

ARRL International DX Contest CW 2020 Full Results

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

In DX Contesting, failure is NOT an option!

The story of the 2020 ARRL International DX Contest (CW) at 8P5A begins not with success, but with failure. Four failures, actually. "Though Yuri, at TO4A, and Andy, at V47T, held my attention all weekend, the real story is the fact it took five amplifiers to finish," says Tom, W2SC, owner of the Barbados powerhouse, and perennial favorite to win, as he did this year.

"About 34 hours in, there was a loud zapping sound. It was a slow time and it startled me. At first, I thought it was the headphones since my headphones make nasty sounds when the battery dies. However, a burning smell soon followed. The directional nose test led me to the amplifier's power supply."

Tom says there was a litany of issues with multiple amplifiers that he was able to address by staying true to his own best practice of keeping a solid inventory of spares and trying hard not to fixate on failures. "It took hours for me to stop mentally debugging what failed in that first amp. I worked hard to resist the urge to stop and look at it. I used five amps this weekend and still had one to spare."

"There was a pretty decent opening on 10 meters on Sunday, but the low bands were just tremendous. Even better than last year." Not only did Tom manage nearly 300 QSOs on 10 meters, he worked more than 600 stations on 160 as well. He bested rival and friend Andy N2NT operating V47T on St. Kitts to take first place in Single Operator High Power.

Andy's will to go on was sapped when his 40-meter Yagi failed Friday night. When talking to friends, he was heard to say "I think I could have given Tom some competition if everything had worked." When he was ready to throw in the towel after only four hours, Andy texted his friend NP4Z. "Felipe told me I was not allowed to quit," Andy says wryly. "I managed to break my rate record. My logging program reported a 362 clock hour at 19Z. That made me happy." As did finishing second despite the issues.

Yuri, VE3DZ, operating at TO4A, held down the No. 4 spot. "Truly amazing story from Andy V47T — that's what real Contesting is all about!" Yuri had his hands full operating for the first time from an unfamiliar station



Tom, W2SC, at 8P5A, where an ample supply of backup amplifiers was key to victory. [W2SC photo]

(FM5BH), unlike the others who have spent years perfecting their stations, Yuri was flying by the seat of his pants as TO4A. After 8P5A, V47T, and long-time KP2M veteran Phil, KT3Y, four-time winner Yuri settled into the fourth-place spot. "I realized I will probably not be able to win this Contest."

That was the story at the top of the Single Combat Warrior category – what most people know as "Single Operator, All Band, High Power, Unassisted, World." To many, the truest test of man and radio, where the air is very thin. The rest of us stand and stare in awe. These are some seriously hard-core operators!

So it was, earlier this year, from Friday, February 14, through Sunday, February 16. An ionosphere that seemed to have no business being that electromagnetically charged came to life, breathing a vitality into the radio spectrum during what has otherwise been a downtime in the solar cycle. It delivered another fantastic game to more than 4,500 amateur radiosport enthusiasts yearning for a fix of their drug of choice.

"One-sixty was the best I ever remember in an ARRL DX Contest," says Mike, W9RE. Mike is a seasoned operator who got into the fray from his home in Indiana, placing sixth in the Single Operator High Power W/VE division — a different game with different but equally formidable challenges. "Conditions were super from 160

meters to 20 meters. When I can work Europeans on 40 meters up until 1200z, conditions are great! Thanks to everyone all over the world who got on to work the U.S. and Canada making it unbelievable fun."

Indeed, to all the amateurs worldwide who get on the air for this annual event, we are truly grateful. Last year K1XX reported that growth in this event is actually greatest outside the U.S. and Canada. We're glad to offer such a great opportunity to work states and provinces on so many different radio bands, and we love getting on the air and making all those contacts.

This year, 904,995 individual QSOs were reported during the game period — during a sunspot minimum. That is a lot of contacts. If you do the math, that is an average of 314 radio contacts taking place every minute of the contest. We must be doing something right!



A striking view at HIØLT, where Matt, KC1XX, put took second place in Single Operator, Unlimited, Low Power with 3.1 million points. [KC1XX photo]

Top 10 DX

Single Operator, High Power

8P5A	6,734,442
V47T	5,901,696
KP2M (KT3Y, op)	5,148,660
TO4A (VE3DZ, op)	4,892,160
CR5E (CT1ILT, op)	3,810,384
EA8RM	3,467,178
ED8W (OM5RW, op)	3,123,651
NP2P (N2TTA, op)	2,850,771
IR2Q (IK2PFL, op)	2,595,546
M6T	2,263,344

Single Operator, Low Power

HQ9X	3,805,110
VP9I	3,618,000
KP2/ND3F	1,906,605
PJ5/KG9N	1,346,169
V47UM (W3UL, op)	1,295,424
CR3EE (OZ2I, op)	1,223,175
MU2K	1,155,420
CO8NMN	1,122,975
DL1IAO	1,037,400
KH6CJJ	1,002,330

Single Operator, QRP

IZ3NVR	227,799
DK7HA	202,917
V31CO	111,969
JH7UJU	76,146
LZ2RS	73,695
HG6C (HA6IAM, op)	62,568
JA6GCE	58,800
IK1RGK	43,596
CO8OH	38,958
JR4DAH	30,420

Single Operator Unlimited, High Power

P44W (W2GD, op)	4,719,999
KP3DX (NP4Z, op)	4,533,846
V26M (N3AD, op)	4,325,148
KH7M (NA2U, op)	2,861,703
EA6FO (EA3M, op)	2,721,708
NP2X (K9VV, op)	2,618,865
SN7Q	2,399,364
CE2LR	2,301,453
9A4M	2,214,855
OM7M (OM5RM, op)	2,200,122

