



ARRL June VHF Contest 2014 Results

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Below average but way better than last year!

Good news — the June 2013 contest propagation was much better on June 21-23 than last year. Bad news — it was still below average even in the best places and really slow in others, like the whole western half of the country. Better news — at least it seems to be trending back up!

A general lack of quotable and colorful propagation comments from various contest reflectors and forums basically tells the story. Conditions were not especially good, but for the majority of participants not totally dismal either. 6 meters in the Midwest produced only a few scattered sporadic E (Es) openings that were relatively short and narrowly focused. A few sweet spots in TX and FL seemed to fare pretty well.

Many of the Top Ten scores were at least half again higher than last year's with some doubling their score. Once again, tropospheric ducting or other enhanced modes on 2 meters and above did not seem to play a major role for the majority of stations. While there was some excellent enhancement reported from mountaintop stations in the FM grid well into the EM and EN grids, in fact, most parts of the country experienced average to poor conditions.

Logs – Up or Down?

1043 logs were submitted, up slightly from 2013's total of 1010, but still fewer than the 1222 in 2012 when conditions were much better. As always, the number of logs submitted is far less than the total number of participants. Overall QSO and grid totals also increased but were still way down from 2012. The number of Classic Rovers has rebounded significantly to 37 from 25 in 2013 but is still down from the 49 entries in 2011. Hopefully, this signals a resurgence of the multiband Classic Rover since the number of Limited Rovers using the lowest four bands (6 meters, 2 meters, 222 MHz, and 432 MHz) has remained relatively constant recently — 42 this year, 43 in 2013 and 42 in 2012.

Based on the June contest records published on the ARRL website (www.arrl.org/contest-records), few existing division or overall scoring records were broken — apologies if any were missed. Limited Rover saw some division records fall as discussed later in this article. Records for the new Single-Op, Three-Band (SO3B); Single-Op, FM-Only (SOFM) categories; and

the new Canadian RAC sections continue to be set and shattered. The records will soon be updated with the 2014 results.

Logging Accuracy – Or Not?

We all make a few logging errors from time to time. While call and grid logging errors are all my own, in my contest Log Checking Reports (LCR), I have noticed losing a fair chunk of my score to Not In Log (NIL) reports. Almost invariably these are QSOs that I'm 100-percent sure that I worked when moving a station from band-to-band. Apparently, in the rush to get back to 6 meters during an opening or to find the next station, the other station forgot to log the Q or accidentally logged me on a different band. This really hurts because the "bad" QSO is often on a band worth higher points and on which I have few QSOs and mults. The deduction results in the loss of both that QSO (including any multiplier credit) plus an equivalent number QSO points, so the result is the loss of a lot of score. From talking to other operators and comparing claimed scores to adjusted scores it's evident this has affected others, too. This is especially noticeable when the score on a microwave band is a negative number because of a single QSO made and lost on that band. This can't be fixed in log checking — please make sure you log accurately to avoid inadvertently penalizing someone else. It could make all the difference in a close finish.

DX in the Log

Since 6 meter conditions did not produce much DX propagation, few DX stations submitted logs. Canadian participation improved slightly from 42 logs in 2013 to 49 but is still way down from the 70 logs submitted in 2012. Nine stations in Mexico again submitted logs in 2014. Jorge, XE2X, had a solid single-op 6 meter-only effort, as did Julian, XE2JS, and Hector, XE2K. Hector, who also contributed a write up of DX participation, was pleasantly surprised to be called by KL7NO. The multiop led by Javier, XE2CQ also did well using only 6 meters. Two stations submitted logs from Cuba; T48K (op - Raul, CO8ZZ) and Doug, CO8DM on 6 meters only. Two stations from Alaska; Kevin, KL7KY, and Ed KL7UW, and one from Hawaii, Fred, KH7Y, submitted logs. Finally, C6ATT also submitted a 6 meter log from the Bahamas.

Tuning Around the Bands

Despite the majority of stations experiencing only short Es openings with sharply defined footprints, some sections had much better 6 meter propagation, notably in Florida and Texas. In the past, 6 meter QSO and grid totals have played a large role in the scores of the top stations in these areas and this year was kind to them again. Unlike 2013 when there were no stations over 1000 QSOs, Chuck, W5PR, (EL29) and Marshall, K5QE's Limited Multiop team in STX (EM31) both broke that barrier with grid multiplier totals well over 200. Also noteworthy, George, K5TR, (EM00) had a multiplier total in the 200s. Tom, WD5K, (EM12); Mike, AE5EB, (EL09); and Dick, K5AND, (EM00) posted good 6 meter results, too. Once again, Marshall, K5QE was able to log more 6 meter multipliers than any other station.



