



ARRL 10 Meter Contest 2014 Results

By Scott Tuthill, K7ZO <k7zo@cableone.net>

Fun (noun): enjoyment, amusement, or pleasure

Remember when you decided to get your ticket? You did it because you knew it would be fun, right? One of the great things about Amateur Radio is that there are just so many ways of having fun. Participating in the contests is one of those, whether you are the competitive type or not. During the 2014 ARRL 10 Meter Contest amateurs worldwide enjoyed and amused themselves over the fine December 13-14 weekend.

In some respects a contest is like a giant party where planet Earth is the party room. Operators get on the air and, in their own way, strive to go meet and talk with as many folks in the room as they want. You log who you talk to and, if you want, submit that log to see how you did compared to others. You might also be part of your local radio club's team and, together with your friends, compete for club bragging rights. You also might use those contacts to complete your DXCC quest or to work that last state or two towards your Worked All States (WAS) or Triple Play awards. During a contest there are certainly many stations on the air to chase. Contests may also provide you motivation to build an antenna just to get on the air or improve the ones you have. It is also a great opportunity to introduce people to the hobby of Amateur Radio.

During the 2014 ARRL 10 Meter contest more than 11,000 operators worldwide got on the air making an estimated 2.6 million QSOs. If evenly spread across the whole weekend this represents about 15 QSOs being made every second! That's a lot of party talk going on. After the contest, a record 5,488 operators submitted their log to the ARRL for the contest results. That's about half the active operators. Perhaps this tells us that while everyone had fun, about 50% of the operators were also in it for the competition. Let's look at some examples of the fun had by all.

These folks had fun

Bruce, AA5B, got a chance during the contest to spend some quality time with his 7 year old grandson, Keenan. Bruce let Keenan rotate the antenna when he needed to beam in a new direction. Keenan, who was visiting from his home in the Ivory Coast (TU), got really excited when Bruce worked a South African station and grandpa pointed on the map where the station was located.

Since Keenan knew how far away home in TU was, he was amazed grandpa could talk to someone in that neighborhood of the world.



Bruce, AA5B, with grandson Keenan. (Photo - AA5B)

Bill, K2PO, took the opportunity during contest weekend to gather up a bunch of friends and have an actual party. In contest lingo this is called a multioperator activation. But, having participated in some multiops myself, this author knows they are usually a bit party and a bit radio operating.



Part of the W7TVC team at K2PO
W8NF, W57L and W6ABM (Photo - K2PO)

Bill and friends AF8Z, K7CIE, KD7VOK, KU1CW, W6ABM, W7TVC, W8NF, WN6W, and WS7L had a great time though as Dave, AF8Z, related they struggled with "...the typical Field Day problem wherein a tent fills with nominally deaf people, socializing in elevated voices, while I try to concentrate on operating..." In the end they persevered, managed to make almost 1,400 QSOs, and placed 5th in the US in the Multioperator, Low Power category. They also contributed their score to the overall Willamette Valley DX Club entry which placed them in the middle of the pack in the Medium Club category. There's a good example where both fun and competition coexist.

Long-time regular contester Don, K6ZO, used the 10 Meter Contest as an opportunity to introduce a new operator to the enjoyment of contesting. His pupil was Christine, KC3CIF, who earned her ticket earlier in 2014. Don's pre-contest training consisted of showing Christine how to use *N1MM Logger* software, how to listen for call signs, how to apply the DX Code of Conduct (www.dx-code.org), and how to break a pileup.



Christine, KC3CIF, at the mic during her first contest! (Photo - K6ZO)

On contest day, Christine sat down at the microphone and quickly made her first QSO with a station in France. From there nothing was holding her back and off and running she went. Since Christine was operating at the W3HAC station in Washington DC, a sought-after multiplier, she quickly drew attention. The 10 Meter Contest is a perfect event for first time testers: A wide band, plenty of activity, loud and clear signals. You can't help but have fun. Imagine if she tried the same thing on

20 meter phone during the ARRL DX Phone contest — probably a bit more challenging and frustrating.

Christine must be hooked on the sport now. She has participated in several other contests and Don is thinking: "...Christine may be headed to becoming a future President of our Radio Club".

Fun with whatever station you have

One of the great things about the ARRL 10 Meter contest is that just about any HF capable operator can have fun getting on the air. Need high power? Nope. Need giant antennas high up in the air? Nope. Amazing results have been had with anything that can radiate RF. Let's take a look at some notable accomplishments:

Fred, NA2U, retired to sunny Arizona several years ago and found himself constrained by that bane of many Amateur Radio operators — CC&Rs and HOAs. Continuing the tradition of inventiveness in our hobby, after some trial and error Fred settled in on an antenna configuration consisting of a ground-mounted screwdriver antenna with radials and a multiband dipole at a height of 58 inches. Yes, inches. Not feet!



Fred, NA2U's carefully concealed screwdriver antenna (Photo - NA2U)

So, how did Fred do during the contest? Amazingly he made 761 QSOs in 16 hours on the air. These QSOs were not all easy stateside stations either. A selection of DX multipliers in Fred's log includes all six continents: ZL, EA8, S5, DL, EA, HK, HI, JA, BY, and VR. One story Fred tells about his antenna setup has to do with a QSO he had with well-known operator and author John, ON4UN. As Fred described, *"I worked ON4UN on 20 meters and when I told him I was running 800 watts to a dipole at 58 inches John asked if I had tried the antenna underground!"* Who said hams don't have a sense of humor? But, actually, if you read some editions of John's books he does have several pages devoted to underground antennas. So, maybe he was not kidding after all.

Tim, K7XC, didn't have the same antenna visibility constraints as Fred. His issue as the contest weekend rapidly approached is that he didn't have any 10 meter antenna at all! Not wanting to miss out on the fun, off he went to rummage through his scrap pile. *"Gotta be some pieces in here to make a couple dipoles. Ten meters does not take much."*



Tim, K7XC's homebrewed crossed dipoles on top of his trailer tower (Photo - K7XC)

His quest was successful and he created a setup of two dipoles crossed at right angles. Each was fed with its own feed line allowing him to switch back and forth. As he described it, *"The ability to instantly switch dual azimuth aiming from NW/SE (Asia/South America) to NE/SW (Europe/Pacific) was awesome. I actually felt that a Yagi would have been a disadvantage as I would have missed possible contacts while turning it back and forth over 90 degrees."* Tim managed 706 QSOs running low power with this very simple and classic antenna system. Most of us learn about dipole antennas as we study to get our ticket. The reason we learn about these first is they are downright awesome antennas.

John, N6HI, has always loved the challenge being a QRP-only operator. Chasing DX and contesting with a maximum of 5 watts is fun for him. Like Fred, NA2U, John also lives in a "NO Antennas" QTH, with a capital "NO"! If QRP operating isn't a big enough challenge think of doing it without an antenna.



John, N6HI's invisible antenna (Photo - K6HI)



John, N6HI's very compact QRP operating position (Photo - K6HI)

Well, of course you need some sort of antenna. A couple of options are possible: The indoor antenna and the invisible outdoor antenna. John went with the second option. As he describes: *"I tied a small rock to the end of a 20 foot hunk of insulated wire, and threw it into a tree outside my window. On the indoors end of the wire I attached a banana plug, and plugged that into the center conductor of the SO-239 antenna output of my tuner."* Ham ingenuity again, finding a way to have fun. With this setup John managed to make 52 QSOs including a couple of Europeans — which from the West Coast was not so easy.

Another John, N4EEB, found himself away from his usual QTH during contest weekend. He had with him his laptop, CW keyer, paddles, and power supply, but no radio and no antenna. Also not wanting to miss out on the fun he borrowed a radio from a friend. For an antenna he hauled out a 40 meter dipole he had in storage and trimmed it down to 10 meter size. Then to quote John on his next step, he *"strung it between two small trees in the front yard using a fishing pole and a spoon."* The highest point was 25 feet and the lowest was 15 feet. Did it work? Did he have fun? You bet. More than 600 QSOs worth of enjoyment and amusement.



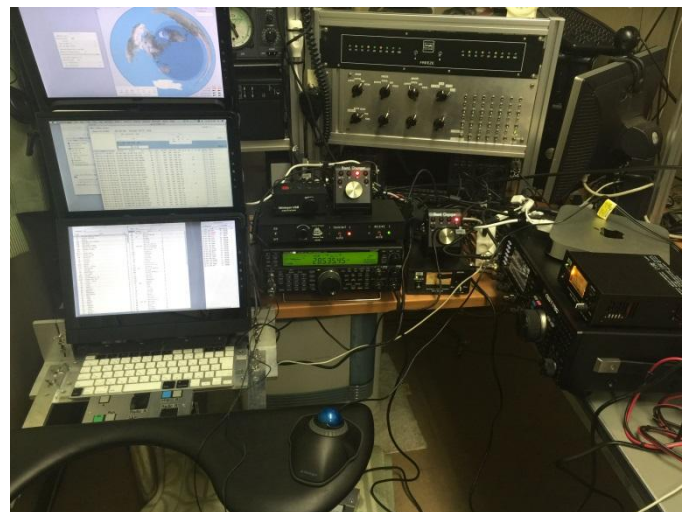
John, N4EEB, at his temporary station inside while his dipole was outside doing all the hard work. (Photo - N4EEB)

While still on the topic of antennas, the 10 Meter Contest is such a great one for homebrewers. Critical dimensions are small and manageable. Any required mechanical supports can be made from just about any material found at your local home improvement store. Henry, K4TMC, has built one of the larger homebrew antennas with his 6 element OWA-type rope supported Yagi tied between two oak trees in his back yard.



An impressive homebrew 6-element 10 meter antenna by Henry, K4TMC (Photo - K4TMC)

Let's not forget that the ARRL 10 Meter contest is a worldwide event. Everyone can talk to everyone and not everyone has homebrew and minimalist setups. The photo shows the very well-appointed shack and "mission control center" at JH1GBZ operated during the contest by Katsuhiko 'Don' Kondou, JH5GHM. What the photo does not show are the antennas Don also had available: two 5-element Yagis in a stack and a separate 7-element beam. These were instantly switchable between two different radios using a custom made switching system located next to the logging keyboard. You can see the switching panel just below the keyboard in the photo.



The well-appointed "mission control center" at JH1GBZ (Photo - JH5GHM)

Top Ten US - By Category

Single Operator, HP, Mixed Mode

K1LZ	2,674,992
N8II	2,077,660
W6YX (N7MH, op)	1,713,150
N3OC	1,621,536
W1WMU	1,558,208
KØTT	1,473,978
NN1N	1,431,202
WX4G	1,323,450
NR3X (N4YDU, op)	1,185,280
W2XL	1,138,464

Single Operator, LP, Mixed Mode

KU2M	1,446,870
KB3WD	1,436,850
K6AM	1,200,914
KH7M (KH6ZM, op)	1,184,056
K2PS	1,178,748
KI6RRN	1,160,280
W3EP	1,090,122
WO4O	1,081,632
N6ZFO	981,376
KTØK	861,732

Single Operator, QRP, Mixed Mode

WA6FGV	327,502
N1CC	325,704
K1WHS	316,590
W7YAQ	310,312
N9NE	278,216
W1WBB	246,160
KB8U	211,572
K3TW	187,000
NK8Q	182,688
WB2AMU	155,958

Single Operator, HP, Phone Only

NR5M	933,966
WB9Z	930,336
W5PR	885,360
NC1I (K9PW, op)	824,892
K5TR (WM5R, op)	788,190
K4ZA	707,476
K2SSS	639,880
K4NV	561,246
N1IXF	537,096
NQ4I (W4DD, op)	510,624

Single Operator, LP, Phone Only

KH6LC (NH6V, op)	703,296
ACØRA	278,640
W1TJL	262,432
WR5O	261,232
KA7PNH	204,878
WA5IYX	191,940
KB9TQO	159,000
N2MUN	154,936
K4FCG (K1KNQ, op)	149,176
N1WRK	147,360

Single Operator, QRP, Phone Only

W6QU (W8QZA, op)	69,488
KB5KYJ	69,264
KKØQ	52,140
KK7EL	41,426
K2GMY	38,480
KA5PVB	34,932
KS4GW	30,456
WBØIWG	26,586
KU4A	23,760
NO4FX	23,528

Single Operator, HP, CW Only

N2IC	1,627,008
K1TO	1,621,928
KD4D	1,322,176
K8IA	1,195,200
WXØB (NM5M, op)	1,153,040
K4BAI	1,082,400
N4AF	1,060,752
WJ9B	1,049,420
W6PH	1,026,740
K6NA	1,022,400

Single Operator, LP, CW Only

WA1Z	886,008
N4WW (N4KM, op)	874,608
K1DC	634,480
WB4TDH	629,248
AE5GT	589,280
WD4AHZ	585,552
K9QVB	479,400
W5MT	422,532
W2EG	406,692
NA8V	386,048

Single Operator, QRP, CW Only

W6JTI	268,256
K6OO	228,664
AA1CA	203,200
KSØMO	156,672
AD4Z	155,520
WA3IIA	145,248
K9AY	137,592
K4FT	126,852
N5OE	120,048
KM6Z	110,864

Single Operator Unlimited, HP, Mixed Mode

N8OO	2,577,568
K7RL	2,281,216
K3WW	2,106,490
WØAIH (NE9U, op)	2,001,084
N4PN	1,977,054
W8MJ	1,905,856
K1RO	1,874,708
W4ML (W4MYA, op)	1,842,640
N4UU	1,689,000
N3UA	1,684,296

Single Operator Unlimited, LP, Mixed Mode

K9OM	1,427,090
N5DO	1,159,180
K8BL	673,932
K3IE	630,336
K2DFC	557,388
W5ZO	542,592
K7XC	392,064
WW2P	360,396
K6MM	326,928
AB1J	315,138

Single Operator Unlimited, QRP, Mixed Mode

K2FF	130,784
N6MA	26,404
N3HCN	21,840
NF1R	18,748
K4YND	17,748
N1RLR	15,006
WE9R	10,584
W3IBT (W3WH, op)	8,064
N4QX	868

Single Operator Unlimited, Phone Only, High

K4XS	1,062,360
K3EST	946,792
W3LL	599,274
K1RH	492,656
WW5TT	459,612
K3DNE	389,100
KDØFW	329,472
KI7M	323,806
N8BI	303,048
N8ZFM	267,960

Single Operator Unlimited, Phone Only, Low

W9XG (K2DRH @K2DRH)	333,760
N9TGR	235,470
WBØTEV	132,912
KE2OI	84,836
KC6R	82,838
KD4SN	82,536
W1AIR	58,200
KK4LGC	53,728
KG5ANP	52,052
KL1JP	50,752

Single Operator Unlimited, QRP, Phone Only

W9RPM	41,064
WB6CZG	8,544
K7ATN	6,364

Single Operator Unlimited, CW Only, High

N9NC	1,495,988
K9CT	1,349,800
K6LL	1,331,840
N3RS	1,320,120
K9RS	1,294,944
N4BP	1,267,692
N5FO	1,254,192
KO7AA	1,205,892
WU2X (K5GO, op)	1,193,264
N2PP	1,102,360

Single Operator Unlimited, CW Only, Low

K6WSC	551,600
W3KB	419,052
NA5NN (W5UE, op)	383,544
WA1FCN	311,040
N4EEB	303,408
WØERP	279,896
W9XT	262,524
K3SV	252,296
KØRI	250,920
K3WI	250,368

Single Operator Unlimited, QRP, CW Only

N7IR	225,548
K5KJ	211,008
NØUR	156,032
N2KW	147,744
WC7S	98,000
KW3F	89,688
N4UW	76,464
KU7Y	54,180
N6RO	49,932
K4EQ	38,976

Multioperator, HP

NX5M	3,216,840
N2NT	3,146,688
AA9A	2,297,552
K6ND	2,084,608
AA1JD	2,029,900
W5KFT	1,970,024
KDØS	1,895,296
K4FJ	1,883,752
W8TK	1,740,354
NX6T	1,391,500

Multioperator, LP

NØNI	1,498,754
WW4LL	1,495,844
WØDLE	1,066,394
N4SVC	1,007,124
W7TVC	981,046
WA1S	718,592
KO3T	683,936
N1WW	574,896
NØHJZ	506,160
KGØUS	481,740

Top Ten Canada – by Category

Single Operator, HP, Mixed Mode

VE3AT	2,335,110
VE3DZ	1,996,722
VA2EW	1,360,040
VE7SZ	762,078
VE1JBC	310,812
VE3TW	231,312
VA2QR (VE2ESU, op)	81,534
VA3MTT	45,232
VE1ZAC	7,128

