles and looked like European military surplus. It turned out that they were from Austria and were traveling the world with their vehicle. They had come from South America and were headed generally for Alaska. They had traveled all over Africa, Asia, and Australia in this compact and very specialized motor home. The lady, Johanna, asked if she could look in our bigger motor home, thinking maybe she would talk to Guenther about one like ours for some of their travels. However, Guenther said he still preferred theirs, because they could go anywhere they desired with it. Guenther, by the way. is also an amateur radio operator, OE5NMM.

As Norman and I were finishing breaking camp, another couple from Berlin, Germany drove in. I introduced them to Gunther and Johanna, gave them chairs and water, and the four of them carried on a nice visit in German while Norman loaded the last of our equipment and prepared to head back east on Route 66 for Kingman, Congress, and Camp Verde, Arizona. And that's how another of our memorable adventures came to an end.



Photo G-Norman demonstrating our station to some ladies who stopped by. We had visitors from all over the world during our 10-day stay at Memorial Point.

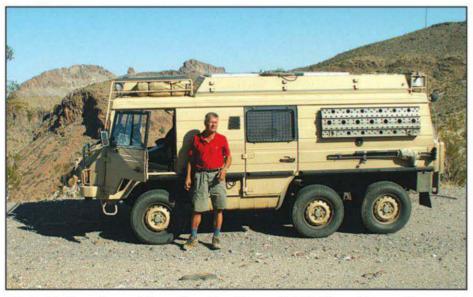


Photo H– One of our visitors, Guenther Wurm, OE5NMM, and his multi-use vehicle from Austria. He and Johanna were on a road trip from South America to Alaska.



Getting Your Kicks ... on Route 66

U.S. Route 66 is the iconic American highway. Officially, it no longer exists, but its heritage is being preserved by groups including California's Citrus Belt Amateur Radio Club http://www.w6jbt.org/index.html, which sponsors the annual Route 66 On The Air event.

The road between Chicago and Los Angeles was officially opened in 1926, running through eight states and covering nearly 2500 miles. It was immortalized in a song written in 1946 by Bobby Troup and turned into a hit by Nat King Cole the same year. [Watch and listen: Video of Nat King Cole performing "Route 66": http://www.youtube.com/watch?v=dCYApJtsyd0; video with photos along the road today, over audio of Nat King Cole: http://www.youtube.com/watch?v=kbQXalTGu-8] and by a TV show that aired between 1960 and 1964.]

Construction of the Interstate Highway System eventually turned Route 66 into more of a byway than a highway (in fact, parts have been designated as National Scenic Byways—see http://byways.org/explore/byways/2489), and the route was formally decommissioned by the federal government in 1985.

The Citrus Belt Amateur Radio Club has sponsored the Route 66 On The Air event each September since 2000; the 2012 event is scheduled for September 8–16. See http://www.w6jbt.org/index.html.

Announcing:

2013 Nominations Open for the CQ Amateur Radio, DX, and Contest Halls of Fame

ach year *CQ* recognizes those who have made significant contributions to amateur radio in general, and to DXing and contesting in particular, creating three categories of awards. Nominations are now open and will close on **March 1, 2013 for all three Halls of Fame**.

CQ Amateur Radio Hall of Fame

Amateur radio operators have been responsible for many advances in communications technology, and entire industries have been built on the foundation of amateur radio experimentation and activity. In an effort to recognize outstanding amateurs and their achievements, and help the public appreciate the far-reaching and long-standing value of amateur radio in our society, we have established the *CQ* Amateur Radio Hall of Fame. Nominations for the 2013 "class" are now open.

The CQ Amateur Radio Hall of Fame honors those whose technical or other accomplishments have helped propel amateur radio forward, or whose achievements in other areas of life have helped improve ham radio's reputation simply through association. Nominees for the CQ Amateur Radio Hall of Fame will be judged on the basis of qualifying in one of two broad areas: those individuals-whether licensed amateurs or not-who have made significant contributions to the amateur radio hobby: and those radio amateurs who have made significant contributions to society in general. Nominees must have made significant contributions of nationwide or worldwide impact.

In order to be consistent with the nomination deadline for the CQ Contest and DX Halls of Fame, the nomination deadline for the CQ Amateur Radio Hall of Fame is March 1. Nominations received after that date will be considered for future selection. Nominations for the Amateur Radio Hall of Fame may be made by clubs, organizations, or individuals. State your candidate's name, where to contact him/her if still living, for which category you are nominating him/her, and a brief one- to two-paragraph description of this person's accomplishments. Please include your name and contact information as well. E-mail to

<hall-of-fame@cq-amateur-radio.com> or mail to CQ Amateur Radio Hall of Fame, 25 Newbridge Rd., Hicksville, NY 11801. The official nomination form is on the CQ website <www.cq-amateur-radio.com>. If you feel someone has earned this recognition, please submit a nomination. Please don't assume that someone else will nominate the person you may have in mind.

We will announce this year's selections at the Dayton Hamvention® in May 2013. Please help us recognize these "ham radio heroes" whose contributions have helped shape our hobby, our nation, or our world.

CQ DX and Contest Halls of Fame

Nominations for the CQ DX Hall of Fame and the CQ Contest Hall of Fame recognize those amateurs who have made

major contributions to DXing and contesting, respectively. The activities and accomplishments that qualify one for membership in these elite groups involve considerable personal sacrifice and can usually be described by the phrase "above and beyond the call of duty." Nominations for the Contest and DX Halls of Fame are made by contesting or DX clubs or national organizations, and must be submitted by March 1 of each year to be considered.

A maximum of two (2) people may be inducted into each hall of fame (DX and contest) each year. Nominations for the CQ Contest and DX Halls of Fame should be directed to CQ (Contest or DX) Hall of Fame, c/o CQ Communications Inc., 25 Newbridge Rd., Hicksville, NY 11801; or via e-mail to <hall-of-fame@cq-amateur-radio.com>. Please specify to which hall of fame the nomination is submitted.





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What You've Told Us...

Our October survey asked about your recent hamfest experiences. Hamfests remain popular with CQ readers, as eight in ten of our survey respondents attended at least one last year. Nearly half of you (47%) attended 2-5 hamfests, while 27% went to just one and 5% visited six or more. Asked how last year compared to recent years, 56% said it's about the same, 31% said they've cut back on hamfests, and 10% said they'd been to more than usual. Local hamfests continue to be big, as 62% of you went to at least one last year, followed by small regional hamfests (37%), large regionals (29%), none (20%), large national hamfests (such as Dayton) (19%), and specialty conventions (8%).

Your hamfest purchases reflect the country's overall economic uncertainty, as 41% of you spent less than usual at hamfests last year, while 36% held the line and only 9% spent more. Flea market bargains continue to be the biggest hamfest draws (32%), followed by socializing (20%), used gear (19%), forums (15%), new gear (13%), and other (5%).

Finally, we asked how you feel hamfests have changed in recent years. One third of you think attendance is generally down (13% say "up," leaving 54% at about the same); 36% feel the number of vendors is down (vs. 5% up and 59% the same); 20% say flea market offerings are generally worse than in the past (vs. 9% better and 71% the same); 15% say fewer good deals vs. the Internet (5% say more, and 80% see no change).

This month's free subscription winner is Howard Pepper, AC4FS, of Palm Coast, Florida.

Reader Survey January 2013

We'd like to know more about you—about who you are, where you live, what kind(s) of work you do, and of course, what kinds of amateur radio activities you enjoy. Why? To help us serve you better.

Each time we run one of these surveys, we'll ask a few different questions and ask you to indicate your answers by circling numbers on the Survey Card and returning it to us. As a bit of incentive, we'll pick one respondent each month and give that person a complimentary one-year subscription (or subscription extension) to *CQ*.

We still have Hurricane Sandy on our minds as we wrap up this issue, so our questions this month will be about your personal emergency preparedness.

Please answer by circling the appropriate numbers on the reply card or by going to the following web link <www.surveymonkey.com/s/CQJan13> [From the digital edition, just click on the link].

1. How would you rate your level of personal and family emergency

nrepared need?
preparedness? Complete1
Excellent
Good
Poor4
2. Do you have a power generator at home? Yes, whole house, with automatic transfer switch
3. What is the fuel source for your generator?
Diesel9
Gasoline10
Liquid propane11
Natural gas12
Other13
No generator14
4 H
4. How many days' fuel supply do you have on hand for your generator?
Less than one day
1–3 days
More than 5 days
No generator
No goriorator
5. Do you have backup power for your home ham station?
Yes, generator20
Yes, batteries21
Yes, solar22
No23
6. Do you have a backup method of recharging handheld batteries?
Yes, generator
Yes, car battery25 Yes, other batteries26
No
NU21
7. For how many days do you have food, water, batteries and candles on
hand in the event of a prolonged power outage?
Less than 128
1–329
3–5
More than 531
25 TALES - No. 1877 - 1827 - 1837 - 1848 - 1848 - 1848 - 1848 - 1848 - 1848 - 1848 - 1848 - 1848 - 1848 - 1848
8. Do you have a family emergency plan including a predetermined contact
Do you have a family emergency plan including a predetermined contact person and meeting point in case you become separated?
Do you have a family emergency plan including a predetermined contact person and meeting point in case you become separated? Yes
person and meeting point in case you become separated?
person and meeting point in case you become separated? Yes

Thank you for your responses. We'll be back with more questions next month.

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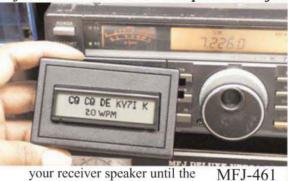
Use it as a backup in case you mis-copy a few characters - - it makes working high speed CW a breeze - - even if you're rusty.

Practice by copying along with the MFJ-461. It'll help you learn the code and increase your speed as you instantly see if you're right or wrong.

Eavesdrop on interesting Morse code OSOs from hams all over the world. It's a universal language that's understood the world over.

MFJ $AutoTrak^{TM}$ automatically locks on, tracks and displays CW speed up to 99 Words-Per-Minute.

Simply place your MFJ-461 close to



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Of course, nothing can clean up and copy a sloppy fist, especially weak signals with lots of QRM/QRN.

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The MFJ-461's serial port lets you display CW text full screen on a bright computer monitor -- just use your computer serial port and terminal program.

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Uses 9 Volt battery. Fits in your shirt pocket with room to spare smaller than a pack of cigarettes. Tiny $2^{1/4} \times 3^{1/4} \times 1$ inches. $5^{1/2}$ ounces.

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Many owners of Heathkit VTVMs have, at times, probably wished that they did not have the bother of needing to change tubes and the battery. Plus, 12AU7 tubes are getting scarcer these days. Realizing this, I thought it might be of interest to some hams to suggest a solid-state modification (or four), thereby eliminating the tubes and battery.

Heathkit VTVM V7, V7A, IM-18 Solid-State Modifications

BY BURL B. ROGERS,* K4VYL

have read some articles in magazines that portrayed projects of new construction, or upgrading of older circuits, which left me ... uninspired? That was somewhat because while the finished item might look nice and function properly, it often seemed it had been built with a number of esoteric components that the average ham would be unlikely to have in his junk box. I thought it might be nice to build these modifications as much as possible with common parts that one might already have, using some of the existing VTVM (Vacuum Tube Volt Meter) parts and using parts that are easily available if you must resort to purchasing. Here's hoping, of course, that you have a good ham friend who is also an expert scrounger.

I have included four different circuits (Mark I–Mark IV) so that you may have some choice of components, depending on what's easiest for you to get. I chose to use the original power transformer supplied with the VTVM along with the input filter and rectifier diode (see fig. 1), then to build onto that.

Most VTVMs utilize the differential amplifier circuit in some form as the input circuit. Since the input resistor stack must be ten times the possible load resistance, then to be of good use the stack resistance should be about ten megohms . That being the case, the actual meter movement resistance must be about one-hundred megohms. Therefore, if you were to choose to build a circuit with bipolar transistors or a transistorized op-amp, the differential amplifier would require a higher input impedance.

A junction FET (JFET) will provide the necessary impedance between the resistor stack and the amplifier input. I built one amplifier circuit with bipolar transistors and one with a 2N2902 (2N124 series) op-amp. The FET I had in house was a 2N5638 made by National Semiconductor. It worked well with a source resistor providing a self-bias of approximately one half the drain voltage.

Note: The 2N5638 FET I was able to order from Mouser Electronics was of Fairchild construction. When received and tested in the breadboard, it showed a much higher value of source voltage bias. That is the reason for the two source resistors using the Fairchild FET transistor in modifications Mk I and III. This allows for an output voltage within the transistors' operating range.

In the Mark I schematic (fig. 2), the amplifier transistors should have betas closely matched. The 2N2222 transistors will suffice if you so match. Please note the pair of 2N2222 transistors reverse-connected with open bases. These are for the protection of the input units. While it is hoped that a



The Heathkit IM-18 is one of three models for which the modifications in this article are designed to work. (Photo courtesy Hans Gatu, SA7AUY, from his website, http://www.heathkit.nu, used by permission)

*c/o CQ magazine

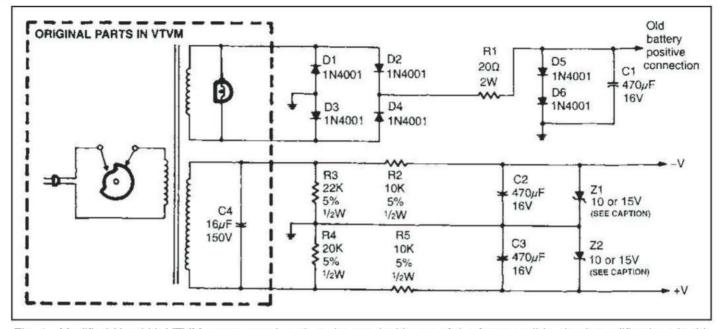


Fig. 1– Modified Heathkit VTVM power supply unit, to be used with any of the four possible circuit modifications in this article. Note: The Zener diodes should be 15V for modifications Mark I, II, and III; 10V for Mark IV.

person will always put the voltage range knob in the proper range position for the voltage being measured, it is not chiseled in granite that one will always be that careful. The reason why the VTVM circuit did not provide that protection was because of the very high impedance of the vacuum tube.

Alternative options are in figs. 3, 4, and 5 (Mk II, III, and IV). For the Mk IV modification, I chose the LF-353N FET opamp. It might prove helpful to provide an eight-pin socket for this unit in case you want to remove the chip for any reason.

I have constructed the four different circuits into four VTVMs and all showed comparable accuracies.

Tips on Assembly

You will need to refer to the original VTVM schematic as well as those included with this article.

1. Remove the tubes and battery. Commend them for their past service and say goodbye.

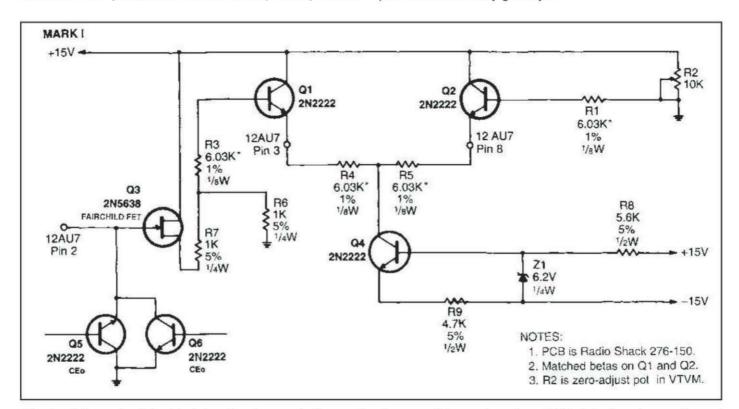


Fig. 2– Schematic of the Mark I option (see text). Notes: See footnote 1 for explanation of "CEo" designation on Q5 and Q6 if you are not familiar with it; the 6.03k value on R1, R3, R4, and R5 is not critical. Any 1% ¹/8-watt resistor value between 5k and 9k should work (but make them all the same value).

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- 2. Remove the metal bracket. Remove the two 150k and the 220k resistors from the zero potentiometer area of the VTVM PCB. Remove the 27k, 10k, and 100-ohm resistors from the power supply area near the AC BAL pot. Disconnect the leads from the AC BAL pot.
 - 3. Unscrew the nuts from the meter's

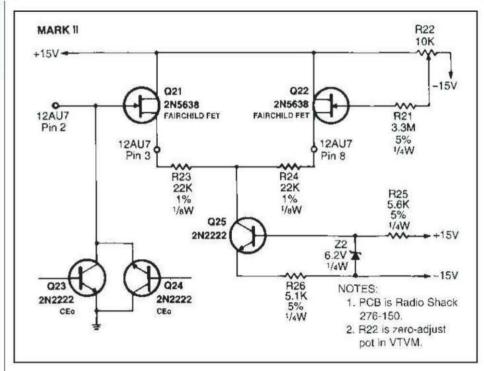


Fig. 3– Mark II schematic. All of the different options will produce the same results. The different choices are provided by the author to help you make best use of parts you may already have available.

positive and negative terminals so the VTVM PCB can be examined from both sides.

- 4. It might be helpful to preassemble the new circuits on a pegboard where you could test them before assembling them on the Radio Shack 276-150 PCB. Assemble the power supply circuit first, and when it checks out to be good, assemble it onto one end of the PCB.
- 5. Install a ³/4-inch to 1-inch throughhole standoff insulator in the old battery hole of the VTVM PCB. If none is read-

ily available in your "someday" box, you can make one by cutting a section out of an old, used BIC® pen.

- 6. Sever the VTVM PCB filament trace (yellow wires connection) just beyond the lamp. Solder new leads from the lamp connection to diode bridge per schematic. Make the leads long enough to be able to work on both sides of the PCB.
- 7. Solder a ground lead to pin 8 of the 12AU7 socket.
 - 8. Sever the lead between the .01-µF

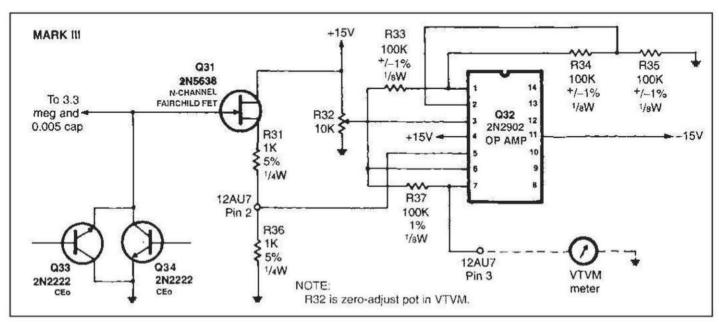


Fig. 4- Schematic of option Mark III. This circuit uses an op-amp, as does Mk IV.

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1600-volt capacitor and the range switch. Remove lead from pin 4, #1 deck (F) on the original PCB.

- 9. Assemble the chosen amplifier circuit on your breadboard and test for performance. If satisfactory, assemble circuit on other end of the PCB. Attach leads to zero pot as per schematic.
- 10. Reconnect VTVM PCB to meter terminals. Assemble the PCB to stand-off terminal using one of the corner holes on board. Make all necessary connections as per schematic.
- 11. Set voltage range knob to +1.5 DCV position. Clip a test lead from the DC test lead to ground. Adjust the zero adjust pot for zero output on the meter.
- 12. Adjust calibrations of plus and minus voltage on the 1.5-volt range using a variable voltage supply input. Monitor the voltage with a known accurate voltmeter, either VTVM or digital. Calibrate the AC on the 150-volt range using your AC line voltage.
- 13. Assemble total unit and forget about tubes and batteries.

Note

1. If you are not familiar with the "CEo" designation on certain of the 2N2222 transistors in the schematics, that refers to "Collector to Emitter, base open circuited

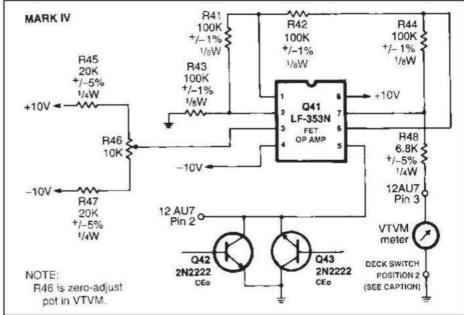


Fig. 5– Mark IV schematic. Note that the output of the meter (lower right) connects to the #2 deck switch position on the VTVM schematic.

configuration." When the NPN, for example, is connected that way it will be using the base-to-emitter junction in reverse as a Zener diode. The current will then pass through the base to collector junction with little voltage drop added to the base-to-

emitter breakdown voltage. Ergo, Zener action, and when you connect another similar transistor in reverse parallel, you now have a negative Zener as wll. It's a nice way to inexpensively get matched Zeners for input voltage protection.

You don't need grass and trees to take ham radio to the field. This entirely self-contained operation was 38 stories above the streets of New York City.

Taking it to the Field in Midtown Manhattan

BY RICH MOSESON,* W2VU

ost of our "take it to the field" stories involve some sort of actual field, whether it's a grassy park or a field of boulders on top of some remote mountain. But the N3Y special event station last November was about as unremote as you could get ... smack in the middle of midtown Manhattan (New York, not Kansas), on a balcony 38 floors above the street at the New Yorker hotel (photo A), across from Macy's, Penn Station, and Madison Square Garden. However, the operation was fully self-contained and "off the grid," just as it might have been on some mountaintop.

Members and friends of NYC Resistor, the New York maker/hacker group, put together three separate stations for the event, including two HF stations and one VHF/UHF satellite station (for more on the special event, see "TeslaGRAM: A Multinational Special Event for a Nearly-Forgotten Laboratory," in the February 2012 issue of *CQ*). Here's a rundown of the equipment at each station:

HF Station #1

The main HF station for the operation was provided by Alain DeCarolis, WW3WW, who described it as follows: "The HF setup I operated for N3Y is the usual setup I have "on call" here under my desk. I usually operate from the NYC parks and the entire station is designed to be easily transported on my bicycle. (I have no car). When I decide to go QRP I use my FT-817ND, but when I feel like going stronger, I take out my inseparable TS-50S (I have had it since high school)."

*Editor, CQ

e-mail: <w2vu@cq-amateur-radio.com

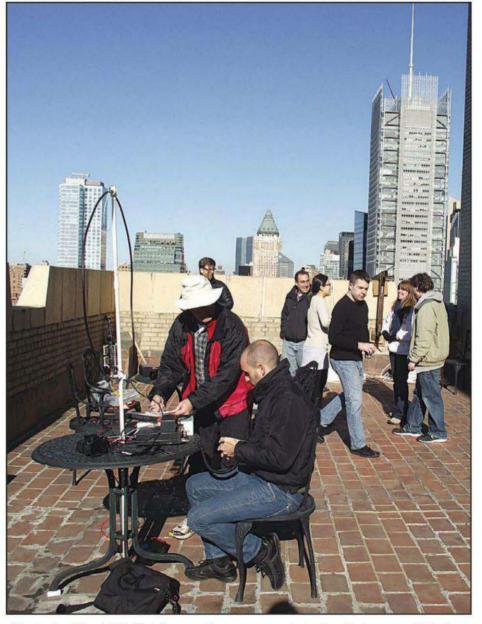


Photo A— The N3Y "field" operation was conducted entirely on a 38th-floor balcony of the New Yorker hotel in the middle of New York City.

The TS-50 was the rig of choice for the N3Y operation, running at about 30 watts PEP on single sideband through an MFJ travel tuner. Alain's antenna was a homebuilt magnetic loop, about three feet in diameter (photo B). It's designed to operate on 20 and 15 meters, but Alain says it also works on 40, although with some loss of efficiency. Alain added: "Some portable antennas of the same sort are also being sold commercially, but I believe that mine has two important advantages: The first is that if you need to you can go full power on it (100W CW), and the second is that my antenna costs only \$20 to build (much, much less than the commercial counterparts). Since I built it with a rudimentary toolset inside a New York City apartment, at first it might seem a bit 'Spartan.' However, the antenna performs great and it's giving me tremendous satisfaction."

Alain's battery was a sealed acid 12Ah purchased on eBay "for probably \$10 or \$15."

"I know it's heavy," he noted, "but given the price difference between an old-style battery and a new one (including the necessary charger), I decided it's not time yet for me to switch to something more exotic."

Alain was somewhat displeased with the results, which he noted were more a function of propagation than his equipment. "Unfortunately," he said, "the short skip propagation of Saturday afternoon only made it possible to contact North American stations ranging from California to Prince Edward Island to New Orleans. Normally I have much better luck but ... what can you do: This is exactly what makes shortwaves and QRP so special."

HF Station #2/Satellite Station #1

The second HF station—which was also pressed into service for satellite contacts and is seen in photo C—was built around a Yaesu FT-857D provided by Diana Eng, KC2UHB, and her husband, Dave Clausen, W2VV. For HF work it was hooked up to a Buddipole dipole (set up for 10 meters) and mast, which was mounted on a tripod, and the satellite antenna was a homebuilt WA5VJB "Cheap Yagi" with two elements on 2 meters and five elements on 70 centimeters.

Power was supplied by Tom Tumino, N2YTF, in the form of a Lithium Iron Nanophosphate Polymer custom battery, which allowed the FT-857 to run a full 100 watts out on HF as well as 50 watts to the FM satellites.



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"I prefer lithium cells for mountaintopping, where low temperatures can be tough on other chemistries," Tom explained, "and the iron nanophosphate cells are supposedly more stable then the regular lithium ion cells. The pack I brought along," he added, "is good for sustained current draws above 20 amps."

Tom also pointed out that the 20Ah battery has built-in protection and separate connections for charging, discharging, and balancing. Plus, he said, he always uses a "Watt's Up" wattmeter to keep track of power usage.

Satellite Station #2/ APRS Station #1

A Yaesu VX-8GR VHF/UHF handheld provided by Bill Ward, KD4ISF, wrapped

up the setup on the 38th floor. It was used alternatively as a backup satellite rig (photo D) and for an APRS beacon provided by Tom to alert nearby hams and anyone monitoring the worldwide APRS map website (http://aprs.fi/) of the special event operation.

The original plan was to have the satellite station be the focus of the operation, since it was assumed that the station's location so close to so many strong RF sources in midtown Manhattan would make HF a QRM nightmare. Plus, the 38th-floor balcony had an unobstructed sky view to the west, so any satellite pass west of New York City should have been fair game. As it turned out, the hotel building itself provided a significant amount of shielding and QRM was never much of a problem on HF. Plus, the satellite contacts were not easy to come by.

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Photo B— The prime operating position at N3Y was a Kenwood TS-50, MFJ travel tuner, and a homemade magnetic loop antenna, provided by Alain De Carolis, WW3WW, center, adjusting the antenna. Watching at the right is Tom Tumino, N2YTF, while Bill Ward, KD4ISF (left), talks with other group members at the second operating position.

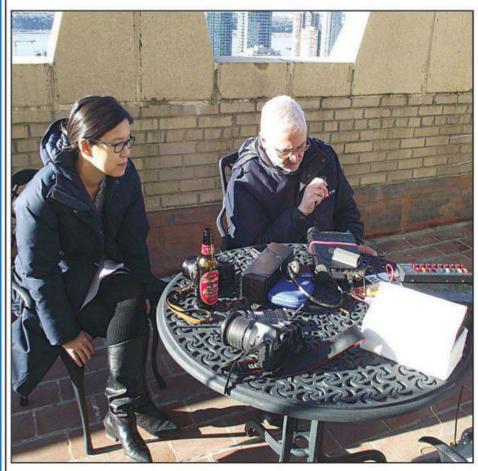


Photo C- NYC Resistor member and ham radio blogger Diana Eng, KC2UHB, listens as author W2VU calls CQ on the second station (see text for details).



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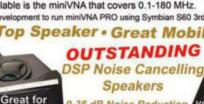
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Photo D- Dave Clausen, W2VV, uses a "Cheap Yagi" satellite antenna to listen for signals from SO-50 on the VX8R handheld, while Bill Ward, KD4ISF, stands by to log any contacts and Chuck Pettis, W7AUM, listens. (Additional photos are at <http://bit.ly/tbQPbh>, courtesy of KD4ISF)

An attempt while I was there to work SO-50 with the VX-8GR handheld was unsuccessful (too much competition from stations with stronger signals, and FM's "capture effect" assures that a weak signal will not be heard when stronger signals are present). A later effort using the FT-857 netted a halfdozen contacts on the late AO-51. Several dozen contacts were made on HF using Alain's station full-time and the 857 in between satellite passes.

Fun On and Off the Air

Overall, I would say that enough contacts were made for everyone to feel the effort had been worthwhile. However, like any radio operation "in the field" (with or without an actual field), what happens on the radio is only half the fun. Whether it's the splendor of the natural world in a forest clearing or on a mountaintop, or the splendor of the manmade world as you gaze at skyscrapers all around you from a New York hotel balcony, getting out "in the field" connects you with your world in a way that just doesn't happen while sitting in your attic or your basement. And if you happen to do it with a bunch of fellow hams, all the better...

More for the New Home Brewer

ou will remember that last month we tried to entice you to build something and actually gave you enough information so that you would not have an excuse to not do so. Well this month we would like to continue in that vein. Last month the simple field strength meter was intended to let you know when you were transmitting. Now it is time to build something that will allow you to check on your receiver so this month we will show you a simple signal generator that should enable you to do just that.

Fig. 1 is a circuit using a low cost color-burst crystal based oscillator at 3.58 MHz which is right in the 80-meter band. The crystal is connected as the feedback element for two of the gates in a common 7400 TTL Quad NAND IC and results in a TTL level square wave output signal. The other two gates are used as output amplifiers. This arrangement produces a square wave signal with enough harmonics to be heard all the way up to the 10 meter band. Power is supplied by a common 6 volt lantern battery and a series 1N4002 silicon diode which drops the voltage to about 5.3 volts for a fresh battery. Although a bit high the TTL gate still operates with no problems and as the battery ages the voltage stays in the TTL operating voltage range for a long time.

As we did last month, fig. 2 is a pictorial diagram for those who need it and a list of components is also presented at the end of the column. As you can see this project is really quite simple and again there is really no excuse for not building it. You will have to do some soldering but not very much and all components are large enough to easily handle, even by the novice.

You should build the circuit in a metal mini-box (with the battery) available at RadioShack and other similar outlets. As with the case of last month's field strength meter you should also add a low cost whip antenna (insulated from the housing through a rubber grommet) to adjust the output level. When using such a signal generator keep in mind that it is also a low power transmitter. Always be sure to use only the lowest output you can (shortest antenna length) to obtain reasonable readings and do not leave it running for any longer than necessary either.

When you build this device there are a couple of uses that should be of interest, even to the non-technical amateur. The first is obviously is as a check of frequency. The chart below shows the various harmonic frequencies that are present. As you tune your receiver from band to band you should be able to find the signal at the proper point. Since color-burst crystals are fairly accurate the harmonics you detect should give you a very good idea of the state of calibration of your receiver.

Band	Frequency 3.58 MHz	
80 meters		
40 meters	7.16 MHz	
20 meters	14.32 MHz	
10 meters	28.64 MHz	

Another application, and one that we mentioned more than 15 years ago in our November 1996 column, is to find out how directional your antenna system is. To do this you would place the signal generator a wavelength or more away from your antenna and adjust the output of the unit by adjusting how much of the whip antenna protrudes out of the case. Set the output to get a mid scale reading on the S meter of your receiver. Now move the

*c/o CQ magazine

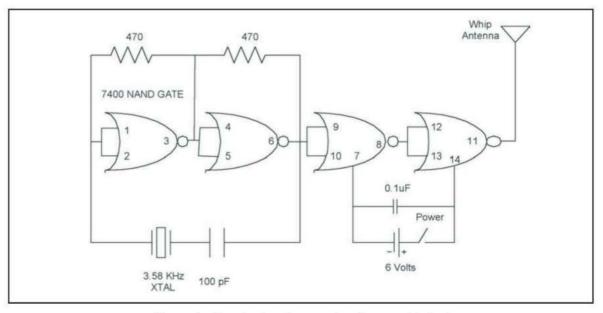


Figure 1- Simple signal generator discussed in text.

generator in a circular path around the antenna every 45 degrees from your original point. Try to keep the distance from the antenna as constant as possible for best results. Take a reading of the signal strength at each point (which is why we used a larger battery—for longer life) and plot them on a sheet of polar graph paper. The results will resemble fig. 3. Since an antenna is a symmetrical device, whatever is

Whip Antenna

Whip Antenna

1N4002

1V GV Lantern Battery

14 7400 NAND Gate
(top view) 7

Fig. 2- Pictorial parts layout of fig. 1.

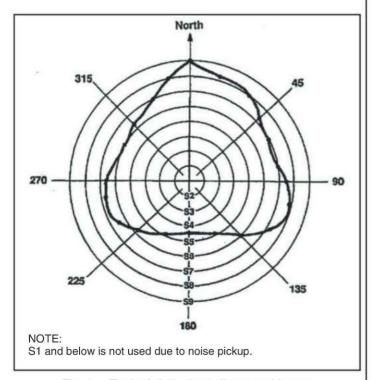


Fig. 3— Typical data chart discussed in text.

received is a pretty good approximation of what will be transmitted (by the same antenna). If you have a beam antenna the job is even easier. In this case you only need to keep the signal generator at a fixed point and rotate the antenna in 45 degree steps. When doing this test do not change bands. The fundamental output at 3.58 MHz is fixed but at the second, third and fourth harmonics however the output levels will be different.

In conclusion, once again, I want to wish all of you a very Happy New Year and hope that all of your hopes and dreams really do come true in 2013.

73, Irwin, WA2NDM

Components for test oscillator

- 1 6 volt Lantern Battery (Local Hardware Store)
- 1 0.1 µF ceramic capacitor (Mouser 80-C350C104J1G)
- 1 100 pF ceramic capacitor (Mouser 80-C322C101J1G)
- 2 470 ohm 1/4- watt resistors (Mouser 30BJ250-470)
- 1 3.58 MHz Color Burst Crystal (Mouser 744-MP036S)
- 1 7400 Quad NAND Gate IC (Mouser 512-74AC00PC)
- 1 1N4002 silicon diode (Mouser 512-1N4002)
- 1 Toggle Switch (Mouser 612-100-A1421)
- 1 Whip Antenna (RadioShack 270-1405)
- 1 Aluminum housing (RadioShack 270-238)

Rubber grommet, solder and wires (misc.)

Note that these sources are only suggestions. You can save quite a bit if you simply shop around on the internet. That is a standard "feature" of home brewing.



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By Any Name, Sandy Tested Our EmComm Mettle

Part I: Amateur Radio's Role in Southern New Jersey and Massachusetts

housands of radio amateurs up and down the U.S. eastern seaboard underlined the critical and robust role amateur radio plays in emergency communications last October when Sandy—variously referred to as tropical storm, hurricane, Superstorm, Frankenstorm, and post tropical storm—reminded us of how deadly serious our EmComm responsibilities are. At press time, we're in the midst of gathering reports from more than a dozen states that felt Sandy's wrath.

In this first of two parts, CQ's "Public Service" begins with a focus on the herculean efforts of radio amateurs in the ARRL Southern New Jersey (SNJ) section, many just a geographic stone's throw from Hurricane Sandy's landfall at Point Pleasant Beach, south of Atlantic City (photo A). Much like Sandy, we then move north to eastern and western Massachusetts, where the actions of EmComm operators in the face of remarkable damage were no less heroic. Next month we'll wrap up with reports from other regions.

*1940 Wetherly Way, Riverside, CA 92506 e-mail: <ki6sn@cq-amateur-radio.com>



Photo A— The Weather Channel chronicled Hurricane Sandy's damage where the storm made U.S. landfall, Point Pleasant, New Jersey. Watch the video at http://bit.ly/SozIRW. (Internet screen grab)

Southern New Jersey: "We Fight the Way We Plan"

"While the recovery will take a long time, the communications emergency is ending in the nine counties of the SNJ Section," Assistant Section Manager Gary Wilson, K2GW, said in early November, fully a week after Hurricane Sandy ravaged the state. "Commercial communications systems are being restored in most parts of the SNJ section. Amateur radio emergency operations continue in Ocean and Atlantic counties under the direction of their emergency coordinators (ECs)." It had been a harrowing and challenging time for the SNJ section's EmComm volunteers. K2GW reported radio amateurs were called upon for:

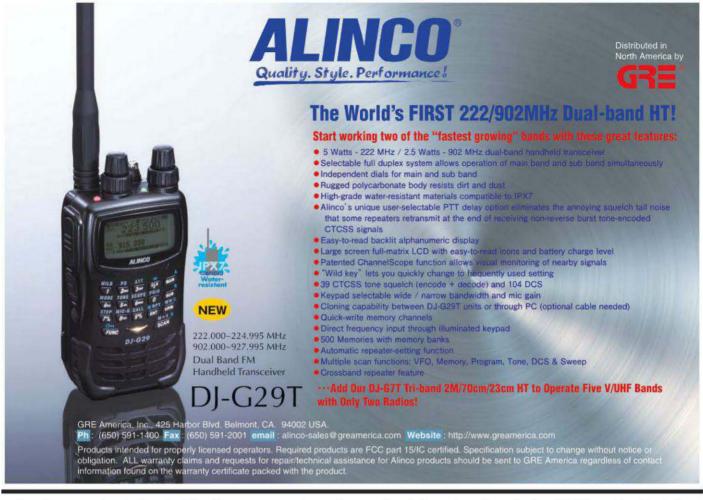
- Weather spotting and reporting via SKY-WARN® http://www.SKYWARN.org
- Communications assistance at emergency evacuation shelters
- Support of the American Red Cross http://www.RedCross.org
- Office of Emergency Management (OEM) support
- · Damage assessment reporting

More than two-hundred amateurs held down communications posts in SNJ during Sandy's onslaught. They spanned across 2-meter and 222-MHz FM, APRS messaging networks, and high-frequency single-sideband phone.

"Each county runs its own emergency net," Wilson noted, "linked at the higher level by the SNJ ARES® (Amateur Radio Emergency Service) Resource Net and New Jersey State RACES® (Radio Amateur Civil Emergency Service) Net, mostly on the NJ2EM 220 repeater."

K2GW said one of the reasons New Jersey is "a little better prepared than other states (in EmComm) is that the New Jersey Office of Emergency Management won't approve a county emergency management plan unless it includes a RACES® annex. As a result, every county Emergency Operations Center (EOC) has permanent amateur radio capability on 2-meter simplex, a 222-MHz radio aimed at the NJ2EM 222-MHz repeater (covering the entire state), 2-meter APRS for text messaging, and 75-meter SSB. These are tested once each month on statewide nets."

Each Red Cross chapter tests its 2-meter capability monthly with the central Red Cross station at N2ARC in Princeton, as well, which then links to the State EOC in West Trenton. Each county has



a 2-meter repeater designated for its own work at the county level.

"We fight the way we plan and practice every month," Wilson said. "That's why the state and county OEMs pay for permanent amateur radio stations in every county EOC and most Red Cross chapters."

At this writing, Wilson said, "John Zruba, K2ZA, SNJ Section Emergency

Coordinator (SEC) and Incident Commander, was running a Section Re source Net on the SNJ ARES® repeater at 7 a.m., 1 p.m., and 7 p.m. each day to provide support to the county ECs. He



Photo B– Casino Pier at Seaside Heights in New Jersey's Ocean County, is a soggy mess in the aftermath of Hurricane Sandy. (Courtesy of Wikimedia Commons)

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Photo C– Eastern Massachusetts ARES® activated its amateur radio command center in the Clay Center Observatory at the Dexter-Southfield School in Brookline. (Courtesy of Marek Kozubal, KB1NCG)

was coordinating requests for sending about six relief operators each to Atlantic and Ocean counties," (See photo B.)

K2ZA was "in contact with Eastern Pennsylvania, Northern New Jersey, and Western Massachusetts sections about their eventually providing relief operators as well."

Ocean County EC (Emergency Coordinator) Bob Murdock, WX2NJ, reported that in Sandy's aftermath six emergency shelters were being consolidated into one and that communications needs could be managed by Ocean County ARES® members. (NOTE: WX2NJ reported he believed "the one last shelter might remain operational for about a week. The ARRL HamAid VHF radios are working great there."—K2GW)

"The Atlantic County EC reported the need for six relief operators to give his operators a needed rest," Wilson said. "Both shoreline counties will continue to determine their long-term amateur radio needs daily, based on Red Cross sheltering plans, and the state of commercial communication restoration."

"Thanks go out to all of the ARES®/RACES® operators in the SNJ Section who showed that planning, regular monthly tests, and dedication pay off when it comes to helping their fellow citizens in a communication emergency," Wilson said. "When all else fails, there's amateur radio."

Eastern and Western Massachusetts: No Lull Before the Storm

By Rob Macedo, KD1CY ARRL Eastern Massachusetts Section Emergency Coordinator

The level of EmComm support required during a monster weather system such as Sandy doesn't just magically happen. There was certainly *no lull before the storm.*

Eastern and Western Massachusetts ARES® started preparatory conference calls for Hurricane Sandy on Thursday October 25, as the threat from this behemoth became significant.

Western Massachusetts Section Emergency Coordinator (SEC) John Ruggiero, N2YHK, joined conference calls held by Eastern Massachusetts ARES® with planning for activation for both the response and recovery phases began.

Eastern Massachusetts ARES® (http://ares.ema.arrl.org/) was put on standby Friday evening, October 26, to identify radio amateurs who would be deployed to various Emergency Operations Centers and shelters. Western Massachusetts ARES® (http://wma.



Photo D- Sandy's storm surge soon took over the observation area on Long Wharf in Boston (http://bit.ly/VO7rFu). (Courtesy of Nick Snow, KB1YMY)

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arrl.org/) went on standby Saturday evening, October 27.

Eastern Massachusetts ARES® activated its amateur radio command centers at the Acushnet Emergency Management Agency in Acushnet and the Clay Center Observatory, co-located at the Dexter-Southfield School in Brookline (photo C). This assured the section would stay connected if widespread 2-meter repeater outages occurred. It was clear Sandy's impact would be significant (photo D).

The city of Boston Emergency Operations Center (EOC) requested amateur radio support, as did the Red Cross for several regional shelters within the Eastern Massachusetts section.

Cape Cod ARES® supported several regional shelters, had radio amateurs at several area hospitals, and ran net control for its district net out of the American Red Cross Chapter in Hyannis under the callsign K1PBO.

The Massachusetts Emergency Management Agency (MEMA) Region Two office in Bridgewater was active as WC1MAB (http://www.WC1MAB.org) through the efforts of Region Two RACES® Radio Officer Mike "Sparky" Leger, N1YLQ, and John Miller, N1UMJ.

WX1BOX, the SKYWARN® amateur

radio station at the National Weather Service office in Taunton (http://www. WX1BOX.org) was active for a 22-hour period from 3:30 a.m. Monday through 1:30 a.m. Tuesday. As Eastern Massachusetts ARES® SEC, I staffed the (WX1BOX) station along with Assistant SEC Carl Aveni, N1FY.

In Western Massachusetts, N2YHK reported that several Red Cross shelters were open in his section. One in Northampton was staffed with a radio amateur. Operators were not requested for others.

The Worcester Emergency Communications Team (WECT) established a resource net and supported SKY-WARN® operations with damage reports across Worcester County. Tim Mongeau, KB1LZF, provided updates from portions of Worcester County for the duration of Sandy's impact on the region.

Eastern Massachusetts ARES® remained on standby for several days after Superstorm Sandy's impact on the region in case a Mutual Aid Team (ARESMAT) was required. Coordination with the SECs of Connecticut, New Jersey, and New York City/Long Island continued in case needs arose.

By the end of the week most Eastern

Massachusetts ARES® teams stood down. The standby was lifted at midday Saturday. It is estimated that more than one-hundred radio amateurs participated in operations in Eastern Massachusetts, with a similar number in the Western Massachusetts section—particularly when factoring in those who gave SKYWARN® reports during Sandy's onslaught.

WX1BOX handled several hundred reports of wind damage. The dispatches included reports of structural damage in some areas, as well as many trees and wires down (photo E). The station also gathered wind and rainfall measurements, as well as storm surge and urban flooding reports from heavy rainfall.

This utilized more than a dozen local area VHF/UHF repeaters with liaisons, as well as the New England Echolink/IRLP Reflector system—IRLP 9123/

Echolink conference *NEW_ENG* node: 9123—which was combined and linked with the VoIP Hurricane Net IRLP 9219/Echolink conference WX_TALK* Node: 7203 system. This created one large hurricane net covering from the Delaware-Maryland-Virginia region into New Jersey, New York, and New England.

The amateur radio station at the

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Photo E– High winds toppled a tree onto a mobile home in Holbrook, southeast of Boston. (Photo courtesy of Rick Reuss, KA1LKB)

National Hurricane Center, WX4NHC, was linked into this network, as well. The damage and meteorological information was shared with other agencies such as the Red Cross, local and state emergency management, and the media to provide up-to-the-minute updates during Sandy's march across the region. This has become a very critical role for

amateur radio and is viewed as equally important to providing communications when all else fails.

At the height of the storm, many wind gusts exceeding hurricane force (74 mph) were recorded across southeastern New England, and as high as 70 mph in the interior of southern New England.

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HATARDS AFFECTING LAND

onal Weather Service

Photo F- Vital storm information provided to WX1BOX and relayed to the the NHC's WX4NHC, appeared in a National Weather Service Advisory October 29. (Internet screen grab)

Sustained winds of 64 mph, with a gust to 86 from the western region of Rhode Island, were reported to WX1BOX and relayed to WX4HNC. Cape Cod ARES® District Emergency Coordinator (DEC) Frank O'Laughlin, WQ1O, reported a gust of 76 mph in the Marstons Mills section of Barnstable, which was also relayed to the NHC.

These bits of vital information appeared in a NHC Advisory issued at 5 p.m. on Monday, October 29. (See photo F.)

Power outage statistics were staggering across the region:

- 386,000 in Massachusetts
- · 122,000 in Rhode Island
- · 630,000 in Connecticut

More than 1.1-million people were powerless in southern New England at Sandy's height. The region's power statistics paled, however, when compared to those from New York City, Long Island, and New Jersey, where more than three



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million were affected for a significantly longer period of time.

Flooding from Sandy's storm surge in southern New England was heaviest from the Westport, Massachusetts area westward through southern Connecticut, where damage was worse than that left in the wake of Hurricane Irene in August 2011.

In southern Rhode Island, stormsurge flooding was the worst since Hurricane Bob in 1991. Beach erosion left sand as deep as four feet, covering nearby roads. In Charlestown, Rhode Island, homes sustained major damage in the surge and in some cases were knocked off their foundation.

South coastal areas were restricted to residents-only and required a pass to get in. But amateur radio operators, embedded with local Emergency Management and Public Safety officials, provided reports and photographs of structural damage and storm surge when their responsibilities for the NWS Taunton SKYWARN® program had ended.

While most of Sandy's impact had faded by early Tuesday morning, a line of rogue thunderstorms associated with *Post Tropical Storm Sandy* affected portions of the ARRL's Eastern Massachusetts section that evening.

A microburst with wind speeds as high as 90 mph was recorded in the Wareham-Onset area, downing 100 trees and capsizing and knocking over boats at Point Independence in Wareham and at the Onset Bay Marina.

Scattered trees and wires were down in Plymouth and Kingston, and all the way up into Lynn, north of the metro Boston area.

One-inch diameter hail was observed in Melrose, along with flash flooding of many streets from the New Bedford-Wareham area to the metro Boston area.

SKYWARN® self-activated on several local area repeaters as the line of rogue storms passed through with reports sent to NWS-Taunton. A complete listing of reports can be seen at the WX1BOX web site in *Post-Hurricane Sandy Coordination Messages* posted there: http://www.WX1BOX.org.

Overall, this was another excellent operation for a significant weather-related event and the second hurricane to affect southern New England in two years, although the full force of the hurricane was felt just to the south.

Hopefully, this will drive further preparedness into the amateur radio community and into the agencies across Massachusetts.—Rob Macedo, KD1CY

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Going to Extremes

s this is being written, we are in the immediate aftermath of Hurricane Sandy. Due to the lead time needed in magazine publishing, you now know things I do not know as this piece is being composed.

What is known is that Sandy brought yet another large-scale emergency that affected millions. In addition to lost lives, many injuries, catastrophic property losses, massive power outages, and a disruption to the economy, once again the vulnerability of our communications networks made its presence known during an emergency.

In just the last year, the USA has experienced drought, flooding, severe storms, an East Coast earthquake, extensive wildfires in the west, and more. Politics aside, the "new normal" seems to find more severe events occurring and fewer responders in position to render assistance. Of course, more folks are impacted because our national population is now over 311 million and growing. The other reality is that many state and local governments are financially strapped, and some have even gone bankrupt. The upshot is they are not likely to be adding to their portfolios of emer-

*5904 Lake Lindero Drive, Agoura Hills, CA 91301 e-mail: <aa6jr@cq-amateur-radio.com> gency responders. Some are simply struggling to maintain basic coverage.

Our Dependence

Let's face it: As a society we're "hooked" on a substance and the habit is hard to kick. That item is one of the smallest known, but like David facing Goliath, sometimes the smallest item carries a big impact. I'm referring to the lowly electron, incredibly tiny, yet it makes much of our modern lifestyle possible. From the macroeconomics of the stock exchanges to the light bulb on your nightstand, and seemingly everything in between, we depend on electrons moving about on some mission to serve us. When they stop moving, as in power outages, we begin to get an idea of how dependent we really are.

With Hurricane Sandy, we again learned the cellphone system is vulnerable to disruption from damaged or powerless cell sites to individual phones that were unable to be recharged. However, that should come as no surprise, because time and again the cell network and its infrastructure has shown itself to be fragile due to causes ranging from simple demand through power failures and physical damage caused by storms or accidents. Following Hurricane Isaac earlier in 2012, New Orleans and surrounding areas again experienced



Like this portion of the historic boardwalk in Atlantic City, New Jersey, many cell phone sites were destroyed by the fierce winds of Hurricane Sandy. Amateur radio remains one form of communications that works "when all else fails." (Photo by Liz Roll/FEMA)

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cell phone and public safety communication outages even after building more robust systems following the Katrina disaster only a few years earlier, and thankfully, while still serious, Isaac was a much smaller event.

If you need an additional measure as to our dependency, take a look at the cell phone charging stations at airports, coffee shops, and other public places. They're always busy. One of the many compelling photos in New York City following Hurricane Sandy showed a location with daisy-chained power strips being used to recharge hungry cell phones. Each device represented a user eager to communicate with loved ones or simply obtain updates on how quickly conditions might improve.

It isn't just cell phone systems that are fragile. Across the country, communities large and small are converting to digital radio systems that are dependent upon linked repeaters, often encrypted transmissions and seemingly vulnerable to their increasing layers of complexity and proprietary components. Contrast that with ham radio, which is still largely analog, using simple freestanding repeaters to serve a given area, equipment dispersed over wide areas (owned by individual operators), and robust. When the chips are down, it's often found that simpler is better. I'm also baffled at the notion that some public safety agencies keep a stockpile of cell phones to use as part of their contingency plans.

What's the Mission?

As ham radio operators, our DNA seems to be encoded with the willingness to use our skills and equipment to benefit others. The immediate protection of life and property top the list, followed by general health-and-welfare traffic. So far, so good.

However, in trying to accomplish those missions, whom do we communicate with? Unless you can answer that question, all the equipment in the world is of little use. That's where a structured response comes into play. To be sure, many emergency-preparedness organizations have established robust links with the ham community. The Red Cross and Salvation Army are among them. ARES, RACES, and SKYWARN groups are found in many areas, but sadly, many regions are not as wellserved. Time and again over the last year, several of these well-trained units have proven their value. What is also evident is that structure and practice are the keys to having ham radio operators poised as an effective backup system for stationary communication systems

that are subject to fail. From supporting your local first-responders up through links to FEMA, there's a role to be filled and a job to be done.

I Want You!

The stern face of Uncle Sam pointing at you from a recruitment poster encouraged countless numbers of recruits to step forward in defense of the nation. He is calling again, only this time, he seeks your communication skills, equipment, and common sense to provide a strong network of trained operators to face future emergencies. We know they will happen; we just don't know where or when. By joining a communications response organization, you add strength to the system. On one hand, you may never be called. On the other hand, yours could be the radio that helps save a life, protect property, or bring comfort to just one person.

Don't rely on old skills and training or past relationships as your cushion against taking action today. Over the last few years a lot has changed in emergency management. Every new event is a learning experience, and those lessons are quickly incorporated into the operating structure. There's a lot to learn and importantly, new relationships to be established. It's far better to get to know the folks at your supported agency well in advance of an emergency. Through training and drills, capabilities are on display and trust is established.

But Wait, There's More

Perhaps it was a coincidence, but as Sandy raged, I received an e-mail from a group seeking to find a class that would help several people obtain training for the Technician exam. The appeal of emergency communications is a strong recruiting tool for bringing new people into realm of licensed operators. Too often, though, we lose track of them once they're licensed. There's no substitute for a good ham-to-ham support network that engages in teaching and communicating both on and off the air. If you have a local club that can support these objectives, great; if not, it only takes two persons to form a club that can devote its energy toward the goals we speak of in this article.

Here's hoping 2013 brings the nation a needed respite or at least a reduction from the many disasters we've faced over the last few years. Nevertheless, your ability is a great way to respond through being prepared—24/7/365—ready to put a little "Magic In the Sky."

73, Jeff, AA6JR



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the ham notebook

Social Media, Ham Radio, and a Generation Gap

t's official. I am an "old man." Besides getting a seemingly continuous stream of junk mail from the AARP (formerly the American Association of Retired Persons), now teens and pre-teens refer to me as "some old guy." This really hit me while waiting in the check-out line at the hardware store. I overheard a group of young kids behind me talking about online bill-paying and self-checkout, and one of them said something like, "Have you noticed that people over 30 are too old to pay bills online and always have trouble in the self-checkout line?"

I wasn't sure who he was talking to, since most of his group was busy punching keys on their cell phones and laughing at something, and the others were staring at something else at the other end of the store.

I almost turned around to give this kid a piece of my mind, but decided to just grit my teeth and say nothing. I realized that I have become an old man and made a mental note about yet another difference between the generations today.

That same week I came across an article mentioning social media in the online radio communications magazine Urgent Communications. The article is called "Embrace Social Media—But Don't Try to Control It." It includes some useful tips for emergency response communicators and how to take advantage of the power of social media to help spread information to the community.

Reading the article made me think about ham radio and social media. Ham radio and social media have a lot in common. Both are global in scope. Ham radio and social media are ways to communicate to others immediately under most circumstances. Most of the time, such communications are not private, but public.

Another thought for the day: Regardless of how you feel about social media, it is here to stay. Like cell phones and smart phones, I tried to avoid adopting them, but failed to resist. Take a look at two videos made by Erik Qualman on his Socialnomics website: "Technology Will Kill," and "Is Social Media a Fad?" The URL is listed in the References section.

New and Old Crash in the Same Space

Many people think social media is something new and different, but as hams, we should consider ourselves among the first users of social media. After all, isn't ham radio all about connecting with strangers as well as friends and family on an international scale?

Speaking of new versus old, here is a chance for us old dudes to teach the younger generation a thing or two. If you are a CW operator or traffichandler, you already know how to shorten messages to increase efficiency and accuracy. Have you brought this practice to text messaging, email, or Twitter on your smart phone or other communication appliance?

For non-CW operators, I am talking about using ham radio abbreviations and prosigns in text messages and other social-media venues. Many of these radio abbreviations go back to the telegraph days in the 18th and 19th centuries. I think it would be very interesting if we added ham radio abbreviations into the newest social-media communications. The concept of using the same phrase as a question and as an answer (Q-signals) is particularly intriguing. By the same token, wouldn't it be interesting if Twitter and other text users started to adopt "our" abbreviations?

Space does not allow me to include a table of abbreviations for hams and Twitter users, but take a look at the abbreviations lists mentioned in the References section and compare them. On Twitter, abbreviations are mandatory; the maxi-



Photo 1– In an effort to expand ham radio awareness into non-ham radio venues, my small group entered a display called "Not Your Grandpa's Ham Radio" at the Bay Area Maker Faire last year. This narrowband 10-GHz system certainly wasn't something hams used in my grandpa's day.

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mum character count on a "tweet" is 140 or less. I am not an extensive Twitter user, but there is a great online publication called "The Simple Twitter Book," by Brent Ozar. Go to Brent's website and download a free copy if you are interested in this new and fast text communication media many kids are using these days.

Expanding Our Universe

How do we leverage social media to help improve and grow interest in ham radio?

Let's take YouTube for this example. Before YouTube, there was television. However, unlike TV, YouTube enables just about anyone in the world with a video camera, a computer, and an internet connection to become an actor, producer, director, promoter, and cameraman. Anyone can become an instant celebrity-sometimes accidently-and even make money in the process of havina fun.

This is the core difference between traditional broadcast content and YouTube: The majority of the people making and posting YouTube videos are doing this for fun. There is a certain air of dedication and a different attitude (let's call this passion) when people do

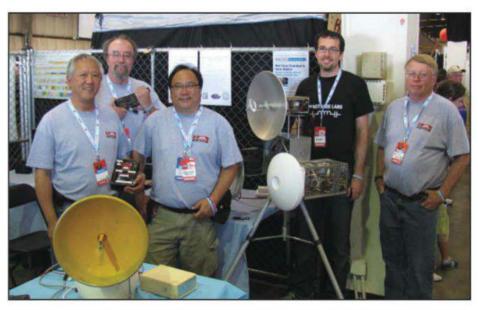


Photo 2- The Bay Area Maker Faire 2012 team, left to right: Brian Yee, W6BY; Dennis Kidder, W6DQ; Wayne Yoshida, KH6WZ; Tony Long, KC6QHP; and Mike Lavelle K6ML.

things on their own time and without remuneration.

If you have not discovered Jeri Ellsworth by now, go to YouTube and search for her. She is a YouTube star, making electronics-related videos of all kinds, and she has thousands of followers. Although she is not a ham, several of us are encouraging her to become one.

In a related vein, Make: magazine has a ham radio columnist who also posts on YouTube and other social media outlets. Diana Eng. KC2UHB, is a New York area YL who is also a fashion designer. She incorporates electronics

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or some technology aspect into her clothing and other items. Diana is a great example of a young 21st century artist—and radio ham.

By making and posting videos and creating content for their blogs and other social media venues, ham radio can get a positive publicity boost beyond our network of ham radio people, a great recruitment and teaching tool. And best of all, the content is free.

Along the same lines, last year I headed a small team of hams and displayed at the Bay Area Maker Faire (San Mateo, CA, in the Silicon Valley). The theme was "Not Your Grandpa's Ham Radio" and was dedicated to show creative and technically minded people what hams are doing today. Our 20-foot display space was filled with our latest microwave frequency projects, an APRS demonstration, ham radio microprocessor-control projects, and other things that did not exist in my grandpa's day (see photo 1).

Although we did this totally for the fun of just doing it, we managed to have some impact on the local college crowd—both students and faculty—to gain an interest in ham radio. Just like the Star Trek Original Series episode

"Space Seed," I was not sure what I started when I combined ham radio with the Maker movement. So far, it is all good.

It's a Generation Thing

The younger generation seems to be much more "open" than many of us older folks. For example, I heard about a dating function on FaceBook, in which all of your friends can follow your comments to and from your guy or girl-friends. Talk about an open network, where is the privacy aspect of dating someone these days?

One thing we should keep in mind when talking on the radio or texting or tweeting a message is that the information is not only public, but it is also global and instantaneous. Remember, depending on the settings (or, quite often, the default settings) on your application, that everyone can see what you are saying and your messages are spread around the globe instantaneously.

Personal security should be a concern to you and your family when communicating via either social media or ham radio. When I was growing up and on the ham bands, my radio tutor would always remind me to talk about things after they happened, rather than talking about things before they happened. For example, since hams can be found by doing simple search on a callsign, you really should not talk about your three-week vacation overseas before you leave, especially after you mentioned that new computer system or big screen TV you just purchased. Instead, wait until you come home and talk about the fun times and the things you did after the event.

A Useful, but Double-Edged Tool

As an "old guy," I am just starting to use social media, but only as time allows. My new day job and new projects are filling my free time, and I actually would rather do something with real things and real people, rather than writing and documenting these events on my comput-

er. However, I must confess that I believe this self-promotion is mandatory and should be part of everyone's lifestyle today.

My recent bout of unemployment forced me to use social media to uncover job opportunities, perform company research, and get connected to new friends and colleagues. At first I was very concerned about the lack of privacy and feared identity theft. However, as my job search continued without success, I had to do something different. I needed to try some new things, because my previous strategies did not work. Social media (and LinkedIn in particular) became one of my most fruitful job search tools.

As they say about today's job market, it is no longer what you know. It is no longer who you know. It is who knows you. Leveraging the power of social media is the only way to make this happen.

Summary

I hope this article has inspired you to at least become aware of social media and how it is used. It is another way of communicating and can supplement what we do on the ham bands. It can be a way to reach beyond our network of ham friends and also connect with younger, equally interesting people—and possibly recruit them onto the ham bands.

If you have kids who are active on social media, you may want to monitor their online activities, since they may not know the impact of what they are doing even while engaging in casual "conversation" with their groups and friends.

I am just starting my venture into social media (LinkedIn, WordPress, YouTube), so if you run into me, I would be glad to connect with you. Also don't forget to "like" CQ magazine on FaceBook and join the CQ Group on LinkedIn!

TNX es 73 and BCNU . . . Wayne, KH6WZ

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Reader Feedback

In Defense of W2OY and Other Curmudgeons

BY JANIS CARSON,* AB2RA

n the September 2012 CQ magazine, the "Zero Bias" editorial mentions Mike Premus, W2OY. I am writing in his defense. I have been active as a ham in central New York since 1959, and did a lot of listening and CW because I did not have effective antennas downtown. I became interested in pursuing a career in electronics as a result of Sputnik and ham radio, so I was a space cadet like a lot of young people at the time. I had a wonderful opportunity to spend part of my career working on satellites later on.

