



# 160 Meter Contest

## 2015 Results

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### ***History Meets the Future at the Bottom of the Ham Radio Spectrum***

“200 Meters and Down” was the range of wavelengths assigned to Amateur Radio in the Radio Act of 1912. Each year, the ARRL 160 Meter Contest provides a reason for all hams to revisit the band that best represents this early history of our hobby. With the allocation and upcoming permission to operate two new low frequency bands (600 meters and 2200 meters), this contest is also an excellent way to get better acquainted with the unique propagation and equipment challenges found in the lower part of the spectrum.

One enthusiastic participant who embraced ham radio history for the 2015 contest is Mike Dormann, W7DRA, of Seattle, WA. Mike’s station is a lot like those assembled by many hams soon after WW II.

*“After being kicked in the pants by AB7E for giving up contesting because of illness, I put together a rig for the ARRL160, a brand new (?) Hallicrafters S40 with a roofing filter and a BC453 Q5er along with an ARC5 VFO and a 6AG7/2x807 MOPA. The final plates have 243 volts at 25 milliamps, giving a rousing 6 watts input (I have no way to measure output power).*”



W7DRA’s shack, including both vintage equipment and recently-built radios using methods and parts from a bygone era in ham radio. (Photo credit – Mike Dormann, W7DRA)

*OK, I really don’t know what a roofing filter is, but all the big guys seem to have one. I assume 5 stages of 455 kcs IF including a 5 kcs crystal filter and a 455 kcs narrow band filter approximates one for an S40. And I know serious 160 meter operators use more than one receiving antenna so I have two; a 3 turn loop mounted on the top of the S40 and a beverage (300 feet of wire lying on the ground going down the hill behind the radio cabin).[for our younger readers, “kcs”is the vintage terminology for kHz – ed.]*

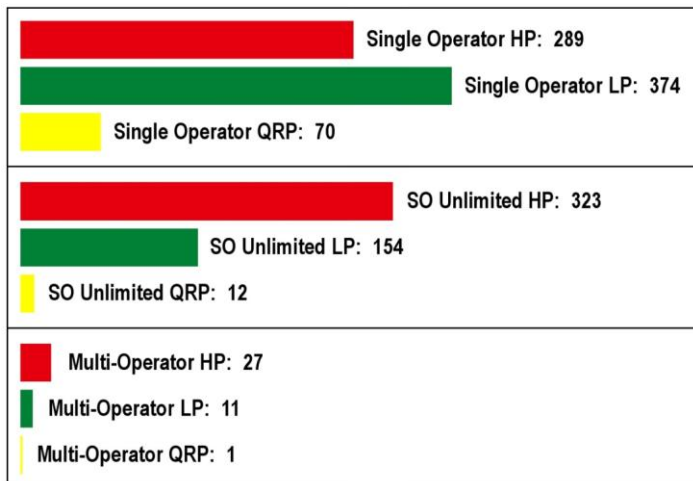
*The real key to 160 meter contest operation is the transmitting antenna, which here is a halfwave inverted L and the ubiquitous FCP [Folded CounterPoise].”*

*I ended up with 52 contacts and 23 sections, for me, a good effort.”*

Fast-forward to the present day. The recently-added Unlimited (aka “assisted”) categories allow single-operator entrants to use spotting networks and the latest signal detection and decoding technology. Traditional spotting networks are rapidly evolving from manually posted spots to automatic acquisition using VE3NEA’s *CW Skimmer* software. Receivers and computers running *CW Skimmer* located around the world are aggregated into a “Reverse Beacon Network” or RBN ([www.reversebeacon.net](http://www.reversebeacon.net)), reporting the call and frequency of stations calling “CQ contest” to anyone with an Internet connected logging program!

Knowing who is on the air and where to find them is no longer limited to the Multi-Operator category. First introduced in 2014, this type of operating has grown rapidly in popularity — in the 2015 contest, more than 41% of the submitted logs claimed the use of assistance! Of course, the other 59% opted to find stations with their own ears, radios and antennas. But there is no escaping the advance of technology. Any station that finds a frequency to call “CQ Contest” is likely to be heard and reported by the RBN, resulting in a rush of Unlimited and Multi-Op stations answering those CQs.

Here's a chart showing how many entries there were for each category. The small number of Multi-Operator entries is immediately apparent!



Entries by category. Note the small number of multi-operator entries, a major change after adding the Unlimited category for single operators in 2014.

Before 2014, single operators who wished to use assistance were required to enter the Multi-Operator category. Now, those hams are part of the Unlimited categories, while Multi-Operator entries include only those that actually had more than one person operating the station.