Single Operator, LP, Mixed Mode

VE4GV	1,014,948
VE1RSM	507,300
VE3WG	360,960
VE1ZA	346,580
VE3FH	246,782
VE5UO	235,144
VE2AWR	214,728
VE4YU	214,616
VE3BR	188,454
VE5SF	176,834

Single Operator, QRP, Mixed Mode

VE6UM	104,920
VA3RKM	12,150

Single Operator, HP, Phone Only

VO1KVT	349,920
VE2JM	121,124
VE2GSO	120,228
VE6CMV	66,722
VA2OBW	23,430
VE9FX	21,228
VE3HED	1,536

Single Operator, LP, Phone Only

VO2NS	158,400
VE7ZR	146,540
VA6NJK	145,084
VE1JS	102,270
VE1PEW	84,968
VE3TU	80,088
VE5AAD	78,000
VE2PDT	60,030
VA7IR	50,280
VE1SQ	48,192

Single Operator, QRP, Phone Only

VA3VF	33,892
VE3BKM	3,328
VE7ETS	1,558
VE7GNR	936
VE3CBK	40

Single Operator, HP, CW Only

VE3OI	937,848
VE7GL (VA7OO, op)	630,016
VE6BBP	532,356
VE3PN	469,440
VA7ST	411,600
VE3FGU	388,608
VE3KY	278,008
VY2SS	91,044
VE3EY	63,360
VA1MM	57,816

Single Operator, LP, CW Only

VE1RGB	368,316
VA3DF	342,616
VE7CA	306,360
VA3ATT	147,052
VE3KP	108,704
VE7NX	98,864
VA7MM	93,940
VA7EU	86,052
VE3ZY	59,200
VO1BQ	58,292

Single Operator, QRP, CW Only

VY2OX	207,792
VE3KZ	61,992
VE3VN	34,776
VE3DQN	17,544
VE3HG	14,976
VE6EX	14,400
VE3IGJ	5,460
VA7AD	704

Single Operator Unlimited, HP, Mixed Mode

VE7UF (VE7JH, op)	1,881,264
VE9AA	1,721,970
VE4EA	990,510
VE3CX	716,800
VA2WA	388,010
VE7XT	296,808
VE3RZ	275,044
VE3NRT	240,112
VE7AX	202,224
VE3ZZ	94,500

Single Operator Unlimited, LP, Mixed Mode

VE9OA	217,710
VE3XAT	206,382
VE2EBK	193,760
VE3HEU	50,468
VE9ACL	38,016
VE7TJF	3,906

Single Operator Unlimited, QRP, Mixed Mode

VA3PAW	18,952
--------	--------

Single Operator Unlimited, HP, Phone Only

VA3PC	75,438
VA2AM	74,592
VE6KD	48,422

Single Operator Unlimited, LP, Phone Only

VE2PIJ	11,790
VE6SPS	8,584
VA2MO	1,320

Single Operator Unlimited, HP, CW Only

VE1OP	897,544
VE5UF	896,896
VE3EJ	457,056
VE5MX	390,688
VE2FK	373,056
VE3UTT	308,256
VE7XF	299,224
VA3DX	282,492
VE7IO	202,920
VE7JKZ	166,000

Single Operator Unlimited, LP, CW Only

VE6WQ	621,760
VE2FU	569,400
VE3GFN	165,200
VO1HP	72,704
VE6UX	69,264
VA7HZ	11,592
VE3CV	7,740
VE3AJ	6,608

Single Operator Unlimited, QRP, CW Only

VE3KI	299,592
VA2SNL	6,256

Multioperator, HP

VE5ZX	977,244
VE3YAA	612,582
VC3M	176,800
VE6AO	13,188

Multioperator, LP

VE9ML	885,920
VA7BEC	785,460
VA7WWV	364

Top Ten Mexico - by Category**Single Operator, HP, Mixed Mode**

XE1H	63,826
------	--------

Single Operator, LP, Mixed Mode

XE1HG	594,638
XE2AU	199,692
XE1ZTW	61,812

Single Operator, HP, Phone Only

XE1B	816,216
XE2IC	359,618
XE1OGG	104,346

Single Operator, LP, Phone Only

XE2O	227,868
XE3DX	214,368
XE2AA	116,460
XE1RF	59,392
XE2PXZ	53,196
XE1/N4DMH	48,048
XE2JUM	27,376
XE1GZU	22,000
XE2YWH	11,656
XE3D	10,890

Single Operator, HP, CW Only

XE1MM	688,012
XE2S	431,568

Single Operator, LP, CW Only

XE2X	82,176
XE1AY	80,696
XE1UYS	72,704
XE2CQ	54,752
4A5XX	41,412
XE3WMA	13,500
XE1RZL	1,156
XE2N	18

Single Operator Unlimited, LP, Mixed Mode

XE2JS	316,356
-------	---------

Single Operator Unlimited, HP, Phone Only

XE2K	191,196
------	---------

Single Operator Unlimited, LP, Phone Only

XE3N	140,676
XE2ST	27,140

Single Operator Unlimited, LP, CW Only

XE2FGC	42,228
--------	--------

Multioperator, HP

XE2B	1,189,656
------	-----------

Multioperator, LP

XE1CRG	53,040
--------	--------

Top Ten DX - by Category**Single Operator, HP, Mixed Mode**

NP2P (N2TTA, op)	2,245,304
EF5T (EA5HT, op)	1,303,574
YT8A (YU1EA, op)	1,116,416
LY9Y	966,038
CT7ACG	943,228
JH1GBZ (JH5GHM, op)	882,392
S51YI	881,742
JA7NVF	823,680
JR2GRX	820,488
OG6N	700,440

Single Operator, LP, Mixed Mode

ZF2DX	2,957,580
YS1YS (JA6WFM, op)	1,235,390
JS6RGJ	922,658
HC1WDT	857,280
RW7M	585,620
EF8O	566,784
PY2NY	564,120
9A5ST	415,548
UI5F	412,274
RW4WA	354,354

Single Operator, QRP, Mixed Mode

ON6QRP	236,610
IZ8JFL	88,192
URØHQ	69,936
9A2EY	69,550
EA2DPA	68,388
DK1IZ	63,474
EF1M (EB1RL, op)	56,848
RW3AI	54,538
DL/W6ZBA	52,826
UT3IT	46,648

Single Operator, HP, Phone Only

HK1T	1,503,252
PJ4DX	1,244,516
DR1D (DL3KO, op)	701,220
CT3FQ	677,504
LU6ETB (VE3AP, op)	622,034
VR2XAN (IV3TAN, op)	572,352
HK3C	548,772
M6T (GØAEV, op)	502,320
TM7F (F6GLH, op)	496,332
EF8S (OH1LEG, op)	495,762

Single Operator, LP, Phone Only

EA8AH	847,700
YY1YLY	785,880
EA8MT	604,230
CO6LC	517,374
KP4BD	494,928
KP4EU	485,556
ZY2B	436,488
EE7Y (EC7WA, op)	423,384
TG9ANF	407,376
EA1DR	385,732

Single Operator, QRP, Phone Only

V31MA	388,750
TG9ADQ	103,664
CO2CW	95,424
CT7AIX	55,076
EA2QU	42,720
PC1EMR	29,014
US5ZCW	19,656
CE3WYZ	18,744
WP4DT	18,528
EA5IFY	18,000

Single Operator, HP, CW Only

KP2M (KT3Y, op)	1,329,996
9A5X	1,042,756
DL1VJ (VK2IA, op @DR1A)	952,536
LZ9W (LZ5FF, op)	931,972
S53A	753,616
ES5RY	738,840
JH3AIU	692,048
CO8ZZ	666,596
C4Z (5B4AIZ, op)	661,656
S51DX	602,736

Single Operator, LP, CW Only

NP3A	1,268,256
WP3C	1,142,940
YT6A	580,068
EA8CN	502,500
M6O (G3WGN, op)	433,160
J35X	396,864
OK4RQ	390,784
GIØRQK	382,296
ZL3TE	364,760
HA6NL	318,128

Single Operator, QRP, CW Only

LT7H	406,992
JA1YNE (JR1NKN, op)	189,312
G3SXW	166,656
HSØZIA	157,248
HA3HX	133,500
JQ1NGT	127,920
ZS6DX	124,000
GM3WUX	87,696
YL2CV	85,200
IV3DRP	76,112

Single Operator Unlimited, HP, Mixed Mode

NP2X	3,690,296
EA8DBM	3,030,698
P4ØCX	2,578,110
EA7KW	2,336,116
HA3NU	1,814,480
EA6URA (EA3AIR, op)	1,692,688
YT2R (YU1AU, op)	1,685,554
ZM1A (ZL3CW, op)	1,664,064
UW2M (URØMC, op)	1,622,206
OL5Y	1,313,216

Single Operator Unlimited, LP, Mixed Mode

PY3OZ	1,816,580
UX1AA	636,300
CE2MVF	625,860
MW5R (MWØEDX, op)	625,356
JA1BPA	547,334
ZR9C (ZS6WN, op)	523,440
EA2NN	450,528
UY5ZZ	447,984
PE2HD	393,926
S56A	382,392

Single Operator Unlimited, QRP, Mixed Mode

RT4W	311,538
RUØLAX	150,800
JK1TCV	115,566
EA8/PD1DX	104,832
LZ3ZZ	40,404
PA9M	23,936
BA4MY	18,618
UN7JID	10,506
R6FAA	2,500
UR5XMM	528

Single Operator Unlimited, HP, Phone Only

9A1UN	790,500
9A5Y (9A7DX, op)	735,644
OK7K (OK1BN, op)	684,944
TM7G (F4CWN, op)	649,128
OM7M (IT9RGY, op)	578,000
DL2ARD	566,488
IZ8EPX	448,740
VK4QH	427,136
LZ2HM	420,854
IW2HAJ	407,880

Single Operator Unlimited, LP, Phone Only

YN5Z (K7ZO, op)	701,964
PU5FJR	391,710
VP9/KU9C	386,124
TG9AJR	328,152
HA4XH	283,200
LU7MT	235,760
G7Y (MØZDZ, op)	228,960
F4GGQ	221,408
IK3TPP	184,032
PY8WW	183,138

Single Operator Unlimited, QRP, Phone Only

IZ8GNNR	101,640
G7KXZ	51,152
KP4TC	15,070
TA1L	8,170
BD9XE	3,286
PD5WL	2,470

Single Operator Unlimited, HP, CW Only

KP2Q (K3TEJ, op)	1,601,312
EI1Y (EI3KG, op)	1,178,880
EA8/IK1PMR	1,110,780
SN7Q	1,026,780
DL1IAO	878,480
ZL2B	874,920
SN2M (SP2XF, op)	863,400
YU7AV	860,928
EI2CN	763,656
ZM2IO (ZL3IO, op)	751,936

Single Operator Unlimited, LP, CW Only

KP4EJ	919,080
CN8KD	906,660
EA4TX	750,924
PP1CZ	577,220
PP5KR	573,040
KP3W	572,628
PY2NA	492,440
ZL1GO	472,868
EF8X (EA8AY, op)	406,788
YT9W	397,184

Single Operator Unlimited, QRP, CW Only

UA4Z	283,752
OK2FD	122,464
3ZØX	120,328
EU6DX	58,280
RD3ARU	32,384
RZ9CJ	28,448
SDØT (SMØTHU, op)	27,720
9A2VX	23,000
VU2UR	22,372
IV3CTS	18,624

Multioperator, HP

FY5KE	4,457,120
CW5W	3,987,674
PJ2T	3,437,992
TM6M	3,232,920
LT1F	2,985,660
PX2A	2,634,792
EF8U	2,505,188
EI7M	2,487,108
CX4AT	2,306,496
PT3T	2,135,824

Multioperator, LP

NP2N	2,010,820
VP2VGG	1,888,416
ZW8T	1,131,822
E7C	677,250
HB9ON	502,304
JR2SCJ	371,742
F4FLQ	351,002
DL1NKS	317,856
OA4O	315,944
CW1DC	297,564

CONTINENTAL LEADERS

Category	Call	Score
Africa		
Single Operator, Low Power, Mixed Mode	EF8O	566,784
Single Operator, High Power, Mixed Mode	ZS6RJ	451,962
Single Operator, Low Power, Phone Only	EA8AH	847,700
Single Operator, High Power, Phone Only	CT3FQ	677,504
Single Operator QRP, CW Only	ZS6DX	124,000
Single Operator, Low Power, CW Only	EA8CN	502,500
Single Operator, High Power, CW Only	ZS1EL	189,504
Multioperator, High Power	EF8U	2,505,188
Single Operator Unlimited, QRP, Mixed Mode	EA8/PD1DX	104,832
Single Operator Unlimited, Low Power, Mixed Mode	ZR9C (ZS6WN, op)	523,440
Single Operator Unlimited, High Power, Mixed Mode	EA8DBM	3,030,698
Single Operator Unlimited, High Power, Phone Only	EA8BVX	64,592
Single Operator Unlimited, Low Power, CW Only	CN8KD	906,660
Single Operator Unlimited, High Power, CW Only	EA8/IK1PMR	1,110,780
Asia		
Single Operator QRP, Mixed Mode	JH3DMQ	15,704
Single Operator, Low Power, Mixed Mode	JS6RGJ	922,658
Single Operator, High Power, Mixed Mode	JH1GBZ (JH5GHM, op)	882,392
Single Operator QRP, Phone Only	JA2MWW	8,910
Single Operator, Low Power, Phone Only	JA7QVI	123,648
Single Operator, High Power, Phone Only	VR2XAN (IV3TAN, op)	572,352
Single Operator QRP, CW Only	JA1YNE (JR1NKN, op)	189,312
Single Operator, Low Power, CW Only	UN6P	275,100
Single Operator, High Power, CW Only	JH3AIU	692,048
Multioperator, High Power	JA3YBK	1,460,968
Multioperator, Low Power	JR2SCJ	371,742
Single Operator Unlimited, QRP, Mixed Mode	RUØLAX	150,800
Single Operator Unlimited, Low Power, Mixed Mode	JA1BPA	547,334
Single Operator Unlimited, High Power, Mixed Mode	JH5RXS	1,283,412
Single Operator Unlimited, QRP, Phone Only	TA1L	8,170
Single Operator Unlimited, Low Power, Phone Only	JA8COE	79,464
Single Operator Unlimited, High Power, Phone Only	BW2/JP1RIW (BM2JCC, op)	175,296
Single Operator Unlimited, QRP, CW Only	RZ9CJ	28,448
Single Operator Unlimited, Low Power, CW Only	RT9S	319,548
Single Operator Unlimited, High Power, CW Only	UA9AGX	251,604
Europe		
Single Operator QRP, Mixed Mode	ON6QRP	236,610
Single Operator, Low Power, Mixed Mode	RW7M	585,620
Single Operator, High Power, Mixed Mode	EF5T (EA5HT, op)	1,303,574
Single Operator QRP, Phone Only	CT7AIX	55,076
Single Operator, Low Power, Phone Only	EE7Y (EC7WA, op)	423,384
Single Operator, High Power, Phone Only	DR1D (DL3KO, op)	701,220
Single Operator QRP, CW Only	G3SXW	166,656
Single Operator, Low Power, CW Only	YT6A	580,068
Single Operator, High Power, CW Only	9A5X	1,042,756
Multioperator, High Power	TM6M	3,232,920
Multioperator, Low Power	E7C	677,250
Single Operator Unlimited, QRP, Mixed Mode	RT4W	311,538
Single Operator Unlimited, Low Power, Mixed Mode	UX1AA	636,300
Single Operator Unlimited, High Power, Mixed Mode	EA7KW	2,336,116
Single Operator Unlimited, QRP, Phone Only	IZ8GNNR	101,640
Single Operator Unlimited, Low Power, Phone Only	HA4XH	283,200
Single Operator Unlimited, High Power, Phone Only	9A1UN	790,500
Single Operator Unlimited, QRP, CW Only	UA4Z	283,752
Single Operator Unlimited, Low Power, CW Only	EA4TX	750,924
Single Operator Unlimited, High Power, CW Only	EI1Y (EI3KG, op)	1,178,880
North America		
Single Operator, Low Power, Mixed Mode	ZF2DX	2,957,580
Single Operator, High Power, Mixed Mode	NP2P (N2TTA, op)	2,245,304
Single Operator QRP, Phone Only	V31MA	388,750
Single Operator, Low Power, Phone Only	CO6LC	517,374
Single Operator, High Power, Phone Only	TG9IIN	439,898
Single Operator QRP, CW Only	H13AA	1,584
Single Operator, Low Power, CW Only	NP3A	1,268,256
Single Operator, High Power, CW Only	KP2M (KT3Y, op)	1,329,996
Multioperator, High Power	ZF1A	1,434,440
Multioperator, Low Power	NP2N	2,010,820