Mike really was not a totally bad guy. The technical excellence of his station set an example for good engineering. He did speak out for proper operating practices and against such things as "phony phonetics"—not sticking to proper word lists on phone. But he was never boring. Maybe he did not do it in the most persuasive way. You cannot say that about many stations you can listen to on 75 meters after dark these days. Squabbles over rights to a frequency detract from the impression outsiders have of the hobby. In those days, SSB was relegated to the upper few kc of the 75-meter band, AM and CW were pervasive, and the "frequency wars" happened on the boundaries. In these squabbles you had your real "lids."

AM often attracts attention because it is so accessible to SWLs. The contemporary AM community has iconic members such as WA1HLR, W2VJZ, and W8VYZ, whose voices are also preserved in audio clips on the internet. Each, like Mike, contributed to the colorful history of the hobby. Some, such as Tim (HLR), have contributed to the preservation and operation of vintage equipment. Others have tweaked less than perfect solid-state gear to reasonable performance. People who have happened on the scene recently have made contributions to the state of the ham radio art by even marketing Class E AM rigs. Wouldn't it be great to see more homebrewing as a result of fresh ideas? Check it out at http://www. classeradio.com/>.

Another well-known ham of that era was Clara, W2RUF, who was active in

*e-mail: <AB2RA@htva.net> web: <wireless-girl.com> the CW traffic nets. I was fortunate to have known her when a friend encouraged me give to the nets a try. A memorial is on the net at http://hamgallery.com/Tribute/W2RUF/w2ruf.pdf. She would not fall into the category of curmudgeons, since her work was more positive in presentation. And contrary to popular opinion, women were active contributors to ham radio in those days.

What I am trying to say is, there is—and always should be—a tension between the past and the future. This is why I am a member of FISTS, but supported the work of No Code International. FISTS does a lot of valuable training and promotes the use of CW. Riley Hollingsworth, K4ZDH, makes a brief reference to this past conflict. Sadly, the work of W5YI (Fred Maia, SK), Bruce Perens, and Guy Matzinger (now W1GUY) on behalf of the hobby through

NCI has almost been forgotten. In this case, the ARRL was the curmudgeon, fighting to the very end the best path to a new resurgence in the hobby. Another legendary icon is Wayne Green, W2NSD, publisher of 73 magazine as well as a number of computer-related journals. His diatribes on the ARRL were a force for positive change and provided a refreshing contrarian take on a number of topics. Ham radio has benefited from all of the voices being heard.

In defense of a curmudgeon, the ARRL has done a lot of good for the hobby such as the WARC bands and protecting our access to the spectrum. It just made a bad call on the Morse testing issue.

We need a W2OY memorial site for good phone operating practice. So let's let W2OY rest in peace. He surely left a mark on the hobby. Good memories, too. 73, Janis, AB2RA

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Becoming a Beginner (and an Expert)

Thank You and 73 to K7SZ

"Learning Curve" editor Rich Arland, K7SZ, has decided that after 10 years of writing various columns for *Popular Communications, CQ VHF*, and *CQ*, it's time to do something else with his free time. So we bid Rich a fond farewell and 73, with our gratitude for a decade of service to our readers. I will be filling in until a new "Learning Curve" editor has been named. — *W2VU*

've got a secret for you ... I've been a ham for more than 40 years, and I'm still a beginner. And so are you. According to our reader surveys, on average, one *CQ* reader in 10 has been licensed

*Editor, CQ

e-mail: <w2vu@cq-amateur-radio.com>

less than five years; and roughly six in 10 have been licensed for more than 25 years. But 100 percent of our readers either are, or can become, beginners at some aspect of amateur radio. In my 40+ years as a ham, I have never met a single amateur who has done absolutely everything the hobby has to offer or who has mastered all of ham radio's different activities and adventures.

Many of us, of course, *are* experts—but in one or two selected areas. If you take a "big gun" in HF contesting and sit him down in front of a satellite station, or a portable microwave setup on some hilltop, chances are he will not intuitively know what to do in order to make contacts. In some cases, he might not even know how to program a VHF/UHF handheld.

What is an expert, anyway? To most of us, anyone who knows more about a subject than we do



Tom Tumino, N2YTF, of the Hall of Science Amateur Radio Club, talks with a young fairgoer at the 2012 World Maker Faire in New York City about home-built low-power ham gear. W2VU's "tuna tin" station is on the table behind the hand key. (W2VU photos)

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Once again, learning to solder was a big hit at the New York Maker Faire. This time, RadioShack® sponsored the activity as part of its return to its roots as a source for builders. We need activities like this at our hamfests, and not just in areas reserved for kids. There were as many adults as children trying their hands with soldering irons here, and at least as many women as men.

is an expert in that subject. If that contesting big gun who's never programmed a handheld before just got one for Christmas, and you-who are perhaps one of our 10 percent of readers licensed less than five years, but have a fair amount of experience in programming handhelds-offer to help, then you are an expert in his eyes. Another ham may be a "tower jockey" who's great at 150 feet, but who knows little about running a wire antenna in an attic. And one of the great things about ham radio is that there's an endless supply of new things to try, to learn about, to fail at, and to reach out to our fellow hams for help in learning to succeed. We are all beginners. But most of us are also experts ... even if we don't realize it.

A Beginner and an Expert

I have spent the past year or so learning about low-power (QRP) operating

"in the field" and slowly putting together a portable HF station with the goal of being able to hike to some remote location, pull a radio, battery, and antenna out of my backpack, and get on the air from "off the grid." I have had (and needed) help at every turn from more experienced QRP/"Trail-Friendly" radio ops.

So far, I've gotten as far as a local park (one contact) and the Hall of Science Amateur Radio Club booth at the 2012 World Maker Faire in New York City, where I set up my kit-built "tuna-tin" station and end-fed halfwave dipole antenna. I made no contacts there but had learned enough about what I was doing to be able to demonstrate the station and talk about its capabilities. In that setting, I was an "expert," because I knew more about it than the average attendee, even though I still consider myself very much a beginner overall. So in this case, I was both a beginner and an expert simultaneously. One other thing ... I had a blast!

(Thank you again to the HOSARC folks for the opportunity to share your booth.)

Become a Beginner

One of the problems ham radio has faced for a very long time is that some people have a tendency to think that whatever it is they do with the hobby and have done for a long time—whether it's DXing, contesting, public service, or operating QRP portable-is what the hobby is all about. And if they start getting tired of what they do, they decide that ham radio is no longer interesting for them. This afflicts newer hams as well as old-timers. Many a new ham who started out on a local repeater and grew bored with it has dropped out rather than seeking out some other aspect of our tremendously diverse hobby.

This is where clubs and magazines are incredibly valuable, because they expose us to the many varied parts of amateur radio. Read about the different

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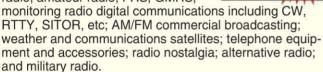
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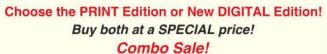
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As usual at a Maker Faire, it wasn't hard to find a fellow ham. Here, Robert Fitzsimons, El2GQB, of the Dublin hacker-space TOG (note the radio antenna in the logo) demonstrates a giant-sized Arduino Uno. Also on hand were the Antique Radio Club of New Jersey (with a program on radio building for the 21st century) and the Brooklyn, New York-based NYC Resistor hackerspace, whose membership includes some of the Maker movement's leading hams.

things people are doing with ham radio, from high-altitude balloon launches to remotely-operated HF stations and so much more; go to club meetings where members and guests talk about the different ways they're using ham radio; discover something new that sounds interesting to you.

Once you've identified that new area of interest, look for books and articles on the topic. The Internet can be a tremendous follow-up resource as well. There are websites and groups for virtually everything that people do with ham radio and they're as close as the nearest search engine. Getting help, getting educated, and making new friends both on and off the air can be just a mouse click away.

So for the new year ... whether you're a new ham or an old-timer looking for a new challenge ... why not become a beginner again and try some new ham radio activity? And remember, once you learn just a little bit more about it than the other folks in your club or on your repeater, then you'll be not only a beginner but an expert as well!

Happy New Year and happy hamming! 73, Rich, W2VU

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The Emtech ZM-2 Tuner Kit

irst, I'd like to wish all of my readers a very Happy New Year. With the coldest time of the year upon us in the Northern Hemisphere, many of us find it is our favorite time to spend inside working on kits. Remember that when it is cold outside, it is important to keep in mind proper ESD procedures to protect your static-sensitive parts when building. When dealing with kit radios, the question often comes up about what antenna tuner to use. After all, having a monster-size kilowatt tuner will suffice, but it is not as desirable as one designed for low-power portable use. A reliable tuner that can handle the wide variety of impedances presented by various types of antennas is important to kit builders, and having a tuner that is a kit is even better!

The Emtech ZM-2 tuner kit meets the requirements of impedance flexibility and portability, as

*7133 Yosemite Drive, Lincoln, NE 68507 e-mail: <k0neb@cq-amateur-radio.com> well as having indication of SWR that is not hard to work with. The ZM-2 will tune all kinds of antennas, including random wires, balanced open-wire feedlines, and coax-fed antennas. It is the proverbial "wet noodle" tuner, but for QRP power levels. The instructions for the ZM-2 are very detailed and suggest winding the two toroids first to get that task out of the way. What is even more interesting is that for those who are adverse to winding toroids, Emtech has an option to buy the kit with the toroids already wound for an extra \$9.25. If you choose to wind them yourself, winding the two toroids is not difficult, as the toroid cores are relatively simple. Just take your time to read the directions and double-check your work each time you add a wire. One of the toroids serves as the coupling transformer to measure SWR, while the other serves to perform impedance-matching duties. The LED SWR indicator in the ZM-2 is taken from the original design by Dan Tayloe, N7VE, which has become popular in many other kits.



Kit contents as packaged. Notice the large toroid and multiple colors of wires.

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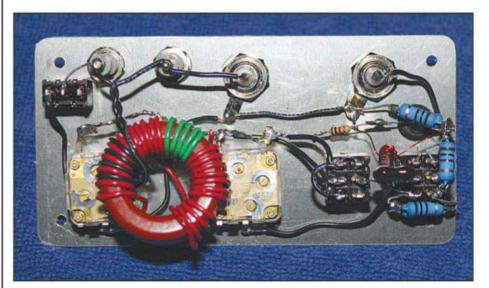




Unlike most antenna tuners, there are no switchable inductors in the ZM-2. There are just the two variable capacitors and a switch that allows you to switch in additional capacitance, if needed on 80 meters. Another switch allows you to tune a random wire instead of a balanced line.

The kit comes with an adhesive decal for the front-panel markings, and a spare decal is provided should you mess things up, like I did, by scratching one of the markings off when installing a switch. The case and front panel come pre-drilled and punched and ready to go. Since there is no PC board in this kit, all of the wiring is point-to-point. After the toroids are wound, you place the decal on the front panel and then mount the components needed on the front panel. The other parts mount to the front-panel components, and you use the extra black wire supplied to make the rest of the connections. These connections do not need to be made in any particular order, but pay close attention to the diagrams to see where each part needs to be to prevent shorts when placing the finished front panel in the case. I simply followed the three supplied diagrams in their order to get the parts mounted and wiring completed. You will spend about an hour winding the two toroids and preparing their leads and a few minutes more preparing the front panel for the label and trimming the label and holes once installed. Be sure to have a sharp X-acto® type hobby knife to work with the label.

The final assembly for me was plac-



Front panel completely wired with the large toroid in place.



The Emtech ZM-2 completed in the supplied case.

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ing the large toroid behind the two tuning capacitors. I recommend that being the last part of the project, as it covers a lot of connections that need to be made. Also, you might find yourself soldering a wire over one already in place as you make your connections. I minimized this by looking ahead at the diagrams to see where the large toroid, as well as other components and wires, was to be placed.

I believe that this kit can be completed by many builders in one evening, but if you take your time, it might take two evenings or a nice afternoon. I recommend taking your time and enjoying the process of building this tuner. Once completed, follow the directions carefully when using this tuner, as it is designed to be used exactly as directed. This includes being careful to turn the link switch to ground when tuning coax-fed antennas and turning it off when tuning a balanced feedline. The tuning is rather sharp, so be careful when turning the knobs, knowing that they interact, so retune each after the other is tuned to get your best match. I got mine into the ballpark by using receiver noise and then followed with the guick tune-up procedure. The best match is indicated when the LED dims or goes out with 5 watts or less signal on the input.

Without a switched inductor, this tuner tunes very quickly and also always presents at least a 2:1 SWR in the tune mode to your transmitter to protect sensitive QRP output stages. Also keep in mind that although a tuner makes your transmitter happy by presenting a correct load to it, you may not be radiating as much RF as you can. Always be sure your antennas are tuned and you have good feedline and a good ground or counterpoise for best results.

The ZM-2 is available from Emtech at http://emtech.steadynet.com for \$65 including shipping in the U.S. and Canada. You have a choice of BNC or SO-239 connectors, and for \$9.25 extra you can have the toroids pre-wound.

Finally, when building a kit, be sure to always keep your parts safe from being disturbed by unwanted visitors, pets, and other hazards. There is nothing worse than coming back to a kit under construction with a cat nearby and finding your parts strewn all over.

If you have any suggestion for currently available kits that should be covered in this column, let me know and I'll look in to them. Enjoy all of the fun winter contests and keep building!

73 de Joe, KØNEB







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New Mini-SSB Rigs and Running Rings Around Your Vertical

appy New Year and I hope you found some new radio toys under the tree to get 2013 off to a good start. We'll get started this month with a couple of new portable SSB transceivers, followed by help for guying vertical antennas, components for builders, an interactive catalog, and a hands-on kit for learning about digital logic.

MFJ Adventure Radios™

MFJ has added two new bands to its Adventure Radios™ line of not-quite-QRP portable single-band HF transceivers. The MFJ-9417 (photo A) gives you 12 watts PEP of single-sideband (SSB) voice on 17 meters (18 MHz) as well as CW capability; and the MFJ-9412 is the 12-meter version, delivering 20 watts PEP on 24 MHz. Both radios feature MFJ's exclusive "ConstantCurrent"™ syllabic speech processing for extra audio punch on transmit, as well as a superhet receiver with a double-balanced mixer and low-noise front end to reduce intermod.

The radios are lightweight and tiny, measuring just 6.5 inches wide by 2.5 inches high and 6 inches deep. However, the receive audio is anything but tiny, with a half-watt of audio delivered through a 3.5-inch speaker mounted on the radios' top side. These little rigs also feature an analog S-meter (which doubles as a speech processing level meter on transmit), analog tuning, and an FET switch to key an external amplifier. If you're not running an amp, then the radios can be powered by a 2-amp AC supply or a 12-volt DC battery. A handheld dynamic microphone is standard, along with a jack for plugging in your favorite key for working CW.

As with everything else from MFJ, the 9417 and 9412 are covered by the company's $NoMatterWhat^{TM}$ one-year limited warranty. List

*1870 Alder Branch Lane, Germantown, TN 38139 e-mail: <wv5j@cq-amateur-radio.com>



Photo A– The MFJ-9417 is one of two new additions to MFJ's Adventure Radio™ line of portable low-power SSB transceivers. It covers the 17-meter band, while the MFJ-9412 operates on 12 meters. (Photo courtesy MFJ Enterprises)

prices for these little transceivers are \$269.95 for the MFJ-9417 and \$289.95 for the MFJ-9412. For more info, visit the MFJ website at <www.mfjenterprises.com>.

DX Engineering Guy Rings

Have you ever wondered how you can securely guy a vertical antenna made from telescoping sections without affecting the antenna's performance? DX Engineering has an answer, with its new set of nonconductive guy rings (photo B) designed for rope guying of most verticals made from aluminum tubing, including DX Engineering, Hustler, and others.

The guy rings are made from glass-reinforced, UV-resistant black poly-resin material that the company says is "virtually impervious to extreme outdoor conditions and mechanical stress." Each ring has holes for up to six guy ropes, with no sharp



Photo B– A set of guy rings from DX Engineering makes it easy to secure vertical antennas made from telescoping aluminum tubing elements. (Photo courtesy of DX Engineering)



Photo C- Installing the DX Engineering guy rings is easy. Simply slide each one over the appropriate-sized element and let it rest on top of the next larger section. (Photo courtesy of DX Engineering)

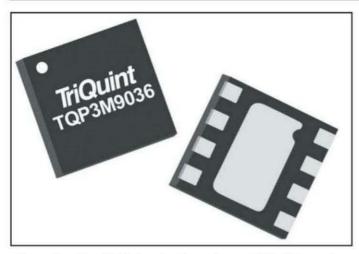


Photo D- The TriQuint Semiconductor TQP3M9036 lownoise amplifier is one of three new products introduced recently by RFMW, Ltd. (Photo courtesy RFMW, Ltd.)

edges to cause catches in the ropes. The set contains five rings, with one each designed to fit 0.75, 1.0, 1.25, 1.50, and 2.0-inch outside diameter (OD) aluminum tubing, so you can use whichever ones are appropriate for the thickness of your antenna. They simply slide over their respective tubing size and seat firmly against the top of the larger section below (photo C). List price is \$7.95 per kit of five rings. For more information, go to <www.dxengineering.com>.

New Components from RFMW

RFMW, Ltd., has added a new transistor, a low-noise amplifier, and an RF switch to its ever-growing line of microwave components. The transistor is the T1G4003532-FL from TriQuint Semiconductor. It operates from DC to 3.5 GHz and puts out up to 37 watts. The FL is a flanged package that can be bolted down. There is also an FS model without the flanges. RFMW says the 3532 is ideal for radars and communications systems requiring high gain and high efficiency.

Also coming from TriQuint is the TQP3M9036 low-noise amplifier (photo D), covering 400–2000 MHz and producing 19 dB of gain with a 0.45-dB noise figure. It requires only bypass/blocking capacitors and a bias inductor for operation—no matching components needed.

Finally, the RFSW1012 switch from RFMD is a single-pole, double-throw (SPDT) RF switch that operates between 5 MHz and 6 GHz and can handle up to 4 watts of RF power (over 500 MHz). Designed to operate in either 50- or 75-ohm environments, the switch has an insertion loss of only 0.3 dB and features 37 dB of isolation.

More information on these products is available at <www.rfmw.com>, or you can contact the company by postal mail at 90 Great Oaks Blvd., #107, San Jose, CA 95119, by phone at (408) 414-1450, or by e-mail at <info@rfmw.com>.

Pastenack Interactive Catalog

Another supplier of RF and microwave products— Pasternack Enterprises, Inc.—has introduced an interactive version of its product catalog. The company says the interactive catalog contains all of the same content as the print version but has added features to make searching and purchasing easier. For example, you can zoom in on a product photo or link directly from a catalog listing to the respective product page on the Pasternack website. Viewers may also move freely back and forth between the catalog and their online shopping cart. Pasternack Marketing Manager Shaun Gameroz tells CQ that the interactive catalog "is proving to be very useful to our growing population of online and mobile customers," and he says it is "simply another helpful tool we are offering our customers." The catalog may be accessed from Pasternack Enterprises' home page at http://www.pasternack.com/ or viewed directly at http://www.pasternack.catalog.com.

LogicBlocks Kit for Computer Education

SparkFun Electronics has introduced the LogicBlocks Kit, designed to help students and beginners learn the basics of digital logic, the basis of digital computing. Understanding digital logic is essential to understanding how circuits and hardware communicate within a computer, according to the company.

SparkFun says the kit includes various blocks—such as Input, AND, OR, and NOT blocks—that snap together to create different strings of logic. Lindsay Levkoff, the company's director of education, says, "The different sequences of the blocks' orientations allow students to actually *see* the logic rather than just having it be a conceptual building block." The kit is priced at \$39.95 and can be ordered from https://www.sparkfun.com/products/11006>. Additional information is available at www.sparkfun.com/LogicBlocks>.

App of the Month

VHF Rovers and other hams who want to know their precise locations and how that translates into the Maidenhead Grid Square system should check out the *HamSquare* app for iPads and iPhones. This free app uses the GPS receiver in your mobile device to pinpoint your location and displays your six-character grid locator (e.g. FN20vs) as well as your latitude and longitude and a margin of error on your screen. It is very handy for VHF contesters, microwave hilltoppers, and others who depend on grid locators for contacts and determining distances covered. HamSquare is available in the iTunes App Store.

Note: Listings in "What's New" are not product reviews and do not constitute a product endorsement by CQ or the column editor. Information in this column is primarily provided by manufacturers/vendors and has not necessarily been independently verified. The purpose of this column is to inform readers about new products in the marketplace. We encourage you to do additional research on products of interest to you.

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The New 40-meter Yagi Adventure



A beautiful view ... and mountains, too! The view across the Rogue River valley from the base of W9KNI's 40-meter tower, showing his second tower supporting a 30-meter Yagi and a Bencher Skylark. (Photos courtesy of the author)

bout five years ago, I put up a 40-meter Yagi at my new QTH in Grants Pass, Oregon. The Yagi had three elements, each about 47 feet or 15 meters long, using high "Q" loading coils. Boom length was about 36 feet, or 8.5 meters. The basis of the design had been developed by W6ANR and had been rendered into reality by my close friend and neighbor Rich, K7ZV. The 40-meter design had been scaled down from Rich's spectacularly successful 80-meter Yagi.

The combination of the antenna and the QTH quickly proved to be very good. Especially in the fall and winter months, Dawn Patrol provided some fascinating DX, both long path and short path. Most of the time, when paths peaked for me, I was hearing the weak DX signals better than anyone else on the West Coast. I did not always win in the pileups; several stations often beat me out. I was running an Amertron AL-1200 with 1500 watts output and being beaten out by one or two "S" units, but the other stations typically had a lot more trouble copying the DX than I did.

However, as one friend put it, the stations beating me out were known to be using final amplifier tubes that had "handles." (Tubes with handles start at 5000 watts plate dissipation and go up from there.). Needless to say, I was well satisfied with the antenna.

Before I go further, let me also describe the site. Grants Pass lies in southwestern Oregon, along the banks of the Rogue River. The river valley is surrounded by mountain peaks, some of our front range going to as high as 4700 feet (1800 meters) above sea level, with taller peaks behind them. The floor of the valley is at about 850 feet (275 meters) above sea level. My home is on the side of a hill coming up from the valley floor, with the home site being about 1400 feet (450 meters) above sea level, and thus about 550 feet (175 meters) above the valley floor. The top of the hill is about another 50 feet (16 meters) higher behind the house, and the tower for the Yagi is on top of the hill. While the mountains surrounding my hill do go much higher, they are six or seven miles (about ten km) away, so they do not trap my signals. While I have no negative horizon, neither do I have significant obstructions.

The tower is a US Tower motorized crank-up, a magnificently engineered and manufactured tower that retracted is about 24 feet (7.5 meters) high and is 89 feet (28 meters) high when fully extended, and capable of holding large antennas such as 40-meter Yagis.

Since the feed line is about 650 feet (200 meters) from the shack, I use ⁷/8-inch (22 mm) cable TV hard line for a feed line. This coax has very low loss at HF frequencies, 72-ohm impedance, and was made up of roll ends obtained from a cable TV operation in California. Homemade splices give me the needed length. Broadband impedance transformers at each end, purchased from Array Solutions, convert the impedance to 50 ohms.

^{*} e-mail: <bob@thelochers.net>

inter finds at the co

DX World Guide by Franz Langner, DJ9ZB

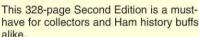
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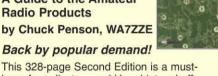
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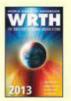
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The only real problem with my antenna was its bandwidth. It was good for about 75 kilohertz, making it almost unusable for SSB. Since 40-meter SSB has become an active DX band, this was becoming something of a handicap.

A New Design

Rich, K7ZV, developed a new design for 40 meters using EZNEC-4. This antenna would use the same style of elements, with the high-Q loading coils, but have a longer boom and an additional element. The primary purpose of this added element was to act as a second driven element, fed out of phase with the other driven element to broaden the bandwidth of the antenna. Further, the boom would be lengthened by about 6 feet (2 meters). The antenna model that Rich developed would offer wide bandwidth and slightly more gain than the existing three-element antenna. We decided to modify my antenna to the new design. Additional materials were procured, and Rich built the new additional element.

Last fall Rich and I took down the 40meter Yagi. We retracted the tower and then lowered the antenna using a rope going through a pulley set on top of the mast. The antenna came down fairly easily.

Events then intervened, though. The weather began to deteriorate, with a

good deal of rain. In the end, it was several weeks before we were able to get the modifications effected and installed.

Finally, during the third week of November the modifications were finished and the antenna was ready to go back up. While the weather was generally not very good for tower work, thanks mainly to a series of rainstorms we finally got a day of fairly clear and dry weather. We set up the antenna at the base of the tower and attached the rope, bringing it down from the pulley to another pulley at the bottom of the tower and away. Rich owns a small tractor, and we set that up to do the actual pulling on the rope. We had a steering harness attached to the antenna. My son Rob. W7GH, helped with the steering.

We started to pull the antenna up. The rope was not running smoothly. At least a part of the problem was that the rope had to run over itself due to the arrangement of the pulley, which could not easily be changed. However, we were confident everything would hold. Nonetheless, Rich, who was driving the tractor and also acting as team leader, cautioned us to be sure we were not immediately under any of the elements, and also cautioned me to stand clear of the rope coming away from the tower.

Slowly the antenna went up, jerking in response to the binding on the rope. At a height of about 20 feet (6 meters),

suddenly the rope broke! In an instant the antenna was on the ground. My glasses had gone flying. I looked around and everyone was OK. Rob had gotten slapped with the tip of an element as it went by but had no personal damage other than a little smarting. Rich was entirely clear. I eventually figured out that my glasses must have been caught by the broken rope as it went by me at a very considerable velocity. I never felt anything, and fortunately my glasses and I were undamaged.

We stood there in shock for several minutes. Frankly, we were very fortunate that there was no injury. One or more of us could easily have been severely injured or killed. Obviously, we were quite dismayed.

After a few minutes of calming ourselves down, we inspected the damage to the antenna. Actually, it was amazingly minor. All four element tips on one side needed replacement, as well as one interior portion of a single element. None of the loading coils were damaged at all, nor were the boom, the mounting hardware, and the feed system. One thing had helped. We had stuck a 4" ×4" $(10 \text{ cm} \times 10 \text{ cm})$ post though the tower to support the boom of the antenna before it went up and that was still in place. The post was aged and weathered and not in the best of condition but served our purpose.



The new 40-meter Yagi where it belongs—high in the air!

When the antenna came down, the boom-to-mast plate struck that post and broke it. The broken part of the post then slammed down to the ground at an angle, forcing the antenna boom away from the tower just a little, but enough that the boom did not strike the concrete base of the tower, and at the same time significantly cushioned the impact of the antenna. In every possible respect we were extremely fortunate.

Needless to say, we were a bit shaken by the turn of events and called a halt to any further antenna work for the day. other than to take an inventory of what pieces of aluminum tubing would be required to replace the damaged pieces.

And then the rains began.

Six days and 3 inches (7.5 cm) of rain later, weather conditions improved, with a dry day and minimal morning fog that was slowly clearing. Rich showed up with some extra aluminum tubing and we began repairs. Two hours later everything was finished. The weather continued to improve. After a break for lunch, Rich and I set out to raise the antenna. Rob was unavailable to help us that day.

Rich in particular had done a lot of thinking on how to set up the raising procedure. He has had a good deal of experience using ropes, blocks, and pulleys. Also, he had a replacement rope that was heavier and stronger, a nylon or Dacron rope with a 9/16-inch diameter (14 mm) and a braided cover, offering more than twice the strength of the original. This time the rope was routed differently using a tree stump on the other side of the tower to hold a block, which both evened the downward pressures on the mast and, more importantly, kept the rope from binding on itself.

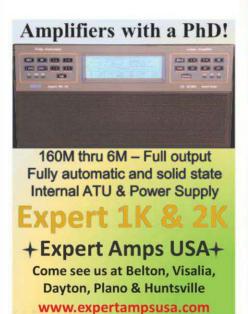
An hour after we had finished lunch, the antenna was on top of the tower.

The rest of the job went very smoothly, although it was a bit time-consuming. Bolts were tightened, boom strut wires were adjusted and then safetied with wire through the turnbuckles, coax was looped, etc., and the job was finished. The ropes were removed, the ladder to the top of the tower was unlashed. and down I came, tired for sure but in very good spirits. We did a partial cleaning of the site, raised the tower—motorized towers are a wonderful inventionand then headed for the shack for that first critical test.

On the Air

First, SWR-outstanding! Less than 1.5:1 across the whole 40-meter band (7.0 to 7.3 MHz). The CQ WW CW contest was on, so I turned the antenna to Europe and listened. I was hearing European signals, but frankly they were not all that good. I called several stations with limited success. My first QSO

with the new antenna was an eastern European, and he was not easy, but he made me feel better. He was 579 here, and I know for a fact that contest stations in his country often use "Tubes







VE Testing On Saturday

Courtesy Talk-In On 146.76

Fox Hunt

with Large Handles." The band sounded a bit strange, and I suspected a bit of a solar issue.

And so it proved to be: A contest wrap-up complained about the poor band conditions on Saturday afternoon, which was right when I was testing the antenna.

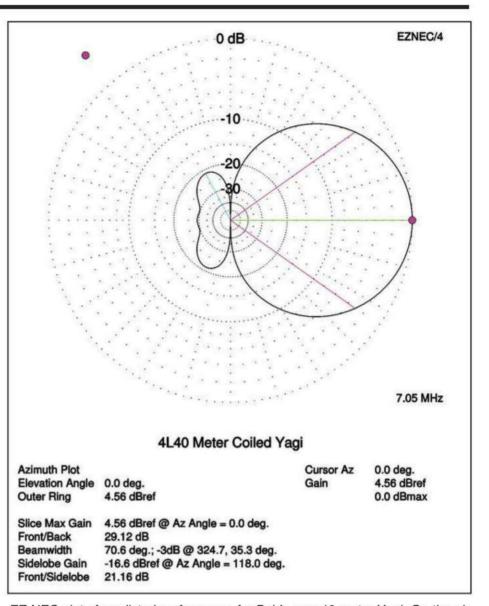
In any case, I am beginning to develop some experience with the antenna. It is still very much "early days" with the Yagi, but my limited experience thus far has entirely validated Rich's design. Front-to-back and front-to-side checks show about 20 dB front-to-back ratio, and about 25 dB front-to-side. Compared with a lot of antennas, these numbers would not seem all that spectacular; however, this antenna was designed to optimize forward gain, not front-toback or front-to-side. Also, significantly, the numbers are very close to the predicted model, which further validates Rich's design.

I have now made some QSOs with the antenna, including excellent long-path QSOs into Europe, as far west as Ireland, with fine strong signals. I had success working 8Q7DV in a big pile-up, and even better, easily worked 5Z4HW in a simplex pile-up. (OK, I admit it; I did move off frequency 200 Hertz.) The antenna is working very well.

The real point of this article, however, is *Safety First*. We were very fortunate indeed that the rope break did not lead to serious injuries. We were being careful up to a point, but frankly we also had a good deal of luck. We could easily have been injured, maimed, or killed.

Post-Incident Analysis

A post-incident analysis: The original rope was a 3/8-inch (or about 10 mm) rope made of some poly material in a three strand configuration. The rope had been stored carefully in a container and not exposed to sunlight when not in use. It had been used successfully before in raising and lowering the earlier 3-element 40-meter Yagi, and had been regularly used with my Yagis for higher bands, none of which, however, weighed more than about 70 pounds (32 kg). At this point, the supplier of the rope was unknown, as was the exact material from which it was fabricated. However, some internet research suggests it had a safe load rating of about 250 pounds (115 kg), at least when new. The exact weight of the new 40-meter Yagi is not known, but my estimate is that it is in the area of 150 pounds (70 kg).



EZ-NEC plot of predicted performance for Bob's new 40-meter Yagi. On-the-air results show the antenna operates very close to the predictions.

Frankly, had I done this research on the rope strength earlier, I am not sure I would ever have used it for the 40-meter Yagi. I can guarantee I never will again! The margin of the safe load was simply too close to the actually load. The jerking of the load caused by the rope having to run over itself undoubtedly caused peaks in the stress load that led to the failure.

Another aspect of rope load safety is confusing. Most rope is rated for tensile strength—the ultimate steady-state load it will carry without breaking. Unfortunately, this number, while important, can be very misleading. It offers no room whatsoever for binding, jerks, or any kind of deterioration. In fact, industry standards derate the tensile strength rating by a factor of better than seven times for a safe load! Therefore,

a rope with a tensile strength of 1,000 pounds is considered to be safe to use for a load of about 135 pounds! To be safe, you should always add an additional safety factor.

It was a very sobering experience, one I know I learned from, and I hope all who read this will gain from it as well. If you are working on a tower project—trust nothing!

However all's well that ends well. To say my thanks to Rich, K7ZV, simply does not do my friend justice. This antenna is his creation. I feel like the pilot of a plane. I know how to fly it well, but it would never have flown at all without the efforts of all the people who built it and those who maintain it. For this project, Rich is all those people.

73, Bob, W9KNI

Marshmallows and Chasing DX

gathered a group of 4-year-old kids. The kids were given a choice between getting one marshmallow immediately or waiting 15 minutes and getting two marshmallows. This was basically a test of the desire for immediate gratification versus the ability to enable delayed gratification for a greater long-term reward. Psychologists now realize that self-control and willpower are interrelated and just part of the series of personality traits that end up determining a person's character.

One learns correct social behavior from some "controlling influence." Parents, teachers, bosses, peers, and the like all are there to tell you when your behavior has strayed beyond the acceptable. What you learn then is that negative behavior has negative consequences. Paraphrasing Aristotle, the only way human beings develop true charac-

ter is through constant practice, until the ethical virtue itself becomes habit. Ultimately, he said people engage in virtuous behavior even if no one is watching.

However, it doesn't always work out that way. Many of us have noticed that peoples' inability to self-regulate their behavior, including the need for immediate gratification, is a major social problem today. We hams are not immune to those same forces.

In a hobby such as ham radio, there really is no similar controlling influence. We rely upon the ability of the other guy to regulate his own behavior. A ham may be a perfect gentleman, courteous and polite, on the job and in social situations, but when he gets in a DXpedition pileup, the self-control he exhibits elsewhere in his life may disappear. He gives into the impulse for the immediate gratification of a contact—right now—regardless of what it takes to get it. That is what adds to the chaos of a pileup.

Unless the DX operator disciplines the pileup through his/her techniques, many of those calling lack the control mechanism that we get from various authority figures in our lives. If you act like a jerk in a pileup, propagation is generally such that the people who know you best, the ones in your local club who might tell you to shape up, can't hear you. They don't know you are being a jerk. The people who *can* hear you being a jerk are one



skip away and they probably don't know you. Thus, bad behavior does not result in negative consequences.

You would think that the characteristics of intelligence and grit required to learn the technical aspects of radio and to get a license should mean that most hams' innate characters would have strong willpower. Why, then, is it that enough hams "fall off the wagon" so as to make pileup behavior a problem?

How Your Behavior is Perceived by Others

It has been noted before that, as a group, hams sometimes tend to be less sensitive to the feelings of others than the overall population. Those who fit that description simply may not have the built-in social mechanisms of seeing their own behavior and understanding, or caring, how that behavior is perceived by others.

Consider this, though: Would you act differently if you knew that your calling in a pileup was being recorded and would be played at your next club meeting? Would the later embarrassment of peer pressure be a motivating factor to change your behavior?

Unfortunately, as much as we would like to think so, rational thinking has relatively little to do with the way humans actually make decisions. Neuroscientists and brain physiologists have learned more about the actual operation of the brain in the last two decades than they did in the last two millennia. No one in Michelangelo's time

^{*}e-mail: <w6sj@arrl.net>

thought that our brains could process millions of small chunks of data every second. On a conscious level, we can't, but on a sub-conscious level, we can.

The rational brain understands that certain operating behaviors are counter-productive. However, it's not in control. Ultimately these subconscious decisions coalesce into habits based upon what behavior has led to success in the past. Sadly, for many, immediate gratification has ruled and has resulted in habits of poor operating practices, just as when it wanted the marshmallow immediately. Even when hams who are guilty of poor behavior read this sentence, they won't think I am talking to or about them. Wrong!

Absent a force such as the ham police to "write tickets" when they see impolite, rude, or inconsiderate behavior, we have to rely upon each individual making decisions for himself. People with a strong sense of honor and self-control can say, "Maybe no one else will ever know what I am doing, but I will." It is that sense of character, of personal integrity, that results in proper operating procedures.

Changing Perceptions

Psychologists have also shown an effective way to change this behavior: Develop a different perception of the norms that govern our behavior. Widespread agreement about what is acceptable behavior can, with time and energy, change

It is the desire to harness that energy that resulted in the DX Code of Conduct based upon encouraging a high standard of ethical behavior. If we all do our jobs right and get

The WPX Program

3333 KENID 3334 MACMA 3332 JO1VRV 3335 JA2FGL SSB ..K6ND ..K5BUD 3186 3202... 3191 .IT9ABN 3203 ..JA2FGL JG400I 3200 3205 KE30 3201 ..WQ5N 3206 JM1LPN Mixed .K6ND ...EA7ZY 2319 2344 .K5BUD 2332 2345 .G3SVQ .K7ULS 2346 JA2FGL 2338 2339 N2WK 2348 .IV3XZG 2340 WO5N 2349 WF2S JM1LPN .W4EY 2350. 2341 .IT9CLU .KG5RJ Digital ...K5BUD 122 EA7ZY 128 JO1VRV 125.WF2S 129....

CW: 400 KB8VCV. 450 JO1VRV. 500 SM2LKW. 600 JA2FGL. 1450 K6ND. 2050 YO9HP. SSB: 500 K5BUD. JM1LPN. 550 IT9CLU. 1050 IT9ABN. 150 JG4OOU. 1500 K6ND. 2200 YO9HP Mixed: 450 IV3XZG. 500 WQ5N, G3SVQ, K7ULS. 550 K4JKB. 600 IT9CLU, JM1LPN. 700 K5BUD. 800 JO1VRV. 900 JA2FGL, KG5RJ. 1150 WF2S. 1850 N2WK. 2200 K6ND. 3000 YO9HP. 3400 K9UQN. 3550 K1BV. Digital: 500 HB9ARI, JO1VRV. 800 WF2S. 1300 YO9HP.

.HB9ARI

160 Meters: K6ND, W4CWA 80 Meters: K6ND 40 Meters: K6ND

30 Meters: K6ND 20 Meters: K6ND, WQ5N, K5BUD 15 Meters: K6ND, K5BUD 12 Meters: Y09HP

10 Meters: K6ND, K5BUD, K7ULS, Y09HP 6 Meters: Y09HP

Asia: K6ND Africa: K6ND

Europe: K6ND, K4JKB, WQ5N, IT9CLU, K5BUD, JE2UFF, WF2S

Oceania: K6ND

North America: K6ND, K5BUD, K7ULS

South America: K6ND

Award of Excellence with 160 Bar: K6ND 30M Bar: K6ND

Award of Excellence Holders: N4MM, W4CRW, K5UR, AWARD OF EXCEINENCE HOODERS, NAMENIN, WALCHW, KSOLH, KEVV, VESXN, DLIMDD, DJTCX, DLSRK, WBASIJ, DLTAA, ON4QX, 9A2AA, OK3EA, OK1MP, NANO, ZL3GO, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VETOP, K9BG, W1CU, G4BUE, N3ED, LU3YLW4, NNAQ, KA3A, VETWJ, VETZIO, NAGO, WANDLE, NANY, EMBOLZ, DEFAD, W1COUL VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC

W3ARK, LA7JO, VK4SS, I8YRK, SMØAJU, N5TV, W6OUL WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FMSWD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, N3XX, IK4GME, VE9RJ, NN1N, HB9AUT, KC6X, N6IBF, W5ODD IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU 15ZJK, IZEOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP OE1EMN, W9IL, I7PXV, S53EO, DF7GK, S57J, E45BM DL1EY, DJ1YH, KUØA, VE2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØFU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, KØKG, DL6ATM, VE9FX, DL2CHN, W2OO, AI6Z, RU3DX, WB9IHH, CT1EEN, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, KT2C, UA9CGL, AE5B, KØDEQ, DKØPM, SV1EOS, UAØFAI, N4GG, UA4RZ, K3QPL, EW1CQ., UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UT9FJ, UT4EK, K9UQN, UR5FEO, LY2MM, N3RC, OH3MKH, RA3CQ, UT3IZI, Z555SI, BUI3ZY, YO9HP, BA3NDK, K8ZT NASCA, UT3IZ, S55SL, RU3ZX, Y09HP, RA3DNC, K8ZT, KE5K, JH8BOE, TF8GX, S58MU, UX1AA, AB1J, DM3FZN, AG4W, UA3QNS, RX3AGD, WB5JID, LY3W, LY5W, RW4WZ, V01CV, DK8MCT, HB9DDO, DL4CW, W9RPM, UA3QNA, RAMAN, AB1J, DM3FZN, RW4WZ, V01CV, DK8MCT, HB9DDO, DL4CW, W9RPM, WASAWA, VANAM, VAN IZ3ENH, DM2DXA, EY8MM, K4HB.

Meter Endorsements: N4MM, W4CRW, K5UR VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8ILC, K9BG, W1CU, G4BUE, LU3YLW4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØD-JZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O FM5WD, SM6CST, I1JQJ, PY2DBU, HIBLC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TOH, N6JV, ONL-4003, W5AWT, N3XX, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, NN1N, W5ODD, IØRIZ, I2MQP, F6HMJ HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP KØIFL, WI3W, INSNUB, SSDA, IKTGPG, AABWU, WJAFF, SSSEO, SSTJ, DL1EY, DJ17H, KUØA, VR2UW, UAØFZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RAØFU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, DA1AAB, HABCU, WKDVILL WGDED, EVGRAN, CYGEOR, CARROLL WGDED, CARROLL CORROLL WB9IHH, G4PWA, OKITED, EUTIT, SSSINJ, DLZAG, RA1AOB, UA9CGL, SM6DHU, KØDEQ, DKØPM, SV1EOS, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UR5FEO, N3RC, UT3IZ RU3ZX, YO9HP, RA3DNC, K8ZT, KESK, JH8BOE, SS8MU, UX1AA, DKSCA, JASKO JA RA3DNC, K8ZT, KE5K, JH8BOE, S58MU, UX1AA, DM3FZN, AG4W, UA3QNS, RX3AGD, LY3W, LY5W, VO1CV, HB9DDO, DL4CW, W9RPM, IZ3ENH, DM2DXA EY8MM, K4HB.

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 con firmed by eQSL.cc. and the ARRL Logbook of The World

*Please Note: The price of the 160, 30, 17, 12, 6, and Digital bars for the Award of Excellence are \$6.50 each

5 Band WAZ

As of November 1, 2012, 892 stations have attained the 200 zone level and 1793 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:

The top contenders for 5 Band WAZ (zones needed, 80 or 40 meters):

K8JRK, 199 (26) UWØLT, 1999 (2 on 40) N4WW, 199 (26) W4LI, 199 (26) K7UR, 199 (34) IK8BQE, 199 (31) JA2IVK, 199 (34 on 40) IK1AOD, 199 (1) VO1FB, 199 (19) KZ4V, 199 (26) W6DN, 199 (17) W3NO, 199 (26) RU3FM, 199 (1) N3UN, 199 (18) W1FZ, 199 (26) SM7BIP, 199 (31) N4NX, 199 (26) EA7GF, 199 (1) JA5IU, 199 (2) RU3DX, 199 (6) N4XR 199 (27) HA5AGS, 199 (1) N5AW, 199 (17) JH7CFX, 199 (2) RA6AX, 199 (6 on 10) RX4HZ, 199 (13) S58Q, 199 (31) K8PT, 199 (26) N8AA, 199 (23)

IN3ZNR, 199 (1) IK4CIE, 199 (1) JK1BSM, 199 (2) RWØLY 199 (2 on 40) JA1CMD, 199 (2) EA5RM, 198 (1, 19) N8LJ, (17, 24) EA5BCX, 198 (27, 39) G3KDB, 198 (1, 12) JA1DM, 198 (2, 40) 9A5I, 198 (1, 16) G3KMQ, 198 (1, 27) N2QT, 198 (23, 24) OK1DWC, 198 (6, 31) W4UM, 198 (18, 23) US7MM, 198 (2, 6) K2TK, 198 (23, 24) K3JGJ, 198 (24, 26) W4DC, 198 (24, 26) F5NBU, 198 (19, 31) W9XY, 198 (22, 26) KZ2I, 198 (24, 26) W9RN, 198 (26, 19 on 40) W5CWQ,198 (17, 18) UA4LY, 198 (6&2 on 10) JA7XBG, 198 (2 on 80&10) JA3GN, 198 (2 on 80&40) N4GG, 198 (18,24) K4JLD (18, 24)

The following have qualified for the basic 5 Band WAZ Award:

SP8HKT (180 zones)

IZ1ANU, 199 (1)

5 Band WAZ updates:

UX1AA (200 zones) K2EP (196 zones) N7XM (200 zones)

*Please note: Cost of the 5 Band WAZ Plaque is \$100 shipped within the U.S.; \$120 all foreign (sent airmail).

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. 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 Floyd Gerald. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cg-amateur-

The WAZ	The second secon
10 Met	ers CW
15 Met	ers CW
90	ers CW
20 Met	ers CW
80 Met	ers CW
160 N 410VA3EF (40 zones)	
160 Mete UX1AA(40 zones) SP7GAQ(35 zones)	r Updates N7XM (37 zones)
All Ban Mix	d WAZ
8943. JA4DHR 8944 F4FFH 8945. AA6RE 8946. R3BM	8947 KP4GC 8948 CU7MD
\$\$ 5232WA8UEG	SB
RT	тү

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, Floyd Gerald, N5FG, P.O. Box 449, Wignis, MS 38577-0449. The processing fee for all CO awards is \$6.00 for subscribers (please include your most recent CO mailing label or a copy) and \$12.00 for nonsubscribers. Please make all checks payable to Floyd Gerald. Applicants sending OSL cards to a CO checkpoint or the Award Manager must include return postage. NSFG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

..JH1LAY

CQ DX Awards Program

SSB

2591	W9RPM	2594	LA5UJ
2592	WA4RD	2595	AB7LA
2593	SM7ZDC		
	C	M	

1135......W9RPM

Digital

63.....W9RPM

The basic award fee for subscribers to CQ is \$6. For nonsubscribers, 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. We recognize 342 active countries. Please make all checks payable to the award manager. Photocopies of documentation issued by recognized national Amateur Radio associations that sponsor international awards may be acceptable for CQ DX award credit in lieu of having QSL cards checked. Documentation must list (itemize) countries that have been credited to an applicant. Screen printouts from eQSL.cc that list countries confirmed through their system are also acceptable. Screen printouts listing countries credited to an applicant through an electronic logging system offered by a national Amateur Radio organization also may be acceptable. Contact the CQ DX Award Manager for specific details

CQ DX Field Award Honor Roll

The CQ DX Field Award Honor Roll recognizes those DXers who have submitted proof of confirmation with 175 or more grid fields. Honor Roll lisiting is automatic upon approval of an application for 175 or more grid fields. To remain on the CQ DX Field Award Honor Roll, annual updates are required. Updates must be accompanied by an SASE if confirmation is desired. The fee for endorsement stickers is \$1.00 each plus SASE. Please make all checks payable to the Award Manager, Keith Gilbertson, Mail all updates to Keith Gilbertson, KØKG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604.

Mixed

K2TQC 275 W1CU 244 HAØDU 240 VE7IG 240 HA1RW 239 VE3XN 234 HA5AGS 228 9A5CY 227 N8PR 224 HA1AG 218	KØDEQ 216 K8SIX 215 W6OAT 215 VE3ZZ 214 VE3ZZ 207 JN3SAC 207 NI6T 207 HA5WA 206 F6HMJ 206 KF8UN 205	OK1AOV 205 RW4NH 203 N4MM 202 W4UM 202 IV3GOW 201 N5KE 200 K8OOK 198 N4NX 192 ON4CAS 191 HA9PP 190	BA4DW 188 HB9DDZ 188 K8YTO 186 K2AU 183 K2SHZ 182 K1NU 180 W5ODD 177 NØFW 176
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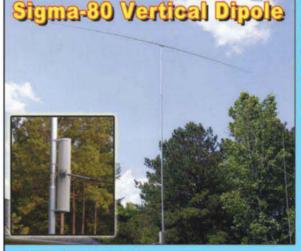
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the support of the worldwide amateur radio community, individuals, their clubs, and the national societies, we can hope that the presence of a strong, widely accepted standard of conduct will reaffirm that norm. Ultimately it will have a positive effect on those hams who are tempted to do something less than honorable. I encourage you to read the *DX Code of Conduct* at <www.dx-code.org> and make a conscious decision to abide by it.

It is also important to consider new hams, the ones who will replace us. How will they learn to behave? Hopefully they will learn from the best operators that being honorable is a more pleasurable experience than whatever pleasure is derived from giving into the impulse for immediate gratification. It is better to be honorable today, even if that means having to wait until tomorrow for the QSO.

Ironically, scientists recently have discovered that the chemical that feeds the brain and is responsible for higher willpower is glucose. When glucose levels are low, the brain will not function well in a process requiring mental effort. Thus, if you feel your willpower sagging, maybe you ought to have a marshmal-

low. With your willpower enabled, you will certainly feel a greater sense of pride when ethical operating practices get you into that DXpedition's log.

DX News

Norman Banks, 5B4AIF, plans to operate as E51E from Aitutaki Island (IOTA OC-083) between December 10, 2012 and January 5, 2013. He will be oper-

ating SSB and RTTY from 6 meters up to 80 meters with full legal power. There will be a 6-meter beacon active when Norman is not on the band, sending his phone number for texting him when the band opens. For more information, visit <www.aitutaki2012.com>.

Note

1. See References below.

References

The Stanford Marshmallow experiment was published in 1972 in the *Journal of Personality and Social Psychology* and may be downloaded (for \$11.95) from http://psycnet.apa.org/index.cfm?fa=buy.optionToBuy&id=1972-20631-001. There are also many references to the study on the Internet, notably http://en.wikipedia.org/wiki/Stanford_marshmallow_experiment and it has been used as the basis for lots of work since then. The comment by Aristotle came from a *New York Times* article, http://www.nytimes.com/2012/03/13/opinion/cultivating-character.html?scp=5&sq=david%20brooks&st=cse.

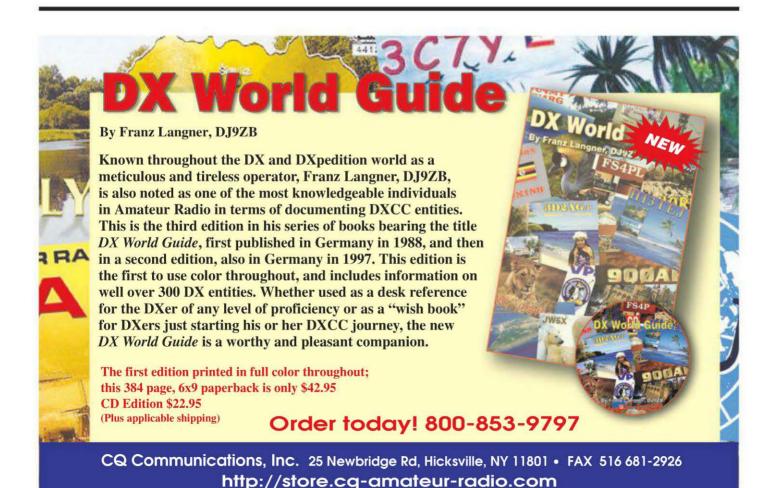
Other resources include the following books:

Willpower: Rediscovering the Greatest Human Strength, by Roy F. Baumeister and John Tierney (Penguin, 2011)

The Social Animal: The Hidden Sources of Love, Character, and Achievement, by David Brooks (Random House, 2012)

Thinking, Fast and Slow, by Daniel Kahneman (Farrar, Straus and Giroux, 2011)

The Power of Habit: Why We Do What We Do in Life and Business, by Charles Duhigg (Random House, 2012)



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THE WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive.

BALVED

				MIXED				
66079A2AA 6331K2VV 5956W1CU 53039A2NA 5142EA2IA 4866VE1YX 4413KF2O 4407S53EO 4344VE3XN 4313I2MQP 4290I2PJA	4228NGJV 4216WA5VGI 4187KØDEQ 4173W9OP 4129S58MU 4074YU7BCD 4022N9AF 3967ON4CAS 3966IK2ILH 3816.WB2YQH 3811N8BJQ 3628.SM6DHU 3540KC9ARR	34129A4W 3379K1BV 3305JH8BOE 3276K9UQN 3252W9IL 3231W2OO 3184JN3SAC 3007W2WC 2946YO9HP 2922OZ1ACB 2820W3LL 2544W6OUL 2532N3XX	2499VE6BF 2493I5RFD 2477 .WD9DZV 2476K5UR 2445AB1J 2428N6QQ 2338!2EAY 2289N3RC 2116AE5B 2192N2SS 2133K0KG 2100AG4W 2004W2FKF	1961W7CB 1918NXØI 1862VE9FX 1818KX1A 1722VE6BMX 1667SQ7B 1655SV1DPI 1593S55SL 1463NE6I 1462DL4CW 1446DF3JO 1400NKØS 1383IWØHOU	1347K6UXO 1329DK8MCT 1322AA4FU 1269K5WAF 1233K4HB 1201IT9ABN 1116YU7FW 1107PY2MC 1075N6OU 10669A3ST 1066JA1CKE 976KM6HB 964K8ZEE	924IW9HII 908	682N8HM 670WW3QB 662JA7OXR 662SP8HKT 653KK3Q 650N3YZ 649RA9CO 647PAØQRB 644KWØH 636ZS2DL 634 UA3LMR/QRP 629WB4SON	620PI4DHV 616DL5JH 607K3CWF 600K14KN 600KB9OWD 600K9OHI
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RF Safety: A Technical Conversation

his past October Daniel Koch, DL3IAE, posted the following query on the Microwave (mw) listserve:

A question to the experts: I have been working on some 10 GHz amps at 10 watt level lately. Although I haven't been feeling uncomfortable, longer lasting exposure to microwaves should not be underestimated, mainly due to the heating effects inside the human body, especially in the eyes.

I try to do most of the snowflaking at low levels to minimize radiation coming out of the open amplifier but placing little copper foil bits close is expensive [Editor's note: The term snowflaking is adding tiny pieces of copper foil in order to increase the power amplifier gain.] Power FETs isn't easy as we all know and sometimes my head has to come pretty close so I can see what I am doing.

I use one of those desk lamps that has a big magnifying glass built in. It will not attenuate radiation in a big way but at least it helps to increase the working distance a bit. I wonder how others tackle this problem and how would it be done professionally in RF labs or so?

Nearly 20 posts were logged on the listserve in response to Daniel's query. Here are many of those responses:

Paul Wade, W1GHZ, wrote:

Years ago, when I was tuning RF amps professionally, we would take an RF sniffer and probe around the amp. Actual levels are hard to measure, but I remember one we had that was pretty bad, so we built a cover of copper mesh screen and poked holes in the screen where the tuning tools went. Output power went up significantly (1/2 dB) with the screen in place, so a fair amount was lost to radiation.

At 10 GHz, a small horn on a power meter will be enough to find harmful radiation. Even a small horn has a capture area of several square cm, so a power level of 1 mw/cm² or less is easy to detect. Less than that is probably safe for short exposures.

If the radiation is bad, you are wasting power. Some impedance matching structures are worse than others. Caution is good.

Barry Malowanchuk, VE4MA, wrote:

I was exposed to high RF while working on 432 antenna arrays back in the 1970s. I felt my eyes "dry out" and I got the heck out of there! It took a month for the dry eyes feeling to disappear.

I have also done a bunch of snow flaking here and had others doing tuning at work without covers on and with a long enough exposure your eyes start to feel tired. At work I had tuning covers made, as Paul describes, and the technician complained about tired eyes when he was not using the covers!

I have used a small old RadioShack® microwave oven "sniffer" to check out hot spots and get an idea of how much stray RF is present. I am not sure how good it is at 10 GHz, but it is probably still a good relative indicator.

Certainly limit your exposure time and proximity if possible. I have considered making and using a metal screen face mask. Caution is good.

e-mail: <n6cl@sbcglobal.net>

VHF Plus Calendar

January 4	Quadrantids meteor shower
January 5, 2013	Last quarter Moon
January 10	Moon apogee
January 11	New Moon
January 18	First quarter Moon
January 19-21	ARRL VHF Sweepstakes
January 22	Moon perigee
January 27	Full Moon

-EME conditions courtesy W5LUU

Jerry Johnson, KØCQ, wrote:

Perhaps it's time to plan tuning a bit better and make the tuning elements adjustable from outside a closed box. Snowflaking is too expensive when eye damage can be a result.

Perhaps something like 3 piston trimmers at 1/8- or 1/4-wave intervals on input and output lines. One thing about trimmers is that they aren't likely to short, which is a hazard while snowflaking. Sure, the half-dozen trimmers will raise the cost, but the first effect of too much RF in the eyes is documented in MIT Rad Lab, where they reported 10 mw from WR90 was enough when close to a rabbit's eye to cause a cataract.

Cataracts are correctable these days, at a cost of \$6,000 or so per eye, plus months of healing. So far all the costs have been covered by Medicare and my supplemental insurance except for prescription drugs. My cataract was caused by old age, but made much worse by the laser treatment for a detached retina and the eye drops following that treatment. Turned the lens into a fuzzy thing that wouldn't focus light. I've recovered well enough to build a DEMI 3-watt PA to which I didn't apply RF power with the cover off.

I typically have used those three shunt trimmers with minimum reactance about 1/2 the line impedance. That would be like tuning screws in waveguide where such a three-screw tuner is reputed (in MIT Rad Lab series) to tune most any load. If 1/8th wave is too close, 5/8th wave ought to work just as well, though it may lengthen the enclosure. Usually in such a three-screw tuner all three screws are not needed; two nearly always should work and sometimes one is enough. Or like Barry's 24-GHz waveguide preamp, a series of holes at close intervals needs only one screw in the right hole. I think a screw won't be enough capacitance in a coax line even at 10 GHz without getting the gap uncontrollably small. The commercial version might be a slot with a carrier for one screw to achieve the same result with more waveguide machining.

Chip Taylor, W1AIM, wrote:

My work in the Health Physics filed was all with ionizing radiation. But our professional organization, the Health Physics Society, is also involved with RF radiation and there have been some excellent articles in our monthly journal, *Health Physics, The Radiation Safety Journal*, as well as on the Health Physics Society's web site

The scientific consensus is that the only harmful effect of RF on the human body is heating, and it takes very high levels of RF to produce heat that one can actually feel. (YouTube videos aside, you can't make popcorn

with a cell phone!) Itching or dry eyes, headaches, and such are not necessarily due to RF exposure. Correlation is not the same as causation. My eyes sometimes itch and get dry just watching TV, and I'm not convinced TV watching is the cause. (Although I suspect it may cause one's brain to atrophy!) Even the link to cataracts is not all that strong; very high levels of microwave radiation can sometimes cause cataracts but it's not a certainty by any means. Most of us who eventually develop cataracts will get them for reasons other than RF exposure. (My cataract was caused by steroids used to treat iritis [an irritation of the iris], not from playing with microwaves.)

As low as the risk is (pretty close to zero for the power levels most of us work with), Paul's advice is good. The mantra for those of us in the HP field is "As low as reasonably achievable." It's not hard to limit or reduce exposure (remember the Inverse Square Law?) and worth doing so.

Barry Malowanchuk, VE4MA, responded to Chip:

Hi Chip, with all respect to the professionals in the field, the "drying of eyes" was real, although I know it was doubted by the professionals contacted by Joe Reisert, W1JR, at the time also. This was an effect that appeared in tens of seconds, not hours or days later. Perhaps dry eyes is a poor way to describe it. It was like you had been awake for 30+ hours or you had been working in a dusty area...eyes really wanted to be closed.

We don't work in high power levels necessarily, but at the frequencies we are dealing with (10 GHz in particular) the power density from small apertures (feedhorns and point-source radiator striplines) can be quite significant.

Ed Cole, KL7UW, wrote:

Several years ago I worked in a commercial 2-way radio shop which also serviced marine radar. Some of the techs were lazy and ran the magnetrons with open waveguide for testing until I complained of getting a headache from that (came on in about 15-min of exposure). Most run about 3 kw peak on 3 GHz. I could tell when anyone did this in short time every time. Dummies! We had waveguide loads.

Jerry Johnson, KØCQ, added:

Strip lines radiate like antennas. Not efficiently but primarily from the current in the line. And when an amplifier enclosure is broad enough to act as a waveguide (over 1/2 wavelength) the conversion from strip line to waveguide mode can couple from the output line to the input line and cause the amplifier to oscillate, only when the case is covered. That's often cured with cross- or length-wise baffles and/or chunks of some RF lossy material glued to the cover.

Besides incorporating tuners adjustable from outside the closed case, we might use a scope and diode detector for relative output instead of a thermal power meter and then pulse the drive to only apply drive for a short time, like a millisecond or less after moving the snowflake. With 100-MHz bandwidth scopes and diode detectors with 1-GHz detected bandwidth, a few microseconds should be enough time to see it with the scope. For existing amplifiers we could add on external tuners for input and output, but not inter-stage tuning.

Doug McGarrett, WA2SAY, responded to Jerry:

Interesting ideas, Dr. Jerry, but I think an open-ended cable with a very small series C at the end connected to a spectrum analyzer is really what you need, so as to see if the signal you're measuring is the same frequency as what you're driving with, and that there aren't any others there—oscillation. Or, of course, with your padded-down SA at the output port. With the path loss of the microwave signal so high, I think that the radiation from a circuit is small enough to ignore.

Let's take a 100W amplifier, and let's say (as another contributor to this thread has) that the radiation is about -0.5 dB. At 10 inches, that's about 42 dB path loss, so the effective power at that range is about 0.7 mW, total, much less than that in 1 cm², which is how the

standard is written. So keep your eyes about 10 inches above the circuit, and you should be OK.