Your choice of category could be quite interesting. Will you adopt a classic attitude and eschew assistance in favor of your own ears and experience? Or, will you embrace current technology and operate an Internet-connected station with modern contesting software that lets you “point-and-shoot” instead of “search-and-pounce”? Either way, there is a place for you. Just show up and join the fray!

### Single-Operator, High Power

At the top of the listing is a familiar call sign, VY2ZM, where Jeff Briggs, K1ZM, once again mounted a successful low band contest effort from Prince Edward Island. Second place was captured by Peter Briggs, K3ZM, from his Virginia QTH. After the contest, Jeff offered these reflections on the competition between contesting brothers:

*“I was able to get back on from PEI again this year for ARRL 160M. It was great to be back up here versus down in Coastal New England. The condx into EU are far better from here, I think.*

*“My brother Peter (K3ZM) and I had a horserace of sorts—but it is totally unfair really since I am so much closer to Europe. Peter does superbly well from coastal*

*VA however and the results every year confirm this. NEXT YEAR, I think will go LOW POWER and Peter will go HIGH POWER, and we can then see what that brings. It may provide a real interesting horserace to try that one year —HI. No additional news here—same station—just an OLDER and SLOWER operator at the controls.”*

Single-Operator, High Power	Score
VY2ZM	610,176
K3ZM	479,364
NO3M	431,238
AA1K	417,728
K1LT	354,368
W3BGN	347,510
WØSD (WØDB, op)	319,696
N2YB	304,873
WD5R (N5ECT, op)	285,984
K1KI	276,003

### Top Ten W/VE Scores, Single-Operator, High Power

The remaining SOHP Top Ten list has many familiar callsigns, with Eric, NO3M, Jon, AA1K, and Victor, K1LT, rounding out the top five.

Both K3ZM and K1LT posted extensive comments and stories to the “3830” list on [contesting.com](http://contesting.com) – along with a number of other excellent contest stories. As you read this and recall your own contest experience, it should be fun to look up the 3830 Soapbox stories and read them once again! A few are included at the end of this article.

### Single-Operator, Low Power

George Dubovsky, N4UA, took the #1 spot SOLP in the 2015 contest from his QTH in central Virginia. The next few spots represent much of the eastern half of the US: Carl, W2TZ, in New York; Greg, K9IG, in Indiana; Charlie, NØTT, near Kansas City, Missouri; and Ed, K8NVR, not far from Cleveland, Ohio.

Single-Operator, Low Power	Score
N4UA	222,255
W2TZ	193,152
K9IG	192,720
NØTT	192,060
K8NVR	171,398
KØTT	166,697
WB8JUI	162,272
K9MMS	157,708
N9NB	156,072
NE9U	154,360

### Top Ten W/VE Scores, Single-Operator, Low Power

Greg, K9IG, described his contest experience in a post to the Society of Midwest Contesters reflector:

*“Wish I had a dollar for every CQ. Wow. Hardly any S&P, lots of CQs. Thank goodness for 250 Hz filters, that’s all that saved my sanity. I also tried to stay low in the band this year and it seemed to work better for me.*

*My Rx array went dead in the middle of the night on Friday with only the NE array working. I gave up and got some sleep. Saturday I was able to fix the antenna, something chewed through the other arrays ...never fails.*

*Afterward it was off the circus with my 5 year old, to deal with a couple more clowns :-)”*

### Single-Operator, QRP

A high-quality antenna system can make 5 watts sound like a LOT more. Bill Johnson, KVØQ, in Colorado nearly scored well enough to make the Top Ten list for low power! Although well behind Bill, the next several QRP finishers represented themselves well. Rounding out the top five are: Vlado, N3CZ, in North Carolina; Mike, W3TS, in Pennsylvania; Gary, KA1J, in Connecticut; and Manny, W2MF, in New Jersey.

Single-Operator, QRP	Score
KVØQ	151,432
N3CZ	62,859
W3TS	61,732
KA1J	58,344
W2MF	51,842
N7IR	46,728
NK8Q	43,906
N8BB	42,804
WTØA (KE5RX, op)	40,089
K9JWV	21,675

**Top Ten W/VE Scores, Single-Operator, QRP**

### Multi-Operator, High Power

The crew at W2GD on the New Jersey shore keeps setting a very high bar for other multi stations to strive for. The 2015 ARRL 160 Meter Contest saw them achieve a convincing victory, 27% higher than the second place crew out in Iowa at Toni, NØNI’s, fine station.