Single Operator Unlimited, Low Power

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HH2AA (KO7SS, op)	3,493,470
HIØLT (KC1XX, op)	3,106,386
OR2F	1,215,780
9Z4Y	876,096
PC3T	827,424
EC4TA	742,050
EW6W	702,372
UZ3A (UX1AA, op)	693,387
DL9EE	651,840
SN7O (SP7IVO, op)	605,280

Single Operator Unlimited, QRP		Single Operator, 20 Meters	
LZ9W (LZ1UQ, op)	767,520	S5ØK	280,356
OK2FD	236,340	II2S (IK2QEI, op)	274,134
OK2AP	55,944	F50GL	250,893
EA2DPA	53,799	9A5X	242,841
JG1LFR	39,060	YT3X	223,728
JA6WFM	29,376	HK1N	222,300
JK7DWD	25,500	PY2NY	216,123
JK1TCV	17,673	S51YI	205,560
EA1AER	17,658	HGØY (HA7GN, op)	202,140
HB9TPN	15,900	OG1D	200,187
Single Operator, 160 Meters		Single Operator, 15 Meters	
NP2J (K8RF, op)	129,108	PX2A (PY2LSM, op)	277,611
GW5R (GW3YDX, op)	86,850	LU3JVO	250,101
S5ØC (S53RM, op)	61,194	PP5KR	212,976
OL1A (OK1CW, op)	59,472	LW8DQ	196,116
CO2AN	58,800	CE2ML	102,795
DR5X (DL8LAS, op)	52,716	CO8LY	84,315
SK3GW (SM5IMO, op)	51,747	LU2EE (LW5EE, op)	70,668
PI4DX (PD1DX, op)	45,630	XR2K (CX1EK, op)	62,868
F6FYA	43,200	OA4/EA7TN	33,345
LY7Z	42,504	LU3MAM	32,853
Single Operator, 80 Meters		Single Operator 10 Meters	
Single Operator, 80 Meters KP4KE (DK8ZB, op)	225,000	Single Operator, 10 Meters	20.749
	225,000 195,120	PY2UDB	20,748
KP4KE (DK8ZB, op)		- ·	20,748 108
KP4KE (DK8ZB, op) TM6M (F1AKK, op)	195,120	PY2UDB PU2USL	108
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X	195,120 141,462	PY2UDB PU2USL Multioperator, Single Transn	108 nitter, High Power
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP	195,120 141,462 140,904 139,536 138,264	PY2UDB PU2USL Multioperator, Single Transn ZF1A	108 nitter, High Power 5,946,675
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op)	195,120 141,462 140,904 139,536 138,264 137,760	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL	108 nitter, High Power 5,946,675 5,263,608
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV	195,120 141,462 140,904 139,536 138,264 137,760 134,064	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W	108 nitter, High Power 5,946,675 5,263,608 5,189,646
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV	195,120 141,462 140,904 139,536 138,264 137,760 134,064	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op)	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op) Single Operator, 40 Meters	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495 122,430	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX 4A7S	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222 2,819,547
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op) Single Operator, 40 Meters S52AW	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495 122,430	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX 4A7S EB5A	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222 2,819,547 2,600,682
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op) Single Operator, 40 Meters S52AW TM5EE (FM5CD, op)	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495 122,430	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX 4A7S EB5A LZ5R	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222 2,819,547 2,600,682 2,152,080
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op) Single Operator, 40 Meters S52AW TM5EE (FM5CD, op) SN3A (SQ2GXO, op)	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495 122,430 278,070 276,330 266,814	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX 4A7S EB5A	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222 2,819,547 2,600,682
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op) Single Operator, 40 Meters S52AW TM5EE (FM5CD, op)	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495 122,430	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX 4A7S EB5A LZ5R OK5Z	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222 2,819,547 2,600,682 2,152,080 2,104,674
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op) Single Operator, 40 Meters S52AW TM5EE (FM5CD, op) SN3A (SQ2GXO, op) YT5A (YU1AU, op)	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495 122,430 278,070 276,330 266,814 249,300	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX 4A7S EB5A LZ5R OK5Z Multioperator, Single Transn	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222 2,819,547 2,600,682 2,152,080 2,104,674 nitter, Low Power
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op) Single Operator, 40 Meters S52AW TM5EE (FM5CD, op) SN3A (SQ2GXO, op) YT5A (YU1AU, op) 9A8M (9A3XU, op)	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495 122,430 278,070 276,330 266,814 249,300 229,299 222,372	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX 4A7S EB5A LZ5R OK5Z Multioperator, Single Transn ZF5T	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222 2,819,547 2,600,682 2,152,080 2,104,674 nitter, Low Power 4,264,656
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op) Single Operator, 40 Meters S52AW TM5EE (FM5CD, op) SN3A (SQ2GXO, op) YT5A (YU1AU, op) 9A8M (9A3XU, op) S57Q	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495 122,430 278,070 276,330 266,814 249,300 229,299	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX 4A7S EB5A LZ5R OK5Z Multioperator, Single Transn ZF5T V3T	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222 2,819,547 2,600,682 2,152,080 2,104,674 nitter, Low Power 4,264,656 4,016,424
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op) Single Operator, 40 Meters S52AW TM5EE (FM5CD, op) SN3A (SQ2GXO, op) YT5A (YU1AU, op) 9A8M (9A3XU, op) S57Q EC5K	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495 122,430 276,330 266,814 249,300 229,299 222,372 219,657	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX 4A7S EB5A LZ5R OK5Z Multioperator, Single Transn ZF5T V3T FY5KE	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222 2,819,547 2,600,682 2,152,080 2,104,674 nitter, Low Power 4,264,656 4,016,424 1,447,992
KP4KE (DK8ZB, op) TM6M (F1AKK, op) J35X SN2M (SP2XF, op) TM6X (F5VHY, op) HB9FAP RW2F (RA2FA, op) HA8JV HA5JI YR2V (YO5LD, op) Single Operator, 40 Meters S52AW TM5EE (FM5CD, op) SN3A (SQ2GXO, op) YT5A (YU1AU, op) 9A8M (9A3XU, op) S57Q EC5K CO8ZZ	195,120 141,462 140,904 139,536 138,264 137,760 134,064 132,495 122,430 278,070 276,330 266,814 249,300 229,299 222,372 219,657 215,232	PY2UDB PU2USL Multioperator, Single Transn ZF1A P4ØL TI7W VP5K VP2MSS HC5DX 4A7S EB5A LZ5R OK5Z Multioperator, Single Transn ZF5T V3T	108 nitter, High Power 5,946,675 5,263,608 5,189,646 5,053,917 4,858,704 3,525,222 2,819,547 2,600,682 2,152,080 2,104,674 nitter, Low Power 4,264,656 4,016,424