Single Operator Unlimited, Low Power, Mixed Mode	8P2K (8P6SH, op)	358,226
Single Operator Unlimited, High Power, Mixed Mode	NP2X	3,690,296
Single Operator Unlimited, QRP, Phone Only	KP4TC	15,070
Single Operator Unlimited, Low Power, Phone Only	YN5Z (K7ZO, op)	701,964
Single Operator Unlimited, High Power, Phone Only	HP1CQ	81,028
Single Operator Unlimited, QRP, CW Only	CO2IZ	8,400
Single Operator Unlimited, Low Power, CW Only	KP4EJ	919,080
Single Operator Unlimited, High Power, CW Only	KP2Q (K3TEJ, op)	1,601,312
Oceania		
Single Operator QRP, Mixed Mode	YBØANN	1,620
Single Operator, Low Power, Mixed Mode	ZL3NB	9,792
Single Operator, High Power, Mixed Mode	9M6XRO	248,248
Single Operator QRP, Phone Only	VK4ATH	3,074
Single Operator, Low Power, Phone Only	VK4LAT	158,232
Single Operator, High Power, Phone Only	VK2CZ	34,840
Single Operator, Low Power, CW Only	ZL3TE	364,760
Single Operator, High Power, CW Only	ZL1ALZ	335,320
Multioperator, High Power	VK4NM	1,366,480
Single Operator Unlimited, Low Power, Mixed Mode	VK4TJF	108,000
Single Operator Unlimited, High Power, Mixed Mode	ZM1A (ZL3CW, op)	1,664,064
Single Operator Unlimited, Low Power, Phone Only	YB5BOY	260
Single Operator Unlimited, High Power, Phone Only	VK4QH	427,136
Single Operator Unlimited, Low Power, CW Only	ZL1GO	472,868
Single Operator Unlimited, High Power, CW Only	ZL2B	874,920
South America		
Single Operator QRP, Mixed Mode	CE7EEA	4,662
Single Operator, Low Power, Mixed Mode	HC1WDT	857,280
Single Operator, High Power, Mixed Mode	LU6UO	600,864
Single Operator QRP, Phone Only	CE3WYZ	18,744
Single Operator, Low Power, Phone Only	YY1YLY	785,880
Single Operator, High Power, Phone Only	HK1T	1,503,252
Single Operator QRP, CW Only	LT7H	406,992
Single Operator, Low Power, CW Only	LU5FF	272,272
Single Operator, High Power, CW Only	PY2MC	545,832
Multioperator, High Power	FY5KE	4,457,120
Multioperator, Low Power	ZW8T	1,131,822
Single Operator Unlimited, Low Power, Mixed Mode	PY3OZ	1,816,580
Single Operator Unlimited, High Power, Mixed Mode	P4ØCX	2,578,110
Single Operator Unlimited, Low Power, Phone Only	PU5FJR	391,710
Single Operator Unlimited, High Power, Phone Only	ZZ5Z (PY5YA, op)	349,440
Single Operator Unlimited, Low Power, CW Only	PP1CZ	577,220
Single Operator Unlimited, High Power, CW Only	HK1MW	692,736

The fun in talking

The ARRL 10 Meter Contest, like other contests, is like a giant on-the-air party. Get on the radio and talk to as many folks as you want, for whatever intent you desire. To many, the thrill of a few of their QSOs is what makes it fun. Often it can be just one special QSO that makes the weekend memorable. Here are post-contest “soapbox” comments from several stations:

Bob, HSØZIA - Biggest thrill working FG8NY after coming back from dinner to check the band one last time Saturday night.

NR3X (Nathan, N4YDU, operator) - Highlight for me came Saturday morning when I was called by HZ1PS, FR4NT and 5R8UI consecutively on SSB - that was a first and probably a last.

Bill, N6ZFO -- Very surprised to be called, on SSB, by C91C on Sunday

David, EA4AOC - With my simple 100w and end fed antenna. I was able to do ZL3TE as well as other entities and American States

For others, they hope to complete their Worked All States (WAS) journey. To some, their goal is to do it during the contest weekend. Many operators mention "Got my last couple of states towards WAS" or "Managed to work WAS this weekend." A typical comment was received from Gary, N7IR, "Worked WAS + DC. I was pleased with my temporary 10 meter dipole, which is only 8 feet off the ground."

Looking through the logs, 183 stations managed WAS during the contest. None of these were from Europe though there were 25 from South America and two each from New Zealand and Australia. For Europeans, the challenge from the propagation needed to work Alaska and Hawaii on 10 meters in December was insurmountable. However, 17 Europeans did manage to work all lower 48 states. It is interesting to compare these WAS accomplishments to 2013. In 2013 only 135 stations managed to accomplish WAS.

Is the increase in 2014 due to propagation? Or, was it due to the creation of the Unlimited categories in 2014 so that more stations were using spotting assistance? In 2013, again no Europeans were able to achieve WAS during the contest though 26 did work all lower 48. Likely the best WAS achievement in 2013 belongs to JA7OWD who took advantage of his QTH in far south Japan to "Work them All." In fact JA7OWD is about the same latitude as northern Africa and in 2013, CN3A in Morocco also managed a WAS during contest weekend.

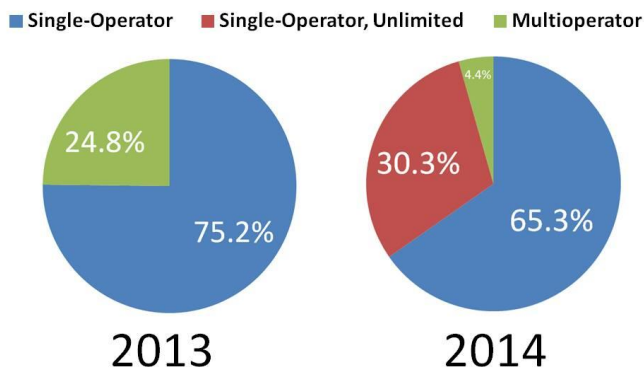
Table 1 -- Number of Stations achieving Worked All States

Continent	2014	2013
Africa	0	2
Asia	0	1
Europe	0	0
North America	148	92
Oceania	10	9
South America	25	31
Total	183	135

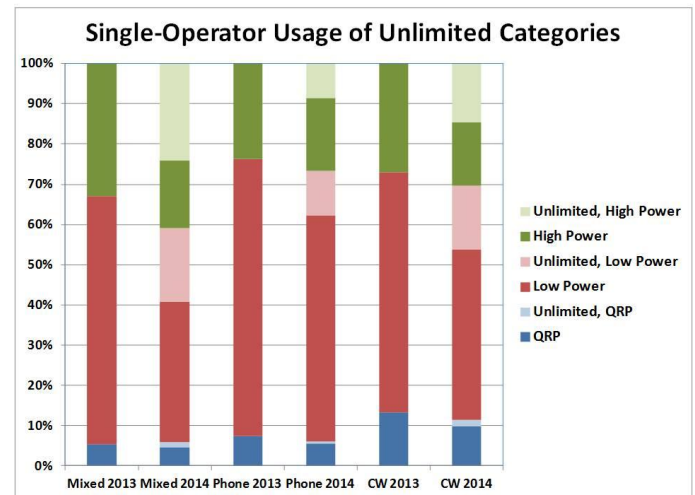
New Unlimited categories — what fun!

For the competition-oriented operators, the major change in contest rules for 2014 was the addition of Unlimited categories. No longer would single operators using spotting assistance or automated multi-channel decoders such as the *CW Skimmer* software by VE3NEA (*“Skimmers”*) have to enter in the Multioperator category. This change has been requested for years. The contest organizers listened and made the change by creating a full set of Single-Operator Unlimited categories. Was the change successful? Did the word about the change get out? Did operators utilize Unlimited categories in order to have more fun? You bet they did!

The new Unlimited Categories Very Popular!



Almost one-third of the entrants participated in the new Unlimited categories. The change in entries between 2013 and 2014 tells the story. Not surprisingly, the Multioperator categories showed a big drop from 2013 to 2014 as the single operators moved to their own categories. Additionally, it looks like some single operators who wanted to operate in an Unlimited way but held back because they didn't want to compete against the Multioperator teams, also took advantage and shifted into Unlimited categories. For the first year of a new scheme, it was very successful.



Digging more into the submitted entries shows how the Unlimited categories were used. By comparing the three Single-Operator categories of Mixed Mode, Phone Only, and CW Only between 2013 and 2014 a few clear trends pop out. First, high power operators took advantage of Unlimited operation more than low power or QRP. This makes sense. If someone is going to grab spots off a cluster or skimmer to "Search and Pounce" he or she will usually be more successful with high power than with low power or QRP. To a QRP operator grabbing and QSYing to a spot does not make much sense if you can't break the pileup when you get there.

Second, Mixed Mode operators took advantage of Unlimited categories more than Phone Only or CW Only. This may be attributed to prior years in which Multioperator categories were only Mixed Mode. Perhaps when the true Unlimited categories were created those operators just operated the way they did in the past. Or perhaps, since Mixed Mode operators have more spots to chase down, they just naturally tend to Unlimited operation. Again, it is just one of things that is more fun to do!

Update on Mexico

Another recent rule change occurred in 2010 when the 32 Mexican (XE) states were added to the multiplier list. Since then XE contest activity has grown nicely with a total of 38 XE logs submitted in 2014 containing 21,000 QSOs — up from 33 logs in 2013 and 30 in 2012. With competitors worldwide chasing down these multipliers, XE operators have realized they will be very popular when they get on the air. As Luis, XE2B, related after the contest: *"I managed to work DXCC (106 countries) plus all stateside and just missed one VE province (NU)."* He has to be one of the very few stations that managed both DXCC and WAS over the weekend. Well done, Luis! As he also described, *"There were several instances that I was asked to repeat the exchange twice or more, because*

they were asking for a number and seemed confused when I was sending my state abbreviation." As a reminder for everyone, XE stations give a three letter state abbreviation for their exchange. A list of the abbreviations can be found on the ARRL contest website in the rules for the 10 Meter Contest.

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 operating from their home QTH. It can be quite motivating to get on the air to make some points for your club or to compete for honors against fellow club members. Many operators mention in their soapbox comments something similar to, "Wanted to get on the air to make some points for our club." Just another way to have some fun on a December weekend.

A total of 1,193 operators submitted logs that were also credited towards club competition. This means that 47% of the W/VE operators were part of one of the 78 different clubs that participated. Way to go club organizers!

In the Local Club category the Central Virginia Contest Club (CVCC) took top honors among the 37 clubs entered. In doing so they repeated their first place finish from 2013 and this makes it 3 out of the last 4 years they have won. Their 9 members combined for more than 5 million points, the only Local club to do so. They also were the only club to exceed 4 million points! CVCC's success formula? High-scoring members. A couple of clubs had more operators than they did, but their more than 600,000 points per member was second best of all clubs and this carried them to the top.

Table 2 - Entrants from the Central Virginia Contest Club

Station call sign and score in 1,000s of points

K4OSO (27) N3UA (1,684) W4ML (1,843) WA4PGM (173)
KG4W (502) W4HZ (1,010) W4PM (201) WD4LBR (95)
KJ4IT (2)

In the equally popular Medium Club category, 35 clubs fought it out. In the end, the 40 members of the Frankfort Radio Club (FRC) once again finished ahead of the 47 members from second place Arizona Outlaws Contest Club (AOCC). FRC's success formula? A combination of participation and high-scoring members. They had the second highest turnout in the Medium Club category and the members had, on average, scores 26% higher than AOCC's.

Table 3 - Entrants from the Frankfort Radio Club

Station call sign and score in 1,000s of points

AA3B (652)	K3TUF (2)	N2MM (1,075)	W2ID (4)
AB2E (3)	K3WW (2,106)	N2NT (3,147)	W2LE (348)
K2RET (44)	K9RS (1,295)	N3DXX (636)	W2MMD (211)
K2SQS (6)	KB3Z (20)	N3KR (116)	W2NO (26)
K2TW (591)	KC2LSD (10)	N3RS (1,320)	W2RDS (25)
K3ATO (517)	KD3TB (185)	NA2JM (18)	W3BGN (355)
K3IPK (383)	KF3B (1,569)	NE3I (74)	W3FIZ (12)
K3JD (62)	KU2C (111)	NK3Y (185)	W3KB (419)
K3MD (27)	KW3F (90)	NW3H (106)	W3UC (109)
K3PP (337)	N2ED (171)	NY3C (93)	WG3J (193)

In the Unlimited Club category six clubs battled it out. Coming out on top again for the fourth year in a row were the 119 members of the Potomac Valley Radio Club (PVRC) who bested second place Yankee Clipper Contest Club (YCCC) by a wide margin. The PVRC repeated their regular success formula by overwhelming their competition with the sheer number of participating members. In fact their average score per log was only 3rd best and the YCCC average score per log was almost 100,000 points higher than PVRC, but if you can get 119 members turning in logs like the PVRC did that will certainly push up your club score. Congratulations to all the clubs and their organizers.

Table 4 - Entrants from the Potomac Valley Radio Club

Station call sign and score in 1,000s of points

AA4FU (244)	K4XL (222)	N4FX (510)	W3DF (122)
AA4KD (1)	K4YCR (16)	N4MM (164)	W3DQ (1)
AK4D (15)	K7SV (181)	N4PD (506)	W3FA (14)
K1DQV (277)	KA3JLW (3)	N4QWF (2)	W3GVX (51)
K1RH (493)	KA4RRU (137)	N4QX (1)	W3IDT (129)
K1RY (14)	KB3WD (1,437)	N4RA (11)	W3KX (624)
K1SE (151)	KD4D (1,322)	N4UEZ (124)	W3LL (599)
K1ZW (14)	KE3X (5)	N4VA (421)	W3OU (258)
K3AJ (840)	KE4S (296)	N4XYZ (65)	W3SFG (152)
K3CCR (230)	KE4VH (19)	N4ZR (113)	W3UL (33)
K3DNE (389)	KF7NN (1)	N8AID (77)	W3US (94)
K3KU (44)	KG4NEL (1)	N8HM (46)	W3YY (69)
K3MZ (36)	KK4UNZ (61)	N8II (2,078)	W4CB (584)
K3OQ (502)	KU1T (29)	NA1DX (169)	W4EE (105)
K3RA (1,385)	N1LN (501)	NC4S (14)	W4GDG (8)
K3TN (420)	N1RM (19)	ND3D (50)	W4JVN (20)
K3WI (250)	N3AM (147)	NN3RP (145)	W4PK (320)
K3YDX (173)	N3HEE (19)	NN3W (534)	W4TG (6)
K3ZO (848)	N3JT (18)	NN4RB (11)	W4VIC (91)
K3ZU (753)	N3OC (1,622)	NR3X (1,185)	W4YE (202)
K4ALE (17)	N3QE (802)	NR4C (37)	WA2VQV (69)
K4EET (24)	N3ST (36)	NR4M (1,007)	WA2WDT (83)
K4EU (404)	N3VN (7)	NS3T (282)	WA3AER (12)
K4FJ (1,884)	N3VOP (88)	W0CN (139)	WA3RGH (2)
K4FPF (17)	N3WD (56)	W0UCE (80)	WA4JUK (370)
K4FTO (40)	N3XL (22)	W1IE (37)	WB2ZAB (189)
K4MI (145)	N3ZV (76)	W2CDO (139)	WJ9B (1,049)
K4MIL (53)	N4AF (1061)	W2GPS (1)	WV4V (53)
K4ORD (325)	N4CW (299)	W3BW (8)	WX3B (493)
K4TMC (54)	N4DJ (409)	W3CB (184)	

Affiliated Club Competition

Unlimited

	Entries	Score
Potomac Valley Radio Club	119	32,894,468
Yankee Clipper Contest Club	69	25,906,636
Florida Contest Group	69	22,266,758
Minnesota Wireless Assn	82	13,753,212
Northern California Contest Club	59	12,311,710
Society of Midwest Contesters	63	9,528,144