It seems every Internet story these days has a cat photo—our obligatory shot comes from Gary, KA1J. “I had a lot of QRC during the contest (C = Cat). This proved to be formidable interference to making Qs.” —Gary, KA1J. (Photo credit – Gary Smith KA1J)

John, W2GD’s, post-contest story demonstrates how much work is involved getting an major temporary facility ready for a contest:

*“As always our team tries to keep the ARRL 160 a somewhat low key event...it’s a shake-down cruise for the Stew [the Stew Perry Topband Distance Challenge – ed.] and CQ160...to test the re-installed two element TX system on the FM broadcast tower out in the salt marsh near Barnegat Bay and all the RX options. We thought we were somewhat ahead of the curve this time having done most of the TX and Beverage cabling the weekend before CQWW CW (the TX antenna and Beverage feedlines are all stored away during the summer hurricane season). Setup on Friday presented about the normal number of challenges both in the shack (a fried 2S1 switch, mislabeled cables) and outside in the woods too (extensive tree damage to five of the six beverages) ...but somehow a full ten minutes before the bell it all came together ready to rock and roll! Thanks to SJDXA members KI4KWR and WS2G for lending a hand.”*

Multi-Operator, High Power	Score
W2GD	553,656
NØNI	424,446
N1LN	421,767
WB9Z	384,540
N3RR	299,750
K5NA	286,308
W4HZ	216,424
K5KC	212,042
VE2OJ	203,010
K3MJW	178,281

**Top Ten W/VE Scores, Multi-Operator, High Power**



NØNI collected the most QSOs of any station in the contest, in any category, while W2GD had the highest multiplier total. Down in North Carolina, the crew at NILN posted a >400k score, while Jerry's gang at WB9Z came up just short of that number after log checking. Jerry, WB9Z, summed up the joy of multiop quite nicely:

*"Some of our team, including myself, have operated together in this contest for decades, so it is always fun to get together to do serious radio, DX, eat great food, tell tall stories and have a lot of laughs."*

### Multi-Operator, Low Power

Down in Florida, Steve, N2CEI, noted the following in his 3830 post:

*"Did not have time to test out the Remote and new RX system with the Power Amplifier so—ran without it! Worked way too hard but— it was fun!"*

Multi-Operator, Low Power	Score
N2CEI	194,106
K8UO	81,322
W5WTM	32,565
N3RN	17,934
WAØRBW	10,988
W6OFM	9,988
W3HAC	7,752
NY2NY	6,664
N9MT	3,072
KD7EJI	304

#### Top Ten W/VE Scores, Multi-Operator, Low Power

Of course, winning your entry category is always fun. N2CEI's group more than doubled the score of the next MOLP entry, K8UO in Michigan, using the club call of the Utica-Shelby Emergency Communication Association.

### Single-Operator Unlimited, High Power

This category is becoming the choice of many top operators (and their well-equipped stations). John Sluyster, VE3EJ, fits both of those characteristics, and he won this category handily from his eastern Ontario location.

In the middle of the continent, Craig, K9CT, (another top op with a great station) took second place from central Illinois. Craig's 3830 comments include some of the reasons why 160 Meter contests are special events:

*"This contest is really one of the best CW events. Lots of good operators and signals filling the bands. Not too many bad signals either...everyone can play fairly close*

*together unless you get a few clix from an older or mis-adjusted radio."*

Single-Op Unlimited, High Power	Score
VE3EJ	466,830
K9CT	375,015
W1WMU	362,516
K3WW	360,510
KF3B	355,308
W3UA (NU3C, op)	322,847
W8MJ	275,706
VE3RZ	274,536
N2CU	273,130
N3QE	248,570

#### Top Ten W/VE Scores, Single-Op Unlimited, High Power

The next several stations on the results list were all strong contenders, including Pat, W1WMU, in Maine; Chas, K3WW, in Eastern PA, Alan KF3B, also in EPA; and W3UA in New Hampshire, operated by George, NU3C.

### Single-Operator Unlimited, Low Power

This group had the closest finish in any category, with John Colyard, W4IX, in South Carolina, edging out Bob Liddy, K8BL, in Ohio, by just a 2% score difference. Both logs had similar error rates, and it was mathematically possible that a more accurate log by K8BL could have changed the order of finish.

Single-Op Unlimited, Low Power	Score
W4IX	205,412
K8BL	201,275
KØTI	168,744
N9CK	162,810
K8FC	161,210
VE3MGY	161,128
K1PTF	124,558
N3UA	119,048
K3MD	118,080
K4WI	111,144

#### Top Ten W/VE Scores, Single-Op Unlimited, Low Power

The next group (#3 through #6) were closely bunched together, with less than 5% spread: Dan, KØTI, in Minnesota; Steve, N9CK, in Wisconsin; Joe, K8FC, in Western NY, and Brian, VE3MGY, in Ontario South.

