ARRL 160-Meter Contest 2018 Full Results

By Mark Beckwith, N5OT (n5ot@arrl.net)

"It was an orderly unfolding of an annual tradition" — N6TR

In spite of challenging conditions, the 2018 ARRL 160 Meter Contest generated nearly record activity on a sometimes-dusty end of the radio bandswitch.

Without a doubt, atmospheric crashes were front and center in December's running of the ARRL 160 Meter Contest. Even with more static than you can fit inside a vintage receiver, 1,380 intrepid operators braved all that Mother Nature could throw in their way, to enjoy more than 364,000 contacts in the space of only 42 hours. Why? Because 160 meters is a challenging radio band, and hams love radio challenges.

When you think about it, this is your car's AM radio we're talking about. When you turn that knob on your dashboard to the top, if you were to keep going, the next thing you would find would be the 160-meter band. In your car you listen around town all day. In your radio shack you listen around the world all night. Indeed, the magic of radio is alive and well on 160 meters.

And so it was last December, on the first full weekend of the month. For operators in North America, winter had settled in. "I got my dates mixed up," Paul, K9PG, explained later. "I thought it was the next weekend. I realized my mistake with only a couple hours to get ready." Paul went on to win his category – for a single operator using 150 W or less without assistance.

160 meters is known for having lots and lots of static. Even on a good night, the atmospheric static crashes make it so difficult to hear other stations, it is common to repeat information over and over until it is received correctly. Unlike on other bands in the high frequency part of the radio spectrum where it is common to use one antenna for both transmitting and receiving, hams will frequently use a completely separate set of highly specialized antennas designed just for receiving. There are many kinds of receive-only antennas, and they all do one thing: receive more signal than they receive noise.

K9PG described his setup as follows: "For receiving I use two BOGs [Beverages-on-the-Ground]. They don't work very well for DX, but for North America they do a really good job for being only 180 feet long and lying on the ground." Now you might think a "Beverage" is something you drink, but in 160-speak it is a receiving antenna invented in 1921 by Harold H. Beverage. Beverages have been used by countless hams to tune in distant signals ever since. Hams learned by experimenting that they actually work pretty well just lying on the ground. This is such a common practice, hams have adopted the dedicated moniker, "BOG."

The overwhelming theme of all the soapbox comments we received bemoaned the terrible conditions. Yet a near record number of operators got on the air, proving once more that the allure of 160 meters is alive and well.

The 2018 running of the ARRL 160 Meter Contest brought with it some of the most raucous static crashes in memory. Here is what some of the operators had to say after the dust settled:

AC4G - "Much QRN from storms passing by both nights and mornings."
NA7TB – "Horrendous QRN."
N1LN - "I can not remember participating in any contest with higher static crashes that just seemed to go on for ever."
W5MX – "The storm QRN was tremendous."
K9CT – "We had a great time….if you subtract the QRN!"
N4KS - "The static crashes eventually chased me away."
WD8DSB – "Lightning activity both nights made conditions difficult."
KC1XX – "The second night was plagued with static crashes."
K3TW - "Severe thunderstorm QRN limited my operating time in this 160m contest."
K5RX - "It was hard to believe I worked some EU through the static crashes."

K5SBR - "Great fun in spite of heavy QRN."
KB8TYJ - "Great contest, except for much thunderstorm QRN."
KJ9C - "Was it summer? Static crashes made DX tough."
W8WTS - "Rates were not high thanks to weak signals and noisy conditions."
NØMH - "Very high static levels."
N4PN - "The band was open both nights but so was the QRN."
N5XJ - "I just could not hear through the static level here."
N9TF - "QRN was heavy both nights."
NIØK - "The static crashes were bad."
TM6M - "Lots of QSB made it difficult!"

Despite the noise, some operators enjoyed the contest:

GØAZH - "fun ☺"

W7AMR - "This is the very first time I worked 160 meters."

Contests are what you make of them, and the ARRL 160-Meter Contest has something for everyone, whether the most die-hard of experienced 160-meter aficionados (single operator), or a whole team of them (multi-operator). You can choose to run an amplifier that keeps the shack warm on a cold winter night (high power), a standard 100-watt class radio (low power, maximum of 150 watts), or a very challenging "peanut whistle" that runs no more than 5 W (QRP). Operators can use the internet to help them find other stations to contact (Unlimited) or they can turn the knob and make contact with whomever they tune across. Each group of competitors and participants masters its own unique challenges to compete against others and make their score.

