



ARRL 10 Meter Contest 2017 Results

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"That was painful" – by many participants

The 45th Annual ARRL 10 Meter Contest was held on December 9th and 10th, 2017. As commented on by everyone who participated, yes, conditions were terrible. Total logs submitted dropped 30% from 2016 to 1,793. Total reported QSOs dropped 65% from 2016 to 98,094. To put this in perspective in 2014, nearest this solar cycle's peak, over 2 million QSOs were reported. So QSO activity in 2017 was 95% below the best year of this solar cycle. During the 2014 contest there were several hours where reported QSOs were close to the total reported during the entire 2017 contest! Average QSOs per log submitted were just 55 versus 366 in 2014. Top category scores averaged just 24% of the scores in 2016.

The highest number of states worked was 43 by PT3T. The top number from North America was 42 by KTØK. Many Caribbean stations were completely shut out from working the US and Canada. Only three European stations reported working any states with CT7ACG coming in tops with five. Somewhat better, 12 stations in Japan managed to work stateside but they all just managed to work a single state. And that state was...Hawaii!

So, all in all, a pretty slow year. But, enough of this depressing reporting. In any contest there are always fun and interesting stories and positive perspectives to be had. The fact is operators around the world got on the air and made contacts, spending time participating in one of their favorite hobbies, amateur radio contesting.

All of the Top Ten, Winners, and Leader tables can be found at the end of the writeup.

The Big Story

The big story of 2017 was the wide ranging and long lived E-skip opening that occurred in North America right at the start of the contest. Operators who were in front of their radios at the opening bell had a fun filled few hours. As several commented afterwards:

- Several very weak 0's and 7's later Fri expanded into a full-tilt Es opening, which really saved the contest. Much later the Es path bended to the south, and I worked a very strong K7JA and NX6T (Chip and Dennis) before the band shut down - Bill, N6ZFO*

- I'm sure I'm repeating what others have said... if you didn't start the contest, you missed all the fun in the first 4+ hours – Max, NG7M*

- I was very pleased to catch the sporadic E openings on Friday night. It resulted in 27 states – Lee, KY7M*

Friday Night QSOs in North America Maps Courtesy of DXMAPS.COM

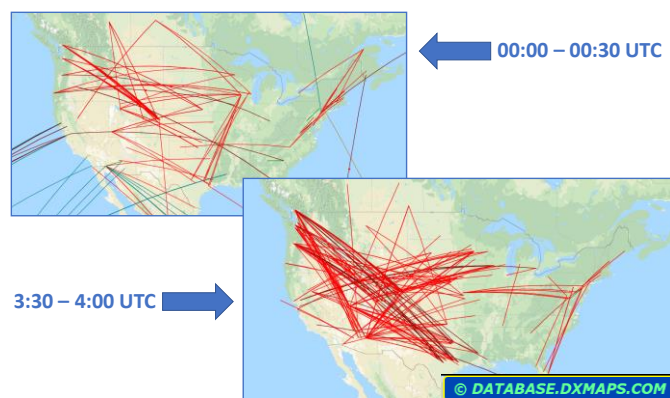


Figure 1 - Friday Night E-skip opening. (Maps courtesy of DXMAPS.COM)

For more information on E-skip openings during the 10 Meter Contest see the online results article for the [2016 ARRL 10 Meter Contest](#). Because of this opening, the first hour of the contest had the highest reported number of QSOs for the whole weekend and the second hour was the third highest. In the years I have been writing about this contest there has been nothing like this.

In total, 20% of the total QSOs made the whole weekend were made during those first four hours. Typically, in a high sunspot year, this percentage is closer to 4%. As a personal example from my Oregon multioperator participation, after that opening burst of QSOs we were able to scratch out just three more QSOs the entire rest of the weekend!

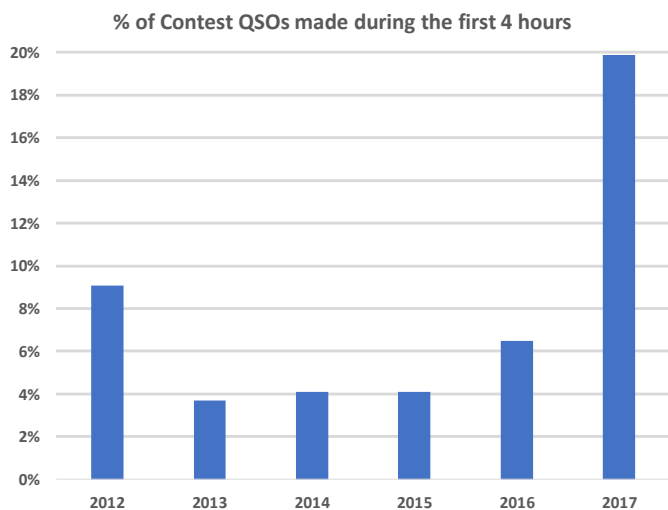


Figure 2 - The contest got off to a fast start in the first 4 hours.

2017 should be a good lesson for all. Drawing upon two classic proverbs — “The early bird gets the worm” and “He who hesitates is lost” — during a 10 Meter Contest in low sunspot years you must be ready for openings whenever they come. Of the 971 US stations that submitted logs 420 (43%) reported making a QSO during the first hour of the contest. Apparently, the word got around that the bands was open because by the end of the first four hours a total of 614 stations (63%) had reported making at least one QSO. That seems like a pretty healthy activity level and awareness by everyone of band conditions. Around 200 US stations who did not make a QSO during the first hour jumped on the air during the next three hours.

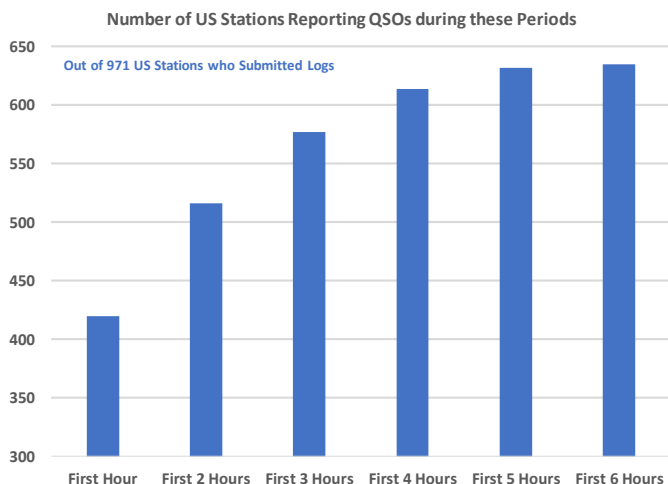


Figure 3 - As the word of the opening got around more stations got on the air.

Certainly, don't be like this guy, who will remain anonymous, lamenting in his comments, “Had it in my head that this was one of those 30 hour contests starting around noon on Saturday, so missed the big opening

Friday evening. Watched a couple of movies on Netflix. Got around to checking the rules Saturday morning while setting up N1MM+ and realized my big mistake.”

Remember even with poor conditions it is possible to make great QSOs. K5VIP completed his 10 meter Worked All States quest by catching a station in Delaware. And, it's still possible to get together and have fun with your friends as evidenced by these photos. After all, in low sunspot years you don't get distracted as much by the need to log QSOs!



Figure 4 - Here are contest founders Larry, WØPAN (left), and Bob, K8IA (right) enjoying a post contest chat. 2017 marked the 44th anniversary of the contest, which began in 1973. Per the sign in the window, yes 10 meters was open in 2017! (Photo from Bob, K8IA)



Figure 5 - The team at AA1JD. From left to right: Hugh, NC1M; Matt, AA1JD; and Bruce, AA1LH. This team placed 2nd in North America and 5th place Worldwide in the ever competitive Multioperator, Single Transmitter, High Power category. (Photo from Matt, AA1JD)

Another bright spot during 2017 was for contesters in Europe. During 2016 they had miserable conditions and on Sunday the band never really opened for anyone. Better

conditions were present in 2017 and the total reported QSOs from stations in Europe doubled from 2016. Both Saturday and Sunday mornings had periods of reasonable openings. Sunday afternoon from 1500 to 1800 UTC proved to be the best period of the contest for them. In his summary, Oliver, DH8BQA, had the rarest of all observations: “Much better than last year!”

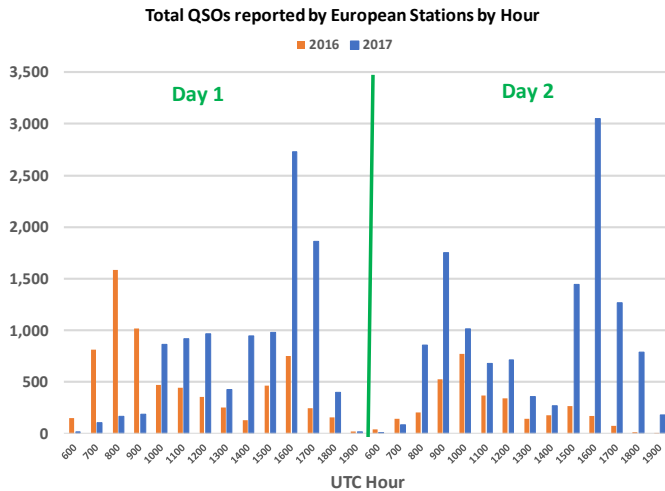


Figure 6 - Improved conditions in Europe over 2016 was a bright spot.

Reading through the Soapbox comments I always find great stories about what operators did during the contest when they weren't on the radio. After all a fun contest weekend does not necessarily involve being in front of the radio the whole time.

- *Had more fun snow blowing the driveway on Sunday — Mike, VE9AA*
- *I did get to do substantial long overdue clean-up and organization in the garage-shack! — Peter, N6ZE*
- *Flew a drone for a while. Shot some boring video. Ate well. Speechless! — Bob, NX5M*
- *I did get a few shelves re-arranged, a few drawers straightened and the floor vacuumed — Edward, KN4Y*
- *Lots of shack stuff was completed — Fred, K4IU*
- *Did manage to get my Christmas Cards all written and ready to go to the post office, so all was not lost — Tom, KB8UUZ*
- *Threw in the towel and went out with the kids and cut some nice Christmas trees — Todd, KH2TJ/W7TR*
- *During the contest, I finished a book by John McPhee, read a full short story by Ben Rehder, before starting a third book — Richard, K5NA*

New All-Time Records

In a year like 2017, being able to set a new all-time record is a tough challenge. In fact, no new World, W-VE-XE, or DX records were set. One lone W Division record was set when KI9A made the first ever entry from the Central Division in the SOU-CW-QRP category. You have to give Chuck credit for operating QRP in a year with minimal propagation! In fact, 36 of the 42 US-VE-XE Section and DX Entity new records were set by operators submitting the first-ever entry in that category.

The following operators need to be recognized for managing to get on the air and actually beating an existing record:

W1QK setting a new record in CT for SOU-CW-LP with a score of 22,320, beating the old record of 20,976 set by K1IU in 2015

KD2RD setting a new record in NLI for SOU-MIX-HP with a score of 2,794, beating the old record of 2,346 set by W3EH in 2014.

HA3HX setting a new record in HA for SOU-CW-QRP with a score of 3,780, beating his old record of 60 set in 2016.

ON9CC operating as OT6M set a new record in ON for SOU-MIX-LP with a score of 18,180, beating the old record of 4,814 set by ON6FC in 2015.

4F3OM setting a new record in DU for SOU-CW-LP with a score of 2,772, beating the old record of 1,500 set by 4F3BZ in 2016.

VK2NSS setting a new record in VK for SOU-PH-LP with a score of 4,080, beating the old record of 952 set by VK2KDP in 2015.

ARRL Affiliated Club Competition

Club competition continues to be a popular and fun aspect of this contest. Operators get a chance to be part of a team while still operating from their home station. For many of us it is motivating to get on the air to make some points for our club or to compete for honors against rival club members. Many operators mention in their Soapbox something similar to: "Wanted to get on the air to make some points for our club." Just a way to create some fun on an otherwise dismal December weekend for 10 meter operation.

In 2017 a total of 506 operators submitted logs that were also credited towards ARRL Affiliated Club Competition. This means about 50% of the W/VE operators were part of one of the 35 different clubs that participated. Given the conditions this year club organizers were key in

motivating folks to get on the air. Way to go club organizers!

In the Local Category the Hampden County Radio Association (HCRA) took top honors among the five clubs in this category. With their win they dethroned the Central Virginia Contest Club who had won this category in five of the previous six years! HCRA's six entrants combined for a bit more than 60,000 points. Though well down from the 750,000 points it took to win this category in 2016, it was enough for a solid victory. Their success formula this year? Member turnout. They had as many submitted scores as any other Local category club.