Jerry Johnson, KØCQ, responded to Doug:

At 10 GHz 1 pF is not small, but for HF work it's tiny. Perhaps a small loop or link would be better at loose coupling.

A spectrum analyzer is a super deluxe tool, and the good ones today cost about the same as an Escalade, like a house did 20 years ago. The old spectrum analyzers don't have the designed capability of looking over the whole spectrum that might come from an amplifier oscillating way outside its expected band with LO leakage, stray mixer products, and harmonics. The earliest spectrum analyzers were intended only to show the spectrum of a signal, generally a pulsed signal, so their dispersion is a small fraction of their center frequency. They didn't sweep from DC to light in one pass, not even from fundamental to the third harmonic of the carrier frequency. Only carrier frequency plus or minus a few or tens of MHz. Some had only slightly reduced sensitivity for harmonics of their swept oscillator, making it a task to determine what some stray signal found was, whether harmonic of the DUT or harmonic spur generated in the SA.

Not all of us are willing to put money in a non-communication device such as test equipment, so we have to do with power and diode detectors, augmented by band-pass filters. So we can peak with the indicator seeing through that band pass filter, then compare the unfiltered detection with the filtered level, allowing for filter loss to see if the amplifier is putting out power at other than the desired frequency. And we can look unfiltered for power with no drive to the transverter.

One thing I've noticed about ham band microwave amps is that there isn't much in the way of harmonic filtration, perhaps some even harmonic reduction in push-pull amps, but less so in quadrature coupled stages and some inherent in the active devices internally matched with single pi low-pass filters, two shunt Cs, and the bond wires making a series L. Sometimes when driven to clipping, I'm sure there is more than trivial power at the harmonics, as well as radiated as splatter in the ham band of interest.

Doug wrote:

Let's take a 100W amplifier, and let's say (as another contributor to this thread has) that the radiation is about -0.5dB. At 10 inches, that's about 42 dB path loss, so the effective power at that range is about 0.7 mW, total, much less than that in 1 cm², which is how the standard is written. So keep your eyes about 10 inches above the circuit, and you should be OK.

Jerry responded:

You presume hemispherical or spherical radiation which may be true in some cases and not in others. The free space 1 wave traveling wave wire radiates more concentrated than a dipole, for sure a narrower pattern than a hemisphere. The free space several wave wire has many lobes and nulls and quite a bit of gain in the lobes, the greatest gain closest to the wire and rising the longer the wire. Making that wire part of a microstrip, stripline, or coplanar coaxial circuit affects the radiation pattern significantly, but doesn't eliminate it. The asymmetry of the macrostrip and coplanar conductors with dielectric next to ground but the low dielectric constant air above makes for complicated wave propagation along the conductor at two speeds, which can enhance radiation.

Doug wrote:

By the way, the free and easy use of the word "stripline" always annoys me. What you're talking about is microstrip. Stripline is bounded by a top and bottom ground plane. I think it's worthwhile respecting the difference, especially in the presence of younger RF folks who may never have encountered actual stripline. And who may not know that in order to make a decent directional coupler, or anything that demands good isolation, like a filter, you really need stripline.

Jerry responded:

True enough about strip line, but like I said above there is as much difference in vintage to modern spectrum analyzers that just calling for a spectrum analyzer to test for stray products out of an amplifier can also be a similarly excessive simplification. Stripline came before microstrip and coplanar.

Joe Hopster, WB8DNO, wrote:

A glass lens doesn't block microwaves. In fact, I used to send 20 mw AM from a klystron across the basement to a crystal detector. When I held an 8-inch glass lens in front of the detector, it would focus the signal much like it would for light. Didn't measure the gain but it seemed to be several dB.

I may have read that the lens of the eye will frost over from heat much like an egg white. Ten GHz will not have to penetrate very deeply to do that.

Mike Sapp, WA3TTS, wrote:

I recall the metalized Low-E glass in my house windows doing a good attenuation number on my 10 GHz test beacon a few years ago when cobbling my 10 GHz transverter together. I would suggest testing a few pieces of the adhesive metalized window film products used for improving window insulation efficiency. One may be able to apply such a metalized film to a standard set of polycarbonate safety glasses. Even an extra 6 or 10dB of attenuation would be a prudent optical safety precaution. If the tint is too dark, turn the lights up.

I did a quick look online for "RF safety glasses" and "EMI Safety Glasses," but nothing popped out of Google that was very obvious. Laser safety glasses are out there, so some company likely makes RF shielded safety glasses as well.

Michael Fletcher, OH2AUE, wrote:

Ten watts at 10 GHz is plenty to feel thermally by the back of the hand (so as not to accidentally damage the more important side of your hand...) not very far from the feedhorn. Of course this kind of power can be radiated elsewhere if not actually terminated and converted to heat.

A good friend of mine mildly burned the other side of his face while tuning a home brew high-power solid-state 23-cm PA (he was looking sideways at the power meter most of the time.).

The real primary risk is thermal, and the most sensitive part in our case is the eye. The retina has no blood vessels to regulate temperature, but is protein rich. If you want to simulate your eye, separate the yolk from a chicken egg and use the albumen (e.g., in a glass test tube) as a very sensitive detector for coagulation (yes, a non-reversible process that will happen to your eye, too). Better yet, spread a thin layer of albumen on a dark low thermal conductor to witness the coagulation.

On the other hand RF is often used in special suits for treating hypothermia: http://adsabs.harvard.edu/abs/2002SPIE. 4916...95J>.

Another item is your magnifying glass lamp. If this is a fluorescent lamp, you should be aware of the UV radiation, especially if the lamp (bulb) itself does not have a secondary envelope. The British Health Protection Agency recommends max. One hour/day if this kind of single envelope CFL is closer than 30 cm to human skin (e.g., the hopefully still functional backside of your hands). See: http://www.hpa.org.uk/NewsCentre/NationalPressReleases/2008 PressReleases/081009Emissionsfromcom pactfluorescentlights/>.

The general sensitivity of RF especially in the decametric wavelength region is not uncommon: Getting a type of headache from RF from open waveguides is something I saw repeatedly in some of my former colleagues. This involved typically 5-20W being radiated from an open waveguide or small dish at C band. They clearly identified after a period of time an open waveguide in the vicinity, but out of sight. I am pretty sure this has some bearing on the relationship between cranial dimensions and the wavelength in question. Or maybe some nerve structure is resonant at C or X band? Wish I had the time and resources to measure the S21 of my head.

Another aspect is the energy waveform envelope, such as pulsed RF (e.g., radars etc.). I have many times heard directly from microwave professionals their auditory experience of PRF frequencies.

Now then, to put all this into some kind of perspective frame, I hope everybody understands by now that the solar spectrum that reaches the Earth still contains a decent part of the electromagnetic spectrum even after some selective filtering of the atmosphere. And at pretty appreciable levels, after all. We do use the darn thing to generate electricity. And who has not witnessed the discoloration of objects lying in the sun, or even your CFL lamp. Or even a filament bulb for that matter. I can easily detect my 60W incandescent lamp noise at X band from 15 cm away: http://www.kolumbus.fi/michael.fletcher/incand.gif.

So, hands up, who has ever suffered from sunburn or worse?

Down under in Oz, there are rules and regulations for clothing and headware of children in order to minimize radiation effects of the sun.

Anyway, if you are really seriously concerned about excessive uncontrolled RF levels, this is the way to go: http://www.w4dex.com/microwave/safe_microwaving.jpg>.

There are all kinds of stuff out there. It all is a question of where to set the limits and to enjoy the rest. So, time for some more coffee, despite the increased risk of pancreatic cancer.

By the way, years ago I was involved in testing and calibrating test equipment and sensors at HF frequencies. Fairly interesting to witness several amps of shortwave RF propagating through your torso (yup, measured with a current clamp around my neck and another pair around each leg for verification). And once again, I have never been quite the same since that day.

Jerry Johnson, KØCQ, added:

An lowa lawyer/electrical engineer by the name of Barbara K. Lunde about 20 years ago began to offer a mesh union suit for RF protection, but it was designed for VHF/UHF protection and didn't include the head or hands. I don't know if it is still offered. Technicians required to work on tall building roofs with many two-way radio antennas at roof level liked the idea because they couldn't turn of the radios that belonged to the public services or competitors while working in their near fields. Lunde's husband Paul (WØLHE) owned a central lowa FM station in those days.

There is one other solution I've already mentioned and that is to arrange the PA to be tuned while enclosed working into a dummy load, either with internal tuners, like a string of capacitors along the input and output lines, or external enclosed tuner boxes on the input and output connectors. Keep the RF contained, and then there's no need to keep the RF out of the body during the adjustments.

Brian Yee, W6BY, wrote:

I simply use the minimum RF drive to get the tuning done. No need to run full RF power out except to verify the snowflaking was correct, and then I do that with the covers on anyway to see if there are any oscillations. Even then I ramp up the power gradually to be able to back out of a problem. Also, I am careful to reposition the snowflake only with power off, then apply DC and RF power to verify the effect of tuning.

Ben Lowe, K4QF, wrote:

Decades ago, there was a government program for High Power Microwave (HPM). As I recall, they published some handbooks. maybe through SRI that are probably around somewhere. One area addressed was the effects of HPM on sensitive parts of the human body, the eyes being one of the most sensitive areas. I believe they designated safe levels as 10 mw/cm² but not for too long of a period. The safe level is probably somewhat frequency sensitive, as there's a reason microwave ovens operate around 2.6 GHz. Water is apparently more absorptive at that wavelength than other microwave frequencies, and in spite of what others may think, you and other flesh are basically comprised of 80% water; hence the best cooking frequency. So is foliage.

In reading electronic warfare history, I saw somewhere that watchmen on ships in the North Atlantic during WW II would stand on the bow of ships and get the radar operators to beam the antenna toward them to warm them up, or thaw them out, whatever the case was. I wouldn't recommend it!

Daniel Koch, DL2IAE, summarized:

Well, it looks like there is no off-the-shelf solution to the problem. I was hoping someone would come up with some sort of protective glasses with a fine metal grid inlay or a similar solution that would attenuate microwaves effectively. My own web search ahead of this post was not very successful, thus my interest in the professional way of dealing with RF exposure. I think we can basically do three things:

1. Reduce exposure time: John Quarmby, G3XDY, suggests using a pulsed low duty cycle RF source: "Set a pulse generator to a repetition rate of 100Hz and pulse width of 100uS and then you are running at an average power of 1% of the peak power. A thermal power meter will indicate the average power so add 20dB to get the peak power for a 1% duty cycle."

An excellent idea. Modulators are cheaply available surplus, even in the 10 GHz range. Or you can also try to modulate the IF of your transverter. This should get you pretty close to the optimum. Still you will have to do the final tweak at maximum power.

2. Maximize the distance from the RF source: Use good illumination and some sort of magnification so your head is away from the RF source. Will my glasses or a magnifier increase the RF field near my eyes by focusing the microwaves, or will the glass or plastic lenses not promote this "optical" effect due to physical size or the materials used? Has anyone tried one of those USB cams?

3. Go QRP: Not really a solution.

Thanks for your thoughts and input. Discussions on the effects of RF on the human body tend to get extremely emotional very quickly, at least in the "real world" outside our hobby, and I personally try to avoid them. However, I think we all should be aware of the possible dangers.

Finally, Jerry Johnson, KØCQ, summarized the problems with snowflaking very succinctly: "Snowflaking is too expensive when eye damage can be a result." Well spoken, Jerry!

Current Contests

The ARRL VHF Sweepstakes is scheduled for the weekend of January 19–21, 2013. For ARRL contest rules, see the issue of *QST* prior to the month of the contest or: http://www.arrl.org.

Current Meteor Showers

The Quadrantids, or Quads, is a brief but very active meteor shower. The expected peak is around 1325 UTC on January 3, with up to 40 meteors per hour at its peak. The actual peak can occur three hours before or after the predicted peak. The best paths are north-south. Long-

duration meteors can be expected about one hour after the predicted peak.

For more information on the above meteor shower predictions see Tomas Hood, NW7US's "Propagation" column elsewhere in this issue. Also visit the International Meteor Organization's website: http://www.imo.net>.

And Finally . . .

This column with its comments on RF safety has given us an interesting look at the dangers of working with RF (non-

ionizing) radiation. We all need to be cautious when working around high power.

If you have a tale to tell about your RF exposure—or anything else related to the wonderful world of the VHF-plus frequencies—please e-mail me at: <n6cl@sbcglobal.net>.

A Happy New Year to all of you, and my best wishes go to you for a safe, healthy, and prosperous 2013.

Until next month . . .

73 de Joe. N6CL





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Alaska: Why Judicial Districts instead of Boroughs?

Plus Awards from Scandinavia, Russia, and Indonesia

laska is unique among American states in that it does not use the traditional county (or parish) as a political subdivision. Instead, Alaska is divided into 18 "boroughs" and 11 "geographical census areas." The borough is probably the closest by analogy to a county, but even then, because of the very low population of most of Alaska. boroughs comprise less than half of the area of the state. The rest of the state is composed of census areas which were established for the 1970 Federal Census. There is a good chart on the website of the National Association of Counties (http://www. naco.org/) which gives an official list of both boroughs and census areas together with population and square miles covered by each. One of the least populated areas is Central Alaska (Yukon-Koyukuk Census Area), which has a density of one person per 26 square miles.

The USA-CA award was developed not long after Alaska became a state on January 3, 1959. I don't have any information in the USA-CA archives regarding the decision to use the four judicial districts instead of boroughs, but can only imagine that this was a logical existing unit that nicely divided the new state into reasonably even pieces for the award.

How hard would it be to achieve USA-CA if we required the use of boroughs and census areas instead of the judicial districts? I invite any of our

*12 Wells Woods Rd., Columbia, CT 06237 e-mail: <k1bv@cq-amateur-radio.com>



The Scandinavian Open CW Award (SOCWA) is a new award that is limited to contacts in 2013, CW contacts with some depth, such as 10 minutes worth.

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F5POJ	1837								

The total number of counties for credit for the United States of America Counties Award is 3077. The basic award fee for subscribers is \$6.00. For nonsubscribers it is \$12.00. To qualify for the special subscriber rate, please send a recent CQ mailing label with your application. Initial application may be submitted in the USA-CA Record Book, which may be obtained from CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801 USA for \$2.50, or by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 12 Wells Woods Road, Columbia, CT 06237 USA. DX stations must include extra postage for airmail reply.

Alaskan award hunters to consider sponsoring an award based on boroughs and census areas. It might be revealing to see who would be the first to work all 29 of them. Any volunteers to create this award?

The Scandinavian Open CW Award (SOCWA)

Let's start off 2013 with a new award that is limited to contacts in 2013, and not just hello-goodbye QSOs, but CW contacts with some depth, such as 10 minutes worth. It shouldn't be too difficult. Or will it be?

The object of The SOCWA is to inspire amateur radio operators in Scandinavia and elsewhere to increase CW activity on the HF ham radio bands. The intent of the award is to encourage and reward amateurs to carry on sustained CW conversations rather than short-duration CW signal reports. The award sponsors are the Öland Island Radio Amateur Society, SK7RN and The Scandinavian CW Activity Group, SCAG.

Participants: SOCWA encourages CW communication by and between licensed amateur radio stations in the Scandinavian countries of Denmark, Finland, Greenland, Iceland, Norway, and Sweden. The prefixes OY, JX, JW, OHØ, and OJØ also count as Scandinavian countries.

Amateur radio operators from non-Scandinavian countries who register on the award website listed below are welcome to participate and qualify for the award. In this regard, qualified QSOs must involve a station in the aforementioned Scandinavian countries.

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Period of activity: This award will be available to successful participants during calendar year 2013, starting on January 1. The SOCWA encourages unlimited CW activity between participating stations. The award will be available to those stations and operators who register and report confirmed contacts as described below. The program may be extended beyond calendar year 2013.

How to register: SOCWA participants register on line at <www.socwa.se>.

Bands: According to the IARU's HF band plan.

Call: A response to calling "CQ SAX" will initiate contact with a station within the SOCWA sphere.

Logging: QSOs should be logged at the SOCWA home page. To qualify for the award, QSOs must a minimum of 10 minutes. Both stations have to log the QSO on the website. The time stamp (GMT) of each station logged on the website must match each other.

General rule: Repeated QSOs between two stations are permitted as long as there is no more than one QSO every 24 hours but on different HF bands. Band variation is desired and encouraged. Always consider the CW speed of your contacted station. If your counter party is sending at a lower speed, reduce your speed to reduce errors and to eliminate the risk of confusion.

Fees: For Scandinavian radio amateurs, after 52 or more verified QSOs, the radio amateur will be awarded the SOCWA via postal means by payment of SEK50. The fee also entitles the amateur to participating in a lottery with many prizes. Each confirmed QSO earns one lottery ticket in the final draw. The lottery prizes are shown on the award website. The number of prizes will depend of the number of participants. Lottery tickets and prizes, however, are limited to Scandinavian radio amateurs. For non-Scandinavian radio

amateurs, after 52 or more confirmed and approved QSOs, you can print, free of charge, the SOCWA Award directly from the home page. Internet: http://www.socwa.se/regler.php>.

Gallery of the Great Genius of Russia

This is a series of awards with certificates that are the most beautifully designed and executed ones I have ever seen from any sponsor. UA6MM based the series on famous Russian leaders of the past. The images are taken from works of art depicting these leaders and the parts they played in key battles in Russian history from the year 850 to 1813. Complete details of each of the seven awards can be found at: http://www.dxawards.com/UA6MM.htm. The awards are sponsored by the Amateur Radio Union of Russia "SRR," together with the Taganrog club "TDXEC" (Taganrog DX-Expedition club). Collectively, the awards are known as the Gallery of the Great Genius of Russia. This program offers a certificate for one set of requirements, and a plaque for additional requirements as noted in the rules.

There isn't enough room in this column for all seven, so I am presenting just one of them.

Anniversary of Peter I, the Great (the first Emperor of all Russia). This award is issued in connection with the 340th anniversary of the birth of "The Great Son of the Russian Land, the Emperor Peter the Great, Peter I" (1672–1725). He was the founder of the first Russian military base "port city," "Fortress of Taganrog" in 1698, and the new northern capital of the Russian Empire, the city of St. Petersburg, in 1703.

1. Russians need 20 QSOs and all others need 10 QSOs with any different stations in the following Russian regions or countries associated with the life of Peter the Great: UA1A, UA2F, UA3A, UA4, UA6L, DL, ES, EW, G, LY, OE, OH, OHØ, OJØ, OZ, PA, SM, SM1, SP, TA, UR, UU, YL, 4K.



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The Anniversary of Peter I award is issued in connection with the 340th anniversary of the birth of "The Great Son of the Russian Land, the Emperor Peter the Great, Peter I" (1672 - 1725).

- 2. Earn at least 340 points from the list of stations in areas below. Each city, region, or country = 10 points per contact:
- a. Cities associated with the activities of Peter I: Moscow, Taganrog, Azov, St. Peterburg, Kronshtadt, Voronesh, Arkhangelsk, Pereslavl-Zalesskiy, Sergiev-Posad, Petrozavodsk, Poltava (Ukraina) Tula, Derbent, Baku, Kaliningrad, Amsterdam, Narva, Viborg, London, Istanbul, Hannover.
- b. Regions: LO (Leningrad region), KL (Curly), AR (Arkhangelsk), VO (Vologda), PS (Pskov), MU (Murmansk), KA (Kaliningrad), MO (Moscow), SM (Smolensk), TL (Tula), RO (Rostov), DA (Dagestan), SV (Sverdlovsk), PM (Perm), SL (Sakhalin), PK (Maritime Territory), KT (Kamchatka).
- 3. Countries: DL, ES, EW, G, I, JW, LA, LY, OE, OH, OHØ, OJØ, OZ, PA, R1FJL, R1MVI, SM, SM1, SP, TA, UT, UU, YL, 4K = 10 points.

Repeated QSOs on different bands or modes count for the award. No mixed mode QSOs.

Bonus QSOs: Any QSO with special event GGGR station and RK1AN, RZ1AWZ, UA2FDM, RV3DA, UA3AHA, UA4LAQ, RK6AH, RU6BS, UA6MM, UA9AV = 50 points each, and other members of the TDXEC = 25 points each.

Application: Send log extract with the specific award and/or plaque being requested, a list of stations contacted, and the QSO information. The fee for the paper award is \$US10 and the cost of each plaque is \$US40. Mail applications to: Nick M. Ermolenko UA6MM, PO Box 73, Taganrog, 347902 Russia. E-mail <ua6mm@yandex.ru or ua6mm@mail.ru>, internet: http://www.ua6mm.narod.ru, also: http://www.ua6mm.narod.ru, also: <a href="http://www.ua6mm.narod.ru, also: <a href="http://www.ua6mm.narod.ru, also: <a href="http://www.ua6mm.narod.ru, also: <a href="http://www.ua6mm.narod.ru<">http://www.ua6mm.narod.ru, also: <a href="http://www.ua6mm.narod.ru<">http://www.ua grz.com/UA6MM>.

Indonesia's Nusantara Award

Indonesia is sometimes known as a country that is made up of islands—lots of islands. In fact, the sponsors of this award make available a listing of the 13,200 different islands comprising Indonesia.

All of your QSOs with Indonesia are available for award credit, since contacts since 1945 are valid. Too many awards are not only tough, but require you to start all over when the sponsor establishes a starting date, such as the current year. Another good feature of this award is that for US applicants, the custodian is in New Jersey.

The Nusantara Award is issued to licensed amateurs and SWLs for making two-way contacts on HF bands 160–10m),



Indonesia's Nusantara Award is issued to licensed amateurs and SWLs for making two-way contacts on HF bands 160–10m), including WARC bands, with a minimum of 10 different islands of Indonesia on or after August 17, 1945.

including WARC bands, with a minimum of 10 different islands of Indonesia on or after August 17, 1945. Repeater, satellite, eQSO, Echolink, or other relay methods are not permitted. The 10 islands must include a minimum of five out of the six main islands of Jawa/Java, Sumatera/Sumatra, Kalimantan/Borneo, Sulawesi/Celebes, Irian/Papua, and Bali.

Endorsement stickers are issued in increments of 10 for additional islands worked. All islands claimed for the award must appear on a map and have a name. Each QSL card must have the printed name of the island from which the operation took place. For major or large islands, the name of a town or city on the island, or grid locator may be sufficient. Please contact the award manager when in doubt. Not all islands in this program may have an IOTA (Islands On The Air) Reference Number. Small islands, individual coastal islands, islands in a bay, in a lake, in a river, or in an estuary, or any that cannot be classified in the IOTA Program might still be accepted for this award. Groups of islands with the same IOTA reference count for separate islands for this award-e.g., Bangka and Belitung are two separate islands for this award (OC-144).

Your claim must be accompanied by certified list (GCR) showing the callsigns of stations worked, dates, times, bands, modes, and island name. Alternatively, a list of stations worked with a copy of the QSL cards can be used as well. Applicants using e-mail may attach the list and scans of the QSL cards. All QSL cards must be in possession and must be produced upon request for inspection.

Use the official application for the

award, which is found on the website listed below.

For DX stations, the award fee is 8 IRCs, \$US6, or 5 Euros for the basic award. The endorsement fee is 1 IRC, \$US1, or 1 Euro regardless of the level claimed. The fee covers the award and postage. There is no fee for handicapped operators or for SWLs. Payment can be made by PayPal (preferred) or cash/IRC (at your own risk). Send the application and fee to Award Manager.

DX Stations should apply to: Stephan

Busono, W2FB, 3 Margaret Drive, Somerset, NJ 08873; e-mail /PayPal: <sbusono@gmail.com>.

Indonesian and DX should apply to: Adhi Widodo, YB3MM, PO Box 6, Pandaan 67156 Indonesia; e-mail/ PayPal: <yb3mm@mdxc.org>. Internet: <http://www.nusantaraaward.com/>

We are always interested in learning of new awards for publication in this column. Please ontact me with details and a sample at the address shown on the first page of this column.

73, Ted, K1BV

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by Walter Maxwell, W2DU

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SUCH A HAM



Did you at least get a chance to see if the SWR was flat, Cliff?



Reviewing New CQ Contest Reporting Dates

Editor's note: Contesting Editor George Tranos, N2GA, was unable to write his column this month due to flooding at his home from Hurricane Sandy. He expects to be able to resume writing the column next month. We wish George and Diane, N2DO, all the best in getting their house—and their lives— back in order.

s we begin 2013, we also begin the transition period during which we will phase in earlier reporting of the results of most CQ-sponsored contests. Complete details are in the October 2012 issue, so we will not repeat them here. However, we will review the new schedule of contest results, both for this year and for 2014 and beyond, once the transition is complete. We will also include the issues in which the rules for various contests will appear, although that schedule is not changing.

1.500				
2013	Schodule	of Contact	Reculte &	Rules

Issue	Contest Results	Contest Rules
January	2012 WPX SSB	2013 WPX RTTY
February	2012 WPX CW	2013 WPX (SSB & CW)
Winter CQ VHF	2012 CQ WW VHF	
March	2012 CQWW DX RTTY	
April	2012 CQWW DX SSB	2013 CQWW Foxhunting
		Wknd
May	2012 CQWW DX CW	
June	2012 CQ DX Marathon	2013 CQWW VHF
	2012 CQWW	
	Foxhunting Wknd	
July	2013 WPX RTTY	2013 CQWW DX RTTY
August	2013 CQWW DX 160	
September	2013 WPX SSB	2013 CQWW DX (SSB & CW)
October	CQWW DX	
	All-Time Records	
November	2013 WPX CW	2014 CQWW DX 160
December		2014 CQ DX Marathon
2014+ Schedule	of Contest Results & R	ules
2014+ Schedule Issue	Contest Results	u <mark>les</mark> Contest Rules
2014+ Schedule Issue January	Contest Results 2013 CQWW VHF	ules
2014+ Schedule Issue	Contest Results 2013 CQWW VHF 2013 CQWW	ules Contest Rules 2014 WPX RTTY
2014+ Schedule Issue January February	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd	u <mark>les</mark> Contest Rules
2014+ Schedule Issue January February	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd 2013 CQWW DX RTTY	ules Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW)
2014+ Schedule Issue January February	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd	Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW) 2014 CQWW Foxhunting
2014+ Schedule Issue January February March April	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd 2013 CQWW DX RTTY 2013 CQWW DX SSB	ules Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW)
2014+ Schedule Issue January February March April	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd 2013 CQWW DX RTTY 2013 CQWW DX SSB 2013 CQWW DX CW	Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW) 2014 CQWW Foxhunting Wknd
2014+ Schedule Issue January February March April May June	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd 2013 CQWW DX RTTY 2013 CQWW DX SSB 2013 CQWW DX CW 2013 CQ DX Marathon	Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW) 2014 CQWW Foxhunting Wknd 2014 CQWW VHF
2014+ Schedule Issue January February March April May June July	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd 2013 CQWW DX RTTY 2013 CQWW DX SSB 2013 CQWW DX CW 2013 CQ DX Marathon 2014 WPX RTTY	Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW) 2014 CQWW Foxhunting Wknd
2014+ Schedule Issue January February March April May June July August	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd 2013 CQWW DX RTTY 2013 CQWW DX SSB 2013 CQWW DX CW 2013 CQ DX Marathon 2014 WPX RTTY 2014 CQWW 160	Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW) 2014 CQWW Foxhunting Wknd 2014 CQWW VHF 2014 CQWW DX RTTY
2014+ Schedule Issue January February March April May June July August September	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd 2013 CQWW DX RTTY 2013 CQWW DX SSB 2013 CQWW DX CW 2013 CQ DX Marathon 2014 WPX RTTY 2014 CQWW 160 2014 WPX SSB	Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW) 2014 CQWW Foxhunting Wknd 2014 CQWW VHF
2014+ Schedule Issue January February March April May June July August	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd 2013 CQWW DX RTTY 2013 CQWW DX SSB 2013 CQWW DX CW 2013 CQ DX Marathon 2014 WPX RTTY 2014 CQWW 160 2014 WPX SSB CQWW DX	Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW) 2014 CQWW Foxhunting Wknd 2014 CQWW VHF 2014 CQWW DX RTTY
2014+ Schedule Issue January February March April May June July August September October	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd 2013 CQWW DX RTTY 2013 CQWW DX SSB 2013 CQWW DX CW 2013 CQ DX Marathon 2014 WPX RTTY 2014 CQWW 160 2014 WPX SSB CQWW DX All-Time Records	Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW) 2014 CQWW Foxhunting Wknd 2014 CQWW VHF 2014 CQWW DX RTTY 2014 CQWW DX (SSB & CW)
2014+ Schedule Issue January February March April May June July August September	Contest Results 2013 CQWW VHF 2013 CQWW Foxhunting Wknd 2013 CQWW DX RTTY 2013 CQWW DX SSB 2013 CQWW DX CW 2013 CQ DX Marathon 2014 WPX RTTY 2014 CQWW 160 2014 WPX SSB CQWW DX	Contest Rules 2014 WPX RTTY 2014 WPX (SSB & CW) 2014 CQWW Foxhunting Wknd 2014 CQWW VHF 2014 CQWW DX RTTY

*c/o CQ Magazine e-mail: <cq@cq-amateur-radio.com> In addition, please remember that the log submission deadline for nearly all CQ-sponsored contests is now 5 days after the end of the contest. Preliminary indications (from the CQWW DX SSB weekend) are that the new deadline is having a negligible effect on the numbers of logs submitted.

The only exceptions to the 5-day rule are: CQ DX Marathon (10 days) and the CQ WW Foxhunting Weekend (flexible, along with activity dates).

Finally, thank you again to all of our contest directors and their committees for the added work that has gone into making this accelerated results reporting possible, and Happy New Year from all of us at *CQ*.

All year	Calendar of Events CQ DX Marathon http://bit.ly/vEKMWD 2012 Logs Due by January 15, 2013
Jan. 1	SARTG New Year RTTY Contest http://www.sartg.com/contest/nyrules.htm
Jan 1	AGCW Happy New Year Contest http://bit.ly/PAcDvl
Jan. 5-6	ARRL RTTY Roundup http://www.arrl.org/rtty-roundup
Jan 5-6	EUCW 160m Contest http://www.eucw.org/eu160.html
Jan. 12-13	Hunting Lions in the Air http://lionshuntingintheair.lionwap.org/
Jan 12-13	MI QRP January CW Contest http://www.miqrp.org/
Jan. 12-13	North American CW QSO Party http://bit.ly/GLPfXz
Jan. 13	DARC 10-Meter Contest http://bit.ly/VZScLN
Jan. 19	LZ Open Contest http://bit.ly/NXeEnZ
Jan. 19-20	Hungarian DX Contest http://bit.ly/NXewVk
Jan. 19-20	North American SSB QSO Party http://bit.ly/GLPfXz
Jan. 25-27	CQ WW 160M CW Contest http://bit.ly/uB0wFb
Jan. 26-27	BARTG RTTY Sprint http://bit.ly/SnijIn
Jan. 26-27 Jan. 26-27	REF CW Contest UBA SSB Contest http://bit.ly/W0gZiE
Feb. 2	Minnesota QSO Party http://bit.ly/P2zALC
Feb. 2-3	10-10 Int'l Winter Contest http://www.ten-ten.org/calendar.html
Feb 2-3	Mexico RTTY Int'l Contest http://www.fmre.org.mx/
Feb. 2-3	Vermont QSO Party http://www.ranv.org/vtqso.html
Feb. 2-3	Delaware QSO Party http://www.fsarc.org/qsoparty/ qsohome.htm
Feb. 3	North American CW Sprint http://www.ncjweb.com/sprintrules.php
Feb. 9-10	CQ WPX RTTY Contest

http://bit.ly/uYC0gp

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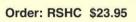
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Good Conditions Predicted for 2013

A Quick Look at Current Cycle 24 Conditions

(Data rounded to nearest whole number)

Sunspots

Observed Monthly, October 2012: 53 Twelve-month smoothed, April 2012: 65

10.7 cm Flux

Observed Monthly, October 2012: 123 Twelve-month smoothed, April 2012: 126

Ap Index

Observed Monthly, October 2012: 9 Twelve-month smoothed, April 2012: 8

One Year Ago: A Quick Look at Solar Cycle Conditions

(Data rounded to nearest whole number)

Sunspots

Observed Monthly, October 2011: 88 Twelve-month smoothed, April 2011: 42

10.7 cm Flux

Observed Monthly, October 2011: 137 Twelve-month smoothed, April 2011: 100

An Index

Observed Monthly, October 2011: 7 Twelve-month smoothed, April 2011: 8

CQ WW SSB How Did You Do?

How did you fare the weekend of the CQ WW DX SSB Contest on October 27 and 28, 2012? My original forecast called for stable conditions, which proved true. Both days saw very low geomagnetic activity, with moderate, though declining 10.7-cm levels. Ten meters was a player this year with hot activity throughout the daylight hours. I'd like to hear reports from you about the contest weekend so we can get a good picture of how all of the solar activity impacted your operation.

ere is an overview of expected propagation conditions on each amateur band between 6 and 160 meters for 2013.

6 Meters: This band will see very little *F*-region propagation, even though this might be the peak of the current solar cycle, Cycle 24. Nevertheless, the summer season will bring the usual troposcatter and sporadic-*E* activity. Aurora will still play a major role during spring and fall.

10 and 12 Meters: These bands will be good during the DX seasons, but will suffer during the summer, except during times of sporadic-*E* activity. Expect most DX openings to be mostly on north and south paths.

*PO Box 27654, Omaha, NE 68127 e-mail: <nw7us@nw7us.us>

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for January 2013

	Ex	pected Si	gnal Quali	ty
Propagation Index Above Normal:2-6, 9-12, 14-21,	(4) A	(3) A	(2) B	(1) C
23-27, 29-31 High Normal: 13	Α	В	С	C-D
Low Normal: 1, 28	В	С-В	C-D	D-E
Below Normal: 7-8, 22 Disturbed: N/A	C C-D	C-D D	D-E 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

- Find the propagation index associated with the particular path opening from the Propagation Charts appearing in The New Shortwave Propagation Handbook by George Jacobs, W3ASK; Theodore J. Cohen, N4XX; and Robert B. Rose, K6GKU.
- 2. With the propagation index, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a propagation index of 3 will be good (B) to fair (C) on Jan. 1st, excellent (A) from Jan. 2nd through the 6th, poor (D) to fair (C) on the 7th and 8th, and so on.
- 3. As an alternative, the Last-Minute Forecast may be used as a general guide to space weather and geomagnetic conditions through the month. When conditions are Above Normal, for example, the geomagnetic field should be quiet and space weather should be mild. On the other hand, days marked as Disturbed will be riddled with geomagnetic storms. Propagation of radio signals in the HF spectrum will be affected by these conditions. In general, when conditions are High Normal to Above Normal, signals will be more reliable on a given path, when the path is ionospherically supported.

15 Meters: This band will be fair to good, seeing worldwide openings during the daylight hours of all seasons. Most openings, though, will be short, except for the strong and frequent north/south path openings.

17 Meters: This band should behave much like 15, but you will find it open more often, with it remaining open for DX an hour or two longer than 15 meters.

20 Meters: Twenty is going to be the main player during this year of moderate solar activity. Expect good conditions during the daylight hours, with worldwide DX openings possible throughout the year. DX conditions on this band tend to peak for a few hours after local sunrise and again during the sunset period. During the summer, expect this band to remain open for DX several hours after local sunset, occasionally later into the night. In the winter months of 2013, nighttime DX openings are expected.

30 Meters: This will be an exciting band for those low-power digital signals. Winter brings longer

nights, providing the right mix for exceptional worldwide DX.

40, 60, 80, and 160 Meters: These are nighttime DX bands. Great worldwide DX should continue on 40 meters from about two hours before sunset to approximately two hours after sunrise during all seasons. Expect coast-to-coast DX on 60 meters. DX openings on 80 and 160 should peak during the early spring, late fall, and winter months. Expect somewhat stronger signals than those of the last few years.

January Propagation

We are in the heart of the winter season. with very short daylight hours. Average daily maximum usable frequencies (MUFs) are at their seasonal lows, but so are noise levels. During the winter months the maximum usable frequencies are generally higher during the daylight hours than during the summer daylight hours. This provides short but strong openings on higher shortwave bands during the day in winter. Then at night the MUF dips down much lower than what would be seen during the summer nights. Summertime MUFs are generally higher during the night time hours than during the winter nights, in part because the ionosphere stays energized through the short nights. Winter nights are longer, so recombination of the ionosphere (which results in a lowering of the MUF) is more complete.

This also means that the *D*-region of the ionosphere is less ionized during the winter, allowing mediumwave and shortwave frequencies to propagate through the *D*-region and off the *E*- and *F*-regions. Finally, the seasonal decrease in weather-related noise makes it easier to hear the weaker DX signals on lower frequencies. With thunderstorms few and far between, storm-related static and noise are greatly reduced.

Because atmospheric noise levels will be at seasonally minimum levels in the Northern Hemisphere during January, the 80 and 160 meter bands should also be hot. Expect some good openings to many parts of the world on 80 meters during the hours of darkness and the sunrise period. Short-skip openings between distances of 50 and 250 miles should be optimal on 80 meters during the daylight hours. During the later afternoon and early evening hours short-skip openings should increase to between 250 and 1500 miles and by nightfall openings up to and beyond 2300 miles should be possible.

Expect some DX openings on the 160-meter band during the hours of darkness. Openings toward Europe and the east should peak at about midnight. Openings toward the South Pacific and in a generally southerly direction may be possible just before daybreak, as well as openings into Asia and North Pacific. Short-skip openings up to 1300 miles should be possible during the hours of darkness, and frequently the skip will extend out as far as 2300 miles. During the daylight hours intense ionospheric absorption will severely limit openings, although some may be possible at times up to 150 miles or so.

Expect 60 meters to play a significant role in nightly DX across the United States. With very low noise levels this month, the weaker signals of 60 meters will be easy to copy.

The optimum band for DX conditions during the hours of darkness should be 40 meters. Expect openings to most

areas of the world from shortly before sundown, through the hours of darkness, and until shortly after sunrise. Signal levels may be exceptionally strong at times. During the daylight hours, short-skip conditions should be optimal for openings between approximately 100 and 600 miles. Skip will lengthen during the late afternoon, and by nightfall short-skip conditions should be optimal for openings between 800 and 2300 miles.

Twenty meters is expected to be a solid band with excellent around-the-clock openings for both DX and short-skip. DX conditions should peak during a window of an hour or so right after sunrise and again during the late afternoon and early evening hours. Short-skip openings between approximately 1300 and 2300 miles should be possible from just after sunrise to as late as midnight. Shorter distance openings should also be possible from mid-morning to midafternoon.

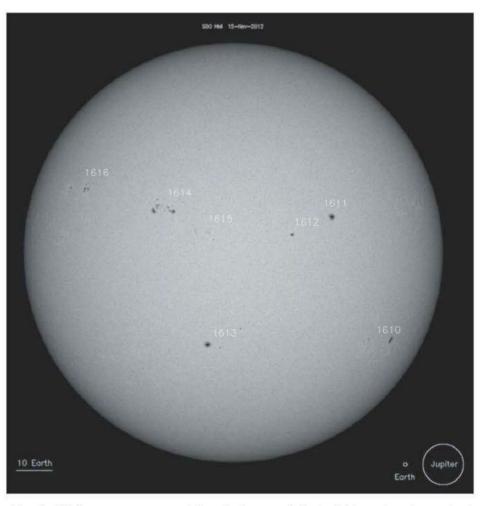


Fig. 1— While many are speculating that sunspot Cycle 24 has already reached its peak, and a dismal one at that, there are others postulating that the cycle is just very prolonged and slow on the uprise. November saw a bit of healthy sunspot activity, and time will tell as to the truth about this cycle's peak level. (Source: NASA)

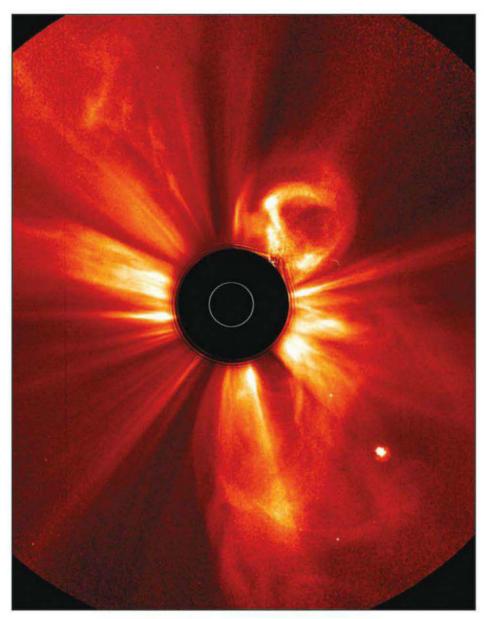


Fig. 2– The Sun produced a series of at least eight coronal mass ejections (CMEs) over a two-day period (Nov. 2–4, 2012). Some of them overlapped each other as the Sun burst some of them into space in a rapid-fire style. The series (see the movie: http://g.nw7us.us/RH9jQV) was taken by the STEREO Ahead spacecraft with its COR2 coronagraph, in which the Sun is blocked out by the black disk (Sun represented by the white circle) so that we can observe activity in the corona. These expanding clouds of charged particles also carry magnetic field into space. In the movie, the bright object moving from right to left below the Sun is the planet Mercury. (Source: NASA/STEREO)

It should be a toss-up between 15 and 17 meters for some great DX propagation openings during the daylight hours. These bands should open to most areas of the world, often with very strong signals. Fifteen meters may have a slight edge before noon, with 17 meters taking the lead after noon and becoming the optimum DX band during the late afternoon hours. Short-skip openings between distances of about 1200 and 2300 miles should be excellent during

the daylight hours. Excellent short-skip openings are expected on 15 and 17 meters from shortly after sunrise through the early evening hours for distances between 1000 and 2300 miles.

VHF Conditions

Sporadic-*E* can occur during January, so be on the lookout. Very little aurora is likely to occur, however, so don't expect auroral-*E* propagation. The

Quadrantids meteor shower is the major meteor shower for January, and it can appear any time during the first week of January. This sometimes can be quite intense, so it may be a good ideato set up some 2- and 6-meter schedules. Morning meteor openings may be the best bet during this month.

Check out the *CQ VHF* magazine "VHF Propagation" column for an indepth look at propagation on VHF and above.

Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for October 2012 is 53. The 12-month running smoothed sunspot number centered on April 2012 is 65. The lowest daily sunspot value during October 2012 was recorded on October 7 with a count of 28. The highest daily sunspot count for October was 83 on October 15. A smoothed sunspot count of 81 is expected for January 2013.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 123.3 for October 2012. The 12-month smoothed 10.7-cm flux centered on April 2012 is 125.8. The predicted smoothed 10.7-cm solar flux for January 2013 is about 136, give or take about eight points.

The observed monthly mean planetary A-index (Ap) for October 2012 is 9. The 12-month smoothed Ap index centered on April 2012 is 8. Expect the overall geomagnetic activity to be quiet to stormy during January. Refer to the Last-Minute Forecast for the outlook on the days this might occur.

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. Please come and participate in my online propagation discussion forum at http:// forums.hf radio.org/>. If you are on Facebook, check out http://www.facebook.com/ NW7US>. Speaking of Facebook, check out the CQ Amateur Radio Magazine fan page at http://www.facebook.com/CQMag.

Now that the new solar cycle is active, I'll be keeping my ears to the radio, hoping to hear you on the air. Happy DX!

73, Tomas, NW7US

Part	Second Part Part	WPX Results (from pag	MILLION CONTROL OF		0.447	204 205 1231	Medica	Make the control	AUFOTA (S	2744 W
KC2BEZ 24,932 106 92 K4HV ** 174,300 423 210 K5LAD **432,140 479 340 **K6MSM **7,579 57 53 **W7JSD **2,166 46 38 **K7Z6 **22,784 100 89 K4RDU **53,317 163 131 WB5AAR **259,644 527 308 **N7FZY6 **7,238 56 47 **N7AME **1,800 31 30 **N2FZY6 **2,785 99 91 KJ3X/4 21 8,588,114 298 1171 (0P: N5FZ) **KW6JJM **6,758 69 62 **KF7BBV **1,798 32 31 **WY1HV2 **21,476 103 91 ***CFTBBV **1,798 32 31 **CFTBBV **1,798 32 31	**WZVU * 48,256 149 128	Number groups after call letters denote following: Band (A = all). Final Score. Number of OSDs, and Pretixes. An asterisk (*) before a call indicates low power. Certificate winners are listed in bold-face. (Note that the country names and groupings reflect the DXCC list at the filme of fine contest.) 2012 WPX SSB RESULTS	**N2GXJ	1.505 68 65 64 1.505 7.82 67 64 1.505 7.82 67 64 1.505 7.82 7.8	12YOJA 14 **AUC 37 **NRSX/4 A 2, **NRSX/4 A 3, **NRSX/4	10.644 555 52	N5VU AASBU SAASB S	156,668 278 212 155,763 404 434 155,949 192 144 461,15 141 115 33,963 108 107 22,869 129 120,807 133,965 133,965 136,860 1	*AEEXC ** *AEEXC ** *AGEKA ** *AGGKA ** *AGGKA ** *AGGKA ** *AGGKA ** *AGGKA ** *AGGKA ** *AGGHE ** *KJENDOF ** *KJENDOF ** *KJENDOF ** *AEGG ** *A	1,136

*KD7HXN	Sarsi	216	12 12	*KA9CLP	9,79	96 69 62	VE3TA	* 207,	260 288	241	1	Turks & Caicos Isla	unde	*RA9AEA	794.1	136,324	248 197
*KU7Y		27	3 3 228 158 89 73	*KC90YE *K9PMV *W9SWT	9,10 7,91 5,51	00 75 70 20 53 48	VA3FP VE3RZ *VA3SWG	21 182, 7 167,	528 280 291 200	248 173 593	*VP52V	A 2,032,550		*RU9YF *R9SD *UA9JNT	90 90	124,929 119,784 114,266	221 189 202 168 241 194
*W7UPF	21 152 " 66	1,281 2, 558 8,716	22 21 270 238 175 164	*K9TCD *KC9VGG *N9IFG	" 3,6 " 9	75 28 25 08 14 13	*VA3UG *VE3FH *VE3NNG	960, 702, 420,	526 745 506 596 138 443	437 361 306	KP2MM	US Virgin Island A 6,621,256		*UA9R *RV9CM *RV9MB	÷	67,326 65,212 56,718	183 147 152 137 172 137
VV/JFF	ONCS 23	1,920 1,155	124 112 30 30 21 21	*KC9TQR *W9YB	28 4,30 4,30	68 44 42 (OP: KC9UWQ)	*VA3DBT *VA3GD *VA3KAI	151, 127, 121,	264 242 776 230	210 194 172		AFRICA African Italy		*RA9JB *UA9JFH *RA9SKL		54,120 53,325 42,939	158 123 162 135 137 117
*KB7QND 3			8 8 130 82	*KG9HM *K9PY *W9EBK	21 48,9 14 19,0	10 145 134 32 105 94	*VE3TU *VA3GKO *VE3NE	100, 92, 80,	362 186 400 147	163 154 134	*IH9YMC	28 27,260 Angola	107 94	*RX9DJ *RA9AMO *UA9ODE		41,820 36,396 27,472	133 123 121 108 110 101
K8WT		7,965 1	847 803 OP: N8BJQ) 043 555	*N9WI *KC9CDW *W09S	13,96 2,0 7 4,3	77 31 31	*VE3RCN *VE3WG *VA3PAW		581 116 452 111	92	*D2QV	28 822,764 Canary Islands	711 412	*UA9AX *R8US *UA9UX		20,967 20,181 15,120	95 87 98 93 75 70
WD8EOL ND8L N8IVE	* 87-	4,144 9,532	794 484 708 463 430 286	KU1CW/Ø KGØF	A 8,764,78 7,530,88	36 2885 1067	*VA30V *VA3FN *VE30IL		180 75 540 63	54	EE8Z EA8DO	A 8,163,175 * 2,671,200	(OP: NP4Z) 1209 600	*RX9CET *R9UG *UA9OAL	3	3,276 2,054 364	28 28 31 26 13 13
W8JRK W8QGP KC8RPV	" 169 129	9,689 8,330	371 262 297 229 243 205	ACØB	2,056,78	(OP: NXØX)	*VE3VID *VE3AJ *VA3DDX	* 3, 2,	760 40 007 33 550 30	31 30	*EA8LS	21 27,645 A 838,452	102 97 644 428 (OP: DJ10J)	*UA9JSJ *RV9DC *RZ8U	28	1,016,880 448,970	9 9 861 456 516 323
N8MSA WA8TM K8BZ	. 6: 3:	3,048 9,078	198 185 166 148 131 117	NAØCW KDØFW WAØJZK	1,546,7- 1,476,03 388,7	34 1147 589 52 513 312	*VE3XAT *VE3IAE *VA3GUY	14 89, 50,	697 142	179 129	*EA8CST *EA8AQV *EA8BQM		336 251 271 208 268 197	*RW9DW *UA90MT *RA9SF	90	436,425 224,020 35,424	504 345 330 230 134 123
K8VE AL7BA/W8 NB8I W8LIG	, 2		121 110 108 100 29 28 26 25	NCØB NØHTV KCØVTJ KØAP	" 301,93 " 125,03 " 100,83 " 81,0"	28 266 207 90 235 177	*VE3AU0 *VE3SWS *VE3PYJ *VE3EDY	7 146, 7,		28 165 40 44	*EA8CZT *EC8AQQ *EA8VD	28 6,075 21 259,570 14 990,416	47 45 348 257 709 478	*RA9AP *UB8QAA *R9RA *RX9CCJ	21	26,352 16,936 856,215 345,408	116 108 85 73 669 477 406 336
KC8ZMN KD8SQ	21 18 ⁻ 14 92	1,248	292 256 202 185 49 48	AAØA KØSIX WAØVPJ	63,60 49,90 27,0	00 193 159 30 159 140	VE4VT VE4KZ	A 3,916,	360 1676	788 244	D4A	Cape Verde A 14,357,235	3718 1163 (OP: N6KT)	*UF8T *UA9MRY *R9MJ	14	100,419 190,762 104,992	215 187 288 253 197 193
	A 1,317	7, 942 1,768	891 531 934 508 655 404	WØRIC WØBH KØVG	" 14,2" " 9,45	71 70 67 53 112 69 54 60 56	*VE4YU *VE4TTH	A 379, 221,	131 440 961 328	299 241	D44AC D4C	21 17,356,864 14 6,534,990	4283 1376 (OP: I4UFH)	*RU9AC *RW9DX *UA9UKL		5,324 532 429	47 44 14 14 13 13
*KB8UUZ *AC8GX *K8PGJ	470 431	0,054 5,400	541 358 539 350 501 312	NAØBR KDØCVO WØDHB	6,33 4,53 28 3,00	25 57 55 20 41 40 07 33 31	*VE5U0 *VE5GC	A 155, A 119, 65,	970 269			Djibouti	(OP: IZ4UEZ)	*RA9U *RD9SA	7	12 18,239	63 61
*N8BV *WS6K/8 *KD8NOH	33	8,034 4,032	532 331 484 318 413 304	NØSMX NØZC NYØT	21 52,33 14 5,73 7 22,84	24 57 54 11 93 91	*VE5KS *VE5ZX	28 27, 21 634,	920 612	89 429	*J28AA	14 225	9 9 (OP: E7ØA)	RWØUU UAØBA RAØQD		865,260 410,550 291,323	922 460 493 345 443 317
*WA8FRE *W8ASA *N8SBE	" 19- " 17:	4,040 5,017	428 305 339 245 305 227	*WIØWA *WBØTSR	491,53	JEWD @WØEWD) 38 587 366	VA6UK VE6KD VE6FN	A 861, 377, 50,	152 442 518 153	134	*7P8PB	A 144	8 8	RUØLL RWØUM RØDX	21	246,740 10,659 2,539,116	340 260 60 57 1428 753
*AC8JF *KB8KE *KF8BT *KD8OSD	15	1,200 9,598	289 236 276 216 309 223 246 190	*WBØLJK *KA8HDE/Ø *WØOVM *KØVVX	" 224,44 " 208,23 " 207,3" " 180,79	36 417 268 15 322 255	*VE6EX *VE6SQ *VE6AMI *VE6EC	A 2,354, 208, 94, 22,	210 354 500 211	235 180 90	CT3FW	Madeira Islands A 98,992 Mayotte	190 184	RNØCF RØAA UAØIBX	90 90	1,856,025 775,992 113,295	(OP: UAØDC) 1252 657 732 447 230 195
*W8GOC *N8HAM *W8KNO	" 110 " 10-	0,188 4,517	204 163 227 189 235 179	*WAØLJM *WØGN *KKØSD	167,04 166,91	10 304 240 72 312 247	*VA6AN VE7CC		670 49	42 1081	*T07BC	A 3,172,628	1478 727 (OP: DL7BC)	RTØB RKØUT *RWØA	14 A	30,858 87,894 5,171,096	125 111 197 171 1892 856
*WJ8E *K8VUS *AA8N	. 8: 6:	2,668 3,248	192 166 164 134 159 133	*KØBAM *NR9A/Ø *KIØI	134,92 133,90 128,70	22 289 226 30 272 203	VA7ST VE7VR VC7R	2,553, 58, 14 5,664 ,	759 1385 595 184	657 129 988	CN2R	Morocco A 27,280,992	5465 1424 (OP: W7EJ)	*RDØA *RAØJBL	023 081: 001	544,500 481,492	(OP: RAØAM) 507 375 579 353
*W8IDM *KE8UM *WB8TQZ	" 41 " 43	6,750 3,942	155 134 141 125 143 127	*WØTUP *NNØQ *KTØA	" 102,80 " 86,73 " 73,03	30 246 177 32 223 179	*VE7RSV *VE7VAW		2 68 151 572 45		*S79NEN	Seychelles 14 135,660	241 204	*RAØQW *UAØC *RZØSB		188,244 158,592 131,461	380 252 397 224 262 209
*K8CR *KD8HHG *KB8UHN	31	0,906 7,824	160 135 111 101 110 94	*NØGOS *KØNEB *KIØJ	66,8 66,2 52,0	20 171 154 00 144 125	*VE7TI *VA7CRZ *VA7ZM	14 133,	545 15	15	ZS5NK	South Africa A 80,190	187 162	*RAØCHK *UAØACG *RXØSA	0	82,302 57,116 51,348	255 174 166 131 145 132
*KA8NJW *NR8R *WA8SDF	" 21 2	6,051 4,104	125 106 123 109 98 92	*WØZF *KOØZ *KDØKIM	40,09 39,19 24,2	95 134 117 74 122 106	*VE7DAQ *VE7YU	3.7 10,		52	*ZS6EE *ZS6GRL *ZS1JY	28 1,283,660 28 35,964 15,478	831 530 119 111 75 71	*RAØWMD *RXØSC *RKØSV	90	26,108 24,153 16,093	126 107 102 97 88 77
*N8NX *KE8F0 *N8YFQ *WT8E	1 1	3,660 7,052 4,184 3,760	96 91 90 84 74 72 85 80	*KRØL *KØUK *WØNFS *WDØT	" 22,53 " 20,4" " 17,4" " 14,33	18 96 83 72 92 84	*VE8DW *VE8GER *VE8NE	A 19, A 316,		297	*ZS6C	Tanzania	9 9	*UAØLNL *UAØZS *RZØSW *RAØUBI	28	5,750 5,474 3,096 67,064	59 50 51 46 36 36 290 166
*WB8WNV *NA8Y *WC8Z	" 1;	3,505 2,629 1,084	80 73 77 73 80 68	*NØUJT *WA5SWN/Ø *NØAX	12,00 11,24	37 87 79 42 76 73	*TE2M	Costa Ric 28 25,	730 124	83 (12KAC)	answib	A 261,040 Zambia	(OP: IK2GZU)	*UAØOD *UAØSOX *UAØUK	21	53,700 798,930 483,527	221 150 694 495 540 389
*K8JTD *KD8RKJ *K8ANM		9,362 9,027 8,892	69 62 61 59 61 57	*AEØAR *ADØH *KØLDS	" 9,84" 8,66	12 90 74 34 64 52	CO2GG	Cuba A 2,683.		655	*9J2RI	A 1,656	24 23 (OP: ZS6RI)	*UAØXAK *RAØAY *RAØSMS		47,320 45,560 4,268	188 130 153 136 44 44
*NT8Z *N8WS *KC8UNR		8,788 6,555 3,952	55 52 60 57 39 38	*NØAJN *KDØKQS *NO2D/Ø	4,3 4,09 2,84	12 44 44 95 46 45 19 41 37	*CM5FZ *C02WL *C06LE	A 497, 446, 317,	124 535 322 478	289	Z21BB	Zimbabwe 28 379,862	427 301	*UAØSJ	7 Asia	177,970 atic Turkey	217 185
*W8KH *NF8M *KK4CIS/8	i i	3,311 2,958 2,812	46 43 36 34 42 38	*WØJEC *KDØCVZ *NØWY	2,72 2,6	13 40 39 32 40 38	*C06LP *C02VE *C02VDD	236, 183, 36,	209 314 158 116		*T6JP	ASIA Afghanistan A 155,507	280 211	*YM3KB	,	99,825 68,761	197 165 155 133 (OP: TA3DJ)
*KD8JAM *N8CN *KB8YSX *W6AMD/8	28 46	1,166 5,566 2,640 406	22 22 152 117 33 33 14 14	*KDØOYR *KØANS *KFØF *NQØI	" 2,41 9,	16 22 22	*C02JW *C02MS *C02CW *C08AW	17, 17, 21 804, 77,	242 78 304 754	469	*T6M0	28 159,558	(OP: OZ2JBC) 295 203 (OP: K9GY)	*TA7A0 *TA4ED	14	10,126 8,990 zerbaijan	63 61 64 58
*NF8J *KG9Z/8	* 9	7,427	297 272 203 187 126 118	*WØPPF *KDØNEL *KDØBKH	14 26,10 20,45 1,50	00 129 116 53 154 113	*CL8AKY	7 5,	500 40	40	*EK3GM	Armenia 28 629,180	671 326	*4K9W	Α	7,399 Bahrain	52 49
*AF8C *KC8R	14 14	4,399 4,100 144	83 77 43 41 9 9	*KØLAF *N9HDE/Ø *KCØRQH	7 24,73 4,5	99 93 12 59 48	*HI8LAM/	Dominican Re 3 A 4,354, 377.	11 1902	797 308	RA/KE5JA	Asiatic Russia 21 424,252	604 367	A92GR	28	275,400 China	367 255
*NR8U AC9S	A 1,53	1,455 1	181 155 107 579	*WØRO	Alaska	36 4 4	*HI3EPR *HI3K *HI3CC	28 776, 21 2,070, 14 440,	145 1218 114 724	302	UA9BS RL9I R9UT	A 9,356,303 3,348,981 2,416,295	2713 979 1483 801 1349 655	BA7IO BD4QH B4TB	Ä	3,606,468 1,204,000 483,536	1932 813 1077 500 681 376
Mean	" 23	B,750	532 344 354 250 OP: W9TC)	AL1G AL7KZ KL5DX	A 1,082,08 296,44 107,60	12 386 258 04 276 183	*HI8GPR *HI8KW		140 10	54 10	RA9JBA UA9AU RX9JD	1,028,375 978,836 551,150	777 433 668 428 523 365	BH7PFH BD4DYH		329,072 37,152	(OP: BA4TB) 437 314 137 108
NQ9A WI9WI KR9E W9GT	" 19:	B,220 5,445	328 265 356 265 325 215 245 198	*KL3HM	A 3,43 Barbados	(OP: KL7SB) 32 37 33	* FG4N0 *FG1PP	Guadeloup A 568, 148,	180 604		R9QQ R9YP R8AA	481,371 359,388 40,255	489 319 471 298 114 97	BG5CLC BD4TJ BH1LYB BG5FCH	50	28,560 11,400 1,316 204	188 105 116 76 28 28 12 12
W90A K9DXL N90K	. 8	5,500 5,320	182 171 231 180 146 118	8P5A *8P6NW	A 24,809,50	(OP: W2SC)	*TG9AXF	Guatemal 14 556,		375	UA9JFR RV9MA RT9A UA9BA	" 31,906 " 25,286 " 19,266 " 210	101 86 103 94 93 78	BH4RZI BY1CW	21	77 134,596	8 7 518 209 (OP: BD1GXH)
K9QC W9WLX KG9N	1 11	2,090 9,976	94 94 111 88 114 76	VY2ZM	Canada A 18.863,41		*HQ2N	Honduras 28 292,	508 521 (OP: JA	256 6WFM)	RZ9UI UA9CBM R9CB	28 1,201,248 37,211 21 1,195,686	869 516 137 127 886 543	*BG8GAM *BD4WN *BG5CIC	A	426,904 255,930 97,614	568 344 404 285 231 187
WB9B N9LIS K9CT	21 3,228	4,773 2,695 3,472 1	45 37 35 35 597 839	VY2/K5WA VE9AA	" 11,796,9" " 1,298,28	(OP: K1ZM) 12 3167 1037 36 864 498	T05K	Martiniqu A 14,817,	e 938 4862	1201	RM9T RK9QWM RA9AAA	688,425	611 411 457 324 402 331	*BD2IAQ *BG4FRZ *BH4SCF	90	65,280 64,800 53,721	207 160 184 150 164 127
AJ9C W9GL KD9MS	" 11- 2: 14 2	4,086 5,298 2,520	236 203 94 91 31 30	V01KVT VE1JS V01BQ	993,88 188,34 15,18	34 748 482 40 260 219 58 62 53	FM1II *FM5FJ	7 52, 14 335,	(OP 015 112	RCØF) 101	UA9YK RU9WZ RK9UN	" 128,184 " 75,544 14 853,230	235 218 185 152 662 478	*BA1SN *BA5HAM *BD7KBH	:	44,070 37,088 35,520	173 130 155 122 143 111
	A 1,524	1,646 1	231 147 033 542 (OP: N4TZ)	*V01TX *VE1AL *V01BBN	A 1,257,04 467,54 248,84	14 470 322 18 321 206	XE2S	Mexico A 3,284,			RU9UC R8MC RX9UKF	7 2,329,002 3.7 21,420	62 61 846 538 72 63	*BD4UK *BG4HRM *BD4RDU	(90 20)	34,969 24,288 22,568 21,375	189 121 119 92 132 91
*K9QVB *W9QL *K9JE	" 899 " 409	8,840 8,156	077 493 739 460 516 339 432 312	*VE1ZA *VE9OA *VE1RAR	19,5 13,60 14 126,63	08 68 63	XE10GG XE1L *XE1X0E *XE1FZE	235, 21 3,636, A 590, 106,	370 2034 303 721	790 343	*RT9S *RV9CBW *UA8WAA *R8MD		1437 696 1221 646 922 531 727 418	*BD70ZG *BG6CJR *BG4HJE *BD6SN		21,375 18,564 18,063 14,694	123 95 105 84 96 81 99 79
*W9JA *NV9X *N9LYE	" 15: 13:	3,201 0,764	279 223 252 204 250 198	VE2EZD VE2JM *VE2AWR	A 78,93 14 1 A 434,80	12 8 7	*XE1ZTW *XE1AY *XE2MVS	20, 9,	250 95 342 59	81 54	*RF8R *RZ9YB	906,963 883,036	727 418 702 447 (OP: RW9RW) 741 427	*BD4TZ *BA5AB *BA4SCP	561 590 590	12,512 9,381 6,068	94 68 69 59 53 41
*W9M0 *N9VPV *K9IAC	" 105 " 95 " 85	5,700 3,438 3,166	236 175 220 174 203 166	*VE2AX0 *VE2KY *VE20XA	55,11 38,20	38 157 126 00 118 100 00 61 60	*HP3FTD	Panama A 60,			*RX9KD *RT9YA *UB9AAJ	820,218 678,084 517,924	700 413 579 363 465 316	*BD5BMC *BD4IJ *BD7JAD		4,200 3,627 3,600	49 42 42 39 43 40
*WX9EP *KB9RDS *K9AMP	6 6 5	7,098 5,858 2,662	206 159 188 149 161 134	*VA2AFH *VE2GLA	21 54,90 14 4,40	15 145 139 30 41 40	WP4I	Puerto Ric A 89,	o 558 190	153	*RU9MN *R8ABC *R90AZ	305,923 294,115 277,680	400 283 403 295 370 267	*BG1RHJ *BD4UM *BG4GYB		3,216 1,504 1,428	50 48 34 32 29 28
*WB9LRK *WR9Y *K9WWT *KC9DOA	" 3I	0,360 5,935	133 116 126 115 121 105 106 94	VE3EJ VE3OI	A 15,890,91 15,554,41 8.328,4	(OP: VE3AT) 77 3981 1217	*WP3GW *KP4CPC	28 339, A 575,	(OP: K 073 524	P4JRS) 361	*RV9WNE *UA9SAW *RZ9UGN	253,184 245,949 221,972	346 256 341 257 317 263	*BG1LYZ *BD3RQ *BD1LEN *BH1LHS		1,377 1,363 330 288	28 27 32 29 12 11 12 12
*K9XB *KC9QOJ	* 2		105 94 105 96 69 63	VA3ZDX VA3YOJ	* 469,4 * 209,6	10 493 326	*KP4RAY *KP4JFR	30, 3, 28 76 ,	316 39	36	*UA9YTN *RA9AN *UA9NP	" 202,242 " 193,024 " 172,032	309 222 283 232 297 224	*BG6QYE *BG2WCG		230 210	12 12 11 10 14 14
I														-			