The 6 and 2 meter tower at K5AND. (Photo by K5AND)

Eleven stations made it over the 500-QSO mark, including the Multiops at W2SZ, W3CCX, NØSZ, and Limited Multiops W5ZN and W4IY. This was achieved despite a shortage of sustained Es propagation apparent in lower grid counts. Notable 6 meter totals over 500 QSOs were also logged by Florida stations Dan, K1TO, in EL87; Bobby, N3LL, in EL86 (Austin); N4WW, in EL98; and Bob, N4BP, in EL96. Tom, K4PI, in EM73 (GA) also managed to rack up a 500-plus total. The Limited Multiop teams at W5ZN in EM45 (AR) and W4IY in FM08 (VA) round out the list. But unlike 2013, the Colorado, New Mexico, and Arizona stations didn't seem to have as much in the way of 6 meter openings.

2 meters is often a starting point for "band running" (moving a station from band to band) since most stations are best equipped for tropospheric propagation (tropo) on 2 meters. The number of stations working more than 100

QSOs on 2 meters increased slightly to 35 from 27 in 2013 and 29 in 2012. Even with essentially flat propagation for most of us, the mountaintop multiops and rovers were able to take advantage of their favorable elevations. They caught whatever limited enhancement opportunities existed and some worked over 200 QSOs on 2 meters. W4IY in FM08 reported working all the way from Canada down to Cuba and the Cayman Islands.

Seven out of the 10 highest 2 meter QSO totals were made by the multiops; W4IY (with an amazing 402), W2SZ, W3SO, K2LIM, W3CCX, K1WHS and AA4ZZ. Mountaintop rover K8GP/R had an outstanding 2 meter total, as did ACØRA/R from the flatlands of the Midwest. Single-Op, High Power (SOHP) veteran Jeff, K1TEO, (FN31) was once again in the Top Ten of 2 meter QSO totals, one reason why he has long been the king of that category.

While many use WSJT to work meteor scatter during the quieter hours in the middle of the night and a few make EME contacts to boost their 2 meter grid totals, W4IY took advantage of their 4300-foot ASL location on Flagpole Knob, VA in FM08 to work as far west as Missouri and well into Canada. They were the top 2 meter grid getter this time with 86 and the author worked them on the bottom four bands from EN41 in IL.

In any given contest, 222 MHz has as good or better propagation than 2 meters and lower environmental noise. Often stations are significantly louder on 222 than they are on 2 meters. In all the ARRL VHF contests, QSOs on 222 score the same higher point value as on 432, and provide multipliers that significantly enhance scores. It's a must-have band for competitive multiops, rovers, and single-ops but fewer single-ops have it due to the increased cost and significantly lower QSO total compared to 2 meters (roughly 35%) or 432 (about 60%). This led to creating the Single-Op, 3-Band category. Only 5 stations in the June VHF contest had 100 or more QSOs on 222; three multiops, K8GP/R, and Jeff, K1TEO.

While more commercial multiband rigs include 432 MHz, propagation on the band is generally more difficult and requires mast-mounted preamps to be truly effective since coax loss can be a significant factor. Often propagation falls off rapidly and stations are much weaker or unworkable on 432. However, given a little tropo enhancement, stations that are workable on 2 and 222 may actually be as strong or stronger on 432, since practically-sized beams are available with more gain than at lower frequencies. Eight stations in the June contest had 432 QSO totals over 100; five multiops, K8GP/R, ACØRA/R, and once again, Jeff, K1TEO.

QSOs on 902/3 MHz and above count for more points and additional multipliers, but unless you have a GPS-locked radio and transverter the displayed frequency can easily be 20 or more kHz away from the actual frequency. This gets worse on the higher bands, but an SDR's waterfall or spectrum display can really come in handy to find a weak signal.

Generally speaking, rovers and portables have an easier time adding these bands than fixed stations since high-gain antennas are significantly smaller and coax runs are shorter, but it can also be harder to point with accuracy. Effective antennas are available with lots of gain, but their rifle-bore beamwidths require accurate rotator readouts and determination of the bearing to the other station from the six-character grid locator. Continually peaking the signal with the antenna is often necessary as you go higher in frequency. Due to the Earth's curvature, just adding or subtracting 180 degrees to your bearing is hardly ever the correct reciprocal bearing, even for a relatively short distance contact of 100 miles. Path obstruction can skew the signal path even further. Accurately aiming the antenna can make the difference between working and not working a station.