Affiliated Club Competition

<i>Club</i>	<i>Score</i>	<i>Entries</i>
Unlimited		
Potomac Valley Radio Club	503,252	71
Minnesota Wireless Assn	367,286	55
Medium		
Yankee Clipper Contest Club	518,024	43
Frankford Radio Club	394,334	33
Arizona Outlaws Contest Club	351,148	29
Florida Contest Group	274,070	38
Society of Midwest Contesters	242,934	45
Northern California Contest Club	219,538	24
Central Texas DX and Contest Club	151,620	7
Texas DX Society	70,712	7
Northeast Maryland Amateur Radio Contest Society	35,558	8
Alabama Contest Group	33,504	6
Mad River Radio Club	32,356	9
Contest Club Ontario	31,968	14
Hudson Valley Contesters and DXers	28,754	8
South East Contest Club	21,892	6
Kentucky Contest Group	21,232	4
Western Washington DX Club	20,664	6
Mother Lode DX/Contest Club	16,098	12
Southern California Contest Club	15,860	15
Sussex County ARC	11,504	3
Contoocook Valley Radio Club	9,110	3
DFW Contest Group	6,812	7
Maritime Contest Club	5,418	3
Big Sky Contesters	4,514	3
Rochester (NY) DX Assn	4,398	6
Tennessee Contest Group	3,974	6
Order of Boiled Owls of New York	2,816	3
Willamette Valley DX Club	2,132	3
Six Meter Club of Chicago	1,332	5
Local		
Hampden County Radio Association	60,282	6
Kansas City Contest Club	36,408	3
Niagara Frontier Radiosport	25,552	5
Bristol (TN) ARC	2,658	4
Sunday Creek Amateur Radio Federation	1,896	6

* A minimum of (3) logs must be submitted by eligible club members for a club to be recognized in the Club Completion results.

* Clubs not listed above need to confirm they have filed an Eligibility List before the event. (See the [ARRL Contest Club Tools](#) web page for more information)

In the popular and always competitive Medium category, 28 clubs fought it out. In the end, the 43 members of the Yankee Clipper Contest Club (YCCC) came out on top by a healthy margin over second place and regional rival Frankford Radio Club. YCCC's success formula? Participation. They had the second most entrants of any Medium club. This allowed them to finish ahead of other clubs who had much higher average scores per member. In fact, their average score per member was only 3rd among all Medium clubs. The Central Texas DX and Contest Club almost doubled YCCC's score per member, but they only had seven members submit scores.

In the Unlimited category only two clubs fought it out in 2017. Congratulations to the 71 members of the Potomac Valley Radio Club (PVRC) who came out on top by a comfortable margin over the Minnesota Wireless Association. They once again found themselves in their usual first place position after being dethroned in 2015 by the Yankee Clipper Contest Club. This means the PVRC has now won the Unlimited category five of the last six years. PVRC's success formula for 2017 was — this should be no surprise by now — member turnout. They had just as many members submit scores in 2017 as 2016 which is a testament to their organization and motivation. There are not many clubs that can pull that off.

Congratulations to all the clubs and their organizers!

Predictions for 2018

The 46th annual ARRL 10 Meter Contest will be held on December 8th and 9th, 2018. What might we expect this year? Well, it's pretty much the same as we experienced in 2017. We are at the bottom of the solar cycle and solar radio flux is pretty much as low as it can get. For the 10 Meter Contest, flux is everything. A lot of it generates good propagation. Not enough of it deprives us. During the 2017 contest Solar Radio flux was in the 70-72 range. Which is really low. Almost as low as it can get. Depending on who you talk to, the minimum solar flux index (SFI) is in the 64 to 67 range. So, in 2017 we just about hit bottom. And, unfortunately, the forecast for the 2018 contest is for the flux to decline more. Something in the range of 68 is forecasted. At this level though, from what you will experience on the bands, it should be the same as 2017.

Remember, though, even without high flux there was fun to be had by being in the right place at the right time and using your creativity and knowledge of propagation and operating modes. The contest started with a long period of sporadic E ionization covering much of the United States. Experienced 10 meter operators caught that opening and had some real fun. Europe also had better propagation in 2017 than in 2016.

Bill, N6ZFO said it perfectly with his Soapbox comments after the 2017 contest: *“Concept of blending meteor scatter, Es, ground wave and F propagation made this contest challenging and actually rather enjoyable”*

F10.7cm Radio Flux Progression

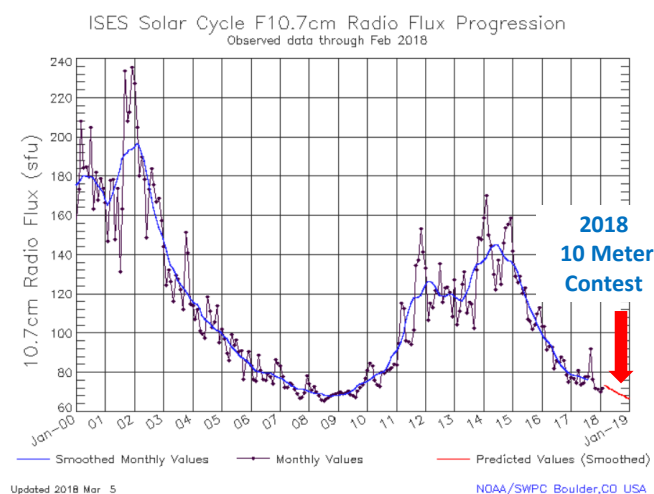


Figure 7 - Solar Radio Flux forecast (Chart courtesy of NOAA/SWPC)

My prediction is that these same opportunities will exist during 2018. You will have to work for your QSOs though just as in 2017. Let me repeat my advice from past year's articles about successful operating strategies for the ARRL 10 Meter contest. The strategies are:

First, an ability to operate CW will become more important for Mixed Mode entries or those Single-Ops interested in maximum QSO counts. CW is a much more effective emission mode in times of marginal propagation. In 2017, 76% of the reported QSOs were made on CW.

Then, searching out other propagation modes than traditional F2-layer ionosphere refraction will be key for those seeking top scores, meeting your personal goals, or just having fun. For instance: backscatter, meteor scatter, transequatorial (TE) and sporadic E ionization will become more important. If you are not familiar with these the ARRL Bookstore has several books which can help you out.

Having the patience and conviction to find path openings that may exist for only minutes over the whole weekend rather than hours on end. Meteor scatter is ethereal in nature with the path open for just a few seconds. It is best around your local dawn — though it could happen any time in the day. Sporadic E often occurs in the early evening hours just when you think you might as well walk away from the radio and the 10 meter band. "It's shut down for good!" may be your thinking. Well — not always. Regular F2 openings will be short, sometimes really short.

As Jim, AD1C, mentioned in his 2015 soapbox: "I heard JM7OLW for about 30 seconds on Sunday." That was the extent of his opening from Colorado to Japan. Or as Steve, K6SCA, put it: "Many times the band would open for a minute or so, then just totally fade away. You never knew where your next contact would come from."

It may also be tempting in these years to just say "I will just watch the spotting network and let others tell me when the band is open." This might work if you are a CW op and you live near, or have your own, [CW Skimmer](#) running. (CW Skimmer is a software package that uses an SDR to automatically log and report CW signals to the [Reverse Beacon Net](#) for distribution via the worldwide spotting networks. A "skimmer" is a complete package of receiver and software that runs continuously — Ed.) Remember 10 meter openings can be very localized and the band might be open for you and not a faraway skimmer.

My past studies have shown that skimmers often will not start producing spots until well after the band is actually open. For that study, see the "Expanded Results" article for the [2013 ARRL 10 Meter Contest](#). The reason being is skimmers typically have lower gain antennas than many contest stations, especially on 10 meters where beams of all size are more common.

My recommendation is commit yourself to actual seat time using that big knob on the front of the radio to tune the band yourself to see what you can hear. If you don't hear anything, fine, get up and walk away — but not for too long! Come back in 15 minutes, or 30 minutes, and check again. In 2016, Robin, K1RCT, applied this strategy well. As he described his operating strategy being made of: "2 hours of 'Oh, I have ten minutes, ok sit down and operate...' time." Your best technology assist might come from a band scope or panadapter in your station that gives you a visual indication of your band activity. By doing it this way at some point you will catch a band opening and have some fun. Also remember if everyone just listened all the time, no one would know if the band is open. So, even if you encounter a seemingly dead band, try calling CQ for a while. The key to a successful operating strategy in 2018 will be more to catch the band opening than to work it.

Additional Analysis and Insights

In the six prior years I have written about the ARRL 10 Meter Contest, each year I have provided additional in-depth analysis beyond the results and people. The intent is to provide insight into contest strategy and planning, how the 10 meter band behaves, or just something to satisfy my, and hopefully your, curiosity. In past years I examined the following topics. These articles can be found on the

ARRL website in the [10 Meter Contest Expanded Results articles](#).

2011

- A Skimmer View of the Contest -- looking at Europe, Asia, and South America openings
- Skimmer Spots Counts as a way to Predict Scores?
- Phone versus CW Mix -- A magic formula?
- A Bit of Contest History

2012

- A Skimmer View of the Contest -- looking at the North America to Europe Opening as well as some perspectives on skimmer spot quality and usage.
- Contest Planning Insights -- characterizing the locations and activity levels in the US by state.

2013

- A look into the North America to Europe opening
- Contest logging program usage

2014

- Breakthrough animated movies of propagation from the US to major contest areas.
- A look at late evening activity in the US and its impact on three close races
- A updated look at contest logging program usage
- New world records established in 2014
- So how many stations really were on the air and how many QSOs were made?

2015

- An updated look at contest logging program usage
- New world records established in 2015
- Total contest activity – how many stations were on the air and how many QSOs did they make?
- Investigating propagation differences in the US between 2014 and 2015

2016

- A very deep dive into 10 meter propagation and how both E-skip and F2 propagation played roles during the contest with visual QSO “movies” to demonstrate.
- An update on entry category usage three years into the Unlimited Category era.
- Updated World, W/VE/XE, and DX records. (News flash for 2017! There were no changes in these.)
- My annual update on logging program usage.

Contest Logging Software – An Update

This year I will once again provide an update on logging program usage. Then I am going to take a very deep dive into Log Check Reports and what we can all learn from them to be better operators.

As I have done in past years, I looked at what logging programs were being used for the ARRL 10 Meter Contest. With access to Cabrillo log files it is easy to investigate. One of the standard Cabrillo tags is

"CREATED-BY:" which is followed by the name of the logging program. A simple Python program looks through all the logs tallying the programs everyone used.

For the 2017 ARRL 10 Meter Contest logging program usage looked like this:

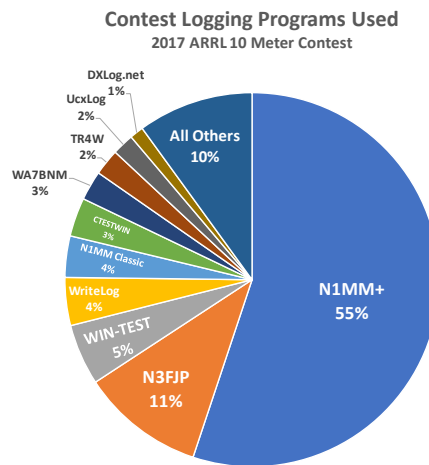


Figure 8 - Logging programs used during the 2017 ARRL 10 Meter Contest.

There are a few programs on this list I am not familiar with. The ARRL 10 Meter Contest is a worldwide event and there are several countries that have a logging program that is popular just in their country or region. For example, *CTESTWIN* is popular in Japan and *UcxLog* and *DXLog.net* are popular in Central and Eastern Europe. There are also a substantial number of operators who still log by hand and then use the [WA7BNM Cabrillo Web Form](#) to create their log file.

In 2017 there were more than 50 different logging programs in use. Overall though, the *N1MM* family is used by far more contesters than any other logging program. It is used by more than five times as many contesters as the second most popular logging program, *N3FJP*. Looking into the *N1MM* family itself you can see the migration to *N1MM+* marching along. 2017 represented the fourth running of the ARRL 10 Meter Contest since *N1MM+* was launched in August 2014. In 2017 94% of *N1MM* users were using *N1MM+* versus 53% in 2014.

The *N1MM+* functionality that encourages/forces you to use the latest version seems to be effective as well as almost 75% of *N1MM+* logs were created by the latest version at the time of the contest. Whereas among the *N1MM Classic* users there were more than 30 different versions in use stretching across 7 different major releases.

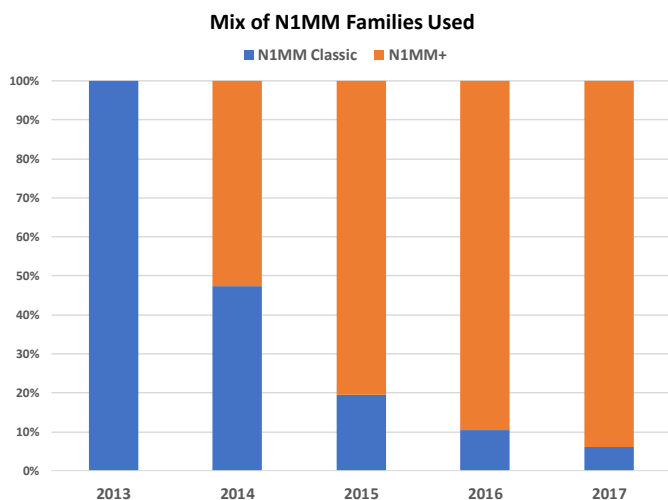


Figure 9 - Mix of N1MM types in use during the ARRL 10 Meter Contest.