*BH4BHB *BG5FIM	- K	100 77	10 7	10	*7M1MCY *JA1JLP	K.	8,736 4,756	64 47	56 41	*JA7LLL *JA7ADV	14 7,452 936			*XV2RZ		92,415	364 183	*9A2Ø4MF	A	598,752	722 462 (OP: 9A4MF)
*BG1SQT *BA4MY *BG6JAI	×.	60 56 9	6 9 3	6 7 3	*JI1UCL *JK1BII *JF1KWG		4,635 4,251 2,262	50 43 30	45 39 29	JH8CXW JA8DIV	A 291,555 263,144	378 351	279 254	*XV4Y	West Mal	3,672 lavsia	38 36	*9A2NO *9A1IW *9A2EY		498,804 398,808 115,907	580 422 541 348 257 257
*BI7JMD *BD4RQ *BG7[E]	28 21	1,682 151,417	31 411	29 223 128	*JN1CDB *JH8SEG/1	Ď	1,690 1,288	34 24 21	26 23 20	JASKXA JASECS	107,508 21 393,764	219 430 506	343	9M2CQC 9M2IDJ	A 1,21 28 32	14,464 26,146	1057 512 417 313	*9A3QB *9A6ARB *9A1CVG	ì	85,778 60,720	203 154 201 165 179 143
*BG7IEU *BA1AK *BH1EBF	27 30	41,344 20,564 17,856	156 115 119	97 96	*JI1LAI *JG1WKM *JH1CVJ	10 10	1,100 290 260	11 10	10 10	*JA8COE *JE8KKX *JJ3DJS/8	A 492,558 33,088 12,348	131 79	94	*9M2T0 *9M2ZAK *9M2ESM	* 4	17,810 42,896 39,360	247 210 150 112 133 123	*9A1MM *9A2Ø3JB	x:	46,189 39,375 34,500	145 125 136 115
*BH1KTL *BD6IF	#: #:	5,616 1,218	74 34	52 29	*7N2JZT/1 *JH1RRP	E	75 27	5 3	5	*JI8BUR	7 780	13	13	*9W2VVH *9W2WWW	28 12	29,956 9,610	254 212 63 62	*9A5IGY	5	29,640	(OP: 9A3JB) 143 130
*BD9GBE *BD6JIN *BA4WR	14	280 72 102,120	16 8 353	14 8 185	*JR1AHP * JF1TEU *JA1KEV	14	27 21,294 12,792	99 94	3 91 82	JA9LJS JF9JTS JA9CCG	A 656,448 268,832 21 209,308	377	248	*9W2CEH	EURO	1,180 DE	23 20	*9A6IND *9A6J0Y *9A2Ø4W		28,514 24,852 22,420	113 106 125 109 101 95
*BD2VJM *BG2VIA		27,888 18,984	201 88	112 84	*JE1GZB *JE1SPY	3.7	1,682 9,932	33 68	29 52	*JA9TQY	7 555,485 A 84,336	425 208	269 168	онох	Aland Isl	lands	2502 1044	*9A7IUP		21,424	(OP: 9A4W) 116 104
*BD4WM	7	2,635 Cyprus	34	31	JA2VHO JA2BNN	A	696,728 413,319	629 513	376 311	*JA9EJG *JA9XAT	28 85		10 5	UIIDA	14 0,13		(OP: OH2PM)	*9A5G *9A5KIS		19,800 9,338	94 88 (OP: 9A2VX) 64 58
C4W H2T	A 28	16,750,800 3,839,844		739	JR2PMT JA2XLV JA2AYH	Ĭ	239,955 197,292	323 328 52	255 246	JAØAXV JAØCIY JJØPJD	A 944,182 258,263 47,502	722 390 142	271	*ZA1TC	Alban A 30	02,583	519 349	*9A1SZ *9A1DL *9AØW		8,946 7,250	70 63 63 58
*5B4AJT	Α	126	(OP: 5E	7 7	JA2CPD JJ2CJB	28	7,242 396 54,954	15 164	51 12 142	JAØJHA JHØOXS	28 547,008 21 97,495	609	352		Andor		(OP: TA1HZ)	*9A2WJ *9A7ZZ	28 7	162,176 24,200 4,176	279 224 98 88 50 48
VR2KF	ΑH	ong Kong 198,792		264	JR2IOB JH2BTM JA2GTW	21 7	1,161,440 25,996 71,760	819 107 130	97 115	*JHØNOS *JHØNEC *JAØNFP	14 322,088 A 334,184 20,580	364 411 90	326 296 70	*C31CT	A 2 Austri	20,832 ia	100 93	OK2BXE	Czeci	h Republic 2.185.690	1273 731
VR2VIY VR2XMT *VR2PW	28 14	3,914 591,717 13,520	752 103	38 399 80	*JA2CUS *JA2AXB	Á	613,056 524,117	584 570	372 341	*JHØJDV *JHØMXV	" 11,245 28 77,274	70 210	65 162	OE1SSS OE1WWL	A 9	9 7,284 82,368	244 201 206 176	OLØW	7	519,995	599 415 (OP: OK1DSZ)
3.130.007.0.00		India			*JR2PAU *JA2KPW *JA2GHP	10 10	187,220 108,550 83,367	294 254 224	230 167 157	*JHØEPI	14 95,757 Jordan	209	177	OE9MON OE3DXA OE8SKQ	* 1	79,566 14,476 20,714	211 178 81 77 1064 598	OK2JK OK1FRO OK1EP	28	48,422 5,712 342,264	163 142 51 48 455 312
VU2RCT VU2JOS VU2HOT	Å	481,289 4,140 60	503 37 5	347 36 5	*JE2DOD *JQ2OUL	-	27,600 14,592	111 93	92 64	*JY4NE	A 1,593,492	1048	551	*OE2LRO *OE2IJL	Ą 2	25,992 840	144 114 14 14	OK2ABU OK1XC	21	61,490 411,642	166 143 513 378
*VU2ABS *VU3NXI	A	51,062 6,716	147 49	121 46	*JR2NTC *JF2FIU *JM2NWF		14,325 12,412 6,776	93 71 59	75 58 44	UPØL UP4L	Kazakhstan A 18,541,055 9,786,309		1235 1047	*0E8SCQ	21 Azore	27 28	3 3	*OK6MA *OK1WCF *OK2ZI	Ą	110,670 4,302,909 3,710,889	265 217 2057 943 1814 897
*VU2SGW *VU3DMP	28	4,284 5,358	45 48	42 47	*JG2KFI *JF2OHQ	W 100	1,440 442	47 15	36 13	UN7QF	* 252,476	(OP: 374	UN7LZ) 254	CQ8X			4344 1200 (OP: OH2UA)	*OK1CID *OK1CLD		1,135,025 612,896	1074 547 688 428
4XØL	Α	Israel 255,024		252	*JG2QUM *JP2MRD *JH2MYN	28	308 65 36,533	15 5 134	14 5 119	UN6GK UN8GU UN8GV	229,320 28 1,098,640 21 2,632,449		496 743	CR2T			1396 704 (OP: CU2AF)	*OK1HEH *OK1BA *OK7N		429,323 418,968 319,853	592 373 590 396 395 317
4Z5LA *4Z5MV	21 A	32,200 37,604	(OP: 47 116 124	100 119	*JA2KKA *JE2BOM *JS2PHO	21	43,542 41,082 1,500	145 140 26	123 123 25	UP6P *UN8PT	2,170,824 A 449,460	1169		EA6SX *EA6UP		slands 41,340 1,357	154 130 23 23	*OK2BZE *OK2BRX *OK2WYK	:	310,072 305,588 188,768	436 343 455 317 347 272
*4Z5PJ *4Z5FL		16,117 690	79 16	71 15	*JF2FKJ *JR2AAN/2	90 80	204	13 2	12	*UN5C *UNØLE	262,680 45,384	349 134	264		Belaru	us		*OK1MJA *OK1MKU	*	186,816 126,522	398 278 253 198
JR1AIB	А	Japan 5,833,618	2100	889	*JI2IXA JA3AOP	7 A	42 1,856,995	3 1059	3 595	*UN7TW *UN9PQ *UN6G	28 16,892 21 344,410	9 86 429		EW8DD EW4MM EW8DJ	' 87	38,650 73,600 31,136	1625 755 883 520 637 484	*OK1DPU *OK2SGY *OK1BLU		125,802 120,310 97,284	301 241 292 227 237 201
J01WK0	-	2,349,900	(OP: JH50 1175	630	JA3QOS JA3FRI	2	899,712 63,705	727 203	426 137	*UN6LN *UN7RL	14 267,090 250,040	338	290	EW8DX EW8CY		99,216 91,980	249 212 274 219	*OK2WZN *OK2MRJ	ř	94,432 91,080	262 208 223 184
JH1HIC JH1ASG JA1TMG	1	895,560 421,611 337,820	740 542 401	439 313 266	JA3AHY JO3JIS JH3GCN	28 21	1,922 1,540,045 105,432	34 1094 212	31 559 191	EX8MAT	Kyrgyzstan A 1,400,841	994	507	EU6AF EW3LN EU8MM		78,200 7,068 1,298	197 170 59 57 23 22	*OK1AOU *OK2KFK *OK2PBG		66,864 62,790 45,457	211 168 200 161 170 131
JA1IXY JA1QZC JA1XUY	× ×	98,124 78,432 75,392	193 184 200	148 152 128	*JF3BFS *J03PSJ	A	919,149 120,528	722 274	483 186	EX2B EX2T	284,900 28 987,705	454 873	275 467	*EU2DX	A 79	407 90,035	13 11 863 465	*OK2TC *OK1VHV	ě	32,500 30,420	150 125 143 117
JA1MJN JG1WCT	80	70,528 63,294	188 210	152 137	*JG3BXS *JS3CGH/3 *JA3KDJ	¥.	25,670 19,513 17,696	114 107 99	85 79 79	*EX7ML	21 622,120 Laos	591	412	*EU2MM *EU6AA *EW7LE	* 1	25,852 15,251 15,222	444 319 106 101 98 86	*OK2SWD *OK2EC *OK2BND	1	19,570 13,072 5,050	117 103 80 76 52 50
JA1IZZ JO1SIM JA1JYS	8	42,642 41,514 32,851	130 174 111	103 111 91	*JR3NDM *JR4ISF/3	90 80	15,549 14,528	98 90	71 64	*XW3DT	28 736,932	692	434	*EU7BBN *EW6EW	21 2	1,428 22,999	25 21 124 109	*OK5SWL		1,952	34 32 OP: OK2SWD)
JE1REU JF1UOX	*	19,902 18,404	104 92	93 86	*JR3SZZ/3 *JH3BYX *JL3WSL	ž	12,870 10,332 4,095	93 71 41	66 63 35	*XX9AU	Macao 21 12,450	141	83	*EW7DK *EW2EG *EW80G	14 7 9	12,728 928 99,600	78 74 32 29 226 200	*OK2TBC *OK1ARO *OK5ET	21 14	21,338 12,600 294	102 94 81 70 14 14
JR1LZK JI1LET JR1HUA	28 21	52,934 2,308,788 247,800	165 1214 333	133 708 280	*JH3GMI *JM3HYL *JO3EVM	W.	656 210 192	17 17 8	16 14 8	JU1DX	Mongolia A 790,603		451 JT1BV)	*EW6DM *EU2EU		71,832 74,304	179 164 219 172	*OK2ILD *OK2BRS *OK1ZY	7 3.7	312,180 148,520 576	406 330 260 235 18 18
JA1NQU JO1COV JI1LNR	5	226,269 204,620 6,164	334 308 48	279 260 46	*JA3DAU *JA3IKG *JA3LKE	28	38,400 20,184	136 101	87 52	JT1E	28 533,544	779 (OP:	376 JT1DA)	ON7HLU		57,896	527 392	* 0K1J0K * 0K1KZ	1.8	60,060 1,012	199 156 23 23
JA1KVT *JM1UTT	3.7 A	12,320 948,024	62 765	55 462	*JR3RIY *JJ3JHP	21	6,188 1,203,184 207,766	55 818 300	556 262	*JT1BZ	A 62,431 Ogasawara	174	149	ON7ON OQ4T	28	16,974 9,016	88 82 61 56 (OP: ON4TO)	OZ6AGX	A D	enmark 291,200	432 320
*JA1GLE *JH1DYU *JH1FNU		359,712 276,940 246,012	453 381 375	288 244 247	*JF3IYW *JI3FSI *JF3VAX	10 10	135,191 121,191 49,632	261 244 143	217 203 132	*JD1BIA	7 22,896	122	72	*0N3AR *0N4CT	A 29	54,976 96,032 29,810	1068 576 424 319 120 110	OZ2BKK OZ1HHH OZ7DK	8	288,108 236,835 33,840	473 318 413 277 147 120
*JA1CPU *JL1MWI *7L1FFH	- K	189,072 175,446 156,780	323 295 271	234 243 180	*JA3BBG *JM3QIS	ř	9,780 4,368	67 42	60 42	A4100 *A410F	Oman 14 4,329 14 7,425			*ON3ND *ON5YU		43,139 4,047 992	214 179 61 57	OZ7EA 5P12EU	Š	25,894 1,600	122 107 21 20
*7K4VPV *JA1AZR	90 50	144,256 91,520	269 241	196 143	*JA3PYH *JA3NOJ *JA3DAY	14	3,145 96 18,860	43 6 88	37 6 82	*A41MX	7 248,024	226		*0R3R	Bosnia-Herz		32 31 a	OZ3BJ *OU8A	28 A	93,195 460,498	(OP: 0Z1HHH) 195 171 658 386
*JJ1KZZ *JA1VGV *JF1WNT		86,574 75,616 72,150	186 191 173	141 139 130	*JG3DIX JH4UYB	7 A	3,150 9,796,779	27 2919 1	25 1047	HL5YI HL5U0G	Republic of Kor A 63,431 45,133			E7DX E77A			4410 1330 (OP: E77DX) 2384 979	*0Z1ACB *0Z4NA *0Z1KVM	X.	442,728 336,826 233,478	578 387 515 343 401 306
*JA1GP *JA1HOM *JK1NSR		56,991 45,560	205 154	121 136	JA4DPL JH4RUF	- 0	926,534 114,534	752 227	458 162	*HL1VAU *HL2NFB	A 327,184 3,400 2,624	438	286 34	*E73MJ *E78CB		60,912 4,800	199 162 51 48	*OZ5TL *OZ2CA		111,321 98,345	310 217 263 221
*JF1MBT *JE1LDU	5	39,050 38,410 36,080	140 141 139	110 115 110	JO4BOW JH4EMK JA4NQD	28	16,264 846 3,880	88 20 44	76 18 40	*HL2/KA8U *DS2G00 *6K2FJJ	21 30,368 7 13,206	118	104	*E76MB *E74NR		11,398 39,186	94 82 144 126	*0Z3ANT *0Z60G *0Z8PG	i	95,480 12,719 12,375	251 217 85 79 76 75
*JA10HP *7M3FMR *JA9DTV/1	5	34,986 34,848 29,520	122 140 104	102 99 80	*JR4PDP *JE4MHL *JA4BDY	A	209,990 65,392 27,451	352 156 118	230 134 97	HZ1TT	Saudi Arabia A 2,504,568	1297	583	LZ1784SIB	Bulgar A 1,44	ria 48,811	1300 609 (OP: LZ1ZF)	*0Z8KEL *0Z1DGQ *0Z1CCB	28 7	1,881 119 8,636	41 33 7 7 69 68
*JE1CWQ *JJ1LRD	20 20 40	29,321 27,936	129 130	109 96	*JA4CSJ *JA4AQR	*	17,088 10,080	77 64	64 60	*HZ1DG *HZ1HN	A 2,297,460 1,603,661	1267 1055	649 527	LZ1BJ LZ3ZZ	* 98	35,424 86,583	978 608 865 533	*0Z9V *0V3X		8,370 1,325	66 62 25 25
*JA1LZK *JR1MRG *JG1LPL	*	26,550 23,639 22,420	122 114 103	90 77 76	*JN4UUS *JJ4CDW *JR4LRY	28 21	2,988 14,129	14 37 95	14 36 71	*HZ1BL *HZ1PS * 7Z1TT	299,945 109,395 14 488,240	205	187	LZ2UW LZ4ØYE LZ1RA	. 1	46,292 12,312 68,392	150 142 80 76 242 206		Е	ngland	(OP: 0Z8AE)
*JI1SAI *JA1SCE *JA1DDZ	Š	20,382 19,314 17,120	96 98 91	86 74 80	*JR4GPA *JA4AVO	14 7	215,975 624	338 13	265 13		Singapore			LZ8A LZ1QN		7,900	82 79 OP: LZ1KDP)	MØUTD G1T	Ą	1,234,944 613,776	976 603 694 456 (OP: MØSCG)
*8J1ØSAI). E	16,037	116 (OP: JH1	79 (OES)	JI5SKS JJ5GSY	A 7	79,704 48	190 4	164 4	9V1YC *9V1DE	A 412,482 A 4,256	32	294 32	LZ1UN LZ1VPS *LZ8E		10,248 1 58,100	63 61 1 1 1995 884	G3SVD G4OJB		340,370 233,160	428 337 404 290
*JA1GFB *7J1ABD *JA1F0	5	12,805 12,705 11,978	88 67 60	65 55 53	*JG5UWK *JJ5HUD *JA5NSR	A	114,240 32,806 112	253 130 8	94 8	9M6/0H2YY	Spratly Islands A 154,755		181	*LZ2PS *LZ5XQ	* 68	81,720 79,913	738 437 207 157	MØVKY G4VMX GØAZG		164,090 90,240 40,386	362 269 215 188 148 127
*JE1RRK *JJ1HHJ		9,945 9,440	72 80	65 59	*JG5DHX *JA5XPD	21	55,245 24,388	162 95	145 91	BV1EK	Taiwan A 381,480	468	289	*LZ10J *LZ3GH	. 6	68,456 60,496	191 172 192 152	G4AFJ G5XW	7	6,394 265,824	50 46 482 288
*JF1ROR *JF1DWJ *JG1SWV	¥5	8,208 6,210 5,371	76 51 41	54 45 41	JA6LCJ JH6QFJ	Ą	4,646,100 556,612	1784 530	850 386	*BU2AW *BU2AE *BV4VQ	21 23,618 A 8,694 21 11,550	78	63	*LZ10NK *LZ3TL *LZ2FM		31,625 19,046 18,330	134 115 98 89 104 94	*MØMCV *G4DFI	Ą	123,824 1,464,457 282,111	247 218 1192 613 483 347
*JA1KK *7L3DGP *JA1LPQ	50 50 50	4,576 3,480 3,360	45 45 41	44 40 35	JA6BWH *JE6JNC	Ä	108,900 103,544	214 230	165 172		Tajikistan			*LZ1FJ *LZ1MC *LZ9V	; 1	16,932 1,248 50,752	116 102 25 24 291 224	*M6TBY *GØCER *G8AFN	X.	258,093 185,130 154,869	427 297 330 255 324 247
*JH8FAJ/1 *JP1LRT		2,808 2,525	27 29	26 25	*JA6GMC *JA6CM *7J6AAO)())()	46,728 41,912 15,120	162 146 84	118 124 72	EYØA *EY7BJ	A 1,234,548	(OP: U		*LZ3RN	. 4	46,343	(OP: LZ1WG) 140 121	*2EØTCC *GØLZX		147,506 121,746	346 262 256 197
*JG1LFR *JH1EYM *JI1BH0		2,370 1,924 1,863	30 27 28	30 26 27	*JE6ADE *JA6EFT *JH6WXF	21	82,560 46,200 2,263	208 155 31	172 132 31		Thailand			*LZ1VVV *LZ2JA *LZ3DJ	21 91	23,970 18,517 45,150	110 102 950 551 185 150	*G8ZRE *GØTAN *MØMXX	V.	118,750 109,512 104,598	326 250 295 216 304 234
*JE1HTV *JG1GC0		1,566 1,242 960	32 28	27 27 23	*JS6SRY	1	253	14	11	*E21FIC *E21YDP	28 523,200 A 2,846,340 950,976	1525 742	753 468	*LZ1KP		52,136	223 196	*GØTRB *MØGKC *MØAUG	6 6	83,220 73,533 73,431	225 190 237 193 236 199
*JA1VWK *JI1DSU *JK1CYF	E	462 252	21 16 12	20 14 12	JA7BME JA7VEI JA7JH	A 28	2,579,310 153,265 35,844	249 123	203 116	*E2ØYLM *E21IZC/8	292,236 21 52		294	SV9GPV	21 2,87	78,092	2306 846	*G6VMR *G4NXG		71,242 57,820	223 179 167 140
*JG1MYK * 7N2UQC *JL1EEI/1	28	42 61,544 32,480	7 185 119	7 157 112	JG7EHM JG7PSJ *8J7J0D0/7	14	46,464 4,158 11,232	133 28 60	128 27 52	A61ZX	Inited Arab Emira A 2,511,620	1383		9A2Ø7T		37,086	859 558 (OP: 9A2EU)	*MØVKG *MØGOJ *GØPBE		57,440 51,480 46,978	191 160 190 156 199 166
*JA1LBZ *JF1PYJ	21	36,273	2 134	113	*JA7HYS *JA7BEW	Ž.	2,900 64	29 4	29 4	*A61QQ	359,127 21 77,154	429 190		9A2Ø2JK 9A8A		05,028 10,164	926 612 (OP: 9A2JK) 71 66	*G1KFB *M6T0K *G7DPE		41,888 37,800 19,500	152 136 164 140 143 125
*JA1RYC *7K4TKB *JA1ANF	K K	23,370 21,505 21,296	102 104 94	95 85 88	*JL7FBV *JH7KTI *JP7CFP	28 21	135 10,921 6,171	10 69 63	9 67 51	*UK7F	Uzbekistan A 309,228			9A3KS 9A8DX	7 1,85	672 54,949	16 14 1236 647	*MØDMJ *MØSFR		17,510 16,849	113 103 91 83
*JA1PUK	ж	13,192	71	68	*JK7UST	E.	2,187	27	27	*UK/RZ1ZZ	14 473,200	526	350	9A2AJ	1.8 46	65,864	601 376	*M6AGY	-	16,300	105 100

**MØWAG	**RD5D	159 133	DILERY D	TM1W 21 5,601,827 2479 931 TM7X - 2,553,224 109-FHAR) F5JY - 49,135 166 155 F6GCV - 10,540 71 68 F8ARK 14 2,221,193 1566 793 F5WN 3,7 166,085 295 241 F71AEY A 734,487 782 509 F8ACE - 580,440 701 420 F6DRP - 489,069 624 441 F74DPW - 364,744 507 359 F6GCI - 153,140 295 247 F74DLL - 315,235 503 335 F6GCI - 153,140 295 247 F74DLL - 315,235 503 335 F6GCI - 153,140 295 247 F74DLL - 315,235 503 335 F6GCI - 153,140 295 247 F74DLL - 315,235 503 335 F6GCI - 153,140 295 247 F74DLL - 315,235 503 335 F6GCI - 153,140 295 247 F74DXP - 109,312 239 F74FSY - 141,834 287 231 F74DXP - 109,312 239 F74FSY - 141,834 287 231 F74DXP - 109,312 239 F74FSY - 141,834 287 231 F74DXP - 109,312 239 F74FSY - 141,834 287 231 F74DXP - 109,312 239 F74FSY - 141,834 287 231 F74DXP - 109,312 239 F74FSY - 141,834 287 231 F74DXP - 109,312 239 F74FSY - 141,834 287 231 F74FSY - 141,834 287 231 F74FSY - 15,545 227 F8BYOU - 37,539 163 129 F74FSB - 20,196 126 102 F74FCU - 20,304 108 94 F74FCU - 2
(OP: RASAKT) RM3F 9,484,079 3755 1237 (OP: LN3DPX) R63K 8,955,804 3594 1228 RM2U 3,130,788 1675 894 UD3D 2,221,128 1658 756 (OP: LN3DPX) UA3VFS 1,514,877 1253 651 R3ZV 889,875 895 525 RN3ZC 680,826 706 466 R3OM 592,974 716 417 RA3MC 534,660 651 402 RC3F 381,888 686 416 R2DW 346,527 450 417 R3NA 300,324 433 348 RZ3DN 297,472 461 332 R3DL 254,584 362 263 RA3BL 213,465 340 285 RA3BL 213,465 340 285	RN4HJQ	148 125 DKT/W 2 21,204 104 93 93 686 449 DBCHLRS 31,520 86 68 649 DJ8QA 8,256 69 64 62 68 649 DJ8QA 8,256 69 64 62 68 649 DJ8QA 8,256 69 64 62 62 62 62 62 62 62	DISSWIB 1,281 21 21 21 21 21 21 21	COP: SV1BJW 7 3,920 35 35 SV1GRD 1.8 7,257 63 59 8 7,257 63 59 8 7,257 63 59 9 59 59 59 59 9 59 5
TMSD	UAGAES 897 7 7 7 7 7 7 7 7 7	846 533 *DL2YAK 151,788 357 278 23 23 30 *DL5ALW 150,892 290 288 487 362 *DD0A 136,754 246 202 288 1439 725 *D0DA 136,160 299 230 1994 586 *DD1CS *19,853 260 207 548 332 *DL6TA *119,853 260 207 548 332 *DL6TA *118,622 233 229 223 483 300 *DK4GC *114,264 285 216 247 218 456 322 *DESAN 97,888 184 184 322 200 2	*OH6G * 594 23 22 *OH6GEN 26 26 12 12 12 *OH2BEN 28 23,328 110 96 *OH0TD 21 23,199 123 111 *OH8KYY * 17,472 99 96 *OG3P 14 273,424 553 368 *(DP: OH3P) **TRICE **TM6M A 15,743,661 4063 1203 *(DP: F8DBF) **FSVKT 1,990,872 1280 709 **FGDZU 1,462,920 1194 668 **FADSK 833,340 805 510 **FSPBD 477,360 612 408 **TM380 434,592 671 432 **TM380 434,592 674 432 **TM380 443,592 674 432 **TM380 444,592 674 432 **TM380 444,592 674 432 **TM380 444,592 644 444 **TM380 444,592 644 **TM380 444,592 644 **TM380 444,592 644	IRAM

IZ1NBX	* 21,358	3 125 118	E	Latvia		*PA3ARM	" 12.905	99 89	+SQ9SHR	¥:	2,418	31 31	*MMØLBX	-	416,973	630 393
IK3UNA/1 IW5ELR IKØGDG	7 738,700 294,118 265,482	803 445 424 319	YL2SM YL2IP YL2BJ		2972 1124 151 137 1739 843	*PA3MET *PAØCYW *PA3HGF	12,903 12,640 11,880 9,798	87 80 98 88 76 71	*SP3QYQ *SQ5ABF *SP5IKO	*	602 490 444	15 14 14 14 13 12	*MM1X *GMØTTY *GMØBKC	14	37,000 11,174 74,793	177 148 86 74 288 233
IC8WIC IR1A	3.7 834,968 1.8 97,709	772 488	YL3FT *YL3DR *YL2CR	7 2,824,356 A 805,475 255,664	1281 746 781 505 450 304	*PD1LG *PDØDK *PA3J	7,548 6,643 5,772	73 68 82 73 54 52	*SP1NY *SP5UD *SQ8OGC	21	301,950 15,540 3,567	409 330 83 74 42 41	YT5A		Serbia 4,490,490	2154 885
IZØGIF *IR4X	A 6,328,036	(OP: IZ3EYZ)	*YL2NK *YL2QV *YL3DX	97,170 17,280 12,180	284 205 93 90 98 87	*PE1DGM *PA9HR *PA3RC	5,445 4,815 1,357	58 55 47 45 23 23	*SP5BMU *SP9IHP *SP2MGR	E	1,275 954 432	26 25 19 18 12 12	YU1DW YT3H	x) x)	353,290 250,515	(OP: YT3W) 547 343 370 293
*102Z *1V3BCA	2,028,285 418,264	(OP: IK2DZN) 458 392	*YL1ZX *YL2PJ	288 21 89,208	13 12 (OP: YL2GCV) 233 189	*PA3DDP *PAØLIE *PAØRHA	1,150 1,034 14 4,260	23 23 25 23 23 22 67 60	*SP5GRM *SP1FRC *SQ4G	14	1,255,130 81,900 50,112	1101 626 236 210 211 174	YU5R YT5W	28 21	570,312 6,010,788	616 356 (OP: YU6DX) 2502 978
*IKØXBX *IK7NXU *IK7RVY	391,590 363,216 253,890	454 376 434 315	*YL5W *YL2GUV	14 569,016 3.7 336,980	863 504 450 332	*PA3GE0 *PE1RM0 *PA8C	3,245 16 7 24,510	4 4	*SQ1W0 *SP5DRE *SQ3LLR	į	46,306 22,620 6,164	195 169 128 116 69 67	YT1A YT8A	14 7	2,565,574 6,557,886	(OP: YT7AW) 1773 842 2176 986
*IZ2BKA *I1DXD *IZ3GNG	219,608 215,594 205,744	405 289 337 308	LY9Y LY2MM	Lithuania A 6,090,858 1,171,810	2481 1046 952 565	*GI7AXB	Northern Irelan A 573,648		*SQ4KLM *SQ3RLC *SP6HDS		2,907 2,303 520	56 51 53 49 20 20	YU1AAX		37,605	(OP: YU1EA) 126 115 (OP: YT1BD)
*IZ5MKA *IK3SSW *IZ7FLT *IK7WPD	203,000 192,384 158,337	364 288 295 241	LY2ER LY2AE LY2DM	210,375 28 88,810 21 167,700	337 255 204 166 309 260	LN8W	Norway A 4,863,488	2225 944	*SP9HZF *SP9EML *SP9LWH *SP4SHD	3.7	164,500 14,898 12,530	271 250 79 78 71 70 403 316	YT4A *YT3M	3.7 A	1,243,200 4,109,560	953 555 (OP: YT1AA) 1986 910
*IW1RHR *IZ3QCH *IZ2UST	147,500 104,600 103,092 97,970	256 197 272 213	LY2UU LY50 LY2BKT LY2OU	7 485,000 138,416 3.7 13,090 1.8 228,285	490 388 288 211 84 77 386 285	LA6KOA LA3ZPA LA8HGA	519,750 185,744 154,406	783 450 311 247 391 287	*SQ20SE *SP80NB	1.8	274,920 2,592 2,080	403 316 38 36 35 32	*YU/S56A *YU5CW *YU3MUP		170,272 93,978 51,356	(OP: YT6W) 316 272 264 207 182 148
*IK8NSR *IZ5IMD *IQ7AF	93,258 76,068	215 198 191 165	*LY1R	1.8 228,285 A 4,803,825 2,594,761	2208 975 (OP: LY9A) 1690 767	LB9RE LA2OTA *LA5LJA	94,792 19,250 A 723,330	195 164 125 110 811 470	CR6K	A	Portugal 15,527,376	4289 1296 (OP: CT1ILT)	*YT1KC *YU8NU *YU2EA		13,800 1,922 589	82 75 33 31 19 19
*IK2YSJ *IZ5RKC *IZ2LQD	68,378 61,845 61,576	3 213 179 5 190 155	*LY4T *LY3B *LY2TS	" 1,201,008 " 681,777 " 615,276	1016 573 736 443 718 422	*LA3BPA *LA1DSA *LA2HFA	510,848 327,474 279,270	563 416 501 339 503 321	CS2C CT1IQI	21 7	8,004,231 51,170	3341 1179 (OP: OK1RF) 125 119	*YT3MA *YT2AAA *YU1TY	28 14	23,545 341,523 148,975	99 85 588 417 379 295
*IW2NRI *I1YGQ *IN3ADW	57,720 53,592	180 162 194 156 189 154	*LY2N *LY1DJ *LY20M	281,710 201,280 130,200	427 286 417 296 292 217	*LA3HPA *LA80KA *LA2NTA	167,679 117,236 86,922	383 279 283 212 248 198	*CT1EGF *CT2KFA *CT1ETK	Ą	255,200 230,298 228,000	380 319 381 293 430 300	*YT1ET *YT2SMS *YT8WW	3.7	58,962 11,712 683,648	259 186 103 96 734 436
*IZ1TYP *IK2IKW *IN3IZT/I7	47,233 42,742 35,712	158 142 140 124	*LY1NDN *LY2BIS *LY1VP	96,585 93,215 81,030	286 235 227 181 235 185	*LA7TN *LA90SA *LA2RR	77,224 54,720 21,900	263 197 200 171 104 100	*CT7ABG *CT1JRZ *CT2GMH		156,180 120,866 118,854	386 285 291 223 279 213	GZ5Y S	hetland A	d and Fair Is 907,798	885 541
*IZ2NZZ *IN3JRZ *IN3EHR	28,186 27,820 25,920	151 130 142 120	*LY2BBF *LY2HQ *LY4Q	38,016 6,200 3,960	157 128 65 62 50 45	*LA4AAA *LA6VQ *LA9NSA	10,934 6,028 1,025	79 77 49 44 26 25	*CT2IWW *CT1EBM *CT1DJE	28	84,688 10,586 13,140	196 158 76 67 74 73	шот		Sicily	(OP: GM4SSA)
*IW4AOT *IN3JJI *IZ2WFL *IZ4RYS	24,948 24,408 24,338 23,265	133 113 134 117	*LY80 *LY5I	14 618,838 7 488,824	768 506 481 392	*LA7IJA *LA10RA	28 60 14 25 Poland	5 5 5 5	*CT1EEK *CS5DX *CT1EVE	21	312,858 132,235 22,624	473 382 265 265 (OP: CT1EGW) 117 112	*IT9ESW *IW9FI	Ą	11,882,041 566,420 253,761	3395 1181 (OP: IT9GSF) 643 446 458 337
*IZØKBA *IO7R *IZ1MLS	23,200 22,246 21,216 20,806	119 103 109 96	LX7I LX1SG	Luxembourg A 12,685,492 468,305	3717 1108 (OP: LX2A) 608 409	S06I SP9AQF	A 2,324,582	(OP: SP6JIU)	*CT1DZY *CT1EWA *CT1DKS	14 7 3.7	117,132 8,910 6	288 258 56 55 1 1	*IW9HHB *IT9AZK *IT9CLN	28	78,624 77,220 9,686	268 216 243 180 61 58
*IK2QIN *IZ8EEL *IZ1HBC	19,710 19,20 19,008	96 90 96 91	LX3PR	" 15 Macedonia	3 3	SP5VYI SQ7DQX SN5V	1,266,432 1,220,184 1,046,653	1130 582 1204 538 856 589	YO3CZW		Romania 5,926,176	2747 1026	*IT9YAO *IT9LED *IT9AXQ	21	3,348 264,152 18,117	37 31 447 356 107 99
*IZØPMV *I2BZN *IZ1FAL	17,664 16,434 15,480	76 69 1 101 83 0 95 90	Z35X Z32XU Z36W	A 926,256 28 14,008 21 37,400	918 552 74 68 172 136	SP5IT SP40IZ	132,288 91,494	(OP: SQ5EBM) 247 208 278 207	YQ6A Y03RU	*	1,107,700	1533 780 (OP: YO6BHN) 1014 583	*IT9AJP *IT9MYY *IR9P	14 7	12,166 97,751 157,974	88 79 272 239 257 226
*IK2SGB *IW1RGP *IK6SBW	14,162 13,85 12,320	88 81 87 77	*Z35F *Z35W *Z37Y	A 105,408 21 289,167 246,328	321 244 472 339 475 328	SP90HL SP5GMM SP8TDV	66,256 37,888 20,332	190 164 129 128 95 92	YO8RNI YO9XC YO9GVN	į	440,022 344,442 109,620	544 354 500 354 232 189	owan		ak Republic	OP: IW9HMQ)
*IK2SGL *IN3EJN *IK5YJK *IZ2NYY	12,160 11,988 11,712	84 81 68 64	*Z31MM *Z37V	560 14 225	(OP: Z3ØKNA) 20 20 15 15	SP9AUV SP1II SP8HXN SQ6R	960 352 105 21 366,99 6	24 24 11 11 7 5 477 357	Y09IKW Y07NE Y05CUQ Y07VT		104,127 42,700 16,352 7,950	199 183 133 122 102 73 56 53	OMØR OM8AA OM3IAG	:	11,644,387 85,140 26,287	3402 1123 (OP: OM3GI) 221 180 115 97
*IWØEAC *IV3IDP *IK4XQT	" 11,592 " 11,310 " 11,172 " 9,976	69 65 85 76	*Z33F	7 651,651 Malta	(OP: Z39W) 582 429	SP3GXH SP8BQL SN5U	124,320 91,630	258 210 228 187	Y09IF YP3A	28 21	8,736 885,036	61 56 951 524 OP: YO3GOD)	OM1ADX OM3DX OM7RU	21 1.8	224,790 133,152 340,599	382 295 266 219 502 331
*IZ5EKX *IZ1QYD *IR1X	9,940 9,864 8,360	71 71 72 72	9H1XT	A 48,504 Market Reef	165 141	SP3ASN SP3GTS SP4JCP	14 54,540 3.7 390,375 1.8 172,500	200 180 507 347 354 250	YO8RAC YO3JW YO4AUP	7 3.7	16,470 ` 51,152 29,040	99 90 162 139 115 110	*OM7AB *OM4DN *OM1DK	A	743,652 422,096 400,140	813 468 600 368 456 405
*IWØBET *IN3MSD *IV3BGG	5,66 5,236 4,968	54 51 6 46 44 8 48 46	*OJØVM	A 136,427	295 227 (OP: OH6VM)	*S09G *S02WHH	A 508,654	590 394 (OP: SP9DTE) 675 388	*Y05KTK *Y07LCB	Α .	474,840	910 522 (OP: Y05PJF) 514 360	*OM8FR *OM6AL *OM2DT	*	350,660 341,658 119,567	528 356 507 342 252 203
*IZ1QXW *IZ5LZP *IZØTHT	4,914 4,900 4,032	53 50 50 48	*ER4LX *ER3CT	Moldova A 1,121,940 622,576	703 466	*SN3B *SP8CGU	450,300 405,858	(OP: SQ3JPV) 508 346	*Y04RST *Y08SGN *Y07ARY		401,488 311,084 305,270	511 368 501 332 504 343	*OM7AX *OM3ZBG *OM3TB	14	53,949 729 77,608	187 147 27 27 264 218
*IZ1QXV *IW3BTR *IK5B0H/2	3,432 2,754 2,697	35 34 31 29	*ER1CS *ER2RM	14 194,370 1.8 33,408 Netherlands	400 330 134 116	*SN1J *SP5X *SQ5LTL	332,010 277,550 234,000	(OP: SP1MWF) 429 305	*Y04US *Y08THG *Y05DGE *Y02MKT	E 6	247,428 211,511 187,411 105,690	454 316 338 257 319 287 237 195	*OMØWR *OM6TX *OM3CDN *OMØCS	7 3.7	8,755 81,420 71,442 213,030	97 85 198 177 179 162 366 270
*IW5ELA *IZ8LIP *IZ8CLM *IK2AUK	" 2,240 " 1,705 " 1,656 " 1,558	31 31 26 24	PC2T PA1NHZ PE2LZ	A 1,722,105 331,114 305,276	1295 693 511 353 421 334	*SP60PZ *SP9RTL *SP8UFB	233,428 231,844 216,006	417 268 412 298	*Y06DBL *Y02MLM *Y07HKM	*	104,040 65,709 62,976	258 204 169 147 188 164	*OM7AGF	Υ	3,549 Slovenia	42 39
*IZØIRH *IZ8DUD *IZ1REP	1,116 940	36 36 20 20	PA7AL PAØJNH PAØLOU	200,616 109,824 108,150	442 312 230 208 235 206	*SP6QKS *SP3HZG *SQ9NKK	206,873 205,556 204,060	412 283 383 268	*Y08RFS *Y09ADN *Y09HRB		58,435 32,330 31,354	177 145 145 122 153 122	S59ABC S53MM	Α .		2776 1047 (OP: S56AA) 2604 1045
*IZ3SX0 *IZ5IOM *IW2DJN	756 704	29 27 16 16	PE1LUB PDØMHZ PAØDOM	72,168 60,681 27,768	224 194 211 179 115 104	*SP6RYD *SP3UIW *SQ5NWD	200,405 188,496 186,461	367 269 361 264 334 253	*Y09CSM *Y07DBR *Y02MKL	8 9	30,625 19,698 16,920	143 125 105 98 96 90	S51F S520P S56B	*	4,107,465 2,063,061 1,030,450	1960 873 1339 693 969 557
*IZ8IBC *I3YYY *IZ2CSX	448 312	16 16 22 13	PD1B PAØVST PA2A	" 20,670 " 1,404 " 925	117 106 26 26 25 25	*SP1QXK *SP4FMD *SP6NVK	173,910 170,880 157,045	369 267 348 245	*Y02MLG *Y09FLD *Y02MBU	:	12,464 11,872 11,840	77 76 66 56 78 74	S5ØK S54ZZ S54K	1,4 3.7	4,833,312 1,510,548 849,420	2405 1012 1229 598 812 484
*IZ2SS0 *IW2FLB *IK20LD	28 50,439	5 5 152 129	PA2MRT PA2W0 *PA8KW	7 216,008 183,401 A 1,023,990	291 268 426 241 861 535	*SQ9IAU *SP5LKJ *SP4AAZ	154,178 145,418 124,173	305 238 289 219	*Y07LKW *Y05TP *Y05CCQ		10,074 8,350 7,848	78 73 55 50 76 72	*S5ØA *S52BT *S59GS		4,732,052 146,371 102,128	1933 901 262 197 263 208
*IW2BZY *II7M	37,064 12,816	77 72 (OP: IZ7SIA)	*PA1PE *PA3ACA *PG1R *PA2W	403,333 290,624 244,200	461 367 389 304 451 296 399 311	*SQ9CWO *SP5TWA *SP3JZX *SP3SPK	" 114,300 " 105,152 " 103,390 " 95,475	237 225 259 212 274 211 261 201	*Y04GVC *Y03GLH *Y08RFJ *Y02SH		5,871 4,526 2,881 1,265	57 57 63 62 46 43 23 23	*S51JS *S51I *S56ZZZ *S52Q	28 21	69,973 54,750 1,218 22,119	190 167 172 150 22 21 112 101
*IZ5WTV *IW5ECP *IZ5UGE	12,342 11,658 8,415	69 67 62 55	*PA9WOR *PA3DBS *PD73X	243,824 217,848 212,472 196,196	435 313 407 312 424 308	*SQ5JUP *SQ6NEJ *SP8BOZ	95,275 80,750 74,250	227 185 253 190	*Y02LIM *Y05CRQ *Y03FRI	28	931 65,888 34,138	20 19 168 142 117 101	*S52WW *S57U *S57PKT	14	674,245 453,840 257,890	827 533 663 465 509 370
*1Z5TJF *103K *1Z5HSK *1Z5CMI	21 237,336 179,025 104,682	395 319 308 275	*PA2GRU *PAØEMO	" 153,386 " 134,478	(OP: PDØEMR) 353 271 335 241	*SN4W *SQ3VV	73,850	218 175 (OP: SP4ICP) 203 175	*Y02MTG *Y02ARV *Y060HS		16,650 3,816 2,640	79 75 39 36 35 33	*S57ZT *S57LR *S57DX	7	1,700 140 2,270,452	35 34 10 10 1264 692
*IK1BBC *IZ5UGM *IK8TFN	96,515 12,960	228 199 73 72	*PA9CC *PA3FMC *PHØAS	" 128,040 " 125,628 " 121,338	292 220 295 228 244 214	*SQ5ASR *SP2RIQ *SQ1PTO	68,554 66,861 62,678	188 151 203 171 198 154	*Y08SHK *Y09CWY *Y05AYT	21	48 26,269 9,660	4 4 135 109 80 70	*S53N	3.7	220,792	362 286 (OP: S58G)
*IX1CKN *IW4CXK *IZ2ACD	14 559,035	44 44 13 13 750 505	*PA3EWG *PA4HM *PA2PCH	" 110,432 " 105,160 " 83,842	297 232 292 239 259 206	*SQ9LOM *HF1Z	60,756 58,353	192 159 (OP: SP1EG)	*Y05KAS *Y05BTZ		27	(OP: Y05CGB)	EE7L/1	Α .		1344 612 (OP: EA7HLU)
*IQ2DN *IIØK	* 371,234 * 85,008	560 419 (OP: IZ2JQP) 3 288 231	*PA3FOE *PA3CMF *PA7BAS	76,356 75,819 64,617	257 202 252 199 225 181	*SP7VS *SQ8GUM *SQ6STI *SQ6LJV	57,565 57,218 44,384 40,454	158 145 165 134 157 146 124 113	*Y05CEU *Y05ALI *Y09FYP *Y08RZJ	14	255,065 96,924 86,106	4 4 489 367 323 246 280 226	EA1AR EB1IC EA1AAW	21 3.7	80,964 153,330 199,867	190 156 326 269 323 269 430 331
*13QK0 *1R7M	75,712 31,610	(OP: IZØUME) 2 224 224 157 145	*PDØME *PD3ALX *PE1RWL *PD1ABO	54,908 53,250 51,840	169 148 155 142 186 160 193 168	*SP4AVG *SP9DEM *SP2ILQ	40,454 33,250 23,166 21,658	124 113 141 125 105 81 112 98	*Y09AGI *Y09RES *Y04DI		86,106 75,905 42,579 32,130	280 226 277 235 196 171 166 153	*EA1JO *EA1AY *EA1KJ *EA1HVW		241,961 75,660 41,480 11,550	430 331 236 194 149 122 67 66
*IZ2JNN *IZ5MXA	6,674 5,600	61 56	*PA1VC *PE1MR *PA/DL1KSR	47,376 46,944 41,595 40,404	193 168 185 163 168 141 181 148	*SP9JZT *SP5GDY *SQ7OTA	19,437 18,078 8,758	97 93 87 69 62 58	*Y06EZ *Y02MJZ *Y05BQQ	7	812 150,332 130,832	30 28 267 236 230 208	*EA1GHH *EA1CM *EA1ET	*	6,496 5,916 1,566	57 56 61 58 28 27
*IZ6NNH *IQ1BD *IZ5RLK	7 283,976	(OP: IZ1DGG)	*PE10LM *PA2CHM *PA1T0	39,204 37,422 34,749	147 132 171 154 167 143	*SP9CL0 *SQ90NK *SP10	6,426 4,860 3,880	53 51 60 60 44 40	*Y09IXC *Y04RSS	ř.	27,234 14,250	105 102 78 75	*EF1J *ED1J	21	270	10 10 (OP: EA1GPL) 648 434
*IZ7SIA *IQØCI	" 34,574 " 4,346	125 118	*PD1TV *PA2CVD *PA1ØØNOM	33,135 32,265 30,702	160 141 158 135 150 129	*SQ3PMM *SP6EWB *SQ8JMZ	2,886 1,584 1,100	39 37 37 36 26 25	ISØHQJ *ISØBSR	A A	5,488 332,024	61 56 629 392	*EE1B	*	387,045	(OP: EA1JJ) 512 423 (OP: EA1YB)
*IZ50QX	3.7 3,066 Kaliningrad	42 42	*PA8KM *PAØJHS	29,606 28,665	(OP: PAØFAW) 151 131 124 105	*SQ70TH *SQ5RIX *SP5MDB	384 136	5 5	*ISØBGL		19,872 Scotland	103 92	*EC1AQT	14	783	300 263 (OP: EB1EVX) 27 27
UA2CZ UA2F	A 47,244 14 545,280		*PAØCGB *PA5CA *PD1SGH	21,909 21,620 21,293	117 109 94 92 112 107	*SP5AUY *SP7DSI *SQ8LSC *SQ6ILJ	28 124,701 55,380 12,870 8,008		GM7V GM3P0I MM3T	A 28		2272 885 (OP: 2EØKLO) 490 294 266 193	*EA1IFU *EF1D	7	700 93,500	28 28 207 187 (OP: EB1DJ)
*RT2F *RA2FU	A 34,432 29,890	159 128	*PC3H *PAØB *PA3DCU	" 19,210 " 15,750 " 15,318	137 113 105 90 83 74	*SN9I	3,708	36 36 (OP: SP9EMI)	*MMØBQN	A		OP: GMØELP) 619 418	EF20	A		1015 608 (OP: EA2A00)