W/VE Results

Single Operator

At the top of the W/VE heap are the single-combat warriors who transmit full power into big antennas, usually with batteries of receiving antennas. Here you will find the likes of Jeff, K1ZM, who piloted his station on Prince Edward Island, VY2ZM, to a decisive victory. He brings a combination of years of experience on 160 meters, and a location that is second to none. "I enjoy the ARRL 160 Meter Contest because it livens up the CW band," Jeff commented. He laughs, "And because the format allows one to take some time off and get some sleep. At my advancing age, that has become quite important! It's always interesting whether or not there are any Asian stations to work from the east coast of North America, and also what stations manage to get on and be heard from Africa. Activity from Australia and New Zealand is thin these days - not like it once was 25 years ago." He laughs again. "It is always fun, and a challenge to work some of the rarer places in the 160-meter contest."

Jeff, K1ZM, piloted his VY2ZM super-station on Prince Edward Island to victory in the Single-operator, High Power category (Photo courtesy of Jeff Briggs, K1ZM)

Single Operator, High Power	
Station	**Score**
VY2ZM (K1ZM, op)	695,556
NO3M	582,632
AA1K	533,596
VA2EW	487,080
K1KI	478,035
K1LT	423,500
WF2W	418,572
NA8V	392,868
W3BGN	342,672
K3ZO	333,114

You might think it takes massive antenna arrays on the East Coast to do well in this contest. Yet K9PG was top scoring Single Op, Low Power entry. Paul got on for the contest from his home in Illinois, on a

small city lot. He uses a single transmitting antenna that is only about 50 feet high (see the detailed story later in this article). "I tuned up the band contacting stations one at a time for about the first 30 minutes, then I found a clear frequency and settled in for the night," Paul relates. "I made it to about 5 AM the next morning. I took a break and got some coffee, then came back and made contacts with what few other stations were left."

Single Operator, Low Power	
Station	**Score**
K9PG	193,076
WB8JUI	156,980
K7SV	143,170
WØUO	135,300
KG9X	128,520
WD8DSB	126,795
K9IG	123,660
NJ3K	119,972
ACØW	115,866
W1QK	110,320

In the QRP class, Mike, W3TS, managed nearly 500 contacts using only 5 watts to a 60-foot-high top loaded vertical (employing existing antennas for 40 and 80 meters), and no assistance.

Single Operator, QRP	
Station	**Score**
W3TS	57,053
N7IR	54,375
W8GP	46,438
N3CO	41,600
K1EP	16,946
KN1H	12,578
K4WY	12,267
N5EE	11,184
W9CC	10,906
K6EI	9,880

Single Operator Unlimited

Using internet assistance to find valuable stations to contact, John, VE3EJ in Ontario, Canada pushed his station to a new record in the Single-Operator Unlimited High Power category. He modestly credited his new record to the current lack of sunspots, which has historically driven hams to lower frequencies. In the Single-Operator Low Power Unlimited group, NE9U logged contacts with a remarkable 990 stations to win it.

Single Operator Unlimited, High Power	
Station	**Score**
VE3EJ	556,640
NN2DX (KO7SS, op)	441,462
NR4M	427,050
KVØQ	402,570
K3WW	378,852
N3QE	361,368
W8MJ	353,256
KØRF	350,625
WB9Z	342,773
AB3CX	309,034

Sunrise greets the VE3EJ transmitting antenna. The 130-foot tower serves as the driven element and top-loaded vertical wires hanging from it can be configured as directors or reflectors, giving John a 3-element vertical Yagi in 4 switchable directions plus an omnidirectional mode. (Photo courtesy of John Sluymer, VE3EJ)

Single Operator Unlimited, Low Power	
Station	**Score**
NE9U	229,020
VE3MGY	205,712
W9XT	130,032
N9CK	122,820
AA4XA	121,800
WØDLE	115,456
NY3B	107,015
KØTI	101,736
W3KB	101,070
K5KJ	81,810

Single Operator Unlimited, QRP	
Station	**Score**
N3CZ	31,080
NK8Q	29,952
K8ZT	25,069
K2QO	13,040
NØUR	12,330
WE9R	8,880
KP2DX (KP2BH, op)	3,450
K2FF	180

Multioperator

The seeming perennial winners at W2GD won the Multioperator, High Power category, boasting a transmitting array supported by a 300-foot tower, and no fewer than seven different receiving antennas. "We experienced our best first hour of any 160 meter contest in the last 30+ years. During that exciting first sixty minutes, we put 249 contacts in the log, including 59 five point contacts with stations in Europe and the Caribbean. What a rush!" John, W2GD, went on to explain that their station is now capable of interleaving multiple transmitters and receivers so they can contact more stations in a given period of time.