## Single-Operator Unlimited, QRP

Regular QRP competitor, Glenn, WØGJ, entered the Unlimited category in 2015, earning the top spot in the QRP category. Second place was another strong entry by Marty, N9SE, followed by Allen, N2KW, in the Western Massachusetts Section.

Single-Op Unlimited, QRP	Score
WØGJ	135,576
N9SE	113,520
N2KW	85,690
N4IJ	35,989
NØUR	27,500
W2DPT	18,179
AA4XX	16,550
K8ZT	12,408
K6MI	10,212
WE9R	6,020

### Top Ten W/VE Scores, Single-Op Unlimited, QRP

What do QRPer's use for antennas? Well, N9SE used an "Inverted-L with two elevated radials, HB Shared Apex Loop RX antenna."

## DX Results

You can see the listings for the results in the various categories, so I'll just pick some particularly interesting operations for comment:

The highest DX score in any category was from XE2X. Jorge operated in the Single-Operator, High Power category, and the proximity to the rest of North America gave him many QSO opportunities. A bit farther away, the PJ2T station, operated by Gene, KB7Q, posted a very good score in this entry category. Laci, OM2VL was the top European in SOHP, with SN5X (SP5GRM, op.) close behind.

SOHP Unlimited had a good effort by Alan, VP9/N3AD, despite major participation from Mr. Murphy:

*"Three hours into the contest noticed no signals and high SWR. It was already too dark (and too wet) to work on antenna. So that was it for first night. In the morning found a blown balun. Ed and I fixed antenna and all OK for second night. I guess score OK for half a contest. Can't say it was fun."*

Other serious competitors in this category were Kam, N3KS, at TI5W and intercontinental leader Ron, GW3YDX.

Single-Op, High Power	Score	Single-Op Unlimited, High Power	Score
XE2X	186,490	KP2Q (K3TEJ, op)	155,190
PJ2T (KB7Q, op)	102,800	VP9/N3AD (N3AD, op)	125,356
XE2S	83,804	TI5W (N3KS, op)	122,634
ZF2AH	60,984	GW3YDX	38,584
OM2VL	28,560	KP3W	22,302
SN5X (SP5GRM, op)	22,792	OK7M (OL6X, op)	21,168
GM4ZUK	15,752	EI2CN	19,834
OK2W	15,750	EA7KW	15,768
CT1CJJ	8,446	S51V	15,190
F6GOX	8,342	DK2FG	6,364
Single-Op, Low Power	Score	Single-Op Unlimited, Low Power	Score
HI8A	5,320	C6AUM (K4RUM, op)	105,300
ON7EH	3,304	HA4XH	8,050
ON6NA	2,958	KP2DX (KP2BH, op)	1,220
XE2ST	2,560	OL1A (OK1CW, op)	1,188
XE1AY	2,184	UT7VR	850
OK2BMU	1,026	V31MA	338
OK1CZ	736	G3RLE	286
CO8DM	672	G4DBN	240
DL5CL	600	JA1KVT	234
G3VGZ	162	EU2EU	200
Single-Op, QRP	Score	Multi-Operator, High Power	Score
JH4UYB	2	JA3YBK	3,240
		DL7AU	672
		OH2BCI	408

### Top DX Scores by Category

Low power entrant Michel, ON7EH, had these comments:

*"As could be expected, only S&P operation. It was often long waiting to get over the calling US/VE-stations on day 1 and Europe on day 2. After the first night +*

morning, we had a disappointing 20 stations; the second day brought another 39!

The Sunday morning sunrise propagation-boost was hoped for and some 12 QSOs in half an hour resulted, including the contest ODXs: WØAIH, K9CT, WB9Z and NA8V. Best DX heard was WØSD.”

## Regional Notes

I always take a look at how each contest behaved at different places across North America. Compared to recent years, the 2015 contest had a bit better results away from the eastern part of the continent.

In the SOUHP category, Craig, K9CT, took second place from Illinois, and in the “original” SOHP, WØSD (WØDB, op.) managed a 7th place finish from South Dakota, while Arkansas station WD5R (N5ECT, op.) came in at 9th place.

Multi-Op, High Power stations from the center of the US made themselves known, with Toni’s crew at NØNI in 2nd, WB9Z in 4th from Illinois, K5NA in 6th from the STX section and K5KC taking 8th from Oklahoma.

Low Power and QRP are always a cross-continental mix in the Top Ten lists. In SOLP, 7 of the Top Ten were in OH, MI, IN, IL, WI, MO and MN. SOULP saw similar results, with the STX, OH, MN, WI, and ONS sections all showing up in the Top Ten.