Medium

Frankford Radio Club	40	16,651,752
Arizona Outlaws Contest Club	47	14,331,432
Contest Club Ontario	39	11,786,532
Southern California Contest Club	27	9,254,746
DFW Contest Group	31	9,191,668
Georgia Contest Group	15	6,428,628
Mad River Radio Club	14	6,241,686
ORCA DX And Contest Club	12	5,575,504
Central Texas DX and Contest Club	10	5,301,270
Grand Mesa Contesters of Colorado	15	5,183,018
Carolina DX Association	19	5,114,306
Maritime Contest Club	10	4,860,048
Alabama Contest Group	18	4,771,892
Louisiana Contest Club	12	4,594,208
Western Washington DX Club	18	4,578,236
Mother Lode DX/Contest Club	18	4,274,432
Hudson Valley Contesters and DXers	13	3,852,028
Tennessee Contest Group	25	3,848,906
Contest Group Du Quebec	12	3,226,372
Willamette Valley DX Club	16	2,684,648
Utah DX Association	12	2,629,802
South East Contest Club	12	2,547,606
Order of Boiled Owls of New York	9	2,132,214
Hampden County Radio Assn	19	1,885,068
Saskatchewan Contest Club	5	1,700,706
North Texas Contest Club	4	1,608,928
Mississippi Valley DX/Contest Club	4	1,497,546
Texas DX Society	3	1,336,976
Rochester (NY) DX Assn	10	1,158,946
North Coast Contesters	6	1,078,062
Kentucky Contest Group	6	1,046,738
CTRI Contest Group	5	486,242
Six Meter Club of Chicago	6	220,100
Swamp Fox Contest Group	7	195,408
Badger Contesters	3	161,336

Local

Central Virginia Contest Club	9	5,538,040
Bozinga DX and Contest Club	3	3,040,388
Radiosport Manitoba	5	2,349,080
Redwood Empire DX Assn	5	1,790,274
Kansas City Contest Club	8	1,586,512
Lincoln ARC	9	1,497,914
Bristol (TN) ARC	10	1,189,296
599 DX Association	9	1,167,016
Hilltop Transmitting Assn	4	1,127,490
Northeast Maryland Amateur Radio Contest Society	9	1,113,418
Spokane DX Association	8	1,059,168
Sussex County ARC	10	1,008,678
Delara Contest Team	5	885,248
Meriden ARC	5	755,410
Niagara Frontier Radiosport	7	737,448
North Carolina DX and Contest Club	5	533,416
Murgas ARC	4	499,752
Midland ARC	4	478,588
Metro DX Club	4	411,278
Contoocook Valley Radio Club	6	401,398
West Park Radiops	6	382,554
Portage County Amateur Radio Service	4	345,368

Brazos Valley ARC	5	315,710
Granite State ARA	7	258,204
Athens County ARA	5	204,814
Columbia-Montour ARC	3	201,168
Sterling Park ARC	4	163,216
West Allis RAC	6	161,282
South Jersey DX Assn	3	158,268
North Fulton ARL	6	135,566
Skyview Radio Society	6	104,242
Bergen ARA	7	93,782
Pottstown Area ARC	6	90,258
Ventura County Amateur Radio Society	3	84,722
Rappahannock Valley Amateur Radio Club	4	71,474
Peterborough Amateur Radio Club	3	70,280
Wireless Association of South Hills	3	48,184

Close Races

Competitive types always enjoy a close race. Watching two teams battle on their chosen field down to the last seconds of the game is just naturally exciting. The 2014 ARRL 10 Meter contest contained an incredible number of such close races for a category-winning high score. Usually in any given year there are one or two close races. 2014, for whatever reason, had nine such races as summarized in the table below.

Table 5 - Close Races in 2014

Category	First Place	Second Place	Victory Margin
US Single-Op, Low Power, Mixed Mode	KU2M	KB3WD	0.7%
US Single-Op, QRP, Mixed Mode	WA6FGV	N1CC	0.5%
US Single-Op, High Power, Phone	NR5M	WB9Z	0.4%
US Single-Op, QRP, Phone	W6QU(W8QZA, op)	KB5KYJ	0.3%
US Single-Op, High Power, CW	N2IC	K1TO	0.3%
US Multiop, High Power	NX5M	N2NT	2.2%
US Multiop, Low Power	NØNI	WW4LL	0.2%
Canada Single-Op, Unlimited, High Power, CW	VE1OP	VE5UF	0.1%
DX Single-Op, Unlimited, Low Power, CW	KP4EJ	CN8KD	1.4%

Note that in many cases the scoring difference between the top two finishers was less than 0.5%. This means that a couple of QSOs here or another multiplier there made the difference between first and second. In the closest race of all, between VE1OP and VE5UF in the Canada Single-Operator Unlimited, High Power, CW Only category the difference between first and second place was essentially a single QSO. How's that for a close race in a 48-hour event? In other cases, though the race was not quite that close it still came down to the final minutes to determine who was going to take first place. Let's take a look at three such races for enjoyment and education.

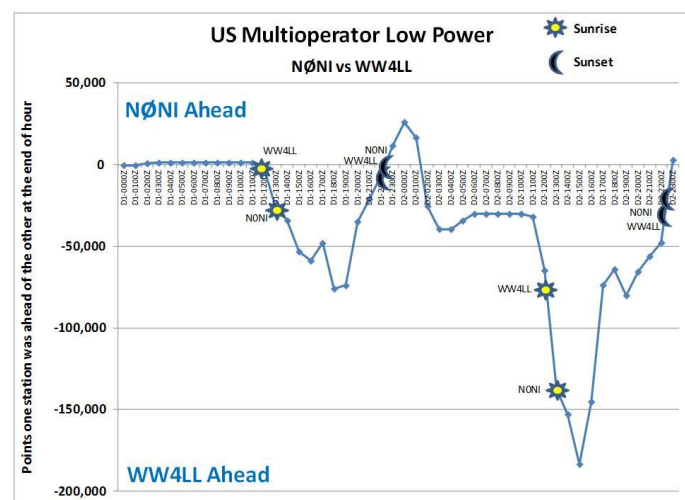
The first two races were Multioperator battles. Historically, Multioperator categories seem to generate tight races. Usually they have enough operators that

keeping the station on the air is not a competitive variable. Though as we will see, if the whole gang takes an hour off for a meal or some other event, that can impact a tight race. What is interesting is to study is how they work through their strategic decisions: When to run versus look for multipliers, when to operate Phone versus CW, how to create a station setup optimized for running on one mode while grabbing multipliers on another.

A win at the wire

The first race was an epic one for top honors in the US Multioperator, Low Power category between NØNI and WW4LL. NØNI is no stranger to close races. In 2013 they almost ran down KD2RD for second place in the same category. In that race during the final 10 hours NØNI closed most, but not quite all, of a 300,000 point lead KD2RD had at daybreak on Sunday. In the final review of that race it looked like NØNI could have pulled it out simply by spending more time on the air. They fell short of KD2RD by only 20 QSOs. They also had 8 hours less time on the air than KD2RD. Could they have found another 20 QSOs somewhere? Probably. We will see if NØNI applied what they learned in 2013 to 2014.

In 2014 NØNI was battling it out with WW4LL. Like NØNI versus KD2RD in 2013 this race was also one of east versus west. WW4LL is in Georgia and NØNI in Iowa. So WW4LL had the early sunrise advantage by about an hour. They are also further south than NØNI so additionally they had about 45 more minutes of daylight than NØNI.



The timeline chart above tracks the back and forth battle between these two stations over the weekend. What it shows is how the two stations scores compared at the end of each hour during the contest. If you could look over the shoulder of the operators at each station and view their scores and compare them, this is what you would have seen. Actually, though you would have seen their

raw scores on the screen. These charts have been adjusted to include the impacts of log checking for each station in order to compare their final scores. Many times the log checking process can have quite an impact on scores, but that's a different story.

In order to set up the story of this close race it is first worth looking at how it ended up — no use waiting for the story to unfold. In the end, NØNI ended up winning by 2,910 points which is about 3 CW QSOs or 1 multiplier. A measly 0.2% was the difference in scores between the two stations after 48 hours. Knowing this is how it ended let's see how the weekend went.

Looking at this race's timeline, it got off to a slow start. For both stations the contest started after sunset Friday night and they made very few QSOs. Low power and marginal openings usually result in pretty low rates. Between the two stations they made a grand total of 62 QSOs and neither station carved out an advantage over the other.

The real race began at sunrise on Saturday morning. WW4LL was on the air right at their sunrise and found the band open to Europe. For the next 30 minutes they had an early advantage over NØNI. The guys in Iowa could only sit by their rigs waiting for the band to open. NØNI finally got a QSO in the log at 12:55 UTC and were also working Europe right away. This was fully 40 minutes before their sunrise so NØNI was clearly "out of the blocks" early and racing.

As the morning progressed WW4LL leveraged their East Coast location and by the end of the 1800 UTC hour had built a 75,000 point lead. At that time they had 485 QSOs and 174 multipliers compared to NØNI's 409 and 143. By this time the band was closed to Europe — NØNI made their last Europe QSO at 1700 and WW4LL at 1725 UTC — changing the race dynamics.

Working up, down, and across the Americas is what counted now and NØNI responded by gaining ground on WW4LL for the rest of the day. By the end of the 2200 UTC hour, just after sunset for both stations, WW4LL's lead was down to 7,000 points. An hour later NØNI had their first lead of the contest and was out in front by 12,000 points. NØNI took advantage of their more westerly location to make more Asian QSOs than WW4LL.

During the 0000 UTC hour on Sunday the two stations made key strategic decisions. NØNI appears to have worked the band at a relatively steady rate until 0015 UTC when they went off the air for an hour except for a single QSO at 0027 UTC. They came back on the air at

0113 UTC were able to make only 8 QSOs in the next 30 minutes then closed down again at 0143 UTC. They did come back on just before 0600 UTC and made another 9 QSOs over 30 minutes mostly to the south of them. WW4LL also appears to have been on the air as the 0000 UTC hour began though working at a slower rate than NØNI. They then took a 90 minute break, not returning to the air until 0147 UTC at which time they began a steady rate of QSOs until 0340 UTC when they shut down for the night. During that period they made 70 QSOs mostly up and down the East Coast but with a few reaching the West Coast. This allowed them to regain a 30,000 point lead over NØNI when both stations shut down for the night.

Looking back at this interesting period you have to wonder: Did WW4LL leave some QSOs on the table during their 90 minute break? After all they were still working them when they shut down and started working them when they got back on the air.

Did WW4LL miss an opening later in the evening? NØNI had an opening later as did N2NT up the coast in New Jersey. (We will look at N2NT's own close race next.)

Did NØNI also leave some QSOs on the table during their 60 minute break? They were working stations up to when they took a break and did so again after getting back on the air.

Similarly did NØNI miss some possible QSOs while off the air for 4 hours before finding the band open around 0600 UTC?

Regardless, as dawn approached Sunday morning, WW4LL held a 30,000 point lead over NØNI. If the same scoring pattern was followed on Sunday as on Saturday then WW4LL would end up on top. They were ahead of NØNI at 0000 UTC Sunday. Would they still be ahead at 0000 UTC Monday at the final bell?

Sunday though began much different than Saturday. WW4LL logged their first contact at 1127 UTC, an hour earlier than on Saturday and a full hour before sunrise. This gave them a full 90 minute advantage over NØNI who didn't make their first QSO until 1304 UTC, so it was WW4LL who came blasting out of the blocks on Sunday. They had 30 QSOs and 4 new multipliers by the time NØNI logged their first contact. WW4LL then put together back-to-back 95 QSO hours during the 1400-1500 UTC stretch, their second best hourly rates of the contest. During the three hours 1300 thru 1500 UTC they made 260 QSOs and logged 33 multipliers as compared to NØNI's 159 and 36 respectively. Suddenly WW4LL

had moved out to a 180,000 point lead as the contest entered the last 8 hours. They had tripled their advantage over NØNI at the same point on Saturday. Things were looking very good for WW4LL.

However, as the morning turned to afternoon and darkness fell on Europe, the tides again turned in NØNI's favor. Starting in the 1600 UTC hour both stations were operating primarily CW to maximize points per QSO. During the 1700 UTC hour NØNI logged 107 QSOs, the highest hourly rate for either station all weekend. WW4LL had a relatively weak hour with just 52 QSOs and their lead quickly shrunk to just over 70,000 points. NØNI chipped another 10,000 points off their deficit during the 1800 UTC hour. NØNI also seemed to have a longer opening into Europe than WW4LL. NØNI worked their last European station at 18:22 UTC and additionally had several Finnish (OH) stations call in later during the well-known late afternoon Scandinavian opening the western US sometimes has. WW4LL worked their last European at 17:53 UTC.

WW4LL responded with a strong 1900 UTC to build their lead back up to 80,000 points. Then WW4LL had one of those, "What happened in that hour?" periods making just 35 QSOs during the 2000 UTC hour. Looking at their log they spent the whole hour S&P'ing. Were they trying to run and just could not get a run going? Were they hoping to track down multipliers not appearing on the spotting networks? The log does not tell that story, but whatever it was, it was the turning point of the contest. NØNI powered on and cut WW4LL's lead by 15,000 points.

From that point on NØNI was sprinting to the finish while WW4LL was trying to hold on with NØNI's footsteps coming up from behind. With one hour to go, WW4LL still had a 48,000 point lead. At this point in the contest 48,000 points represented about 40 CW QSOs or about 8 multipliers. That's still a pretty good lead. But, would it be enough to hold off the hard charging NØNI? Remember in 2013 NØNI was chasing down KD2RD and fell just short. What would happen this time?

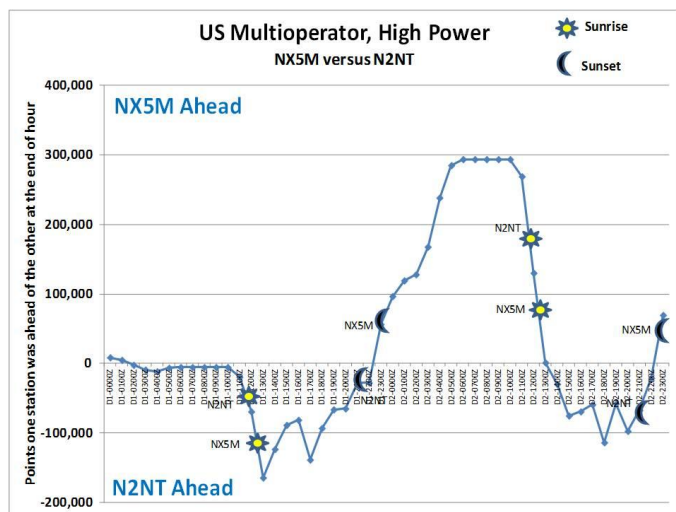
During the last hour NØNI turned in a very respectable 70 QSO performance, all on CW, as well as tracking down 5 more multipliers. The team at WW4LL could only manage 41 QSOs and 3 multipliers. As during the 2000 UTC hour, WW4LL spent the hour largely in S&P mode. NØNI was solidly running as well as making quick QSYs to work additional stations in between run QSOs. Literally in the last five minutes of the contest NØNI passed WW4LL for victory. The final margin of victory for NØNI was 2,910 points. This is about 3 CW QSOs, 6 Phone QSOs, or 1 mult. That's a close race.

So, did NØNI learn from their 2013 experiences? In 2013 they spent 23 hours and 44 minutes on the air. In 2014 they extended that by 1:20 and spent 25 hours and 5 minutes on the air. Could they have won without that extra on air time? No way!

What about the jumble of off times each station took on Saturday night? What if WW4LL had stayed on the air during their 90 minute break? Could they have made enough QSOs to hold off NØNI? Absolutely. (The late Saturday night opening was an interesting and important period of the contest. It is examined in a separate section of this article.)

A heavyweight slugfest

The next race was for top honors in the US Multioperator, High Power category. The contenders in this match were NX5M in Texas versus N2NT in New Jersey. Adding to the battle was the fact that this 10 Meter contest was to be NX5M's last before tearing the station down, so Bob and his team really wanted to finish on top. So how did the race play out? Among the close race battles this was not the closest, but it was interesting and exciting just the same.



Starting at the left end of the timeline you can see that not much was going on during the first 10 hours of the contest. For both stations the contest started after sunset and there were not a whole lot of QSOs to be had during Friday evening with each station having very similar results. When N2NT shut down for the night they had 189 QSOs and 59 multipliers whereas NX5M had 162 QSOs and 59 multipliers. A slight lead for N2NT but the real race began at sunrise on Saturday morning.

For the 10 Meter Contest, understanding sunrise, sunset, and total daylight is important to understanding a close race. 10 meters is typically a daylight band except in cases of extreme solar activity or when E-skip occurs. In

this case because N2NT's QTH is much further east than NX5M's, their sunrise was an hour earlier and this let them get off to a quicker start each day relative to NX5M. Conversely, NX5M's more westerly QTH meant they had a later sunset and they would still have propagation well after the band closed down at N2NT. Also importantly, NX5M's QTH is further south than N2NT's and thus they had about 50 minutes more daylight each day. So the relative differences were similar to those of NØNI and WW4LL except in this case the western station had the total daylight advantage.

Taking advantage of their earlier sunrise, N2NT jumped out to a lead through both more QSOs and more multipliers. At the end of the 1300 UTC hour on Saturday they had a 164,000 point lead over NX5M. This would turn out to be their largest lead of the weekend. As the propagation strengthened, NX5M fought back, importantly by picking up many of the multipliers that N2NT already logged. By the end of the 1600 UTC hour NX5M had cut N2NT's lead in half.