E7CW	541,200
V4/K3VX	333,720
F8KLY	210,600
S53D	73,836
PR1M	69,255

Multioperator, Two Transmitter

PJ4A	7,411,875
CR3DX	5,269,005
EI7M	3,873,945
EA7X	3,526,269
RL3A	1,845,120
HG7T	1,802,640
XE2B	1,636,845
LY4A	1,600,704
ZL3X	1,311,177
AH2R	999,630

Multioperator, Multitransmitter

PJ2T	7,888,608
CR3W	4,918,884
KH6/N6DA	4,383,504
9A1A	3,820,770
E7DX	3,325,455
LN8W	2,577,150
DR4A	2,565,198
JA3YBK	1,476,144
RU1A	1,259,604

Results in the U.S. and Canada

In the United States and Canada, competitors must make contact with stations that are outside that region. Contacts with countries as defined in the rules count as multipliers. Simply put, you get your score by multiplying your contacts by your multipliers. So the goal is to strike the best balance of making a lot of contacts, but making sure to make those contacts with stations in a lot of different places. This is not easy, and the ones who master it earn the recognition and respect of their peers, and handsome awards from the American Radio Relay League. The League offers a lot of resources about how the game is played. Listed here are the top ten entries in all the different categories in the event. For full access to the detailed scores of all 4,380 entrants in all categories, you can find them on the ARRL website.

There are different divisions for stations that run more than 150 watts ("High Power"), and for stations that run

more than five watts but no more than 150 watts ("Low Power"), and stations that run five watts or less ("QRP") Those are further broken down into groups where the operator is allowed to use external assistance to learn where to tune in for other stations ("Unlimited"), and stations not using this kind of assistance. Each group presents different ways to test radio operators and stations to measure their DX prowess. To land a spot in the Top Ten of any of these categories out of such a large field is a great accomplishment.

There are also categories for stations using multiple radio operators. There is a "multiop" category where only one signal is permitted at any time ("Multi-Single"), a category where two signals are permitted ("Multi-Two"), and the biggest stations with the biggest teams can enter a category where they can have a signal on all the different bands they want simultaneously ("Multi-Multi").

Finally, for operators who wish to restrict themselves to only one band for the whole event, there is a Single-Op category for each band.

As you can see that is a lot of different categories that stations and operators can enter. When you look at these results, you can see some tight races between multiple entrants in some categories. In other categories, stations got in there and just ran away with it.



Chris, NØCC, put his compact station to good use with 172 contacts in 112 countries. [NØCC photo]

Bob, WA1Z at the helm of KC1XX definitely ran away with it, scoring about 15 per cent higher than Dave, K1ZZ in the No. 2 spot. By contrast, among the single-ops running low power, that same 15 per cent contains all three of the highest scores. In the Multi-Multi category, the margin between No. 1 W3LPL and No. 2 K3LR, is less than half a per cent! Imagine two teams of about 10 operators each hammering out over 6,000 contacts in 48

straight hours, only to finish the equivalent of 27 contacts apart!

Results Outside the U.S. and Canada

Competitors who are not in the U.S. and Canada may only contact stations within the U.S. and Canada for credit in the event. For these entrants, the multipliers are states and provinces (for all entrants, multipliers are counted once per band). Unlike stations in the U.S. and Canada, who can work all the countries they can possibly find, the stations outside the U.S. and Canada are limited to states and Canadian provinces, so they have more of a ceiling of possible multipliers. This is one reason 10 meters is so important. A top competitor outside the USA will commonly make contact with most or all of the states and provinces on the easier bands. Sometimes this game is won on 160 meters or 10 meters or both.

Our lead story this year was that race between 8P5A, V47T, KP2M and TO4A. When the dust settled on those guys, Tom's victory was decisive. Likewise, PJ4A and PJ2T ran away with Multi-Two and Multi-Multi, respectively. But in other categories there were some close calls! Notably, the Multi-Single categories had plenty of action at the top of the billing. Note the 4-way race for the No. 2 spot in Multi-Single High Power, with P40L, TI7W, VP5K and VP2MSS all within five per cent of each other. That's definitely the kind of thing that will keep your butt in the chair for the whole weekend!