Sometimes working another station on a microwave band can take quite a bit of time with finding the other station, then waiting for the QSB to peak so that the information is readable on CW. Often the signals are just not there on the higher bands. Despite these challenges, adding SHF and microwave bands with their higher point values is a necessity for the more competitive single-ops, multiops, portables, and rovers. The law of diminishing returns comes with population density, however, in locations where there may be few, if any, other stations available to work in a 200- to 400-mile radius. The author finds it hard to work his own and adjacent grids unless a rover passes through. It's really good to see the ranks of the Classic Rovers starting to bounce back a little, since they do carry equipment for those bands.

Single-Operator Scores

The majority of contest activity originates with the single-op entrants who build stations that range from a single band with a modest antenna to a multi-band powerhouse with stacked arrays. These stations have been the backbone of VHF+ contesting — even the modest single-band stations make an essential contribution to the winner's success. These stations allow others to enjoy the bands by providing a lot more stations to work.

Low power stations with 100-200 W amplifiers have always been the mainstay of contest activity since well before the category was established, so it's no surprise

that the Single-Op, Low Power (SOLP) category proved to be the most popular. The Overall SOLP W3ZZ First Log Award - Memorial has been sponsored by Tim, K3LR, and Dave, W9PA, for the third year and goes to Dale Porterfield, KJ4ZYB. Good job and welcome to the ranks of SOLP VHF+ contesting!

Top Ten - Single-Operator, Low Power

K2DRH	241,450
WB1GQR (W1SJ, op)	138,171
N3LL	135,975
N3RG	119,314
N4QWZ	115,322
AF1T	81,900
W9GA	81,738
NØLL	80,698
K1KG	71,020

Despite mediocre totals on 6 meters and a lower overall QSO total than the third-place finisher, Bob, K2DRH, in EN41 (IL) took first place in SOLP with a score of 241K using 8 bands through 3456 MHz. His overall multiplier total was augmented by working a lot of weak 6 meter stations while being on the fringe of the real 6 meter Es openings. These would otherwise be unworkable without the gain and arrival angle steering of the 8x7-element 6 meter array and the rest of the 6 meter antenna farm he's grown.

Frequent Top Ten finisher WB1GQR, manned by Mitch, W1SJ, moved up to second with 138K, also using 8 bands through 3456. While he had 94 fewer QSOs and 16 fewer grids, it was the higher point values on 222 and above that gave Mitch the edge over 3rd-place finisher N3LL. Thanks to good 6 meter Es openings to Florida, Bobby shook off the worst conditions he has ever seen in 2013 with a 5 band effort of 136K. Ray, N3RG, (FM29) used 7 bands and took 4th place with 119K and Todd, N4QWZ, who has a great station that can usually span the 400-mile path to the author's QTH up to 432 MHz, even in flat conditions, rounded out the Top Five with a 115K, 6-band log.

The Single-Op, High Power (SOHP) category is where big guns of the VHF+ contesting world really get to play. Jeff, K1TEO, in FN31 (CT) with his 10-band station took top honors with 415K, despite few Es opportunities, flat tropo conditions, major tower repair and equipment troubleshooting work before the contest, and suddenly losing 5 and 10 GHz capability towards the end. When the desire to excel kicks in, getting down and doing all the hard work it takes to get things back up and working after a disaster really separates the leaders from the followers.

Top-Ten - Single-Operator, High Power

K1TEO	415,336
K5TR	281,796
K1RZ	258,272
W5PR	235,840
K5AND	143,200
WD5K	122,574
W3PAW	115,404
W4ZRZ	113,231
W9RM	102,912

George, K5TR, in EM00 (TX) took advantage of arguably some of the best Es conditions in the country during this contest. He deployed his antenna arsenal and added 1296 MHz, creating a 5-band station to bootstrap himself up to a second-place finish with 282K. Dave, K1RZ, posted an 8-band effort to score 258K and take 3rd place with relatively low 6 meter totals but a strong showing on the higher bands. Chuck, W5PR, in EL29 parlayed contest-high single-op 6 meter numbers into a single-band 4th-place finish and Dick, K5AND, in EM00 moved up the ranks on 7 bands with good numbers on 6 meters and 143K to take fifth.