To observe longer term trends in program usage I compared the logging programs used in 2017 to those used in 2013. Among the Top 10 programs, the *N1MM* family is the only one to show significant growth. *N1MM* family usage has increased from 45.4% of logs in 2013 to 58.6% of logs in 2017. Both *Win-Test* and *TR4W* usage have declined over the same period by 2.1% and 2.8% respectively. *WriteLog* usage has also decreased by 1.6%. The overall story is really one about continued consolidation around one major logging platform – *N1MM+*.

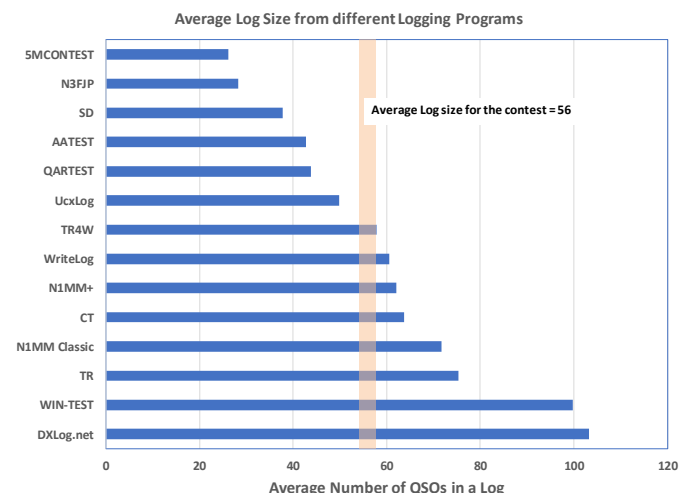


Figure 11 - Average log sizes by popular logging programs during the 2017 ARRL 10 Meter Contest.

DXLog.net and *Win-Test* users have the largest average log size. Almost twice the average log. *CT* and *TRLog* also have logs larger than average. For these two “oldie but goodie” loggers there must be some die-hard users among a few serious contesters. *WriteLog* and *N1MM* all have pretty much the same log size. Just a little above average. Also interesting is that *N3FJP*, which is the second most popular program, has relatively small logs at less than half the average log size. It would thus seem to appeal to more casual and beginning contesters. (*N3FJP*’s simplicity and low cost make it an excellent logging program to try if you’re just getting started – Ed.)

Exploring Log Check Reports

In the January 10th, 2018 issue of the ARRL’s [Contest Update](#), the editor, Brian, N9ADG suggested to the contest community that there were many untapped opportunities in analyzing Log Check Reports (LCR). As a refresher, a Log Check Report is prepared for each operator that submits a log in many of the larger contests. Specialized and highly sophisticated software examines every contact in the log to determine if it is a Good QSO or if there is something wrong with it — a “Busted” QSO. Was the call sign or contest exchange copied incorrectly? If one of these was copied incorrectly, what was the correct version? Was the claimed QSO in the log of the operator on the other side? Was it a duplicate of another QSO in the log? In some cases, the log check software will identify call signs that showed up in your log alone. They are called “Uniques.”

Each contest looks at different aspects of the QSOs. But what is similar is that as a contest entrant you will be provided with a report, a Log Check Report (LCR), that details all the findings. It will also provide you with your

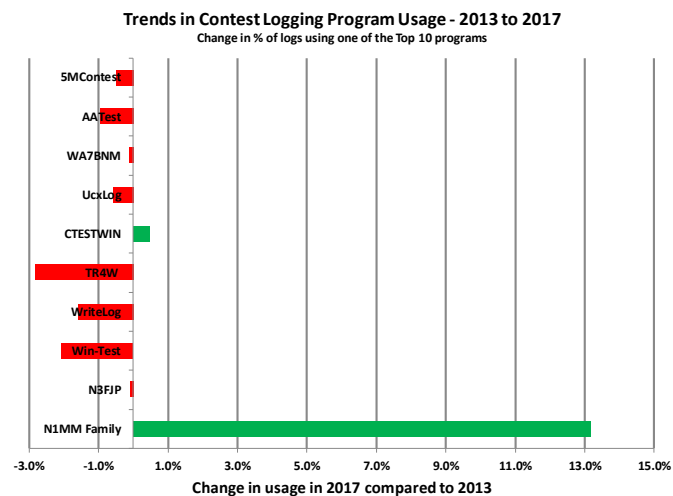


Figure 10 - Change in usage among popular logging programs – 2013 to 2017.

Another perspective about contest logging program that I have heard discussed is “What do serious contesters use?” Using a metric of “Average size of log submitted” seems at least plausible to provide this insight. Serious contesters usually make more QSOs than the casual ones. Using this metric the view looks as follows:

final “checked” score and reconcile why is it different than the “raw” score you submitted.

So, for this year’s deep dive investigation I took up Brian’s challenge and will analyze the LCRs from two ARRL 10 Meter Contests. ARRL Contest Branch Manager, Bart Jahnke, W9JJ, provided me the LCRs for each participant in the 2017 and 2014 contests. My perspective is to present what we can all learn about improving log accuracy. There is no intent to point fingers at specific operators — except those that are exceptional in their accuracy. Currently, ARRL LCRs are a private communication from the contest sponsor to the contest participant. I am not going to violate that. (So, I will not be touching on many of the examples that Bart, W9JJ, suggested as they are directed at providing feedback to specific operators.) Let’s start by looking at the 2017 edition.

The Exceptional Among Us

If a log is checked and is found to have no errors, other than duplicate QSOs, it is called a “Golden Log.” Of the 1,793 logs submitted for the 2017 ARRL 10 Meter Contest a total of 749 were Golden! At least to me it was a total surprise that 42% of the logs were Golden. True, these logs tended to be smaller than average — it is easier to have a Golden Log if you don’t make a lot of QSOs. The 749 Golden Logs contained 17% of the reported QSOs. Or, looking at it another way the average log had 56 QSOs whereas the average Golden Log had 23 QSOs. Still it is possible to have a large Golden Log and the following operators should be recognized for having Golden Logs at least twice the average log size. Well done all!

Table 1 – Golden Logs

<i>Call sign</i>	<i># of QSOs</i>	<i>Entry Category</i>
KY7M	341	SOU,MIX,HP
SP8N	187	SOU,PH,HP
NN7ZZ	170	SO,CW,HP
OHØZ	142	MSHP
DK1AX	140	SOU,CW,HP
N7EPD	136	SO,CW,HP
DL9ZP	130	SO,CW,LP
OH2PM	125	SOU,CW,HP
N1SOH	124	MSHP
N6VV	120	MSHP
DL4WA	116	SO,CW,HP
N1IX	116	SO,CW,LP
AF1T	113	SO,PH,HP
OF6MW	113	SOU,CW,HP

Summarized conclusions of looking at busted QSOs in the LCRs.

This is going to be a long, dry, and grueling study. If you are an inquisitive analytic type, you will love it. Not everyone is that way. Let me summarize the findings for those that are just interested in the conclusions. If you

want to improve your logging accuracy here are lessons learned from this study:

If you want to improve your logging accuracy in the ARRL 10 Meter Contest

- Double check every exchange that is suggested to you by a “pre-fill” or “history” capability in your logging program
- On a Phone QSO if you hear “New” in the exchange, don’t assume it is New York. If you are not sure, spend the time to make sure it is not New Jersey or New Mexico.
- Review your Cabrillo file before submitting for formatting errors and respond to any e-mail replies from the contest sponsor about errors in your log.
- As the contest progresses, and serial numbers get longer, increase your diligence in correctly copying them, especially on CW
- Study up and be comfortable copying CW serial numbers from operators using cut numbers.

Figure 12 - Major lessons learned from examining the Log Check Reports – Part 1.

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- Study up and be comfortable copying CW serial numbers from operators using cut numbers.

Figure 13 - Major lessons learned from examining the Log Check Reports – Part 2

Where did these recommendations come from? Let’s start by taking some broad views of what sorts of errors were made in copying the call sign and/or exchange of QSOs in the 2017 contest. Of the 98,105 reported QSOs, 71,174 or about 72% were able to be cross-checked in the log checking process. This means that logs were submitted from both stations involved in the QSO. Of these 2,212 or 3.1% had some sort of error. The error rate for CW QSOs was the same as for Phone QSOs — 3.1%. The error rate for copying call signs was noticeably lower than for copying exchanges — 1.2% vs 1.8%. And, the error rate for copying call signs in CW QSOs is actually 20% lower than in Phone QSOs. This could be due to skimmers and the Reverse Beacon Network distributing call signs to Unlimited operators. Torturing the data some more should tell this story but I am going to leave that for another time.

QSO Error Rates 2017 ARRL 10 Meter Contest

	All QSOs	Phone QSOs	CW QSOs
Busted Call	1.2%	1.5%	1.2%
Busted Exchange	1.8%	1.6%	1.9%
Total Busted	3.1%	3.1%	3.1%

Figure 14 - Overall QSO Error Rates.

From the total picture you can see that for Phone QSOs there is a fairly equal chance of busting the call sign or the exchange. However, for CW QSOs the chance of busting the exchange is almost 60% higher than busting the call sign. Why might that be and what lessons can be learned and what steps can be taken to improve?

One unique aspect of the ARRL 10 Meter Contest is that some exchanges are letters, for those stations in W, VE, and XE and some exchanges are serial numbers, for the rest of the world. Let's look at the error rates for stations with each type of exchange.

Exchange Copying Error Rates 2017 ARRL 10 Meter Contest

	All QSOs	Exchanges with Letters	Serial Number Exchanges
Phone QSOs	1.6%	0.58%	2.16%
CW QSOs	1.9%	0.75%	3.61%
All QSOs	1.8%	0.73%	3.15%

Figure 15 - Exchange Copying Error Rates.

Now we might be on to something! Torture the data long enough and it will confess. QSOs with serial number exchanges are 4.3 times more likely to be copied in error than QSOs with letters for the exchange. This ratio is also higher for CW QSOs than Phone QSOs, 4.8 vs 3.7. What this is really telling us that the exchange logging error rate for CW QSOs with serial number exchanges is 6.2 times that for Phone QSOs with letters for the exchange.

There could be several reasons for the difference. If numbers in general are harder to copy than letters in CW this would be a cause. A serial number exchange is also somewhat random and unbounded. Within broad limits it could be anything. There are also many variations of "cut number" abbreviations that an operator must translate. Conversely, potential letter-based exchanges are finite based on the total number of states in W and XE and

provinces in VE. They are also always made of 2 or 3 characters. In many cases the call sign also narrows down the potential exchanges. If a VE4 calls you and you think you hear him or her send "599 BC" you know better double check. Similarly, if a W1 calls in and you copy "59 WA" you might double check that it was not "59 MA". Finally, it is also possible that the logging program being used has a "pre-fill" capability for stations with letter-based exchanges that is not possible with serial number exchanges. A station would not have to type the exchange — just confirm, if they even bother to do that, what they hear is what was entered for them.

So, all in all, there are many more challenges in logging an accurate QSO from stations who are giving out serial number exchanges. It shows in the error rates. The opportunities for improvement are in practicing copying numbers on CW, including being fluent in "cut numbers". Also, simply asking for repeats if you are not sure you logged the correct number could lead to improved accuracy.

Busted Call sign Case Studies

Now that we have made some big picture discoveries, let's look at some specific examples. First, we will look at the call signs that were the most busted in logs. In the scoring of the ARRL 10 Meter Contest copying call signs correctly is a high priority. If you mis-copy one you lose not only that QSO from your final score but a penalty of more additional QSO of the same points. If you mis-copy an exchange you only lose credit for that QSO. So, the highest priority is to get the call sign copied correctly. Note this examination is not an investigation into the operating of the operator with the call sign being studied. Rather, it is a study of everyone who worked them. Remember, LCR's are private so I am not uncovering anything specific to a single operator or station.

For stations who were reported in more than 100 logs the Top Five most frequently busted calls, measured by % of QSOs busted were:

Table 2 – 2017 Most frequently busted call signs

Call sign	% of QSOs busted
LU9DDJ	8.4%
PA/PY2SEX	4.7%
LQØD	4.5%
P4/DL6RAI	4.0%
DL9ZP	3.8%

Remember, the overall average for the contest is that 1.2% of QSOs had the call sign busted. These five were busted at rates 3 to 7 times greater than average. Let's look at each one of these.

LU9DDJ operated as a Single Operator Unlimited, Phone Only, Low Power station. He spent most of the time running versus searching and pouncing (S&P) around the band. Meaning most of the QSOs with him by other stations involved them calling LU9DDJ. Twelve of the 14 times his call sign was busted the call logged was LU9DDS. There was only one instance of him being spotted as LU9DDS and none of the busted call signs was made anywhere near that time. So, what happened here?

Short of having a recording of LU9DDJ's QSOs, this one is going to go down as a mystery. All that I can think of is there may have been something in the way the "J" was enunciated that led to some operators believing they heard an "S" instead of a "J". Remember though, the vast majority copied the "J" correctly. This is a good reminder to always use standard phonetics when operating Phone.

PA/PY2SEX operated as a Single Operator Unlimited, CW Only, Low Power station. About 2/3 of the QSOs were made while running and about 1/3 while S&P-ing. Three of the five times the call sign was busted involved errors with the "E" — two of those where it was missed totally and the call sign logged being PA/PY2SX. Both of these were during a S&P QSO by PA/PY2SEX. One of the busted calls logged while running was for "PA/PY2WSX" which is likely just a keyboard typo since the "W" and "E" are next to each other on keyboard. During the contest there were eight Reverse Beacon Network or skimmer spots for "PY2SEX" — the correct call without the "PA/" prefix. None of these lead to a busted QSO in anyone's log. That is a good testament to operators double checking what is spotted to what they hear. So, its hard to draw any lessons from this one. One finger slip on the keyboard and a couple of dropped "dits".