Though the contest ran before the COVID-19 pandemic started to really take hold, and for reasons that didn't involve the novel coronavirus, the team at 9A1TT were, unintentionally, ahead of the curve on contesting in an era of physical distancing. Richard, 9A1TT, left a soapbox comment that had us wanting more. "Five ops operated from four countries... We'll be back."

Richard has been building his contest station in his homeland, Croatia, and has decided to let youth who don't have access to a big station use his by remote control. Now this has evolved into supporting the IARU's Region 1 Youth On The Air program, but he wants to push the bar even further. He has established the ambitious goal of "enabling free access to remote stations by any youth — on any device — from anywhere, whether from Africa or Berlin. All they need is high-speed internet." Even 4G data is sufficient, he says.

"Remote contesting is the answer to many of today's obstacles," Richard says of his almost prophetic operation. To remain competitive, multi-operator stations and teams are getting bigger and bigger. Implemented right, a big station can field a team of operators who don't have to be physically present. It's a much larger

pool of operators and opportunity. Youth today do not have the same kind of access to ham stations as older generations did. "But this is the funny thing — this is where remote radio turns things on its head — you can strike up relationships in a flash on social media — in March for WPX we fielded a team of four operators in only four hours. None of them had ever met and didn't know each other. The focus has changed. Remote is the way to go."

"Remote Ham Radio has made all this feasible. I wouldn't make my station available to youth on the internet unless I could be confident my equipment was safe. RHR has done a first rate job integrating operators into stations in ways where the equipment is protected. I am perfectly comfortable reaching out to youth anywhere in the world who want to operate together by remotely connecting into my station."



Five operators in four countries, Richard, 9A1TT, has found a unique way to run Multi-Operator, Single Transmitter with operators from around the world, and no travel.

"When I see a young guy using my station proudly announce on social media, 'I just worked 200 guys in two hours, who can beat that?' I feel like this is a good way to support youth and the future."

First Place Multi-Multi World winner PJ2T celebrated 20 years of ARRL DX this year. This little bit of ham radio democracy has managed to last longer than most off-shore club efforts, and at this time the club and station are stronger than ever. This is a testament to the vision of its founder and leader, Geoff Howard, WØCG, who was inducted into the Contest Hall of Fame earlier this year.

The author remembers working this QTH decades ago in his teenage years, like a beacon from Zone 9. Operators could count on the gang getting on the air from the Coral Cliff for an easy multiplier on as many bands as it could manage. As president of the Caribbean Contesting Consortium, the club that keeps the station making contacts year after year, the author is glad to be able to help keep it going now.

This year, the station made the better part of a million more points over last year, mostly on the shoulders of the surprise 10-meter opening on Day 2 that yielded an additional 37 multipliers. Those 10-meter openings are so important, and can come out of nowhere when you least expect them, that you literally train for those moments. When they pay off, it is an absolute rush. This was one of those years.

Speaking of the Coral Cliff, the ham whose vision originally put it on the air over 50 years ago, Chet Brandon PJ9EE, invented the signature refreshment enjoyed there to this day. He dubbed it The Cliffhanger, and it requires Curacao limes among other things. Below, we captured a wild Curacao Cliffhanger in its natural habitat. Inset into that photo is a snapshot of the PJ2T 20th Anniversary Commemorative Beer Glass.

Here's to another 20 years!

	VLJLJ	4,323,413
	N3RD	4,294,320
	N3RS	4,215,141
	K1RX	4,157,334
5,763,204	Simple On anaton Halingited I	Da
4,915,053		
4,643,562		2,767,107
4,148,520		1,562,652
3,908,124		1,491,504
3,757,119		1,403,025
3,730,788		1,372,860
3,557,376		1,341,390
3,397,272		1,280,988
3,240,576		1,245,825
		1,209,312
	KIKNQ	1,178,496
1,948,032	Circle On anaton Halingited O	
1,833,588		
1,755,990		390,054
1,474,968		300,906
1,338,564		120,018
1,100,655		61,596
1,055,604		30,240
1,052,028		24,633
902,088		24,000
834,768		22,512
		17,622
		2,184
464,607	VA3AMX	2,184
450,882		
236,649	- · · · · · · · · · · · · · · · · · · ·	4=0.455
234,600	• • • •	156,408
233,748	W4ZV	73,500
	4,915,053 4,643,562 4,148,520 3,908,124 3,757,119 3,730,788 3,557,376 3,397,272 3,240,576 1,948,032 1,833,588 1,755,990 1,474,968 1,338,564 1,100,655 1,055,604 1,052,028 902,088 834,768 464,607 450,882 236,649 234,600	N3RS K1RX 5,763,204 4,915,053 4,643,562 4,148,520 3,908,124 3,757,119 3,730,788 3,557,376 3,397,272 3,240,576 1,948,032 1,833,588 1,755,990 1,474,968 1,338,564 1,100,655 1,055,604 1,052,028 902,088 834,768 N3RS K1RX Single Operator Unlimited, Long Control Co

K2YAZ

N7RCS

W1UU

NDØC

KI1G

K5ZD

AA3B

K3WW

AA1K

VE3EJ

VA2WA

W6QU (W8QZA, op)