The Single-Operator Portable (SO-Portable) category limits station to 10 W, making it 10-20 dB more difficult to be heard on the bottom four band and a few opt to run amps and enter as SOLP instead. Chris, W1MR, from FN43gd (NH) moved up from third to first place this time with his 8-band station, scoring 23K. Tor, N4OGW, is a newcomer to VHF+ contesting who really made a big splash his first time out from Little Mountain with a five-element, 6 meter Yagi hanging from a tree and a 2 meter, nine-element beam. He took second place with 14K and made a new Mississippi Section record. He reports that his 10 W signal was often not heard by stations he called but he still covered up to 250 miles. Ya gotta listen for the weak ones!

Top Ten - Single-Operator, Portable

W1MR	23,310
N4OGW	14,673
KB5WIA	10,291
W9SZ	5,763
WØPV	4,895
AF6RR	4,743
NV4B/5	3,381
WB2AMU	2,730
N2SPI	2,320
KG2A	2,160

Dave, KB5WIA, in CA with a 4-band effort moved up from fifth to third with 10K. Fourth place is held by

Zack, W9SZ, with 6K who took a 10-band station to a hilltop in EN50 (IL). When you are in the flatlands of Illinois, any high spot can be an advantage. John, WØPV, joined the Top Five with 5K from a 6 meter-only effort from Florida, running 5 W.

This is the second year for the two new single-operator categories. Single-Op, 3-Band (SO3B) is clearly a popular choice with 118 entries defecting mostly from the SOLP category. Single Op, FM-Only (SOFM) almost doubled in size with 17 log submissions. As expected, many of these set new section, division and overall records.

Top Ten - Single-Operator, Three Band

AB5EB	138,891
K1TO	105,376
AA5AM	94,080
N3RN	56,048
K15YG	51,198
KG6IYN	50,304
K4UB	45,047
KO9A	40,810
K9MU	33,880
KM4ID	27,768



The AB5EB antenna farm covers a lot of bands! (Photo by AB5EB)

Sporadic E made SO3B a faceoff between Texas and Florida for the top spot. Mike, AB5EB, used his EL09 (STX) sweet spot with another 49 Qs on 2 meters and 432 to vault himself into first place. Mike took second place in SOLP with only 6 meters last year but added two bands to enter SO3B and elbow out K1TO in FL with 139K for a new category record. Dan, K1TO, in EL87 (FL) is a past WRTC champion who likes the action on 6 meters and had the most QSOs of anyone on that band from Florida with 712. His single-band effort yielded a score of 105K which also broke the old record (and earned him a Southeastern Division record) but could not overcome Mike's multiplier advantage on 6 meters and the additional 2 bands.

With stiff competition for the top spots, Scott, AA5AM, in EM13 (STX) dropped to third place while also breaking his own inaugural category and West Gulf Division records with 94K. Bob, N3RN, in FN11 (PA) used his station to make the best use of 2 meters and 432 in this category, taking fourth place at 56K. Rounding out the Top Five was Steve, KI5YG, in EM00 (STX) who also took advantage of 6 meters with 51K to edge out KG6IYN in San Diego, less than 900 points behind.

Entries in the SOFM category spanned both coasts and many included QSOs on all of the bottom four bands. The top score in the SOFM category was logged by Ev, W2EV, of FN03 in WNY. Ev doubled last year's first-place effort with 54 Qs and 22 grids on four bands for 1650 points, the first to crack the 1000-point mark in this new category.

Top Ten – Single-Operator, FM Only

W2EV	1,650
KI6JJW	616
N9VM (N1VM, op)	510
KB1YSK	423
W7AIT	418
W2EBB	216
N2PEQ	203
KA6AMB	200
N1LF	176

Second place went to the opposite side of the country and Steve, KI6JJW, who used four bands from his CM87 (EB) QTH to score 616 points. Third place went to N9VM, piloted by Victor, N1VM, who scored 510 points from CM96 in SJV. KB1YSK (NH), W7AIT (SJV), and W3EBB in LA (not LAX) rounded out the Top Five.