LQØD submitted a Multioperator, Low Power entry. Since their log did not include specific frequencies is it hard to estimate how much they were running vs. S&P-ing. There were six different call signs in the seven times their call sign was busted. None of the busted call signs were spotted. So the busts were seemingly due to random logging errors. Most often the "Q" was busted, being copied once each as "Z", U", and "Y". Once the "D" was copied as an "N" on CW — somehow an extra "dit" snuck in there. Twice on CW they were logged as LQØDK — likely because the other operator thought the "K" was part of the call sign instead of them signing clear. So again, its hard to learn anything from this one.

P4/DL6RAI operated as a Single Operator Unlimited, CW Only, High Power station. About 80% of his QSOs were made while running. Six of the seven times his call sign was busted was while he was running (calling CQ). Twice the final "I" was missing from the call sign, three times the

"6" was logged as a "4", and once the "P4" was logged as "PV". We can see some similarities with other errors uncovered so far. "Dits" at the end of the call sign in CW were lost, and numbers being miscopied. The first station that logged this station as P4/DL4RAI actually put out a spot with the call. But, this did not lead to any further logging errors. Once again a positive testament to operators double checking what is spotted to what they hear. The other two times the "6" was copied as "4" were back-to-back QSOs from stations with the same postal address given in the log file. In this case the propagation of error was quite local in nature!

The final call sign of the Top Five is DL9ZP. He operated as a Single Operator, CW Only, Low Power station. Since his log did not include specific frequencies is it hard to estimate how much he was running vs S&P-ing. Twice the "Z" was copied as a "G", once the "P" was copied as an "L" and once the "9" was copied as an "8". The "Z"/"G" error could be due to missing a "dah" in the "Z". The other two could be CW copying errors or keyboard typos as the two characters are close to each other on the keyboard. None of the busted call signs logged were ever spotted.

So what can we learn from looking at the five call signs? Unfortunately, not much, as this is a case where the data is pretty sparse. There just are not enough examples from which to draw clear trends. Later I will look at the data from the 2014 contest that contains 20 times the QSO data. Maybe we can learn something then.

Moving on now let's look at busted exchanges. We already know that exchanges with numbers in them are busted 4.3 times as often as exchanges with letters in them. Also that exchanges in CW QSOs are busted about 20% more often than exchanges in Phone QSOs.

Let's start looking at Phone QSO with letter-based exchanges. This is the most accurate of situations with only 0.58% of exchanges busted. Looking through the data at first it seems random. How could someone who is saying "59 Oregon" be logged as "59 CA"? Well what this probably means is the source of most of these types of errors are due to outdated "pre-fill" files and forgetting to confirm the exchange before logging it. Somewhere around 80% of logging errors in these QSOs are due to this issue.

There is another set of errors that may be due more to actual over the air copying mistakes. There are several examples where stations in New Jersey were logged as in New York, and vice versa. So, the lessons from this class of QSOs are: (1) Always confirm an exchange that your logging program suggests, and (2) If an exchange starts with "New" pay attention. Don't assume that if you can't

quite make out the name of state it is “New York” because more hams live there than “New Jersey.” If you are not sure, ask for repeats until you are sure.

The next group to look at are CW QSOs with letter-based exchanges. Operators are also pretty accurate with these QSOs with only 0.75% of them busted. The data exhibits the same patterns seen with Phone QSOs. For example, the state exchange busted the most was MA with 27 errors. The states actually logged and the counts were: CT/2, FL/1, ME/2, MI/1, NY/15!, RI/1, VA/3, VT/1, WA/1. The 15 times NY was logged instead of MA all were associated with the same call sign, N2KW. So, unless N2KW was sending the wrong exchange, these all were due to outdated “pre-fill” files and operators forgetting to check the exchange actually being sent. In fact, N2KW who lives and usually operates in New York, was operating from the K1TTT station in MA during this contest. So, again lesson learned: Always Check The Exchange Pre-filled by a Logging Program.

There was another interesting example around a single call sign. Six operators mis-logged WJ9B’s exchange as “IL” instead of “ID”. I don’t think Willie has ever operated from IL so an out of date pre-fill file is likely not to blame. Neither were bad spots. There were no spots for WJ9B indicating he was in IL. This one may be more of an example of CW and the power of suggestion. If you work a “9” station who gives you “ID” as the exchange and you know “ID” is in 7-land, the power of suggestion might make you log “IL” instead — when you second guess yourself. Did you really hear a “D” or did you miss the leading “dit” of the “L”. Guess what? You probably had it right the first time. Trust yourself.

Summarizing here for stations giving letters as exchanges — the single biggest source of busted exchanges is where a logging program “pre-fills” the exchange from a past contest log, when in fact the operator has changed QTH’s. Always double check any “pre-filled” exchanges.

Moving on now to where serial numbers are exchanges, from the earlier work we know that serial number exchanges are busted quite a bit more than when exchanges are letters. In the case of Phone QSOs the busted exchange rate increases from 0.58% to 2.16%. In the case of CW QSOs the busted exchange rate increases from 0.75% to 3.61% -- almost a 5X increase. Are there any lessons to be learned?

Let’s look first at Phone QSOs. First, upon closer examination of the log data I found that 10% of the busted Phone QSOs with serial numbers were from a single log. What happened in that log was that a “59” was appended to the front of every serial number. This may have

happened in the creation of the Cabrillo file after the QSOs were logged and the contest over. So, the lesson here is to always give your log a good review before you send it in. And if you receive a report back from the log submission robot about problems with your log, correct them! Beyond that trying to decipher any patterns is surprisingly difficult.

One simple investigation looked to see if the bust rate changed as the number of digits in the serial number increased.

**Serial Number Copying Error Rates
2017 ARRL 10 Meter Contest**

	All QSOs	1 digit Serial Number	2 digit Serial Number	3 digit Serial Number
Phone QSOs	2.20%	1.05%	2.28%	2.67%
CW QSOs	3.66%	2.27%	3.46%	4.84%

Figure 16 - Serial Number Copying Error Rates.

Absolutely the error rate increases as the number of digits in the serial number increases. Note I couldn’t study any 4-digit serial numbers from the 2017 contest. There weren’t any! The lesson here is that as the contest progresses, and serial numbers get larger, that is the time to be extra diligent in copying the exchange.

Next I looked to see if there were any types of numbers that were busted more often than others. For this I looked just at a subset of Phone QSOs. There were 96 busted exchanges where both the sent serial number and the logged serial number had two digits. I looked at them to see if there is a pattern to which digit was miscopied. Of the 96, 36 didn’t have a single digit correct, 13 had the first digit correct and the second wrong, and 46 had the second digit correct and the first wrong. The difference between the first and second digit error rate is probably statistically significant, but I am not sure what advice to offer. I also looked to see if there are certain serial number ranges that have higher error rates than others. Those findings are shown in the next chart.

Table 3 – 2017 Phone QSO Serial Number error rates

<i>Sent Serial Number Range</i>	<i>% of QSOs busted</i>
10-19	1.6%
20-29	1.2%
30-39	2.1%
40-49	2.8%
50-59	2.1%
60-69	4.0%
70-79	1.7%
80-89	1.8%
90-99	1.3%

Fascinating! Not all serial numbers are copied equally well. Serial numbers from 60 to 69, were busted well more than twice the average rate of 1.3%. And serial numbers from 20 to 29 were copied much better than average. Again though, its interesting but I don't know what lesson to take or advice to offer from it. Perhaps if you are on Phone and sending a serial number that contains entirely or in part, numbers in the range of 60 to 69, 40 to 49, and 30 to 39 — be extra diligent in enunciating your numbers. This is a courtesy to the station you are working and will reduce the chance they will bust your exchange.

Finally, we can look at CW QSOs that have serial numbers in the exchange. These are the QSOs where the exchange is busted the most. By far. At 3.61% of QSOs busted the rate is 6X that for Phone QSOs with letter exchanges. So, if there is place where improvements can be made, it's for CW serial number exchanges.

Before we look at the numbers, it is interesting to think about the relative challenges of copying a serial number in a Phone vs CW QSO. With a Phone QSO you have the common challenges of QSB, QRN, and QRM. Additionally, there is the challenge of languages and accents. As a least common denominator exchanges are typically given in English. But for many operators English is not their first language. How comfortable would you be exchanging a serial number with someone in a language that you don't use every day? And, then there is the challenge of understanding the many diverse accents around the world. All and all it is a great compliment to all the operators that everyone does as well as they do.

Thinking about CW, there are no language and accent issues other than CW is a common "foreign language" for everyone. Ham radio operators have learned this language and is only used when practicing their ham radio hobby. There also no accent challenges, though in some respects "cut numbers" could be considered a CW accent. Though CW may be a common language there are, as with spoken English, diverse levels of fluency among operators as demonstrated by the speed they can send, and most importantly, receive. The net result of these differences is that copying exchanges in a CW QSO is more difficult than for a Phone QSO. With those thoughts what did the LCRs show?

First, referring to Figure 16. as with Phone QSOs, the chance of busting a serial number increases as the number of digits in the serial number increases. In fact, it increases even faster than with Phone QSOs.

Although I couldn't study any 4-digit serial numbers from the 2017 contest, it is plausible that bust rates could be in excess of 6%. The same lesson applies here. Late in the

contest when serial numbers are getting bigger, that is the time to be extra diligent in copying the exchange.

I then also looked at the similar set of CW QSOs as I did for Phone — just those where the sent serial number was under 100. I then looked at the bust rate for difference first and second digits to see if there are any differences across different digits. Personally, I know my greatest challenges are with 2 and 3. Your mileage may vary.

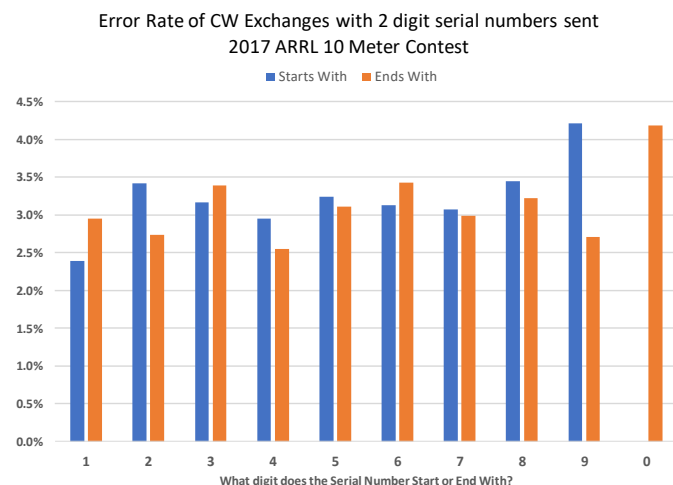


Figure 17 - Error rates with different serial number digits.

All in all, the error rates are remarkably similar for the different first and second digits. The two that stand out with higher error rates are beginning with a 9 or ending with a 0. These two digits are also ones which more commonly are sent with cut numbers – a “N” for “9” and a “O” or even “T” for “0”. For a contester the lesson is to study up, and if possible, practice receiving cut numbers to improve your logging. Then, for those that send cut numbers ask yourself is it really a benefit to you because it does seem to make your serial numbers more difficult to copy.

Can we learn anything more from looking at 2014 data?

When I started thinking about this investigation I knew the data set from the 2017 was going to be sparse. There were less than 100,000 QSOs in the logs submitted. The average log contained just around 55 QSOs. And I was going to be looking into events that happen at a rate from <1% to around 3% of QSOs. So I also asked W9JJ for the LCRs from the 2014 edition. In that contest, during the best 10 meter conditions of this solar cycle, over 2,000,000 QSOs were in the submitted logs. Over 20 times the total in 2017. And, the average log contained over 360 QSOs. It is much easier to uncover subtle trends when you have this much data. So, what was there?

First, looking overall error rates it is remarkable how similar the patterns are. Again, as in 2017, total Phone and CW error rates are the same. Call sign and exchange error rates are the same for Phone QSOs and the exchange has a higher error rate for CW QSOs. What is amazing is that each and every error rate in 2014 was lower than in 2017 despite the average log containing almost 7X the QSOs. All I can think of is that better conditions lead to louder and clearer signals to copy. It also reinforces the lesson that if you are having trouble copying someone, which happens more often in low sunspot years, make sure to ask for repeats until you get it correct!

QSO Error Rates ARRL 10 Meter Contest

2017	All QSOs	Phone QSOs	CW QSOs
Busted Call	1.2%	1.5%	1.2%
Busted Exchange	1.8%	1.6%	1.9%
Total Busted	3.1%	3.1%	3.1%

2014	All QSOs	Phone QSOs	CW QSOs
Busted Call	1.0%	1.2%	1.0%
Busted Exchange	1.5%	1.3%	1.6%
Total Busted	2.5%	2.5%	3.6%

Figure 18 - Overall QSO Error Rates – 2014 vs 2017

Looking at exchange copying errors, again it stands out that 2014 had lower error rates, particularly for CW QSOs with serial number exchanges.