Single Operator Unlimited, High Power

138,408

130,074

117,885

107,169

94,770

5,921,280

5,647,674

5,562,642

5,257,953

4,611,960

4,604,046

4,529,415

N4XD	64,548	Single Operator, 15 Meter	rs
KM1R	24,156	N4BP	31,506
NIØG	23,580	K4RDU	13,230
N1QY	12,282	VE2NCG	3,402
NEØU	12,150	WUØA	2,550
W8WTS	9,315	N6RM	2,394
K1WHS	6,324	κφυυ	1,575
KA1J	6,156	WB2AMU	1,008
		WB7FJG	648
Single Operator, 80 Meters		KQ2RP	504
K4ZW	221,880	NZ5M	390
W3BGN	202,419	Single Onemates 40 Mate	
W1WEF	171,351	Single Operator, 10 Meter	
K9ZO	151,470	W4DD	3,807
KVØQ	146,070	K4WI	3,456
K4EA	142,692	Multioperator, Single Tra	nsmitter, High Power
N4IJ	111,636	N5DX	5,649,039
K1DC	74,160	K2QMF	4,380,444
VE3PN	73,236	K5TR	3,375,735
WØEWD	73,125	AA4LS	3,284,400
Single Operator, 40 Meters		N1MM	3,244,098
N800	532,335	КЗРН	3,008,880
N2MF	501,486	AA9A	2,932,056
KA1IS	375,417	AA7A	2,784,726
K2SSS	294,000	N1RR	2,715,579
N9SE	215,736	W2IRT	2,360,547
K1EA	102,342	Multioperator, Single Tra	nsmitter. Low Power
KJ4QHL	94,620	K1XM	1,695,447
K2UF	89,712	K3TD	602,208
W2EG	88,692	W1FM	563,040
K6AR	88,146	W3YI	227,688
Single Operator, 20 Meters		NJ1F	102,258
KU2M	510,615	кøuк	63,327
N7TU	373,152		
W6YA	307,197	Multioperator, Two Trans	
N8BJQ	292,896	W2FU	6,507,396
K8LX	283,230	N4WW	6,377,910
W2VJN	252,588	K1IR	5,918,985
N5CR	238,950	K8AZ	5,543,874
W8WA	206,325	VE3JM	5,482,161
WB4TDH	151,188	K2AX	4,539,969
N5JJ	140,448	K4TCG	4,534,920
	,	NØNI	4,478,760
		K5KG	3,674,211
		NØAX	3,225,672

Multioperator, Multitransmitter

W3LPL	9,706,275
K3LR	9,662,778
NR4M	8,733,054
K1TTT	6,278,370
K1KP	2,703,168
NE3F	2,177,496
W1CSM	1,817,529
NJ3I	1,777,842

A Word About Accuracy

One of the most interesting aspects of this sport is the pivotal role played by operator accuracy. Sometimes winners are determined in the log-checking stages. If you look at every callsign singled out above, their accuracy runs better than 1.6 per cent. You can understand how a contest can be won or lost as a function of how well you copy the stations you work, and how accurately you log what you hear. No operator is perfect, it's more about putting in the practice to get good at it. Definitely make that a goal!

And with that, another ARRL International DX Contest, CW, is in the books. Though it's never too early to start making plans for next year!

The next running of ARRL DX CW is Feb. 20-21, 2021.

Continental Winners

Africa		
Single Operator, High Power	EA8RM	3,467,178
Single Operator, Low Power	CR3EE (OZ2I, op)	1,223,175
Single Operator Unlimited, High Power	ED8M (EA8DIG, op)	512,316
Single Operator Unlimited, Low Power	EF8O (EA8OM, op)	200,832
Single Operator, 20 Meters	EA8DHV	11,349
Multioperator, Two Transmitter	CR3DX	5,269,005
Multioperator, Multitransmitter	CR3W	4,918,884
Asia		
Single Operator, High Power	JH1GBZ (JH5GHM, op)	824,760
Single Operator, Low Power	JH1EAQ	385,182
Single Operator, QRP	JH7UJU	76,146
Single Operator Unlimited, High Power	P33W (5B4AMM, op)	1,234,752
Single Operator Unlimited, Low Power	5B/RN3QO	327,228
Single Operator Unlimited, QRP	JG1LFR	39,060
Single Operator, 160 Meters	JAØQNJ	7,500
Single Operator, 80 Meters	JH1OGC	39,198
Single Operator, 40 Meters	7J1AAI	104,781
Single Operator, 20 Meters	JH3AIU	117,096
Single Operator, 15 Meters	4X1VF	1,596
Multioperator, Single Transmitter, High Power	JH4UYB	1,079,925
Multioperator, Single Transmitter, Low Power	JK2VOC	33,072
Multioperator, Two Transmitter	JH8YOH	830,922
Multioperator, Multitransmitter	JA3YBK	1,476,144
Europe		
Single Operator, High Power	CR5E (CT1ILT, op)	3,810,384
Single Operator, Low Power	MU2K	1,155,420
Single Operator, QRP	IZ3NVR	227,799
Single Operator Unlimited, High Power	EA6FO (EA3M, op)	2,721,708
Single Operator Unlimited, Low Power	OR2F	1,215,780
Single Operator Unlimited, QRP	LZ9W (LZ1UQ, op)	767,520
Single Operator, 160 Meters	GW5R (GW3YDX, op)	86,850
Single Operator, 80 Meters	TM6M (F1AKK, op)	195,120
Single Operator, 40 Meters	S52AW	278,070
Single Operator, 20 Meters	S5ØK	280,356
Single Operator, 15 Meters	HG1S (HA1TJ, op)	14,586
Multioperator, Single Transmitter, High Power	EB5A	2,600,682
Multioperator, Single Transmitter, Low Power	9A7T	831,168
Multioperator, Two Transmitter	EI7M	3,873,945
Multioperator, Multitransmitter	9A1A	3,820,770