Multioperator High Power	
Station	**Score**
W2GD	619,190
NØNI	495,618
N1LN	474,089
W5MX	404,500
K9CT	391,356
W3UA	388,212
W4MYA	380,672
KC1XX	370,311
K9RS	356,000
NA7TB	352,110

Worthy of note is the two-operator team of Jeff, W2FU, and Dean, NW2K, running W2FU in Western New York by remote control, to a new record in the Multioperator, Low Power category. According to Jeff, "We intended to do a casual test of our fully remote two-radio operation. I was only available for the first few hours, but Dean got carried away and put in the rest. He did all the heavy lifting in this one." Their remote station uses a four-vertical transmitting array, a separate vertical array for receiving, plus an additional four Beverages.

Multioperator, Low Power	
Station	**Score**
W2FU	258,944
N2KW	149,856
WQ3N	124,608
W4GZX	36,608
K1RQ	36,225
W5WTM	24,660
KN4DUA	9,045
N9MT	2,520

DX Results

For operators outside of the ARRL/RAC sections, the contest is different because you can't contact every station you hear – you can only contact W/VE stations for credit. On one hand this limits the number of contacts you can make. On the other hand, the Ws and VEs are regarded as some of the best operators around, so working them can be both quick and exhilarating. For some, activating a station in another country is a welcome opportunity to get away from home for a while and thaw out, while sharpening their operating skills.

Single Operator

Single Operator, High Power	
Station	**Score**
PJ2T (W8WTS, op)	120,640
ZF9CW	115,128
TM6M (F1AKK, op)	45,828
HGØR (HAØNAR, op)	21,600
GM4Z (GM4ZUK, op)	14,520
TF3SG	9,840
DF2PY	7,488
UYØZG	5,974
RW3PZ	5,740
JH7XMO	5,580

The Caribbean Contesting Consortium club station on the coral cliff at Signal Point on the island of Curaçao is the home of PJ2T – another perennial high-scoring station, on the air now for 20 years. Jim, W8WTS, put in a big score as the winner in the Single-operator, High Power category. "The ARRL 160 Meter Contest brings out above average skilled operators, which makes the contest even more enjoyable. I was hearing very well considering conditions were not optimal." Like W2GD, Jim also benefited from new improvements that allowed him to tune the band while ("mostly") holding down a run frequency. "This helped my score," he assured.

Single Operator, Low Power	
Station	**Score**
XE2MVY	7,280
R7NW	2,450
OK1CZ	1,672
OK6Y (OK2PTZ, op)	1,400
LY4ZZ (LY2BMX, op)	1,386
US8UA	1,320
DL5CL	1,302
JE1SPY	1,224
JA1BJI	986
PAØTCA	918
SP9FMP	918

Outside the U.S. and Canada, the highest Single-Operator, Low Power entry was Oscar, XE2MVY, in Mexico. His transmitting antenna is like many – the ubiquitous 160 meter inverted-L made of wire - where you run your antenna radiator as high as you can vertically, then bend it over and run it horizontally (or as close as you can get) the rest of the way [see sidebar]. "For reception I use a Beverage on the ground," Oscar describes. "It's a short antenna, only 200 feet. It is pointed northeast."

Single Operator Unlimited

The non-USA/VE single operator running up the greatest Unlimited score was Julio, YV1KK, slowly but surely building up the Signal Hill Contest Station where he used the call 4M1K. Like Oscar's setup, Julio also runs an inverted-L. He was trying out three new listening antennas: a Beverage, a Pennant, and a special double-half-delta-loop ("DHDL"). Barely able to contain his enthusiasm, Julio exclaimed, "Thanks for the QSOs! It was a good opportunity to try these new antennas."

Single Operator Unlimited, High Power	
Station	**Score**
4M1K (YV1KK, op)	76,896
XE2S	53,250
P4/DL6RAI	50,544
OM3RM	46,726
OK7Z (OK2ZI, op)	29,052
G4AMT	28,050
XE2T	25,742
SK3W (SM3SGP, op)	23,358
F6AGM	21,708
UX1UA	18,308

Single Operator Unlimited, Low Power	
Station	**Score**
IK2CLB	6,552
LZ2ZG	1,872
XE2B	1,748
OK2BFN	1,610
DL3TU	1,596
SP1D	1,554
LA5LJA	988
DL6MHW	896
OK2VV	736
G3RLE	646

Multioperator

The winning DX Multioperator, High Power team traveled to the island of Montserrat to do just that. "We worked all summer developing and tuning the antennas - all of them wire," reports Lee, K7NM, the lead operator at VP2MSK. "We had a 160M full size dipole about 800 feet above the water line back toward the United States. For receiving, we put in a 700-foot- long Beverage. Wow, did it work well! We could hear extremely well with most of the antenna lying on the ground."