Exchange Copying Error Rates ARRL 10 Meter Contest

2017	All QSOs	Exchanges with Letters	Serial Number Exchanges
Phone QSOs	1.6%	0.58%	2.16%
CW QSOs	1.9%	0.75%	3.61%
All QSOs	1.8%	0.73%	3.15%

2014	All QSOs	Exchanges with Letters	Serial Number Exchanges
Phone QSOs	1.3%	0.55%	2.01%
CW QSOs	1.6%	0.51%	2.61%
All QSOs	1.5%	0.52%	2.38%

Figure 19 - Exchange Copying Error Rates – 2014 vs 2017

Looking at the top most busted call signs from 2014 tells us more than from the 2017 contest.

Table 4 – 2014 Most frequently busted call signs

Call sign	% of QSOs busted
OG55W	30.6%
XE2PXZ	14.8%
UE55KS	9.2%
BW2/JPIRIW	5.4%
CW1DC	5.1%
CO6HK	4.6%

Instead of going through the list call by call, here are my summary conclusions:

OG55W and UE55KS, using special call signs with non-standard prefix numbering, were very hard for stations to copy correctly. OG55W who operated CW Only and mostly S&P had their call sign busted over 30% of the time. UE55KS had an overall lower error rate but spent more time running and thus their call sign appeared on skimmers and spotting clusters for everyone to see. The lesson here is just don't use these types of call sign if you want to help folks copy your call sign and if you hear someone come back to you with an incorrect call sign – correct it for them before giving them an exchange!

XE2PXZ and CO6HK who operated Phone Only and are native Spanish speakers had their call signs busted many many times more than normal. This was not due to spotting errors. For XE2PXZ virtually every bust was due to a station logging the call as XE2PXS. That is converting the “Z” to an “S”. In the case of CO6HK the most common busted call was CE6HK followed by CO6DK. Without having recordings of the QSOs it is hard to pinpoint what happened. The two general pieces of advice are: (1) Always use standard phonetics, and (2) for stations in the US, who did 95% of the “busting”, realize that different accents will make different letters and words sound different. Pay attention and sort it out. It is your job to copy the call sign correctly – and remember that vast majority of people did so.

BW2/JPIRIW is just a long complex call sign, even on Phone which where he did all his operating. The busted call signs most often had to do with the second letter of the prefix in his home call. The “P” was often logged as a “O” or a “H”. The “BW” and “RIW” part of the call sign were always correct. Again, this is a case of a non-native English speaker on Phone. And, most of the “busting” was done by operators in other non-English speaking countries. The two general pieces of advice area: (1) Keep your call sign as short as possible, though in this case he may not have had a choice, and (2) Use standard phonetics.

Finally, when I started drilling down into the sources and causes of busted exchanges the total amount of data finally overwhelmed me. I didn't look at nuances of exchanges based on letters or numbers, other than the simple number of digits in a serial number exchange. I had to do that in 2014 because there were many many QSOs made with 4-digit serial numbers. There were over 150,000 of them, 50% more than the total QSO count in the whole 2017 contest!

Serial Number Copying Error Rates ARRL 10 Meter Contest

2017	All QSOs	1 digit Serial Number	2 digit Serial Number	3 digit Serial Number	4 digit Serial Number
Phone QSOs	2.20%	1.05%	2.28%	2.67%	N/A
CW QSOs	3.66%	2.27%	3.46%	4.84%	N/A

2014	All QSOs	1 digit Serial Number	2 digit Serial Number	3 digit Serial Number	4 digit Serial Number
Phone QSOs	2.01%	1.25%	2.16%	2.02%	1.94%
CW QSOs	2.61%	1.11%	2.44%	2.65%	3.07%

Figure 20 - Serial Number Copying Error Rates – 2014 vs 2017

Looking at this chart I am glad I did look at serial number length. For Phone QSOs it looks like the error rate is basically the same for any serial number longer than one digit. It is even possible that accuracy increases as the serial number increases. There is enough data behind these calculations that the differences may represent a significant difference. For CW QSOs there still appears to be an increasing error rate as the serial numbers get larger. However, the 2014 error rates were well below those seen in 2017. Again, I surmise that the better conditions led to less QSB and overall louder signals made it easier to copy serial numbers. The repeat lesson here is in poor conditions, make sure to ask for repeats on any part of the QSO you are not sure about. If you are the running station don't give your exchange until you have the call sign correct. If you are S&P-ing don't call until you have the call sign correct and don't send your exchange until you have a high confidence that you copied the running station's exchange.

That's it for this year. Hope you enjoyed this discussion!
73, Scott, K7ZO

Top Ten – United States

Single Operator, Mixed Mode, High Power	
K1WHS (K1BX, op)	142,058
KØTT	83,582
KTØK	78,584
N8OO	56,012
WØETT	42,848
KU2M	23,328
K9ZO	21,920
N4OX	21,384
N4XD	18,768
K3TC	17,422
Single Operator, Mixed Mode, Low Power	
N8II	41,650
KFØUR	30,150
KØUK	14,940
ND9G	12,036
ACØW	11,760
KI6RRN	10,672
K2PS	10,314
KØPC	8,160
KØAD	8,100
N5JJ	7,958
Single Operator, Mixed Mode, QRP	
K2YGM	2,210
NDØC	2,210
N9NE	1,596
N3ZV	1,456
NS7K	1,170
W1TW	784
N4ELM	448
WA6FGV	432
WB2AMU	336
W1IE	312
Single Operator, Phone Only, High Power	
K5TR (WM5R, op)	11,914
WØSD (KEØHQZ, op)	10,800
AF1T	4,520
AF1T	4,480
N4MM	2,040
NØWRK	1,290
KD7RF	1,176
W6LP (NC6R, op)	912
K9MWM	902
KF9US	624
Single Operator, Phone Only, Low Power	
W5PR	3,504
K2SDS	1,680
WZ8T	1,530
K4FCG (K1KNQ, op)	1,240
N7FLT	1,118
NF7E	810
W5WTC	616
KBØSNI	484
KEØITC	456
K7VIT	450
Single Operator, Phone Only, QRP	
KB5KYJ	1,036
WBØIWG	112
N8MWK	48
W6QU (W8QZA, op)	32
KD8RTT	16
K6DPD	14
KF6ZYD	2
Single Operator, CW Only, High Power	
K5NA	67,524
W5KFT (K5PI, op)	58,752
WJ9B	55,488
K1KI	48,480
KD4D	47,068

W6YX (N7MH, op)	41,040	N9VPV	288
WØZA	38,456	WA7YXY	140
K1RM	29,824	K5LGX	110
K1TO	29,028	K9ZM	90
KM6JD	25,740	K7HKR	90
Single Operator, CW Only, Low Power		N6ORB	48
W3BGN	24,816	Single Operator Unlimited, Phone Only, QRP	
N4WW (N4KM, op)	24,448	N9NBC	24
K9QVB	21,744	Single Operator Unlimited, CW Only, High Power	
N4TB	21,140	N2MM	67,968
AE5GT	18,000	N6SS	62,208
WA7NB	16,500	N2KW	52,608
N1IX	12,528	W3EP	51,912
W9RE	11,904	N3RD	37,696
K7SV	11,536	W8HAP	32,448
N4ZI	10,752	K9CT	27,512
Single Operator, CW Only, QRP		AA3B	24,552
N5OE	3,920	N6EE	21,296
WØCW	1,232	N1LN	20,064
K2SM	768	Single Operator Unlimited, CW Only, Low Power	
K7HBN	644	W1QK	22,320
KR2Q	420	W9XT	15,688
N8AP	416	N9TF	12,160
K3TW	360	K6WSC	8,064
K2YAZ	336	NZ3D	7,680
WB4BIN	288	W1KM	7,392
KC4IM	180	K1XM	6,408
Single Operator Unlimited, Mixed Mode, High Power		K2DFC	6,120
KY7M (KY7M, op @NA7TB)	81,030	KØTI	4,788
K3ZU	66,752	K4GMH	4,704
N5XZ	64,056	Single Operator Unlimited, CW Only, QRP	
N4RV	56,600	NØUR	4,240
KØKX	53,430	KI9A	448
W4MYA	52,752	W5UE	144
K3EST	51,408	WA7LNW	112
KØLD (WAØMHJ, op)	50,630	K3HW	40
WB9Z	49,704	N9LQ	24
W1TJL	43,100	AF5Q	16
Single Operator Unlimited, Mixed Mode, Low Power		Multioperator, Single Transmitter, High Power	
K1ZE	27,216	N2NT	106,080
K5KJ	13,962	AA1JD	101,790
K1DJ	7,112	WØRIC	81,840
KE8EAS	5,200	NX5M	80,154
AB9YC	5,082	W8PR	60,928
W6OAT	4,350	KT4Q	41,360
K9PG	4,136	N7AT	32,384
K7WP	3,600	W7RN	31,140
KM4HI	3,248	W6TCP	28,810
WR2G	3,162	WW4CP	26,880
Single Operator Unlimited, Mixed Mode, QRP		Multioperator, Single Transmitter, Low Power	
K4LQ	7,038	W7TVC	17,150
W2MF	3,168	AAØAW	12,736
K2GMY	3,136	KD9GKL	9,184
N1RR	1,260	W1FM	8,756
Single Operator Unlimited, Phone Only, High Power		N4SVC	4,482
W2RD	1,666	N9CDX	2,080
KC8QDQ	924	W2NPT	1,144
KA1ZD	880	W7PU	1,032
WTØDX	528	KC1EWL	528
KD8ZCH	96	K4OTH	416
AE7VA	88		
KØCZH	64		
KF7U	56		
W1PEF	44		
KØARY	40		
Single Operator Unlimited, Phone Only, Low Power			
K2DRH	7,070		
W3LL	1,716		
ADØTA	1,500		
KEØNWG	528		

Top Ten - Canada

Single Operator, Mixed Mode, High Power	
VA3TIC	30
Single Operator, Mixed Mode, Low Power	
VE7SGW	532
VE3RCN	168
VA3RKM	76
VE6SH	64
VE3TM	52
Single Operator, Phone Only, Low Power	
VE2NCG	2
Single Operator, CW Only, High Power	
VE5UF	10,600
VE3PN	9,920
VE2FWW	6,300
VE3EJ	6,000
VE6WQ	3,520
VE9AA	1,404
VE3DZ	1,276
VE7JKZ	352
VE3FJ	312
VA7ST	64
Single Operator, CW Only, Low Power	
VE5GC	8,976
CF7MM	2,596
VE5VA	1,508
VE4TV	1,344
VE4MR	792
VA3EC	476
VE3ZY	468
VE3AYR	48
VA2LGQ	16
VE7BGP	12
Single Operator, CW Only, QRP	
VA3RJ	112
VE3CBK	8
Single Operator Unlimited, Mixed Mode, High Power	
VE5MX	8,234
VE6TL	2,686
VE4EA	792
Single Operator Unlimited, Mixed Mode, Low Power	
VA3DF	8,640
VE3PJ	1,728
Single Operator Unlimited, CW Only, High Power	
VE6BBP	8,256
VE7XF	6,912
VE1OP	3,904
VA3DX	2,880
VE3CX	1,664
VO1HP	96
Single Operator Unlimited, CW Only, Low Power	
VE3VY	280
Multioperator, Single Transmitter, High Power	
VE9CB	110

Top Ten - Mexico

Single Operator, Mixed Mode, Low Power	
XE1H	702
XE3A	224
XE2MWY	48
Single Operator, Phone Only, High Power	
XE1R	260
Single Operator, Phone Only, Low Power	
XE1AO	196
XE2PEA	120
XE2MXI	4
XE2OCM	2
XE2QD	2

Single Operator, Phone Only, QRP	
XE2MZL	2
Single Operator, CW Only, High Power	
XE2X	4,692
XE2S	1,100
Single Operator Unlimited, Phone Only, Low Power	
XE2JS	868
Single Operator Unlimited, CW Only, Low Power	
XE2B	2,736
XE1EE	72
Multioperator, Single Transmitter, Low Power	
XE2N	168

Top Ten - DX

Single Operator, Mixed Mode, High Power	
G4FKA	38,496
OA4SS	29,072
F6GOX	21,336
GM5X (GM4YXI, op)	13,826
PV8DX	13,720
DM2FDO	13,514
OF3BCX (OH1ZAA, op)	11,376
US8ICM	10,260
MM1E (MMØGOR, op)	8,468
I3FGX	5,580
Single Operator, Mixed Mode, Low Power	
PY1ZV	25,172
3G1D (XQ1FM, op)	20,412
LW1EUD	14,820
TM6M	12,376
PU4GOD	10,890
EA8ZT	8,418
R3LC	6,954
PA2REH	6,952
YO4FZX	6,468
ON5WL	5,568
Single Operator, Mixed Mode, QRP	
PY2NY	7,104
YW2LV	1,300
JR1UJX	1,288
ON8NT	888
VK3GK	810
JH7UJU	756
NP2Q	384
JR2EKD	170
ON2AD	48
Single Operator, Phone Only, High Power	
PP5JR	96,820
ZW5T (PY5ZD, op)	28,768
CE5JZO	13,530
FR4QT	12,032
F5LIW	10,570
LW3EK	10,218
F1RHS	5,742
ES5MG	3,002
6W1SU	2,772
EA5DFV	1,764
Single Operator, Phone Only, Low Power	
LU9VD (LU9VEA, op)	10,360
LU8VR	8,610
YTØW (YU1JW, op)	6,486
LQ7E (LW3DN, op)	6,102
LU1MPK	5,550
LW4EF	5,456
PU2WDX	3,696
PU2PSP	3,564
9Z4Y	3,276
EA8BOA	2,730