Multioperator Scores

While some of these are fixed stations maintained by generous hosts who love the camaraderie and competition, others take an expeditionary outlook to find just the right mountaintop spot from which to operate. They lug huge amounts of stuff up bad roads to sit in trailers, trucks, and tents, often enduring the wind and cold in their remote locations. Having done this many years ago from Wayah Bald in NC with the Fourlanders as W4AQL and operating in a cold, driving rainstorm inside the box of a rental truck, the author can tell you first-hand that it takes a lot of desire and determination. When 6 meters opened to EU with a huge pileup, though, all the work suddenly became worth it.

Limited Multiops can operate as many bands as they wish, but they can only count the results from four bands. Most acquire their best score from the bottom four bands

while Unlimited Multiops can count QSOs from practically dc to daylight. Multiop stations are on the air all the time, establishing the limits of what's possible for VHF+ contesting.

K5QE posted a score of 483K from the STX flatlands to win the Limited Multioperator category, but not without a fight to retain their crown. Being in a 6 meter sweet spot and having the best overall 6 meter numbers of any station boosted their bottom line. Despite a close encounter with a black bear, the W4IY team at their mountaintop FM08 QTH did better on the other three bands due to some of the few tropo enhancement opportunities reported in this contest. They also had a little Transequatorial Propagation (TEP) to South America and a location with a view of many more stations to work, but even a great score of 466K was not quite enough to overcome K5QE's 6 meter gold mine.

Top Ten – Limited Multioperator

K5QE	483,448
W4IY	466,880
W3SO	411,554
K2LIM	294,756
W5ZN	269,028
AA4ZZ	217,074
W2LV	133,224
N2NT	113,687
N8ZM	95,632
W4NH	61,480

W3SO from WPA also took advantage of some Es and the enhanced tropo to double their previous score to 412K, only to find themselves relegated to third place.



The W5ZN Zilla Contest Group is (L-R) KX9X, NN1N, N4HY, W5ZN, and W9WI – These are the men your mother warned you about! (Photo by W5ZN)

With fewer multipliers, K2LIM dropped down to fourth place with 295K. W5ZN made it into the Top Five by

logging 269K with solid performances on 6 meters and 2 meters despite reporting only marginal conditions on 6 meters.

It's almost a cliché to report that the crew at W2SZ, the Mt Greylock Expeditionary Force, posted another win in the Unlimited Multioperator category. Solid performance on 6 and 2 meters as well as outstanding numbers on the higher bands really set this group apart from the others — their score was double that of the closest competitor at 1093K, the only score over the million mark. 2014 marks their 24th time winning the June VHF Contest.

Top Ten – Unlimited Multioperator

W2SZ	1,093,902
W3CCX	521,260
K1WHS	257,570
KBØHH	136,960
NØSZ	109,392
W6TE	88,328
WE1P	87,176
W6TV	82,176
AD4ES	80,808
N7CW	58,656

Neither N6VI nor the K8GP Grid Pirates mounted a multiop effort leaving the door open for W3CCX to move all the way up to second place with a score of 521K. Those Mt. Airy VHF Radio Club Packrats have been another perennial in this category from Camelback Mountain in PA. K1WHS in ME claimed the third spot with 258K. K1WHS is a powerhouse on VHF with some of the best VHF operators. Dave has designed successful antennas used by many big guns, little pistols, and rovers on 903 through 3456 MHz.

KBØHH in KS moved up several places in the Top Ten to take fourth with a score of 137K using only 5 bands. NØSZ from CO scored 109K and captured fifth place with solid numbers on 6 meters. However, his score was much smaller on the other bands, which is typical of stations competing from that part of the country. You guys out on the Front Range, listen up!

On the Rove Again

Rovers really enhance everyone's ability to work grids that are under-represented, providing additional QSOs and needed mults for the fixed and portable stations on multiple bands, as well as with other rovers. When the author first came to Illinois and didn't yet have any towers planted, roving with some new friends around the local grids was found to be a difficult, yet rewarding, experience. The increase in the Classic Rovers and the steady numbers of Limited Rovers are a hopeful sign that

more will continue to join their ranks. Here in the Midwest they often offer the only opportunity to work grids in western Great Plains states that have few or no VHF+ operators. 2014 was really great for the rovers — they posted some amazing scores.



ACØRA/R somewhere in the Great Corn Desert of the Midwest with this nice 4-band rover setup. (Photo by ACØRA)

In the Limited Rover category, Wyatt, ACØRA/R, really burst onto the scene by winning his inaugural June VHF Contest. In only his second serious rover outing (he took 2nd in January) he's established himself as one of the top young guns. His 147K score from 10 different grids in IL, IA and WI blew away the 2013 Central Division record from W9YOY/R. Wyatt made good use of all four bands and his grid total compares favorably with the top Classic Rovers with more experience and many more bands.