Finally, at the QRP power level, there is good representation from more western locations! The SOQRP winner KVØQ is in Colorado, with 7th place N7IR checking in from Arizona, 8th place WTØA in Nebraska and 10th place K9JWV making the list from Utah. Unlimited winner WØGJ is in Iowa, and the farthest west of all stations making any Top Ten list at 9th place is John, K6MI, in the SJV section.

## A Note on the Importance of Contest Clubs

Contest clubs provide both camaraderie and mutual assistance among members. New and experienced contesters have a place to mingle, and it doesn’t matter whether you have several towers, kW amplifiers and the latest equipment or wires in the trees and vintage radios. A little math tells us that the three Unlimited clubs (50 logs or more) represent 18% of all submitted logs. Add the top ten Medium clubs and that number doubles.

Affiliated Club Competition		
Club Name	Score	Entries
<b>Unlimited Category</b>		
Potomac Valley Radio Club	6,176,891	86
Yankee Clipper Contest Club	5,210,489	73
Society of Midwest Contesters	3,851,175	68
<b>Medium Category</b>		
Frankford Radio Club	4,645,167	47
Minnesota Wireless Association	2,845,864	47
Contest Club Ontario	2,019,644	28
North Coast Contesters	1,224,778	12
Mad River Radio Club	1,191,818	12
Arizona Outlaws Contest Club	927,268	23
Alabama Contest Group	758,096	13
Tennessee Contest Group	739,308	17
Northern California Contest Club	729,728	22
CTRI Contest Group	643,071	5
Florida Contest Group	618,466	19
Iowa DX and Contest Club	614,282	3
South East Contest Club	572,531	10
Central Texas DX and Contest Club	520,214	8
Louisiana Contest Club	427,178	6
Western Washington DX Club	417,501	8
Willamette Valley DX Club	382,064	8
Mississippi Valley DX/Contest Club	374,488	4
Kentucky Contest Group	369,056	10
Georgia Contest Group	343,721	5
Grand Mesa Contesters of Colorado	343,148	7
Rochester (NY) DX Assn	330,064	7
DFW Contest Group	292,034	13
Swamp Fox Contest Group	269,469	4
Southern California Contest Club	261,490	14
Big Sky Contesters	200,420	4
North Texas Contest Club	194,809	5
Carolina DX Association	187,354	4
Utah DX Association	171,097	4
Hudson Valley Contesters and Dxers	150,770	6
Orca DX and Contest Club	147,646	3
Radiosport Manitoba	91,822	3
<b>Local Category</b>		
Central Virginia Contest Club	390,879	6
Niagara Frontier Radiosport	317,227	6
North Carolina DX and Contest Club	312,913	4
599 DX Association	303,629	3
Northeast Wisconsin DX Assn	240,254	3
Kansas City Contest Club	214,100	6
Maritime Contest Club	185,216	4
Mall City Contest Group	159,724	3
Bristol (TN) ARC	153,773	4
Spokane DX Association	148,674	4
Delara Contest Team	143,298	3
Mother Lode DX/Contest Club	123,299	5
West Park Radiops	85,820	4
Metro DX Club	71,169	6
Meriden ARC	10,276	3

When we take all the clubs' entries into account, the total is 53% of all logs. That's pretty convincing evidence of the value contest participants place on their local or regional clubs! Find your nearest club on the ARRL website, or ask a local ham you know is an active contester. You will learn how to be more competitive — and have more fun — in your future forays into contesting.

### The Wrap Up...

There is plenty of time until December 2-4, 2016, when the next ARRL 160 Meter Contest will fill the Medium Wave spectrum with signals. Use it wisely to get your equipment and antennas into proper shape for another weekend spent exploring the fascinating realm of low-frequency ham radio!

### Soapbox and E-mail Comments

As I've done for several years, your author selected some comments from posts to the "3830" list, Soapbox comments submitted with the logs, notes from a couple club e-mail lists, and private e-mails. I've organized them by topic—I think this collection will give you some useful insight into the contest from a wide range of perspectives.

#### Band Conditions—

*Friday night: very high noise level — mostly S9 on inverted L. Saturday night: noise dropped to S5 to S6 on inverted L — much quieter. Not much DX heard. Surprised to not hear many of the usual NA and EU DX stations that are often on top band. No DX heard during my sunrise. —K9MMS*

*The first night much better here. — OK7M (OK1DIG)*

*Conditions seemed better on Sunday morning. — GW9J (GWØGEI)*

*Always enjoy this one ...EU signals were good but not enough of them on. —VO1HP*

*I thought 160m was in good shape, and I was very pleased with the amount of DX I worked. I missed several western Canadian and US sections, and California in particular seemed hard to hear. I worked just about everything I heard. —VE9CB*