Single Operator, Phone Only, QRP		Single Operator Unlimited, Mixed Mode, QRP	
LU4VZ	3,080	MM3AWD	1,196
PP5XA	1,170	JK1TCV	820
PY2VTC	612	PE2K	24
PU2TRX	400	Single Operator Unlimited, Phone Only, High Power	
I5KAP	396	CV7S (CX7SS, op)	29,880
PU4ALZ	352	PY5QW	13,728
PY2BN	170	SP8N	11,594
JA1NEZ	54	LU8VLE	8,874
JH3DMQ	52	PP5JD	6,460
DU7OK	12	DK5A (DK5KMA, op)	5,046
PU7MCV	12	PY2LED	4,732
Single Operator, CW Only, High Power		ZR6GR	3,696
ZZ4X	93,840	ES6RW	2,940
XR2K (CX1EK, op)	58,280	DM5TS	2,546
PY2MC	47,436	Single Operator Unlimited, Phone Only, Low Power	
CE3DNP	28,620	LU9DDJ	18,090
EA6VQ	23,892	PP1WW	14,784
IQ9UI (IT9EQO, op)	19,456	PU2UAF	4,600
9A4W	15,496	VK2NSS	4,080
YQ6A (YO6BHN, op)	14,896	ED8H (EA8ARI, op)	3,724
YL2TD	14,100	PU5DUD	3,432
DLØRD (DL3ECQ, op)	13,952	PY8WW	2,686
Single Operator, CW Only, Low Power		PY5FO	2,200
V51YJ	88,200	CE7KF	1,980
LU6DO	28,952	PT7ZT	1,824
CB3R (XQ3SK, op)	18,720	Single Operator Unlimited, Phone Only, QRP	
LZ2HR	18,444	PU2RTO	336
DL9ZP	16,120	Single Operator Unlimited, CW Only, High Power	
US7VF	14,880	CX2BR	111,884
F5VMN	14,784	CX4SS	49,152
OA4O (OA4DX, op)	14,060	PAØO	43,172
OK1DKR	13,520	S57Q	33,384
F6AUS	12,896	P4/DL6RAI	31,752
Single Operator, CW Only, QRP		PA5WT	29,260
US5VX	4,608	LU1DZ	25,296
JQ1NGT	4,010	S5ØØR (S51FB, op)	23,392
DL4XU	2,816	M3I (GØORH, op)	23,364
DL2TM	2,640	HG7T (HA7TM, op)	21,360
OK1DZD	2,100	Single Operator Unlimited, CW Only, Low Power	
UT9EZ	1,276	PP5TU	72,036
DL8TG	988	PP1CZ	63,204
EA6SX	900	PP5BI	52,000
DL3MVC	816	PA/PY2SEX	16,920
LY5G	760	EA7RM	14,904
Single Operator Unlimited, Mixed Mode, High Power		DK3GI	13,696
DL2ARD	124,188	LU4HK	12,064
DH8BQA	83,496	PY1SL	10,472
S51DI	69,632	DK9OY	7,700
DL5WW	55,080	PAØCMU	7,584
YT8A (YU1EA, op)	51,306	Single Operator Unlimited, CW Only, QRP	
DL2SAX	40,068	LU7DID	10,080
F5NBX	33,480	HA3HX	3,780
LZ9W (LZ1VLS, op)	26,100	CE3OP	2,688
DK2OY	25,568	EU8F	588
DL6KVA	24,864	JG1EIQ	56
Single Operator Unlimited, Mixed Mode, Low Power		Multioperator, Single Transmitter, High Power	
PY3OZ	117,688	CW5W	447,120
PY5ZHP	34,656	PT3T	219,190
IT9SSI	25,714	LU2DX	210,480
PY1AX	20,874	LZ5R	75,144
F8ATS	19,006	EA5RS	34,720
OT6M (ON9CC, op)	18,180	TMØW	25,116
PA4O	17,568	9H6A	20,944
ZW2F (PY2LCD, op)	15,548	PW5T	20,736
PY2LSM	14,362	OHØZ	16,680
YO2LEA	11,528	PY2NFT	8,976

Multioperator, Single Transmitter, Low Power	
PY2SR	42,880
LQØD	26,106
ZZ2P	21,888
PJ2T	18,876
OK1OFM	5,616
PV2B	5,320
JJ1ZEJ	3,520
CE1CA	3,192
ED1L	3,174
PY2KC	3,108

Continental Winners

Africa

Single Operator, Mixed Mode, Low Power	EA8ZT	8,418
Single Operator, Phone Only, High Power	FR4QT	12,032
Single Operator, Phone Only, Low Power	EA8BOA	2,730
Single Operator, CW Only, Low Power	V51YJ	88,200
Single Operator Unlimited, Mixed Mode, Low Power	SU9JG (EA7TN, op)	210
Single Operator Unlimited, Phone Only, High Power	ZR6GR	3,696
Single Operator Unlimited, Phone Only, Low Power	ED8H (EA8ARI, op)	3,724

Asia

Single Operator, Mixed Mode, High Power	JE1VTZ	1,914
Single Operator, Mixed Mode, Low Power	JR1MEG	4,116
Single Operator, Mixed Mode, QRP	JR1UJX	1,288
Single Operator, Phone Only, High Power	JA7OWD	1,100
Single Operator, Phone Only, Low Power	JS6TQS	364
Single Operator, Phone Only, QRP	JA1NEZ	54
Single Operator, CW Only, High Power	RT9S	6,528
Single Operator, CW Only, Low Power	JJ1LBJ	4,836
Single Operator, CW Only, QRP	JQ1NGT	4,010
Single Operator Unlimited, Mixed Mode, High Power	JH4UTP	15,120
Single Operator Unlimited, Mixed Mode, Low Power	JH6WHN	1,800
Single Operator Unlimited, Mixed Mode, QRP	JK1TCV	820
Single Operator Unlimited, Phone Only, High Power	JG2REJ	12
Single Operator Unlimited, CW Only, High Power	4Z5LY	6,080
Single Operator Unlimited, CW Only, Low Power	7K1CPT	2,680
Single Operator Unlimited, CW Only, QRP	JG1EIQ	56
Multioperator, Single Transmitter, High Power	9M4COK	24
Multioperator, Single Transmitter, Low Power	JJ1ZEJ	3,520

Europe

Single Operator, Mixed Mode, High Power	G4FKA	38,496
Single Operator, Mixed Mode, Low Power	TM6M	12,376
Single Operator, Mixed Mode, QRP	ON8NT	888
Single Operator, Phone Only, High Power	F5LIW YTØW	10,570
Single Operator, Phone Only, Low Power	(YU1JW, op)	6,486
Single Operator, Phone Only, QRP	I5KAP	396
Single Operator, CW Only, High Power	EA6VQ	23,892
Single Operator, CW Only, Low Power	LZ2HR	18,444
Single Operator, CW Only, QRP	US5VX	4,608
Single Operator Unlimited, Mixed Mode, High Power	DL2ARD	124,188
Single Operator Unlimited, Mixed Mode, Low Power	IT9SSI	25,714
Single Operator Unlimited, Mixed Mode, QRP	MM3AWD	1,196

Single Operator Unlimited, Phone Only, High Power	SP8N	11,594
Single Operator Unlimited, Phone Only, Low Power	EA4AA	1,456
Single Operator Unlimited, CW Only, High Power	PAØO	43,172
Single Operator Unlimited, CW Only, Low Power	PA/PY2SEX	16,920
Single Operator Unlimited, CW Only, QRP	HA3HX	3,780
Multioperator, Single Transmitter, High Power	LZ5R	75,144
Multioperator, Single Transmitter, Low Power	OK1OFM	5,616

North America

Single Operator, Mixed Mode, QRP	NP2Q	384
Single Operator, Phone Only, Low Power	KP2XX	550
Single Operator, CW Only, High Power	ZF9CW	3,672
Single Operator, CW Only, Low Power	HI8A	1,584
Single Operator Unlimited, Mixed Mode, Low Power	NP2X	11,044
Single Operator Unlimited, Phone Only, Low Power	WP2SC	72
Single Operator Unlimited, CW Only, Low Power	HP1AC	812

Oceania

Single Operator, Mixed Mode, High Power	FK8IK	2,712
Single Operator, Mixed Mode, Low Power	4F3BZ	1,440
Single Operator, Mixed Mode, QRP	VK3GK	810
Single Operator, Phone Only, High Power	VK2CZ	1,464
Single Operator, Phone Only, Low Power	VK7DW	110
Single Operator, Phone Only, QRP	DU7OK	12
Single Operator, CW Only, High Power	VK2PN	3,104
Single Operator, CW Only, Low Power	VK2IG	3,920
Single Operator Unlimited, Mixed Mode, High Power	VK5GR	6,216
Single Operator Unlimited, Phone Only, High Power	VK4QH	350
Single Operator Unlimited, Phone Only, Low Power	VK2NSS	4,080
Single Operator Unlimited, CW Only, Low Power	4F3OM	2,772
Multioperator, Single Transmitter, Low Power	DV3KRD	68

South America

Single Operator, Mixed Mode, High Power	OA4SS	29,072
Single Operator, Mixed Mode, Low Power	PY1ZV	25,172
Single Operator, Mixed Mode, QRP	PY2NY	7,104
Single Operator, Phone Only, High Power	PP5JR	96,820
Single Operator, Phone Only, Low Power	LU9VD (LU9VEA, op)	10,360
Single Operator, Phone Only, QRP	LU4VZ	3,080
Single Operator, CW Only, High Power	ZZ4X	93,840
Single Operator, CW Only, Low Power	LU6DO	28,952
Single Operator, CW Only, QRP	PR7AR	12
Single Operator Unlimited, Mixed Mode, High Power	PY6TS	16,560
Single Operator Unlimited, Mixed Mode, Low Power	PY3OZ	117,688
Single Operator Unlimited, Phone Only, High Power	CV7S (CX7SS, op)	29,880
Single Operator Unlimited, Phone Only, Low Power	LU9DDJ	18,090
Single Operator Unlimited, Phone Only, QRP	PU2RTO	336
Single Operator Unlimited, CW Only, High Power	CX2BR	111,884
Single Operator Unlimited, CW Only, Low Power	PP5TU	72,036
Single Operator Unlimited, CW Only, QRP	LU7DID	10,080

Multioperator, Single Transmitter, High Power	CW5W	447,120	WA7YXY	140	SOU-PH-LP
Multioperator, Single Transmitter, Low Power	PY2SR	42,880	K7HKR	90	SOU-PH-LP
			N6ORB	48	SOU-PH-LP

Regional Leaders

West Coast Region

(Pacific, Northwestern and Southwestern Divisions; Alberta, British Columbia and NT Sections)

W7GKF	13,392	SO-MIX-HP
WA8WZG	12,300	SO-MIX-HP
K7JQ	10,944	SO-MIX-HP
K7RL	7,760	SO-MIX-HP
K6XX	5,678	SO-MIX-HP
KI6RRN	10,672	SO-MIX-LP
N7LOX	7,120	SO-MIX-LP
AA7UN	6,780	SO-MIX-LP
W7MTL	4,092	SO-MIX-LP
NW7E	3,066	SO-MIX-LP
WA6FGV	432	SO-MIX-QRP
KD7RF	1,176	SO-PH-HP
W6LP (NC6R, op)	912	SO-PH-HP
K6LRN	120	SO-PH-HP
K7STO	16	SO-PH-HP
WZ8T	1,530	SO-PH-LP
N7FLT	1,118	SO-PH-LP
NF7E	810	SO-PH-LP
K7VIT	450	SO-PH-LP
KE7K	192	SO-PH-LP
W6QU (W8QZA, op)	32	SO-PH-QRP
K6DPD	14	SO-PH-QRP
KF6ZYD	2	SO-PH-QRP
WJ9B	55,488	SO-CW-HP
W6YX (N7MH, op)	41,040	SO-CW-HP
KM6JD	25,740	SO-CW-HP
AA7V	18,760	SO-CW-HP
N7EPD	14,688	SO-CW-HP
WA7NB	16,500	SO-CW-LP
K7GS	5,168	SO-CW-LP
KH6CJJ	3,640	SO-CW-LP
W7USA	2,640	SO-CW-LP
CF7MM	2,596	SO-CW-LP
K7HBN	644	SO-CW-QRP
WD6DX	108	SO-CW-QRP
NU7Y	64	SO-CW-QRP
KY7M (KY7M, op @NA7TB)	81,030	SOU-MIX-HP
K3EST	51,408	SOU-MIX-HP
N7NM	40,392	SOU-MIX-HP
KA6BIM	34,870	SOU-MIX-HP
K9YC	16,688	SOU-MIX-HP
W6OAT	4,350	SOU-MIX-LP
K7WP	3,600	SOU-MIX-LP
WQ6X	2,952	SOU-MIX-LP
WA7AXT	1,022	SOU-MIX-LP
N9NA	204	SOU-MIX-LP
K2GMY	3,136	SOU-MIX-QRP
W2RD	1,666	SOU-PH-HP
AE7VA	88	SOU-PH-HP
KF7U	56	SOU-PH-HP