N2NT responded in the next hour with 210 QSOs, their best hourly count of the contest. They took advantage of the band being open for them to Europe, Africa, North and South America at the same time. They also spent the hour on phone and experienced the higher QSO rates that phone operation typically generates. As a result, they grew their lead back up over 140,000 points.

However, from that point through the rest of Saturday and well into Sunday the contest belonged to the team at NX5M. They gained on N2NT for 13 straight hours. During those 13 hours NX5M made 932 QSOs and logged 57 multipliers to N2NT's 526 and 46 respectively. It also appears that NX5M exploited the Saturday evening opening to a greater extent than N2NT. During the 0000 UTC to 0700 UTC period NX5M more than doubled N2NT's QSO count. As an example, NX5M made 149 QSOs in the 0400 and 0500 UTC hours, fully 5 to 6 hours after sunset. During that period N2NT managed just 13. NX5M also kept on the air for the whole period whereas N2NT took a one hour break during the 0000 UTC hour Sunday. A team dinner perhaps? An equipment issue? We will see if this operating gap had a potential impact on the score. The net result of all of this is that when both stations shut down for the night on Saturday NX5M had built up a 290,000 point lead. They were showing 1,755 QSOs and 286 multipliers to N2NT's 1,632 and 254 respectively.

As Sunday dawned, N2NT was up and at it early. The band opened to Europe right away and their first QSO was logged at 1128 UTC, fully an hour earlier than NX5M. NX5M did not make their first European QSO

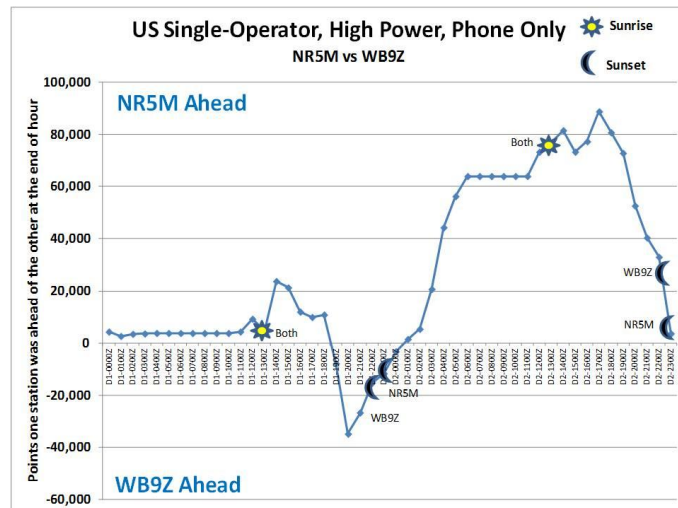
until 1255 UTC. Once again N2NT used their propagation advantage to gain on NX5M notably by grabbing needed multipliers. By the end of the 1400 UTC hour they were once again in the lead. By the end of the 1800 UTC hour they had created an over 110,000 point advantage. More importantly their lead at this point was 20% greater than it had been at the same point on Saturday.

So, N2NT had improved their position. The question was, "Would it hold up against the inevitable gains NX5M would make after sunset at N2NT?" The two teams more or less fought to a draw over the next couple of hours with N2NT retaining their lead. When the sun set on N2NT they still had a 67,000 point lead over NX5M at the end of the 2100 UTC hour. This also was bigger than their lead at sunset on Saturday. In fact it was over double their lead on Saturday! But, would it hold up?

During the last two hours NX5M operated almost exclusively in phone mode with its high rate of 2-point QSOs. By the end of the 2200 UTC hour they had cut N2NT's lead to 21,000 pointx. So the race came down to the last hour — would N2NT's lead hold up? During the last 60 minutes NX5M was able to make 153 QSOs and log 5 multipliers to N2NT's 38 and 4 respectively. Likely somewhere around the 23:15 mark NX5M passed N2NT "going into the final straightaway" and "ran through the tape" to a 70,000 point victory a little more than 2% ahead. Though not as close as the NØNI versus WW4LL race this was still a good one. It came down to the last hour.

Single-Ops rock to the top

Now let's turn to a Single-Operator battle. The race for the top spot in the US Single-Operator, High Power, Phone category between two superb operators was about as close as NØNI versus WW4LL. In the end George, NR5M, edged out Jerry, WB9Z, by 3,630 points or just 0.4% of their final scores. The score difference could have gone the other way with a single multiplier more by WB9Z or 10 more QSOs. Let's take a look at the race for more insight.



The locations of these two stations gave the race a distinctly different character than the others. WB9Z is in Illinois which is both north and east of NR5M in Texas. Their sunrises were within a few minutes of each other but NR5M's sunset was about an hour later, giving him an advantage on total daylight hours.

As was the pattern in the other races, the first dozen or so hours of the contest were uneventful. The contest started after dark for both stations, there really was not much of any opening on Friday night, and both operators awoke at dawn on Saturday morning ready to start the real contest. NR5M was up early and on the air at 1152 UTC, an hour and 20 minutes before sunrise. George made 20 or so QSOs over the next 90 minutes getting a bit of lead over WB9Z who didn't make a QSO until 1311 UTC.

The early morning advantage went to NR5M who built a 23,000 point lead with a higher rate and stronger opening into Europe at the end of the 1400 UTC hour. By then, the band was in better shape for WB9Z; his rate grew, multipliers found their way into his log, and he gained on NR5M for the next 6 hours. At the end of the 2000 UTC hour WB9Z had a 34,000 point lead over NR5M, which would turn out to be his biggest lead of the weekend.

During the 2100 UTC hour it looks like WB9Z took a 30-minute break which allowed NR5M to gain back some ground. In the 2200 UTC hour each station's rates were similar but NR5M added 6 more multipliers so that by hour's end he was only 15,000 points behind WB9Z. The 2300 UTC hour was also "advantage NR5M" as his sunset was an hour after WB9Z's, allowing him to make 50 more QSOs during the hour. So as the first day ended, WB9Z had a 12,000 point lead over NR5M. The race could still go either way. What would the second day hold?

As Sunday began at 0000 UTC, WB9Z was running at a rate of about 60 QSO per hour. Not a great rate but not bad for being 90 minutes after his sunset. Then at 0020 UTC he went QRT for the night except for a single QSO at 0213 UTC with W5PR in Texas. On the other hand NR5M kept plugging away even as rates inevitably fell after sunset. His 0100 and 0200 UTC hours contained a total of 32 QSOs and at one point he went 20 minutes without a QSO.

However, by being on the air he also caught the Saturday night opening as it unfolded, beginning just before 0300 UTC. His Texas QTH was seemingly in "The Right Place at the Right time." In the four hours of 0300 through 0600 NR5M logged 198 QSOs. He even worked a multiplier by catching KE5GCH in nearby New Mexico when the skip became really short. When NR5M called it quits for the night he had built up a 64,000 point lead. Catching this evening opening is probably what won the contest for NR5M. What happened at WB9Z? He did make that one QSO at 0213 UTC, but that was before the late night opening really turned on. WB9Z is very much located in the area where other folks were making QSOs, so it looks like Jerry just missed the action.

As Sunday dawned NR5M was again on the air early with WB9Z waiting until his sunrise. In the same pattern as Saturday, NR5M gained on WB9Z in the early hours and at the end of the 1400 UTC hour had extended his lead to 81,000 points. The lead moved out to 89,000 points at the end of the 1700 UTC hour. It was then WB9Z's turn and he gained on NR5M in each remaining hour of the contest. Each station's QSO rates were relatively similar but WB9Z was doing some aggressive multiplier hunting and this paid off with logging 23 multipliers in the last 6 hours. Comparatively, NR5M spent the whole time running and only logged 3 new multipliers. Could WB9Z catch NR5M?

WB9Z had a great last hour catching a nice Asian opening, made 132 QSOs, and grabbed 6 multipliers. But when the clock struck midnight, NR5M had managed to hold off WB9Z. Not by much — just 3,630 points of his earlier lead was left. This difference represented just 0.4% of their final scores. One single multiplier or 10 more QSOs by WB9Z would have tipped the race in his favor. Looking back at the race is there anything to learn?

The biggest story line, and likely where NR5M won the race, was during the late Saturday night opening. NR5M looked like he was going to stay in his chair until he knew the band was dead and thus was there when it sprung to life. Looking at the complete contest weekend,

NR5M was on the air for more than 33 hours as compared to WB9Z's 23 hours. In this case the old adage of "Keeping your Butt in the Chair" was likely a factor in the final standing. Could WB9Z have made another 10 QSOs by spending more time on their air? Very likely.

Looking at the final scores of the two stations you can see a bit about their contest strategy as well as how they adapted to their locations. Relative to WB9Z, NR5M was QSO rich and multiplier poor. On the other hand, relative to NR5M, WB9Z was QSO poor and multiplier rich. NR5M took advantage of his longer daylight hours and more southerly location to make more QSOs. Notably he had 350 more QSOs with North America than WB9Z. (200 of those were made during the late Saturday night period!) WB9Z actually did better into Europe than NR5M by 165 QSOs which is a testament to WB9Z's excellent station. NR5M spent more time CQing and let the mults come to him. WB9Z spent more time turning the dial looking for multipliers. In the end WB9Z had 17 multipliers more than NR5M.

Was it WB9Z's multiplier hunting that made the difference? Of these 17 additional multipliers, 11 were with Mexican states and Jerry also found Labrador and Newfoundland which George didn't. In this case, WB9Z took advantage of his location, especially for the Mexican multipliers. NR5M is just too close to Mexico to reliably work those XE multipliers. Though it is hard to say, in the end it looks like NR5M's "CQ and let the mults come to me" strategy was just about as successful as WB9Z's "Go and find the mults." Over half of WB9Z's multiplier advantage was with XE states that NR5M could not work. After netting out the XE multipliers WB9Z did work six more than NR5M, which in a close race is significant. And, as we know, if WB9Z had found just one more multiplier the race would have gone the other way.

Additional Analysis and Insights

In the four 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 being to provide insight into contest strategy and planning, how the 10 meter band behaves, or just something to satisfy my, and hopefully your, curiosity and inquisitiveness. These articles can be found on the ARRL website in the 10 Meter Contest Expanded Results articles for 2011-2013 (www.arrl.org/contest-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

This year I will take a look at the following topics:

- 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
- How many stations really were on the air and how many QSOs were made?

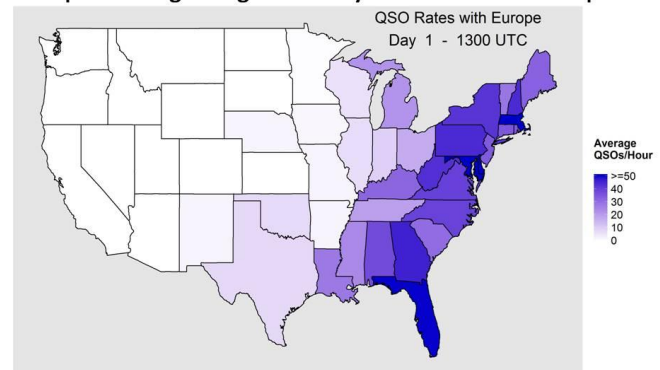
Before getting into the analysis let me review the tools I use. Since I wrote last year's article, and during the "off season", I spent hours and hours developing a completely new set of analysis tools. Gone is the 27-year-old copy of QuickBasic. In its place is a much more modern toolset centered on the Python and R programming languages. In no way would I claim I am proficient in either, after all I am not a software engineer, but I was able to get them to work well enough to do what I want. Hopefully you will enjoy what I have coaxed these programming tools to do. If you are interested in learning more, send me an email (see the article title).

Animated propagation movies

Leading with what I consider the best analysis, let's look at a breakthrough way to view propagation. When I started working on the new tool set I had this analysis in mind: I just knew there should be a way to build, in essence, a movie that portrays how propagation across the US plays out across the whole contest weekend. As a metric for propagation I used "What is the average QSO rate of stations in each state with a given target area during a certain time period."

The raw data to build these views was extracted from submitted logs by a Python program. The raw data was then input into Excel for further processing and formatting. This was then output and read by an R program to build the maps. I specifically tackled the learning of R because it has the ability to build the type of maps I needed — which by the way are formally called Choropleth maps. (An example of one map is shown below) One map was created for each 30 minute period during the contest. All of these maps were assembled into an animated movie through Microsoft *Movie Maker*. Each movie lasts a bit less than two minutes.

Example Choropleth Map portraying propagation from each US state with Europe. Metric = Average QSOs/hour for a station in each state with Europe for 30 minute period beginning at the day and time on the map.



Of course the challenge then became how to share these movies with you. With the right tools they could be embedded into the PDF document but it would become a pretty large file, leading to long download times. Better to post the videos on a video sharing site, like Vimeo, and provide the links to them as I have done. You may view the movies from the following links. Depending on your browser, PDF viewer, and operating system you may be able to do automatically load the movies. If that does not work, just copy the URL below into your browser, or go to the Vimeo site and search for the videos with these ID Numbers.

Some of these movies start out kind of slow. For example, the European movie does not show anything for a while because the first QSOs between the US and Europe don't happen until many hours into the contest. Have patience and allow each movie to play through.

United States to Europe:

United States to North America:

United States to South America:

United States to Asia:

<https://vimeo.com/124625918>

<https://vimeo.com/124625917>

<https://vimeo.com/124625916>

<https://vimeo.com/124625915>

These movies pretty well tell the story of how 10 meter propagation from around the world washes across the US during mid-December. From Europe, the band first opens on the East Coast. The opening then moves east to west as sunrise moves across the US. The path then closes down about the same time for all as this is caused by sunset in Europe. The reverse happens with Asia. The path opens up, more or less, across the whole US at the same time. The driving factor is sunrise in Japan. Then the path closes down east to west as sunset moves across the US. I will let you draw your own conclusions from here in terms of more detail and the other geographies.

Once these tools are in place and additional data sets obtained, more analysis is possible. The only limiting factors are time and an ability to actually understand the results. For example, a favorite line of discussion among contesters is "Propagation was better last year! You should have seen it then." (Or conversely, "Propagation was better this year!). With the tools and data it is possible to create a movie which might answer those questions. For example, here is a movie that compares propagation with Europe during the 2013 contest to that during the 2014 contest.

2014 versus 2013 United States to Europe:
<https://vimeo.com/125578200>

Interpretation gets to be more complex. What I see is that during 2014 on Day 1 the path was better early along the East Coast but then as the day progressed, QSO rates were generally below those seen during 2013. For Day 2 the two years were pretty comparable early but as the day progressed, 2014 showed generally higher QSO rates than 2013.

Evening Activity in the U.S.

One thing I do in preparing to write each year's article is to read the soapbox comments everyone wrote. Every one of them! In doing so I came across many references to the quality of the evening opening in the US on Saturday night versus Friday night. Some typical comments were:

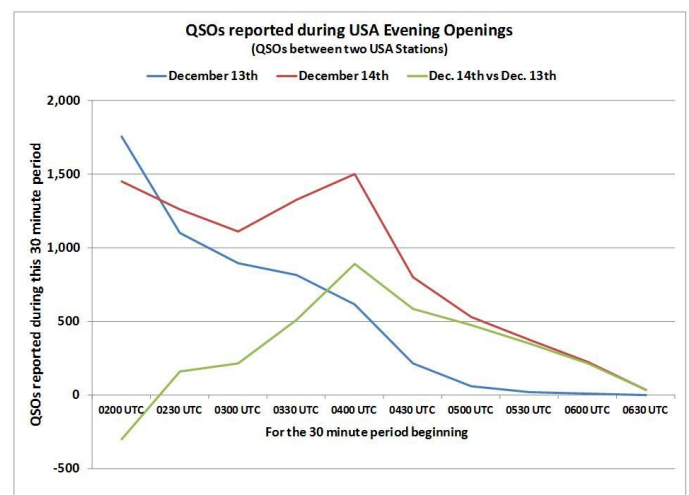
"The E-skip finally got hot around 0230 [Saturday night], but most of the casual ops had long since QRTed"
- Bill, K4XS.

"Best part of the contest was on Saturday night, when 10 turned into 6 meters for awhile" Jamie, NS3T.

"Big Es late Saturday night but hardly anyone around to work it!" W9XG (operator Bob, K2DRH.)