EE2W *EA2LMI *EF2F	21 A	2,389,671 1432 711 1,090,100 983 550 287,066 514 362	*SA7AHC *SAØE	190	38,907 28,080	134 131 152 130 (OP: SAØBJL)	*UT4PZ *USØYA *UT3EK	100	588 546 48	14 14 14 13 4 4	*YF1FTK *YD1EGP *YB8EL	- A-1	564 290 100	13 12 10 10 5 5	PS2T PV8ABC	7 3.7	1,977,880	713 502 (OP: OH2MM) 7 7
*EA2RW *EA2BVV		(OP: EA2DNR) 78,676 211 178 15,120 121 105	*SMØHBV/3 *SI5Y	(#)	26,904 22,032	133 114 122 108 (OP: SM5BKK)	*UT7LA *UT7NW *URØHQ	21	266,455 241,293 182,512	413 331 389 299 319 272	ZL/VO1AU	Ne A	ew Zealand 5.418.803	2168 797	*PY2NY *ZX5ZZ	Ą	3,088,025 1,160,454	1438 745 789 527 (OP: PY5PDC)
*EA2AVM *EA2DDE *EA2DT	14	14,499 89 81 10,212 89 74 479,160 691 495	*SM6XVI *SMØFM *SM4WKT		19,344 14,507 13,515	107 104 92 89 91 85	*UR5FCM *UR3QNV *UR5MM	14	40,890 4,505 357,136	172 141 54 53 588 442	ZL2CC *ZL3IO *ZL2MM	7 A	256,494 6,182,904 33,558	261 197 2283 894 124 94	*PY5AS *PY1PDF *ZW2T	1	787,314 139,152 115,200	643 453 296 223 217 192
*EA2CHL ED3B	A	2,107 46 43 2,639,536 1697 796	*SH30 *SM5ISM	*	11,424	71 68 (OP: SM3TLG) 67 61	*UT8UF *UR3PGW *UT7MD	7	219,172 75,820 27,495	550 349 257 223 146 141	*ZL3DW *ZL1YE *ZL2U0	28	10,664 314,464 108	68 62 435 248 6 6	*PY10N *PY2TEL	201	92,571 62,168	(OP: PY2TI) 199 177 188 152
EF3A		(OP: EA3BOX) 660,500 755 500 (OP: EA3KU)	*7858	28	5,000	52 50 (OP: SM5CSS) 25 25	*UX7U *UR5EFL	*	26,931	154 141 (OP: UX7UA) 145 129	* ZL2GQ *ZL2K	21	39,618 1,820	163 93 28 26 (OP: ZL2KT)	*PV8RF *PY2MR			(OP: PY2AXH) 165 135 155 129
EA3HEK *EE3P	A	2,492 31 28 1,246,474 1311 601 (OP: EA3DUW)	*SM6IQD *SK3W		1,224 588	24 24 14 14 (OP: SM3SGP)	*USØU *US1MM *US1GBH		13,736 7,696 437	117 101 74 74 20 19	*T88TW	21	Palau 16	4 4	*PY2DXA *PY3IP *PY2RDZ	50 30 30	48,120 46,683 43,623	148 120 151 133 158 131
*EA3GHZ *EA3FCQ *EB3WH		267,872 507 352 220,629 360 293 99,603 233 189	*SM7RZJ *SM6DPB *SH7DX	21 14	133 980 76,838	7 7 20 20 249 206	*UZ7M	7	2,561,598 1,214,292	1177 738 (OP: UT9MZ) 873 564	15 Indiana		hilippines		*PY3AJB *PY1NS *PR2W	į.	43,596 39,424 30,485	144 126 148 128 127 91
*EA3AYQ *EA3GYK	4	97,614 249 198 71,925 214 175 (OP: DK7TM)	*SA3BGM/5 *SM5MX *SM6FJY	7	1,147 275,280 20,592	31 31 366 310 109 99	*UU2CW *UT5PY *US2IZ	3.7	1,042,317 170,400	745 537 263 240 320 252	DU1AV DU1UGZ	, 14	756,865 162,393	1550 515 (OP: DU1IVT) 868 257 268 209	*PY3TIO	(M)	28,350 24,510	(OP: PT2AW) 109 105 117 95
*EA3HJO *EA3HDT *EA3DWX	(80)	49,950 163 135 16,920 106 94 13,376 90 76	HB9CVQ		vitzerland 1,167,438	887 537	*UR8QR *UX2MK		60,621 35,760	170 167 134 120	DU9X0 *DV1JM *DV1UBY	7 A	494,750 1,341,072 35,690	447 250 979 402 114 83	*PY4DK *PY3ZK *PY2SRL	(90) (90) (97)	21,384 20,532 19,747	98 88 107 87 101 91
*EA3EXP *EA3NA *EA3DJL	28	11,040 86 80 72,822 192 159 23,670 98 90	*HB9ARF *HB9WDY *HB9MXY	A	591,162 374,960 146,229	708 429 504 344 297 237	GW9X	A	Wales 449,748	578 403 OP: MW1LCR)	*DU6/N6SS *DU7/KDØ. *DU1LC		20,736 3,080 406,340	80 64 30 28 640 220	*PV8AZ *PY2RFU *PY1MT	:	18,480 4,128 2,730	98 77 47 43 40 39
*EA3GXD *EF3E	21	22,352 94 88 32,640 150 136 (OP: EC3PL)	*HB9RJG *HB9EYP *HB9EMS	*	127,676 119,004 10,585	310 236 264 211 79 73	GW4BKG GW4BLE *GW8NBI	7 3.7 A	223,600	366 260 322 227 275 208	*DU1EG *DU4JT *DU7RH	14 3.7	160,050 374 130	290 194 12 11 5 5	*PY1PM *PY1XP *PV8DR	90 90	1,566 988 286	27 27 27 26 11 11
*EF3AB *EE3E	÷	31,490 148 134 189 9 9 (OP: EA3ELZ)	*HB9TSU	28	5,117 Ukraine	47 43	*MW1CFA *GW4EVX	28	30,186 55,338	158 129 165 138	Domin		TH AMERIC		*PU2LEP *PY2MTS *PU5FJR	28	5,134,649 2,242,880 1,463,405	1932 923 1221 652 957 541
EA4KD EA4TG	A 21	2,231,829 1402 711 346,626 572 393	UZ2M UY7MM	Α	11,640,179 4,222,968	4007 1279 (OP: URØMC) 2595 983	VK4CT	Δ	OCEANIA Australia 5,147,126	1882 733	LT1F	Α .	Argentina 16,704,753	4334 1271 (OP: LU1FAM)	*ZV2C	(4)	477,256 337,518	514 353 (OP: PY2CX) 405 306
*EA4EF *EA4GHB *EA4CWW	Ä	92,004 219 187 44,950 179 155 38,160 155 120	US5D UXØRR		3,380,520 1,150,518	1762 858 (OP: UT7DX) 1006 569	VK3TDX VK3TZ			(OP: VK4EMM) 795 440 454 299	LV5V LT5Y	193	1,637,025 189,306	1012 575 (OP: LU5VV) 316 234	*PU1PYZ *PY2SBY *PP5JAK	961 981 181	335,276 322,973 182,172	412 316 436 301 297 228
*EA4FLY *EA4FJJ *EA4MI	4	16,554 97 89 9,519 64 57 1,500 31 30	UT6EE US5U0 UR5RP		1,061,174 693,000 632,700	945 529 699 462 755 475	VK4GH VK3AVV VK8AA		290,615 142,880 48,190	368 263 253 188 149 122	LU9EY LU3DAT	:	112,833 27,400	(OP: LU1YU) 253 199 118 100	*PU5BIA *PU1MMZ *PU2WDX		154,822 150,570 134,480	290 199 289 239 259 205
*EA4AOC *EA4YK	21 14	33,300 161 148 12,028 104 97	UT5RB UT5UKY UT8IT	(H)	468,375 340,736 212,878	633 375 488 352 350 326	VK2BCQ VK2TTP		25,872 6,068	(OP: VK2CZ) 99 77 41 37	LU1VM LU7DW LU6FEC	21 7 3.7	493,649 1,239 78,720	578 299 22 21 135 120	*PU2KIV *PU3SVA *PU2UIB	90	89,595 31,635 29,945	222 181 119 111 129 113
EA5GTQ EA5DIT EB5KT	A 28 21	238,788 374 297 27,200 106 100 674,424 851 522	UT2UB UU4JC UTØVE	:	200,100 164,724 124,280	385 276 310 259 296 239	VK2PN VK7GN VK8AS	28 21	5,060 391,876 387,504	48 44 437 313 518 276	*LU7HW *LU5FR *LW1HR	Ä	1,133,719 910,962 436,050	850 491 758 442 494 342	*PU1SAT *PX3X		28,304 26,765	126 116 120 101 (OP: PY3DJB)
EA5GS EA5DFV	14	(OP: EA5KV) 139,682 284 211 3,898,378 2371 979	UY8IO UT7UE US4IQS		114,124 52,850 50,048	268 206 188 151 164 136	VK3GK VK7ZX *VK5PAS	7 A	96,120 4,303,684 414,352	200 178 1249 623 455 304	*LW4EF *L59D *LU5CAB		157,311 89,178 50,939	306 231 214 167 174 133	*PY2YRC *PU2KXM *PU1KVA	30 30 30	17,640 14,514 11,920	93 90 97 82 90 80
*EA5AER *ED5W	Ä	2,433,090 1703 803 809,286 764 458 (OP: EASFWW)	UT8LN US4IRT UX7LL	28	9,348 3,503 3,638	64 57 34 31 37 34	*VK6MAB *VK2ERP *VK3FM	*	82,335 75,190 69,000	190 165 181 146 158 138	*LU7DSU *LR1A *LW7DUC	2003 2003 2013	11,098 8,820 5,070	67 62 67 60 47 39	*PY2HH *PY2VOX *PP5CIT	2	11,700 10,064 3,783	81 78 81 68 39 39
*EA5MON *EA5HRB *EB5CS		342,990 467 333 320,112 442 324 163,404 346 267	UT6IS UZØU	21 14	110,896 3,250,640	283 232 1997 908 (OP: UY5ZZ)	*VK2B0 *VK4BL *VK3NRW	÷	38,986 34,344 27,448	124 101 127 108 106 94	*LW8DQ *LU6FOV	28	3,011,602 2,837,100	1433 746 (OP: LW7DX) 1352 735	*PU5ADX *PU2RKP	9	3,626 3,555	(OP: PY5KC) 40 37 51 45
*ED5A *ED5L	(4)	92,316 238 196 (OP: EA5HRT) 27,192 138 132	UT7QL UX1VT UT5UGR	3.7 1.8	1,009,855 243,168 299,882	1111 671 380 298 455 317	*VK7GM *VK4FATT *VK6WX		24,780 15,276 3,700	95 84 68 57 43 37	*LU7EC *AY8A		2,525,888 1,070,913	1383 647 791 487 (OP: LU8ADX)	*PY1CD *PY1WX *PS7DX	90 90 95	2,664 2,613 1,104	41 37 40 39 45 24
*EA5UJ *EB5BB		(OP: EC5AEI) 15,876 101 81 10,836 77 63	UT5ECZ UR4LFA *UU7J	Ä	19,950 6,380 6,531,670	106 95 59 58 2860 1115	*VK5UE *VK3VTH	14 7	176 12,288	10 8 50 48	*LU8DCF *LU9DAG *LU3DR		985,150 905,513 779,833	756 475 740 467 663 433	*PU2SDX *PU8TLS *PV8RR	:	931 828 352	20 19 26 23 17 16
*ED5Z *EA5HRM	(90)	7,638 72 67 (OP: EA5ZD) 7,139 64 59	*USØHZ *UR4U	300	2,084,541 1,862,091	(OP: UU4JMG) 1477 681 1272 693	*V85TX *V85ZX	Brun 14 7	ei Darussala 13,940 64,449	m 72 68 145 93	*LU9DPM *LU2ICA *LU1EXR		284,856 170,496 147,705	386 286 278 222 264 215	*PU2LED *PY4RR *PY2DJ	21	4,002 2,470	10 9 47 46 39 38
*EA5EOR *EA5HJO *EB5BBM	28	180,960 309 240 51,408 162 144 50,400 147 126	*UT1IM *UR5ETN		950,175 794,612	(OP: UR4UDI) 900 515 810 481	9M6YBG	21	st Malaysia 223,480	421 185	*LW3DG *LU5FF *LU8DY		120,684 118,110 116,594	255 178 219 186 238 194	*PY1ZV *PY1TR *PY4WWW	14	1,287,453 22,100 3,612	854 543 111 100 42 42
*EA5XY *EA5HKZ *EF5V	21 14 7	143,260 305 260 3,127 59 59 84,251 194 173	*UT3I *UTØLK	170	636,174 609,450	751 459 (OP: US2IHS) 803 478	*9W6ZAM	28	1,632 Guam	24 24	*LU3YEP *LU1DR *LU2FDA		111,000 52,780 30,492	271 200 163 140 129 99	*PV2P *PY6KY	7	325,040 8,643	267 239 (OP: PY2DY) 44 43
EE7H	A	(OP: EA5AVW) 393,312 611 408	*UR7QC *UV3QF *UX3HA		569,622 536,284 510,198	632 417 693 428 709 403	NH2T *KH2/J03		1 27	614 320 (OP: N2NL) 3 3	*LU1MPK		14,742	87 73 (OP: LW1DRH) 83 78	*PY2LCD *PS8ET	30	7,406 162	48 46 6 6
EA7HGX EA7JB	28	(OP: EA7ELY) 3,760 50 47 399,122 560 394	*UY4F *UZ2L		468,714 454,565	628 409 623 397 (OP: US4LS)	*N1BJ/KH	2 1	Hawaii	2 2	*LW1EUD *L73DX	1	11,844 5,750	82 63 48 46 (OP: LU7DUE)	XR3P	A	Chile 1,034,640	783 479 (OP: CE3PG)
EA7ATX	21	2,859,740 1871 884 (OP: EA7ISH) 253,528 459 344	*UV5EE0 *UT2AA *UYØCA	90	353,444 339,577 333,870	550 364 480 349 535 359	WH7M NH7A	Α.	12,799,780 9,905,280	3816 980 (OP: K1YR) 3214 924	*LU5MT *LR1H *LU1FM	21 14 7	252,992 665,660 13,384	346 268 603 401 58 56	CE3CT	28	175,350 8,812,826	305 210 2991 1018 (OP: CE4CT)
*EE7R *ED7R	A	1,165,794 954 574 (OP: EA7IA) 1,009,125 1230 621	*US2IW *US7IA *UY1IP	i	319,410 290,274 283,028	430 338 462 303 525 346	NH6WZ KH6OA NH6P	21	253,422 19,470 4,121,650	360 234 82 66 1935 746	P49Y	Α	Aruba 22,182,251	5312 1261	XR3A *XQ7UP	21 A	2,473,640 103,463 2,216,865	1303 670 239 157 1238 645
*EE7J	192	(OP: EA7IZJ) 105,340 265 229 (OP: EA7FTZ)	*UX7FD *UR7CT *UR6LEY		271,062 254,529 239,008	471 333 410 297 396 308	KH6QJ *KH6CJJ	3.7 A	672,948	(OP: KH7Y) 19 17 662 324	*P4ØW	A	13,062,600	(OP: W2GD)	*CE3WYZ *CA3SOC *3G4W	28	13,206 1,056,088 96,425	75 71 795 484 227 175
*EA7JIY *EA7CWA *EA7WV *EA7JHV	*	74,315 204 167 7,104 50 48 4,080 42 40 1,887 42 37	*UX6IB *US5IND *UR3AHF *UT1EI		222,606 211,680 208,080	386 298 422 288 383 289 319 258	*NH6AB *KH6SAT *AH6KW	-	203,732 8,450 7,884	318 212 52 50 64 54	*P43E		1,046,560 Bolivia	858 422	*CE3TMM *XR1I	14	340 445,284	(OP: XQ4CW) 17 17 480 342
*EA7EPF *EA7FRX *EA7VJ	28	1,887 42 37 26,037 107 99 13,179 76 69 12,328 68 67	*US7IY *UY5TE *UT5ULX		189,630 173,283 160,132 147,371	319 258 382 267 366 266 270 259	*KH6XL *KH7AL *WH7GG	14	4,800 782 972	44 40 17 17 18 18	PT5T	A	98,640 Brazil		HK1R		Colombia 1,976,744	(OP: CE1KR)
*EF7A *EA7HMD	21	338,776 494 376 (OP: EC7ABV) 43,299 161 153	*US5ISV *US6IKV *UX2KA	(90)	147,048 136,795 110,768	336 264 328 251 218 184	YB4IR	Ą	Indonesia 2,404,368	1233 566	PP1CZ PY4RGS	Α .	16,578,468 2,759,888 2,006,901	(OP: PP5XX) 1369 724 1066 663	HK1T *5K3R	7 21	14,512,230 2,819,245	2344 1062 1389 715 (OP: HK3R)
*EA7RM	7	12,537 68 63 Sweden	*UUØJC *UT4MW *US7LM		94,668 88,592 86,193	228 196 230 196 219 183	YB30X YC1LA YC1KI	21 7	387,750 1,173,786 304,590	433 275 831 498 290 195	ZW5V PY1WS		314,600 276,352	395 286 (OP: PY5KA)	*HK3TK *5K3W *HK6P	14 3.7	68,908 3,564 164,104	178 161 36 36 203 146
SM4DQE SM6NOC SB6A	A	911,113 946 511 833,257 758 487 570,414 678 426	*UT7LW *UR5AMJ *US7IID		81,120 67,744 62,832	196 156 173 146 193 187	*YB1TJ *YB6EN *YB1LZ *YF1AR	:	1,426,810 385,581 274,835 158,603	920 545 390 301 391 263 262 199	PY1RY PP5AX PP5JY		197,760 68,425 65,268	367 254 333 240 186 161 169 148	PJ2T		Curacao	2171 788
SM7PEV SM2S SM5EP0		171,810 300 249 133,249 271 227 128,444 238 197	*UR5MAF *US5MSJ *US8UA	*	52,598 48,960 44,156	217 182 170 160 149 133	*YB7SKM *YB6DE *YBØCOU	*	114,560 101,352 80,511	248 160 212 164 178 141	PY2KP PV8ADI PV8CQ	*	36,822 35,765 32,054	133 114 133 115 117 94	*PJ20F	A	5,192	(OP: AC8AP) 45 44
SM7DQV SM6CMU SI3A	a a	108,900 237 198 93,120 197 160 73,986 254 209	*US5ZE *UT8UD *US7IGN		32,469 31,098 30,129	175 137 150 146 131 121	*YC1BRS *YB7MRK *YB1AQD		37,130 32,865 27,573	117 94 120 105 108 101	PY3BRA PW5G	*	13,246 8,874	95 74 53 51 (OP: PP5WG)	*HC2/KF6Z\		Ecuador 3,477,285 396,490	1630 735 442 310
SLØW	(90)	(OP: SM3LIV) 63,420 189 151 (OP: SMØAJU)	*UU2JA *USØTA *UT7VR	90	27,825 23,912 22,895	115 105 110 98 108 95	*YC6EI *YBØNSI *YB3IZK	28	21,812 869,440 199,680	82 76 688 440 312 240	PY9BDA PY2LCN PY1SGT	*	1,419 1,196 323	39 33 30 26 20 19	ZP5DBC		Paraguay 991,028	811 436
SK7A SA6P	*	58,282 233 181 (OP: SA7AOI) 51,194 177 143	*UX3IO *UR5LAK *UY5TF	*	22,357 15,366 13,608	98 79 93 78 90 81	*YBØAKM *YB1UUN *YC9CT	21	194,577 40,002 90,111	291 237 122 113 231 147	PX5E PY5QW	28	17,785,368 4,643,936		ZP5MAL *ZP9MCE	21 28	507,276 583,920	534 366 585 360
SA7AUW SM3NFB	(MC)	(OP: SA6AVB) 34,700 125 100 21,255 117 109	*UY2ZZ *UT2HM *UU3JU	(M)	12,348 11,826 8,700	68 63 82 73 77 75	*YF8RIM *YBØCOX *YC1BTJ		57,589 36,612 8,305	164 133 124 113 57 55	ZY5Y PY7ZBK	- A	3,215,668	1470 766 (OP: PP5BS) 246 209	PZ5P	AS	Suriname 15,667,080 (4143 1210 OP: RX3APM)
SD3A SM2IXM	14	9,272 84 76 (OP: SM3FJF) 69,720 237 210	*UR3LD0 *UX7FB *US6IKF		6,960 3,321 1,971	52 48 42 41 27 27	*YC1DYY *YC6E0 *YC6EFY	*	8,140 5,593 3,534	58 55 51 47 41 38	PP5RZ PU2WCD PU2LVA	*	24,534 13,612 6,300	124 87 89 82 63 60	9Y4W	14	lad & Tobago 9,177,904	2869 1096
SK2AZ SM3M	3.7	16,206 119 111 (OP: SM2JEB) 1,001,151 837 519	*UT5JCE *UR3LPP *US3ITA		1,944 1,675 266	29 27 26 25 16 14	*YC1ELI *YB9WZJ *YB2DX	14 7	1,472 675,540 303,048	26 23 579 417 275 207	PY5KC PU200T PV8AA		2,376 380 3	38 36 21 20 1 1	*9Z4DZ	21	41,704 Uruguay	138 104
*SJ7M *SM5BS *SM3EAE	Ä	393,470 498 365 134,208 306 233 68,515 236 193	*UT2DV *UT7EW *UTØNN	28	83,650 61,134	5 1 207 175 162 138	*YC2WBF *YE3JT *YB1BGI		83,611 62,480 31,242	154 121 132 110 94 82	PV8DX PR5B	21	11,236,625	(OP: PY2LSM)	CW5W CX2DK	A 21	15,933,607 3,551,292	4213 1207 (OP: CX6VM) 1504 828
*SE6N *SM6XUZ	(5) 160	66,000 200 165 (OP: SA6AXR) 54,009 198 153	*UT1XX *UT1UW *UR5LCZ	*	40,680 28,992 2,465	140 120 105 96 29 29	*YD1DDB *YCØIEM *YD1BSL		19,825 4,929 1,600	73 65 31 31 20 20	PY2NZ ZV2V	14	9,184 7,101,512	59 56	*CX5TR *CX3TQ *CX1DP	A 28	223,602 135,596 1,510,083	318 249 275 218 999 543
			1				June 156547)				1				1			

*CX9AU *CX2TG	140	823,832 635,375	692 598	424 391	N4DWK K4GAA N4PB	10	469,476 405,130 390,340	439 324 448 319 431 290	KD7DCR KB7KYK WR7Q	*	266,552 187,341 180,544	410 286 377 231 454 248	*VA7BEC *VA7HZ	A 14	1,073,655 192	846 8	495 8	VR2XLN	H 21	ong Kong 230,324	487	284
YV6BXN 4M5W	7 3.7	enezuela 259,584 491,301	229 360	208 237	ND4V N7E0/4 NS1S/4		317,768 234,434 192,479	397 314 319 251 258 217	WW7CA K7MKL NG7M		80,990 78,942 73,500	192 178 197 177 275 175	VY1EI	21	917,889 Mexico	1005	401	*VU3DJQ *VU3TMO	Ą	India 444,204 17.952	455 96	324 88
*YY5EPM *YV5COR	Å		OP: YV5 150 95		KD4RF		167,320	(OP: K1ZZI) 288 235 (OP: W9EQ)	WV7P AJ7T KO7P		61,586 60,384 35,910	222 166 217 148 121 105	XE1GZU XE1KK *XE3N	A 21 A	97,200 729,790 1,116,900	193 684 967	162 437 450	*VU3LMS	(97)	819 Israel	21	21
*YV4MP *YV5NWG	003	12,261 8,321	(OP: YY5 68 57	67 53	AF4AI N4NM N3UA/4		139,605 127,779 126,730	271 205 244 191 239 190	N7RVD NO7T W6NF/7		34,428 32,552 29,481	132 114 111 104 103 93	*XE2RV	28	12,220 erto Rico	87	65	4XØA 4X9A	28 21	2,609,750 3,505,614	1503 (OP: 4 1651	650 X1VF) 798
*YV5JG0 *YV5KG *4M1F	21	943 2,177,872 978,040	23 1222 711	632 490	K4EDI KC4HW N4ZZ		121,520 100,182 98,736	231 196 233 177 298 187	W7CT NQ6C/7 WA1PMA/7		24,892 17,479 16,748	98 98 84 77 79 79	*NP4G	14	497,377 itts & Nevis		353	*4Z5IW	Α	418,500	(OP : 4	Z400) 310
*YY50SW *YV5NEA	14	9,405 283,968	(OP: YV 69 369	57 272	KZ1X/4 K4SWE KR4F	362	68,480 63,273 27,324	161 160 161 131 94 92	W6RLL/7 KM7W	28 21	29,300 2,151,728	115 100 1344 724 (OP: K7ZO)	V47JA	Α	638,469		351	JQ1BVI JE1LFX	À	Japan 3,547,021 452,920	1652 480	761 335
*YV50IE	AS	85,068 SSISTED	202	153	N4GG KØLUZ/4 N4DXI		22,995 10,638 9,020	91 73 67 54 59 55	K6LL/7 K7EIQ *WZ7ZR	7 A	2,080,880 960 1,558,752	1345 740 20 20 1166 624	*EA8CNB	Can	AFRICA ary Islands 1,983,296	1120	608	7L20HM JA1WPX JH10VY		159,402 153,786 11,900	263 251 71	186 213 70
KI1G		H AMERIC ted States 11,971,296		1266	KI4VCT K4XZ NS1L/4	28 21	12,784 372 5,364,639	73 68 12 12 2265 1071 (OP: W4SVO)	*W7S0 *W7MLG *K7JE *N7MAL		552,375 182,721 172,050 138,229	590 375 335 231 276 222 336 217	*EC8AFM *ED8D	28 21	22,714 935,520	94 669 (OP: E	82 480 A8MT)	JH1ACA *JH1EAQ *JA1BJI	21 A	334,150 1,061,548 692,661	396 781 655	326 466 373
W1KQ NM1JY	?	1,608,920 1,132,168	1048 1027 (OP:	584 548	K4KZZ WD4EFZ KD4RH	7	299,184 76,160 46,842	313 271 147 136 126 111	*K7TYF *AE7NR *K7LOP		118,800 62,424 48,580	280 198 213 153 157 140	СТЗНЕ	Mad 28	eira Islands 1,351,396		524	*JM1LRQ *JH1DGQ *JA1XRH *JA1MZM	360 (90 (80	454,346 360,114 131,008 39,183	513 396 233 137	367 282 184 111
KB10WT K1SM W1AN		721,594 590,920 464,079	619 543 451	421 374 343	*KT4ZB *W4DTB *N4HXI	<u>A</u> 	1,949,935 529,968 304,114	1225 655 558 362 400 302	*AC7MV *K7EMI *KB7QFE		40,171 24,970 15,770	161 139 134 110 90 83	*CN8WW	A	Morocco 72,884	173	137	*JA1BIV *JA1KEB *JA1IST	:	30,700 1,584 1,302	144 24 24	100 22 21
K1AR KT1B W1PL	100	432,327 419,900 413,049	502 448 504	357 323 357	*K9ES/4 *AK4QU *AB4SF	# / # /	301,476 253,328 246,980	395 259 381 284 338 265	*AE7GT *K7HPT *K7DAC		14,790 5,643 3,552	98 87 74 57 40 37	ZS1LS	So A	uth Africa 104,104	202	182	JG2REJ JA2DLM	A 28	234,260 1.392	360 24	265 24
K1JB WK1J W1EBI	1	401,120 188,135 44,400	518 284 117	368 197 111	*K3IE/4 *N4BFR *N4UEZ		139,986 99,575 90,951	278 231 238 175 214 183	*K6TUJ/7 WA8Y	14 A	5,472 351,080	62 57 422 268		Asia	ASIA atic Russia			JH2FXK JF2IWL *8J2NDP/2	21 7	122,012 37,665 130,900	228 112 304	188 93 170
W1BYH K1PH KV1J	14	30,680 26,400 98,697	110 98 209	104 88 197	*N4ARO *K9AIH/4 *VE3JDF/W4		69,255 41,800 30,690	167 135 135 110 128 110	K3EQ/8 N8AGU KX8D		168,025 55,640 51,724	308 235 151 130 160 134	RC90 RW9QA RA8T	A	17,536,244 3,172,124 2,565,615	3915 1504 1234	718 669	*JF20ZH * JE2HXL	28	50,570 2,046	(OP: JK 147 32	130 31
*KA2KON/1 *NR1I *N1API	Ä	1,563,136 1,223,344	923 881 (OP: V		*KB4YPK *W4WNT *KC4YB0		29,585 25,988 24,552	115 97 98 89 108 88	NI8G KD8PHI		48,438 12,352	164 138 (OP: W8CAR) 69 64	RX9CAZ RM9RZ	3 9 00 3003	1,490,940 1,456,768	(OP: RA 881 885	540 599	JO3DDD JS3CTQ	Ÿ	2,185,000 689,073	1220 634	625 399
*AD1L *W3SM/1 *K1KXN	(M) (M) (M)	875,996 339,434 286,425 278,100	736 408 407 373	463 314 285 270	*K1ZW/4 *KC2NYU/4 *N4TOL *K4ADR		14,040 12,090 9,796 6,072	73 72 66 65 65 62 51 46	N8KOJ K8ND AA8LL N8HP	28 14	1,809 12,155 4,144 215,460	28 27 76 55 40 37 309 285	RG8K RK9KWI RO90	*	482,300 125,048 68,328	487 250 170	371 203 146	JN3SAC *JR3BOT *JL3RDC	Ą	119,930 70,641 32,344	227 188 137	179 141 104
*K1VOI *K1DEC *KB1WKB		35,482 21,845 15,987	125 94 76	113 85 73	*NB4F *KI4HHK *N1H0/4		4,797 4,223 595	42 39 42 41 17 17	*K8BL *WD8S *KC8CY	Ā	618,068 392,326 219,844	485 484 485 374 337 244	R9SA RN9CM R9UAG RT9J	28	51,480 37,080 132,300 12,992	154 136 245 75	132 103 196 64	*JA3PYC JH4UTP JO4CFV	Ą	29,973 3,385,975 365,585	110 1538 433	103 775 289
*KB1ST *WA1N *WA1ZYX		14,819 12,716 7,700	79 72 58	73 68 55	*K4CWW *K4MOA	28 21	226,566 6,909	473 246 49 49	*WD8KNC N2BJ/9	Α	190,696 2,768,781	343 242 1431 753	RA9JP R9DA RT80	21	2,533,824 410,742 238,944	1335 451 333	747 342 262	JO4CTB JM4WUZ	21	321,468 593,332	439 560	267 422
*NF10 *NE1F *N1VVV	28	840 826 2,304	15 14 33	14 14 32	K5QXR K5MV AD5VJ	Ä	2,225,080 1,667,900 1,064,877	1368 715 1222 650 991 529	WN90 W9AV		1,098,100 679,770	828 556 (OP: W9IU) 800 415	RK9DM UA90C RW9TP	14	1,295,720 279,000 236,300	807 352 311	580 310 278	JA6BZI *JA6DIJ *JH6WHN	A A 28	1,479,289 492,102 9,747	900 520 66	527 351 57
*N1QD *KG1E	21 14	8,232 1,036,630	56 795	56 590	W3TZ/5 W5HP N5MOA		778,707 64,960 51,737	678 453 162 145 142 133	N9FN WW9R N9WKW		666,037 527,795 436,872	649 383 783 373 499 334	RK8I UA9YF * RV9UP	Ä	197,208 63,792 4,626,720	291 161 1804	249 144 840	JA7ZP *JA7KQC	A 28	324,786 47,816	401 154	266 139
W2YC AB2E N2SQW WT4Q/2	Ä	2,297,622 1,674,711 1,451,738 1,054,000	1167 1251 987 784	587 547 500	KG5VK WØVX/5 AA5AU	28	49,046 8,058 384	146 137 53 51 12 12 101 84	K9EN N9YKE NS9I KØTQ/9		223,560 150,715 148,518	344 270 256 215 257 222	*UA9AL *RK9UE *RA9DZ		2,556,440 1,026,500 635,040	1283 767 596	632 500 420	JR9GMS	A	24,288	100	92
N2MUN WC2L W2CCW	*	643,500 504,640 194,922	606 509 305	396 332 234	N5MT NQ5K WA5ZUP	21	24,108 1,245,184 97,812	1080 608 (OP: W5ASP) 251 198	NF9V K8LEE/9 W9IIX	28 21	114,632 22,784 22,841 159,536	234 184 94 89 113 91 263 236	*RV9AM *RK9DC *RW9C *RZ9CJ	0801	556,686 458,898 311,505	484 421 399	338 409 285	JAØFVU JHØEQN JRØBUL	A 28 A	212,750 137,340 4,922 178,245	316 273 51	230 210 46
N1IBM/2 W1GD/2 WA3AFS/2	(A)	131,937 39,962 30,080	214 111 94	199 106 94	*NE5LL *KE5LQ	A	369,098 231,084	504 358 (OP: N1CC) 335 262	*KB9UWU *N9UA *KA9MOM	Ā	1,082,943 204,678 81,696	770 513 276 274 201 184	*RA9C *RG8U *UA9AGX	**	233,282 193,250 58,000 36,064	320 280 156 129	266 250 145 112	*JAØBJY *JAØVTK	21	8,436 azakhstan	303 72	233 57
K2CYE K2SSS W2RR	28	8,840 178,365 98,580	55 353 254	52 235 186	*AB5XZ *AE5NO *WJ5DX	28	63,196 990 113,685	207 148 22 22 264 195	*KB9NW *W9VQ *WA9LEY	÷	79,002 42,624 18,091	201 171 144 128 84 79	*RV9CX *UI8W		28,785 26,132	112 107 (OP: RW	101 94	UN1L UN2G UN4PG	Ą 28	7,478,818 400,325 69,275	2405 464 172	989 335 163
N2YBB K2RET	21 14	408,478 262,854	OP: WA2 416 359	358 306	*KE5FXE *WF5E	7	109,552 84,812	(OP: W5AJ) 245 167 231 182	*KB90 *W8FIB/9 *K9PG		17,974 7,007 3,939	94 86 51 49 41 39	*RU9AZ *UA9CSA *RM8W	*	19,092 13,978 6,466	89 66 57	86 58 53	UP5P UN2E	14	1,207,524 1,153,040	775 (OP: U 745	564 N7PL) 560
*K2DSL *WA2MCR *KS2G	Ā	658,140 562,320 449,242	652 603 481	360 362	NGQQ	A	4,046,868	(OP: W5AJ)	*N9TGR	21	1,001,616	6 6 787 542	*RA9MX *R9MC *UB9UAK	28 21	34,578 925,688 3,325	118 696 37	113 502 35	UN7BEW *UN7MMM *UN6T	(90)	3,589 2,947,204 7,772	40 1467 61	37 722 58
*WA2TML *K9CHP/2 *N2CQ *KB2NGK	21	265,136 57,510 16,999 14,162	340 153 95 75	292 135 89 73	N6JV K6MM NY6I		2,768,304 1,538,400 1,399,918	1685 749 1144 641 976 598	KBØEO KØKX WDØECO	A	2,376,704 1,730,784 641,784	1361 704 945 596 759 408	RUØFM UAØSR	Ä	6,087,732 2,913,801	2300 1580	959 759	*UN9GD	28	22,410 Qatar	99	83
*NY6DX/2 *W2MF	21 7 1.8	632,818 54,730	727 197	397 130	WX6ZZ N6WS W1RH/6	36	947,023 919,524 784,356	(OP: K6RIM) 837 539 666 444 899 489	KMØDX WØHBH KDØS		217,701 189,312 172,788	458 297 (OP: WØTT) 293 232 262 238	RAØFU RAØACM RWØBG RØQA	# #	1,603,080 450,892 51,168 34,800	1232 507 135 125	549 338 123 120	A71EM DS5DNO	A Repu	6,281,652 iblic of Kore: 46,767		871
AA3B N3RR N3RD	A	3,736,512 2,793,604 2,677,170	1546 1338 1260	832 734 699	K6AAX KI6QDH W6GJB	*	655,578 437,510 411,312	811 387 541 335 472 328	NØQO NØUU K4IU/Ø		92,169 81,260 41,574	215 171 189 170 133 123	RXØAO RXØAE UBØA	28	19,264 833,316 405,854	91 724 459	86 428 307	*DS2NMJ *DS5TOS	A 7	62,848 110,522	189 242	128 146
K3WW K3MD W3KL	(8)	1,883,772 1,732,722 1,371,312	1013 1168 893	639 634 534	K6LRN N6VH WB6JJJ		305,522 258,995 217,128	401 314 398 277 347 249	W6GX/Ø KØTZ KSØT		22,407 21,560 14,910	92 77 97 88 75 70	RMØW RKØAB UAØQBR	14	309,720 214,797 89,910	413 320 195	290 253 162	HSØZJU HSØZCW	Ą.	Thailand 2,914,120 1,755,840	1452 1135	740 590
W3FV WA3F NN3Q		1,000,728 945,120 518,910	731 746 489	492 440 353	WM6DX W6KC	*	137,795 123,906	247 217 (OP: W6DPD) 264 193	KCØUUT N5MU/Ø WØCEM	14	7,124 5,445 123,525	56 52 45 45 227 225	*UAØWW *RAØANO *UAØIT	Ä	565,547 1,449 1,320	562 23 22	367 23 22	A61BK	United	Arab Emirat		386
N3MX NW3H KD3TB		482,515 324,555 300,160	501 405 358 367	341 281 280	W6GMP W6SZN W6PK		110,656 31,625 23,852	220 182 134 115 98 89	NØUN *NXØI *AD1C/Ø	A	6,950 606,616 483,552	50 50 792 397 535 368	*UAØWY	21 Asia	831,833 atic Turkey	696	499	A61K *A65CA	3.7 A	452,473 64,904	330 167 (OP: R\	259 133 /6AJJ)
NN3RP AA3K NB3R N3WD	*	261,290 227,853 180,999 148,674	291 282 251	265 261 221 213	KZ50M/6 N6ER W4EF/6	*	19,458 18,240 10,540	95 94 (OP: K6III) 78 76 66 62	*KCØDEB *WØLSD *WGØM *KFØIQ	21	402,784 273,300 78,672 4,797	510 328 364 300 205 176 41 41	*TA5CV *TA3ATA	A 21	48,081 216	115 9	93 9	XV1X	28	Vietnam 957,190	799	481
K3IT K3QX K3YDX		12,896 4,032 2,079	73 44 27	62 36 27	KI6KVW NO6T		9,453 7,467	72 69 64 57 (OP: N6NC)	WL7E	A	Alaska 5,642,300	2284 850	*XU7ACY	A C	ambodia 119,068	306	206		E	UROPE Austria		
K3YG AK3S W3FW	21 14	407 155,178 1,479,184	255 1067	233 658	AI6Z WB6CZG K6III	28	6,240 3,502 1,675	54 52 40 34 25 25	AL9A	*	2,509,800 Canada	1399 712	BD5RV BD4CQ	Ą	China 2,556,469 410,670	1277 584	683 338	OE6MDF OE6HLF OE5CSP	Ą	1,795,682 778,092 36,478	1223 759 127	658 471 122
*W3LL *N3ALN *ND3D	A	1,931,130 411,156 203,984	1047 519 342	645 324 244	N2NS/6 NE61 *WV6E	21 A	81,356 2,233 271,656	189 172 29 29 380 294	VE9HF * VE1BVD *VO1DJT	Ā	8,789,700 657,030 272,640	2639 1059 574 363 357 284	BD4KYA BG9BTH BD4TS	28 21	202,300 256 24,100	505 19 108	238 16 100	*0E5JSL *0E2E	Ļ	308,691 208,616	394 351 (OP: OE	309 293
*K3FS *AB3IC *W30D	040	141,858 102,420 62,634	264 231 151	180 143	*K6AAB *N6DZR *K6MMU		223,780 190,311 129,162	395 268 305 237 268 206	*VE9ML VE2FXL	7 A	255,387 243	234 213 9 9	*BG4ACE *BD3CB *BG5LU *BA4SD	Ä	477,666 309,618 240,264 172,653	699 472 446 305	357 309 282 233	*OE4VMB	387	30,012 Belarus	145	123
*KN3A *WB40BF/3 *KC8RHC/3 *W4EE/3	*	40,446 21,266 18,860 11,368	132 108 93 56	126 98 82 56	*K6FI *K6DSW *N6ORB *NS6T		86,025 56,280 50,540 990	217 155 189 140 175 140 23 22	*VE2EBK *VG2W	Å	756,040 693,440	631 410 533 394 OP: VA2WDQ)	*BD7MTJ *BG4KLA *BD9BKC		28,512 17,892 2,754	125 92 36	99 84 34	EW2A EU1AZ EV1R	A	3,889,458 3,149,664 3,141,861	1985 1708 1790	906 872 843
*N3ZA *N3GJ	21 14	228,222 7,599	303 52	279 51	*NS6T *KD6WKY *WS6T *AG6AN	28 21	990 12 3 9,387	23 22 2 2 1 1 63 63	VE3MV VA3DX VE3CX	A 21	553,104 327,430 3,325,688	550 334 333 274 1592 796	*BD5FFK *BH3OTC *BH1JGA		1,464 1,372 510	26 31 18	24 28 17	EW7BR EW80M EW1BA	44	1,245,825 10,292 5,548	1006 66 41	565 62 38
N4WW NF4A N4RV	A	6,512,198 4,729,318 2,860,188	2188 2148 1425	1078 947 723	KW7XX W6AEA/7	Å	3,866,447 2,175,992	2182 767 1294 686	VA3YP *VE3JSQ *VE3TL	14 A 14	1,689,035 59,362 20,740	1119 641 160 134 85 85	*BG9BJZ *BH1KZQ *BD6AHU	7	105 35 6,525	7 8 59	7 7 45	EW8KY EW6GF EU3AR *EW5W	1,4 1.8 A	494,553 438,561 328,308 1,482,848	750 732 477 1142	467 439 327 596
KG4W AI4DX		2,229,255 1,525,992	1211 970 (OP: V	735 536 V4NF)	W7PP KK7YL		1,184,228 1,175,706	866 548 1007 558 (OP: K7FA)	*VY2MGY/3	7	685,640	637 281 (OP: VE3MGY)	H22H	A	Cyprus 13,617,600	3590	1200	*EU3AA *EU1EU	18 (F)	97,776 73,117	(OP: E 257 241	
WJ2D/4 KD2JA/4 AA4DD	000	1,384,932 1,256,080 946,803	858 807 740	524 560 429	KY7M N3RC/7 AD7KG	(0)	1,157,580 1,096,984 488,754	860 590 1033 532 554 378	*VE6FI VE7XF	21 A	227,106 1,373,582	353 279 898 574	P3J	5967	1,559,920	(OP: 5 8 1083 (OP: 5 8	496 4AHJ)	*EU4AA *EW1FR	21 1.8	40,950 364	149 15	130 14
N4DJ N4NX W4AS		803,187 677,474 610,414	673 535 497	427 446 413	K7LV K7VIT KV7DX	**	468,578 445,486 287,546	514 361 517 353 556 322	VETAX VATEC VETTG	21	133,551 115,455 32,330	233 213 244 179 116 106	5B4KH		5,336,788 Georgia	2087		0Q5M	A	Belgium 4,205,362	1929 (OP: 0	N5Z0)
K40V		597,144	601	417				(OP: AA7V)	VA70M	14	843,776	687 512	4L50	7	5,963,804	1447	737	OS8A	187	3,485,580	1702	

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Part
**Part *
Mary 14 20 20 20 20 20 20 20 2
Fig.
***FTCPM** 18
Control Cont
180,650 287 233 145 150
C1212FO
***LZPOO
**TK4LS 28 236,335 392 277
Value Valu
Croatia
9A2U 28 576,240 611 392 UA4CC "101,074 283 194 "DK3WW "8,856 57 54 \(\frac{125MO}{25MO} \) \(\frac{253,968}{25M} \) \(\frac{433}{256} \) \(\frac{256}{250} \) \(\frac{1}{25M} \) \(\frac{257}{250} \) \(\frac{1}{25MO} \) \(\frac{253,968}{250} \) \(\frac{433}{256} \) \(\frac{257}{250} \) \(\frac{1}{25MO} \) \(\frac{253,968}{250} \) \(\frac{433}{256} \) \(\frac{257}{250} \) \(\frac{1}{25MO} \) \(\frac{253,968}{250} \) \(\frac{433}{256} \) \(\frac{257}{250} \) \(\f
9A283B 14 2,720,133 1793 871 RNACX 15,768 87 56 DRZK 3.7 163,222 311 262 (273KKE 352,253 411 341 \$\$\text{SNBY}\$ 330 11 11 (0P; 9N-9N-9N-9N-9N-9N-9N-9N-9N-9N-9N-9N-9N-9
**PARGEA A 456,252 615 394 **RW4WA A 2,349,000 1606 870 (OP-9ARGEA) **UAMINOX ** 195,871 325 247 48 48 48 48 48 48 48 48 48 48 48 48 48
*9A4WY * 1,500 24 20 *RA4CEW * 1,248 24 24 90 475
"9AZU5SI 14 ZUU,59Z 4Z3 336 "HV4AS 14 4,/38 49 46 OH6OS " 701 040 708 508 "K4VET " 16,605 90 81 "SU/L / 92,394 188 1/4
SPBLBK 1.8 121,208 282 218
No.
0K3C 422,095 483 355 R7HF 363,990 594 389 0H3/R 119,068 208 206 (OP-0K2ZC) R0F7 1 127,008 242 196 0H5/DA 105,252 230 196 (ZDIHL 1 2 2 2 CT1FOQ 41,374 146 137 0K6DJ 82,164 200 167 RZ6HKM 80,618 194 173 0H2/V 8,610 78 70 TIRBM 21 650,886 710 498 CT7AEZ 189 10 9
OKINDO 35,350 10 97 10 97 10 00 10 10 10 00 10 10 10 10 10 10 10
0L9Z 14 5,014,488 2383 1032 RZ6FA 4,025 39 35 OG6N 2,915,500 1562 850 170 TV 57,195 239 205 (OP:YO9GZU) 0K1UC 7 1,742,959 1148 629 RAGXV 7 595,059 593 417 OH2KI 14 264 12 12 12 12 12 12 12 12 12 12 12 12 12
**OKIAY ** 456,960 579 384 **RN6A ** 206,885 317 257 **OHSFOR ** OHSFOR ** O
OKZBEN* 128,235 327 249 **RABYJ 17,242 84 74 **OHSFKU 29,100 111 97 **CKZBEN 65,783 195 157 **RIGIDR 5,406 54 53 **OHSKA 54,655 216 189 216 22,104 23,104 24,055 216 189 24,055 216 24,055 216 24,055 216 24,055 216 24,055
*OKBRA 14 371,840 629 415 R9XT A 530,454 723 419 TM7F A 7,617,195 2884 1121 Denmark UASFGJ * 484,802 517 446 **OP: FGGLH) 1/12 FGGLH
021HY A 931,602 763 574 RC9F 79.200 264 198 F4FFH 2,178,495 1367 815 YL9T 28 67,248 180 144 VSFB 37 122,388 257 217 021ADL 21 1,204,294 935 509 "UBSXAB 14 14,453 104 97 FIRHS 182,850 317 255 YL2KF 7 209,880 319 264 198 198,240 105 105 105 105 105 105 105 105 105 10
European Turkey F4CPF 56,700 151 135 1427 1427B A 52,480 173 160 175,080 476,280 567 405 151 173 173 173 173 173 173 173 173 173 17
SXSP 21 2,447.600 1929 844 (OP: FIJRD)
Figland Dizzoy 6,725,915 2613 1085 F5NBX 240,825 392 247 C5NBFT A 662,640 667 502 LY3CY A 174,754 343 262 MMRAMW A 1460,250 983 500
125,100 264 225 1535 1,932,645 123 809
GBDYT 28 150,234 301 219 DR2AT 1.125,040 973 560 F4FRF 3.325 35 35 LY7M 1.8 376,957 519 343 - MMJMMC 2.618 35 34 MMJMMC 2.618 36 34 MMJMMC 2.618 35 35 35 MMJMMC 2.618 35 34 MMJMMC 2.618 35 35 35 MMJMMC 2.618 35 35 MMJMMC 2.618 35 35 MMJMMC 2.618 35 MMJMMMC 2.618 35 MMJMMMC 2.618 35

Tasking 14 194,080 394 336 UCA 405,322 337 410 SV2FLO 181,146 91 86 183 164 184 184 184 184 184 184 184 184 184 18
Estonia Diljikk 219,114 417 282 SVINK 21 68,310 237 198 Macedonia YUSA 4,178,944 1939 896 (1977) 198 (1978) 19
ESARD 28 405,074 523 337 DL-JLM 184,667 320 259 ESARD 14 662,1848 877 541 DLSRCW 172,809 365 273 HASJV A 9,564,399 3217 1215 ESARD 14 662,1848 876 49 DLSRCW 172,809 365 273 HASJV A 9,654,399 3217 1215 ESARD 184,644 263 221 HASJV A 9,654,399 3217
RD1A A 162,324 319 243 DL9NDV 113,669 241 197 HA8LLK 30,015 131 115 Netherlands (0F:YU1YV) R01B 129,030 308 253 D62MKV 103,752 245 198 HA5JI 28 373,584 501 344 PA3AAV A 99,072 232 192 4710 4710 A 2,597,181 480 737 R1DX 14 259,038 531 369 DL6EZ 97,536 216 192 HA5DO 203,252 311 244 PA3FFA 82,703 242 191
RO1A 32 8 8 DL5ASK 87.110 206 155 **HASBSW A 1.322.616 994 608 PA3GEO 14 756 28 27 **YT7AA 12.384 77 72 (OP:UB1ACM) DK6AH 81.243 217 177 **HG8C 145.140 290 236 PA3CWN 7 171.584 245 224 **YT7EE 21 75.828 221 178 (OP:UB1ACM) DK6AH 81.243 217 177 **HG8C 145.140 290 236 PA3CWN 7 171.584 245 224 **YT7EE 21 75.828 221 178 (OP:UB1ACM) DK6AH 81.243 217 177 **HG8C 145.140 290 236 PA3CWN 7 171.584 245 224 **YT7EE 21 75.828 221 178 (OP:UB1ACM) DK6AH 81.243 217 177 **HG8C 145.140 290 236 PA3CWN 7 171.584 245 224 **YT7EE 21 75.828 27 177 177 177 177 177 177 177 177 177
**RA10D ** 112,808 271 236 D6AG
RUSA 1,268,028 1002 597 DJ3JD 23,296 102 91 HA1ZH 101,304 211 166 PA4PS 242,408 444 314 SICILY 1,054,647 1046 603 DJ8EW 14,872 90 88 HA4XH 21 2,442,462 1346 759 PE4BAS 222,724 389 292 III9X 28 1,243,772 973 556 (OP: RASIT) DF5EM 11,076 75 71 HA0NAR 14 5,824 54 52 PG2AA 187,040 357 280 (OP: IT9SPB)

IT9XTP *IT9AUH	21 21	1,558,375 192,072	1177 68 445 31		A	1,874,698 484,960	1458 746 614 433	*HK3JJB	Colombia 7 83,07	0 125	117	YO9GSB BY1SK	27 47	9,519 7.205	61 5 63 5		183,513 83,790	355 233	249 171
*IT9IMJ *IR9Z	14	37,008 10,509	151 14 99 9	14 *UT8EL 13 *UT3RS	H.	466,580 376,842	642 410 525 347		Ecuador			F4FPG 3Z3Z		6,069 5,250	56 5 45 4	WC5B/8	139,832	303	227
*IT9JDH	3.7 Slove	139,200 k Republic	260 23	*UT5ER\ *UX7IB *UW7CN		359,970 194,180 163,784	560 355 358 292 283 236	*HC5VF	A 412,79	4 463	323	RX3AU LU6EVD	1	3,708	39 30 34 3	KD9ST	4,563,870	2362	894
OM7PY *OM8DD	28 A	9,072 854,128	56 5 806 50	4 *UR5XFC		159,960 138,425	340 258 325 245	*CX1CAK	Uruguay 28 7,72	2 57	54	JI3CJO OM8JP	1	2,686 2,144 1,449	34 3 32 3 23 2	KØRH	2,889,789 1,009,944	2321 832	713 507
*0M40	70	444,266	592 38 (OP: OM3I	32 *UT2IV NI) *UT4WA	#3 #2	57,128 9,990	172 148 62 54	YW5T	Venezuela 7 6,849,68	4 1516		DF7LS JR1USU	*	1,176 66	21 2 6	KCØDWX	26,085	124	111
*OM4AQP *OMØDX *OM8LA	21	211,002 60,060 54,769	360 27 196 16 157 1 4	5 *UT5L0	28 21	526,128	50 43 595 452 310 273	*YV8AD	A 2,390,77	(OP: Y	635	JA1POS EI4II	 21	45 9 117,898	5 3 268 23	KL7AIR	Alaska 760,682	681	442
UMOLA		lovenia	10/ 14	*UT2AB	14	167,895 27,336 724,895	110 102 926 565	*YV5JF *YY70MF	28 1,330,66 21 33,48		479 112	EA1CJJ SP4LVK	21	109,068 92,571	276 24 241 17		Canada 3,712,328	1513	757
S51DX S51AF	Ÿ	321,222 316,958	486 34 580 36	1 *UY5ZI	W)	858	(OP: USØYW) 22 22	TI5N	QRP A 1,449,72	5 1089	515	WA6FGV JH3DMQ		91,455 79,325	224 19 200 16	VA2TG	2,467,941 2,044,700	1217 1121	669 635
S57W S57S S53F	14	248,254 5,280 5,149,956	369 27 50 2381 103	8 *URSIDX	7 3.7 1.8		708 479 13 12 240 193	TM9K	" 953,68	(OP: W 0 826	8QZA) 524	IZ3NVR MW8T	į.	64,872 46,800 44,968	174 15 165 15 160 14	VC3T	5,010,247 1,803,458	1802 1132	881 562
S5ØG	7	2,891,904	1764 88 (OP: S57A)	86 N)	****	Wales		LU7HZ DL8LR	" 756,64 " 749,70		422 490	JR1NKN			P: MMØCW. 151 11) VE3ZJS	3,913	43	43
S51CK S53M	×	1,913,330 1,549,863	1386 73 1210 65	57	14 AU 21	(2957 1105 OP: MWØZZK) 85 79	NDØC IZ8JFL	" 641,60 " 541,25	0 663	401 433	KF7IYQ/2	:	24,472 20,856	98 93 93 83 93 83	VE6A0	12,680,220 477,325	3689 656	1140 313
\$56X *\$5ØXX	7 A	3,454,297 3,156,849	(OP: S51F 1487 79 1707 79	11		11,455	85 79	0040 RN4HAB	500,14 496,35	3 705	421 429	W3EK DL1DXA VU2PTT	2	20,381 19,550 10,416	93 8 99 8 64 6	VE7NA	80,483	205	151
*S52W *S55Z		60,372 31,320	198 17 133 12	20		OCEANIA Australia	1000 017	HG6C E77TA	" 485,20 " 482,46	(OP: HA	404 (6IAM) 382	SP9GLJ IK7XNF		6,710 5,376	58 5 61 5	HUØA	El Salvador 2,937,141	1746	711
*\$53NW	3.7	243,837 Spain	394 29	VK4IU VK4QH	7	5,118,505 12,462 210,405	1926 817 70 67 252 169	UX2MF RT4W	396,58 388,54	9 514 4 596	401 416	JA6WEQ 9M2SM		2,728 1,430 1,302	49 4- 27 20 22 2	i	US Virgin Islands 21,335,538		1259
EC1AE EA1XT	A 21	84,360 513,166	206 19 595 37	00 *VK100	Α	95,509	200 149	JR3RWB EA1GT	365,16 352,69 334,23	2 490	408 291 346	VU2UR	8	1,127	OP: 9M2GE1 25 2:	KP2TM KP2DX	17,121,160 674,561	5274 611	1301 359
EA1EA ED1Q	3.7 1.8	134,829 6,625	241 21 62 5 (OP: EA10	3 9M8Z	Ea	ast Malaysia 8,261,785	2636 959	KCØMO	316,46	4 462	304 KØOU)	VE3GTC CO8ZZ	3	1,008 612 504	34 2 17 1 14 1	'	AFRICA		
*EF1W	A	804,972	785 51 (OP: EA1W	8 S)		Guam	(OP: 9M6DXX)	HA7YS UT5UUV DR2Q	283,97 274,45	8 491	318 298 340	JAØGSG E27EK	*	45 8	5	A25HQ	Botswana 202,170	302	230
*EA1YG *EA1GWM	28 3.7	380,915 4,988	520 35 44	KG6DX	28		1910 808	KT8K	" 273,36	(OP: DL8		YT1CS SP3DRM	14	131,108 81,468 50,220	355 293 264 213	0.00000000	Guinea-Bissau		
EC2DX *EA2CE	A	9,440,957 116,550	3035 114 283 22		A	Hawaii 4,104	40 38	N9LB	245,31 232,71	5 453 6 368	301 258	ON3DI RU4SM UAØA		50,220 43,792 38,350	214 18 204 18 123 11	JUZHE	697,872		372
EB3CW	A	8,096,272	2944 113		Α	Indonesia 94,466	203 149	RA1AL PE2K SP2DNI	230,68 220,15 203,79	8 431	324 302 271	LY5G JA2JSF	:	31,106 26,936	172 15 119 10	CQ9T	Madeira Islands 21,845,680		1360
EE3A EA3XL	ž.	4,514,610 185,000	1977 9° (OP: EA3AT) 317 25	M) *YBØMW *YB2ECG	/M	51,186 40,005	139 114 138 105	EF8C	188,72	6 247 (OP: \	197 WP3A)	UA1CEC SQ30GP	į	23,580 13,886 13,000	151 13 119 10 109 10	FDEA	Morocco 38,510,454	6579	1601
EA3CEC EE3R	21	46,648 976,773	157 13 853 5 7	YC8HI	21 3.7		16 16 23 21 62 49	NT4TS IZ1JLF EU3NA	" 187,11 " 175,65 " 164,33	3 359	243 261 254	LA8WG DU1AJ	- 3	10,920 10,354	114 10 68 6	!	Namibia	4050	780
*EA3B0 *EA3AKA	A 3.7	396 94,500	12 212 18	2	N	lew Zealand		YO9FTN UT8UL	" 150,33 133,15	1 293 2 286	239 228	MØJBA BG7FBI IZ5JLW	ic 6	7,440 5,300 3,763	86 81 67 53 53 53	1	3,758,040 Senegal	1000	/ou
ED4A	A	1,516,455	1235 70	15 AZMOT	A 14	1,036,074	262 210 (OP: ZL1ANH) 780 481	LU1VK RW3AI	" 132,07 123,51 " 115,96	9 264	178 197 231	Y060EJ BH4RNX	8	3,248 1,288	60 5 31 2	6V7Z	27,788,120	6043	1465
EA4ETW EA4AK	14	347,014 231,914	(OP: EA4T 550 38 390 38	36			(OP: W3SE)	UX8ZA RA4FUT	112,34 103,03	7 306 2 280	219 216	R2WW LZ1/TA2AH UX7QG	HS :	1,254 1,053 720	34 3: 28 2: 24 2:	3V8BB	Tunisia 26,263,647	5018	1363
*EA4EUI *EA4ZK	À	390,855 864	501 36		A	Philippines 92,316	217 147	SP5XSL Y04AAC YU1LM	" 100,88 " 100,11 " 95,55	6 260	208 206 195	IZ5PNL VR2JAM		440 378	20 2 14 1		ASIA		
EA5EV EA5AX	A	1,072,746 281,430	888 54 387 29			TH AMERIC	A	KC5WA CT2KCG	92,31 79,66	0 249	170 187	DJ6TB IZ2WMW		81 16	OP: VR2UNO	RF9C	Asiatic Russia 29,872,318	5696	1489
ED5J	28	110,290	259 20 (OP: EA5D	5 111601	A	Argentina 528	11 11 2668 1009	EA1TI IK3XTY	71,37 67,46	2 232	178 178	\$57\$U 9A2Ø9L	7.	609,329 217,722	550 42 329 26	DKOWING	1,363,984 1,096,620 151,317	893 782 272	523 490 207
ED5N *EC5AN	3.7	491,720 5,610	515 38 68 6	6 LUZADA	28	7,746,093 4,503,842 2,130	2668 1009 1950 827 35 30	DF2WF I2BPP JA2MWV	66,39 58,98 58,68	1 192	178 169 120	SP2Q0T	e .	180,576	(OP: 9A9I) UI9I	141,375	256	195
*EA5HSI EA7ZY	7 28	345,779 112,772	383 32	LW6DG	21 7	3,352,016 1,296,297	1534 766 643 369	LZ7FLP LZ7H	57,03 53,97	8 193 6 199	158 156	SP4GFG HA8V I2/IZ3IBL	į	172,125 57,961 31,680	301 25 174 14 118 11	BZØCWH	4,692,506 35,207	1941 136	826 109
EC7ZK EA7EU	7 3.7	582,400 622,566	534 41 573 42	6 *LU4HW	A	164,502 75,046	(OP: LU9ESD) 296 234 183 157	DL/KL1A IZ2QKG AI9K	53,46 48,13 45,56	9 208	162 161 136	K3TW/4 DDØVS	į	12,996 8,976	60 5 77 6	YM7KA	Asiatic Turkey 14,529,592	3861	1133
*EA7HOJ *ED7C	A 28	448 21,736	16 96 (OP: EA7	6 *LUSEOT				AB3GB JK1TCV	" 43,26 " 41,80	8 147 8 135	116 104	N1TM ACØZG UX9Q	3.7	3,104 4 36,010	32 3: 2 138 13	TC3C YM3KM	7,521,552 2,544,048	2531 1251	828 604
*EF7W	14	425,898	642 47 (OP: EC7K)	8	2.63	Aruba	5365 1303	EA3FF SQ8MFB KD8DVY/4	* 40,52 40,32 38,90	6 168	136 143 131	K9JWV/7		4,272	(OP: UR9Q0 57 4	BY5CD	China 5,457,870	2340	894
SJ2W	S	weden 6,281,184	2465 109	900000	Α	23,229,004	(OP: DF7ZS)	LZ2NG EA4EMC	37,35 36,35	6 138	132 128	9A4AA R3VA	1.8	1,984 91	32 3: 8	B3C B4S	1,915,948 1,822,048	1352 1201	634 587
SE6E	×.	2,500,000	(OP: SM2LI	Y)	Α		3677 1164	DJ3GE OZ6OM	32,63 31,52	7 125	129 113		MULTI	-OPERATO)R	BY8DX BY2AA BY4SA	1,499,797 1,319,010 808,353	1200 992 765	559 571 441
SMØBSO SI2E	10	720,954 66,144	780 50 185 15	9 PY3DX	W.	105,842 98,208	(OP: PY2MNL) 214 187 212 186	9A2Ø40P IW3SGT W2JEK	" 30,83 25,13 " 23,90	4 141	129 118 96	S	INGLE 1	TRANSMIT H AMERIC	TER	B4X/6 BY6LY	530,530 380,568	658 795	371 303
SM5CZQ SJ6A	28	2,754 53,430	OP: SM2EK 28 147 13	PY5ZD PP5JN	28	96,222	221 174 933 547	7K1CPT Y050PH	20,48 20,46	2 104 0 98	77 93	AK1W		ted States 14,020,635	3935 128	BY1CQ BY1QH	289,954 97,539 54,240	512 248	298 183
8SØC	14	1,889,264	OP: SM6JS 1282 80	M) PY1EW PY2HL	21	1,078,740 540	819 468 16 15	PY2BN UAØSBQ EA7HE	" 20,24 " 18,01 " 17,46	8 89	92 77 90	KM1W NG1R		3,872,750 2,137,278	1566 879 1249 689	BD4SVB BY4RWT	54,349 2,880 1,950	177 39 33	139 36 30
*SE5S *SM6MVE	Å	752,640 343,285	708 49 505 38	PT2CM	14	55007,550	1902 887 (OP: PT2IC)	N8XX PDØPMS	" 16,89 " 15,68	6 103 8 119	88 106	NC11 W1BUR		705,200 7,560	685 411 56 5	The second section	Cyprus 37,798,352		1556
*SHØG *SE5E	Ď	93,870 78,873	245 2° 221 18	0 PY2KJ PY7ZY	10	72,562 62,080	178 146 167 128	M5AEF RC9YA	" 11,03 " 9,33	8 60	89 58 RW9Y)	WW2DX AB2DE		19,167,080 1,514,688	4495 137 3		Hong Kong		
*SM3L	у.	286	OP: SM5AJ 11 (OP: SA3BP	1 PR7AP A) *PY2VZ	7 A	12,141 252,560 1,434,860	72 71 226 205 945 554	YO2LAN WA5RML	9,04 8,37	2 67 8 90	66 71	WV2ZOW N2FF W2GH		1,033,734 614,658 419,888	860 45 555 40 438 32		972 Japan	28	27
*SD6N	7	49,392	170 14 (OP: SM6	4 *PV7M V)		963,500	791 470 (OP: PT7ZT)	OK1DMP SQ7IQI	8,28 5,89 5,72	1 48	56 43 54	NO2J N2NGW		275,076 205,146	400 28 316 26	JA1ZGP	166,722	309	222
HB8CSA	Sw	itzerland 6,404,905	2493 10	*PY1SX *PY30PF *PY7DJ	9.0	93,593 92,364 53,055	193 173 200 172 220 135	KA5PVB AF9J	5,58 5,04	6 68 4 61	57 52 44	WR3Z N3WAX		10,964,307 569,859	3668 1213 597 333		2,163,405		619
*HB9DHG	28		OP: HB9DU 185 13	R) *PY3FOX *PY2ABN		34,068 33,176	121 102 131 116	KK7VL DU7JGU	4,97 4,91 3,95	47 4 63	44 54 43	W3LJ		214,750	336 25	02.100	3,158,218 Kazakhstan	1450	766
EM2G	, L	lkraine 4,593,493	2374 106	*PY2JCN *PP5ZB *PY2NM		29,526 24,600 6,750	145 111 115 100 60 54	YO4HHP EA3GI	1,76	8 37 8 27	34 27	WF3C/4 K4NAB		2,957,184 2,714,838 506,483	1751 81 1629 77 553 36	0.20	27,522,568	5365	1451
UW5IM		2,493,517	(OP: UR7G 1558 76	0) *PR3A *PY3FJ	28	4,639,460 1,323,552	1872 868 863 544	UU9JQ K6RM/4 EA3FHP	1,72 1,63 1,40	2 24 4 30	32 24 26	N4DXY		216,832	353 24	9K2HN	Kuwait 15,264,424	4211	1112
UR5AS UTØU	×	2,295,984 1,710,000	1634 74 1080 72 (OP: UT5UD	O PU2STZ		1,248,566 853,549 839,300	864 551 687 449 720 436	RK6AQM	1,22 1,15	5 25 0 25	26 25 25	K5KDX K5TR N5FM		219,964 59,210	348 25 219 15 181 15	7Z1SJ	Saudi Arabia 12,592,800	3363	1080
US3IZ UTØEO	-	531,118 270,522	629 4° 451 33	3 *PY2TKB 9 *PU1KG0	i "	774,204 396,198	660 433 457 319	OZ1LTR JH7UJU JL6LTB	95 94	0 23	29 20 19	AD5XM		55,266 3,432	181 15 42 3	ВРОР	Taiwan 2,137,674	1485	661
UT7NY UU2JQ UZ5ZV		51,600 40,230 37,674	138 12 139 13 132 1	5 *PY2XV	*	357,408 100,534 79,261	442 306 237 167 218 169	KG7WZ VU2GUR	. 82 68	8 23 4 18	23 18	NY6N KX7M/6 WQ6X		14,316,616 10,136,232 5,377,580	4215 130 3480 112 2503 86		United Arab Emirat	tes	
UT7QF UVØI	28 21	225,081 2,277,986	344 26 1754 79	7 *ZW5WII	М "	73,788	195 172 (OP: PU5IKE)	EA3GYE F6BZG	53 49 33	5 16	19 15 12	KE1B/6 KU6W		5,377,580 2,716,270 2,090,574	1783 74 1304 66	Nobn	607,523 West Malaysia	565	413
UT7U		992,993	(OP: UR5IF 843 48	x) *PU5AGN *PY2XC	N .	24,960 13,800 3,663	119 104 76 69 37 37	YC1RHS LU3HFA	" 1 28 120,33	8 2 0 249	2 191	WI6I WM6A		1,724,800 567,816	1734 61 545 40	9M2NNM	420,282	625	362
UX1UA US1I	14	668,682 6,520,784	(OP: UT7U 667 40 2950 120	6 *PY2LUC 8 *PY9MM	21	1,069,932	11 10 721 547	ON6NL I5KAP R2AD	92,10 79,97 30,68	7 198	169 159 118	W6KA K6UD		437,524 161,403	572 35 330 21)	EUROPE Austria		
E030	X	3,768,498	(OP: UX2I 2143 102	0) *PP5BB *PY2VM	14	37,023	128 123 53 51	V050HY LU7VCH	27,73 21,72	0 104 5 95	94 79	KS7AA KK7PR		7,268,469 3,758,686	2533 969 2089 829	0E6XUG	19,989,925 167,480	4905 334	1465 265
US1MY UT8QQ	7	7,290 81,954	DP: UR3QC 85 8 193 1 7	31	A	Chile 507,000	572 338	RA4CLU KG4CDL	" 14,96 " 11,31 " 10,72	9 87	80 77 62	W7IWW N7VF WS7L		1,006,368 878,548 411,585	1075 523 737 45 507 34	EW8Z0	Belarus 356,928	528	338
UW5ZM UY3AW	3.7	853,461 81,993	743 48 196 18	13			(OP: CE3OPE) 337 250	R7MX DL2TM	10,54 9,73	0 72	68 59	WX7P WS7V		241,224 192,533	389 27 404 25	EW8ZZ	3,520 1,320	44 34	40 33
				1		32								term a 152 002		10			