N6SS	62,208	SOU-CW-HP
K6LL	11,484	SOU-CW-HP
VE6BBP	8,256	SOU-CW-HP
VE7XF	6,912	SOU-CW-HP
K7XC	4,032	SOU-CW-HP
K6WSC	8,064	SOU-CW-LP
KD6WKY	1,984	SOU-CW-LP
AC7JM	800	SOU-CW-LP
K3WYC	672	SOU-CW-LP
K7QA	336	SOU-CW-LP
WØRIC	81,840	MSHP
N7AT	32,384	MSHP
W7RN	31,140	MSHP
W6TCP	28,810	MSHP
K7JR	13,764	MSHP
W7TVC	17,150	MSLP
W7PU	1,032	MSLP

Midwest Region

(Dakota, Midwest, Rocky Mountain and West Gulf Divisions; Manitoba and Saskatchewan Sections)

KØTT	83,582	SO-MIX-HP
KTØK	78,584	SO-MIX-HP
WØETT	42,848	SO-MIX-HP
NCØB	14,212	SO-MIX-HP
KØSRL	7,920	SO-MIX-HP
KFØUR	30,150	SO-MIX-LP
KØUK	14,940	SO-MIX-LP
ACØW	11,760	SO-MIX-LP
KØPC	8,160	SO-MIX-LP
KØAD	8,100	SO-MIX-LP
NDØC	2,210	SO-MIX-QRP
NS7K	1,170	SO-MIX-QRP
NZ5G	20	SO-MIX-QRP
K5TR (WM5R, op)	11,914	SO-PH-HP
WØSD (KEØHQZ, op)	10,800	SO-PH-HP
NØWRK	1,290	SO-PH-HP
K9MWM	902	SO-PH-HP
WE6EZ	520	SO-PH-HP
W5PR	3,504	SO-PH-LP
W5WTC	616	SO-PH-LP
KBØSNI	484	SO-PH-LP
KEØITC	456	SO-PH-LP
NGØC	352	SO-PH-LP
KB5KYJ	1,036	SO-PH-QRP
WBØIWG	112	SO-PH-QRP
K5NA	67,524	SO-CW-HP
W5KFT (K5PI, op)	58,752	SO-CW-HP
WØZA	38,456	SO-CW-HP
NN7ZZ (N5LZ, op)	21,760	SO-CW-HP
KØKT	11,352	SO-CW-HP
AE5GT	18,000	SO-CW-LP
VE5GC	8,976	SO-CW-LP
KNØV	8,904	SO-CW-LP
N4IJ	8,648	SO-CW-LP
WKØP	6,688	SO-CW-LP
N5OE	3,920	SO-CW-QRP
WØCW	1,232	SO-CW-QRP
WB4BIN	288	SO-CW-QRP

KIØG	96	SO-CW-QRP	KE8UM	16	SO-PH-LP
W5TTE	80	SO-CW-QRP	N8MWK	48	SO-PH-QRP
ADØBI	80	SO-CW-QRP	KD8RTT	16	SO-PH-QRP
N5XZ	64,056	SOU-MIX-HP			
KØKX	53,430	SOU-MIX-HP	W8TWA	14,552	SO-CW-HP
KØLD (WAØMHJ, op)	50,630	SOU-MIX-HP	VE3PN	9,920	SO-CW-HP
KBØEO	37,468	SOU-MIX-HP	K8MP	6,804	SO-CW-HP
NG7M	30,544	SOU-MIX-HP	VE3EJ	6,000	SO-CW-HP
			N4TZ	4,664	SO-CW-HP
K5KJ	13,962	SOU-MIX-LP			
N5DO	3,040	SOU-MIX-LP	K9QVB	21,744	SO-CW-LP
NØMK	1,624	SOU-MIX-LP	W9RE	11,904	SO-CW-LP
WØYJT	624	SOU-MIX-LP	WB8WKQ	8,844	SO-CW-LP
WØSEI	576	SOU-MIX-LP	K4FT	2,688	SO-CW-LP
			N9CO	1,872	SO-CW-LP
WTØDX	528	SOU-PH-HP			
KØARY	40	SOU-PH-HP	N8AP	416	SO-CW-QRP
			K2YAZ	336	SO-CW-QRP
ADØTA	1,500	SOU-PH-LP	VA3RJ	112	SO-CW-QRP
KEØNWG	528	SOU-PH-LP	KEØL	16	SO-CW-QRP
K5LGX	110	SOU-PH-LP	WD8RIF	12	SO-CW-QRP
KBØLZQ	20	SOU-PH-LP			
KDØUXO	2	SOU-PH-LP	WB9Z	49,704	SOU-MIX-HP
			W9IU	10,478	SOU-MIX-HP
WØAD	15,312	SOU-CW-HP	W9PA	3,404	SOU-MIX-HP
K7SCX	7,296	SOU-CW-HP	N2BJ	2,112	SOU-MIX-HP
KØJPL	6,800	SOU-CW-HP	KC9K	1,856	SOU-MIX-HP
AC4CA	5,952	SOU-CW-HP			
AK7O	3,008	SOU-CW-HP	VA3DF	8,640	SOU-MIX-LP
			KE8EAS	5,200	SOU-MIX-LP
KØTI	4,788	SOU-CW-LP	AB9YC	5,082	SOU-MIX-LP
KØQC	3,808	SOU-CW-LP	K9PG	4,136	SOU-MIX-LP
K5GM	1,632	SOU-CW-LP	VE3PJ	1,728	SOU-MIX-LP
KØTC	960	SOU-CW-LP			
K5TMT	576	SOU-CW-LP	KC8QDQ	924	SOU-PH-HP
			KD8ZCH	96	SOU-PH-HP
NØUR	4,240	SOU-CW-QRP			
WA7LNW	112	SOU-CW-QRP	K2DRH	7,070	SOU-PH-LP
AF5Q	16	SOU-CW-QRP	N9VPV	288	SOU-PH-LP
			K9ZM	90	SOU-PH-LP
NX5M	80,154	MSHP	NR9K	12	SOU-PH-LP
WA5PFJ	2,584	MSHP	KC9CND	12	SOU-PH-LP
WØGJ	352	MSHP			
			N9NBC	24	SOU-PH-QRP
AAØAW	12,736	MSLP			
KEØØR	258	MSLP	K9CT	27,512	SOU-CW-HP
K5LRW	130	MSLP	K9NW	16,872	SOU-CW-HP
			KE4KY	15,232	SOU-CW-HP
			KE8M	8,960	SOU-CW-HP
Central Region			VA3DX	2,880	SOU-CW-HP
(Central and Great Lakes Divisions; Ontario East, Ontario North, Ontario South, and Greater Toronto Area Sections)					
K9ZO	21,920	SO-MIX-HP	W9XT	15,688	SOU-CW-LP
K9BGL	8,064	SO-MIX-HP	N9TF	12,160	SOU-CW-LP
ND4Y	3,304	SO-MIX-HP	NA9RB	3,440	SOU-CW-LP
N9LYE	1,456	SO-MIX-HP	N8EA	2,736	SOU-CW-LP
K8ESQ	1,140	SO-MIX-HP	K8AJS	1,792	SOU-CW-LP
ND9G	12,036	SO-MIX-LP	KI9A	448	SOU-CW-QRP
W8MET	2,280	SO-MIX-LP	N9LQ	24	SOU-CW-QRP
N8CWU	1,428	SO-MIX-LP			
KD9MS	1,200	SO-MIX-LP	W8PR	60,928	MSHP
N8TCP	1,008	SO-MIX-LP	W9JP	288	MSHP
N9NE	1,596	SO-MIX-QRP	KD9GKL	9,184	MSLP
KE4TZJ	8	SO-MIX-QRP	N9CDX	2,080	MSLP
KF9US	624	SO-PH-HP			
K8DJR	260	SO-PH-HP			
			Southeast Region		
			(Delta, Roanoke and Southeastern Divisions)		
N8VZ	104	SO-PH-LP	N8OO	56,012	SO-MIX-HP
WB9W	40	SO-PH-LP	N4OX	21,384	SO-MIX-HP
KB8UUZ	36	SO-PH-LP	N4XD	18,768	SO-MIX-HP
KD8WVX	32	SO-PH-LP	N4PN	8,844	SO-MIX-HP
			N4FP	7,182	SO-MIX-HP

N8II	41,650	SO-MIX-LP	WW4CP	26,880	MSHP
K2PS	10,314	SO-MIX-LP	AD4E5	10,668	MSHP
AJ6T	6,118	SO-MIX-LP	W4YCC	3,320	MSHP
KD5J	2,090	SO-MIX-LP	K3TD	1,716	MSHP
NZ5O	1,504	SO-MIX-LP	N4SVC	4,482	MSLP
N3ZV	1,456	SO-MIX-QRP	K4OTH	416	MSLP
N4ELM	448	SO-MIX-QRP	W4BSF	64	MSLP
W1IE	312	SO-MIX-QRP	KG5IQU	24	MSLP
WB4GHZ	48	SO-MIX-QRP	Northeast Region		
N4MM	2,040	SO-PH-HP	(New England, Hudson and Atlantic Divisions; Maritime and Quebec Sections)		
W4DD	480	SO-PH-HP	K1WHS (K1BX, op)	142,058	SO-MIX-HP
W4SLT	72	SO-PH-HP	KU2M	23,328	SO-MIX-HP
K4FCG (K1KNQ, op)	1,240	SO-PH-LP	K3TC	17,422	SO-MIX-HP
KK4AND	168	SO-PH-LP	W1JA	10,696	SO-MIX-HP
KK4BZ	150	SO-PH-LP	K1VMT	10,560	SO-MIX-HP
K4PZC	132	SO-PH-LP	NS3T	3,660	SO-MIX-LP
W5DRR	60	SO-PH-LP	AC1J	3,168	SO-MIX-LP
K1TO	29,028	SO-CW-HP	K2TV	2,652	SO-MIX-LP
K4BAI	15,872	SO-CW-HP	K1MC	2,520	SO-MIX-LP
K5LG	13,192	SO-CW-HP	N2BEG	1,984	SO-MIX-LP
N4CW	6,816	SO-CW-HP	K2YGM	2,210	SO-MIX-QRP
AD4TJ	6,600	SO-CW-HP	W1TW	784	SO-MIX-QRP
N4WW (N4KM, op)	24,448	SO-CW-LP	WB2AMU	336	SO-MIX-QRP
N4TB	21,140	SO-CW-LP	AF1T	4,520	SO-PH-HP
K7SV	11,536	SO-CW-LP	AF1T	4,480	SO-PH-HP
N4ZI	10,752	SO-CW-LP	4U1WB (AJ3M, op)	480	SO-PH-HP
WB4TDH	7,600	SO-CW-LP	N3DUE	276	SO-PH-HP
K3TW	360	SO-CW-QRP	N1JHJ	110	SO-PH-HP
KC4IM	180	SO-CW-QRP	K2SDS	1,680	SO-PH-LP
KN4VV	48	SO-CW-QRP	N2HMM	280	SO-PH-LP
W8IM	16	SO-CW-QRP	N3VOP	250	SO-PH-LP
W4ZGR	8	SO-CW-QRP	NP2GG	224	SO-PH-LP
N4RV	56,600	SOU-MIX-HP	KA1AMR	216	SO-PH-LP
W4MYA	52,752	SOU-MIX-HP	K1KI	48,480	SO-CW-HP
W3IP	33,440	SOU-MIX-HP	KD4D	47,068	SO-CW-HP
W4TAA	29,412	SOU-MIX-HP	K1RM	29,824	SO-CW-HP
K5KG	22,940	SOU-MIX-HP	KW2J	13,776	SO-CW-HP
KM4HI	3,248	SOU-MIX-LP	W1ECT	11,760	SO-CW-HP
KN4FIM	448	SOU-MIX-LP	W3BGN	24,816	SO-CW-LP
W4EE	408	SOU-MIX-LP	N1IX	12,528	SO-CW-LP
K3MZ	288	SOU-MIX-LP	W3SM	7,920	SO-CW-LP
NØSMX	224	SOU-MIX-LP	K1TR	4,480	SO-CW-LP
K4LQ	7,038	SOU-MIX-QRP	W3CB	3,900	SO-CW-LP
W4ZAO	24	SOU-PH-LP	K2SM	768	SO-CW-QRP
K5KVN	8	SOU-PH-LP	KR2Q	420	SO-CW-QRP
W5TCB	6	SOU-PH-LP	W2JEK	176	SO-CW-QRP
KM4SII	2	SOU-PH-LP	KQ2RP	88	SO-CW-QRP
N6EE	21,296	SOU-CW-HP	W2BVH	48	SO-CW-QRP
N1LN	20,064	SOU-CW-HP	N1JI	48	SO-CW-QRP
NN7CW	14,784	SOU-CW-HP	K3ZU	66,752	SOU-MIX-HP
N4BP	13,776	SOU-CW-HP	W1TJL	43,100	SOU-MIX-HP
K5AUP	10,396	SOU-CW-HP	K1GQ	41,452	SOU-MIX-HP
K4GMH	4,704	SOU-CW-LP	KK1W	30,736	SOU-MIX-HP
N4UA	2,584	SOU-CW-LP	K3OO	28,480	SOU-MIX-HP
K4EJ	1,776	SOU-CW-LP	K1ZE	27,216	SOU-MIX-LP
K3KO	756	SOU-CW-LP	K1DJ	7,112	SOU-MIX-LP
N3UA	704	SOU-CW-LP	WR2G	3,162	SOU-MIX-LP
W5UE	144	SOU-CW-QRP	W1DYJ	1,958	SOU-MIX-LP
KT4Q	41,360	MSHP	N1API	1,728	SOU-MIX-LP
			W2MF	3,168	SOU-MIX-QRP