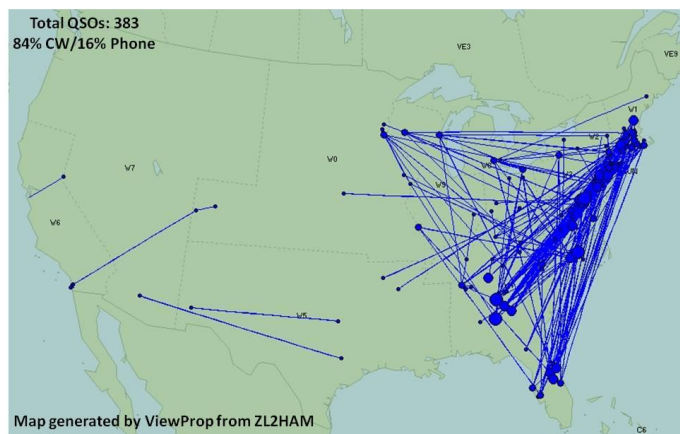
Seeing all these comments I thought I should take a look at what happened. First, I wondered if their observations

were true? Were there more QSOs on Saturday night than on Friday night? Luckily I had the log data to answer the question. It was already extracted from the logs to build the "North America working US" propagation movie just described. As shown below, sure enough, the evening opening on Saturday was much better than on Friday. In particular, starting about 0300 UTC on Sunday (Saturday night in the US) operators started to make many more QSOs than they did on the first night. The peak of the opening appears to be the 30 minutes starting at 0400 UTC when over 1,500 QSOs were logged — a rate of almost one per second. The band remained open through the rest of the night until the QSO rate dropped to zero around 0700 UTC or 2AM local time on the East Coast.

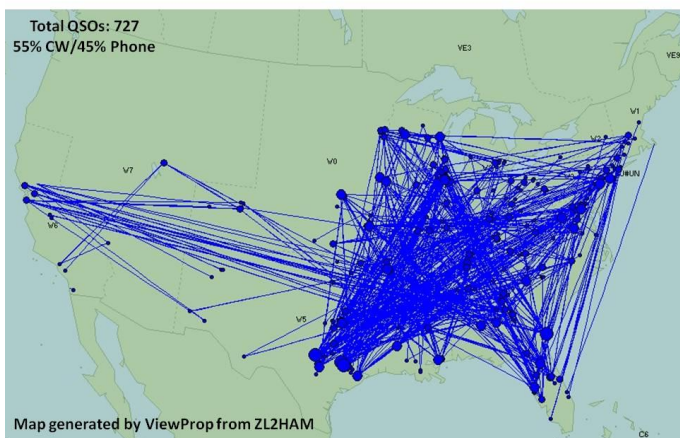


Second, I wondered if a picture of the differences in the opening between the two nights could be developed? To do this I needed to map individual QSOs. A different tool was needed than what I used to build the propagation movies. For this work I turned to *ViewProp* by ZL2HAM (<https://groups.yahoo.com/neo/groups/viewprop/info>). This program can input a Cabrillo file and be configured to draw a line on a map representing each QSO. One map was made for QSOs made during the 0400 to 0415 UTC periods on Friday and Saturday night and these are presented below.

QSO's Logged: 0400-0415 UTC December 13th



QSO's Logged: 0400-0415 UTC December 14th



Differences in the two nights show up quite clearly. On Friday night the opening was mostly just up and down the East Coast with few QSOs west of the Appalachian Mountains. On Saturday night the opening reached all the way west to the Mississippi River and beyond, notably into Texas where several of the big players were racking up QSOs.

Also note the western edge of the opening just barely made it to Iowa where NØNI was in a close race in the US Multioperator, Low Power category with WW4LL in Georgia. Looking at NØNI's log though shows they made no QSOs between 0143 and 0553 UTC. At 0553 they caught the end of the opening and made 10 QSOs in about 30 minutes. Did they truly miss the peak of the opening or were they monitoring the band and the opening missed them? Only they know for sure but luckily they made those 10 QSOs. Without them they would have ended up in second place. What about WW4LL? They were off the air for an hour around 0000 UTC Sunday and then made their last QSO for the night at 0340 UTC, when the band still appeared to be open.

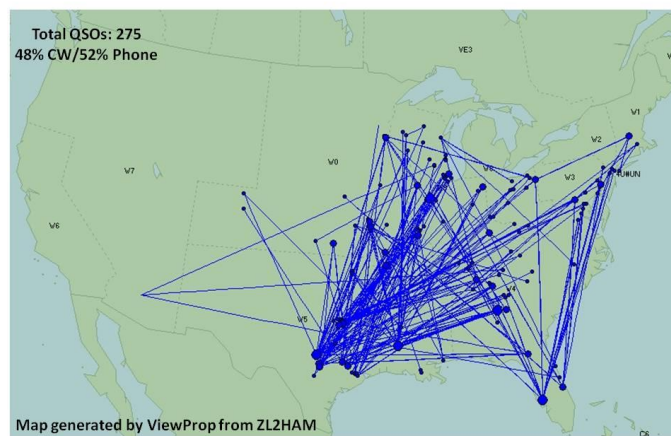
Could they have found a contest-winning three more QSOs in those periods? It seems like they could have.

Did this Saturday night opening also have an impact on the NX5M versus N2NT race for US Multioperator, High Power honors? Maybe. The race was not as close as NØNI versus WW4LL. The final margin of victory for NX5M was on the order of 50 CW or 100 phone QSOs.

Over a 48 hour contest many things can happen that swing scores one way or another. However, during Saturday evening from 0200 to 0700 UTC, NX5M worked 165 more QSOs than N2NT. If N2NT had simply matched NX5M during these hours, N2NT would have won.

The question of why NX5M did better during this period can't be totally answered with the data at hand. One interesting conjecture can be seen on the QSO map. NX5M in Texas appeared to be ideally situated for the opening. From their location propagation was available into the high population areas up and down the East Coast and across the upper Midwest. On the other hand, it looks like N2NT was on the northeast corner of the opening and, from their location propagation was open into less populated areas. Perhaps N2NT just could not match NX5M's QSO total?

QSO's Logged: 0500-0515 UTC December 14th

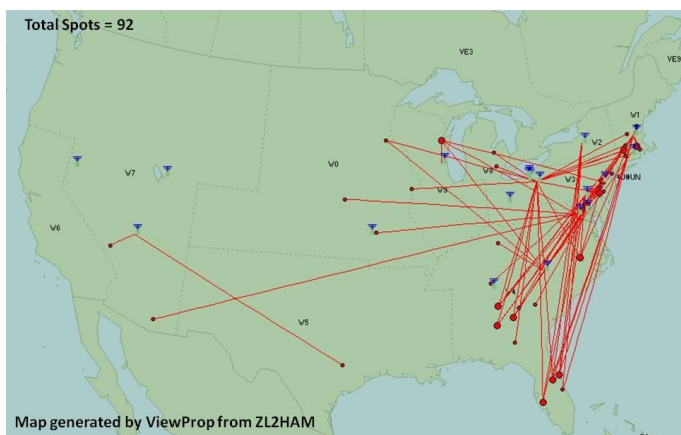


The map of QSOs logged one hour later, during the 0500-0515 UTC period does seem to show that the opening was closing down for those stations in the northeast while it was still going strong in Texas. In many things in life sometimes "Being in the right place at the right time" can be the difference between winning and losing. This may have been one of those times. If Saturday night had played out a different way, N2NT could have taken home the victory.

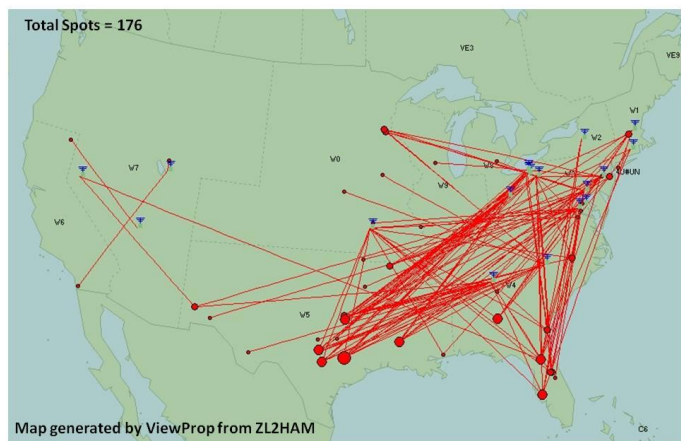
For WB9Z versus NR5M race in the US Single-Operator, High Power Phone category, this Saturday opening seemed to make the difference. NR5M caught it and made 198 QSOs in the 0300 to 0600 hours. WB9Z made no QSOs during this period though being in the area where the opening was active. Since WB9Z came up just 10 QSOs short, the way in which each station took advantage of this opening made the difference.

To complete the study of this Saturday evening opening a similar picture was created using CW *Skimmer* spots from the Reverse Beacon Network as shown below.

Skimmer Spots: 0400-0415 UTC December 13th



Skimmer Spots: 0400-0415 UTC December 14th



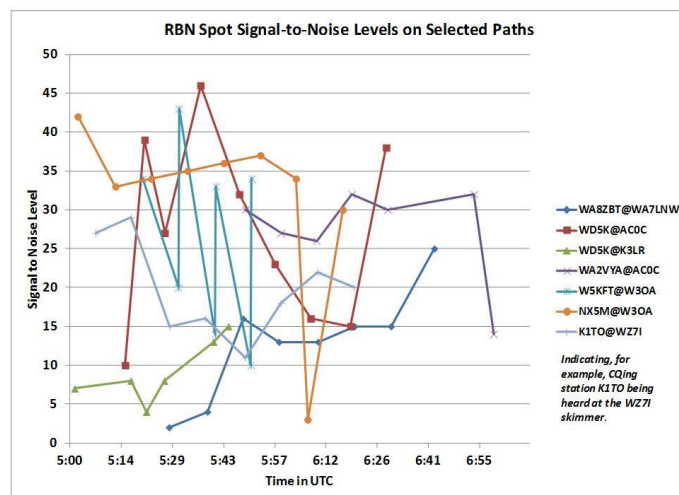
These two maps tell pretty much the same story as the one created from the QSOs. One difference though is that they are more "sparse." To some extent this is because the number of *Skimmers* is much smaller than the number of stations on the air. They also catch only CW activity and not phone. Also keep in mind that *Skimmers* often use low gain, omnidirectional antennas. When band conditions are marginal the skimmer network is not the best source of information on the quality of the opening.

A similar situation was observed in the study I did for the 2013 contest article on how the band opens in the morning from the US to Europe. In that case many US stations were making QSOs with Europe 30 minutes before the skimmer network showed the band was open. Even with modern technology, the best way to tell if a band is open is to turn on the radio and listen to the band.

Finally, what about soapbox comments of running out of people to work? Did these have any basis in fact or were they just a case of grizzly old testers finding something to complain about? Torturing the *Skimmer* data some more may give a hint.

Using the Signal-to-Noise Ratio (SNR) data contained in the RBN spots as a measure of signal strength we can see if the band really was open and no one was home. (I know SNR should not be used this way because SNR can and will also go up if noise goes down and this trend could just as easily and plausibly been going on at the same time. But what the heck, let's give it a try anyway.) Sorting through the RBN spots in the period after 0500 UTC there are several examples of where the same transmitting station was heard by the same *Skimmer* multiple times. These were used to draw a timeline of the SNR.

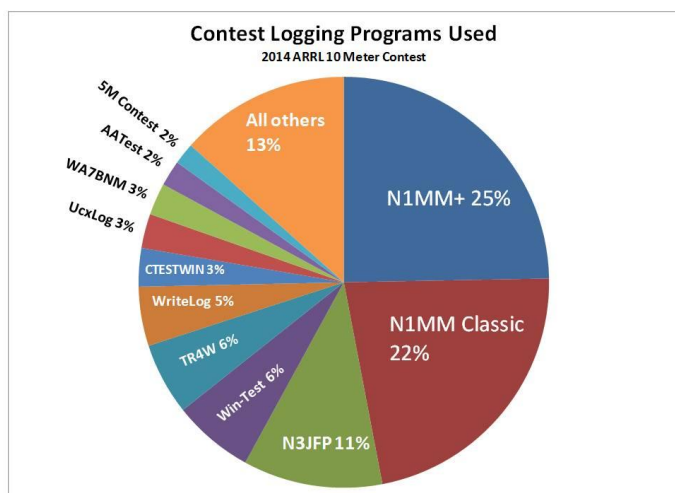
Though appearing as a jumble of lines, it does look like the band was still open after 0600 UTC and even towards 0700 UTC. (0700 was 2AM Eastern Time) If all the lines had a strong "down and to the right" trend then you might say the band was dying out. But, in this case it looks like the operators were the ones dying out, or perhaps everyone still awake had worked everyone. Those grizzled old contest veterans may have been right!



An updated view of contest logging programs

Perusing the Soapbox comments I also noticed that many operators were using the recently-released *N1MM Plus* for the first time. With access to Cabrillo log files it is fairly easy to summarize contest logging programs used by the entrants. One of the standard Cabrillo tags is "CREATED-BY:" which is followed by the name of the logging program. Another Python program was created to look through all the logs and tally the programs used.

For the 2014 ARRL 10 Meter Contest logging program usage looked like this:

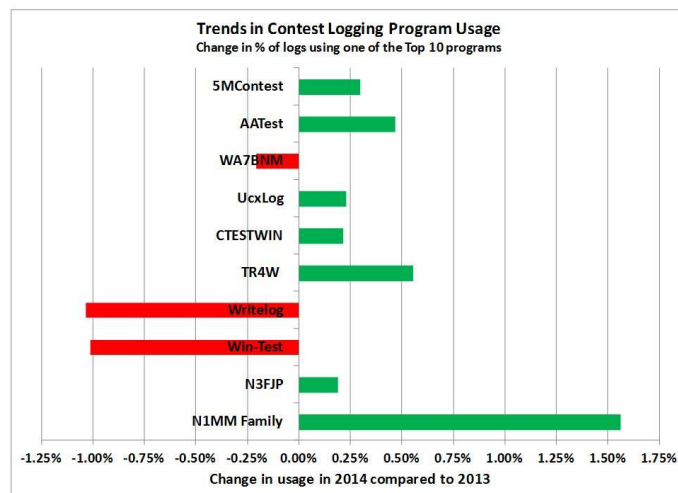


There are a few programs on this list I am not familiar with. The ARRL 10 Meter Contest is a worldwide event and there are several countries which have a logging program popular just in their country or region. For example *CTESTWIN* is popular in Japan and *UcxLog* is popular in central and eastern Europe. There are also a noticeable number of operators who still log by hand and then use the WA7BNM Cabrillo Web Form to create their log file. Overall, *N1MM Logger* is used by far more contesters than any other logging program. It is used four times more than the second most popular logging program by N3FJP. We can also see that more than half of the *N1MM Logger* users had already migrated to *N1MM Plus* by the time the ARRL 10 Meter contest was held in mid-December, less than three months after the program ended beta testing on September 22!

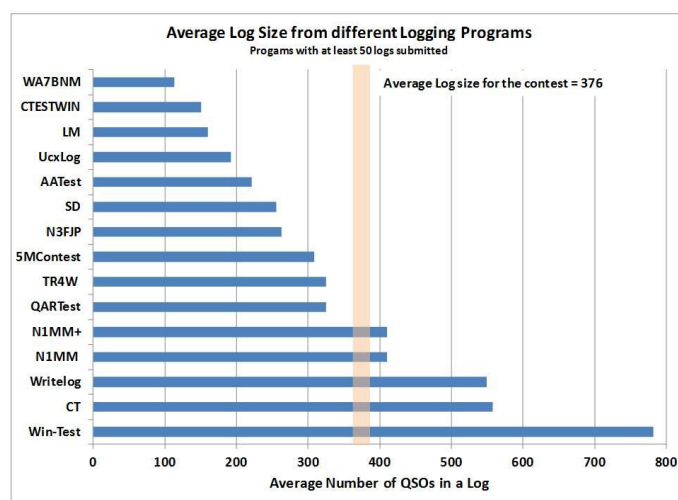
Comparing the logging programs used in 2014 to those used in 2013 we can see usage trends occurring. Realize there really are not any major changes — other than the migration to *N1MM Plus*. Once we learn a logging program, most of us really don't switch very often.

There is a small uptick in the percentage of us using the top ten programs. In 2013 85.4% used one of the top ten

programs and in 2014 this increased to 86.6%. However, in both years there are still a total of 85 different logging programs and methods used. The *N1MM* family is grew from 45.4% in 2013 to 47.0% in 2014. Both *Win-Test* and *WriteLog* showed declines of 1.0% between 2013 and 2014. Among the rest of the top ten programs, the year to year changes are 0.5% or less.