Multioperator, High Power	
Station	**Score**
VP2MSK	54,002
LY7Z	25,648
S51V	20,600
RL3A	18,100
PP5JR	16,356
FS/K9EL	11,954
SN8B	11,610
OK6O	4,234

With Montserrat's volcano looming in the background, the VP2MSK team smiles knowing they blew away their competition. L-R: Glenn, AC7ZN/VP2MZN; Lee, K7MN/VP2MLB; Steve, WM7Z/VP2MSA and Rich, NS7K/VP2MSK. (Photo courtesy of Lee Barrett, K7NM)

In an interesting twist, Lee's mentor Larry, K3VX, was the lead operator for the winning DX Multioperator, Low Power group operating from Bermuda as VP9I. In the 1960s, when Lee was a kid in New York with a non-renewable Novice class license, Larry drove Lee to the FCC Field office in Manhattan to take his General class license examination. Hams have a long history of raising up newbies, relationships that can sometimes continue for decades. Neither would say who taught the other how to send "CQ Contest."

Multioperator, Low Power	
Station	**Score**
VP9I	47,200
V31MA	6,880
C6ADM	280

Affiliated Club Competition

Unlimited Club Category

If the goal of Affiliated Club Competition is to get a lot of operators on the air, the plan is working. In the Unlimited category, the Potomac Valley Radio Club (PVRC) outscored the Frankford Radio Club (FRC) to win all the marbles. This led to some great trash talk when one club realized they had a superior score if measured per operator. The long and the short of that is, it is not measured per operator, that's why it's called the Club Competition.

Club	Score	Entries
Potomac Valley Radio Club	7,252,431	92
Frankford Radio Club	6,711,488	67
Yankee Clipper Contest Club	5,492,214	65
Society of Midwest Contesters	4,227,350	59
Minnesota Wireless Assn	2,603,300	56

Medium Club Category

In the Medium category, civility was the order of the day. Contest Club Ontario (CCO) beat the North Coast Contesters (NCC) by a relatively small margin. Again, CCO fielded substantially more entrants than NCC. When asked how they did it, both CCO President John, VE3EJ, and CCO Vice President, Tom, VE3CX, gave kudos to their club for just doing a good job of getting stations on the air. "I don't think there was any particular strategy on the part of CCO, just a great opportunity to get on 160 during a rather bleak time up here weather wise. Participation was no doubt up as a result of improved low band conditions during the sun spot low," related John. Tom quickly adds "John is quite modest when it comes to his accomplishments. As a club, we don't really do anything special. Everyone gets on, has fun contesting, and we turn in our scores." You can't say it better.

Club	Score	Entries
Contest Club Ontario	2,212,305	26
North Coast Contesters	2,109,797	17
Mad River Radio Club	1,634,587	11
Arizona Outlaws Contest Club	918,326	23
Hudson Valley Contesters and DXers	756,285	9
Northern California Contest Club	688,560	24
Grand Mesa Contesters of Colorado	665,084	8
Kentucky Contest Group	651,227	9
Tennessee Contest Group	544,863	12
Western Washington DX Club	482,073	10
Florida Contest Group	468,382	14
Central TX DX and Contest Club	422,131	8
Big Sky Contesters	385,323	5
DFW Contest Group	383,278	10
Mother Lode DX/Contest Club	378,409	7
North Texas Contest Club	321,193	4
Southern California Contest Club	309,084	12
Alabama Contest Group	301,361	3
South East Contest Club	290,628	9
Willamette Valley DX Club	262,515	6
Georgia Contest Group	250,709	4
Kansas City Contest Club	214,904	5
Orca DX and Contest Club	169,232	6
Maritime Contest Club	160,613	4
Delara Contest Team	145,960	3
Rochester (NY) DX Assn	132,401	6
Northeast Wisconsin DX Assn	88,326	3
Northeast Maryland Amateur Radio Contest Society	85,105	4
Spokane DX Association	76,175	4
Swamp Fox Contest Group	39,925	3
Driftless Zone Contesters	27,068	3

Local Club Category

For local clubs where the stations are not particularly spread out, the Central Virginia Contest Club secured the top spot over the Connecticut Rhode Island Contest Group, by fielding more operators and also making higher scores.