N1RR	1,260	SOU-MIX-QRP	Single Operator, Mixed Mode, Low Power	
KA1ZD	880	SOU-PH-HP	Atlantic	NS3T 3,660
KØCZH	64	SOU-PH-HP	Central	ND9G 12,036
W1PEF	44	SOU-PH-HP	Dakota	ACØW 11,760
N2RJ	24	SOU-PH-HP	Delta	KD5J 2,090
			Great Lakes	W8MET 2,280
W3LL	1,716	SOU-PH-LP	Hudson	K2TV 2,652
N2MM	67,968	SOU-CW-HP	Midwest	NWØM 3,738
N2KW	52,608	SOU-CW-HP	New England	AC1J 3,168
W3EP	51,912	SOU-CW-HP	Northwestern	N7LOX 7,120
N3RD	37,696	SOU-CW-HP	Pacific	AF6SA 1,530
W8HAP	32,448	SOU-CW-HP	Roanoke	N8II 41,650
			Rocky Mountain	KFØUR 30,150
W1QK	22,320	SOU-CW-LP	Southeastern	K2PS 10,314
NZ3D	7,680	SOU-CW-LP	Southwestern	KI6RRN 10,672
W1KM	7,392	SOU-CW-LP	West Gulf	N5JJ 7,958
K1XM	6,408	SOU-CW-LP	Canada	VE7SGW 532
K2DFC	6,120	SOU-CW-LP	Mexico	XE1H 702
			Single Operator, Mixed Mode, QRP	
K3HW	40	SOU-CW-QRP	Central	N9NE 1,596
N2NT	106,080	MSHP	Dakota	NDØC 2,210
AA1JD	101,790	MSHP	Delta	N4ELM 448
K3CCR	21,760	MSHP	Great Lakes	KE4TZJ 8
WA2JQK	18,144	MSHP	Hudson	K2YGM 2,210
WA2CP	11,928	MSHP	New England	W1TW 784
			Roanoke	N3ZV 1,456
W1FM	8,756	MSLP	Rocky Mountain	NS7K 1,170
W2NPT	1,144	MSLP	Southwestern	WA6FGV 432
KC1EWL	528	MSLP	West Gulf	NZ5G 20
W3KWH	220	MSLP	Single Operator, Phone Only, High Power	
			Atlantic	4U1WB (AJ3M, op) 480
MSHP = Multioperator, Single Transmitter, High Power			Central	KF9US 624
MSLP = Multioperator, Single Transmitter, Low Power			Dakota	WØSD (KEØHQZ, op) 10,800
SO-CW-HP = Single Operator, CW Only, High Power			Great Lakes	K8DJR 260
SO-CW-LP = Single Operator, CW Only, Low Power			Hudson	KD2NXM 30
SO-CW-QRP = Single Operator, CW Only, QRP			Midwest	WØPPF 2
SO-MIX-HP = Single Operator, Mixed Mode, High Power			New England	AF1T 4,520
SO-MIX-LP = Single Operator, Mixed Mode, Low Power			Northwestern	K7STO 16
SO-MIX-QRP = Single Operator, Mixed Mode, QRP			Pacific	W6LP (NC6R, op) 912
SO-PH-HP = Single Operator, Phone Only, High Power			Roanoke	N4MM 2,040
SO-PH-LP = Single Operator, Phone Only, Low Power			Rocky Mountain	NØWRK 1,290
SO-PH-QRP = Single Operator, Phone Only, QRP			Southeastern	W4DD 480
SOU-CW-HP = Single Operator Unlimited, CW Only, High Power			Southwestern	KD7RF 1,176
SOU-CW-LP = Single Operator Unlimited, CW Only, Low Power			West Gulf	K5TR (WM5R, op) 11,914
SOU-CW-QRP = Single Operator Unlimited, CW Only, QRP			Mexico	XE1R 260
SOU-MIX-HP = Single Operator Unlimited, Mixed Mode, High Power			Single Operator, Phone Only, Low Power	
SOU-MIX-LP = Single Operator Unlimited, Mixed Mode, Low Power			Atlantic	K2SDS 1,680
SOU-MIX-QRP = Single Operator Unlimited, Mixed Mode, QRP			Central	WB9W 40
SOU-PH-HP = Single Operator Unlimited, Phone Only, High Power			Dakota	NGØC 352
SOU-PH-LP = Single Operator Unlimited, Phone Only, Low Power			Delta	W4UT 16
			Great Lakes	N8VZ 104
			Hudson	N2HMM 280
			Midwest	KEØITC 456
			New England	NP2GG 224
			Northwestern	WZ8T 1,530
			Pacific	K6MCS 64
			Roanoke	KK4BZ 150
			Rocky Mountain	KBØSNI 484
			Southeastern	K4FCG (K1KNQ, op) 1,240
			Southwestern	NF7E 810
			West Gulf	W5PR 3,504
			Canada	VE2NCG 2
			Mexico	XE1AO 196
			Single Operator, Phone Only, QRP	
			Dakota	WBØIWG 112
			Great Lakes	N8MWK 48
			Pacific	KF6ZYD 2
			Southwestern	W6QU (W8QZA, op) 32
			West Gulf	KB5KYJ 1,036
			Mexico	XE2MZL 2

Division Winners

Single Operator, Mixed Mode, High Power	
Atlantic	K3TC 17,422
Central	K9ZO 21,920
Dakota	KØTT 83,582
Delta	N8OO 56,012
Great Lakes	ND4Y 3,304
Hudson	KU2M 23,328
Midwest	KTØK 78,584
New England	K1WHS (K1BX, op) 142,058
Northwestern	W7GKF 13,392
Pacific	K6XX 5,678
Roanoke	N4XD 18,768
Rocky Mountain	WØETT 42,848
Southeastern	N4OX 21,384
Southwestern	WA8WZG 12,300
West Gulf	N5KF 4,158
Canada	VA3TIC 30

Single Operator, CW Only, High Power			Single Operator Unlimited, Mixed Mode, Low Power		
Atlantic	KD4D	47,068	Atlantic	W6YTG	944
Central	N4TZ	4,664	Central	AB9YC	5,082
Dakota	WØOR	7,728	Dakota	NØMK	1,624
Delta	K5LG	13,192	Delta	KS4X	120
Great Lakes	W8TWA	14,552	Great Lakes	KE8EAS	5,200
Hudson	K2TTT	8,128	Hudson	WR2G	3,162
Midwest	KØKT	11,352	Midwest	WØYJT	624
New England	K1KI	48,480	New England	K1ZE	27,216
Northwestern	WJ9B	55,488	Northwestern	WA7AXT	1,022
Pacific	W6YX (N7MH, op)	41,040	Pacific	W6OAT	4,350
Roanoke	N4CW	6,816	Roanoke	KN4FIM	448
Rocky Mountain	WØZA	38,456	Southeastern	KM4HI	3,248
Southeastern	K1TO	29,028	Southwestern	K7WP	3,600
Southwestern	AA7V	18,760	West Gulf	K5KJ	13,962
West Gulf	K5NA	67,524	Canada	VA3DF	8,640
Canada	VE5UF	10,600	Single Operator Unlimited, Mixed Mode, QRP		
Mexico	XE2X	4,692	Atlantic	W2MF	3,168
Single Operator, CW Only, Low Power			New England	N1RR	1,260
Atlantic	W3BGN	24,816	Pacific	K2GMY	3,136
Central	K9QVB	21,744	Southeastern	K4LQ	7,038
Dakota	KNØV	8,904	Single Operator Unlimited, Phone Only, High Power		
Delta	N4ZI	10,752	Atlantic	KØCZH	64
Great Lakes	WB8WKQ	8,844	Great Lakes	KC8QDQ	924
Hudson	KA2D	2,520	Hudson	N2RJ	24
Midwest	KØFLY	6,032	Midwest	KØARY	40
New England	N1IX	12,528	New England	KA1ZD	880
Northwestern	K7GS	5,168	Rocky Mountain	WTØDX	528
Pacific	KH6CJJ	3,640	Southwestern	W2RD	1,666
Roanoke	K7SV	11,536	Single Operator Unlimited, Phone Only, Low Power		
Rocky Mountain	WKØP	6,688	Atlantic	W3LL	1,716
Southeastern	N4WW (N4KM, op)	24,448	Central	K2DRH	7,070
Southwestern	WA7NB	16,500	Dakota	KEØNWG	528
West Gulf	AE5GT	18,000	Delta	K5KVN	8
Canada	VE5GC	8,976	Great Lakes	KD8BB	2
Single Operator, CW Only, QRP			Midwest	KBØLZQ	20
Atlantic	K2SM	768	Northwestern	WA7YXY	140
Central	KEØL	16	Pacific	N6ORB	48
Dakota	KEØTT	20	Roanoke	W4ZAO	24
Great Lakes	N8AP	416	Rocky Mountain	ADØTA	1,500
Hudson	KR2Q	420	Southwestern	K7HKR	90
Midwest	WØCW	1,232	West Gulf	K5LGX	110
New England	N1JI	48	Mexico	XE2JS	868
Northwestern	K7HBN	644	Single Operator Unlimited, Phone Only, QRP		
Pacific	WD6DX	108	Central	N9NBC	24
Roanoke	KC4IM	180	Single Operator Unlimited, CW Only, High Power		
Rocky Mountain	W5TTE	80	Atlantic	N2MM	67,968
Southeastern	K3TW	360	Central	K9CT	27,512
Southwestern	NU7Y	64	Dakota	WØAD	15,312
West Gulf	N5OE	3,920	Delta	K3IE	3,608
Canada	VA3RJ	112	Great Lakes	KE4KY	15,232
Single Operator Unlimited, Mixed Mode, High Power			Hudson	W2LE	3,456
Atlantic	K3ZU	66,752	Midwest	KØJPL	6,800
Central	WB9Z	49,704	New England	N2KW	52,608
Dakota	KØKX	53,430	Northwestern	K7DSE	2,124
Delta	K5RM	8,064	Pacific	K7XC	4,032
Hudson	AB2DE	4,004	Roanoke	N1LN	20,064
Midwest	K3PA	30,024	Rocky Mountain	K7SCX	7,296
New England	W1TJL	43,100	Southeastern	N6EE	21,296
Northwestern	N7NM	40,392	Southwestern	N6SS	62,208
Pacific	K3EST	51,408	West Gulf	AC4CA	5,952
Roanoke	N4RV	56,600	Canada	VE6BBP	8,256
Rocky Mountain	NG7M	30,544	Single Operator Unlimited, CW Only, Low Power		
Southeastern	W4TAA	29,412	Atlantic	NZ3D	7,680
Southwestern	KY7M (KY7M, op @NA7TB)	81,030	Central	W9XT	15,688
West Gulf	N5XZ	64,056	Dakota	KØTI	4,788
Canada	VE5MX	8,234	Delta	W4TTM	100
			Great Lakes	N8EA	2,736
			Hudson	K2DFC	6,120
			New England	W1QK	22,320

Northwestern	K7QA	336
Pacific	KD6WKY	1,984
Roanoke	K4GMH	4,704
Southeastern	K4EJ	1,776
Southwestern	K6WSC	8,064
West Gulf	K5GM	1,632
Canada	VE3VY	280
Mexico	XE2B	2,736
Single Operator Unlimited, CW Only, QRP		
Atlantic	K3HW	40
Central	KI9A	448
Dakota	NØUR	4,240
Delta	W5UE	144
Rocky Mountain	WA7LNW	112
West Gulf	AF5Q	16
Multioperator, Single Transmitter, High Power		
Atlantic	K3CCR	21,760
Central	W9JP	288
Great Lakes	W8PR	60,928
Hudson	N2NT	106,080
Midwest	WØGJ	352
New England	AA1JD	101,790
Northwestern	K7JR	13,764
Pacific	W7RN	31,140
Roanoke	WW4CP	26,880
Southeastern	KT4Q	41,360
Southwestern	WØRIC	81,840
West Gulf	NX5M	80,154
Canada	VE9CB	110
Multioperator, Single Transmitter, Low Power		
Atlantic	W3KWH	220
Central	KD9GKL	9,184
Dakota	AAØAW	12,736
Delta	W4BSF	64
Hudson	W2NPT	1,144
New England	W1FM	8,756
Northwestern	W7TVC	17,150
Roanoke	K4OTH	416
Rocky Mountain	K5LRW	130
Southeastern	N4SVC	4,482
Mexico	XE2N	168