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



Win-Test users have the largest average log size. *CT* and *WriteLog* log sizes are next, but on average 200 QSOs smaller than a *Win-Test* log. *Win-Test* logs were, on average, more than twice as large as the average log submitted in 2014. It is interesting that *CT* does not have many users any more but those who do continue to use it are pretty serious. Also interesting is that *N3FJP*, which

is the second most popular program, has relatively small logs at around 70% of the average log. Thus, it seems to appeal to more casual contesters. The N1MM family users had logs just slightly bigger than average. Amazingly, the average log size for *N1MM Logger* and *N1MM Plus* users was exactly the same!

New world records

2014 may be the last for eight years in which any new world records are achieved during this sunspot cycle. If so, 2014 certainly will have left its mark in the record book. Let's take a look at what happened. (This table of all world records as well as a similar table of all time W/VE/XE records can be found online at www.arrl.org/contest-records)

ARRL 10 Meter Contest World Records					
Single-Operator Categories					
	Station	Score	QSOs	Mults	Year
High Power, Mixed Mode	ZD8Z (N6TJ, op.)	4,733,880	5,063	309	2002
Low Power, Mixed Mode	ZF2DX	2,957,580	3,543	270	2014
QRP, Mixed Mode	K6GX	886,650	1,064	257	2001
High Power, Phone Only	D4C (IZ4DPV, op)	1,885,290	4,810	197	2013
Low Power, Phone Only	VP2EX	1,291,800	4,306	150	1990
QRP, Phone Only	V31MA	388,750	1,565	125	2014
High Power, CW Only	PZ5JR (OH0XX, op)	2,100,744	3,211	163	1999
Low Power, CW Only	CE2/VE7SV (VE7SV, op)	1,328,000	2,105	160	2011
QRP, CW Only	KP2/N3IQ (ND3F, op)	791,120	1,593	124	2000
Single-Operator, Unlimited Categories					
	Station	Score	QSOs	Mults	Year
High Power, Mixed Mode	NP2X (K9VV, op)	3,690,296	3,985	284	2014
Low Power, Mixed Mode	PY3OZ	1,816,580	1,855	305	2014
QRP, Mixed Mode	RT4W	311,538	668	137	2014
High Power, Phone Only	K4XS	1,062,360	2,959	180	2014
Low Power, Phone Only	YN5Z (K7ZO, op)	701,964	2,304	153	2014
QRP, Phone Only	Z8GMR	101,640	390	132	2014
High Power, CW Only	KP2Q (K3TEJ, op)	1,601,312	2,467	163	2014
Low Power, CW Only	KP4EJ	919,080	1,750	135	2014
QRP, CW Only	VE3KI	299,592	660	114	2014
Multioperator Categories					
	Station	Score	QSOs	Mults	Year
High Power	FY5KE (F1HAR, F5HRY, F6FVY, ops)	4,457,120	3,797	356	2014
Low Power	T15N (N2BA, T15KD, ops)	2,565,348	2,709	313	2011

First, congratulations to the nine stations establishing world records in the new Single-Operator Unlimited categories. Seven are stations in North or South America with the remaining two from Europe. Note that in all cases the Unlimited category record scores are lower than those in the classic Single-Operator categories, but they are still great scores and may live until the next sunspot peak. In the long run, expect Single-Operator Unlimited category records to eventually exceed the classic scores.

There were three new world records in the established categories. That's pretty good for a year in which conditions were not anywhere near as good as in the years 2000-2002 at the peak of the prior sunspot cycle. Yet two of the three new records displaced ones from that period. Each has a great story within the story, let's hear from the operators.

ZF2DX — Single-Operator, Low Power, Mixed Mode, displaced WP2Z's record from 2000. As Kevin, ZF2DX, related in his post contest soapbox, "*I operated portable*

from the north side of the island with the radio station setup inside the back seat of my van. My operating QTH was a public place so many people would pull off the road and take a look at the antenna — the same 3 element design by K5GO that was used for the FT5ZM gang, It's amazing what a small antenna can do when over salt water." Kevin managed over 3,500 QSOs with this Field Day type setup and broke the prior record by almost 30%. Yes, that is amazing!

V31MA — Single-Operator, QRP, Phone Only, displaced KP4KE's record from 2002. As Marc, V31MA, related in his post contest comments, "*...I started the contest just for fun with the goal to make 100 QRP Qs. Conditions were outstanding and after the first hour, I reached the 100 QSO mark. I realized I had a good chance for much more Qs so decided to try for 500..."* He ended up with 1,565 QSOs and a new record. Not bad for just a "fun" operation.

FY5KE — Multioperator, High Power, displaced D4C's record from 2011. As Larry, F6FVY, said for the team of he, F1HAR, and F5HRY, "*15 years have passed since 1999 when we entered the ARRL 10 Meter Contest in M/S as CT8W (#1 EU - #2 world) for the last time."* It seems like they remembered everything they learned back in 1999 and managed to set a new record with fewer QSOs and fewer multipliers than the old record. You might wonder how did they do that? They made 66% of their QSOs on CW whereas D4C made only 47% of their QSOs on CW. FY5KE had 600 more CW QSOs than D4C and CW QSOs are worth 4 points while phone QSOs are worth 2 points. That was the difference.

Congratulations to all the new record holders. You have set the bar at which others must aim.

Total Contest Activity - How many stations? How many QSOs?

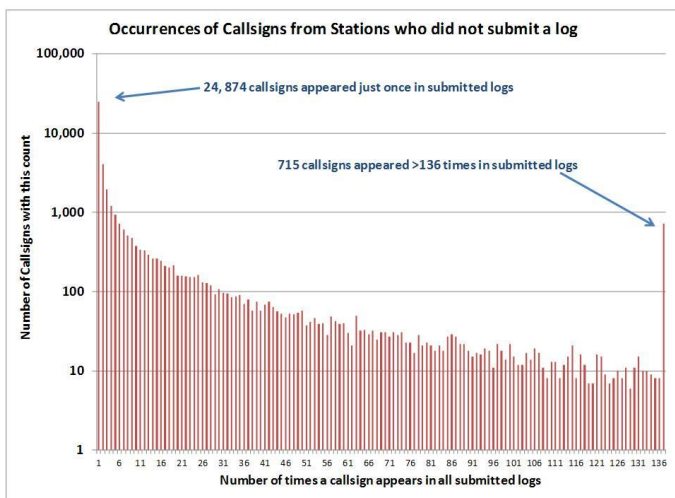
Inquisitive types might wonder, "How many stations worldwide actually got on the air during the contest?" Or, "I wonder how many QSOs were really made during the contest?" While exact answers are impossible to obtain, some educated guesses are possible by looking at the logs.

What we do know is that 5,483 stations submitted logs for scoring and these contained 2,016,340 QSOs. (For this article I am going count each contact in each log. You could argue that a contact in a log is just one side of a QSO between two stations and thus I was double-counting. Each contact counts as a separate QSO for each station, though, so I used this method.) The question then becomes how many other stations were on the air but did

not submit logs and how many QSOs did they make? Again, we can look at the submitted logs.

Incredibly, looking across all logs submitted, a total of 48,909 different call signs can be found. Does this mean this many stations were actually on the air? No way. For example, 24,874 call signs were logged in just a single QSO. While some are from a real station, the vast majority of them are busted call signs. So while the QSO was likely real and should count towards total QSOs, the call sign is not valid.

The number of QSOs reported with call signs which did not submit a log is shown below. Note that the Y-axis scale is logarithmic in order to display the huge number of call signs for which there are very few instances. In fact of the 48,909 call signs, 33,011 or 67% are found in 5 or fewer contacts.



So how many stations were actually on the air? A closer estimate could be calculated by applying sophisticated analysis to the call sign list, attempting to match likely busted calls to a known good call, but I don't have those tools. As a simple estimate, I set a threshold of 15 QSOs. If a call sign was found in more than 15 QSOs it was judged a good call sign. Sure, some call signs in more than 15 QSOs were busted and some call signs with less than 15 QSOs were good. But this value seemed to be a reasonable compromise and I arrived at an estimate of 11,739 stations on the air — 5,483 for which we have logs and 6,256 for which we don't. If you feel like the good/no-good line should be drawn at 25 QSOs then the total estimate drops to 9,931 calls. It feels accurate that at least twice as many stations were on the air as those who turned in logs for scoring.

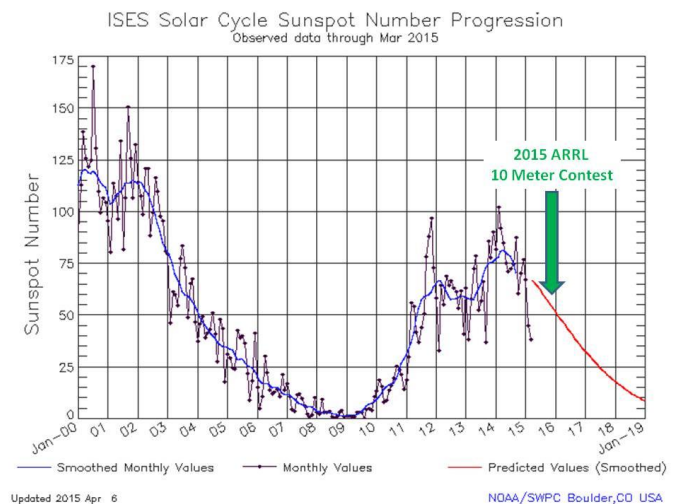
Moving on now to how many QSOs were made in total, the logs submitted contain a bit more than 2 million QSOs. Of these 2 million QSOs, 73%, or 1.47 million,

were made with stations who also submitted logs. The remaining 550,000 are with stations who did not submit logs. So if we had those missing logs we would first add another 550,000 QSOs to the total. (Remember I am counting both sides of a contact as a QSO.)

What about contacts between two stations who didn't submit logs? Those certainly occurred, but how many? By making the assumption that 85% of their QSOs were with stations who turned in logs, there may be another 100,000 QSOs between two stations, neither of whom submitted logs for score. This gets us to a final estimate of 2.67 million QSOs being made during the contest. Spread evenly across the 48-hour operating period this means 15 QSOs were being made every second or over 55,000 QSOs per hour. That's a lot of activity.

Predictions for 2015

The 43rd annual ARRL 10 Meter Contest will be held on December 12th and 13th, 2015. What might we expect this year? If there is one truth about how an ARRL 10 Meter contest will behave, it has to do with propagation: Good propagation brings out more operators. Good propagation means each participant can make more QSOs more easily. These two factors build on themselves in almost an exponential way driving up the overall fun quotient. And since propagation is based on what the Sun is doing, let's start by looking at solar forecasts.



Looking back at 2013, Solar Cycle 24 held to form by rising to a nice second peak. In fact this peak coincided wonderfully with the 2013 edition of the ARRL 10 Meter Contest. Amateurs worldwide jumped at the opportunities it gave them. Following this peak, sunspot numbers began an inevitable decline through 2014 as we entered Cycle 24's late phases. However, the Sun once again had an uptick in activity just in time for the late 2014 contest season. The CQWW contests in October

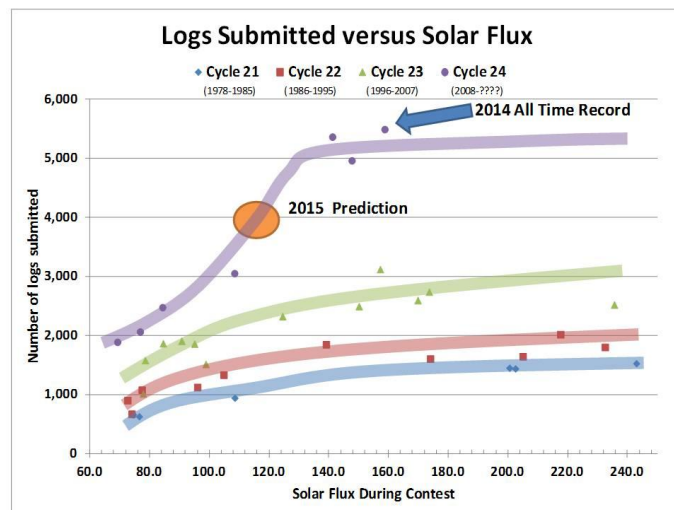
and November had great conditions. Did it hold out for the ARRL 10 Meter contest? Yes, it did! As Bob, K2XL, said in his post-contest comments: *"The departing sunspot cycle has left us a going away present."*

What about 2015? Sunspot cycles are notoriously hard to forecast. If you remember, initial forecasts for Cycle 24 suggested it could be the cycle of all cycles. Alas, it has proven to be the weakest since the ARRL 10 Meter Contest began in 1973. Not since Cycle 20 which peaked in the late-1960s have we seen such a weak cycle. The April 2015 forecast by NOAA's Space Weather Prediction Center for December 2015 is for a smoothed sunspot number in the 44 to 64 range with corresponding 10.7 cm radio flux levels in the 99 to 117 range. Their single predicted numbers are for a smoothed sunspot number of 54 and flux of 108. These levels, though down from the last two years, should still allow for reasonable 10 meter propagation. History shows that as long as the sunspot number is above 50 and flux levels are above 100 there will be plenty of good openings on 10 meters.

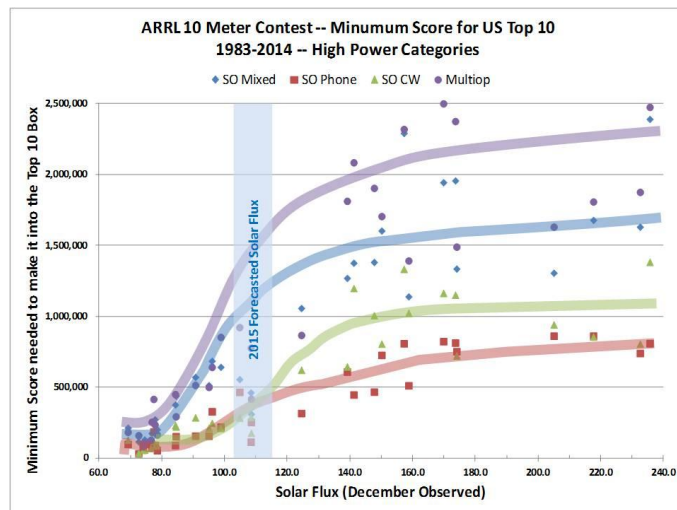
Compared to recent years, 2015 conditions should be fairly similar to 2012. If you operated in 2012, pull out your log to see how things were. Or read the 2012 contest results! Most importantly, these conditions will almost assuredly be better than any year for the rest of the decade! As Alan, KF3B, observed: *"It's unlikely that we will have such good conditions next year but the contest will be great fun in any case."* Exactly! It will still be a fun weekend.

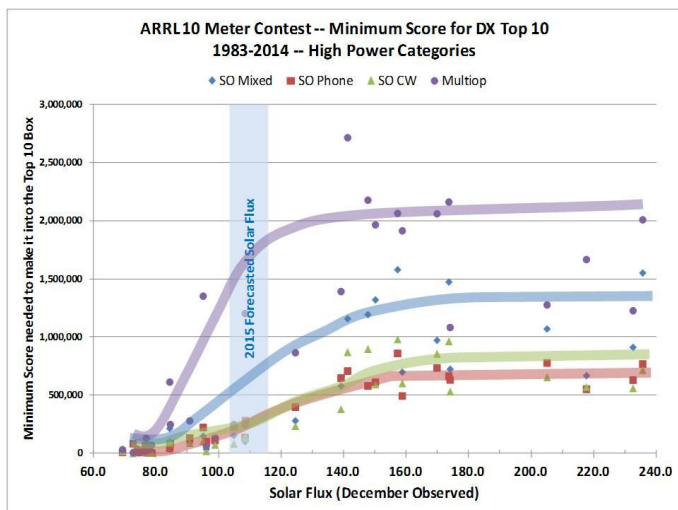
Though the path Cycle 24 will take is hard to forecast, it is certainly going to be going down from here through the end of the decade. By 2019 you will certainly be looking back at 2015 and wishing conditions were at least that good, so plan on operating now.

With this level of solar activity, what activity and scoring should you expect during the contest? From a participation standpoint, overall there has been a growth in contesting worldwide and increasing numbers of hams will enter contests. Additionally, history clearly shows that in the ARRL 10 Meter Contest, better propagation drives more hams to get on the air. With the worldwide spread of the Internet, computer logging programs, standardized log file formats, and electronic log submission, it is easier than ever to submit a log, thus, higher percentages of operators submit logs. This all came together last year with the incredible 5,488 logs and 2 million QSOs. With a flux level in the 110 range in 2015, I predict 4,000 logs will be received.



Continuing the predictions, "What score might it take to get into a Top Ten box?" This is also positively correlated with solar flux, meaning the higher the flux, the higher the score you need. I have studied this for the US and DX High Power categories, with the results presented in the following two charts. (I apologize to those in VE and XE and those operating in Low Power and QRP categories for not preparing similar charts for you. Putting these together is very data and time intensive and I have just not had enough of the latter to complete them. All the data you need is in the ARRL searchable database. Additionally, there is just not enough historical data for the new Unlimited categories yet.)