Club	Score	Entries
Central Virginia Contest Club	514,067	6
CTRI Contest Group	406,667	5
Niagara Frontier Radiosport	403,392	7
Bristol (TN) ARC	150,060	5

Here are some interesting stories submitted by participants in the contest…

QRP-in-a-Cabin
by Jim Peterson, K6EI

This was my third year running QRP (5W) in the ARRL 160-Meter Contest from our cabin at Loon Lake, Washington (in EWA, north of Spokane). I had a real hoot! The local area was totally empty of neighbors, although I did observe a flock of turkeys, a couple of deer, one rabbit, and a pair of bald eagles during my weekend stay.

Jim, K6EI, made the Top Ten in both the Single Operator QRP category and the unofficial "unheated cabin" category! (Photo courtesy of Jim Peterson, K6EI)

Speaking of "cool", the cabin is designed for summer-only use, which meant that operating when there were sub-freezing temperatures outside was something of a challenge. I set up a small electric heater under my chair to ward off frostbite.

Setting up was a breeze since there was no snow on the ground. My two transmit antennas consisted of a dipole with its feedpoint up 60 feet in a pine tree and a 55-foot tall inverted-L with two elevated radials for longer distances. Both antennas were near the cabin on top of a 90-foot hill surrounded by lake to the north, east, and south. I also set up a VE3DO receive loop based on the design posted by Jim Brown, K9YC, at http://audiosystemsgroup.com/VE3DO.pdf.

This receive loop was amazingly effective – in fact, the results were jaw-dropping with some signals that had been totally undetectable becoming fully copiable. Wow! Next year I'd like to install two more of these on the hilltop to cover additional directions. I used my Elecraft K3S along with spectral pan display. (I love this rig!) Being able to toggle between the two transmit antennas as well as the receive antenna was great. And having the option of diversity reception between the antennas is very cool. And the K3S's internal preamp was more than adequate for boosting the input from the receive loop. Even though my dipole at Loon Lake is physically high (~150 feet above local terrain), on 160 meters this antenna is functionally an NVIS (Near-Vertical Incidence Skywave) antenna with not much power emitted at the lower elevation angles. My signal was strong into Oregon and Idaho, but working stations on the Midwest and East Coast was a real challenge.

I have used inverted-L designs at locations in California with great success, but here in Eastern Washington, things were different. Readings of my test transmissions from my inverted-L via the Reverse Beacon Network seemed encouraging. But then it began to rain Friday afternoon. The inverted L was located inside a fairly dense grove of pine trees most at least 80- to 100 feet tall. With all that near-field wet foliage surrounding the inverted L, I noticed that incoming signals received via the inverted L were typically a couple S units weaker than received signals via the dipole.

Not surprisingly, I made very few contacts during the contest with the inverted L. The dipole, which I fed with 200-feet of "window-line" ladder line, also had its limitations. As long as the ladder line was dry, I could make West Coast contacts without difficulty. But each period of rainfall coincided with my almost complete inability to make any contacts.

I suspect this was probably due to dielectric losses introduced by the wet window line.

Like last year, I could hear really, really well for most of the contest, which was a real pleasure. Band conditions this year were good with A and K indexes hovering between 2 and 3 most of the weekend. Since I was running QRP, my transmit signal wasn't big — which meant that 80% of the folks that I could hear couldn't hear me. But I still had fun and achieved a final count of 135 contacts in 39 sections. Not as good as some years, but still a real hoot!

Plans for next year:
1. Move the inverted L away from inside the pine grove to a nearby meadow
2. Replace the dipole's 200 feet of "window-line" feed with something that won't become lossy when wet!

The K9PG Chicken-wire Counterpoise

Paul, K9PG, won the unassisted single operator competition for stations running 150 W or less this year. The best part is, he did it from his home in Illinois on a small lot in a residential neighborhood. Another best part is, among contest operators, sometimes they call that part of the country where Paul lives, "The Black Hole" for contest contacts. Hmmm.

The Inverted-L antenna is a favorite on 160 meters because a vertical radiator on what we call "Top Band" is a tall order, if you forgive the pun. That's because a quarter-wavelength on 160 meters is nearly 130 feet. Most hams don't have the ability to put up a full-height vertical. Verticals are preferable over horizontal antennas like dipoles on Top Band because they do a better job for contacts that take place over longer distances. In order for a dipole to do this it would have to be really high. Like over 200 feet high.

Inverted Ls work pretty great on 160 because even if they are not completely vertical, as long as you get the part closest to the feed point to be vertical for as high as you can (if you have a tree in the right spot they work more than well enough to snag some pretty juicy far-off contacts.