N	orth	Δn	1eri	ca

North America		
Single Operator, High Power	8P5A	6,734,442
Single Operator, Low Power	HQ9X	3,805,110
Single Operator, QRP	V31CO	111,969
Single Operator Unlimited, High Power	KP3DX (NP4Z, op)	4,533,846
Single Operator Unlimited, Low Power	HH2AA (KO7SS, op)	3,493,470
Single Operator, 160 Meters	NP2J (K8RF, op)	129,108
Single Operator, 80 Meters	KP4KE (DK8ZB, op)	225,000
Single Operator, 40 Meters	CO8ZZ	215,232
Single Operator, 20 Meters	AL1G	127,008
Single Operator, 15 Meters	CO8LY	84,315
Multioperator, Single Transmitter, High Power	ZF1A	5,946,675
Multioperator, Single Transmitter, Low Power	ZF5T	4,264,656
Multioperator, Two Transmitter	XE2B	1,636,845
Oceania		
Single Operator, High Power	KH6TU (AD6E, op)	1,752,750
Single Operator, Low Power	KH6CJJ	1,002,330
Single Operator, QRP	N7ET/DU7	9,996
Single Operator Unlimited, High Power	KH7M (NA2U, op)	2,861,703
Single Operator Unlimited, Low Power	KH6/WØZT	185,004
Single Operator Unlimited, QRP	KH6/W7EE	6,936
Single Operator, 80 Meters	DU6/N6SS	13,026
Single Operator, 40 Meters	ZL2AGY	48,000
Single Operator, 20 Meters	ZM1M (ZL1BBW, op)	112,035
Single Operator, 15 Meters	VK4CT	32,265
Multioperator, Two Transmitter	ZL3X	1,311,177
Multioperator, Multitransmitter	KH6/N6DA	4,383,504
South America		
Single Operator, High Power	PS2T (PY2ZEA, op)	1,241,100
Single Operator, Low Power	HC2AO	842,697

Single Operator, High Power	PS2T (PY2ZEA, op)	1,241,100
Single Operator, Low Power	HC2AO	842,697
Single Operator, QRP	PY2VQ	2,673
Single Operator Unlimited, High Power	P44W (W2GD, op)	4,719,999
Single Operator Unlimited, Low Power	9Z4Y	876,096
Single Operator, 80 Meters	PY2PT	90,801
Single Operator, 40 Meters	PY2KJ	46,224
Single Operator, 20 Meters	HK1N	222,300
Single Operator, 15 Meters	PX2A (PY2LSM, op)	277,611
Single Operator, 10 Meters	PY2UDB	20,748
Multioperator, Single Transmitter, High Power	P4ØL	5,263,608
Multioperator, Single Transmitter, Low Power	FY5KE	1,447,992
Multioperator, Two Transmitter	PJ4A	7,411,875
Multioperator, Multitransmitter	PJ2T	7,888,608

Regional Leaders		KA6BIM	1,175,904	SOUHP	
Boxes list call sign, score,	and class:		K6WSC	512,400	SOULP
M2 = Multioperator, Two	Transmitter		AK6A	348,348	SOULP
MM = Multioperator, Mul	titransmitter		K6JS	250,677	SOULP
MSHP = Multioperator, Si	ngle Transmitter	, High Power	K7TQ	226,176	SOULP
MSLP = Multioperator, Sir	ngle Transmitter,	Low Power	N6PN	221,364	SOULP
SO-10 = Single Operator, 2	10 Meters				
SO-15 = Single Operator, 2	15 Meters		KW6G	24,000	SOUQRP
SO-160 = Single Operator,	160 Meters		VA7UNX	663	SOUQRP
SO-20 = Single Operator, 2	20 Meters		K2GMY	3	SOUQRP
SO-40 = Single Operator,	10 Meters				
SO-80 = Single Operator, 8	30 Meters		W6RKC	1,458	SO-160
SOHP = Single Operator, H	ligh Power		N6TI	660	SO-160
SOLP = Single Operator, Lo	ow Power		W7WR	432	SO-160
SOQRP = Single Operator,	QRP				
SOUHP = Single Operator	Unlimited, High	Power	W6RW	33,252	SO-80
SOULP = Single Operator (Jnlimited, Low P	ower	W7CD	9,699	SO-80
SOUQRP = Single Operato	r Unlimited, QRF	•	N7GP	8,901	SO-80
			N7VPN	2,331	SO-80
West Coast Region			W70N	1,512	SO-80
(Pacific, Northwestern an					
Alberta, British Columbia	and NT Sections	5)	K6AR	88,146	SO-40
NO6T (KI6RRN, op	2 152 240	COLID	N7RK	17,658	SO-40
@WA6TQT)	3,153,240	SOHP	AG6V	10,428	SO-40
N9RV	2,700,960	SOHP	KA9A	2,160	SO-40
K6XX	2,025,720	SOHP	KB6A	2,142	SO-40
K6NA N7ZG	1,258,812	SOHP SOHP			
N/2G	1,153,845	ЗОПР	N7TU	373,152	SO-20
NTGO (NEZO on)	1,100,655	SOLP	W6YA	307,197	SO-20
NT6Q (N5ZO, op) WJ9B	1,055,604	SOLP	W2VJN	252,588	SO-20
KM6Z	291,438	SOLP	N5CR	238,950	SO-20
WN6K	196,020	SOLP	N6ZFO	76,032	SO-20
W70M	159,020	SOLP			
VV / OIVI	139,048	JOLF	N6RM	2,394	SO-15
N7IR	234,600	SOQRP	WB7FJG	648	SO-15
W6JTI	233,748	SOQRP			
W6QU (W8QZA, op)	130,074	SOQRP	AA7A	2,784,726	MSHP
KF7WNS	4,002	SOQRP	W8TK	2,037,978	MSHP
N6HI	1,152	SOQRP	W7RM	1,986,336	MSHP
	_,		NX6T	1,364,121	MSHP
K7RL	2,593,500	SOUHP	K7RI	921,435	MSHP
WØRIC (W4IX, op)	1,711,500	SOUHP	MEVV	2 660 040	MO
K6LL	1,563,714	SOUHP	W6YX	2,660,040	M2
N6JV	1,244,175	SOUHP	W7RN	2,299,968	M2