ON6BR ON4CRD ON4CP	Belgium 1,871,155 334,024 15,280	1208 477 90	715 344 80	YT2T YU7AJM	Serbia 10,151,880 828,307	3599 796		G6PZ OH5Z PI4DX IQ1RY	18,294,624 16,180,905 13,473,653 12,167,280	5173 4933 4039 3794		*KDØOYR *AB30B *AG6KA *KB1WRH	**	2,400 1,820 1,675 1,320	26 27	25 *SQ	BHM 2NFB 3PMM 1WBV		3,432 3,400 2,886 2,772	37 33 35 34 39 37 30 28
E74ACL	Bosnia-Herzegovin 902,010		562	119P 119K 109A	Sicily 10,264,944 7,459,803 4,311,945	3850 3080 2324	1203 1023	E72ØRS G50 LY22A S55T	12,020,479 11,496,200 10,941,016 10,470,735	4137 3909 3932 3244	1307 1223 1256 1089	*KC9VGG *KF7SKB *W5TJS *KC9TQR	28	975 350 36 4,368	28 14 4 44	25 *MN 14 *EA7 4 *OZ8 39 *LA9	IØIMC 7JHV BKEL BNSA	:	2,618 1,887 1,881 1,025	35 34 42 37 41 33 26 25
9A22P 9A8M 9A1CRD	Croatia 18,871,685 9,072,856 15,312	4871 3181 97	1435 1196 87	OM7M	3,073,455 Slovak Republic 15,957,970	4198	1385	DM4X 7SØX DR7B DAØT CQ7A	10,227,148 7,714,107 5,306,712 4,631,852 4.281,255	3604 3239 2716 2427 2331	1231 1143 984 926 961	*W9YB *KJ6MQM *KB1WU0 *KK4FYV		4,368 2,856 950 84	36 19	/Q) *DL1 34 *IZ1 19 *IZ3	REP	200	940 800 756 756 675	20 20 26 25 27 27 29 27 15 15
OK2KOJ OK2RVM	Czech Republic 2,489,418 497,743	1447 639	753 391	OMØA OM4C	3,164,808 3,164,355 Slovenia 9,217,440	1975 1672	855	SP9PDF IQØRM EE1D DJ5AN	4,010,495 1,933,963 1,791,282 1,289,377	2003 1196 1211 969	895 739 722 619	*KK4BSM *KB3SQV *KK4GGZ *AG6AN	21	27 24 12 9,387	3 4 2	3 *F4F	WN 1JGA	÷	540 510 286	18 18 18 17 11 11 (OP: SA3BPA)
OZ2AR OZ5GX	Denmark 1,534,496 1,106,432	1109 991	632 512	S56CW S59T	4,169,616 1,134 Spain	2176 30	894 27	SK6HD YB8Y	1,015,014 OCEANIA 5,664,852	911 2618	546 636	*KK6BJ *KDØNEL *KC2YXU	14 7	276 20,453 616	154 1	14 *JG1 *BH	IAJT IMYK IKZQ	2.0	260 126 42 35	10 10 7 7 7 7 8 7
G2W M4U G5FZ	England 9,225,118 2,624,820 1,658,270 1,398,036	3374 1602 1264 1019	820 695	EC1DBO ED1C ED1G	5,000,760 1,917,876 1,769,459 4,202,880	2462 1367 1309 2103	724 719	PJ4Z PW7T LR3M	57,741,867 44,052,624 15,359,800	9873 7943 4347	1641 1624 1259	UA5A S59ABC	A 		3949 120 OP: RA3AN 2776 104 (OP: S56A	KT) *PU2	IDP BWWW 2STZ 1PYZ 5KAO	28	1,510,083 1,248,566 853,549 335,276 163,724	999 543 864 551 687 449 412 316 325 244
GXØFUN GØD G4EKT	512,079 11,055 Estonia	588 71	678 393 67	ED2W ED3X EE3T	554,800 10,874,058	736 3549 2992	475 1279	XR6T LU4FM PR5D	14,278,810 10,570,752 6,822,520	4174 3258 2494		RN3DMU HZ1TT UD3D	*	3,146,094 2,504,568 2,221,128	2003 80 1297 50 1858 75 OP: UB3DA	61 *LU3 83 *PU2 56 *ZW	SYEP 2KIV 5WIM	(MV 2.0) 3.07	111,000 89,595 73,788	271 200 222 181 195 172 (OP: PU5IKE)
ES9C ES1XQ ES1N	21,585,315 1,064,061 5,559	5603 1092 62	1549 573 51	EA4RCT EA5URV	6,449,960 16,020 1,293,516	94	89]	MULTI-OPERAT MULTI-TRANSMIT NORTH AMERIC	TER		IZ3SQW DG7HL YP6Z		1,957,893 684,950 576,678	1430 70 698 4 587 4 OP: Y06P2	01 *PUS 75 *PY2 31 *UBS	5AGM 2YRC BQAA	:	24,960 17,640 16,936 12,816	119 104 93 90 85 73 77 72
RZ1AWT	European Russia 91,805	286	215		Sweden			NX5M	United States 19,565,898	6827	1441	ON7HLU JO4CTB		357,896 321,468	439 20	92 67 *PY2	2V0X	590	10,064	(OP: IZ7SIA) 81 68
RL3A RU5TT	22,523,280 3,095,810	6003 2005	1 560 877	SK70A	3,333,524 Switzerland	1797	853	WX3B NR60	18,216,301 17,320,290	5102 5759	1335	DL1WM WP4I IZØRCP		112,554 89,658 83,265	190 1	22 *IT9 53 *IZ5 83 *EA8	UGE	i	9,686 8,415 6,075	61 58 62 55 47 45
UG3G RT2M	955,136 346,110	1095	574 417	НВ9ЕЕ НВ9МН	6,710,349 5,615,400	2572 2318	955	NE1C AK7AZ NQØK	9,110,720 3,608,815 118,604	3299 2292 293	1136 805 199	F1PYN		72,982 28,702	208 10 125 1	82 *PU!	SADX SSHR		3,626 2,418	40 37 31 31
RC3W RL3QWA	272,285 208,314	471 443	355 326	HB90DK HB9FA	553,656 246,000	575 406	408 300	N. HICCO	Alaska			EA3HEK BH1LYB RA3ICK	÷	2,492 1,316 280	28	28 *YL3	JMD BAGV	21	1,682 318,763	31 29 453 361
RA3SI RK3FWE	158,337 41,454	275 169	241 147	UX2U	Ukraine 4.545.260	2497	943	KL7RA	19,449,164 Canada	5008	1316	PY1EW BY1CW	28 21	1,078,740 134,596	819 4	68 *UB	3KMF 6ACR UGM		94,127 22,040 12,960	233 199 125 116 73 72
RT4F RK4HYT	20,857,344 1,083,810	5837 985	1536 546	UT7E	4,536,773	2422		VC6Z VA5AA	19,953,621 6,161,524	5048 2401	1361 974	D4C	14	6,534,990	OP: BD1GX 2278 9	(H) *SQ	BKFH CKN	:	5,661 4.092	53 51 44 44
UE85DRK	2,991,807	2222	843		OCEANIA Australia			VE710	1,900,555 AFRICA			BH4RNX LZ1/TA2AHS		1,288 1,053		28 *DO	BOGC 7CED	740	3,567 783 372	42 41 29 27 12 12
RK9FYS	65,148	227	178	VK4NM VK6AHR	11,989,252 21,165	3368 93		EB8AH	76,018,024	11714	1784	IZ2WMW	90	16	OP: TA2AH	4S) *UBA	4AAV 2/JO3XG	γ "	160 27	10 10
DQ4W	Fed. Rep. of Germa 9,663,060	3145	1210	9M6SDX	East Malaysia 2,132,568	1397	486	JE1ZWT	ASIA 8,428,028			*EA2LMI *ED7R	Ä	1,090,100 1,009,125	983 55 1230 65 (OP: EA712	21 *LR1	1H	14	665,660 85,008	603 401 288 231
DLØUM DD2CW DP7D	3,872,642 3,070,244 2,435,070	1717 2117 1422	887 772 785		Guam			B1Z BVØJ	7,590,180 6,963,698	3056 3388		*0H3F0G *Y05LD	:	998,037 818,100	904 5 860 5	19 · IV3		1941	25,452	(OP: IZØUME) 126 126 59 59
DLØP DL1NKS	1,616,502 1,500,642	1164	643 583	WH2DX	1,407,710 Hawaii	997	478	DR1A	EUROPE 51,608,753	10636	1841	*UB9AAJ *F4GDI		517,924 443,820	465 3° 551 39	16 *SQ	SHKZ SRLC HFU	ж.	3,127 2,303 700	59 59 53 49 28 28
DJØA DC6RI	1,396,383 1,032,669	920 969	597 549	кн7х	19,038,120	4430	1180	9A1A OT5A	38,960,724 34,489,028	8801 7921	1749 1687	*VK5PAS *LA1DSA *EA5HRB		414,352 327,474 320,112	501 33	39 *F40	IOBY GTD	7	320 592,724	16 16 645 418
DQ5X DP5P DKØSU	892,680 670,016 256,366	955 706 368	519 464 271	YB1C	Indonesia 4,708,340	1927	845	HG1S LY7A	34,413,120 26,861,948 19,266,170	8514 6713 6106	1579	*RV9WND *UR6LEY		253,184 239,008	346 25	56 •Y0	SHSI 2MJZ IGVZ	÷	345,779 150,332 48,840	383 329 267 236 139 132
DR2P	198,900			YE3J	317,070	427	234											7447		100 102
DLØH	163,386	376 324	260 261			721	204	DP6T	18,691,695	5415	1485 1412	*CT2KFA *VE4TTH		230,298 221,961	328 24	41	SIA		34,574	125 118
DLØH DLØML DLØTUM	163,386 61,623 1,600	324 187 27	261 167 25	DU1HR	Philippines	1120	480	DP6T EE1W EA3GTJ SN6F	18,691,695 15,352,676 6,967,635 5,052,861	5415 5249 3028 2494	1412 1115 963	*VE4TTH *UR3AHF *DL7DET		221,961 208,080 201,772	328 24 383 25 412 25	41 89 92		" IDER/		
DLØML DLØTUM	163,386 61,623 1,600 Finland	324 187 27	261 167 25		Philippines 1,671,360 416,540	1120 617	480	DP6T EE1W EA3GTJ SN6F UZ2Q DB5ØEFA	18,691,695 15,352,676 6,967,635 5,052,861 761,022 323,613	5415 5249 3028 2494 877 531	1412 1115 963 459 369	*VE4TTH *UR3AHF *DL7DET *IZ2QGH *VA3DBT		221,961 208,080 201,772 172,546 151,620	328 24 383 28 412 29 315 24 277 2	41 89 92 42 T	RIBAN		SINGLE E	LEMENT
DLØML	163,386 61,623 1,600	324 187	261 167 25	DU1HR 4GØLD	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina	1120 617	480 236	DP6T EE1W EA3GTJ SN6F UZ2Q	18,691,695 15,352,676 6,967,635 5,052,861 761,022 323,613 320,594	5415 5249 3028 2494 877	1412 1115 963 459 369	*VE4TTH *UR3AHF *DL7DET *IZ2QGH *VA3DBT *2EØTCC *GØLZX *OM2DT		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567	328 24 383 28 412 29 315 24 277 2 346 20 256 19 252 20	41 89 92 42 T 10 62 97 03 NF4/	RIBAN X/4		SINGLE E ted States 8,815,183 4,729,318	3230 1157 (OP: N4PN) 2148 947
DLØML DLØTUM OH8X OH6K OH2K	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece	324 187 27 3994 538 174	261 167 25 1344 370 143	DU1HR	Philippines 1,671,360 416,540 SOUTH AMERIC	1120 617 A 4400 4310 2236	480 236 1334 1299 938	DP6T EE1W EA3GTJ SN6F UZ2Q DB5ØEFA IZ10MY VK4KW VK2KDP	18,691,695 15,352,676 6,967,635 5,952,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196	5415 5249 3028 2494 877 531 425	1412 1115 963 459 369 314 1216 631	*VE4TTH *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EØTCC *GØLZX *OM2DT *DL6TA *Y02MKT		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,690	328 24 383 26 412 29 315 24 277 2 346 20 256 19 252 20 293 22 237 19	41 89 92 T 10 62 NXØ 97 03 NF4/29 W6T 95 N6JN	RIBAN x/4 k		SINGLE E ted States 8,815,183 4,729,318 3,302,784 2,768,304	3230 1157 (0P: N4PN) 2148 947 1855 752 1685 749
OH8X OH6K	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340	324 187 27 3994 538	261 167 25 1344 370	DU1HR 4GØLD LS1D AY5F LV6D L73D LU1UM	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646	1120 617 A 4400 4310 2236 1548 1097	480 236 1334 1299 938 799 486	DP6T EE1W EA3GTJ SN6F UZ2Q DB5ØEF/ IZ10MY	18.691.695 15.352.676 6.967.635 5.052.851 761.022 323.613 320.594 OCEANIA 18.934.336 3.228.196 303.303	5415 5249 3028 2494 877 531 425 4713 1443 489	1412 1115 963 459 369 314 1216 631	*VE4TTH *UR3AHF *DL7DET *IZ2QGH *VA3DBT *2EØTCC *GØLZX *OM2DT *DL6TA *Y02MKT *SP5TWA *OZ2CA *IZ2UST		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,690 105,152 98,345 97,970	328 24 383 28 412 29 315 24 277 2 346 20 256 19 252 20 293 22 293 22 259 22 263 22 258 20	41 89 92 T 10 662 NXØ 97 03 NF4/29 W6T 95 N6J/12 KG4/1 02 ACØI	RIBAN X/4 K / W EA/7		SINGLE E ted States 8,815,183 4,729,318 3,302,784	3230 1157 (OP: N4PN) 2148 947 1855 752 1685 749 1211 735 1294 686 1636 684
DLØML DLØTUM OH8X OH6K OH2K SZ3P	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540	324 187 27 3994 538 174 2449 1911	261 167 25 1344 370 143	DU1HR 4GØLD LS1D AY5F LV6D L73D LU1UM LT5D L6ØS	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,497,646 1,427,755 668,152	1120 617 A 4400 4310 2236 1548 1097 926 653	480 236 1334 1299 938 799 486 565 376	DP6T EE1W EA3GTJ SN6F UZ2Q DB5ØEFA IZ10MY VK4KW VK2KDP DX1DBT	18,691,695 15,352,676 6,967,635 5,052,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,222,196 303,303 SOUTH AMERICA 47,996,898	5415 5249 3028 2494 877 531 425 4713 1443 489 CA 9039	1412 1115 963 459 369 314 1216 631 231	*VE4TTH *UR3AHF *DL7DET *IZ2OGH *VA3DBT *2EØTCC *GØLZX *OMZDT *DL6TA *YOZMKT *SP5TWA *OZ2CA *IZZUST *VE6AMI *EIBGSB		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,690 105,152 98,345 97,970 94,500 92,650	328 24 383 24 412 29 315 22 777 2 346 20 256 19 252 20 293 237 19 259 2 263 23 258 20 258 20 259 2	41 89 92 42 T 100 62 NXØ: 97 03 NF4/* 29 W6T 95 N6J/\ 12 KG4\ 21 W6A 02 ACØ: 80 18 K3M	RIBAN X/4 K K / W EA/7 B		SINGLE E ted States 8,815,183 4,729,318 3,302,784 2,768,304 2,229,255 2,175,992 2,056,788 1,732,722	3230 1157 (OP: N4PN) 2148 947 1855 752 1885 749 1211 735 1294 686 1636 684 (OP: NX9X) 1168 634
DLØML DLØTUM OH8X OH6K OH2K SZ3P SZ1A EI8ØIRTS	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man	324 187 27 3994 538 174 2449 1911	261 167 25 1344 370 143 895 808	DU1HR 4GØLD LS1D AY5F LV6D L73D LU1UM LT5D	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755	1120 617 A 4400 4310 2236 1548 1097 926	480 236 1334 1299 938 799 486 565 376	DP6T EE1W EA3GTJ SN6F UZ2Q DB5ØEFA IZ1OMY VK4KW VK2KDP DX1DBT	18,691,695 15,352,676 6,967,635 5,082,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIO 47,996,388 11,032,521	5415 5249 3028 2494 877 531 425 4713 1443 489 CA 9039	1412 1115 963 459 369 314 1216 631 231	*VE4TTH *UR3AHF *DL7DET *IZ20GH *IZ20GH *VA3DBT *2EØTCC *GØLZX *OM2DT *DL6TA *VO2MKT *SP5TWA *OZ2CA *IZ2UST *VE6AMI *EI9GSB *ED5A		221,961 208,070 201,772 172,546 151,620 147,566 121,746 118,622 105,690 105,152 98,345 97,970 94,500 92,650 92,316	328 24 383 21 412 25 315 2 277 2 2 346 21 256 11 252 277 11 259 2 2 263 22 263 22 263 22 264 2 271 11 249 2 2 238 11 OP: EASHF	41 89 92 42 T 10	RIBAN X/4 A K / W EA/7 B D E		SINGLE E ted States 8,815,183 4,729,318 3,302,784 2,269,255 2,175,992 2,056,788 1,732,722 1,674,711 1,667,900	3230 1157 (OP: N4PN) 2148 947 1855 752 1685 749 1211 735 1294 686 1636 684 (OP: NXØX) 1168 634 1251 587
DLØML DLØTUM OH8X OH6K OH2K SZ3P SZ1A	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725	324 187 27 3994 538 174 2449 1911	261 167 25 1344 370 143 895 808	DU1HR 4GØLD LS1D AY5F LV6D L73D LU1UM LT5D L6ØS LQ4D PQ5B PW2D	Philippines 1,671,380 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,814	1120 617 A 4400 4310 2236 1548 1097 926 653 286 4298 4053	480 236 1334 1299 938 799 486 565 376 205	DP6T EE1W EA3GTJ SN6F UZ20 DB5ØEFA IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B	18,691,695 15,352,676 6,967,635 5,052,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIO 47,996,898 11,032,521 ROOKIE United States	5415 5249 3028 2494 877 531 425 4713 1443 489 CA 9039 3382	1412 1115 963 459 369 314 1216 631 231 1662 1159	*VE4TTH *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EØTCC *GØLZX *OM2DT *DL6TA *YO2MKT *SP5TWA *OZ2CA *IZ2UST *VE6AMI *E196SB *ED5A *SN1T *LA2NTA		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,690 105,152 98,345 97,970 94,500 92,660 92,316	328 24 383 21 412 25 277 2: 346 21 256 1: 252 21 293 2: 259 2: 259 2: 258 2: 258 2: 258 2: 249 2: 238 1:	41 8 992 42 T T 100	RIBAN X/4 K K / W EA/7 B D E		SINGLE E ted States 8,815,183 4,729,318 3,302,784 2,768,304 2,229,255 2,175,992 2,056,788 1,732,722 1,674,711 1,667,900 1,608,920 1,538,400	3230 1157 (OP: N4PN) 2148 947 1855 729 1885 749 1211 735 1294 686 1636 684 (OP: NXØX) 1168 634 1251 587 1222 650 1048 584
DLØML DLØTUM OH8X OH6K OH2K SZ3P SZ1A EI8ØIRTS GT8IOM I050 IR6T	163.886 61.623 1.600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2.670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918	324 187 27 3994 538 174 2449 1911 707 977 3778 2737	261 167 25 1344 370 143 895 808 474 577	DU1HR 4GØLD LS1D AY5F LV6D L73D LU1UM LT5D L6ØS LQ4D PW2D PW2D PW2D PW2D PW2D PW4O	Philippines 1,671,380 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,814 8,287,457 5,662,569	1120 617 4400 4310 2236 1548 1097 926 653 286 4298 4053 2842 2005	480 236 1334 1299 938 799 486 565 376 205 1269 1291 1021 957	DP6T EE1W EA3GTJ SN6F UZ20 DB50EFI IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H	18,691,695 15,352,676 6,967,635 5,052,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,222,196 303,303 SOUTH AMERIN 47,996,398 11,032,521 ROOKIE United States A 655,578 413,049 413,049 412,052	5415 5249 3028 2494 877 531 425 4713 1443 489 CA 9039 3382	1412 1115 963 459 369 314 1216 631 231 1662 1159	*VE4TTH *UR3AHF *DL7DET *IZ20GH *VA3DBT *ZEBTCC *GØLZX *OM2DT *DL6TA *YO2MKT *SP5TWA *OZ2CA *IZ2UST *VE6AMI *EIGSSB *ED5A *SN1T *LA2NTA *VK6MAB *LA2NTA *VK6MAB *EA7JIY		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,630 105,152 98,345 97,970 92,650 92,316 88,059 86,922 82,335 74,315	328 2: 383 2: 412 2: 315 2: 277 2: 346 2: 255 2: 259 2: 259 2: 258 2: 211 1: 249 2: 238 1: 0P: EA5HF 249 1: 0P: EA5HF 248 1: 190 1: 248 1: 190 1: 248 1: 190 1: 248 1: 190 1: 248 1: 190 1: 248 1: 190 1: 248 1: 190 1: 248 1: 190 1: 248 1: 190 1: 248 1: 190 1: 248 1: 190 1: 248 1: 190 1: 204	41 12 12 14 16 16 16 16 16 16 16 16 16 16 16 16 16	RIBAN X/4 A K K V W W.EA/7 B D E V Q M M S S O W P/7		SINGLE E led States 8,815,183 4,729,318 4,729,318 4,2768,304 2,229,255 2,175,992 2,056,788 1,732,722 1,674,711 1,667,900 1,538,490 1,531,455 1,451,738	3230 1157 (OP: N4PN) 2148 947 1855 752 1885 749 1211 735 1294 686 (OP: NXBV) 1168 634 1251 587 1222 650 1048 584 1144 641 1107 579 987 547
DLØML DLØTUM OHBX OHBK OHBK OHBK SZ3P SZ1A EIBØIRTS GTBIOM IOSO IRBT IRST IRST	163.886 61.623 1.600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2.670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7.665,918 5,059,884 4,085,876	324 187 27 3994 538 174 2449 1911 707 977 3778 2737 2208 1921	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004	DU1HR 4GØLD AYSF LV6D L73D LU1UM LT5D L6ØS L04D P05B PW2D PW2T	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,385 5,670,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,814 8,287,457	1120 617 4400 4310 2236 1548 1097 926 653 286 4298 4053 2842	480 236 1334 1299 938 799 486 565 376 205 1269 1291 1021	DP6T EE1W EA3GTJ SN6F UZ2Q DB50EFIZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H N1AGE KJ6HB7	18,691,695 15,352,676 6,967,635 5,052,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIO 47,996,398 11,032,521 ROOKIE United States A 655,578 4 413,049 2 121,052 1 131,652 1 131,652	5415 5249 3028 2494 877 531 425 4713 1443 489 3382 811 504 358 260 287	1412 1115 963 459 369 314 1216 631 231 1662 1159 387 357 246 207 195	*VE4TTH *UR3AHF *DL7DET *UR2GH *VA3DBT *ZEBTCC *GØLZX *OM2DT *OM2DT *OM2DT *VO2MKT *SPSTWA *OZ2CA *IZZUST *LZUST *SN1T *LA2NTA *VK6MAB		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,630 105,152 98,345 97,970 92,650 92,316 88,059 (89,22 82,335 74,315 69,973 60,822	328 2: 383 2: 412 2: 315 2: 277 2: 256 1: 252 2: 253 2: 259 2: 258 2: 211 1: 249 2: 238 1: 0P: EA5HE 248 1: 190 1: 204 1: 190 1: 205 1: 190 1: 205 1: 205 1: 205 1: 205 1: 204 1: 204 1: 204 1: 205 1:	41 12 12 14 16 16 16 17 16 17 16 17 16 17 16 17 17 17 17 17 17 17 17 17 17 17 17 17	RIBAN X/4 K K W EA/7 B D C O M S D W F F F F F F F F F F F F		SINGLE E ted States 8,815,183 3,022,784 2,768,804 2,229,255 2,175,992 2,056,788 1,732,722 1,667,910 1,668,920 1,533,455 1,451,738 1,451,738 1,451,738	3230 1157 (OP: N4PN) 2148 947 1855 752 1885 749 1211 735 1294 686 (OP: NXBX) 1168 634 1251 587 1222 650 1048 584 1144 641 1107 579 987 547 1060 515 1187 541 1818 503
DLØML DLØTUM OHØK OHØK OHØK OHØK SZ3P SZ1A EI8ØIRTS GT8IOM I050 IR6T IR5A IR6T IR5A I06RS I07T	163.886 61.623 1.600 Finland 10,948.224 452.510 54.340 Greece 3,805.540 2.670,440 Ireland 658.860 Isle of Man 1,110,725 Italy 13,781,740 7.665.918 5.059.880 4.085.276 2.295.240 1,742.784	324 187 27 3994 538 174 2449 1911 707 977 3778 2737 2208 1921 1553 1280	261 167 25 1344 370 143 895 808 474 577 1372 11063 1004 744 696	DU1HR 4GØLD LS1D AY5F LV6D L73D LU1UM LT5D L6ØS L04D PQ5B PW2D PW2D PW2T ZW40 PX7C ZV2K ZV8T PR5A	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,814 8,287,457 5,662,569 4,159,876 3,811,148 1,768,044 1,215,164	1120 617 4400 4310 2236 1548 1097 926 653 286 4298 44053 2842 2005 1635 1635 1635 1635 1635 1842	480 236 1334 1299 938 799 486 565 376 205 1269 1021 957 812 814 587 494	DP6T EE1W EA3GTJ SN6F UZ20 DB50EFA IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H N1AGE KJ6HBY WA6KEK KØSTPA	18,691,695 15,352,676 6,967,635 5,052,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIO 47,996,398 11,032,521 ROOKIE United States A 655,578 4 413,049 2 121,052 1 131,652 1 131,652 1 141,290 1 61,116 1 45,924	5415 5249 3028 2494 877 531 425 4713 1443 489 2A 9039 3382 811 504 358 260 287 192 167	1412 1115 963 459 369 314 1216 631 231 1662 1159 387 246 207 246 207 132 129 87	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GOLZX *OMEDI *		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,152 98,345 97,970 94,500 92,650 92,316 88,059 (86,922 82,335 74,315 69,973 60,822 54,720	328 2: 383 2: 412 2: 315 2: 277 2: 346 2: 256 2: 252 2: 33 2: 259 2: 258 2: 258 2: 258 2: 211 1: 249 2: 249 1: 200 1: 204 1: 204 1: 205 1: 400: 546 8: 248 1: 200 1	41 12 12 12 12 12 12 12 12 12 12 12 12 12	RIBAN X/4 K / K / W EA/7 B D E V O M S S O W M S R W H H		SINGLE E ted States 8,815,183 4,729,318 3,302,784 2,768,804 2,229,255 2,175,992 2,056,788 1,732,722 1,667,910 1,668,920 1,538,400 1,531,455 1,451,738 1,253,466 1,253,2748 1,218,5100	3230 1157 (OP: N4PN) 2148 947 11855 752 1685 749 1211 735 1294 686 (OP: NX8N) 1168 634 1251 587 1292 650 1048 584 11107 579 987 547 1060 515 1187 541 818 503 1150 566
DLOML DLOTUM OHBX OHBX OHBX OHBX SZ3P SZ1A EIBBIRTS GTBIOM IO50 IR6T IR5A IY4FGM IO6RS	163,386 61,623 1,600 Finland 10,948,224 452,510 452,510 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 5,059,880 4,085,276 2,295,240	324 187 27 3994 538 174 2449 1911 707 977 3778 2737 2208 1921 1553	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 744	DU1HR 4GØLD AY5F LV6D AY5F LV73D LU1UM LT5D L6ØS LQ4D PQ5B PW2D PW2T ZW40 PX7C ZV2K ZW8T PR5A	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,497,646 1,427,755 668,152 159,285 Brazii 17,088,354 15,690,814 8,287,457 5,662,569 4,159,876 3,811,148 1,768,044 1,215,164	1120 617 4400 4310 2236 1548 1097 926 653 286 4298 4053 2842 2005 1635 1685 1032 841	480 236 1334 1299 938 799 486 565 376 205 1269 1021 957 812 814 587 494	DP6T EE1W EA3GTJ SN6F UZ20 DB50EFI IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H N1AGE KJ6HBY K0ASTP/4 K02PK K02PK K02PH W7MCM	18,691,695 15,322,676 6,947,635 5,052,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIC 47,996,888 47,996,888 413,049 212,052 1131,652 121,290 661,116 45,924 118,879 112,352 111,852	5415 5249 3028 2494 877 531 425 4713 1443 489 52 A 9039 3382 56 66 66 66 66 66 66 66 66 66 66 66 66	1412 1115 963 459 369 314 1216 631 231 1662 1159 387 246 207 195 132 129 87	*VE4TTH *UR3AHF *DL7DET *UR3DBT *V250GH *V43DBT *226GTCC *GGLZX *OM2DT *DL6TA *V22MKT *SP5TWA *DZCCA *LZ2UST *UL22UST *UL22UST *LA2NTA *VK6MAB *EA7.JIY *S51JS *F8KKH *LA9USA		221,961 208,080 201,772 172,546 151,620 147,506 121,746 118,622 105,620 105,152 98,345 97,970 94,500 92,316 88,059 88,925 88,925 86,922 82,335 74,315 69,973 60,822 54,720 53,325 54,950	328 2: 412 2: 41	41 12.7 92 10 10 10 10 10 10 10 10 10 10 10 10 10	RIBAN X/4 X K / / W EA/7 B D E V G M S S OW P/7 M N W W H P P C C 7 V J		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,292,255 2,175,992 2,056,788 1,732,722 1,167,711 1,667,900 1,638,400 1,531,455 1,451,738,400 1,538,400 1,	3230 1157 (OP: N4PN) 2148 947 752 1685 749 1211 735 1294 686 (OP: NX9N) 1168 634 1251 587 1292 650 1048 584 11107 579 987 547 1060 515 1187 541 818 503 1150 566 879 520 866 548
DLØML DLØTUM OHØX OHØX OHØX OHØX SZ3P SZ1A EI8ØIRTS GTBIOM IO50 IR6T IR6T IR6T IO6RS IO77 II5PT IO3UD IO3PN	163,386 61,623 1,600 Finland 10,948,224 452,510 454,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 4,005,276 2,295,240 1,742,784 1,697,076 977,466 398,537	324 187 27 3994 538 174 2449 1911 707 3778 2208 1921 1553 1280 1271 1003 527	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 696 708 629 353	DU1HR 4GØLD LS1D AY5F LV6D L73D LU1UM LT5D L6ØS L04D PQ5B PW2D PW2D PW2T ZW40 PX7C ZV2K ZV8T PR5A	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,814 8,287,457 5,662,569 4,159,876 3,811,148 1,768,044 1,215,164	1120 617 4400 4310 2236 1548 1097 926 653 286 4298 44053 2842 2005 1635 1635 1635 1635 1635 1842	480 236 1334 1299 938 799 486 565 376 205 1269 1021 957 812 814 43 494 43	DP6T EE1W EA3GTJ SN6F UZ20 DB50EF, IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL W1GH N1AGE KJ6HBY WA6KEK K08TP/4 K02EPK K0BPHI W7MCM N9LIS K4DKE	18,691,695 15,322,676 6,947,635 5,052,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIN 47,996,889 47,996,889 413,049 212,052 131,652 121,290 661,116 45,924 118,879 11,832 11,832 11,832 11,832 11,832 11,832 11,832 11,832 11,832	5415 5249 3028 2494 877 531 425 4713 1443 489 CA 9039 3382 811 504 358 260 287 192 167 98 66 63 35 6	1412 1115 963 459 314 1216 631 231 1662 1159 387 357 246 207 195 212 198 87 192 62 35 62 63 63 63 63 63 63 63 63 63 63 63 63 63	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2E9TCC *GOLZX *OMZDT *DL6TA *VO2MKT *SP\$TWA *OZ2CA *IZ2UST *VE6AMM *E19GSB *ED5A *SN1T *LA2NTA *VK6MAB *EA7JIY *S\$1JS *F8KKH *LA9JFH *PY7DJ *EA4GHB		221,961 208,080 201,772 172,546 151,620 147,506 121,746 118,622 105,690 105,152 98,345 97,970 94,500 92,316 88,059 88,059 88,059 88,059 69,23 60,822 54,720 53,325 54,950 47,233 44,950	328 2: 412 2: 412 2: 412 2: 412 2: 412 2: 412 2: 412 2: 412 2: 412 2: 56 1: 412 2: 56 1: 412 2: 56 1: 412 2: 56 1: 412 2: 56 1: 412 2: 56 1: 412 2: 56 1: 412 2: 56 1: 412 2: 56 1: 56 1: 56 1: 56 1: 56 1: 56 1: 56 1: 56 1: 56 1: 56 1: 56 1: 56 1: 56 1: 57 1: 56 1: 56 1: 56 1: 56 1: 56 1: 56 1: 57 1: 56 1: 56 1: 57 1: 56 1: 56 1: 57 1: 56 1: 56 1: 57 1: 56 1: 56 1: 57 1: 56 1: 56 1: 56 1: 57 1: 56 1: 57 1: 56 1: 56 1: 57 1: 56 1: 56 1: 57 1: 56 1: 56 1: 57 1: 56 1: 56 1: 56 1: 56 1: 57 1: 56 1:	41 12.7 92 10 10 10 10 10 10 10 10 10 10 10 10 10	RIBAN K / / K / / W / K / / W / K / / W / K / / W / K / W / K / W / W		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,292,255 2,175,992 2,056,788 1,732,722 1,167,471 1,667,900 1,538,400 1,538,	3230 1157 (OP: N4PN) 21148 947 1855 752 1685 749 1211 735 1294 686 1836 684 (OP: NXØX) 1168 634 1251 657 1122 650 1048 584 1144 641 1107 579 1987 547 1060 515 1187 541 818 503 1150 566 879 520 921 529 924 512
DLØML DLØTUM OHØK OHØK OHØK OHØK SZ3P SZ1A EI8ØIRTS GT8IOM IOSO IR6T IR5A IV4F6M IO6RS IO7T IISPT IO3UD IO3PN GJ2A	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Haly 13,781,740 7,665,918 4,085,276 2,295,240 1,742,784 1,697,076 977,466 398,537 Jersey 60,350 Luxembourg	3244 187 27 3994 538 174 2449 1911 707 3778 2737 2737 1553 1280 1271 1003 527	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 744 629 708 629 353	LS1D AV5F LV6D LV3D LV3D LV3D LU11UM LT5D L60S L04D PW2D PW2D PW2D PW2T ZW4O PX7C ZV2K ZW8T PR5A PT2CVA PV3AA	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,814 8,287,457 5,662,569 4,159,876 3,811,148 1,788,044 1,215,164 1,020,604 5,031 Chile 5,993,478	1120 617 4400 4310 2236 653 286 4298 4053 2805 1635 1685 1685 1685 1685 1468	480 236 1334 1299 938 799 486 565 376 205 1269 1021 957 812 814 43 494 43	DP6T EE1W EA3GTJ SN6F UZ20 DB50EF, DE5DEF, DE5	18,691,695 15,352,676 6,967,635 5,082,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIC 47,996,898 11,032,521 ROOKIE United States A 655,578 413,494 212,052 131,652 121,290 61,116 445,924 18,879 112,352 118,879 12,352 118,879 12,352 118,879 12,352 1155,178 21 155,178	5415 5249 3028 2494 4713 1445 489 CCA 8111 504 358 2600 355 66 255 93 2	1412 1115 963 459 314 1216 631 231 1662 1159 387 347 246 207 707 132 129 129 132 149 149 159 169 169 169 169 169 169 169 169 169 16	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GBLZX *OM2DT *DL6TA *VO2MKT *SP5TWA *OZ2CA *IZ2UST *VE6AMI *LIZ2UST *VE6AMI *E19GSB *ED5A *SN1T *LA2NTA *VK6MAB *EA7.IIY *S\$1US *F8KKH *LA9OSA *UA9JFH *PY7DJ *EA3HJO *EA3HJO *DD7NT *IM6TOK		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,622 105,630 105,152 98,345 97,970 94,500 92,650 92,316 88,059 86,922 86,335 74,315 69,973 60,822 54,720 53,325 54,7233 44,950 41,019 39,902 37,800	328 2: 412 2: 383 3: 412 2: 315 2: 277 2: 346 2: 256 1: 252 2: 237 1: 252 2: 238 2: 237 1: 252 2: 249 2: 248 1: 249 1: 00°; SASH 249 1: 00°; SASH 240 1: 00°; SASH 240 1: 100°; SASH 100°;	41 12.7. 92 10 62 NXB 97 10 62 NXB 97 10 82 NSB 97 NSB 98 W6T 112 KG4W 112 KG4W 113 K3W 114 NSB 115 K3M 116 NSB 117 K5M 117 NSB 118 N	RIBAN X/4 A K K // W W W W W W W W W W W W		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,229,255 2,175,992 1,732,722 1,674,711 1,667,900 1,608,920 1,533,1455 1,451,738 1,258,662 1,285,165 1,184,293 1,184,360 1,184,293 1,184,360 1,184,293 1,288,662 1,285,165 1,282,748 1,218,360 1,184,293 977,856 919,524 777,876	3230 1157 (OP: N4PN) 2148 947 1855 752 1685 749 1211 735 1294 686 (OP: NXBX) 1168 634 1251 587 1222 650 1048 584 1144 641 1107 579 987 547 1060 515 1818 503 1150 566 6879 520 866 548 1033 532 991 529 924 512 752 463 990 492 666 444 457
DLØML DLØTUM OHØX OHØX OHØX OHØX SZ3P SZ1A EI8ØIRTS GTBIOM IO50 IR6T IR6T IR6T IO6RS IO77 II5PT IO3UD IO3PN	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Haly 13,781,740 7,665,918 5,059,880 4,085,276 2,295,240 1,742,784 1,697,076 977,466 398,537 Jersey 60,350 Luxembourg 1,212,432	3244 187 27 3994 538 174 2449 1911 707 3778 2737 2737 1553 1280 1271 1003 527 207	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 696 708 629 353	LS1D AV5F LV6D LV3D LV3D LV3D LU11UM LT5D L60S L04D PW2D PW2D PW2D PW2T ZW4O PX7C ZV2K ZW8T PR5A PT2CVA PV3AA	Philippines 1,671,360 416,540 SOUTH AMMERIC Argentina 17,695,510 17,023,385 5,670,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,814 8,287,457 5,662,569 4,159,876 3,811,148 1,768,044 1,020,604 1,215,164 1,020,604 1,5933,478 3,124,784 MULTI-OPERATC TWO TRANSMITT	1120 617 A 4400 617 A 4400 2236 1548 1548 451 286 4298 4298 1685 1685 1032 45 2325 1468 OR ER	480 236 1334 1299 938 799 486 565 376 205 1269 1021 957 812 814 43 494 43	DP6T EE1W EA3GTJ SNGF UZ20 DB50EF, IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H N1AGE KJ6HBY WA6KEK KJ6HBY WA6KEK KD8PHI W7MCM N9LIS K4DKE AK3S KF7IYO// AC0ZG *W4D1B	18.691,695 15.352,676 6.967,635 5.082,861 761,022 323,613 320,594 OCEANIA 18.934,336 3,228,196 303,303 SOUTH AMERIC 47,996,898 11,032,521 ROOKIE United States A 655,784 413,042 121,052 131,652 121,250 161,116 445,924 18.879 122,352 11,250 18.879 12,352 11,250 12,352 11,250 12,352 12,555,784 18.879 12,352 11,555,178 21,555,784 4 529,886 7 4 4 529,886 7 4 4 529,886 7 7 4 4 5 507,676	5415 5249 3028 2494 425 425 425 425 425 425 425 425 425 42	1412 1115 963 459 314 1216 631 231 1662 1159 387 246 207 795 132 22 129 87 64 233 88 88 233 362 338 387 387 387 387 387 387 387 387 387	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GBLZX *OM2DT *DL6TA *YO2MKT *SP5TWA *OZ2CA *IZ2UST *VE6AMI *IZ2UST *VE6AMI *E19GSB *ED5A *SN1T *LA2NTA *VK6MAB *EA7.IIY *S\$1US *F8KKH *LA9OSA *UA9JFH *PY7DJ *EA3HJO *EA3HJO *PD1TY *EA4GHB *P4GLO *DD7NT *MGTOK *PD1TY *VA3PAW		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,622 105,632 98,345 97,970 94,500 92,316 88,059 86,922 86,923 87,973 86,922 54,720 53,325 54,933 44,930 47,233 44,930 37,800 33,135 30,452	328 2: 412 2: 383 3: 412 2: 315 2: 277 2: 346 2: 256 1: 252 2: 237 1: 252 2: 238 2: 237 1: 252 2: 249 2: 258 2: 249 2: 249 1: 00°: SOAIR 248 1: 10°: SOAIR 250 1: 10°: SOAIR 260 1: 10°: SOAIR 2	41 12.7. 41 19 92 17 10 662 NXØ. 997 10 662 NXØ. 997 N6J. 112 KG4V. 112 KG4V. 113 K3M. 114 K3M. 115 K3M. 115 K3M. 116 K3M. 117 K3M. 117 K3M. 118 K3	RIBAN X/4 A K / W WEA/7 B D E V Q Q M M S S W WH H PP C/7 Z/Z Z/Z Z/Z Z/Z Z/Z Z/Z Z/Z		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,2768,304 2,229,255 2,175,992 1,674,711 1,667,900 1,608,920 1,531,455 1,451,738 1,258,662 1,282,562 1,282,5165 1,184,228 1,184,228 1,184,284 1,218,360 1,218,360 1,21	3230 1157 (0P: N4PN) 2148 947 1855 752 1855 752 1294 686 684 (0P: NXBX) 1168 634 1251 587 1222 650 1048 584 1144 641 1107 579 987 547 1060 515 1187 541 818 503 866 548 1033 532 991 529 9924 512 752 463 732 481 (0P: K7XBV)
DLØML DLØTUM OHØK OHØK OHØK OHØK SZ3P SZ1A EI8ØIRTS GT8IOM IOSO IR6T IR5A IV4F6M IO6RS IO7T IISPT IO3UD IO3PN GJ2A	163,386 61,623 1,600 Finland 10,948,224 452,510 54,350 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Haly 13,781,740 7,665,918 4,085,276 2,295,240 1,742,784 1,697,076 396,537 Jersey 60,350 Luxembourg 1,212,432 Netherlands 2,798,761	3244 187 27 3994 538 174 2449 1911 707 3778 2737 2737 1553 1280 1271 1003 527 207	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 744 629 708 629 353	LS1D AV5F LV6D LV3D LV3D LV3D LU11UM LT5D L60S L04D PW2D PW2D PW2D PW2T ZW4O PX7C ZV2K ZW8T PR5A PT2CVA PV3AA	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,497,646 1,427,755 668,152 170,888,354 15,690,814 1,215,164 1,202,604 5,031 Chile 5,931 Chile 5,933,478 3,124,784 MULTI-OPERATC TWO TRANSMITT NORTH AMERIC United States	1120 617 A 4400 617 A 4400 2236 1548 41097 926 653 2842 2005 1635 1685 1685 1685 1685 1685 1685 1685 168	480 236 1334 1299 938 799 486 565 376 205 1269 1021 957 812 814 43 494 43	DP6T EE1W EA3GTJ SN6F UZ20 DB50EF, IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL W16H N1AGE KJ6HBY WA6KEK KBSTPJ W7MCM N9LIS K4DKE KD2PHI W7MCM N9LIS K4DKE K4DK K4DK	18,691,695 15,352,676 6,967,635 5,052,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIC 47,996,898 11,032,521 ROOKIE United States A 655,578 4 413,049 2 121,052 1 131,652 2 121,290 1 61,116 4 45,924 1 18,79 2 12,056 1 12,290 2 1 155,178 2 12,058 2 1 155,178 2 1 155,787 3 132 2 1 155,178 2 1 155,787 3 132 2 1 155,178 2 1 155,787 4 A 529,988 5 507,676 4 435,400 4 421,824 4 34,5400	5415 5249 3028 877 531 425 529 93 328 877 531 1443 489 528 625 529 66 65 525 539 501 56	1412 1963 4599 314 1216 631 231 1662 1159 387 357 246 607 195 192 193 87 64 623 388 88 82 338 633 338 633 338 633 338 633 338 633 633	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EØTCC *GOLZX *OMZDT *DL6TA *VO2MKT *SP\$TWA *OZ2CA *IZ2UST *VE6AMM *E19GSB *EDSA *SN1T *LA2NTA *VK6MAB *EA7JIY *S\$1JS *F8KKH *LA9UST *LA2NTA *UK9MAB *EA7JIY *LA2NTA *UK9MAB *EA7JIY *S\$1JS *F8KKH *LA9UST *LA2NTA *VK6MAB *EA7JIY *S\$1JS *F8KKH *LA9UST *LA2NTA *PMTD *LA2NTA *PMTD *LA2NTA *PMTD *EA4GHB *F4GL0 *PMTD *MGTOK *PD1TV *VA3PAW *OE4VMB *SAØE		221,961 208,080 201,772 172,546 151,620 147,506 121,746 118,622 105,690 105,152 98,345 97,970 94,500 92,316 88,059 86,922 82,335 74,315 60,822 54,720 53,325 53,055 44,950 47,233 44,950 41,019 39,902 37,800 33,135 30,452 28,080	328 2: 383 2: 412 2: 315 2: 277 2: 346 2: 256 1: 256 1: 259 2: 258 2: 2277 1: 259 2: 268 2: 2211 1: 249 2: 228 1: 0P: EA5HF 248 1: 1204 1: 1205 1: 0P: SAUB. 1106 1: 1111 1: 1111 1: 1152 1: 1109: SAUB.	41 12.7. 92 10 62 NX8 97 10 652 NX8 97 10 87 10 10 10 10 10 10 10 10 10 10 10 10 10	RIBAN X/4 A K / / WEA/7 B D E V Q Q M M S S W WH H P P P P P P P P P P P P P P P P		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,229,255 2,175,992 1,732,722 1,674,711 1,667,900 1,608,920 1,533,1455 1,451,738 1,258,662 1,285,165 1,184,293 1,184,360 1,184,293 1,184,360 1,184,293 1,288,662 1,285,165 1,282,748 1,218,360 1,184,293 977,856 919,524 777,876	3230 1157 (OP: N4PN) 2148 947 1855 752 1685 749 1211 735 1294 686 1636 684 (OP: NXØX) 1168 534 1251 587 1222 650 1144 641 1107 579 987 547 1060 515 1187 541 818 503 1150 566 879 520 924 512 924 512 924 512 926 666 444 678 453 732 481 (OP: K7ABV) 800 415 606 396
DLØML DLØTUM OHØK OHØK OHØK OHØK SZ3P SZ1A EIBØIRTS GT8IOM IOSO IR6T IR5A I/4F6M IO6RS IO7T IISPT IO3UD IO3PN GJ2A LX75RL PA6V	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 5,059,880 4,085,57 2,295,240 1,742,784 1,697,076 977,466 398,537 Jersey 60,350 Luxembourg 1,212,432 Netherlands 2,798,761 1,703,398 1,76,616	3294 187 27 3994 538 174 2449 1911 707 977 3778 2737 2208 1921 1553 1280 1271 1003 527 912	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 708 629 353 170 624	DUTHR 4GØLD LSTD AY5F LV6D L73D LU1UM LT5D L6ØS L04D P05B PW2D ZW4O PY7C ZV2K ZW2K ZW2K ZW2K ZW3C ZW2K ZW3C ZW2K ZW3C ZW2K ZW2K ZW3C ZW2K ZW3C ZW2K ZW3C ZW2K ZW3C ZW3C ZW3C ZW3C ZW3C ZW3C ZW3C ZW3C	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,985 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,814 8,287,457 5,662,599 4,159,876 3,811,148 1,768,044 1,215,164 1,020,604 1,225,164 1,020,604 1,02	1120 617 A 4400 4310 2236 653 286 4298 4453 2842 2005 1635 1032 21468 DR ER A 4361 43849	480 236 1334 1299 938 799 486 565 376 205 1269 1021 1021 1021 1021 1021 1021 1021 102	DP6T EE1W EA3GTJ SN6F UZ20 DB50EF, IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL W76H N1AGE KJGHBY WA6KEK K9STPJ K4DKE AK3STPJ ACGCZ6 *W4DTB *AB10D *AC8GX *K8PGJ *NA4EA *K08NO *AK4NON	18,691,695 15,352,676 6,967,635 5,082,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIC 47,996,898 11,032,521 ROOKIE United States A 655,578 4 413,049 2 212,052 1 131,652 1 12,290 1 14,879 1 12,352 1 16,511 2 4 18,79 2 1 20,856 4 43,944 4 529,968 507,676 4 435,400 421,824 H 314,032	5415 5249 3028 877 531 425 5249 3028 877 531 1443 1443 489 525 525 66 525 529 501 356 6413 358 522 558 529 501 356 6413 358	1412 963 369 314 1216 631 231 1662 1159 387 246 207 246 207 195 132 145 63 312 23 387 363 388 88 88 362 338 338 338 338 338 338 338 338 338 348 34	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EØTCC *GOLZX *OM2DT *DL6TA *VO2MKT *SP\$TWA *OZ2CA *IZ2UST *VE6AMI *EI9GSB *EDSA *SNIT *LA2NTA *VK6MAB *EA7JIY *S\$1JS *F8KKH *LA9UFH *PY7DJ *EA3HFH *PY7DJ *IZ1TYP *EA4GHB *F4GL0 *PD1TV *VA3PAW *OE4WMB *SAØE *OE2LRO *JG1LPL		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 119,567 119,567 119,567 105,152 98,345 97,970 94,500 92,316 88,059 86,922 82,335 74,315 60,822 54,720 53,325 53,055 53,055 54,950 47,233 44,950 41,019 39,902 37,800 33,135 30,452 28,080 25,992 28,080	328 2 2 383 2 2 412 2 2 3 315 2 2 2 7 7 2 3 346 2 1 2 5 6 1 1 1 2 5 6 1 1 1 2 5 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	41 12.7. 41 19 92 17 10 62 NXØ 997 NF4/29 W6A 029 N6J/11 12 KG44/11 12 KG4/11 12 KG4/1	RIBAN XX/4 A K // K // K // K // K // K // K // K // K // K // K // K // K K		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,298,255 2,175,992 2,056,788 1,732,722 1,156,790 1,538,400 1,588,400 1,581,455 1,451,738 1,531,455 1,451,738 1,218,368 1,218,	3230 1157 (OP: N4PN) 2148 947 1855 752 1685 749 1211 735 1294 686 1636 684 (OP: NXØX) 1168 584 1144 641 1107 579 1087 547 1080 518 87 547 1080 566 879 520 924 512 924 512 924 512 926 666 444 678 453 990 492 924 818 (OP: NXØX) 937 547 1080 586 879 529 924 512 926 666 444 678 453 990 492 924 818 900 492 924 918 918 928 927 481 928 929 492 928 929 492 929 492 929 929 492 929
DLØML DLØTUM OHØK OHØK OHØK OHØK SZ3P SZ1A EI8ØIRTS GT8IOM I050 IR6T IR5A I07T IISPT I03UD I03PN GJ2A LX75RL PA6V PA6B PA5W LN7H	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Haly 13,781,740 7,665,918 5,059,880 4,085,57 2,295,760 1,742,784 1,697,76 977,466 398,537 Jersey 60,350 Luxembourg 1,212,432 Netherlands 2,798,761 1,703,398 176,616 Norway 681,675	324 187 27 3994 187 27 3994 1911 707 3778 2737 2208 1921 1003 527 207 912 1504 970 326 794	261 167 25 1344 370 143 895 808 474 577 1372 1131 1004 744 696 708 629 353 170 624 811 543 264	DUTHR 4GØLD LS1D AYSF LV6D L73D L01UM L15D L60S L04D P058 PW2T ZW40 PY37 ZW40 PY37 R5A PT2CVA PY3AA CE1TT CE2LS	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazii 17,088,354 15,690,814 18,287,457 5,662,569 4,159,876 3,811,148 1,768,044 1,215,164 1,020,604 5,031 Chile 5,933,478 3,124,784 MULTI-OPERATC TWO TRANSMITT NORTH AMERIC United States 14,400,995 13,697,376	1120 617 A 4400 617 A 4400 2236 1548 1097 9266 653 286 4298 44053 2842 2005 1635 1685 1685 1685 1685 2445 2325 1685 A 4361 4468	480 236 1334 1299 938 799 6565 3762 1021 1021 1021 1021 1021 1021 1021 10	DP6T EE1W EA3GTJ SN6F UZ2Q DB50EF, IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H N1AGE KJ6HBY WA6KEK KØSTPJ KØSTPJ KØSTPJ KØSTPJ ACØZZ *KØSTPJ *AKJOU *NWSQ	18,691,695 15,352,676 6,967,635 5,062,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERINA 47,996,398 11,032,521 ROOKIE United States A 655,578 4 413,049 2 121,052 1 131,652 1 12,900 2 1 12,502 1 12,502 1 12,502 1 12,502 1 12,200 1 18,879 1 12,352 1 12,352 1 12,352 1 12,352 1 12,352 1 12,352 1 12,352 1 12,352 1 12,352 1 12,352 1 13,552 1 13,552 1 13,552 1 13,552 1 13,552 1 13,552 1 13,553 1 13,532 1 13,533 1 13,532 1 13,5333 1 13,533 1 13	5415 5249 3028 877 531 1443 489 CA 9039 3382 811 504 506 6 6 6 6 5 5 6 6 6 6 5 5 6 6 6 6 5 5 6	1412 963 369 314 1216 631 231 1662 1159 387 246 207 246 207 195 132 87 63 383 387 387 387 387 387 387 387 387 38	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GØLZX *OM2DT *OLETA *VO2MKT *OZCA *IZ2UST *VE6AMI *IZ2UST *UE6AMI *IZ3UST *UE6AMI *IZ3UST *UE6AMI *STJJS *SN1T *LA9CSA *SN1T *LA9CSA *UA9JFH *PY7DJ *EA3HJ0 *DD7NT *EA3HJ0 *DD7NT *IMSTOK *PD1TV *VA3PAW *OE4VMB *SAØE *OE2LRO *JG1LPL *UB3DAO *UB3DAO *UB3DAO *IS8BGL		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,152 98,345 97,970 94,500 92,650 92,316 88,059 86,922 82,337 60,822 84,950 47,233 44,950 47,233 44,950 37,800	328 2: 412 2: 41	41 12.7 42 10 62 NXØ 97 10 62 NXØ 97 NF4/ 29 W6T 11 12 KG44 21 W6A 22 W6A 80 K3M 80 K3M	RIBAN XX/4 A K / K / / / / / / / / / / / / / / / /		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,292,255 2,175,992 2,056,788 1,732,722 1,167,771 1,667,900 1,538,400 1,788,400 1,788,400 1,788,400 1,788,602 1,788,400 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,602 1,788,707 7,701 643,500 641,784 641,600 610,414 601,125 437,510	3230 1157 (0P: N4PN) 21148 947 1855 752 1885 749 1211 735 1294 686 634 (0P: NXBX) 1168 634 1251 587 1222 650 1048 584 1144 641 1107 579 987 547 1060 515 1187 541 818 503 879 520 991 529 9924 512 752 463 879 520 991 529 992 4512 752 463 879 520 991 529 991 529 992 4512 752 463 879 520 879 520 879 520 879 520 879 520 879 679 878 879 520 879 679 979 879 679 979 879 679 979 879 679 979 879 799 879 7
DLØML DLØTUM OHØK OHØK OHØK OHØK SZ3P SZ1A EIBØIRTS GT8IOM IOSO IR6T IR5A I/4F6M IO6RS IO7T IISPT IO3UD IO3PN GJ2A LX75RL PA6V PA6B PASW	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 4,085,276 6,959,800 4,085,276 6,959,800 1,742,784 1,697,076 6,977,466 398,537 Jersey 60,350 Luxembourg 1,212,432 Netherlands 2,798,761 1,078,398 176,616 Norway 681,675 115,842 36,974	3244 187 27 3994 538 174 2449 1911 707 977 3778 2208 1921 1553 527 207 912 1504 970 326	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 744 696 629 355 370 170 624	DUTHR 4GØLD LS1D AYSF LV6D L73D L73D LU1UM L15D L60S L04D P058 PW2T ZW40 PW2T ZW40 PYX7C ZV2K ZW8T PR5A PT2CVA PY3AA CE1TT CE2LS KE3X WC6H K48P NØMA	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,385 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,814 1,768,044 1,215,164 1,020,604 1,199,876 3,811,148 1,768,044 1,215,164 1,020,604 1,02	1120 617 A 4400 4310 2236 1548 1097 926 653 286 4053 286 1032 2842 2005 1685 11468 DR ER	480 236 1334 1299 938 799 205 1291 1957 812 814 5542 494 43 934 724 1285 1232 899 866	DPGT EETW EASGTJ SNGF UZ20 DB50EF,IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WTGH N1AGE KJ6HBY WA6KEK K08STP/A KC2ZPK AKSTP/A KC2K KFIYOZ AKSTP/A KFSIXE	18.691,695 15.352,676 6.967,635 5.082,861 761,022 323,613 320,594 OCEANIA 18.934,336 3,228,196 333,333 SOUTH AMERIC 47,996,898 11.032,521 ROOKIE United States A 655,784 413,049 212,052 121,200 61,116 445,244 18.879 121,352 121,202 121,202 121,203 131,552 121,203 131,552 121,203 131,552 121,203 131,552 131,55	5415 5249 3028 2897 531 1443 489 524 552 539 1358 625 539 1356 626 2800 2800 2800 2800 2800 2800 2800	1412 963 369 314 1216 6311 231 1662 1159 387 246 207 195 207 195 362 338 88 830 233 369 314 357 646 207 195 369 317 409 409 409 409 409 409 409 409	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GOLZX *OMZDI *DL6TA *YOZMKT *SP5TWA *OZCCA *IZ2USMKT *EBGSMB *ED5A *SN1T *LA2NTA *VK6MAB *EA7JIY *S51JS *F8KKH *LA9OSA *LA9JFH *PYTDJ *EA3HJ0 *IZ1TYP *EA4GHB *F4GLO *DD7NIT *MGTOK *PD1TV *VA3PAW *OE4VMB *SAØE *OE2LRO *JG1LPL *UB3DAO *IS8BGL *VO7DBR *VU3TMO *IG4TMSTMC *VO7DBR *VU3TMO *IG4TMSTMC *IG4		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,632 105,152 98,345 97,970 94,500 92,650 92,316 88,059 86,922 82,335 74,315 69,973 60,822 54,720 53,325 53,055 59,973 44,233 44,950 41,019 39,903 33,135 30,012 37,800 25,992 22,420 19,872 20,440 19,872 21,9688 17,952 21,7892	328 2: 383 2: 412 2: 315 2: 277 2: 346 2: 256 2: 256 2: 258 2: 258 2: 258 2: 258 2: 258 2: 258 2: 249 2: 258 2: 249 2: 258 2: 249 2: 258 2: 249 2: 258 2: 249 2: 258 2: 249 2: 258 2: 258 2: 269 2: 211 1: 209 2: 211 1: 200 1: 200 1: 160 1: 179 1: 179 1: 179 1: 179 1: 179 1: 179 1: 179 1: 179 1: 179 1: 170 1: 17	41	RIBAN X.V.4 A. K. / W.B. / W.B. V. Q. M. S. S. W. H. P. P. G. 77 M. M. W.		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,292,255 2,175,992 2,056,788 1,732,722 1,667,900 1,608,920 1,531,455 1,451,738 1,258,662 1,285,165 1,282,662 1,285,165 1,282,663 1,732,742 1,184,128 1,196,48,77 1,194 1,19	3230 1157 (0P: N4PN) 21148 947 1855 752 1885 749 1211 735 1895 684 1636 684 (0P: NX9X) 1168 634 1251 587 1222 650 1048 584 1144 641 1107 579 987 547 1060 515 1187 541 818 503 1150 566 879 520 924 512 759 408 806 548 1033 532 991 529 924 512 759 408 806 415 816 666 448 1033 532 991 492 807 807 807 807 807 807 807 807 807 807
DLOML DLOMUM DLOMUM OHEX OHEX OHEX OHEX SZ3P SZ1A EI80IRTS GT8IOM IO50 IR6T IR6A IR6A IV4F6M IO6RS IO7T IO3UD IO3PN GJZA LX75RL PA6W PA6B PASW LN7H LATK LN1B S09Q	163,386 61,623 1,600 Finland 10,948,224 452,510 543,400 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 4,085,276 60,950 4,085,276 60,950 Luxembourg 1,212,432 Netherlands 2,798,761 1,078,398 1	324 187 27 3994 538 174 538 174 538 174 538 174 538 1911 707 977 2078 1921 1553 1280 3527 207 912 1504 970 376 376 376 376 376 376 376 376 376 376	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 744 696 629 353 170 624 447 258 139	DUTHR 4GØLD LSTD AYSF LV6D L73D LU1UM LT5D L6ØS L04D PQ5B PW2D ZW4O PY7C ZV2K ZV2K ZV2K ZV2K PY3AA CETTT CE2LS KE3X WC6H K48P NØMA NASNN	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,814 18,287,457 5,662,569 4,159,876 3,811,148 1,768,044 1,215,164 1,020,604 5,031 Chile 5,993,478 3,124,784 MULTI-OPERATC TWO TRANSMITT NORTH AMERIC United States 14,400,995 13,697,376 10,975,920 4,349,362 4,292,762 Canada 3,566,800 1,629,015	1120 617 A 4400 4310 2236 1548 11997 2266 653 2842 22005 1685 1685 1685 1468 DR ER A 4361 44849 3342 2148 2704	480 236 1334 1299 938 486 565 565 567 205 1291 1021 1021 957 542 443 934 724 1285 1245 1245 1245 1245 1245 1245 1245 124	DPGT EETW EASGTJ SNGF UZ20 DB50EF,IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WTGH N1AGE N1AGE KBSTP/A KC2PK KBSTP/A KC3CPK KBSTP/A KKSTP/A KKSTP	18.691,695 15,352,676 6,967,635 5,082,861 761,022 323,613 320,594 OCEANIA 18.934,336 3,228,196 303,303 SOUTH AMERIC 47,996,898 11,032,521 ROOKIE United States A 655,784 413,040 212,052 121,200 61,116 145,924 18.879 121,205 212,120 20,206 61,100 145,924 18.879 121,205 21,205	5415 5249 3028 2494 4713 1443 489 524 549 549 549 549 549 549 549 549 549 54	1412 963 369 314 1216 631 1216 631 1216 631 1662 1159 387 246 207 195 362 32 32 33 35 36 337 46 337 46 337 46 337 46 337 46 337 46 46 337 46 46 337 46 46 46 46 47 47 47 48 48 48 48 48 48 48 48 48 48	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GOLZX *OMZDI *DL6TA *YO2WKT *SP5TWA *OZ2CA *IZ2USM*T *VE6ASMB *ED5A *SN1T *LA2NTA *VK6MAB *EA7JIY *S51JS *F8KKH *LA9OSA *UA9JFH *PY7DJ *EA3HJ0 *IZ1TYP *EA4GHB *F4GLO *DD7NI *MGTOK *PDTIV *VA3PAW *OE4UMB *SAØE *OE2LRO *JG1LPL *UB3DAO *ISBBGL *VO7DBR *VU3TMO *BG4KLA *COZJW *CA3HDT		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,632 105,152 98,345 97,970 94,500 92,650 92,316 88,059 86,922 82,335 74,315 69,973 60,822 54,720 53,325 53,055 49,950 41,019 39,902 37,800 33,135 30,012 37,800 25,992 22,420 19,872 20,400 19,872 21,7,653	328 2 2 383 2 2 2 412 2 2 3 3 46 2 1 2 2 5 6 2 1 2 2 5 6 2 1 2 5 6 2 1 2 5 6 2 1 2 5 6 2 1 2 5 6 2 1 2 5 6 2 1 2 5 6 2 1 2 5 6 2 1 2 5 6 2 1 2 5 6 2 1 2 5 6 2 1 1 1 1 2 5 6 1 1 1 2 5 6 1 1 1 1 2 5 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	41	RIBAN X.V.4 A.K. / W.B. / W.B. V. Q. M. S. D. E. C. S. M. H. D. P. C. Z. Z. C. X. J. V. V. D. E. C. S. M. H. D. H. S. D. E. C. S. M. H. D. H. S. D. E. S. M. S. D. E. C. S. M. H. D. H. S. D. E. S. M. S. D. E. S. D. E. V. D. D. E.		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,229,255 2,175,992 2,056,788 1,732,722 1,667,900 1,608,920 1,531,455 1,451,738,420 1,288,662 1,285,165 1,282,748 1,218,360 1,334,400 1,351,455 1,451,738 1,258,662 1,285,165 1,282,748 1,218,360 1,351,165 1,232,748 1,218,360 1,351,165 1,321,748 1,218,360 1,351,165 1,322,748 1,218,360 1,351,165 1,322,748 1,218,360 1,351,165 1,310,341,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351,351 1,351 1,351 1,351,351 1,35	3230 1157 (0P: N4PN) 21148 947 1855 752 1885 749 1211 735 1294 686 1636 684 (0P: NX9X) 1188 534 1251 587 1222 650 1048 584 1144 641 1107 579 987 547 1060 515 1187 541 818 503 1150 566 879 520 866 548 1033 532 991 529 924 512 924 512 927 52 463 990 492 924 512 927 52 463 990 492 924 512 924 512 924 512 924 512 924 512 924 512 924 512 924 512 927 481 927 52 928 481 929 492 924 512 924 512 924 512 924 512 924 512 927 52 928 481 929 492 924 512 927 52 928 481 929 492 928 481 929 492 929 492 929 492 929 492 929 929 929 929 929 929 929 929 929 929 921 529 924 512 929 481 929 481 92
DLOML DLOMUM DLOMUM OHEX OHEX OHEX OHEX SZ3P SZ1A EI80IRTS GT810M IO50 IR6T IR6A IR6A IR6T IR6A IR6A IR6A IR6A IR6A IR6A IR6A IR6A	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 5,059,880 4,085,276 2,295,240 1,742,784 1,697,076 977,466 398,537 Jersey 60,350 Luxembourg 1,212,432 Netherlands 2,798,761 1,078,380 1,078,361 Norway 681,675 115,842 36,974 Poland 10,474,718 9,426,816 3,317,892	324 187 27 3994 187 27 378 2737 3778 2737 2208 1921 1003 527 207 912 1504 970 326 3339 3023 3023 3033 8033 803	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 744 696 629 353 170 624 447 258 139 128 1189 128 1189	LS1D AYSF LV6D L73D L73D L73D L01UM LT5D L60S L04D P05B PW2T ZW40 PW2T ZW40 PYXTC ZV2K PY3AA CE1TT CE2LS KE3X WC6H K48P N0MA NASNN VE3MIS VE3WBT CR3A	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,614 1,27,755 6,602,569 4,159,876 3,811,148 1,788,044 1,215,164 1,020,604 5,031 Chile 5,993,478 3,124,784 MULTI-OPERATO TWO TRANSMITT NORTH AMERIC United States 14,400,995 13,697,376 10,975,920 4,349,362 4,292,762 Canada 3,596,800 1,629,015 AFRICA 50,282,186	1120 617 A 4400 617 A 4400 2236 653 286 653 286 4053 286 1685 1685 11832 2842 2005 1685 1468 DR ER A 4361 4349 3842 2148 2704 1357 1127	480 236 1334 1299 938 486 565 565 567 205 1291 1021 957 542 43 43 934 724 1285 1232 1245 1232 1245 1232 1245 1246 1246 1246 1246 1246 1246 1246 1246	DPGT EETW EASGLJ SNGF UZ20 DB50EF, IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WTGH N1AGE KJ6HBY WAGKEK KØSTP/A KC2ZPA WAGKEK KØSTP/A KC2ZPA "W4DTB "AB10D "AC3GX "KF7IVA "KFFIXE "KFIXE "KFIX	18.691,695 15.352,676 6.967,635 5.082,861 761,022 323,613 320,594 OCEANIA 18.934,336 3,228,196 333,333 SOUTH AMERIC 47,996,898 11,032,521 ROOKIE United States A 655,784 212,052 121,202 131,552 131,	5415 5249 3028 877 5311 1443 489 C:A 9039 3382 8111 504 558 529 93 92 558 529 559 501 356 6255 529 529 522 222 222 203	1412 963 369 314 1216 6311 1266 231 1662 1159 387 246 207 195 207 195 36 203 38 203 393 201 201 201 201 201 201 201 201	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GOLZX *OMEDI *IZ2UST *VE6AMB *ED5A *SN1T *LA2NTA *VK6MAB *EA7JIY *S51JS *F8KKH *LA90SA *UA9JFH *PY7DJ *EA3HBO *P1TTY *PF1TU *MFTOK *PD1TTY *MFTOK *PD1TTY *OMEDI *OMED *OMEDI *OMEDI *OMEDI *OMEDI *OMEDI *OMEDI *OMEDI *OMEDI *OMEDI *		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 119,567 105,620 105,620 105,620 105,620 92,316 88,059 86,922 88,935 74,315 69,973 60,822 54,720 53,325 53,055 49,950 41,019 37,800 41,019 37,800 37,800 41,019 37,800 25,992 22,420 22,420 22,420 22,420 22,420 21,9638 17,952 27,782 21,77,765	328 2 2 383 2 2 412 2 2 3 346 2 2 2 2 7 7 2 2 3 4 6 2 1 2 2 5 6 2 1 2 2 5 6 2 1 2 2 5 6 2 1 2 2 5 6 2 1 2 2 5 6 2 1 2 2 5 6 2 1 2 2 5 6 2 1 2 2 5 6 2 1 2 2 5 6 2 1 2 1 1 1 1 2 2 5 6 2 1 1 1 1 2 5 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	41	RIBAN X.V.4 A. K. / W.B. / W.B. / W.B. S. W. V. G. M. S. S. W. V. W.		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,292,255 2,175,992 2,056,788 1,732,722 1,667,900 1,008,920 1,533,400 1,531,455 1,451,738 1,288,662 1,285,165 1,232,748 1,218,360 1,364,778,707 731,120 643,500 641,787,707 641,787,707 731,700 643,500 641,600 610,414 601,125 437,510 431,510 388,170 353,904 322,4847	3230 1157 (OP: N4PN) 21148 947 1855 752 1885 749 1211 735 1294 686 1836 684 (OP: NX9X) 1168 534 1251 587 1222 650 1048 584 1144 641 1107 579 197 547 1060 515 1187 541 818 503 1150 566 879 520 924 512 924 512 924 512 927 451 927 451 928 451 929 492 924 512 924 512 927 413 930 492 948 959 949 492 949 492 949 492 949 492 949 492 949 492 949 492 949 497 413 959 488 959 488 959 488 959 488 959 488 959 488 959 342 948 319 959 342 948 323 948 323 94
DLOML DLOMUM DLOMUM OHEX OHEX OHEX OHEX SZ3P SZ1A EI80IRTS GT810M IO50 IR6T IR5A IR6T IR5A IO77 IO3UD IO3PN GJ2A LX75RL PA6B PA5W LN7H LA1K LN1B SO9Q HF3A SN9V SN7H SPGYAO	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 4,005,276 60,595 Luxembourg 1,212,432 Netherlands 2,798,761 1,078,381	324 187 27 3994 538 174 538 174 538 174 538 174 538 1911 707 977 3778 2737 2208 1921 1553 1280 3527 5912 1564 376 336 339 3023 339 3023 339 3023 3667 318 803 1667 318	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 744 636 708 629 353 170 624 811 543 264 447 258 447 258 447 258	LS1D AYSF LV6D LV73D LU1UM LT5D L09D LU1UM LT5D L09D LU1UM LT5D PQSB PW2D PW2T ZW40 PW2T ZW40 PW2T ZW40 PW7T CE2LS KE3X WC6H K48P NBMA NASNN VE3MIS VE3WBT CR3A VS5V CR3A VS5V CR3A	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,614 1,287,457 5,662,569 4,159,876 3,811,148 1,788,044 1,215,164 1,020,604 5,031 Chile 5,993,478 3,124,784 MULTI-OPERATC TWO TRANSMITT NORTH AMERIC United States 14,400,995 13,697,376 10,975,920 4,349,382 4,292,762 Canada 3,596,800 1,629,015 AFRICA 50,282,186 36,092,544 31,118,395	1120 617 A 4400 617 A 4400 617 4490 6236 1548 4310 2236 653 286 4298 4453 1885 18	480 236 1334 1299 938 486 565 565 567 205 1291 1291 957 542 43 43 934 724 1285 1232 1245 1232 1245 1232 1245 1247 1247 1247 1247 1247 1247 1247 1247	DPGT EETW EASGTJ SNGF UZ2Q DB50EF, IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H N1AGE KJ6HBY WA6KEK KJ6HBY WA6KEK KMSTPJ KC2ZPK KMSTPJ ACAGGX *KPSTYYQA ACAGGX *KPSTYYQA ACAGGX *KPSTYYQA *KFSTYYYQA *KFSTYYYAA *KSTYYYAA *KST	18.691,695 15.352,676 6.967,635 5.082,861 761,022 323,613 320,594 OCEANIA 18.934,336 3,228,196 333,333 SOUTH AMERIC 47,996,898 11,032,521 ROOKIE United States A 655,784 413,049 212,052 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 121,202 131,552 131,	5415 5249 3028 2494 4713 1443 489 CA 9039 3382 8111 504 4713 358 2600 66 35 522 558 39 5011 403 381 403 381 403 381 381 381 381 381 381 381 381 381 38	1412 963 369 314 1216 6311 1662 1159 387 357 246 631 132 148 251 148 261 233 362 338 369 314 369 374 469 469 478 478 478 478 478 478 478 478	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GBLZX *OM2DT *DL6TA *YO2MAT *OZCGA *IZ2UST *VE6AMI *E19GSB *ED5A *SN1T *LA2UST *VK6MAB *EA7JIY *S\$1JS *F8KKH *LA9OSA *UA9JFH *PY7DJ *EA3HJ0 *EA3HJ0 *DL7TTY *VA3PAW *OE4VMB *SAGE *OE1LPL *UB3DAO *IG1LPL *UB		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,746 119,746 119,622 105,152 98,345 97,970 94,500 92,316 88,059 86,922 86,923 54,230 53,325 54,315 69,973 60,822 54,720 53,355 49,933 44,930 41,019 39,902 42,420 37,800 33,135 30,452 30,012 28,080 25,992 22,420 20,400 19,872 19,682 17,785 16,920 16,92	328 2 2 383 2 2 277 2 3 46 21 252 21 256 11 252 21 256 2 21 257 2 266 3 2 2 258 2 2 11 11 2 25 2 2 2 2 38 1 2 2 2 38 2 3 2 2 2 38 2 3 2 2 3 2 3	41	RIBAN XX/4 A K / K / / / / / / / / / / / / / / / /		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,229,255 2,175,992 2,056,788 1,732,722 1,167,771 1,667,971 1,668,920 1,538,400 1,531,455 1,451,738 1,451,738 1,451,738 1,285,165 1,285,	3230 1157 (OP: N4PN) 2148 947 1855 752 1685 749 1211 735 686 684 (OP: NX9X) 1168 587 1222 650 108 587 1222 650 1168 587 1222 650 1168 587 1222 650 1170 587 1223 650 1150 566 866 548 1134 641 1150 566 87 547 1150 566 87 547 1150 566 886 548 1033 532 891 529 924 512 891 529 924 512 891 529 924 512 891 529 924 512 896 492 897 492 898 493 898 493 899 492 899 492 899 492 899 492 899 492 899 492 899 492 899 492 890 492 800 492 800 492 800 492 800 492 800 4
DLOML DLOMUM DLOMUM OHAK OHAK OHAK OHAK OHAK OHAK OHAK OHAK	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Haly 13,781,740 7,665,918 4,085,276 2,295,240 1,742,784 1,697,076 977,466 398,337 Jersey 61,372 Luxembourg 1,212,432 Netherlands 2,798,761 1,078,398 176,616 Norway 681,675 115,842 36,974 Poland 10,474,718 9,426,816 3,317,892 2,566,026 2,106,570 Portugal	324 187 27 3994 538 174 2449 1911 707 977 3778 2208 1921 1003 527 207 326 794 360 163 3339 3023 1803 3023 1803 1049	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 629 353 170 624 811 543 264 447 4258 1169 849 779 770 583	DUTHR 4GØLD LSTD AYSF LV6D L73D LUTUM LT5D L6ØS L04D POSB PW2D PW2T ZW4C ZV2K ZV2K ZV2K ZV2K PY3AA CETTT CE2LS KE3X KC6H KABP N6DMA NA5NN VE3MIS VE3WBT CR3A CR3A CR3A CR3A CR3A CR3A CR3A CR3	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,024 3,493,223 1,497,646 1,427,755 668,152 159,285 Brazii 17,088,354 15,690,814 1,298,7457 5,662,569 4,159,876 3,811,148 1,768,044 1,215,164 1,020,604 1,215,164 1,020,604 1,215,164 1,020,604 1,247,84 MULTI-OPERATC TWO TRANSMITT NORTH AMERIC United States 14,400,995 13,697,376 10,975,920 4,349,362 4,349,362 4,282,762 Canada 3,596,800 1,529,015 AFRICA 50,282,186 36,092,544 31,118,395 28,787,382 ASIA	1120 617 A 44000 617 A 44000 4236 A 44000 4236 A 4100 7926 A 4298 A 4053 A 2842 A 4051 A 4208 A 4051 A 4208 A 4051 A 4208 A 4361 A 5945	480 236 1334 1299 938 799 486 565 5376 205 1269 1291 19577 5412 814 434 434 434 434 434 1232 1245 899 866 800 487	DP6T EETW EASGTJ SN6F UZ20 DB50EF, DB5	18,691,695 15,352,676 6,967,635 5,082,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIC 47,996,389 11,032,521 ROOKIE United States A 655,578 413,494 212,052 131,652 121,290 61,116 445,924 18,879 12,352 1155,178 2 12,855 2 12,855 2 12,855 2 12,855 2 14,854 4 14,944 4 14,824 4 14,824 4 14,824 4 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 14,824 8 16,020 8 16,020 8 16,020 8 16,020 8 16,020 8 16,020 8 16,020 8 16,020 8 16,020 8 17	5415 5249 3028 2494 4713 1443 489 CA 525 338 260 35 66 35 522 539 5011 493 486 269 263 3145 522 203 3145 125 125 107	1412 963 314 1216 631 1216 631 1231 1662 1159 387 246 207 195 129 87 88 2 235 236 235 236 237 246 621 195 195 195 195 195 195 195 19	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GBLZX *OM2DIT *DL6TA *YO2MKT *SP5TWA *OZ2CA *IZ2UST *VE6AMF *IZ2UST *VE6AMF *E196SB *ED5A *SN1T *LA2NTA *VK6MAB *EA7JIY *S51JS *F8KKH *LA9OSA *UA9USA		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,562 105,152 98,345 97,970 94,500 92,316 88,059 86,922 86,923 54,720 53,325 53,055 49,930 33,135 53,053 44,930 33,135 53,053 44,930 33,135 53,053 41,019 39,902 22,420 20,400 21,878 28,080 25,992 22,420 21,795 21,795 216,920 21,470 21,795 216,920 21,470 21,795 216,920 21,4105 216,920 216,920 216,920 217,785 216,920 212,865 21,986	328 2 328 2 412 2 383 32 2277 2 346 2 277 2 346 2 283 2 283 2 283 2 283 2 293 1 292 2 288 2 293 2 295 2 298	41	RIBAN X.V.4 A.K. / W.B.B.D.E.V.Q.M.S.O.W.P.P.P.P.P.P.P.P.P.P.P.P.P.P.P.P.P.P		SINGLE E led States 8,815,183 8,815,183 8,815,183 8,815,183 1,2768,291 2,768,294 2,292,255 2,175,992 1,674,711 1,667,900 1,608,920 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,745,760 1,538,420 1,745,760 1,741,745 1,741	3230 1157 (0P: N4PN) 2148 947 1855 752 1294 686 1636 684 (0P: NXBX) 1168 534 1251 587 1222 650 1048 584 1144 641 1107 579 987 547 1060 515 1187 541 818 503 879 520 924 512 752 463 879 520 914 529 924 512 752 463 879 520 914 929 924 512 752 463 879 520 914 929 924 512 752 463 879 520 914 929 924 512 752 463 879 520 914 929 924 512 752 463 879 520 879 492 879 492 87
DLOML DLOMUM DLOMUM OHEX OHEX OHEX OHEX SZ3P SZ1A EI80IRTS GT810M IO50 IR6T IR5A IR6T IR5A IO77 IO3UD IO3PN GJ2A LX75RL PA6B PA5W LN7H LA1K LN1B SO9Q HF3A SN9V SN7H SPGYAO	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 4,005,276 60,350 Luxembourg 1,212,432 Netherlands 2,798,761 1,078,378 Poland 10,474,718 9,426,816 3,317,892 2,566,026 2,106,670 1,392,787	324 187 27 3994 538 174 2449 1911 707 977 3778 2208 1921 1003 527 207 326 794 360 163 3339 3023 1803 3023 1803 1049	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 744 696 629 353 170 624 447 258 139 128 1189 128 1199 128 1199 1199 128 1199 129 129 129 129 129 129 129 129 12	LS1D AYSF LV6D LV73D LU1UM LT5D L09D LU1UM LT5D L09D LU1UM LT5D PQSB PW2D PW2T ZW40 PW2T ZW40 PW2T ZW40 PW7T CE2LS KE3X WC6H K48P NBMA NASNN VE3MIS VE3WBT CR3A VS5V CR3A VS5V CR3A	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 159,285 Brazil 17,088,354 15,690,614 8,287,457 5,662,569 4,159,876 3,811,148 1,788,044 1,215,164 1,020,604 5,031 Chile 5,993,478 3,124,784 MULTI-OPERATC TWO TRANSMITT NORTH AMERIC United States 14,400,995 13,697,376 10,975,920 4,349,362 4,292,762 Canada 1,629,015 AFRICA 50,282,186 36,092,544 31,118,395 28,737,382	1120 617 A 4400 617 4400 2236 653 286 1548 4053 286 4298 4053 286 4298 4053 286 4298 2005 1685 21468 DR ER A 4361 44849 3342 2148 22148 2704 1357 1127 8518 7341 15945 5822 6282	480 236 1334 1399 938 486 565 565 565 567 1021 1021 1021 1021 957 542 443 43 934 724 1285 1232 1245 899 866 800 487	DPGT EETW EASGTJ SNGF UZ20 DB50EF, DB5	18,691,695 15,352,676 6,967,635 5,082,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIC 47,996,389 11,032,521 ROOKIE United States A 655,578 413,494 212,052 131,652 121,290 61,116 445,924 18,879 112,352 1155,178 2 12,052 2 1155,178 4 4 4 5,924 112,352 1155,178 2 12,055 116,257 117,200 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,878 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,870 1	5415 5249 3028 2494 4713 1443 489 CA 525 529 3382 260 287 192 213 245 250 280 250 250 250 250 250 250 250 250 250 25	1412 963 314 1216 6311 231 1662 1159 1662 1159 387 246 207 195 207 195 317 406 207 195 317 406 207 195 317 407 408 408 409 409 409 409 409 409 409 409	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DET *2EØTCC *GDLZX *OMZDIT *DL6TA *YOZUKT *SP5TWA *OZZCA *IZZUST *VE6AMF *IZZUST *VE6AMF *E19GSB *ED5A *SN1T *LA2NTA *VK6MAB *EA7JIY *S51JS *F8KKH *LA9OSA *UA9JEH *PY7DJ *EA3HJO *LA9OSA *UA9JEH *PY7DJ *EA3HJO *UA9JEH *PY7DJ *EA3HJO *UA9JEH *S6TLPL *UB3DAO *ISØBGL *VUA9TMO *ISØBGL *ISØBGL *ISØBGL *ISØBGL *ISØBGL *ISØBGL *ISØB		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,74	328 2 328 2 412 2 383 32 2277 2 346 21 252 277 2 346 21 252 21 253 2 253 2 253 2 253 2 253 2 258 2 38 3 2 258 2 38 3 2 258 2 211 11 204 11 205 11 207 11 205 11 207 11 208 11 209 11 209 11 209 11 209 11 209 11 209 11 200	41	RIBAN X.V.4 A.K. / W.B. / W.		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,278,304 2,29,255 2,175,992 1,674,711 1,667,900 1,608,920 1,534,450 1,538,400 1,538,420 1,288,662 1,285,165 1,232,748 1,218,360 1,361,454 1,218,360 1,361,454 1,661,474 1,661,475 679,770 643,550 641,784 641,600 610,414 601,125 437,510 431,930 435,3904 322,410 314,847 298,016 287,546 286,552 256,996 228,390	3230 1157 (0P: N4PN) 2148 947 1855 752 1294 686 1636 684 (0P: NXBX) 1168 534 1251 587 1222 650 1048 584 1144 641 1107 579 987 547 1060 515 1187 541 818 503 879 520 914 529 924 512 752 463 879 520 924 512 752 463 879 520 866 444 1033 532 991 529 992 451 752 463 879 520 879 520 879 520 879 520 879 408 879 520 879 408 879 408 879 520 879 408 879 520 879 408 879 478 879 478 879 478 879 478 879 478 879 478 879 478 877 579 478 877 577 478 877 577 478 877 577 477 477 477 477 477 477 477 477 4
DLOML DLOMUM DLOMUM OHEX OHEX OHEX OHEX OHEX SZ3P SZ1A EIBØIRTS GTBIOM IO50 IR6T IR5A IR5A IO7T IISPT IO31D IO3PN GJ2A LX75RL PAGV PAGB PASW LN7H LATK LN1B SO90 HF3A SN9V SN7H SPCYAO SP2KPD CR6P	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 4,085,276 2,295,240 1,742,784 1,997,076 977,466 398,537 Jersey 60,350 Luxembourg 1,212,432 Netherlands 2,798,761 1,078,398 176,616 Norway 681,675 11,5842 36,974 Poland 10,474,718 9,426,816 3,317,897 Porlugal 4,528,260 3,269,743 Romania	324 187 27 3994 538 174 538 174 538 174 538 174 538 1911 707 977 3778 2737 2208 1921 1553 1280 3527 207 912 1504 336 1667 336 339 3023 3667 794 318 1049 2146	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 744 696 629 353 170 624 447 258 139 128 1199 128 1199 128 1199 128 1199 128 129 129 129 129 129 129 129 129 129 129	LS1D AYSF LV6D L73D L173D L173D L174D L73D L174D L73D L73D L73D L73D L73D L73D L73D L73	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 15,083,844 15,690,814 17,088,384 15,690,814 17,088,384 15,690,814 17,088,384 17,680,04 1,215,164 1,020,604 5,031 Chile 5,031 Chile 5,993,478 3,124,784 MULTI-OPERATC TWO TRANSMITT NORTH AMERIC United States 14,400,985 13,697,376 10,975,920 4,349,362 4,	1120 617 A 4400 617 4400 2236 653 286 1548 4053 286 4298 4053 286 4298 4053 286 4298 2005 1685 21468 DR ER A 4361 44849 3342 2148 22148 2704 1357 1127 8518 7341 15945 5822 6282	480 236 1334 1299 938 799 486 565 535 205 1291 1957 542 494 43 934 724 1285 1232 1245 899 866 800 487 1702 1544 1441 1431 1401 1307	DP6T EETW EASGTJ SN6F UZ20 DB50EF, UZ20 DB50EF, UZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H N1AGE KJ6HBY WA6KEK KD8PHI KG2ZPK KD8PHI AGE KF3TYQ/AC0Z6 *W4DTB *AB40D *AK40U *NW50 *KF7TYQ/* *KF7TYQ	18,691,695 15,352,676 6,967,635 5,082,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIC 47,996,389 11,032,521 ROOKIE United States A 655,578 413,494 212,052 131,652 121,290 61,116 445,924 18,879 112,352 1155,178 2 12,052 2 1155,178 4 4 4 5,924 112,352 1155,178 2 12,055 116,257 117,200 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,878 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,879 118,870 1	5415 5249 3028 2494 4713 1443 489 CA 525 529 528 69 66 35 625 539 5011 402 528 628 722 828 220 203 145 125 125 125 125 125 125 125 125 125 12	1412 963 314 1216 6311 231 1216 6311 1612 1159 162 172 173 173 173 173 173 173 173 173	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GOLZX *OM2DT *DL6TA *V22WKT *SP5TWA *OZ2CA *1Z2UST *VE6AMM *E196SB *ED5A *SN1T *LA2NTA *VK6MAB *EA7JIY *S51JS *F8KKH *LA90SA *UA9JFH *PY7DJ *EA3HB *F4GL0 *DD7NT *M6TOK *PD1TV *VA3PAW *SAØE *OE2LRO *JG1LPL *JG1BBBGGL *VU3TMB *SAØE *OE2LRO *JG1LPL *JG1BBBGGL *VU3TMB *SAØE *OC2UW *CA3HDDT *VO7DBR *VU3TMB *SAØE *VU3TMB *SAØE *OC2UW *CA3HDDT *VO7DBR *VU3TMB *VU3TMB *SAØE *OC2UW *CA3HDDT *VO7DBR *VU3TMB *VU3TMB *VU3TMB *VU3TMB *SAØE *OC2UW *CA3HDDT *VO2WKL *M6AGY *VK4FATT *VO2MBL **VG2MBL **VG3MBL **VG2MBL **VG2MBL **VG2MBL **VG2MBL **VG2MBL **VG2MBL **VG3MBL **VG2MBL **VG2MBL **VG2MBL **VG2MBL **VG3MBL *		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 119,567 119,567 119,5690 105,152 98,345 97,970 94,600 92,316 88,059 88,	328 2 2 383 2 2 412 2 2 3 346 2 2 277 2 3 346 2 2 256 2 2 258 2 2 258 2 2 37 11 12 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3	41	RIBAN X.V4 A.K. / W.B. V. Q.M. S. W. H. P. P. C. / V. V. D. E. V. Q.M. S. W. H. P. P. C. / V.	Unit	\$\frac{1}{8}\$\frac	3230 1157 (OP: N4PN) 2148 947 413 584 373 481 (OP: K7AP) 529 924 512 666 340 497 413 588 375 541 606 396 444 678 453 488 323 448 323 448 323 448 323 448 323 448 323 478 300 (OP: W6RKC) 502 330 (OP: W6RKC) 506 399 12 666 340 497 413 588 375 541 335 541 335 541 358 3732 481 (OP: K7AP) 600 492 493 493 493 493 493 493 493 493 493 493
DLOML DLOMUM DLOMUM OHEX OHEX OHEX OHEX OHEX SZ3P SZ1A EI80IRTS GT8IOM IO50 IR6T IR5A IO7T II5PT IO3UD IO3PN GJ2A LX75RL PA6B PA5W LX75RL LX75RL LX75RL LX75RL S090 LK77H LATK LN1B S090 SP2KPD CR6P CS2P YP7P YR2X YR8D	163,386 61,623 1,600 Finland 10,948,224 452,510 452,510 452,510 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Haly 13,781,740 7,665,918 4,085,276 60,350 Luxembourg 1,212,432 Netherlands 2,798,761 1,078,398 11,616 Norway 681,675 115,842 30,974 Poland 10,474,718 9,426,816 3,317,992 2,566,026 1,392,787 Porlugal 4,528,260 3,269,743 Romania 2,142,750 811,600	3244 187 27 3994 538 174 538 174 538 174 538 174 538 174 538 1921 553 1280 520 794 360 163 339 3023 3023 1667 794 360 163 339 3023 1667 794 360 163 527 794 527 795 795 795 795 795 795 795 795 795 79	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 744 696 708 629 353 170 624 447 258 119 543 264 477 258 359 953 750 486 465 465	LS1D AY5F LV6D L73D L173D L173	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 15,980,814 17,088,384 15,690,814 17,088,384 1,768,094 1,199,676 3,811,148 1,768,094 1,215,164 1,020,604 5,031 Chile 5,983,478 3,124,784 MULTI-OPERATIT TWO TRANSMITT NORTH AMERIC United States 14,400,995 13,697,376 10,975,320 11,975,320 11	1120 617 A 4400 617 4400 6236 4310 2236 553 286 4298 4053 286 4298 4053 286 4298 8411 1357 1127 8518 7341 1357 1127 8518 7341 8582 7665 6593 7665 6593 7665 6593 7665	480 236 1334 1299 938 486 5376 205 1269 11021 957 812 814 43 934 724 1285 1232 1245 1242 43 800 487 1702 1547 1547 1547 1547 1547 1547 1547 1547	DP6T EE1W EA3GTJ SN6F UZ2Q DB50EF, IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H N1AGE KJ6HBY WA6KEK KJ6HBY WA6KEK KSTPJ KSPTUD, ACØZG **W4DTB** **AR410D **AR40U **NW5Q **KF7IYO, ACØZG **KF7IYO, AC	18,691,695 15,352,676 6,967,635 5,062,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERIC 47,996,898 11,032,521 ROOKIE United States A 655,578 A 413,049 - 212,052 - 131,652 - 141,290 - 61,116 - 445,924 - 18,879 - 12,352 - 10,856 - 12,290 - 12,290 - 12,290 - 12,290 - 12,290 - 12,352 - 12,290 - 12,352 - 12,290 - 12,352 - 10,856 - 12,352 - 10,856 - 12,352 - 10,856 - 12,352 - 11,551,352 - 10,856 - 12,352 - 11,551,352 -	5415 5249 3028 2494 489 524 4713 1443 489 524 525 524 525 529 520 520 520 520 520 520 520 520 520 520	1412 963 369 314 1216 6311 1216 6311 1662 1159 387 347 247 64 233 387 64 207 195 36 207 195 36 207 195 36 207 36 37 38 207 38 38 207 38 38 38 38 38 38 38 38 38 38	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GOLZX *OM2DT *DL6TA *V22WKT *SP5TWA *D22CA *1Z2UST *VE6AMM *1Z2UST *UR3AMM *1Z2UST *VE6AMM *1E19GSB *ED5A *SN1T *LA2NTA *VK6MAB *EA7.JIY *S51JS *F8KKH *LA90SA *UA9JFH *PY7DJ *EA3HN0 *IZ1TYP *EA4GHB *F4GL0 *DD7NT *M6TOK *PD1TV *VA3PAW *SAØE *OE2LRO *JG1LPL *UB3DAO *ISØBGL *VU77DBR *VU3TMO *BC4KUA *CO2JW *CA3HDT *VO2WKL *M6AGY *VK4FATT *VO2MBL *VG2MBL *VG3MBL *VG2MBL *VG2MBL *VG3MBL *VG3M		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 119,567 119,567 118,622 105,690 92,316 88,059 92,316 88,059 88,922 82,335 74,315 69,973 60,822 54,720 53,325 53,055 49,950 47,233 44,950 41,019 37,800 28,080 22,420 20,400 19,872 17,892 21,7892 17,893 17,548 11,550 11,310 9,884 9,338 7,548 6,960 6,716	328 2: 328 2: 412 2: 315 2: 277 2: 346 2: 2277 2: 249 3: 256 1: 259 1: 259 1: 259 1: 259 1: 259 1: 259 1: 259 1: 259 1: 259 1: 259 1: 260 1: 260 1: 270 1: 2	41	RIBAN X.V4 A.K. / W.B. V. Q.M. S. W. H. P. C. / V. V. W. B. D. E. V. Q.M. S. W. H. P. C. / V. V. V. W. B. D. E. V. Q.M. S. W. H. P. C. / V.		SINGLE E led States 8,815,183 4,729,318 3,302,784 2,278,304 2,29,255 2,175,992 1,674,711 1,667,901 1,608,920 1,531,455 1,538,400 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,641,538 1,232,748 1,218,360 1,361,451 1,361,478 1,278,700 641,500 610,414 601,125 437,510 441,840 641,600 610,414 601,125 437,510 431,840 431,840 431,840 266,552 258,953 256,956 228,330 223,560 228,330 223,560	3230 1157 (OP: N4PN) 2148 947 413 584 1032 566 340 1150 666 340 415 666 340 41
DLOML DLOMUM DLOMUM OHAX OHAX OHAX OHAX OHAX OHAX OHAX OHAX	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 4,085,276 6,959,800 4,085,276 6,959,800 4,085,276 6,959,800 4,085,276 1,742,784 1,697,076 6,977,466 398,537 Jersey 60,350 Luxembourg 1,212,432 Netherlands 2,798,761 1,078,398 1,76,616 Norway 681,675 115,842 3,6,974 Poland 10,474,718 9,426,816 3,317,892 3,6974 Poland 10,474,718 9,426,816 1,927,787 Portugal 4,528,266 2,106,570 1,392,787 Portugal 4,528,260 2,106,570 1,392,787 Portugal 4,528,260 2,106,570 1,392,787 Portugal 4,528,260 3,269,743 Romania 2,142,750 811,620	3244 187 27 3994 538 174 2449 1911 707 977 3778 2737 208 1921 1553 1280 3527 207 912 1504 376 376 376 376 376 376 376 376 376 376	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 629 353 170 624 811 543 264 447 258 139 128 139 128 139 149 159 159 159 159 159 159 159 159 159 15	LS1D AY5F LV6D L73D L173D L173	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,487,646 1,427,755 668,152 15,980,814 17,088,384 15,690,814 17,088,384 1,768,094 1,193,976 3,811,148 1,768,094 1,215,164 1,020,604 5,031 Chile 5,983,478 3,124,784 MULTI-OPERATIT TWO TRANSMITT NORTH AMERIC United States 14,400,995 13,697,376 10,975,320 11,520,115 11,111,111,111,111,111,111,111,111,	1120 617 A 4400 617 A 4400 2236 653 286 1097 926 653 286 4298 4453 2862 2325 1468 DR ER 4361 4349 22148 2704 1357 71127 8518 7341 127 8518 7545 5822 6282 4958 7665 6593 6503 6508 6503 6508 6503 6508 6503 6508 6508 6508	480 236 1334 1299 938 486 567 567 205 1269 11021 957 812 814 43 934 724 1285 1232 1245 1232 1245 1232 1245 1232 1245 1232 1245 1232 1245 1232 1245 1232 1245 1232 1245 1232 1245 1232 1245 1246 1252 1252 1252 1252 1252 1252 1252 125	DP6T EE1W EA3GTJ SN6F UZ2Q DB50EF, IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H N1AGE KJ6HBY WA6KEK KJ6HBY WA6KEK KSTPJ KSPFJ AC2ZPK KSPFJ AC3ZPK KSPFJ AC3ZPK KSPFJ AC4ZPK KSPFJ AC5ZPK AC5ZPK KSPFJ AC5ZPK	18,691,695 15,352,676 6,967,635 5,062,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERINA 47,996,398 11,032,521 ROOKIE United States A 655,578 A 413,049 - 212,052 - 131,652 - 131,652 - 121,290 - 61,116 - 445,924 - 18,879 - 12,352 - 10,856 - 12,352 - 12,290 - 12,352 - 12,290 - 12,352 - 12,290 - 12,352 - 12,352 - 148,941 - 344,540 - 441,824 - 457,540 - 441,824 - 18,879 - 10,856 - 443,540 - 441,824 - 18,879 - 10,856 - 10,856 - 43,540 - 441,824 - 118,800 - 102,800 -	5415 5249 3028 877 5313 489 3382 2494 489 529 529 529 528 522 528 522 528 529 521 528 529 529 529 529 529 529 529 529 529 529	1412 963 314 1216 6311 135 387 369 314 1216 631159 387 246 62 1159 387 644 259 228 350 312 338 82 2 2 350 312 32 32 32 32 32 32 32 32 32 32 32 32 32	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *UR3DBT *IZ20GH *VA3DBT *2EØTCC *GOLZX *OMZDT *DL6TA *V22MKT *SP5TWA *OZ2CA *IZ2LIST *VE6AMM *EJ96SB *ED5A *SN1T *LA2NTA *VK6MAB *EA7JIY *S51JS *F8KKH *LA9NTA *LA2NTA *VK6MAB *EA7JIY *S51JS *F8KKH *LA9NTA *UR3JFH *PY7DJ *EA4GHB *F4GL0 *DD7NT *M6TOK *PD1TV *VA3PAW *OE4VMB *SAØE *OE2LRO *US3PAH *VOZDBH *SAØE *OE2LRO *US3PAH *SAØE *OE2LRO *US3PAH *SAØE *OE2LRO *SAØE *OE2LRO *SAØE *OE2LRO *SAØE *OUS3PAH *SAØE *OE2LRO *SAØE *OE3LRO *SAØE *OUS3PAH *SAØE *SAØE *SAØE *SAØE *SAØE *SAØE *OUS3PAH *SAØE *SAØE *SAØE *SAØE *SAØE *SAØE *SAØE *SAØE *SAØE *		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 119,567 119,567 118,622 105,690 105,152 98,345 97,970 94,500 92,316 88,059 88,	328 2 2 383 2 2 412 2 2 3 3 46 2 2 2 7 7 2 3 46 2 2 2 5 6 11 2 5 6 11 2 5 6 11 2 5 6 11 2 5 6 11 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 2 5 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	41	RIBAN X.V.A. K. F. J. J. J. L.	Unit	SINGLE E led States 8,815,183 4,729,318 3,302,784 2,229,2,765,992 2,056,788 1,732,722 1,157,992 1,158,400 1,531,455	3230 1157 (OP: N4PN) 21148 947 1855 752 1294 686 1836 684 (OP: NX9) 11688 534 1221 556 1231 681 1221 650 1081 681 1144 681 1107 579 987 547 11660 515 1187 541 1818 503 1150 566 879 520 991 529 924 512 991 529 924 512 (OP: K7AB) 1060 390 492 491 497 413 666 444 678 453 732 481 (OP: K7AB) 497 413 666 390 492 491 679 492 494 497 497 413 588 375 541 335 448 319 599 342 478 303 (OP: W6RKC) 506 299 414 278 303 (OP: W6RKC) 506 299 414 278 398 277 395 258 399 342 478 303 (OP: W6RKC) 506 299 414 278 398 277 395 258 398 277 395 258 398 277 395 258 398 277 395 258 398 277 395 258
DLOML DLOMUM DLOMUM OHAX OHAX OHAX OHAX OHAX OHAX OHAX OHAX	163,386 61,623 1,600 Finland 10,948,224 452,510 54,340 Greece 3,805,540 2,670,440 Ireland 658,860 Isle of Man 1,110,725 Italy 13,781,740 7,665,918 4,085,276 6,959,800 4,085,276 6,959,800 4,085,276 6,959,800 4,085,276 1,742,784 1,697,076 6,977,466 398,537 Jersey 60,350 Luxembourg 1,212,432 Netherlands 2,798,761 1,078,398 1,76,616 Norway 681,675 115,842 36,974 Poland 10,474,718 9,426,816 3,317,892 2,566,026 2,106,570 1,392,787 Portugal 4,528,260 3,269,743 Romania 2,142,750 81,1675 688,572 1,992,787	3244 187 27 3994 538 174 2449 1911 707 977 3778 2737 208 1921 1553 1280 3527 207 912 1504 360 163 3339 3023 3667 794 360 163 3339 3023 3667 794 376 3768 401 1391 763 708 401	261 167 25 1344 370 143 895 808 474 577 1372 1131 1063 1004 744 696 629 353 170 624 811 543 264 447 258 139 149 159 199 199 199 199 199 199 199 199 19	DUTHR 4GØLD LS1D AYSF LV6D L73D L173D L175D L60S L04D POSB PW2T ZW4C ZW2K ZW8T ZW8T ZW8T PR5A PT2CVA PY3AA CE1TT CE2LS KE3X WC6H K4BP NØMA NASNN VE3MIS VE3WBT CR3A V55V E093 CO3L A73A J75DX	Philippines 1,671,360 416,540 SOUTH AMERIC Argentina 17,695,510 17,023,395 5,870,004 3,493,228 1,497,646 1,427,755 668,152 159,285 Brazii 17,088,354 15,690,814 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,202,604 1,215,164 1,21	1120 617 A 4400 617 A 4400 2236 653 286 1097 926 653 286 4298 4453 2862 2325 1468 DR ER 4361 4349 22148 2704 1357 71127 8518 7341 127 8518 7545 5822 6282 4958 7665 6593 6503 6508 6503 6508 6503 6508 6503 6508 6508 6508	480 236 1334 1299 938 799 4565 3205 1269 1291 19577 812 814 454 494 43 934 724 1285 1232 1245 899 866 800 487 1544 1441 1433 1401 1307	DP6T EETW EASGTJ SN6F UZ20 DB50EF, IZ10MY VK4KW VK2KDP DX1DBT LP1H 3G1B K6AAX W1PL WT6H N1AGE K6STPYO K6STP	18,691,695 15,352,676 6,967,635 5,082,861 761,022 323,613 320,594 OCEANIA 18,934,336 3,228,196 303,303 SOUTH AMERICA 47,996,898 11,032,521 ROOKIE United States A 655,578 4 413,049 2 12,052 131,652 121,250 6 1,116 4 45,924 1 18,879 1 12,352 2 1 155,178 2 2 0,856 7 4 4 48,941 1 41,844 1 41,844 1 41,844 1 41,844 1 41,844 1 41,844 1 41,844 1 118,800 1 42,842 1 18,941 1 118,800 1 42,842 1 18,941 1 118,800 1 42,842 1 118,800 1 42,842 1 118,800 1 42,842 1 46,002 1 75,482 1 16,531 1 17,200 1 65,311 1 18,800 1 102,200 1 75,482 1 102,200 1 75,482 1 102,200 1 75,48	5415 5249 3028 2494 4 4713 1443 489 CA 9039 3388 2600 263 358 260 267 525 529 529 529 262 203 227 228 222 203 227 228 222 203 227 228 220 203 227 228 265 66 69 26 66 69 26 66 66 66 66 66 66 66 66 66 66 66 66	1412 963 314 1216 6311 231 1662 1159 1662 1159 1662 1159 1662 1159 1662 1159 1662 1662 1662 1662 1662 1662 1662 166	*VE4TTH *UR3AHF *DL7DET *UR3AHF *DL7DET *UR3AHF *DL7DET *IZ20GH *VA3DBT *2EBTCC *GOLZX *OMZDI *DL6TA *YOZMAT *OZCCA *IZZUST *I		221,961 208,080 201,772 172,546 151,620 147,506 121,746 119,567 118,622 105,632 105,132 98,345 97,970 94,500 92,316 88,059 86,922 82,333 74,315 69,973 60,822 54,720 53,325 53,055 53,055 53,055 49,933 44,950 47,233 44,950 47,233 44,950 47,233 44,950 16,920 17,765 18,080 17,952 22,420 19,872 21,480 11,310 15,276 16,920 16,930 17,952 17,765 11,181 11,810 11,1310 11,810 11,810 11,810 11,830 17,546	328 2 2 383 2 2 412 2 2 3 3 46 2 2 2 7 7 2 3 3 46 2 2 2 5 6 11 2 5 6 2 1 2 5 6 1 1 2 5 6 2 1 2 5 6 1 1 2 5 6 2 1 2 5 6 1 1 2 5 6 2 1 2 5 6 1 1 2 5 6 2 1 2 5 6 1 1 2 5	41	RIBAN X.V.A. K. F. J. W. G. M. S. D. B. V. Q. M. S. D. W. W. H. P. P. C. V. J. Z. C.X. J. S. Z. J.	Unit	SINGLE E led States 8,815,183 4,729,318 3,302,784 2,292,255 2,175,992 2,175,992 1,667,781 1,667,900 1,538,400 1,538,400 1,538,450 1,538,400 1,538,420 1,451,738 1,258,542 1,228,748 1,218,360 1,381,455 1,451,738 1,288,662 1,285,165 1,282,748 1,218,360 1,381,455 1,451,738 1,553,420 1,538,420 1,538,420 1,538,420 1,538,420 1,538,420 1,641,738 1,738,707 731,120 679,773 1,120 679,773	3230 1157 (OP: N4PN) 21148 947 1855 752 1855 752 1855 769 1211 735 1636 684 (OP: NXBX) 1168 634 1251 587 1222 650 1048 584 1144 641 1107 579 987 547 1060 515 1187 541 818 503 866 548 1133 532 921 529 924 512 924 512 929 492 927 529 928 752 929 492 929 492 920 492 921 529 921 52