K9PG won the Single Operator Low Power category from this suburban lot using an inverted-L hanging from the big tree and fed against 500 square feet of "chicken wire". When Paul says he likes "CW" he means both the mode and the ground material. (Photo courtesy of Paul Gentry, K9PG)

So Paul decided to try an Inverted L in his backyard. Next problem: you have to feed an Inverted-L against "ground." There is a lot of hocus-pocus about "ground" and we won't really get into all that here, but generally if you lay as much wire as you can on the ground under the antenna, it will play better than if you didn't do that. Usually this is done by laying out "radials." Purists will tell you that your radials need to be a quarter-wave long. Did we say a quarter wave on 160 meters is 130 feet? You see the problem. Unless you have a lot that's 260 feet in all directions, this will be a real trick. Paul couldn't manage these radials in his yard.

But fear not. You've heard that experiment trumps theory? Read on.

When strategizing about the contest with his friend and antenna guru W2GD, John suggested to Paul that he lay out a ground screen of chicken wire under his Inverted-L. "I'm no antenna expert," Paul tells us, "and this sounded crazy. But John really encouraged me to give it a try. I went out and bought 4 rolls of chicken wire and wound up with about 200 square feet of it all electrically tied together, directly under my Inverted-L. That was in 2017. I was amazed at how well it worked, and I came in fourth place (but he was only about 5% off the winner – Ed.)." Of course Paul had to roll it all up before mowing season.

“Now last fall, about a month before the contest, I rolled it all out again, and bought even more. This year I managed to lay out about 500 square feet of chicken wire.” Paul admits, “I didn’t really connect it properly – I just kind of twisted it all together and made sure all the chunks of chicken wire were electrically connected, then I connected it all to the ground rod at the antenna feedpoint. Voila!”

Perhaps in a subsequent reporting, we may pursue discussion of the pros and cons of laying chicken wire out under your verticals, but K9PG is quite happy to have entered the contest and won his category overall using this simple idea.

Antenna ideas for 160 meters

One of the great things about 160 meters is that antennas can be quite temporary, given there is a good time of year for 160 meters when the lawnmowers are winterized, and a not-so-good time of year for 160 meters when the mowers are out prowling for barely-buried (if at all) radial wires and sections of chicken wire. As a result, many 160 meter operators tend to wait until the mowers are put away before laying out their counterpoises, while taking up their radials in the spring when the grass starts to grow once more.

Here are some examples of antennas reported by 160-Meter Contest entrants in the Soapbox comments.

"Non-resonant 80M dipole, loaded as long wire off tuner." - AB5ZA

"Gap vertical working very well." - KG9Z

"Sloping full size dipole. One part is slope, the another part is horizontal 3-5m over the ground." - SP4Z at K1VR

"All in all didn't do too bad considering 43' high wire homebrew whatsit antenna." - KS7T

"22 meter high vertical." - HA8WY

"Four square and SAL-30 for diversity receive." - N6RO

"End-fed wire." - KN1H

"Had to RX on TX antenna. Just moved into new QTH that day. XYL not happy :-) " - MM2N

"I was using my 40 meter sloping dipole." - N2FF

"Surprised how well my station did using a 54 feet end fed wire." - N4KS

"Used shunt-fed 89' tower for TX, VE3DO loop and 2 magnetic loops for RX." - N6TV
"Shortened half-sloper at the top of my 35' tower." - N9TF

"No 160 antenna." – N9VPV

"Tuned 80m inverted vee at 38 ft. Thanks for the good ears!" - NDØC

"Loaded up my 40-80M wire and managed to get out a bit."- NG1I

"Vertical Tee with elevated radials." - NN2L

"Low OCF antenna, only 10m high." - OK1CZ

"Low OCF antenna." - OLØA

"A modified Scorpion SA-680S. Still have some troubles with the electric foldover mount, but the antenna itself is fantastic!" - VE9AA

"A bigger antenna would help." – WØYJT

"Inverted-L TX antenna, and a Hi-Z 3-element steerable vertical RX array." - W2GPS

"TX: 150 foot inverted L with folded counterpoise (60 feet vertical). RX: K9AY loops and 20m dipole." - W4KAZ

"A 160m dipole only up 17 feet." - W8KNO

"Inverted L on a small city lot." - W9BGJ

"160m low dipole." - W9FI

"Random wire antenna with no radials." - W9KHH

"Shortened inverted L in need of tuning and tree clearing." - WB3JKQ

"Made my 80m centerfed Zepp into a Marconi antenna, twisting the ladder line together at the tuner." - WB9TFH

The Old Ham has Sung

You know that old saying, “It ain't over until the old ham has sung?” Well, here we are at the end of another ARRL 160 Meter Contest write-up. If you want to know more about some of the interesting lash-ups hams used to get their stations onto 160 meters, definitely take a look at the sidebars. Note especially the discussion about how K9PG came to win it from a city lot. It just goes to show you can be competitive without huge antennas and a lot of space. Certainly getting a signal on the air is half the game. If you've never done it before, well, what follows is a list of 1,380 other hams who would love to put you in their long next time around, static crashes or no static crashes. We all hope to see you on the air next December in the annual 2019 ARRL 160-Meter Contest.