K7ZS	1,270,332	M2	WD5K	49,704	SO-80
VE7FO	123,552	M2	NØOK	23,994	SO-80
N7BV	119,733	M2	VE4JBB	9,360	SO-80
	113), 33		12.000	3,300	30 00
Midwest Region			КØРК	46,428	SO-40
(Dakota, Midwest, Ro	cky Mountain and \	West Gulf Divisions;	N9HDE	8,052	SO-40
Manitoba and Saskato	chewan Sections)		WDØBGZ	6,966	SO-40
K5GN	3,908,124	SOHP	KNØV	6,018	SO-40
WXØB (AD5Q, op)	3,045,840	SOHP	K7ULS	4,872	SO-40
K5WA	2,854,395	SOHP		·	
N5AW	2,821,479	SOHP	N5JJ	140,448	SO-20
K5RX	1,054,473	SOHP	W7UT	102,336	SO-20
			NØIS	56,088	SO-20
AD5A	1,474,968	SOLP	WNØL	18,900	SO-20
WØUO	1,338,564	SOLP	ADØH	11,319	SO-20
KCØV	276,948	SOLP	•	,	
кØХХ	250,128	SOLP	WUØA	2,550	SO-15
NN5T	228,705	SOLP	кØUU	1,575	SO-15
			NZ5M	390	SO-15
NDØC	94,770	SOQRP	NØJK	3	SO-15
N3CI	36,000	SOQRP	,	_	
NRØR	5,550	SOQRP	K5TR	3,375,735	MSHP
KIØG	4,674	SOQRP	NØKE	80,391	MSHP
WA5RR	4,329	SOQRP			
			кøuк	63,327	MSLP
N2IC	4,041,918	SOUHP		55,5=	
KØRF	2,449,434	SOUHP	NØNI	4,478,760	M2
кøкх	1,982,772	SOUHP	NØAX	3,225,672	M2
K5BG	1,173,459	SOUHP	NØMA	627,102	M2
NØAV	1,047,396	SOUHP		0=1,=0=	
			Central Region		
N5DO	506,112	SOULP	(Central and Great Lak	es Divisions;	
NØUR	499,032	SOULP	Ontario East, Ontario I	-	th,
AAØAI	357,189	SOULP	and Greater Toronto A	rea Sections)	
AD1C	316,350	SOULP	W9RE	3,757,119	SOHP
WA8ZBT	285,975	SOULP	VE3AT	3,557,376	SOHP
			VE3VN	2,759,127	SOHP
K5NZ	300,906	SOUQRP	NA8V	2,538,900	SOHP
			K8GL	1,637,109	SOHP
NIØG	23,580	SO-160			
NEØU	12,150	SO-160	N4TZ	1,833,588	SOLP
KSØMO	216	SO-160	VE3TM	422,331	SOLP
			WB8JUI	414,288	SOLP
ĸvøq	146,070	SO-80	K9UIY	315,735	SOLP
WØEWD	73,125	SO-80	K4IE	296,334	SOLP
	•				

K2YAZ	138,408	SOQRP	W9ET (WB9SBD, op)	81	SO-15
W8RTJ	78,228	SOQRP			
N8RQJ	68,808	SOQRP	AA9A	2,932,056	MSHP
VE3NR	969	SOQRP	VE3YAA	1,559,112	MSHP
			W8PR	1,068,228	MSHP
VE3EJ	4,529,415	SOUHP	W4CDA	414,141	MSHP
WB9Z	3,003,714	SOUHP			
K8CX	2,445,312	SOUHP	K8AZ	5,543,874	M2
VE3NNT	2,344,674	SOUHP	VE3JM	5,482,161	M2
W8MJ	2,256,345	SOUHP	W9VW	2,941,884	M2
			W8BI	317,133	M2
VA3DF	1,562,652	SOULP			
W9XT	1,245,825	SOULP	Southeast Region		
N8VV	607,005	SOULP	(Delta, Roanoke and Sout	heastern Divisio	ns)
VE3MGY	537,930	SOULP	N4AF	3,730,788	SOHP
WT9Q	469,854	SOULP	N4YDU	3,397,272	SOHP
			NN7CW	3,168,369	SOHP
K8ZT	120,018	SOUQRP	W4CB (W2RU, op)	2,641,572	SOHP
KU4A	22,512	SOUQRP	K4AB	2,193,009	SOHP
VE3HG	17,622	SOUQRP			
VA3AMX	2,184	SOUQRP	K5KU	1,948,032	SOLP
NU4N	2,184	SOUQRP	N8II	1,755,990	SOLP
			KD5DD (KG5HVO, op)	1,052,028	SOLP
W8WTS	9,315	SO-160	K5FUV	525,750	SOLP
WD8DSB	4,896	SO-160	AC4G	469,017	SOLP
ND9G	4,386	SO-160			
WO9S	3,330	SO-160	K2DM	464,607	SOQRP
KC4WQ	1,518	SO-160	K3TW	236,649	SOQRP
			N7RCS	117,885	SOQRP
K9ZO	151,470	SO-80	K4LPQ	38,808	SOQRP
VE3PN	73,236	SO-80	WR4I	29,232	SOQRP
AC8CE	22,035	SO-80			
			W4NF	3,495,987	SOUHP
N9SE	215,736	SO-40	KØZR	2,755,116	SOUHP
WA8RCN	46,215	SO-40	WO40	2,323,470	SOUHP
VA3SY	44,196	SO-40	N4UU	2,179,089	SOUHP
K9CJ	29,640	SO-40	K5EK	2,000,016	SOUHP
VE3OSZ	18,666	SO-40			
			K1KNQ	1,178,496	SOULP
N8BJQ	292,896	SO-20	WA1FCN	1,145,529	SOULP
K8LX	283,230	SO-20	AD8J	709,422	SOULP
W8WA	206,325	SO-20	KEØUI	286,200	SOULP
VA3SB	106,470	SO-20	K90M	254,430	SOULP
N8LJ	41,004	SO-20			