Top Ten – Limited Rover

ACØRA/R	146,692
WW7D/R	40,140
K2QO/R	39,624
AL1VE/R	32,120
N6GP	29,625
KD5EUO/R	27,972
W9YOY/R	27,664
K9PW/R	12,648
N2ZBH/R	11,628
KE7IHG/R	10,350

It was a tight race for second place with Darryl, WW7D/R, pushing past Mark, K2QO/R, and his sidekick Paul, W2TAU, by a mere 516 points. WW7D/R ran 10 grids in the Northwestern Division to break his own 2012 division record with 40K. K2QO/R took third with just under 40K on a 6-band rove through the Atlantic Division. Not far behind them was Tim, AL1VE/R, who dropped to fourth place this time out with a 9-grid 32K rove in the Midwest Division. Tim, N6GP/R, did a less extensive rove in 4 grids in the ORG section to capture fifth with 30K.

In the Classic Rover category, Andy, K1RA, and Terry, W8ZN, raised the Grid Pirate flag and did a 10-band, five-grid rove through the high spots of the Roanoke Division in the tradition of the W3IY/R Intergalactic Roving Battle Jitney. K8GP/R took advantage of the mountaintop tropo enhancement to work up and down the East Coast and well into the Midwest to score 295K, far outdistancing their competition. Their web page at www.k1ra.us/roving/k1ra-k8gp-rover-arri-june-vhf-2014 is beautifully done and well worth visiting.

Top Ten – Classic Rover

K8GP	295,317
VE3SMA/R	127,641
VE3OIL/R	125,704
W6TTF	70,416
WA3PTV	50,676
K4SME/R	45,652
AG4V/R	43,888
NN3Q/R	42,186
VE3WJ	41,107
W9SNR/R	32,307

Steve, VE3SMA/R, and Russ, VE3OIL/R, locked horns in an unusual battle for second in another close rover finish. In the claimed scores it initially looked as if Russ had beaten Steve, but in a rare reversal of fortune, Steve lost fewer points to log checking deductions, edging out Russ with an 11-band, seven-grid effort of 128K that included seven laser contacts. Russ settled for third with 11 bands in 9 grids for 126K, also with 7 laser QSOs. In 4th place, Carole, W6TTF/R, took her 10-band rove through nine grids in the Pacific Division areas of southern CA and logged a score of 70K. Joe, WA3PTV/R, crossed back over from Unlimited Rover to visit 4 grids in the Atlantic Division on 10 bands to capture 5th place with 51K.

There were 6 entries in the Unlimited Rover Category, down from 10 in 2013 and none of them were the same stations except K8DOG/R. John, W3HMS, mounted a 10-band, three-grid rove in PA to garner 19K for the win. Tom, K6EU/R, visited 3 grids in Southern CA while operating the bottom 4 bands for a 16K, 2nd-place finish. Ron, AF5Q/R, hit six grids around OK in the West Gulf Division with the lowest 4 bands, taking 3rd with 10K.

Top Ten – Unlimited Rover

W3HMS	18,678
K6EU/R	15,768
AF5Q	10,375
N2QIP/R	2,046
K8DOG/R	1,813
WA5KBH/R	756



K8GP/R in FM08 racking up the QSOs with Terry, W8ZN, in control. (Photo by K1RA)

Club Competition

This year's competition is a little unusual in that a Medium Club (Potomac Valley Radio Club – PVRC) took the top spot over an Unlimited Club (Society of Midwest Contesters – SMC). The lineup of clubs got pretty scrambled from last year when the SMC was in the Medium category but bulked up with another 10 logs to make the Unlimited category – the only such group in the contest. Meanwhile, PVRC stayed almost the same – which was hard to do with lackluster conditions - and took home the Medium gavel. Local champs Clovis Amateur Radio Pioneers weren't in the club table at all last year, yet swept by some familiar names!