KD4RF	40	167,320	288 235	*KT4ZB	¥6	1,949,935	1225 655	*K1VU	80	41.697	125	113	EE3A	60	4.514.610 1977 915	UA9FGJ	w	484.802	517 446
		77	(OP: W9EQ)	*NX6T		1,920,810	1403 645	*WØZF	100	40,095	138	135			(OP: EA3ATM)	JE1LFX	6	452,920	480 335
KA4OTB AA5B	- 6	166,100 155,763	289 220 404 243	*WZ7ZR	и.	1.558.752	(OP: K6AM) 1166 624	*N6ENO *W7RV	- 6	35,088 30,636	158 104	129	OQ5M		4,205,362 1929 917 (OP: ON5ZO)	GW9X		449,748	578 403 P: MW1LCR)
N3WD		148,674	251 213	*WB8TLI		1,330,732	891 531	*W2DZ	20	30.528		106	SV5DKL	21	4,178,160 2123 1008	DL1NEO		427.800	502 372
KR2E/7	9.	147,744	291 228	*KB9UWU		1,082,943	770 513	*N6ZE	8	29,920	126	110	UA4FEN	3	4,097,236 2195 988	BD4CQ		410,670	584 338
WA30FC/4	- 5	147,586	226 218	*KB90WD	-	978,112	1077 493	*K6CSL	- 5	27,063	118	97	EW2A		3,889,458 1985 906	ES2IPA	1.0	403,256	594 379
W4VKU K6ATZ	87	141,316 138,600	228 196 261 200	*N1API *NW2K		875,996 758,961	736 463 818 441	*WV6N *AK4NZ	27	24,843 23,023	106 97	91 91	EU1AZ EV1R	85	3,149,664 1708 872 3,141,861 1790 843	4U1GSC EA4ETW	¥5	361,344 347,014	558 384 550 386
AJ4HW	90	134,136	261 207	*KD3HN	0.0	743,785	656 395	*NØRZT/4	70	19,844	100	82	UAØSR	00	2,913,801 1580 759	R2DW	*	346,527	450 417
WA7PRC	*	129,690	280 198	*W1MA	90	692,580	634 420	*AB1QP	50	19,623	96	93	CO2GG		2,683,535 1588 655	UT5UKY	*)	340,736	488 352
N4NM WK4Y		127,779 126,352	244 191 271 212	*K2DSL *AA6K		658,140 657,360	652 420 606 415	*AA6EE *N2CQ		18,920 16,999	106 95	88 89	JO1WKO OK2BXE		2,349,900 1175 630 2,185,690 1273 731	F1NZC DL8EAQ	-	338,100 331,272	437 350 448 344
K4EDI	- 1	121,520	231 196	*K8BL	1	618,068	485 484	*N2GXJ	- 1	15,876	86	81	F4FFH		2,178,495 1367 815	J47X	*	325,827	525 369
W70N		106,860	262 195	*W7S0	W.	552,375	590 375	*AA4LR	- 8	14,007	78	69	Y03APJ	-	1,905,057 1140 693		127		OP: SV7BVM)
NØQO KB6A	×	92,169 78,546	215 171 220 159	*W7FYW *NN6DX	XI.	499,995 495,132	578 369 578 372	*NØAX *N2JJ	V.	9,856 9,792	68 67	64 64	GØVXE OE6MDF	6	1,861,880 1328 712 1,795,682 1223 658	RV1CC ZW5V	190	320,640 314,600	382 320 395 286
KI7Y	¥2	68,832	197 144	WWODA		400,102	(OP: W1PR)	*ADØH	¥0.	8.684	64	52	DF5MA	10.	1.668,576 1150 672	24404		314,000	(OP: PY5KA)
WJ1R	5	67,728	159 136	*WBØTSR	10	491,538	587 366	*K7TR	80	7,800	60	50	ED4A	00	1,516,455 1235 705	AL7KZ		296,442	386 258
WG7X N3IYX	ě	64,242 61.073	212 166 185 157	*AD1C/Ø *K2GV	0	483,552 470,400	535 368 451 320	*W8DM/5 *N8WS	20	6,630 6,555	54 60	51 57	SV1JGX	6	(OP: EA4TV) 1,465.632 1220 672	JF9JTS JAØCIY		268,832 258,263	377 248 390 271
AJ7T	¥	60,384	217 148	*KS2G	¥.	449,242	481 362	*KI4YIK	¥.	4,452	58	53	VEGAA		1,298,286 864 498	NH6WZ		253,422	360 234
K7CS/4		59,492	174 139	*N3ALN	W.	411,156	519 324	*KI4HHK	W.	4,223	42	41	9A2Ø7T		1,237,086 859 558	IK2TDM	20	244,362	331 278
WB7BBQ	×	55,640 55,160	151 130 164 140	*WI5ID		408,120	507 358 (OP: K5IID)	*KC8UNR *WA6GFR	×	3,952 3,738	39 43	38 42	EYØA	10	(OP: 9A2EU) 1.234.548 970 497	RA3BL BD4KYA	*	213,465 202,300	340 285 505 238
N3XUD	50	53,448	152 131	*KCØDEB	20	402,784	510 328	*K7DAC	95	3,552	40	37	LIDA		(OP: UA4LCQ)	PA7AL	1.00	200,616	442 312
W6FB	5	48,990	166 142	*NK7L	100	384,130	575 359	*KC7RPO	5	3,306	39	38	SQ7DQX	- 5	1,220,184 1204 538	JA2XLV		197,292	328 246
NJ2F/4 K7MY	ž.	45,136 44,732	134 124 119 106	*N7MZW *AD1L	i.	379,088 339,434	691 344 408 314	*KG7P *WA4PGM	- 2	2,278 1,971	45 31	34 27	9A2Ø2JK		1,205,028 926 612 (OP: 9A2JK)	VE1JS EU3NA	- 8	188,340 164,338	260 219 324 254
W1GD/2		39.962	111 106	*K9JE		332,280	432 312	*AE5NO		990	22	22	LN3C		1,192,620 1139 572	GDØAMD		163,185	347 253
K4GM	27	39,131	129 109	*KS4X	10	294,048	382 288	*N6AJR	W.	646	18	17			(OP: LA9DFA)	DF5BX	¥0	155,034	320 243
N5FO W6SZN	ž.	33,063 31,625	108 107 134 115	*K4NC *WA1FXK/2	90	291,720 267,582	414 264 396 277	*N1H0/4 *N4LKE	- ŵ	595 180	17 9	17	LA7GNA LY2MM		1,191,344 945 616 1,171,810 952 565	JA1WPX IZ5ASZ	6	153,786 148,392	251 213 260 229
K1PH	20	26,400	98 88	*WA2TML	83	265,136	340 292	*KE5SNJ	28	16.344	85	72	UXØRR	22	1,150,518 1006 569	IZ4EFP	5)	144,060	299 245
W6PK		23,852	98 89	*AB4SF	Y.	246,980	338 265	*N1VVV		2,304	33	32	Y03RU		1,107,700 1014 583	IZ5NSH	- 5	143,314	345 262
NF9V WB5C		22,784 22,692	94 89 120 93	*AJ4VE *K6AAB		241,965 223,780	347 283 395 268	*KM4HI *KO3T	21	425,632 338,256		376 348	SN5V	9	1,072,746 888 549 1,046,653 856 589	DF6RI IR7R	- 7	141,062 135,460	298 251 341 260
K9QC	¥	22,092	94 94	*KA1EKR	¥	198,660	308 220	*NF8J		221.680		272	31434		(OP: SQ5EBM)	MØRNR		129,285	255 221
K3IT	К.	12,896	73 62	*N6DZR	W)	190,311	305 237	*WA4AXT	K.	173,990	288	254	OG4T	60	1,044,110 867 526	R01B		129,030	308 253
N4DXI W2YE/4	80	9,020 8,816	59 55 62 58	*N8SBE *K7HP	#1.	175,017 167,134	305 227 309 214	*KG9Z/8 *N5DTT		97,427 94,272		187 1 92	V01KVT	X)	(OP: OH4MFA) 993.884 748 482	G6T	**	125,100	264 225 (OP: G4MKP)
AI6Z	20	6,240	54 52	*KKØSD	20	166,105	299 239	*K7XE/6	2	71,786		143	UA9AU	20	978.836 668 428	RK9KWI		125,048	250 203
WB9B		4,773	45 37	*KV2R		162,396	285 234	*W7UPF		68,716	175	164	IK8UND	*	964,320 993 560	JN3SAC	*	119,930	227 179
WN1GIV/4	28	903,378	919 471 (OP: N4BP)	*NG4L *W4BAB	2	147,446 142,688	272 214 271 208	*AE6YB *K4NVJ	0	36,704 14,874	145 75	124 74	DF7EF R3ZV		919,100 796 505 889,875 895 525	VA7FC G6NHU	7	115,455 111,360	244 179 244 240
KU8E/4	87	349,875	545 311	*N4IJ/5	W.	140,128	281 232	*N6BHX	80	9,408	76	64	EW4MM	65	873,600 883 520	PAØJNH	10	109,824	230 208
K4NV	×1	174,300	423 210	*NR9A/Ø	90	133,980	272 203	*N5IF	×	1,782	36	33	DL9GWD		858,528 735 528	DG2MKV	×.	103,752	245 198
KQ6ES K6LL/7	21	89,776 2,080,880	291 181 1345 740	*NY4JB *NV9X	80	131,820 130,764	271 195 252 204	*W7JFF *KG1E	14	1,155 1,036,630	21 795	21 590	F4DSK SM6NOC		833,340 803 510 833,257 758 487	JA1IXY	50	99,216 98,124	249 212 193 148
KZ5J	"	724,710	769 493	*K4FTO		123,977	246 199	*NN5Z		331,653	533	357	DFØBV	•	808,848 741 492	F5JFU		94,428	188 183
N2YBB		408,478	416 358	*W8G0C	5	110,188	204 163		21	3545033	(OP: KE	PX)		2	(OP: DL1MAJ)	G4VMX	1	90,240	215 188
ND5T K7RF	8	328,650 280,761	565 350 392 299	*WØQQG/4 *W6RFF	80	101,061 96,654	228 171 211 181	*WØPPF *AF8C		26,100 14,399	129	116 77	OE6HLF SMØBSO		778,092 759 471 720,954 780 507	EI9FVB OK6DJ	¥.	86,457 82,164	208 179 200 167
NOGF	10:	90,630	253 190	*KA9MOM	30	81,696	201 184	*KD7JS	100	152	8	8	9A2Ø6B	*	704,696 694 472	JA1QZC	X5	78,432	184 152
			(OP: K2RD)	*AF4DR	90	79,341	197 159	*WF5E	7	84,812		182			(OP: 9A5ADH)	EU6AF	60	78,200	197 170
NE61 N8HP	14	2,233 215,460	29 29 309 285	*WGØM *KTØA	W.	78,672 73,032	205 176 223 179	*W1DYJ		37,026	(OP: W	iAJ) 102	DF2TT V47JA		648,566 648 479 638,469 579 351	JA1XUY YT2AA		75,392 73,308	200 128 183 164
KD8SQ		92,500	202 185	*N4ARO	H	69,255	167 135	*NU1H	- 1	1,848	23	22	UR5RP		632,700 755 475	PE1LUB		72,168	224 194
WN20	7	204,294	341 237	*W1CRK	W.	67,932	174 153	*KCØRQH	1	462	14	14	EW8DJ	- 5	631,136 637 484	JA1MJN		70,528	188 152
KX9DX		48,069	(OP: N2GC) 231 147	*KØNEB *AF5CC	36	66,220 64,239	171 154 198 161	*KB7QND	3.7	12,382	130	82	IK2LFF VE3MV	ě	608,832 765 453 553,104 550 334	F5CQ SP9OHL		67,032 66,256	159 147 190 164
K7EIQ	00	960	20 20	*AB5XZ	90	63,196	207 148			DX			IZ8JFL	*	541,250 700 433	HL5YI	(10)	63.431	189 137
W8JMF	3.7	11,232	49 48	*K4DMH	85	58,916	174 143	RT4R0	A	7,517,104	3448 1	148	RN3B0	52	517,409 622 421	1Z7FLP	82	57,038	193 158
K4JC *NR3X/4	A	2 430 441	55 52 1517 711	*K6DSW *KC5FP	1	56,280 55,096	189 140 166 142	KP2MM		6,621,256		956	GM8SBH	22	499,500 563 444 (OP: GMØFGI)	JJØPJD	1	48,139	208 161 142 117
NH3A/4	A	2,439,441	(OP: N4YDU)	*W2VU	8	48,256	149 128	LZ2DF	8	4,606,848	(OP: N21 2040 1		DL8ZAW	10	493,680 556 374	F5VML		47,502 46,718	152 142
			(01.114100)	11210	***	40,200	.40 120			7,000,040	2070		DEULINIT		.50,000 500 574	1 . OTHE		40,710	.06 176

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A1IZZ	81	42,642	130	103	UP5P		1,207,524	775	564
ØAZG		40,386	148	127 109	шаное	310	222 000	(OP: U	N/PL)
P1MWN H1B	10	38,804	125		JHØNOS	110	322,088	364	326
пів		35,264	125 (OP: OF	116	IR5X		252,960	475 (OP: IZ5	372
ZEDWD		2/176	148	128	ENANY		221 014		359
Z6RWD	23	34,176			EA4AK		231,914	390	
W4WZ		32,760	130	117 113	PY2KJ		72,562	178	146
Z6OM		31,527	125		PY7ZY		62,080	167	128
Y3BY	63	30,797	111	103	RU4SM	1065	43,792	204	184
W3SGT	-	25,134	141	118	SK2AZ		16,206	119	111
050PH		20,460	98	93	DV4040	190	10.111	(OP: SM	
E8DW	1150	19,178	88	86	PY1CAS		12,141	72	71
O5CUQ		16,352	102	73 88	MØJBA		7,440	86	80
J8EW		14,872	90		Y060EJ		3,248	60	58
H10VY		11,900	71	70	9A8DX	7	1,854,949	1236	647
12GLB	41	10,556	54	52	IK3UNA/1	- 1	738,700	803	445
IC9YA		9,338	60	58	RA30A	310	501,421	531	389
	4.0			RW9Y)	LY2UU	280	485,000	490	388
ILØSM	7.1	8,256	69	64	IW5ELR		294,118	424	319
4451	- 2	0.004	(OP: DG		YV6BXN		259,584	229	208
4AFJ	3.0	6,394	50	46	ZL2CC		256,494	261	197
KØUXO	- 3	4,536	43	42	G3TDH		123,824	247	218
U7JGU		3,956	47	43	JJ5GSY		48	4	4
A4CU	100	1,225	25	25	DM5ØUEA	3.7	1,358,934	1146	586
U6QI	10	528	11	11	V/T 4 5	12103	4 040 0	(OP: DL	
K3PQG	200	270	10	10	YT4A	51.90	1,243,200	953	555
E2FXL		243	9	9	0.000	и	704 6	(OP: Y	
XØA	28	2,609,750	1503	650	9A2R		784,665	764	477
22.0		200/092	(OP: 4		EA7EU		622,566	573	427
A2U		576,240	611	392	EATEA		134,829	241	213
	0.00		(OP: 9		OR5N		130,804	277	212
VP4WW		339,756	589	276		0.00		(OP: 0	
	-		(OP: KP		KH6QJ		1,938	19	17
A4WC		319,923	560	369	IZ5MOQ	1.8	253,968	433	296
V9DJ0		300,390	531	323	SV1GRD		7,257	63	59
Z4GWE		214,935	359	267	*ZL310	A	6,182,904	2283	894
N6NL	**	92,105	219	169	*RT9S		3,285,816	1437	696
Y2AE		88,810	204	166	*TO7BC		3,172,628	1478	727
IN4PG		69,275	172	163				(OP: D	
IG7M	10	31,209	116	103	*IB1B	. 11	2,966,194	1386	847
Z2GNQ	50	14,040	78	72				(OP: IV	V1QN)
7MX	40.00	10,540	72	68	*E21EIC		2,846,340	1525	753
Y5KC	**	2,376	38	36	*XQ7UP		2,216,865	1238	645
S1LL	**	45	5	5	*102Z		2,028,285	1270	705
X9A	21	3,505,614	1651	798				(OP: IK	2DZN)
			(OP: 4	Z40Q)	*UR4U	111	1,862,091	1272	693
V9GPV	84.	2,878,092	2306	846				(OP: UP	
Y1EI	100	917,889	1005	401	*DL6NDW	129	1,510,625	1285	625
B5KT	9.5	674,424	851	522	*EW5W	94	1,482,848	1142	596
W000555		COMMISSION	(OP: E		15000000		ALBERTANIST.	(OP: E	
Q4B	**	576,400	620	440	*PY2VZ	*	1,434,860	945	554
A 100 CO			(OP: ON		*YB1TJ	н	1,426,810	920	545
A1XT	**	513,166	595	379	*EE7R		1,165,794	954	574
A/KE5JA	41	424,252	604	367			1.00,.04		EATIA)
9DA	100	410,742	451	342	*LU7HW	100	1,133,719	850	491
Z5NFD	100	208,453	334	307	*ER4LX	5.95	1.121.940	1051	542
A5GS	6	139,682	284	211	*LY2SA		1,102,900	967	538
Z3NVR	- 0	46,800	165	150	*JH1EAQ		1,061,548	781	466
OSRAC	80	16,470	99	90	*P43E		1.046.560	858	422
U2PTT		10,416	64	62	*PD9X		1,004,792	976	568
A6WEQ		1,430	27	26	*UA3ABJ	- 11	992,351	917	551
A2Ø3B	14	2,720,133	1793	871	*PV7M	00	963,500	791	470
1200	100	2,720,100	(OP: 9		2 V / IVI		200,300		T7ZT)
	1100	2,187,516	1580	866	*EI5GSB	:00.0	958,938	899	543
V3D			1000	UUU	LIUUUU			055	040
Y3D	**		1386	730	*OPAA		0/18 170	771	530
Y3D 51CK SØC		1,913,330 1,889,264	1386 1282	730 806	* 0P4A *JM1UTT		948,170 948,024	771 765	530 462

Looking Ahead in



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

- · Sparks in the Snow
- CW Results, 2012 CQ World-Wide WPX Contest
 - · An HF Modem Autoswitch

Upcoming specials: QRP (March), Take it to the Field (June), Emergency Communications (Oct.), Technology (Dec.).