*The Grinch stole the band for most of Saturday. He finally gave it back on Sunday morning. Low score reflects the band conditions — tough year for QRP. Thanks for the contacts and your extreme patience. — N7IR*

#### Station Descriptions—

*Another field day style expedition to my cabin in northern Wisconsin. Balmy conditions to string up my 30 foot inverted L and K9AY loop....last year I was tromping through 3 feet of snow...this year 1/4 inch of snow and lake is still open water! —NE9U*

*Thanks to all who participated. This was mostly a test of a new antenna that I installed this past summer - a full sized delta loop with it's flat top around 170ft above the ground. I used a drone that I modified to 'carry and drop' using a remotely controlled electro-permanent magnet in order to drop the loop corner lines precisely over the (really high) tree branches. The antenna seemed to work well, although I haven't done an RBN analysis yet to confirm. —TI5W (N3KS)*

*Antenna: 140 foot inverted vee fed with window line..lots of tuning with the antenna tuner. —NOBUI*

*A casual effort from K2LE/1. K3, 1500w and phased Inverted-Ls. Not much from the west. Europe was better second night. NE/SW Beverage still not working properly. —W1VE*

*This was a last minute remote operation from a hotel room Sunday morning from 2am to 6am. I ran a K3 radio thru a KPA-500 amplifier into a 160-dipole @ 70 feet. For those stations who heard me, if my operation seemed a bit erratic it was due to internet latency disrupting an orderly operation. Thank y'all for your patience. —WQ6X (@NX6T)*

#### Operating Experiences—

*Somehow CW just sounds better on 160 meters. — WW9R*

*My ham radio computer crashed big time ( power supply failure) just as the contest was starting. I unpacked my other computer, loaded and configured software, installed drivers for usb to serial cables and then it was time to give it a quick test before contesting. My dummy load was still packed (new qth) so I turned the power output on the K3 down to "Zero" and hit F4 to send my call. Much to my surprise I heard my call and a report come back to me! I hit F2 to send my exchange. NO3M must have a suburb set of ears to hear that "Zero" output! —WA5POK*

*My only RX antenna this time was the Hi-Z Tri-angle array. It was the first season using it as the only RX antenna. On occasion I found it to be a bit too directional! When the signals were strong it didn't matter, but on weaker signals, I either missed them or*

*had to hunt for them with the direction switch. — K3SWZ*

*With last year's contacts and occasional operating through the year, I entered this year's contest only needing VT, WV, and LA [for WAS]. I wound up with 146 QSOs and worked two LA and two VT stations. Never even heard a WV station. I thought, from my meager perspective, that there were more stations on this year than last year... —W6JHB*

*Had the vertical and linear all oiled up and ready to go. Got home at just before 0000 GMT and discovered the test started two hours earlier! Grandkids showed up two hours later. Managed to operate a record busting 1 hour. Came home from church, and found out stations were boiling in an hour or so after my sunrise. Too embarrassed to submit a log! [But now you confess everything!] —KM1R*

*Goal was to simply dabble in this contest and have fun. Mission accomplished. —K3WA*

*Thanks all for the contacts! Working US stations on topband from LY is always a fun. —LY2XW*

#### ***Visits from Murphy—***

*Just a bit of time to play radio this evening. I tried to fix an RFI problem with a newly installed touch faucet in the kitchen. The ferrite didn't help — 100 watts would turn the water on — so I ran a KW. —WB6JJJ*

*I had a lot of problems with N1MM and the K1EL Winkeyer. Worked fine the rest of the year, so it must be an RF issue limited to 160M. —K8BKM*

*My antenna system was uncooperative so I couldn't get full power out. Hence the low power category this time. —N3KN*

*Shortly before the start, my K3 mysteriously went nearly deaf, hearing only the loudest of callers. Spent 10 minutes checking antenna connections and finally by chance I discovered it was a problem with the narrow CW filter that had somehow quit. Opening up the width control to the next filter gave normal signal levels. Managed a strong first hour nevertheless (152 q's). —AA1K*

*Bad news at N5UM — Ice storm brought down some of the antennas and did major tree damage. Good news at N5UM — the 160 meter antenna survived so was able to work this contest. —N5UM*