Affiliated Club Competition

	Logs	Score
Unlimited Club Category		
Society of Midwest Contesters	57	579,810

Medium Club Category

Potomac Valley Radio Club	31	1,319,404
North East Weak Signal Group	16	986,314
Mt Airy VHF Radio Club	18	891,437
Florida Contest Group	16	717,585
Central Texas DX and Contest Club	7	648,691
Southern California Contest Club	23	459,242
Contest Club Ontario	21	395,444
Grand Mesa Contesters of Colorado	9	299,276
Carolina DX Association	4	239,346
Northern Lights Radio Society	17	213,535
Yankee Clipper Contest Club	19	213,092
DFW Contest Club	12	208,427
Badger Contesters	8	208,390
Pacific Northwest VHF Society	29	207,744
Arizona Outlaws Contest Club	23	200,670
Florida Weak Signal Society	9	173,957
Frankford Radio Club	8	141,195
Northern California Contest Club	19	136,268
North Texas Contest Club	3	125,190
Tennessee Contest Group	7	122,621
Alabama Contest Group	11	106,589
South East Contest Club	6	69,359
Bergen ARA	3	57,431
Cold Brook Contest Club	4	52,429
Utah DX Assn	3	41,704
Mad River Radio Club	6	39,431
CTRI Contest Group	3	34,573
Georgia Contest Group	5	34,328
North Coast Contesters	3	34,312
Louisiana Contest Club	4	33,409
Roadrunners Microwave Group	3	33,135
Western Washington DX Club	4	19,330
Willamette Valley DX Club	5	14,963
Bristol (TN) ARC	5	10,267
Rochester VHF Group	5	9,973
Hudson Valley Contesters and DXers	3	2,976
Minnesota Wireless Assn	3	2,376

Local Club Category

Clovis Amateur Radio Pioneers	3	82,516
Chippewa Valley VHF Contesters	3	49,001
Eastern Connecticut ARA	3	28,849
Rappahannock ARA	3	24,966
Portage County Amateur Radio Service	4	8,047
Ventura County Amateur Radio Society	4	6,824
Burlington County Radio Club	3	5,637
Meriden ARC	3	3,490
Contoocook Valley Radio Club	4	3,126
Raritan Bay Radio Amateurs	3	1,557
Radiosport Manitoba	3	366

Epilog

To briefly sum up the 2014 June contest; here in the Midwest and in many parts of the country, it was a slogfest with Es and tropo opportunities few and far between for most stations. When the band was not open (which was most of the time) you had to keep your butt glued to the seat or you would miss a contact — pretty true of VHF+ contesting in general. To wring out every possible Q you have to sit there though the slow hours, track the local rovers, and be ready to pounce on and run the bands with anyone and everyone who turns on a radio just to see if anyone's around or has a few minutes to spare to “check out the contest”. This is true even when you're sorely tempted to pull your headphones off your aching ears and take a nap or kick back and have a beer. As the author observes, “When I read the Soapbox comments from some of the multiops about their great dinner with wine and a few beers, I can't help but wonder if that has anything to do with why folks forget to log me!” We'll see you on June 20-22 of 2014 to wring out a few QSOs!

Sponsored Plaque Winners

Plaque Category	Plaque Sponsor	Winner
Overall Single-Operator, Low Power	Society of Midwest Contesters	K2DRH
Overall Single-Operator, 3-Band	Northern Lights Radio Society	AB5EB
Overall Single-Operator, Low Power, Rookie	W3ZZ First Log Award - Memorial by Tim K3LR and Dave W9PA	KJ4ZYB
Overall Limited Multioperator	Gene Zimmerman, W3ZZ Memorial - ARRL Contest Branch	K5QE
Overall Rover	73 Tim KE3HT/SK, Microwave DX Addict	K8GP
Atlantic Division Rover	Potomac Valley Radio Club	WA3PTV
Dakota Division, Single-Operator, Low Power	Northern Lights Radio Society	WBØHHM
Hudson Division, Single-Operator, Low Power	NY2NY - In Memory of W2GFF & W2HBA	K2KIB
Northwestern Division Multioperator	Randy Stegemeyer, W7HR	KE7SW
Roanoke Division Rover	Potomac Valley Radio Club	K8GP
Southwestern Division, Single-Operator, Low Power	Bud Semon, N7CW	WJØF
Canada, Single-Operator, Low Power	Northern Lights Radio Society	VA3ZV
Northwestern Division, Single-Operator, 3-Band	Pacific Northwest VHF Society	WB7FJG

Additional tables provided at the end of this article include the Regional Leaders by Category, Division Winners by Category, and a comprehensive QSOs and Multipliers Breakdown for the Top Ten stations in each category.