Do you have a ham radio story to tell? Something for one of our specials? See our writers' guidelines on the CQ website at http://www.cq-amateur-radio.com/ guide.html>.

1-7715 1	*.IA2CUS	0.00	632,835 615,276	648 441 718 422	*JE8KKX *YB7MRK	4	33,088 32,865	131 94 120 105	*EU4AA *UT2AB		40,950 27,336	149 130 110 102
Part	*OK1CLD	305	613,056	584 372	*OK2TC	1901	32,500	150 125	*S52Q	3.00	27,336 22,119	112 101
Perfect ST. 0.07 SER. 268 PATRONOM SOUTH S	*XE1XOE		590,303	721 343	*YO9HRB		31,354	153 122	*RD3AJB		14,508	96 93
***PALIDAD *** \$64,279 *** \$78,000 *	*WP3GW		575,073	524 361	*PA1ØØNOM		30,702	150 129	*JA3BBG		9,780	67 60
DMI-POLY SEPTION SEP	*UA1CUR		556,278	676 417	*PR2W	4.1	30,485	127 91	*7M1MCY		8,736	64 56
	*ON4VDV		524,728	550 428		10.7		131 121	*F4CGJ *ZL2K			28 26
MARCHAN 462-866 508 515 FEDDON 20,727 107 506 FEDDON 20,727 107 107 506 FEDDON 20,727 10	*DM2SR *EI7JZ				*PA8KM		29,606		*G7RSM		35	
**************************************	*JA6DIJ		492,102	520 351 745 465	*ER3DX	4	29,472	107 96			27	
MAINTENN	*BG4ACE		477.666	699 357		100	29,260	159 133		**		780 481
MAINTEGN		0.00	456,252	615 394	*IW2MYG	140	28,203	139 119			453,840	663 465
PACHAGE* **A42, **PACHAGE***	*JM1LRQ	*		513 367	*JA4BDY		27,451	118 97				(OP: CE1KR)
Person	*OZ1ACB		442,728	578 387	*SMØHBV/3		26,904	133 114				(OP: EC7KW)
Section Sect	*VE3NNG			568 344 443 306	*SP6FXY *F8CRS	(4)					371,840 371,234	
March Marc		587	393,470 392.040			1	24,510 24,153		*YT2AAA		341.523	(OP: IZ2JQP) 588 417
	*IKØXBX		391.590	481 342	*JR1MRG		23,639	114 77	*DL9ZP		320,000	
1-22400000000000000000000000000000000000	*HB9WDY		374,960	504 344	*DK1FW	4	22,792	93 88	*OG3P		273,424	553 368
1027HAR	*IZ3KKE	100	352,253	411 341		949	(1	OP: SM5BKK)		90% 5mS		490 360
RILBIAN 323,548 346 332 27196C 19.008 107 56 74776Z 133,642 248 221 7476C 131,645 248 221 7476C 131,645 248 221 7476C 131,645 248 221 7476C 131,645 248 221 7476C 241,645 241,	*OZ4NA	100	336,826	515 343	*SP9JZT	195	19,437	97 93	*G3VAO		192,060	394 330
Delimbi	*RL6MA		325,360	548 332	*IZ1HBC		19,008	107 96	*VA7CRZ		133,042	249 221
CHICAGE 310,072 458 439 7,468.40 15,120 18 72 7,468.40 7,469.40 7,	*DL1MHJ		317,220	434 311	*MØSFR		16,849	91 83				(OP: EB1EVX)
LIASHE 283,201 482 301 JHASEN 15,150 75 70 JAADAY 16,868 88 82 14,264 14,264 14,264 14,264 14,264 14,264 14,264 14,264 14,264 14,264 14,264 16,6	*OK2BZE	(00)	310,072	436 343	*7J6AA0	(0)	15,120	84 72	*VA3GUY	00	50,697	142 129
PARCHE 283,200 480 300 ***PARCHE*** 14,528 39 57 57 47 47 47 47 47 47	*US7IA		308,691 290,274		*UA9UX	(8)	15,120 15,120		*SP5DRE *JA3DAY			
Second S	*UA6HHE		283,200	480 300	*JR4ISF/3		14,528	90 64	*RV6ACC		10,864	100 97
September Sept	*JH1DYU		276,940	381 244	*IK2SGB		14,162	78 73	*PY2VM		6,018	53 51
CORDEN 283,475 543 231 JAIGNES 12,805 88 65 VIGUE 7 10 10 10 10 10 10 10	*UA9SAW	36	245,949	341 257	*CE3WYZ	(4)5	13,206	75 71	*IZ6NNH	(90)	3,240	55 54
PARAMOR	*CO6LP		236,775	503 231	*JA1GFB	5	12,805	88 65	*VK5UE	125	176	10 8
PASDBS 212,472 407 312 717 717 718	*PA9WOR		217,848	435 313	*IK6SBW	•	12,320	87 77	*EN1C		845,435	708 479
SSP910KK 204, 469 373 285 CTITEM 10,586 76 67 CTIED 283,976 341,385 CTITEM 10,586 76 67 CTIED 283,976 341,385 CTIED 383,976 CTIED	*PA3DBS	5	212,472	407 312		3	(OP: SM3TLG)		223	15	(OP: VE3MGY)
POISS 20331 350 273 VERDING 10200 61 60	*VE6SQ *SQ9NKK	100				(6)					312,180 283,976	414 308
PD73X	*DL3LSM	351			*VE20XA *JA4AQR	186	10,200		*VE3SWS	120	146.190	(OP: IZ1DGG)
SAME	*PD73X		196.196	424 308	*RA9FRD		8,556	72 69	*YC2WBF		83,611	154 121
Deptit	*JA1CPU *OK2WYK	590	189,072	323 234	*IV3XZG		7,353	57 57	*MØVWK		21,902	100 94
CT21HH	*DF9FT	(00)	184,527	336 261	*DG7RO	(6)	5,995	58 55	*VK3VTH		12,288	50 48
Company Comp	*CT2IVH		162,908	374 293	*PJ20F		5.192	45 44				(OP: EA1HEO)
SOBJAIL	*LW4EF		157,311	306 231	*IZ1QXW	•	4,914	45 42				(OP: OZ8AE)
INTERPRED 147,500	*SQ9IAU		154,178	310 254	*DL1RIO	1	3,648	50 48	*S53NW		243,837	394 297
TK4PY **144,256	*IK7WPD	(36)	147,500	308 250	*RL3AN	90	3,128	39 34			224,548 220,792	362 286
USBIKV	*7K4VPV	ů.	144,256	269 196	*HL2/KA8U		2,624	39 32	*OMØCS		213,030	366 270
**OutDots **136,754 **26 **202 **2024 **3014	*US6IKV	:	136,795	328 251	*9A4WY		1,500	24 20	*UR8IDX		552	13 12
SOBNIZB	*OH3DP	100	136,754		*JG2KFI		1,449 1,440		*VE3EDY	1.8	8,140	50 44
PSTSKM	*SQ8NZB *JA1XRH	383	132,153	249 203	*IZ8FTW *DL5FCY			22 20 23 22				
YBFSKM	*DF1LX		131,000	233 184		100.00		20 10				
HZIPS	*YB7SKM	1878	125,628	295 228	*G4JFS		931	14 14				
1017IRH			125,628 116,790 114,560	295 228 272 229 248 160	*G4JFS *DH6YMC *IW2DJN	•	931 588 578	14 14 18 17	ARAG RAS	4REM, 5	5C5W, 5Q4B,	IVV RD4CD
DILDING	*HZ1PS		125,628 116,790 114,560 114,240 109,395	295 228 272 229 248 160 253 170 205 187	*G4JFS *DH6YMC *IW2DJN *IZ8IBC	•	931 588 578 512 448	14 14 18 17 17 16 16 16	AB4G, BA5 BD4GNV, BC DB1EF, DF	4REM, 5 BJ, BE 38SWA, BUO, D	5C5W, 5Q4B, D2OB, BD2L CE2WZ, CX5 DG1BQC, DH	IYY, BD4CD, BBE, DAØHEL, 2PL, DJ2BC,
SVPCUD 94,940 237 202 103 779,833 663 435 105 102 102 103	*HZ1PS *XE1FZE *Z35F		125,628 116,790 114,560 114,240 109,395 106,020 105,408	295 228 272 229 248 160 253 170 205 187 253 180 321 244	*G4JFS *DH6YMC *IW2DJN *IZ8IBC *IW7EGJ *I3YYY		931 588 578 512 448 363 312	14 14 18 17 17 16 16 16 13 11 22 13	AB4G, BA5 BD4GNV, BC DB1EF, DF	4REM, 5 BJ, BE 38SWA, BUO, D	5C5W, 5Q4B, D2OB, BD2L CE2WZ, CX5 DG1BQC, DH	IYY, BD4CD, BBE, DAØHEL, 2PL, DJ2BC,
SVPCUD 94,940 237 202 103 779,833 663 435 105 102 102 103	*HZ1PS *XE1FZE *Z35F *IW1RHR *DL7URH	* * * * * * * * * * * * * * * * * * * *	125,628 116,790 114,560 114,240 109,395 106,020 105,408 104,607 103,716	295 228 272 229 248 160 253 170 205 187 253 180 321 244 256 197 265 201	*G4JFS *DH6YMC *IW2DJN *IZ8IBC *IW7ECJ *I3YYY *D05ALX *JK1CYF	*	931 588 578 512 448 363 312 264 252	14 14 18 17 17 16 16 16 13 11 22 13 13 12 12 12	AB4G, BA5 BD4GNV, BC DB1EF, DF DL1EKO, DL DM5DX, E7	4REM, 5 BJ, BC 38SWA, BUO, D 1VTL, C 2U, E73	5C5W, 5Q4B, D2OB, BD2L CE2WZ, CX5 IG1BQC, DH DL6ER, DL6H'	JYY, BD4CD, BE, DAØHEL, 2PL, DJ2BC, WH, DL7UGO, 77M, EA1AW,
SVPCUD 94,940 237 202 103 779,833 663 435 105 102 102 103	*HZ1PS *XE1FZE *Z35F *IW1RHR *DL7URH *VE3TU *EU3AA	* * * * * * * * * * * * * * * * * * * *	125,628 116,790 114,560 114,240 109,395 106,020 105,408 104,607 103,716 100,245 97,776	295 228 272 229 248 160 253 170 205 187 253 180 321 244 256 197 265 201 201 163 257 194	*G4JFS *DH6YMC *IW2DJN *IZ8IBC *IW7ECJ *I3YYY *D05ALX *JK1CYF *B61SQT *LU7EC		931 588 578 512 448 363 312 264 252 60 2,525,888	14 14 18 17 17 16 16 16 13 11 22 13 13 12 12 12 6 6 1383 647	AB4G, BA5 BD4GNV, BC DB1EF, DF DL1EKO, DL DM5DX, E7	4REM, 5 BJ, BC 38SWA, BUO, D 1VTL, C 2U, E73	5C5W, 5Q4B, D2OB, BD2L CE2WZ, CX5 IG1BQC, DH DL6ER, DL6H'	JYY, BD4CD, BE, DAØHEL, 2PL, DJ2BC, WH, DL7UGO, 77M, EA1AW,
PY30PP	*HZ1PS *XE1FZE *Z35F *IW1RHR *DL7URH *VE3TU *EU3AA *DLØNG	*	125,628 116,790 114,560 114,240 109,395 106,020 105,408 104,607 103,716 100,245 97,776 97,740	295 228 272 229 248 160 253 170 205 187 253 180 321 244 256 197 265 201 201 163 257 194 220 181 (OP: DK8NC)	*G4JFS *DH6YMC *IW2DJN *IZ8IBC *IW7ECJ *I3YYY *D05ALX *JK1CYF *BG1SQT *LU7EC *AY8A	28	931 588 578 512 448 363 312 264 252 60 2,525,888 1,070,913	14 14 18 17 17 16 16 16 13 11 22 13 13 12 12 12 6 6 1383 647 791 487 (OP: LU8ADX)	AB4G, BA5 BD4GNV, BC DB1EF, DF1 DL1EKO, DL DM5DX, E7: EA1EWY, EA EA2MH, EA EA4GB, EA41 EC5CYI, EC7: G3RSD, G3 GM41B, HA9	4REM, 5 BJ, BC G8SWA, BUO, D 1VTL, C 2U, E73 1FDI, EA 2WD, E 2WD, E X, EA5W AMY, EO GK HA3	6C5W, 5Q4B, 920B, BD2L 920B, BD2L 920B, BD2L 920B, SD2 920B, SD2 920B, SD2 920B, SD2 920B, SD2 920B, SD2 920B, SD2 930B,	JYY, BD4CD, BBE, DAØHEL, 2PL, DJ2BC, WH, DL7UGO, 77M, EA1AW, :A1YO, EA1YT, NO, EA4DUT, :A6XQ, EB2RA, EI7JK, EU6RO, YVU, G6ENY, :TET, I HSG7DR
PUTHF **92,316	*HZ1PS *XE1FZE *Z35F *IW1RHR *DL7URH *VE3TU *EU3AA *DLØNG *DL5GAC *SV7CUD	* * * * * * * * * * * * * * * * * * *	125,628 116,790 114,560 114,240 109,395 106,020 105,408 104,607 103,716 100,245 97,776 97,740 96,960 94,940	295 228 272 229 248 160 253 170 205 187 253 180 321 244 256 197 265 201 201 163 257 194 220 181 (OP: DK8NC) 242 192 237 202	*G4JFS *DH6YMC *IW2DJN *IZ8IBC *IW7ECJ *I3YYY *D05ALX *JK1CYF *BG1SQT *LU7EC *AY8A *LU8DCF *LU3DR	28	931 588 578 512 448 363 312 264 252 60 2,525,888 1,070,913 985,150 779,833	14 14 18 17 17 16 16 16 16 13 11 22 13 13 12 12 12 6 1383 647 791 487 (OP: LUBADX) 756 475 663 433	AB4G, BA5 BD4GNV, BC DB1EF, DF1 DL1EKO, DL DM5DX, E7: EA1EWY, EA EA2MH, EA EA4GB, EA41 EC5CYI, EC7: G3RSD, G3 GM41B, HA9	4REM, 5 BJ, BC G8SWA, BUO, D 1VTL, C 2U, E73 1FDI, EA 2WD, E 2WD, E X, EA5W AMY, EO GK HA3	6C5W, 5Q4B, 920B, BD2L 920B, BD2L 920B, BD2L 920B, SD2 920B, SD2 920B, SD2 920B, SD2 920B, SD2 920B, SD2 920B, SD2 930B,	JYY, BD4CD, BBE, DAØHEL, 2PL, DJ2BC, WH, DL7UGO, 77M, EA1AW, :A1YO, EA1YT, NO, EA4DUT, :A6XQ, EB2RA, EI7JK, EU6RO, YVU, G6ENY, :TET, I HSG7DB
NASHIN 65,392 156 134 782UQC 61,544 185 157 163 140 167 133 133	*HZ1PS *XE1FZE *Z35F *IW1RHR *DL7URH *VE3TU *EU3AA *DLØNG *DL5GAC *SV7CUD *IK8NSR *RL6LP	* * * * * * * * * * * * * * * * * * * *	125.628 116.790 114.560 114.240 109.395 106.020 105.408 104.607 103.716 100.245 97.776 97.740 96.960 94.940 93.258 93.015	295 228 272 229 248 160 253 170 205 187 253 180 321 244 256 197 265 201 201 163 257 194 220 181 (OP: DKSNC) 242 192 237 202 215 198 227 195	*GAJFS *DH6YMC *IW2DJN *IZ8IBC *IW7ECJ *I3YYY *DO5ALX *JK1CYF *BG1SQT *LU7EC *AY8A *LU8DCF *LU3DR *HQ2N	28	931 588 578 512 448 363 312 264 252 60 2,525,888 1,070,913 985,150 779,833 292,608	14 14 18 17 17 16 16 16 16 13 11 12 13 13 12 12 12 6 6 6 1383 647 791 487 (OP: LU8ADX) 756 475 663 433 521 256 OP: JA6WFM)	AB4G, BA5 BD4GNV, BG DB1EF, DF1 DL1EKO, DL DM5DX, E7: EA1EWY, EA EA2MH, EA EA4GB, EA4T EC5CY1, EC7: G3RSD, G3RSD, G3RSD, G3RSD, G2W HSØZDY, I2V UMFULL, I2V UMFULL	4REM, 5 BJ, BC 38SWA, BUO, D 1VTL, C 2U, E73 1FDI, EA 2WD, E "X, EA5W AMY, EC RWL, GK, HA3 V3IAU, RO, K9JI	5C5W, 5Q4B, D2OB, BD2U CE2WZ, CX5 G1BQC, DH DL6ER, DL6H DL6ER, DL6H DL6ER, DL6H DL6ER, DL6H DL6ER, DL6H DL6ER, DL6H DL6ER, EAS P, EA6AFM, E TDZZ, ED5D, G3VQD, G4H OU, HF1K, HI3 DAR, IR1Y, IV. IZ2SMQ, IZ4 J KB1GKN, K	JYY, BD4CD, SBE, DAØHEL, 52PL, DJ2BC, WH, DL7UGO, 77M, EA1AW, 6A1YO, EA1YT, NO. EA4DUT, 6A6XO, EB2RA, EI7JK, EU6RO, AYU, G6ENY, TIEJ, HSØZOR, 3JCC, IV3NVN, MJP, IZ8TXX, E4KY, KEYSW.
NASHIN 65,392 156 134 782UQC 61,544 185 157 163 140 167 133 133	*HZ1PS *XE1FZE *Z35F *IW1RHR *DL7URH *VE3TU *EU3AA *DLØNG *DLSGAC *SV7CUD *IK8MSR *RL6LP *PY3OPP *DU7HF	* * * * * * * * * * * * * * * * * * * *	125.628 116.790 114.560 114.240 109.395 106.020 105.408 104.607 103.716 97.776 97.770 96.960 94.940 93.258 93.015 92.364 92.316	295 228 272 229 248 160 253 170 205 187 253 180 254 256 197 265 201 201 163 257 194 220 181 (OP: DKSNC) 242 195 242 195 200 172 217 147	*GAJFS *DH6YMC *DH6YMC *IW2DJN *IZ8IBC *IW7ECJ *I3YYY *DO5ALX *JK1CYF *BG1SQT *LU7EC *AY8A *LU8DCF *LU3DR *HQZN *CE5PHI *F5LIW	28	931 588 578 512 448 363 312 264 252 269 2,525,888 1,070,913 985,150 779,833 292,608 (100,750 194,640	14 14 18 17 17 16 16 16 16 16 18 11 122 13 13 12 12 12 16 6 6 1383 647 791 487 (OP: LURADX) 756 475 663 433 521 256 OP: JA6WFM) 337 250 OP: JA6WFM) 337 250 319 240	AB4G, BA5 BD4GNV, BG DB1EF, DF1 DL1EKO, DL DM5DX, E7: EA1EWY, EA EA2MH, EA EA4GB, EA4T EC5CYI, EC7: G3RSD, G3 GM4JR, HAØ HSØZDY, IZV IWØHOU, IZV IWØHOU, IZV IWGHOU, IXV	4REM, 5 18J, BD 38SWA, BUO, D 1VTL, C 2U, E73 1FDI, EA 2WD, E 2WD, E XX, EA5W AMY, EC 16K, HA3 VIJ, 1K30 V31AU, RO, K9JU WOE, LA	5C5W, 5Q4B, 120B, BD2L CE2WZ, CXS G18QC, DH DL6ER, DL6H' IW, E74Y, E 1.3K, EA1OS, E 1.3K, E 1.	JYY, BD4CD, SBE, DAØHEL, SPL, DJ2BC, WH, DL7UGO, T7M, EA1AW, EA1YO, EA1YT, NO, EA4DUT, AGEXQ, EB2RA, EI7JK, EUGRO, AYU, GGENY, TEJ, HSØZDR, 3JCC, IV3NVN, MJP, I28TXX, LY1K, LY2KZ, LYMT, DWYT, LYSTX, LYZKZ, LYZZZ, LYZZZZ, LZZZZZZZZZZZZZZZZZZZZZ
NASHIN 65,392 156 134 782UQC 61,544 185 157 163 140 167 133 133	*HZ1PS *XE1FZE *235F *WITRHR *DL7URH *VE3TU *EU3AA *DLØNG *DL5GAC *SV7CUD *IK8MSR *RL6LP *PY3OPP *DU7HF *JA1AZR *VE3RCN	# # # # # # # # # # # # # # # # # # #	125,628 116,792 114,560 114,240 109,345 106,020 105,408 104,607 102,245 97,776 97,740 99,960 94,940 93,258 93,015 92,364 92,316 91,520 80,255	295 228 272 229 248 160 253 170 205 187 253 180 254 256 197 265 201 201 163 257 194 220 181 (OP: DKSNC) 242 192 237 202 215 198 227 195 200 172 217 147 241 143 183 152	**G4JFS** **OH6YMC **IW2DJM** **IZ8JBC **IW7ECJ **ISYTYY **OD5ALX **JK1CYF **BG1SQT **LU7EC **AY8A **LU8DCF **LU3DR **HQ2N **CESPHI **F5LIW **PU5BIA **PU1MMZ	28	931 588 578 512 448 363 312 264 42 52 60 2,525,888 1.070.913 985,150 779,833 292,608 (10 208,750 194,640 154,822	14 14 18 17 17 16 16 16 16 13 11 122 13 13 12 12 12 16 6 6 1383 647 791 487 (OP: LURADX) 756 475 663 433 521 256 OP: JAGSWEY 337 250 319 240 290 199 289 239	AB4G, BA5 BD4GNV, BG DB1EF, DF1 DL1EKO, DL DM5DX, E7: EA1EWY, EA EA2MH, EA EA4GB, EA4T EC5CYI, EC7: G3RSD, G3 GM4JR, HAØ HSØZDY, IZV IWØHOU, IZV IWØHOU, IZV IWGHOU, IXV	4REM, 5 18J, BD 38SWA, BUO, D 1VTL, C 2U, E73 1FDI, EA 2WD, E 2WD, E XX, EA5W AMY, EC 16K, HA3 VIJ, 1K30 V31AU, RO, K9JU WOE, LA	5C5W, 5Q4B, 120B, BD2L CE2WZ, CXS G18QC, DH DL6ER, DL6H' IW, E74Y, E 1.3K, EA1OS, E 1.3K, E 1.	JYY, BD4CD, SBE, DAØHEL, SPL, DJ2BC, WH, DL7UGO, T7M, EA1AW, EA1YO, EA1YT, NO, EA4DUT, AGEXQ, EB2RA, EI7JK, EUGRO, AYU, GGENY, TEJ, HSØZDR, 3JCC, IV3NVN, MJP, I28TXX, LY1K, LY2KZ, LYMT, DWYT, LYSTX, LYZKZ, LYZZZ, LYZZZZ, LZZZZZZZZZZZZZZZZZZZZZ
	*HZIPS *XE1FZE *235F *WITRHR *UTURH *VE3TU *EU3AA *DLØNG *DL5GAC *SV7CUD *IK8MSR *RL6LP *PY3OPP *DU7HF *JA1AZR *VE3RCN *CR8WW *JR380T	* * * * * * * * * * * * * * * * * * *	125,628 114,560 114,249 109,395 106,020 105,408 104,607 103,716 100,245 97,740 96,960 94,940 93,258 93,015 92,364 92,316 91,520 72,884 70,641	295 228 248 160 253 170 225 181 253 180 321 244 256 197 265 201 181 (0P-DK8NC) 242 192 237 202 215 198 227 195 200 172 217 147 241 143 143 143 173 137	**G4JFS** **OH6YMC** **IVYEDJM** **IZSIBC** **IVYEGJ** **IVYEGJ** **IVYEGJ** **JKICYF** **BG1SQT** **LU3DR** **LU3DR** **LU3DR** **LU3DR** **LU3DR** **CE5PHI** **F5LIW** **PU5BIA** **PU1MMZ** **MU9GSY** **PU2YTC**	28	931 588 578 512 448 363 312 252 680 2,525,888 1,070,913 985,150,70 194,640 154,822 150,570 146,272 79,261	14 14 14 18 17 17 16 16 16 16 16 16 13 11 122 13 13 12 12 12 12 12 12 12 12 12 12 12 12 12	AB4G, BA5 BD4GNV, B DB1EF, DFI DL1EKO, DL DM5DX, E7: EA1EWY, EA EA2MH, EA EA3GB, EA3T EC5CYI, EC7 G3RSD, G3 GM4JR, HAØ HSØZDY, IZV IWØHOU, IZV IWØHOU, IZV JG1SXP, K4F KJ4FEL, KJ6I N1WQ, N2CJ OE5FZO, OM PAØRRA, P.	4REM, 5 BJ, BE G8SWA, BUO, D 1VTL, C 2U, E73 1FDI, EA 2WD, E X, EA5W AMY, EC IRWL, GK, HA3 VIJ, IK3G VIJ,	5C5W, 5Q4B, 220B, BD2L CE2WZ, CX5 (6180C, DH DLEER, DLEH WH, E74Y, E 11JK, E410S, E 30SVQ, G 44V, E 30SVQ, G 45V, E 30SVQ, E 30SVQ	JYY, B04CD, B04CB, B05E, DAØHEL, B2PL, DJ.2BC, WH, DL.7UGO, WH, DL.7UGO, T7M, EA.1AW, EA.1AW, EA.1AW, EA.1AW, EB.7M, EB.7
	*HZIPS *XE1FZE *235F *WITRHR *UTURH *VE3TU *EU3AA *DLØNG *DLEGAC *SV7CUD *IK8MSR *RL6LP *PY3OPP *DU7HF *JA1AZR *VE3RCN *UR3BOT *IK2YSJ *JE4MHL	#	125,628 114,560 114,249 109,395 106,020 105,408 104,607 103,716 100,245 97,7740 96,960 94,940 93,258 93,015 92,364 92,316 91,520 90,256 72,884 70,641 68,378	295 228 272 229 248 160 253 170 205 187 253 180 321 244 256 197 255 201 201 163 201 163 201 220 215 198 220 215 198 227 195 200 172 227 195 200 172 217 144 143 143 183 152 173 179 188 141 213 179	"G4JFS "DH6YMC "IW2DJN "IZ8IBC "IW7ECJ "IW7ECJ "ISYYY "D05ALX "JK1CYF "BG1SQT "LU7EC "AY8A "LU8DCF "LU3DR "LU3DR "LU3DR "F5LIW "F5LIW "F5LIW "F5LIW "F5LIW "F9LISIA "PU1MMZ "MUBGSY "PU2CT "KP4JFR "7N2UQC	28	931 588 578 512 448 363 312 252 252 588 1,070,913 985,150 77,833 292,608 208,750 154,822 154,640 154,827 79,261 79,000	14 14 14 18 17 17 17 16 16 16 16 16 16 16 13 11 122 13 13 12 12 12 12 12 16 6 6 1833 647 791 187 756 475 663 433 6521 256 0P: JAGWEPN 337 250 0P: JAGWEPN 337 250 290 1939 336 224 12 18 169 202 160 185 157	AB4G, BA5 BD4GNV, B DB1EF, DFI DL1EKO, DL DM5DX, E7: EA1EWY, EA EA2MH, EA EA3GB, EA3T EC5CYI, EC7 G3RSD, G3 GM4JR, HAØ HSØZDY, IZV IWØHOU, IZV IWØHOU, IZV JG1SXP, K4F KJ4FEL, KJ6I N1WQ, N2CJ OE5FZO, OM PAØRRA, P.	4REM, 5 BJ, BE G8SWA, BUO, D 1VTL, C 2U, E73 1FDI, EA 2WD, E X, EA5W AMY, EC IRWL, GK, HA3 VIJ, IK3G VIJ,	5C5W, 5Q4B, 220B, BD2L CE2WZ, CX5 (6180C, DH DLEER, DLEH WH, E74Y, E 11JK, E410S, E 30SVQ, G 44V, E 30SVQ, G 45V, E 30SVQ, E 30SVQ	JYY, B04CD, B04CB, B05E, DAØHEL, B2PL, DJ.2BC, WH, DL.7UGO, WH, DL.7UGO, T7M, EA.1AW, EA.1AW, EA.1AW, EA.1AW, EB.7M, EB.7
DMSPKK S51.44 174 158 GP-TIZKAC SPBMLX, SPJTHOV, SPSCLU, SPSCLU, SPGMLX SPSCLU,	*HZ1PS *XE1FZE *23F *IM/1RHR *DL7URH *VE3TU *EU3AA *DL0NG *DL5GAC *SV7CUD *IKANSR *RL6LP *PY3OPP *U17HF *JA1AZR *UE3RCN *CR8WW *JR3BOT *IK2YSJ *JE4MHL *A65CA	* * * * * * * * * * * * * * * * * * *	125,628 116,790 114,560 114,240 199,395 106,020 105,408 104,607 103,716 100,245 97,740 96,960 94,940 93,215 93,015 92,364 92,316 91,520 80,256 72,884 70,641 65,378 65,392 64,904	295 228 272 229 248 160 253 170 205 187 253 180 321 244 256 197 255 201 201 163 201 163 201 163 201 172 220 181 237 202 215 198 220 172 242 198 220 172 241 143 183 152 173 137 188 141 213 179 156 134 167 133 109: RV6AJU	-G4JFS -OH6YMC -IW2DJM -IW2DJM -IZ8IBG -IW7EGJ -ISYYY -D05ALX -JK1CYF -BG1SQT -LU7EC -AY8A -LU8DCF -LU3DR -HQ2N -CE5PHI -F5LIW -PU5BIA -PU1MMZ -MUGGSY -PU2VTC -KP4JFR -7N2UGC -LU1DR -YB1UUN	28	931 588 578 5122 448 3633 312 264 4252 0 2,525,888 1,070,913 298,5150 985,150 985,150 985,150 194,640 154,822 179,261 79,261 79,000 61,544 52,780 40,000 40,000 40,000 40,000	14 14 14 18 17 17 17 16 16 16 16 16 16 16 13 11 122 13 13 12 12 12 12 12 12 12 12 12 12 12 12 12	AB4G, BA5 BD4GNV, B DB1EF, DFI DL1EKO, DL DM5DX, E7: EA1EWY, EA EA2MH, EA EA3GB, EA3T EC5CYI, EC7 G3RSD, G3 GM4JR, HAØ HSØZDY, IZV IWØHOU, IZV IWØHOU, IZV JG1SXP, K4F KJ4FEL, KJ6I N1WQ, N2CJ OE5FZO, OM PAØRRA, P.	4REM, 5 BJ, BE G8SWA, BUO, D 1VTL, C 2U, E73 1FDI, EA 2WD, E X, EA5W AMY, EC IRWL, GK, HA3 VIJ, IK3G VIJ,	5C5W, 5Q4B, 220B, BD2L CE2WZ, CX5 (6180C, DH DLEER, DLEH WH, E74Y, E 11JK, E410S, E 30SVQ, G 44V, E 30SVQ, G 45V, E 30SVQ, E 30SVQ	JYY, B04CD, B04CB, B05E, DAØHEL, B2PL, DJ.2BC, WH, DL.7UGO, WH, DL.7UGO, T7M, EA.1AW, EA.1AW, EA.1AW, EA.1AW, EB.7M, EB.7
Vezaxo	*HZIPS *XE1FZE *Z3F *IWIRHR *DL7URH *VE3TU *EU3AA *DLØNG *DL5GAC *SV7GUD *IK8MSR *RL6LP *PY30PP *DU7HF *JA1AZR *JA1AZR *VE3RCN *CN8WW *JR3BOT *KEYSJ *JE4MHL *A65CA *DL1SVA	* * * * * * * * * * * * * * * * * * *	125,628 116,790 114,560 114,240 199,395 106,020 105,408 104,807 104,807 97,740 96,960 94,940 93,258 93,015 92,316 91,520 80,256 72,884 70,641 65,392 64,904	295 228 272 229 248 160 253 170 205 187 255 187 256 197 256 197 257 267 271 287 287 287 287 287 287 287 287 287 287	-G4JFS -DH6YMC -IW2DJM -IW2DJM -IZ8IBC -IW7ECJ -IS3YYY -D05ALX -JK1CYF -BG1SQT -LU7EC -AY8A -LU8DCF -LU3DR -H02N -CE5PHI -F5LW -PU5BIA -PU1MMZ -MUBGSY -PU2WTC -KP4JFR -7N2UOC -LU1DR -RA9SF -RB6CW	288	931 588 578 578 578 3612 448 363 312 264 252 60 2,525,888 1,070,913 (985,150 779,833 292,608 (208,750) 154,822 150,570 146,272 79,261 76,000 61,544 60,002 35,444 40,002 35,444 40,002	14 14 14 18 17 17 17 16 16 16 16 16 16 16 13 11 122 13 13 12 12 12 12 12 12 12 12 12 12 12 12 12	AB4G, BA5 BD45NV, BD B1EF, DF, DL1EKO, DL DM5DX, E7 EA1EWY, EA EA2MH, EA EA4GB, EA41E EGSCYI, EC7 G3RSD, G3 GM4JR, HA0 HS0ZDV, I2V IJG1SXP, K44 KJ4FEL, KJ6I N1WO, N2CJ OKZRN, OM PAØRRA, P PYZHAM, P R R RA9AU, RAS R KAPA, RN; R R R R R R R R R R R R R R R R R R	4REM, 5 18J, BE 38SWA, BUO, D 1VTL, E 2U, E73 1FDI, EA 2WD, E 3X, EA5W AMY, EC 6RWL, GK, HA3 VIJ, IK3 VIJ, IK3 V	SCSW, 504B, 200B, BD2LC CE2WZ, CXX. GG1BOC, DH. LIGER, DL6H: WW, E74Y, E1JK, E41OS, EASBHK, E43, E70ZZ, E05D, G3VOD, G44OU, HFIK, HIZZSMO, 124, JK816KN, K38D, LA6NIA, OKTIA, OKTIONO, OVER CANALON, ENGRAPH, EASBHK, E43, E1GKN, K3BOL, LA6NIA, BN5AU, NEGMOKITA, OKTIONO, OVER CANALON, E1GKN, K3BOL, LA6NIA, E1GKN,	JYY, B04CD, B04CH, B04C
PDOME 54,908 169 148 *XEZRV 12,220 87 65 LA4SJS, LA6GK, LA9XSJ, DBSLBL, LUNKEA, LANGER, LAYSKA, LASSA, LBSLBL, LUNKEA, LASSA 51,348 145 132 "IMSECP 11,658 69 67 LISAA, LBSCD, LUSIV, LUS	*HZ1PS *XE1FZE *235F *IM/1RHR *DL7URH *VE3TU *EU3AA *DL0NG *DL5GAC *SV7CUD *IKIMNSR *RL6LP *PY3OPP *PY3OPP *UJ7HF *JA1AZR *JE3MH *A65CA *DL1SKAC *IM2NRI *IM3NR *ILST *IM3NR *IM3	* * * * * * * * * * * * * * * * * * *	125,629 116,790 114,560 114,240 109,395 106,020 105,408 104,607 103,716 97,740 96,960 93,258 93,015 92,364 92,316 80,258	295 228 272 229 248 160 253 170 205 187 255 187 255 180 321 244 256 197 255 207 201 163 257 194 220 181 (0P. DK8NDC, 242 215 198 220 172 217 147 241 143 183 152 213 177 241 143 183 151 173 137 188 141 156 134 167 133 (0P. RV6AJJ) 178 159 190 155	-G4JFS -DH6YMC -IW2DJM -IW2DJM -IZ8IBC -IW7ECJ -IS3YYY -D05ALX -JK1CYF -BG1SQT -LU7EC -AY8A -LU8DCF -LU3DR -H02N -CE5PHI -F5LW -PU5BIA -PU1MMZ -MUBGSY -PU2WTC -KP4JFR -7N2UOC -LU1DR -RA9SF -RB6CW	288	931 588 578 572 448 363 3613 3612 264 48 252 60 2,525,888 1,077,9,913 292,500 194,640 154,822 157,780 40,002 35,424 34,608 25,780	14 14 14 18 17 17 17 16 16 16 16 16 16 16 16 16 18 17 12 12 12 12 12 12 12 12 12 12 12 12 12	AB4G, BA5 BD45NV, BD B1EF, DF, DL1EKO, DL DM5DX, E7 EA1EWY, EA EA2MH, EA EA4GB, EA41E EGSCYI, EC7 G3RSD, G3 GM4JR, HA0 HS0ZDV, I2V IJG1SXP, K44 KJ4FEL, KJ6I N1WO, N2CJ OKZRN, OM PAØRRA, P PYZHAM, P R R RA9AU, RAS R KAPA, RN; R R R R R R R R R R R R R R R R R R	4REM, 5 18J, BE 38SWA, BUO, D 1VTL, E 2U, E73 1FDI, EA 2WD, E 3X, EA5W AMY, EC 6RWL, GK, HA3 VIJ, IK3 VIJ, IK3 V	SCSW, 504B, 200B, BD2LC CE2WZ, CXX. GG1BOC, DH. LIGER, DL6H: WW, E74Y, E1JK, E41OS, EASBHK, E43, E70ZZ, E05D, G3VOD, G44OU, HFIK, HIZZSMO, 124, JK816KN, K38D, LA6NIA, OKTIA, OKTIONO, OVER CANALON, ENGRAPH, EASBHK, E43, E1GKN, K3BOL, LA6NIA, BN5AU, NEGMOKITA, OKTIONO, OVER CANALON, E1GKN, K3BOL, LA6NIA, E1GKN,	JYY, B04CD, B04CH, B04C
YBBMWM	*HZ1PS *XE1FZE *235F *IM/1RHR *DL7URH *VE3TU *EU3AA *DL0NG *DL5GAC *SV7CUD *IKIRNSR *RL6LP *PY3OPP *UJ7HF *JA1AZR *JE3RGN *CR8WW *JR3BOT *IK2YSJ *JE4MHL *A65CA *DL1SVA *IJZ5RKC *IJW2NRL *JW3PKK *G4MXG *S08GUM		125,628 116,790 114,560 114,240 199,395 106,095 105,408 104,607 103,716 97,740 94,940 93,258 93,0115 92,364 61,520 82,364 61,520 82,364 61,520 82,364 61,520 82,364 61,520 82,364 83,0115 83,0115 83,0115 84,940 84,940 84,940 85,392 86,490 86,	295 228 227 229 248 160 253 170 205 187 253 180 253 180 253 180 251 187 256 197 251 187 256 197 257 198 220 181 (0P) DK8DC 215 242 192 237 202 215 198 227 195 200 172 2217 147 241 143 183 152 173 137 188 141 183 152 173 179 156 7 133 (0P: RK6ALI) 178 159 190 155 174 158 166 174 158	-G4JFS -DH6YMC -IW2DJN -IW7EGJ -IW7EGJ -IW7FGJ -ISYYY -DD5ALX -ISG1SGT -LU7EG -AY8A -LU8DCF -LU3DR -HQ2N -CE5PHI -F5LIW -PU5BIA -PU1MMZ -PU1MMZ -PU5BIA -PU5BI	288	931 588 578 578 578 578 361 2448 363 312 264 2,525,888 1,070,913 985,150 779,833 292,608 (208,750 154,850 154,822 150,570 145,272 79,261 145,272 79,261 35,444 35,630 23,328	14 14 14 18 17 17 17 16 16 16 16 16 16 16 16 16 18 17 12 12 13 13 12 12 12 12 12 12 12 12 12 12 12 12 12	AB4G, BA5 BD45NV, BU BUFF, DFI DUTEKO, DU DM5DX, E7 EATEWY, EA EAZMH, EA EAZMH, EA EAGB, EAH EGGGY, EG7 GGMSU, GG GMSU,	4REM, 5, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81	GCSW, 504B, 200B. BD2L CCSW, 504B, 200B. BD2L CCSWZ, CXS G180C. DH LLGER. DLGH! W. E74Y, E 11JK, EA1OS, E 24Y, E 11JK, EA1OS, E 24Y, E 11JK, EA1OS, E 24Y, K 25Y, E 24Y, E	JYY, B04CD, B04CB, B04C
YBBMWM	*HZ1PS *XE1FZE *Z3F *IM/I RHR *DL.7URH *VE3TU *EU3AA *DL.ØNG *DL.5GAC *SV7CUD *IK8MSR *RL6LP *PY30PP *DU7HF *JA1AZR *VE3RCN *CR8WW *JR3B0T *IK2YSJ *JE4MHL *A65CA *DL1SVA *IZ5RKC *IW2NRI *DM3PKK *G4MXG *S08GUM *VE2AXO		125,628 116,790 114,560 114,240 119,395 106,095 105,408 104,607 103,716 97,740 96,960 94,940 93,215 93,0115 92,364 91,520 84,940 93,215 84,940 94,940 93,215 84,940 85,184 86,392 86,490	295 228 228 160 272 229 248 160 253 170 205 187 253 180 253 180 253 180 254 255 197 255 198 220 181 (0P) DKNDC 242 192 237 202 215 198 227 195 200 172 2217 147 241 143 183 152 173 137 188 141 183 152 173 137 188 141 188 141 188 141 188 141 188 156 174 158 190 155 174 158 180 165 174 158 175 126	-G4JFS -DH6YMC -IW2DJN -IW7EGJ -IW7EGJ -IW7FGJ -ISYYY -DD5ALX -ISHSYY -DD5ALX -ISHSYY -DD5ALX -ISHSYY -BG1SGT -LU7EG -AY8A -LU8DCF -LU3DR -LU3DR -LU3DR -LU3DR -FLU3DR -FLU3DR -PU1MMZ -W14DR -YB1UM -YB1UM -YB1UDR -Y	288	931 588 578 578 578 578 361 2448 363 312 264 2,525,888 1,070,913 985,150 779,833 292,608 (208,750 154,850 154,822 150,570 145,272 79,261 145,272 79,261 35,444 34,600 23,544 35,444 34,600 23,544 35,444 36,600 23,500 24,544 36,600 24,6	14 14 14 18 17 17 17 16 16 16 16 16 16 16 16 16 16 18 17 12 12 12 12 12 12 12 12 12 12 12 12 12	AB4G, BA5 BD45NV, BU BUFF, DF: DU FIERO, DU DM5DX, E7 EATEWY, EA EAZMH, EA EAZMH, EA EAGB, EAH EGGGYI, E67 G3RSD, G2 G3RSD, G2 G3RSD, G3 G	4REM, 5, BJ, BB, BB, BB, BB, BB, BB, BB, BB, BB	GCSW, 504B, 200B. BD2L GCSW, 504B, 200B. BD2L GCSW, 504B, 200B. BD2L GCSW, 504B, 200B, 200	JYY, B04CD, B04C
"JAGGMC 46,728 162 118 "DC1DB 1,656 24 23 PV93AJB 43,596 144 126 "GGFPU 171 9 9 Rule Violations: Yellow Cards: EDSK, E04M, RV9CP, URSAKU, EVALUE 1820 133 123 "R9MC 21 275,688 696 502 ECSAAE - unclaimed assistance [rule IV(e)] "C11FOQ 41,374 146 137 "JABSOX 798,930 694 495 RX1CQ - excess power [rule V.A.c] "RU4SO 602,922 736 514 374 374 375 374 375 376 515 423 Red Cards: TG9ANF - unclaimed assistance and	*HZ1PS *XE1FZE *Z3F *XM1RHR *DL7URH *DL5URH *VE3TU *EU3AA *DL0NG *DL5GAC *SV7CUD *IK8MSR *RL6LP *PY30PP *DU7HF *JA1AZR *VE3RCN *CR8WW *JR38BOT *IK2YSJ *JE4MHL *A65CA *DL1SVA *IZ5RKC *UW2NRI *DM3PKK *G4MXG *S08GUM *VE2AXO *PD0ME *DK6NF		125,628 116,790 114,560 114,240 199,395 105,408 104,607 103,716 100,245 97,7740 96,960 94,940 93,258 93,015 92,364 91,520 93,916 91,520 94,940 92,316 91,520 94,940 93,215 94,940 94,940 95,256 96,256	295 228 227 2292 248 160 253 170 205 187 253 180 321 244 256 201 201 163 227 192 220 181 (0P- DK8NC) 242 192 227 195 220 172 2215 198 220 172 2217 143 183 152 173 137 241 143 187 133 (0P- RV6AJJ) 1178 159 190 155 174 158 166 134 167 146 165 134 167 146 165 134 167 147 168 134	-G4JFS -DH6YMC -IW2DJN -IW7ECJ -IZ8BC -IW7FCJ -IS7YY -DD5ALX -IS7YY -DD5ALX -IL16CF -B61SQT -LU7EC -AY8A -LU8DCF -LU3DR -LU3DR -LU3DR -LU3DR -LU3DR -LU3DR -F5LIW -	288	9311 588 578 578 578 578 578 448 363 3312 264 252 252 888 1,070,913 985,150 779,833 292,608 (208,750 194,640 154,822 179,261 78,000 61,544 20,272 33,424 34,608 23,730 23,328 16,892 12,342 12,220 11,700	144 14 18 17 17 17 16 16 16 16 13 11 22 13 13 12 12 12 12 12 13 13 12 14 15 15 16 6 6 13 19 12 15 12 15 12 15 12 15 12 15 12 15 12 15 15 15 15 15 15 15 15 15 16 3 140 12 113 13 12 12 12 18 169 202 160 185 157 163 140 122 113 133 112 124 13 134 123 137 120 124 13 134 123 137 120 124 13 134 123 137 12 124 13 134 125 137 15 15 17 76 16 86 17 76 17 76 17 76 18 77 65	AB4G, BA5 BD45NV, BU BB1EF, DF, DL1EKO, DL DM5DX, E7 EA1EWY, EA EA2MH, EA EA3MH, EA EA4GB, EA4T ECSCYI, EC7 G3RSD, G3 GM4JR, HA6 HS0ZDV, IZU IWOHOU, IW JG1SXP, K44 KJ4FEL, KJ6I M1WO, NZCJ OGSFZO, OH OKZRIN, JON PAJBRA, PA PAJBRA, PA RN, PA	4REM, 5, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8,	CSW, 504B, 200B. BD2L CCBW, 504B, 504B, 200B. BD2L CCBW, 504B, 200B.	JYY, B04CD, B04CH, B04C
"JAGGMC 46,728 162 118 "DC1DB 1,656 24 23 PV93AJB 43,596 144 126 "GGFPU 171 9 9 Rule Violations: Yellow Cards: EDSK, E04M, RV9CP, URSAKU, EVALUE 1820 133 123 "R9MC 21 275,688 696 502 ECSAAE - unclaimed assistance [rule IV(e)] "C11FOQ 41,374 146 137 "JABSOX 798,930 694 495 RX1CQ - excess power [rule V.A.c] "RU4SO 602,922 736 514 374 374 375 374 375 376 515 423 Red Cards: TG9ANF - unclaimed assistance and	*HZ1PS *XE1FZE *Z3F *XS1F *IM/1RHR *DL/JURH *DL/JURH *DL/DRG *DL/SGAC *SV7CUD *IK/8MSR *RLGLP *PY30PP *DU/7HF *JA1AZR *JE3MGL		125,628 116,790 114,560 114,240 199,395 105,408 104,607 103,716 100,245 97,740 96,940 93,215 93,015 94,940 93,215 93,015 92,364 91,520 63,278 64,904 63,282 61,845 65,144 56,144	295 228 228 160 272 229 248 160 253 170 205 187 253 180 321 244 256 197 201 181 201 162 201 181 200 172 220 181 (0P.P.DKSNC 242 192 2237 202 215 198 220 172 2217 143 183 152 200 172 2217 143 183 152 173 137 188 141 213 179 188 141 213 179 180 156 174 165 174 165 174 166 175 186 188 148 175 196 176 186 177 187 188 159 190 156 174 166 175 186 188 148 175 196 176 188 178 159 190 156 174 180 185 133 185 133 185 133 185 133 185 133	-G4JFS -DH6YMC -IW2DJN -IW7ECJ -IZ8BC -IW7FCJ -IS3YY -DD5ALX -IS4YY -DD5ALX -IL4FC -B61SQT -LU7EC -AY8A -LU8DCF -LU3DR -LU3DR -LU3DR -LU3DR -LU3DR -F5LIW -T5BIA -F5LIW -T5BIA -T10BIA -T10B	288	9311 588 578 578 572 448 363 3312 264 245 252 285,888 1,070,913 985,150 77,9,833 292,608 208,750 146,272 79,261 76,000 61,672 79,261 78,000 23,328 6,892 23,328 16,892 17,700 21,658 8,848	14 14 14 18 17 17 17 16 16 16 16 16 16 16 16 16 16 16 16 17 12 12 12 12 12 12 12 12 12 12 12 12 12	AB4G, BA5 BD45NV, BU BB1EF, DF, DL1EKO, DL DM5DX, E7 EA1EWY, EA EA2MH, EA EA3MH, EA EA4GB, EA4T ECSCYI, EC7 G3RSD, G3 GM4JR, HA6 HS0ZDV, IZU IWOHOU, IW JG1SXP, K44 KJ4FEL, KJ6I M1WO, NZCJ OGSFZO, OH OKZRIN, JON PAJBRA, PA PAJBRA, PA RN, PA	4REM, 5, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8,	CSW, 504B, 200B. BD2L CCBW, 504B, 504B, 200B. BD2L CCBW, 504B, 200B.	JYY, B04CD, B04CH, B04C
*IKZİKW 42,742 158 142 *PÜZLED 11 10 9 Yellow Cards: EDSK, EO4M, RV9CP, URSAKU. *RXBDJ 41,820 133 123 *R9MC 21 925,688 696 502 ECARTE — unclaimed assistance [rule IV(e)] ******CTIFFIO 41,374 146 137 *IJABSOX *788,930 694 495 *KTCG — excess power [rule V.Ac.] *****DLBZAJ 41,340 157 130 *602,922 736 514 *****UASD 41,328 164 414 *EE18 387,045 512 423 Red Cards: TG9ANF — unclaimed assistance and	*HZ1PS *XE1FZE *Z3F *XM1RHR *DL7URH *VE3TU *VE3AA *DL0NG *DL5GAC *SV7CUD *IK8MSR *RL6LP *PY30PP *PY30PP *JA1AZR *JE3MR *JE3RCN *CR8WW *JR38BOT *IK2YSJ *JE4MHL *A65CA *DL1SVA *DL1SVA *DL9NG *DL9NG *IW2NRI *DM3PKK *G4NXG *S08GUM *VE2AXO *PD0ME *DK6NF *RX0SA *Y80MWW *HA5UA *JF20ZH		125,628 116,790 114,560 114,240 199,392 105,408 104,607 103,716 100,245 97,740 96,940 93,215 93,015 93,015 93,015 93,016 91,520 84,940 93,215 93,016 91,520 86,378	295 228 227 229 248 160 253 170 205 187 253 180 321 244 256 197 201 181 201 182 201 181 201 182 201 181 201 181 211 220 181 220 181 220 181 220 181 220 181 220 181 220 181 220 181 220 181 221 192 220 17 242 192 227 195 200 172 221 198 227 195 200 172 221 198 227 195 200 172 217 147 241 143 183 152 173 137 188 141 213 179 188 141 213 179 180 152 174 156 134 167 140 165 134 167 140 165 134 167 140 165 134 167 140 165 134 167 139 114 153 131 1153 131 1153 131	-G4JFS -OH6YMC -IW2DJN -IW2DJN -IZ8IBC -IW7ECJ	288	931 588 578 572 448 363 3613 3612 264 252 60 2.525,888 1,070,918 985,150 779,833 225,260 208,750 194,642 154,822 176,004 154,827 179,261 78,261 78,273 40,002 33,424 34,608 25,730 22,342 21,342 21,242 21,242 11,700 11,658 8,848 6,188	14 14 14 18 17 17 17 16 16 16 16 16 16 16 16 16 16 16 16 17 12 12 12 12 12 12 12 12 12 12 12 12 12	AB4G, BA5 BD45NV, BU BB1EF, DF, DL1EKO, DL DM5DX, E7 EA1EWY, EA EA2MH, EA EA3MH, EA EA4GB, EA4T ECSCYI, EC7 G3RSD, G3 GM4JR, HA6 HS0ZDV, IZU IWOHOU, IW JG1SXP, K44 KJ4FEL, KJ6I M1WO, NZCJ OGSFZO, OH OKZRIN, JON PAJBRA, PA PAJBRA, PA RN, PA	4REM, 5, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8,	CSW, 504B, 200B. BD2L CCBW, 504B, 504B, 200B. BD2L CCBW, 504B, 200B.	JYY, B04CD, B04CH, B04C
DL8ZAJ 41,340 157 130 *RU4SO 602,922 736 514 ** UA5D 41,328 164 144 *EE1B 87,045 512 423 Red Cards: TG9ANF - unclaimed assistance and	*HZ1PS *XE1FZE *Z3F *XE1FZE *Z3F *IM/IRHR *DL/JURH *VE3TU *EU3AA *DLONG *DLSGAC *SV7CUD *IK8MSR *RL6LP *PY30PP *PY30PP *JA1AZR *JE3MFA *JE3MFA *JE3FKC *IW2NRI *JE4WHL *A65CA *DL1SVA *DLONG *IK2YSJ *JE4WHL *A65CA *DL1SVA *DM3PKK *G4NXG *IW2NRI *IW3NRI *IW		125,628 116,790 114,560 114,240 199,392 105,408 104,607 103,716 100,245 97,740 96,940 93,215 93,016 91,520 80,316 91,520 80,316 91,520 80,316 91,520 80,316 91,520 80,316 91,520 80,316 91,520 80,316 91,520 81,520	295 228 228 160 272 229 248 160 253 170 205 187 253 180 321 244 256 197 205 181 201 182 201 181 201 182 201 181 201 181 217 227 192 227 195 220 172 227 195 200 172 2215 198 227 195 200 172 2217 143 183 152 207 195 200 172 217 147 241 143 167 188 141 213 179 156 134 167 133 (OP: RV6AI) 165 134 167 140 165 134 167 180 165 134 167 180 168 138 175 132 175 132 175 135 131 175 136 175	-G4JFS -DH6YMC -IW2DJN -IW3EDJ -IZ8IBC -IW7ECJ -ISYYY -DD5ALX -ISYYY -DD5ALX -ISYYY -DD5ALX -ISYYY -DD5ALX -ILU7EC -AY8A -LU8DCF -LU3DR -H02N -CE5PHI -F5LIW -PU5BIA -PU1MMZ -PU1MMZ -PU1MMZ -PU1MMZ -YB1UUN -	28	9311 588 578 578 572 448 363 3112 2448 363 3612 252 252 888 1.070.913 985.150 779.833 292.608 208.750 144,640 154,822 179.261 76.000 61.544 52.780 40.002 35.424 434.608 25,730 23.328 16.892 12.342 12.220 11.658 8.848 6.188 4.879 1.656	144 14 18 17 17 17 16 16 16 16 13 11 22 13 31 12 12 12 12 12 16 6 6 1383 647 791 487 709: LUBADX) 756 475 663 433 356 224 289 299 199 336 224 289 218 169 202 160 185 157 163 140 122 113 134 123 133 112 124 83 (01) 96 86 87 65 55 52 41 41 (0P; DISFS) 56 55 52 41 41 (0P; DISFS) 54 14 11 (0P; DISFS) 54 24 54 34	AB4G, BA5 BD4GNV, BU BB1EF, DF: DU1EKO, DL DM5DX, E7: EATEWY, EA EAZMH, EA EAZMH, EA EAGB, EAH ECSCYI, EC7 GGM4JR, HAB HS0ZDY, EC7 GGM4JR, HAB HS0ZDY, EC7 GGM4JR, HAB HS0ZDY, EC7 GGM4JR, HAB HS0ZDY, EC7 GM4JR, HAB HS0ZDY, EC7 GM4JR, HAB HS0ZDY, EC7 GM4JR, HAB HS0ZDY, EC7 GM4JR, HAB HS0ZDY, EC7 HS0ZDY, EC7 GM4JR, PA HS0ZDY, EC7 H	4REM, 5. 4REM,	CSW, 504B, 200B. BD2L CCBW, 504B, 504B, 200B. BD2L CCBW, 504B, 200B.	JYY, B04CD, B04CH, B04C
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102EUG 40,000 100 100 1 (UP: EATES) excess power (nites IV(e), V.A(c))	*HZ1PS *XE1FZE *Z3F *XS1FZE *Z3F *IM/IRHR *DL/JURH *VE3TU *EU3AA *DLONG *DLSGAC *SV7CUD *IK8MSR *RL6LP *PY30PP *PY30PP *JA1AZR *VE3RCN *CR8WW *JR38D1 *IK2YSJ *JE4MHL *A65CA *DL1SVA *DL1SVA *DL1SVA *DL1SVA *DL1SVA *DL1SVA *DM3PKK *GANXG *S08GUM *VE2AXO *PDM8PKK *GANXG *S08GUM *VE2AXO *PDM8PKK *GANXG *S08GUM *VE2AXO *PDM8PKK *GANXG *JA6GMC *PY3AJB *IK2IKWW *RX9DJ *IK2IKWW *RX9DJ *CT1F0O		125,628 116,790 114,560 114,240 199,392 105,408 104,607 103,716 100,245 97,740 96,940 93,215 93,016 91,520 80,316 91,520 80,316 91,520 80,316 91,520 80,316 91,520 80,316 91,520 80,316 91,520 80,316 91,520 80,316 91,520 80,316 81,316	295 228 228 160 272 229 248 160 253 170 205 187 253 180 321 244 256 197 201 180 201 160 201 160 201 160 217 227 198 220 181 220 181 220 181 237 202 215 198 220 172 227 195 200 172 2217 143 183 152 207 185 180 162 173 137 188 141 213 179 185 159 160 162 173 174 156 134 167 133 (0P: RV6AI) 165 134 167 130 168 130 169 1	-G4JFS -OH6YMC -IW2DJM -IW2DJM -IZ8IBG -IW7EGJ -ISYYY -IZ8IBG -IW7EGJ -ISYYY -IZ9IBG -IW7EGJ -ISYYY -ISYYY -ISYYY -ISYYY -ISYYY -ISBGSOT -LU7EC -AY8A -LU8DCF -LU3DR -IU3DR -IU3DR -IU3DR -IU3DR -IU3DR -IU4DR -IU5DR -IU4DR -IU5DR -IU5D	288	9311 588 578 578 572 448 3633 312 2444 2552 985,1573 985,1573 292,688 1,077,913 985,158 1,077,913 194,640 154,822 157,80 154,827 179,261 176,000 61,544 52,780 49,002 35,424 34,508 25,730 23,328 16,892 11,700 11,656 171 1,656 172 1,656 173 1,656 1	144 14 18 177 17 16 16 16 16 13 11 22 13 12 12 12 12 13 12 17 16 18 17 76 18 17 76 19 18 18 17 19 18 18 17 19 18 18 17 19 18 18 18 19 19 18 18 18 18 18 18 18 18 18 18 18 18 18	AB4G, BA5 BD4GNV, BU BB1EF, DF: DL1EKO, DL DM5DX, E7 EA1EWY, EA EA2MH, EA EA4BM, EAH EGG6VI, E67 GGRSD, GG GG GGRSD, GG	4REM. 5. 4REM. 6. 4REM.	GCSW, 504B, 200B BD2L CCSW, 504B, 200B,	JYY, B04CD, B04C
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DX BOOKS: "Up Two – Adventures of a DXpeditioner," "Contesting in Africa," Micro-DXpeditioning Uncovered," "DX Delights – Tales of Travels with my Radio." All informative and fun! Signed by the author, Roger Western, G3SXW. Details: <g3sxw@btinternet.com>, \$20 each including postage. PayPal or cash to G3SXW.

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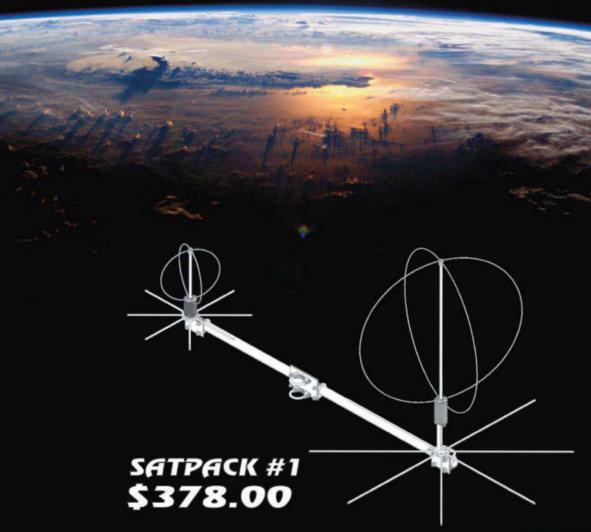
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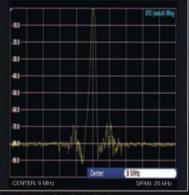
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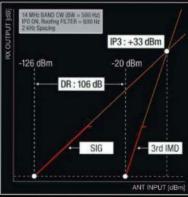
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