2014 Predictions versus Actuals

Minimum Score for a Top 10 Place

High Power Categories

(P) = Predicted, (A) = Actual

	SO Mixed	SO Phone	SO CW	Multiop
US	1,550,000(P)	750,000(P)	1,150,000(P)	1,750,000(P)
	1,138,464(A)	510,624(A)	1,022,400(A)	1,391,500(A)
DX	1,100,000(P)	600,000(P)	750,000(P)	2,200,000(P)
	700,440(A)	495,762(A)	602,736(A)	1,916,186(A)

The actual minimum scores required came in under predictions. One major impact was the new unlimited categories. These divided the entrants across more categories, thus lowering the entry point into the Top 10 Box. In the past a score that might only have been good enough for Top 20, now might be good enough for Top 10!

Based on these two charts and applying some "windage" to the more recent results my predictions for the minimum score it will take to get into a High Power Top Ten box in the US and DX during the 2015 contest are in the following chart:

2015 Predictions

Minimum Score for a Top 10 Place

High Power Categories

	SO Mixed	SO Phone	SO CW	Multiop
US	1,000,000	400,000	450,000	1,250,000
DX	600,000	250,000	275,000	1,600,000

For you competitive types, notice the creation of the new Unlimited categories has made it easier to work yourself into a Top Ten box. Because entrants are now spread across more categories it reduces the competition in any single category. The impact on you is that it reduces the competition. You are a "Bigger Fish in a Smaller Pond!" You can see this to some extent in how my predictions for 2014 played out. In every single case it actually took fewer points to get into the Top Ten than I predicted even though conditions were better than when I made my predictions in April of 2014.

If you are so inclined, take these goals, choose your category, and figure out what sort of QSO and multiplier total it will take to reach your goal. Write these down in big bold letters on a piece of paper and post it in clear sight at your operating position. Then sit down, get on the air, and don't get up until you have exceeded your goals! Even if you are not so inclined, make sure to sit down and get on the air – the 2015 contest on Dec 12th and 13th looks like once again it will be a fun one. And, given where we are in the solar cycle, in future years you will look back on 2015 and say to yourself "Boy those were the good old days!"

Division Winners

Single Operator, Mixed Mode

Atlantic	NK8Q	182,688	QRP
Central	N9NE	278,216	QRP
Dakota	WFØT	27,132	QRP
Great Lakes	KB8U	211,572	QRP
Hudson	WB2AMU	155,958	QRP
New England	K1WHS	316,590	QRP
Northwestern	W7Yaq	310,312	QRP
Pacific	WD6DX	64,980	QRP
Roanoke	KK4UNZ	61,248	QRP
Rocky Mountain	NS7K	56,606	QRP
Southeastern	K3TW	187,000	QRP
Southwestern	WA6FGV	327,502	QRP
West Gulf	N1CC	325,704	QRP
Canada	VE6UM	104,920	QRP

Atlantic	KB3WD	1,436,850	LP
Central	N9WKW	142,380	LP
Dakota	ACØW	521,968	LP
Delta	W4DAN	126,280	LP
Great Lakes	N8VV	563,312	LP
Hudson	KU2M	1,446,870	LP
Mexico	XE1HG	594,638	LP
Midwest	KTØK	861,732	LP
New England	W3EP	1,090,122	LP
Northwestern	W7WHO	434,720	LP
Pacific	KH7M (KH6ZM, op)	1,184,056	LP
Roanoke	N4VA	421,400	LP
Rocky Mountain	KFØUR	574,434	LP
Southeastern	K2PS	1,178,748	LP
Southwestern	K6AM	1,200,914	LP
West Gulf	WA8ZBT	455,592	LP
Canada	VE4GV	1,014,948	LP

Atlantic	N3OC	1,621,536	HP
Central	W9OP	517,716	HP
Dakota	KØTT	1,473,978	HP
Delta	K5UZ	913,070	HP
Great Lakes	K8BZ	823,264	HP
Hudson	W2XL	1,138,464	HP
Mexico	XE1H	63,826	HP
Midwest	KØDEQ	1,038,116	HP
New England	K1LZ	2,674,992	HP
Northwestern	W7GKF	743,728	HP
Pacific	W6YX (N7MH, op)	1,713,150	HP
Roanoke	N8II	2,077,660	HP
Rocky Mountain	AA5B	568,400	HP
Southeastern	WX4G	1,323,450	HP
Southwestern	N6AN (@W6UE)	692,920	HP
West Gulf	N5XZ	298,400	HP
Canada	VE3AT	2,335,110	HP

Single Operator, Phone Only

Atlantic	N3NTF	1,440	QRP
Central	N9FRY	23,140	QRP
Dakota	WBØIWG	26,586	QRP
Delta	KE5SNJ	4,160	QRP
Great Lakes	KU4A	23,760	QRP
Hudson	N2EAB	12,168	QRP
Midwest	WØJMW	4,582	QRP
New England	NZ1MT	2,688	QRP
Northwestern	NT7S	20,160	QRP
Pacific	K2GMY	38,480	QRP
Roanoke	NO4FX	23,528	QRP
Rocky Mountain	KKØQ	52,140	QRP
Southeastern	KS4GW	30,456	QRP
Southwestern	W6QU (W8QZA, op)	69,488	QRP
West Gulf	KB5KYJ	69,264	QRP
Canada	VA3VF	33,892	QRP

Atlantic	N3VOP	88,060	LP
Central	KB9TQO	159,000	LP
Dakota	KØVH	39,936	LP
Delta	N5FG	68,796	LP
Great Lakes	KB8UUZ	104,796	LP
Hudson	N2MUN	154,936	LP
Mexico	XE2O	227,868	LP
Midwest	ACØRA	278,640	LP
New England	W1TJL	262,432	LP
Northwestern	KB7HDX	129,584	LP
Pacific	KH6LC (NH6V, op)	703,296	LP
Roanoke	K4PZC	100,566	LP
Rocky Mountain	KA7PNH	204,878	LP
Southeastern	K4FCG (K1KNQ, op)	149,176	LP
Southwestern	KF6ILA	102,000	LP
West Gulf	WR5O	261,232	LP
Canada	VO2NS	158,400	LP

Atlantic	K4ZA	707,476	HP
Central	WB9Z	930,336	HP
Dakota	KØRJW	34,048	HP
Delta	W4EEH	303,876	HP
Great Lakes	KE8FT	199,348	HP
Hudson	N2YBB	151,044	HP
Mexico	XE1B	816,216	HP
Midwest	KDØLRG	286,212	HP
New England	NC1I (K9PW, op)	824,892	HP
Northwestern	K7YK	442,400	HP
Pacific	K6JAT	137,600	HP
Roanoke	K4CGY	228,052	HP
Rocky Mountain	KØJU	493,612	HP
Southeastern	K4NV	561,246	HP
Southwestern	W7WW	492,708	HP
West Gulf	NR5M	933,966	HP
Canada	VO1KVT	349,920	HP

Single Operator, CW Only

Atlantic	WA3IIA	145,248	QRP
Central	K9AY	137,592	QRP
Dakota	KEØG	51,040	QRP
Delta	NU4B	74,400	QRP
Great Lakes	K4FT	126,852	QRP
Hudson	NQ2W	61,824	QRP
Midwest	KSØMO	156,672	QRP
New England	AA1CA	203,200	QRP
Northwestern	W7GB	65,800	QRP
Pacific	W6JTI	268,256	QRP
Roanoke	N3CZ	97,856	QRP
Rocky Mountain	KØAV	14,268	QRP
Southeastern	AD4Z	155,520	QRP
Southwestern	KM6Z	110,864	QRP
West Gulf	N5OE	120,048	QRP
Canada	VY2OX	207,792	QRP

Atlantic	K2LNS	379,940	LP
Central	K9QVB	479,400	LP
Dakota	KNØV	343,168	LP
Delta	N2WN	217,124	LP
Great Lakes	NA8V	386,048	LP
Hudson	W2EG	406,692	LP
Mexico	XE2X	82,176	LP
Midwest	WNØL	59,616	LP
New England	WA1Z	886,008	LP
Northwestern	K7WA	253,828	LP
Pacific	KJ6MBW	226,480	LP
Roanoke	K4ORD	324,768	LP
Rocky Mountain	NØGOS	117,040	LP
Southeastern	N4WW (N4KM, op)	874,608	LP
Southwestern	WA6DBC	276,000	LP

West Gulf	AE5GT	589,280	LP				
Canada	VE1RGB	368,316	LP	Atlantic	KE2OI	84,836	LP
				Central	W9XG (K2DRH @K2DRH)	333,760	LP
Atlantic	KD4D	1,322,176	HP	Dakota	WØRK	12,000	LP
Central	K9MA	660,584	HP	Delta	KC5WA	28,324	LP
Dakota	NEØU	573,040	HP	Great Lakes	KD4SN	82,536	LP
Delta	AD4EB	698,700	HP	Hudson	N2FF	43,344	LP
Great Lakes	W8TA	593,712	HP	Mexico	XE3N	140,676	LP
Hudson	K2UF	279,984	HP	Midwest	NRØQ	27,888	LP
Mexico	XE1MM	688,012	HP	New England	W1AIR	58,200	LP
Midwest	NSØR	254,232	HP	Northwestern	KL1JP	50,752	LP
New England	W1QK	802,244	HP	Pacific	N6ORB	32,916	LP
Northwestern	WJ9B	1,049,420	HP	Roanoke	KM4RK	14,484	LP
Pacific	N6TV	1,009,748	HP	Rocky Mountain	KC6R	82,838	LP
Roanoke	N4AF	1,060,752	HP	Southeastern	KK4LGC	53,728	LP
Rocky Mountain	N2IC	1,627,008	HP	Southwestern	WØPAN	28,656	LP
Southeastern	K1TO	1,621,928	HP	West Gulf	WBØTEV	132,912	LP
Southwestern	K8IA	1,195,200	HP	Canada	VE2PIJ	11,790	LP
West Gulf	WXØB (NM5M, op)	1,153,040	HP				
Canada	VE3OI	937,848	HP	Atlantic	W3LL	599,274	HP
				Central	W9JA	55,512	HP
Single Operator Unlimited, Mixed Mode				Dakota	NØODK	88,944	HP
Atlantic	N3HCN	21,840	QRP	Delta	W3TZ	72,900	HP
Central	WE9R	10,584	QRP	Great Lakes	N8BI	303,048	HP
Delta	K2FF	130,784	QRP	Hudson	KM2O	140,836	HP
New England	N1RLR	15,006	QRP	Mexico	XE2K	191,196	HP
Pacific	NF1R	18,748	QRP	Midwest	KDØFW	329,472	HP
Roanoke	K4YND	17,748	QRP	New England	KA1ZD	185,426	HP
Southwestern	N6MA	26,404	QRP	Northwestern	KI7M	323,806	HP
Canada	VA3PAW	18,952	QRP	Pacific	K3EST	946,792	HP
				Roanoke	N1GC	170,016	HP
Atlantic	WW2P	360,396	LP	Rocky Mountain	WB7S	140,600	HP
Central	K9PG	281,454	LP	Southeastern	K4XS	1,062,360	HP
Dakota	AAØAW	311,982	LP	Southwestern	K7LY	250,992	HP
Delta	K3IE	630,336	LP	West Gulf	WW5TT	459,612	HP
Great Lakes	K8BL	673,932	LP	Canada	VA3PC	75,438	HP
Hudson	K2DFC	557,388	LP				
Mexico	XE2JS	316,356	LP	Single Operator Unlimited, CW Only			
Midwest	NXØI	309,380	LP	Atlantic	KW3F	89,688	QRP
New England	AB1J	315,138	LP	Dakota	NØUR	156,032	QRP
Northwestern	KN7K	253,644	LP	Delta	N4UW	76,464	QRP
Pacific	K6MM	326,928	LP	Hudson	N2KW	147,744	QRP
Roanoke	AA4R	282,632	LP	Midwest	K4EQ	38,976	QRP
Rocky Mountain	AD1C	158,808	LP	Pacific	KU7Y	54,180	QRP
Southeastern	K9OM	1,427,090	LP	Rocky Mountain	WC7S	98,000	QRP
Southwestern	W6SAN	128,400	LP	Southwestern	N7IR	225,548	QRP
West Gulf	N5DO	1,159,180	LP	West Gulf	K5KJ	211,008	QRP
Canada	VE9OA	217,710	LP	Canada	VE3KI	299,592	QRP
Atlantic	K3WW	2,106,490	HP	Atlantic	W3KB	419,052	LP
Central	WØAIH (NE9U, op)	2,001,084	HP	Central	W9XT	262,524	LP
Dakota	KØCN	461,202	HP	Dakota	WØERP	279,896	LP
Delta	N8OO	2,577,568	HP	Delta	NA5NN (W5UE, op)	383,544	LP
Great Lakes	W8MJ	1,905,856	HP	Great Lakes	W8BI (KD8SAV, op)	212,676	LP
Hudson	N1EU	161,188	HP	Hudson	WB2AA	99,600	LP
Midwest	KØBJ	837,144	HP	Mexico	XE2FGC	42,228	LP
New England	K1RO	1,874,708	HP	New England	KE1J	238,712	LP
Northwestern	K7RL	2,281,216	HP	Northwestern	WL7E	208,972	LP
Pacific	K6SRZ	1,430,946	HP	Pacific	KZ2V	166,944	LP
Roanoke	W4ML (W4MYA, op)	1,842,640	HP	Roanoke	AA4FU	244,160	LP
Rocky Mountain	W7CT	359,608	HP	Rocky Mountain	KØRI	250,920	LP
Southeastern	N4PN	1,977,054	HP	Southeastern	WA1FCN	311,040	LP
Southwestern	K7JQ	655,506	HP	Southwestern	K6WSC	551,600	LP
West Gulf	N5ZC	577,584	HP	West Gulf	K5GM	76,752	LP
Canada	VE7UF (VE7JH, op)	1,881,264	HP	Canada	VE6WQ	621,760	LP
Single Operator Unlimited, Phone Only				Atlantic	N3RS	1,320,120	HP
Central	W9RPM	41,064	QRP	Central	K9CT	1,349,800	HP
Northwestern	K7ATN	6,364	QRP	Dakota	KØIR	204,624	HP
Pacific	WB6CZG	8,544	QRP				

Delta	AA5AU	483,924	HP
Great Lakes	K1LT	863,532	HP
Hudson	WU2X (K5GO, op)	1,193,264	HP
Midwest	WØGXA	406,504	HP
New England	N9NC	1,495,988	HP
Northwestern	N7NM	564,876	HP
Pacific	KH7Y	1,017,072	HP
Roanoke	NR4M	1,007,456	HP
Rocky Mountain	N5FO	1,254,192	HP
Southeastern	N4BP	1,267,692	HP
Southwestern	K6LL	1,331,840	HP
West Gulf	W5GN	853,072	HP
Canada	VE1OP	897,544	HP

Multioperator, HP

Atlantic	K3OQ	501,600	HP
Central	AA9A	2,297,552	HP
Dakota	KDØS	1,895,296	HP
Delta	K5UA	621,456	HP
Great Lakes	W8PR	845,918	HP
Hudson	N2NT	3,146,688	HP
Mexico	XE2B	1,189,656	HP
Midwest	W1NA	1,193,130	HP
New England	K6ND	2,084,608	HP
Northwestern	WC7Q	588,990	HP
Pacific	KH6RR	1,319,200	HP
Roanoke	K4FJ	1,883,752	HP
Rocky Mountain	KØDU	1,227,150	HP
Southeastern	AA4HP	1,115,072	HP
Southwestern	W8TK	1,740,354	HP
West Gulf	NX5M	3,216,840	HP
Canada	VE5ZX	977,244	HP

Multioperator, LP

Atlantic	KO3T	683,936	LP
Central	N9CDX	244,216	LP
Dakota	NØHJZ	506,160	LP
Dakota	NDØC	3,696	LP
Delta	WN2E	88,984	LP
Great Lakes	KA3MTU	13,250	LP
Mexico	XE1CRG	53,040	LP
Midwest	NØNI	1,498,754	LP
New England	N1WW	574,896	LP
Northwestern	W7TVC	981,046	LP
Pacific	N6GEO	332,904	LP
Roanoke	WD4LBR	95,408	LP
Rocky Mountain	WØDLE	1,066,394	LP
Southeastern	WW4LL	1,495,844	LP
Southwestern	N7UJJ	90,528	LP
West Gulf	KS5Z	280,980	LP
Canada	VE9ML	885,920	LP