Continental Winners		
Africa		
Single Operator Unlimited, High Power	EA8DO	4,620
Asia		
Single Operator, High Power	JH7XMO	5,580
Single Operator, Low Power	JE1SPY	1,224
Single Operator, QRP	JK1TCV	20
Single Operator Unlimited, High Power	RAØFF	10,496
Single Operator Unlimited, Low Power	JQ1EPD/1	16
Single Operator Unlimited, QRP	JG1LFR	12
Europe		
Single Operator, High Power	TM6M (F1AKK, op)	45,828
Single Operator, Low Power	R7NW	2,450
Single Operator, QRP	RC7B	8
Single Operator Unlimited, High Power	OM3RM	46,726
Single Operator Unlimited, Low Power	IK2CLB	6,552
Single Operator Unlimited, QRP	DL2SAX	260
Multioperator, High Power	LY7Z	25,648
North America		
Single Operator, High Power	ZF9CW	115,128
Single Operator, Low Power	XE2MVY	7,280
Single Operator Unlimited, High Power	XE2S	53,250
Single Operator Unlimited, Low Power	XE2B	1,748
Multioperator, High Power	VP2MSK	54,002
Multioperator, Low Power	VP9I	47,200
Oceania		
Single Operator, High Power	VK2GR	286
Single Operator, Low Power	VK3IO	200
South America		
Single Operator, High Power	PJ2T (W8WTS, op)	120,640
Single Operator, Low Power	HK6J	384
Single Operator Unlimited, High Power	4M1K (YV1KK, op)	76,896
Multioperator, High Power	PP5JR	16,356

REGIONAL LEADERS

West Coast Region			Midwest Region			Central Region			Southeast Region			Northeast Region	
(Pacific, Northwestern and Southwestern Divisions; Alberta, British Columbia and NT Sections)			*(Dakota, Midwest, Rocky Mountain and West Gulf Divisions; Manitoba and Saskatchewan Sections)*			*(Central and Great Lakes Divisions; Ontario East, Ontario North, Ontario South, and Greater Toronto Area Sections)*			*(Delta, Roanoke and Southeastern Divisions)*			*(New England, Hudson and Atlantic Divisions; Maritime and Quebec Sections)*	
Single Operator, High Power													
WJ9B	185,442		NEØU	183,635		K1LT	423,500		KV4FZ	332,580		VY2ZM (K1ZM, op)	695,556
VE6BBP	163,776		WD5COV	165,480		NA8V	392,868		NP2J (K8RF, op)	332,160		NO3M	582,632
N9RV	140,262		K5RX	156,600		VE3DZ	327,918		N4XD	301,698		AA1K	533,596
W6AYC	133,472		K5WA	135,897		K8FH	285,545		KP2M (KT3Y, op)	199,295		VA2EW	487,080
W8KA	128,610		WØOR	133,381		K9NR	279,896		K4SV	167,315		K1KI	478,035
Single Operator, Low Power													
AC7A	38,640		WØUO	135,300		K9PG	193,076		K7SV	143,170		NJ3K	119,972
NØVD	31,850		ACØW	115,866		WB8JUI	156,980		K4ORD	64,911		W1QK	110,320
K7QBO	31,280		KØPK	78,468		KG9X	128,520		K3IE	57,618		K2ZR	78,600
VA7MM	27,090		KØTT	70,632		WD8DSB	126,795		WA1FCN	50,991		WS3C	73,386
N7LOX	26,564		AEØEE	44,590		K9IG	123,660		KB9DKR	48,793		WW1ME	63,225
Single Operator, QRP													
N7IR	54,375		N5OE	7,030		W8GP	46,438		K4WY	12,267		W3TS	57,053
K6EI	9,880		WØYJT	1,804		N3CO	41,600		N5EE	11,184		K1EP	16,946
VE7VV	6,150		WDØEMR	1,260		W9CC	10,906		K4TZ	200		KN1H	12,578
K6MI	2,880		WBØB	800		AC8AP	2,673					WB2CPU	9,664
W6MZ	2,147		NDØC	616		W9QL	1,638					K3HX	6,512