## DIVISION LEADERS

Division	Single-Op, High Power	Single-Op, Low Power	Single-Op, QRP	Single-Op Unlimited, High Power	Single-Op Unlimited, Low Power	Single-Op Unlimited, QRP	Multi-Op, High Power	Multi-Op, Low Power
<b>Atlantic</b>	NO3M	W2TZ	W3TS	K3WW	K8FC		W2GD	N3RN
<b>Central</b>	WØAIH (KØTG, op)	K9IG	W9SE	K9CT	N9CK	N9SE	WB9Z	N9MT
<b>Dakota</b>	WØSD (WØDB, op)	KØTT	NNØQ	KØIDX	KØTI	NØUR	KØJE	WAØRB W
<b>Delta</b>	WD5R (N5ECT, op)	K3IE	W6UB	N5CW	W4TTM			
<b>Great Lakes</b>	K1LT	K8NVR	N8BB	W8MJ	K8BL	K8ZT		K8UO
<b>Hudson</b>	K2TTT	K2TTM	K2JT	N2GC	WA2JQK	W2DPT		NY2NY
<b>Midwest</b>	KIØI	NØTT	WTØA (KE5RX, op)	K2DSW	KØJPL	WØGJ	NØNI	
<b>New England</b>	K1KI	N1JD	KA1J	W1WMU	W1WBB	N2KW	K1VR	
<b>Northwestern</b>	WJ9B	A17H	W7DRA	KA6BIM	K7LFY			KD7EJI
<b>Pacific</b>	N6NF	N6RK	K6EI	NR6O (JG3KIV, op)	K6MI		W7RN	W6OFM
<b>Roanoke</b>	K3ZM	N4UA	N3CZ	K2AV	W4IX	AA4XX	N1LN	
<b>Rocky Mountain</b>	K7IA	WØDLE	KVØQ	K7SCX	KØRI			
<b>Southeastern</b>	N4PN	WA1FCN	W5NZ	AA4CF	K4WI		WX4ML B	N2CEI
<b>Southwestern</b>	N7GP (N5IA, op)	AC7A	N7IR	KY7M	W8KA		W7FSL	
<b>West Gulf</b>	K5WA	WØUO	N5OE	K5ZO	K5KJ	N4IJ	K5NA	W5WTM
<b>Canada</b>	VY2ZM	VE3CFK	VE7VV	VE3EJ	VE3MGY		VE2OJ	

## Regional Leaders

SOQRP/LP/HP = Single-Op; SOULP/HP = Single-Op Unlimited; MSL/MSH = Multi-Operator, Single Transmitter