W4Q0 W4ER	61,596 24,633	SOUQRP SOUQRP	Northeast Region (New England, Hudson and A Maritime and Quebec Section		ions;
W4ZV	73,500	SO-160	KC1XX (WA1Z, op)	5,763,204	SOHP
N4XD	64,548	SO-160	K1ZZ	4,915,053	SOHP
K4WY	2,958	SO-160	VY2TT	4,643,562	SOHP
NA4CW	330	SO-160	KQ2M	4,148,520	SOHP
			N1UR	3,240,576	SOHP
K4ZW	221,880	SO-80			
K4EA	142,692	SO-80	K1VUT	902,088	SOLP
N4IJ	111,636	SO-80	W1VE (VE4EA, op)	834,768	SOLP
K1DC	74,160	SO-80	N8NA	570,447	SOLP
AB4B	41,736	SO-80	VE1RSM	407,028	SOLP
			K1HT	356,364	SOLP
N800	532,335	SO-40			
KJ4QHL	94,620	SO-40	N1IX	450,882	SOQRP
NS4T	67,665	SO-40	W1UU	107,169	SOQRP
AA8R	22,935	SO-40	VE9HF	68,997	SOQRP
N3GD	10,488	SO-40	WB2CPU	57,267	SOQRP
			K8CN	53,244	SOQRP
WB4TDH	151,188	SO-20			
W4JKC	102,168	SO-20	KI1G	5,921,280	SOUHP
W4VQ	66,000	SO-20	K5ZD	5,647,674	SOUHP
W6DVS	44,550	SO-20	AA3B	5,562,642	SOUHP
N4MM	18,768	SO-20	K3WW	5,257,953	SOUHP
			AA1K	4,611,960	SOUHP
N4BP	31,506	SO-15		0 -0- 40-	
K4RDU	13,230	SO-15	NN1C (@K1VR)	2,767,107	SOULP
			N9NC	1,491,504	SOULP
W4DD		SO-10	KS1J	1,403,025	SOULP
K4WI	3,456	SO-10	KE3X	1,372,860	SOULP
			VO1HP	1,341,390	SOULP
N4RV	2,023,584	MSHP	NOW	200.054	COLIODD
KØAL	636,579	MSHP	N2WK	390,054	SOUQRP
			KW2A	30,240	SOUQRP
K3TD	602,208	MSLP	\/\/27N4 (\/17N4 .cm\	156,408	SO 160
			VY2ZM (K1ZM, op) KM1R	24,156	SO-160
N4WW	6,377,910	M2		•	SO-160
K4TCG	4,534,920	M2	N1QY K1WHS	12,282 6,324	SO-160
K5KG	3,674,211	M2		•	SO-160
NBANA	0 = 00 = = :		KA1J	6,156	SO-160
NR4M	8,733,054	MM	W3BGN	202,419	SO-80
			W1WEF	171,351	SO-80
			VY2OX	64,170	SO-80
			VIZOA	04,170	30-00

W1HI	52,875	
K1MC	31,824	SO-80
N2MF	501,486	SO-40
KA1IS	375,417	SO-40
K2SSS	294,000	SO-40
K1EA	102,342	SO-40
K2UF	89,712	SO-40
KU2M	510,615	SO-20
K3GW	114,480	SO-20
K1EFI	45,732	SO-20
VO1BQ	41,976	SO-20
WA2JQK	36,504	SO-20
VE2NCG	3,402	SO-15
WB2AMU	1,008	SO-15
KQ2RP	504	SO-15
N5DX	5,649,039	MSHP
K2QMF	4,380,444	MSHP
AA4LS	3,284,400	MSHP
N1MM	3,244,098	MSHP
КЗРН	3,008,880	MSHP
K1XM	1,695,447	MSLP
W1FM	563,040	MSLP
W3YI	227,688	MSLP
NJ1F	102,258	MSLP
W2FU	6,507,396	M2
K1IR	5,918,985	M2
K2AX	4,539,969	M2
W2CG	2,254,074	M2
KB3VQC	2,150,955	M2
W3LPL	9,706,275	MM
K3LR	9,662,778	MM
K1TTT	6,278,370	MM
K1KP	2,703,168	MM
NE3F	2,177,496	MM
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