Single Operator Unlimited, High Power												
K4XU	197,395		KVØQ	402,570		VE3EJ	556,640		NR4M	427,050		NN2DX (KO7SS, op)	441,462
VE7CC	180,908		KØRF	350,625		W8MJ	353,256		N4RV	286,258		K3WW	378,852
KA6BIM	146,610		KØKX	210,600		WB9Z	342,773		K4XL	244,644		N3QE	361,368
KG7CW	138,957		NØAV	166,963		WØAIH (KØTG, op)	250,408		K2AV	191,916		AB3CX	309,034
N6RK	137,238		NN5K	164,052		VE3NE	181,968		N4HB	186,030		W8FJ	303,920
Single Operator Unlimited, Low Power													
N6BT	19,337		WØDLE	115,456		NE9U	229,020		AA4XA	121,800		NY3B	107,015
N6GEO	11,544		KØTI	101,736		VE3MGY	205,712		K4JKB	59,356		W3KB	101,070
N3RC	10,718		K5KJ	81,810		W9XT	130,032		W4TTM	33,350		K3MD	80,872
VE7CA	7,878		AA5AM	79,524		N9CK	122,820		WU4G	24,035		NC1CC (WA1BXY, op)	75,383
NR7RR	7,831		W5FN	78,795		K8BL	81,650		K4LPQ	11,592		KN3A	35,264
Single Operator Unlimited, QRP													
			NØUR	12,330		K8ZT	25,069		N3CZ	31,080		NK8Q	29,952
						WE9R	8,880		KP2DX (KP2BH, op)	3,450		K2QO	13,040
									K2FF	180			
Multioperator, High Power													
NA7TB	352,110		NØNI	495,618		W5MX	404,500		N1LN	474,089		W2GD	619,190
K6DAJ	183,400		NØIS	224,328		K9CT	391,356		W4MYA	380,672		W3UA	388,212
N6JV	151,962		K5ZO	218,960		VE3FAS	44,496		WA1T	335,916		KC1XX	370,311
N5ZO	89,232		K5CM	156,600		KG9Z	21,168		W4NF	225,456		K9RS	356,000
N6DZ	47,700		NØKE	61,864					KC4D	205,590		NN3W	253,503
Multioperator, Low Power													
			W5WTM	24,660		N9MT	2,520		W4GZX	36,608		W2FU	258,944
									KN4DUA	9,045		N2KW	149,856
												WQ3N	124,608
												K1RQ	36,225

DIVISION WINNERS																				
SO: Single-Operator; SOU: Single-Operator Unlimited; M: Multioperator; HP: High Power (>150 W); LP: Low Power (150 W max); QRP: 5 W max																				
	SOHP		**SOLP**		**SOQRP**		**SOUHP**		**SOULP**		**SOUQRP**		**MHP**		**MLP**					
Atlantic	NO3M		NJ3K		W3TS		K3WW		NY3B		NK8Q		W2GD		W2FU					
Central	K9NR		K9PG		W9CC		WB9Z		NE9U		WE9R		K9CT		N9MT					
Dakota	NEØU		ACØW		NDØC		KØKX		KØTI		NØUR									
Delta	WD5R (N5ECT, op)		K3IE		N5EE		AD4EB		W4TTM		K2FF				W4GZX					
Great Lakes	K1LT		WB8JUI		W8GP		W8MJ		K8BL		K8ZT		W5MX							
Hudson	K2XA		W2EG		W2JEK		N2GC		W2DPT						K1RQ					
Midwest	KIØI		NZØT		WØYJT		NØAV		KØVBU				NØNI							
New England	K1KI		W1QK		K1EP		NN2DX (KO7SS, op)		NC1CC (WA1BXY, op)				W3UA		N2KW					
Northwestern	WJ9B		K7QBO		K6EI		K4XU		NR7RR				W6OFM							
Pacific	N6TQ		N6NF		K6MI		N6RK		N6GEO				K6DAJ							
Roanoke	N4XD		K7SV		K4WY		NR4M		AA4XA		N3CZ		N1LN							
Rocky Mountain	WD5COV		K6XT				KVØQ		WØDLE				NØKE							
Southeastern	KV4FZ		WA1FCN				N4PN		K3TW		KP2DX (KP2BH, op)		WA1T							
Southwestern	W6AYC		AC7A		N7IR		WA7AN (K9DR, op)		N6BT				NA7TB							
West Gulf	K5RX		WØUO		N5OE		W5TM		K5KJ				K5ZO		W5WTM					
Canada	VY2ZM (K1ZM, op)		VE3VSM		VE7VV		VE3EJ		VE3MGY				VE2OJ							