Northeast Region			Southeast Region			Central Region			Midwest Region			West Coast Region		
New England, Hudson and Atlantic Divisions; Maritime and Quebec Sections			Delta, Roanoke and Southeastern Divisions			Central and Great Lakes Divisions; Ontario Section			Dakota, Midwest, Rocky Mountain and West Gulf Divisions; Manitoba and Saskatchewan Sections			Pacific, Northwestern and Southwestern Divisions; Alberta, British Columbia and NWT Sections		
Call	Score	Cat	Call	Score	Cat	Call	Score	Cat	Call	Score	Cat	Call	Score	Cat
W3TS	61,732	SOQRP	N3CZ	62,859	SOQRP	N8BB	42,804	SOQRP	KVØQ	151,432	SOQRP	N7IR	46,728	SOQRP
KA1J	58,344	SOQRP	W6UB	20,682	SOQRP	N3CO	21,164	SOQRP	WTØA	40,089	SOQRP	VE7VV	19,175	SOQRP
W2MF	51,842	SOQRP	KW4JS	13,320	SOQRP	W9SE	19,788	SOQRP	(KESRX, op)			K6EI	5,628	SOQRP
NK8Q	43,906	SOQRP	N4IVE	9,204	SOQRP	W9CC	17,442	SOQRP	K9JWV	21,675	SOQRP	AE6JV	3,875	SOQRP
KU1N	20,812	SOQRP	KA3EHL	7,704	SOQRP	K88U	10,962	SOQRP	N5OE	17,974	SOQRP	N6LL	3,151	SOQRP
W2TZ	193,152	SOLP	N4UA	222,255	SOLP	K9IG	192,720	SOLP	KIØII	9,660	SOQRP	N6RK	78,001	SOLP
N1JD	110,208	SOLP	N9NB	156,072	SOLP	K8NVR	171,398	SOLP	NØTT	192,060	SOLP	VE7SL	47,656	SOLP
N1IX	94,402	SOLP	WA1FCN	111,150	SOLP	WB8JUI	162,272	SOLP	KØTT	166,697	SOLP	VE6WQ	44,400	SOLP
N3BUD	87,308	SOLP	WA4PSC	108,205	SOLP	K9MMS	157,708	SOLP	WØDLE	150,612	SOLP	AI7H	42,770	SOLP
W2MMD	84,932	SOLP	K1DC	107,672	SOLP	NE9U	154,360	SOLP	W7SE	104,076	SOLP	AC7A	39,830	SOLP
(WK2G, op)									WØUO	102,816	SOLP			
VY2ZM	610,176	SOHP	K3ZM	479,364	SOHP	K1LT	354,368	SOHP	WØSD	319,696	SOHP	N7GP	241,947	SOHP
									(WØDB, op)			(N5IA, op)		
NO3M	431,238	SOHP	WD5R	285,984	SOHP	VE3PN	203,424	SOHP	NEØU	169,482	SOHP	WJ9B	166,754	SOHP
AA1K	417,728	SOHP	(N5ECT, op)											
			N4PN	182,868	SOHP	WØAIH	202,500	SOHP	KIØI	157,035	SOHP	N9RV	159,488	SOHP
						(KØTG, op)								
W3BGN	347,510	SOHP	N4AF	173,524	SOHP	W9RE	194,496	SOHP	KØDEQ	140,187	SOHP	N5CR	135,459	SOHP
N2YB	304,873	SOHP	K4SV	145,600	SOHP	NX9G (@	164,862	SOHP	K7IA	95,940	SOHP	VE6BBP	120,120	SOHP
						K9XD)								
N2KW	85,690	SOUQRP	AA4XX	16,550	SOUQRP	N9SE	113,520	SOUQRP	WØGJ	135,576	SOUQRP	K6MI	10,212	SOUQRP
W2DPT	18,179	SOUQRP	KG4IGC	5,568	SOUQRP	K8ZT	12,408	SOUQRP	N4IJ	35,989	SOUQRP	K7LFY	59,840	SOUQRP
K1TW	160	SOUQRP	W4IX	205,412	SOUQRP	WE9R	6,020	SOUQRP	NØUR	27,500	SOUQRP	KG7YUV	46,505	SOUQRP
K8FC	161,210	SOUQRP	N3UA	119,048	SOUQRP	K8BL	201,275	SOUQRP	KØTI	168,744	SOUQRP	W8KA	29,146	SOUQRP
K1PTF	124,558	SOUQRP	K4WI	111,144	SOUQRP	N9CK	162,810	SOUQRP	ACØW	110,290	SOUQRP	W6RW	14,784	SOUQRP
K3MD	118,080	SOUQRP	W4TTM	40,176	SOUQRP	VE3MGY	161,128	SOUQRP	KØPK	74,948	SOUQRP	KN7K	6,120	SOUQRP
W1WBB	101,655	SOUQRP	N4PD	35,685	SOUQRP	K4FT	105,084	SOUQRP	KØYR	61,520	SOUQRP	KA6BIM	168,168	SOUQRP
VA2WA	76,880	SOUQRP	K2AV	232,200	SOUQRP	VE3VSM	75,263	SOUQRP	KØMPH	60,300	SOUQRP	KG7H	154,473	SOUQRP
W1WMU	362,516	SOUQRP	N4HB	179,982	SOUQRP	VE3EJ	466,830	SOUQRP	KØIDX	176,928	SOUQRP	NR6O	141,869	SOUQRP
												(JG3KIV, op)		
K3WW	360,510	SOUHP	N5CW	176,831	SOUHP	K9CT	375,015	SOUHP	K5ZO	165,120	SOUHP	K7OX	132,762	SOUHP
KF3B	355,308	SOUHP	AA4CF	175,721	SOUHP	W8MJ	275,706	SOUHP	K2DSW	136,400	SOUHP	K7XC	107,184	SOUHP
W3UA	322,847	SOUHP	WO4O	161,073	SOUHP	W9IU	209,100	SOUHP	K9DU	125,367	SOUHP	W6OFM	9,988	ML
(NU3C, op)														
VE3RZ	274,536	SOUHP	N2CEI	194,106	ML	VE3KI	137,940	SOUHP	KØBJ	121,396	SOUHP	KD7EJ	304	ML
N3RN	17,934	ML	N1LN	421,767	MH	N9KY	220	ML	W5WTM	32,565	ML	W7RN	80,975	MH
W3HAC	7,752	ML	W4HZ	216,424	MH	WB9Z	384,540	MH	WAØRBW	10,988	ML	KH6LC	75,682	MH
NY2NY	6,664	ML	KC4D	139,772	MH	K8UO	81,322	ML	A15H	4	ML	W6DR	67,479	MH
W2GD	553,656	MH	WX4MLB	14,092	MH	N9MT	3,072	ML	NØNI	424,446	MH	K6SAL	62,928	MH
N3RR	299,750	MH							K5NA	286,308	MH	W7FSL	61,760	MH
VE2OJ	203,010	MH							K5KC	212,042	MH			
K3MJW	178,281	MH							KØLIR	155,308	MH			
K1VR	175,136	MH							KØJE	33,880	MH			