Some Thoughts on Working Grids on 2 Meters

By Curt Roseman, K9AKS

The 86 grids worked on 2 meters by multiop station W4IY in Virginia is quite a good total. However, it is not among the very highest in the history of the contest (going back to 1985 when grids were introduced as multipliers). The accompanying table shows the top sixteen totals over the years. In the 1980s some really good conditions, especially the tropo in 1985, led to several totals over 100. Other high 2 meter grid totals were common in that era, when everyday activity on the band was high in many areas of the country. Over the years, however, activity declined and 2 meters became relatively less important as a contributor to multi-band scores in the June contest. Indeed, none of the top sixteen totals are from the 1990s.

ARRL JUNE VHF CONTEST

All-time High Number Of Grids Worked on 2 Meters

GRIDS	CALL	CATEGORY	SECT	YEAR
121	W8VP	M	OH	1985
116	W9UD	M	IL	1985
110	AA9D	M	IL	1987
108	WD8ISK	M	OH	1985
105	N8FMD	M	WV	1989
102	K5QE	L	STX	2013
99	N4AR	S	KY	1985
98	K5QE	M	STX	2011
96	W8VP	M	OH	1987
96	K9NS	L	IL	2005
95	K5QE	M	STX	2009
94	K5QE	M	STX	2012
94	K5QE	M	STX	2010
92	K8GP	L	WV	2002
89	K8GP	M	WV	2001
89	AA9D	M	IL	1989

Something of a resurgence however, occurred in the new millennium. In recent years, some multiop stations (K5QE, K8GP, and K9NS) racked up large numbers of grids. Even though relatively low levels of everyday activity persists, their totals were probably increased by working grids using digital modes on meteor scatter, via moonbounce, and by taking advantage of rovers who cover numerous grids where activity is low or nonexistent. Back in the 1980s, a station could dredge up large number of grids when conditions were enhanced by working home stations and portables on SSB or CW. Digital modes were not available and rovers were rare, but activity levels were high.

Mexican and DX Participation in the 2014 ARRL June VHF Contest

By Hector Garcia, XE2K

For a good number of Mexican operators this contest is very important. They try to be in front of the radio the most time so they can to catch those rare openings, mostly on 6 and 2 meters.

The stations located closer to the United States are the ones that can make the most contacts — sometimes a few hundred on 6 meters — but not always. The Yucatan Peninsula is sometimes blessed with great openings to the Midwest and East Coast; Florida is usually the main market with long openings.



Hector, XE2K, used this 8-element Loop-Fed Array on 6 meters. (Photo by XE2K)

This year, results are based mainly on 6 meter contacts, giving some interesting numbers and reaffirming that a good antenna, even without the best propagation, can provide fun and a good number of contacts, converting the XEs into believers. Along the U.S. border, there were several Mexican states active.

Baja California had activity by XE2CQ from Tijuana (DM12) and XE2K from Mexicali (DM22). These stations are just a few miles from the border in a very noisy environment, but have the advantage of ground wave to CA and some AZ for more grids and points. Both passed the 200-QSO mark; XE2CQ's high-power

station used a Vertical Omni and a 7-element Loop-Fed Array (LFA). XE2K used a pair of stacked halos and an 8-element LFA. XE2CQ and XE2K showed very similar coverage areas with good numbers of stations from the Northwest and British Columbia, CO, TX, OK, NE, MO and few more stations to the west of Mississippi River. XE2K was able to contact one station from SC and one from KL7.

Sonora is a big state but not very active on the VHF bands. This time XE2S from Hermosillo (DL49), located 150 miles south of the border, depended mainly on limited propagation with short openings compared to other locations closer to the border. His 3-element LFA made him happy to reach 66 QSOs.

Chihuahua is the biggest state in Mexico and was represented by two stations from the same grid: XE2JS operating from rare grid DL78 in a semi-portable operation, reaching 160 contacts using a 6-element LFA, and XE2JA also in DL78 made 14 contacts using a dipole in his portable station. XE2JS enjoyed short but productive openings to all the West Coast and Midwest, but unfortunately no stations from the East Coast made it into his log and only one from XE1.



XE2JS made the trip to operate Single-Op Portable from the rare grid DL78. (Photo from XE2K)

Nuevo Leon State showed some activity as members of XE2NL Radio Club from Monterrey activated DL95 with 13 QSOs on 6 and 2 meters.

Tamaulipas State this year showed again with activity by XE2X. With a limited time of operation he achieved the biggest QSO total not only for a XE, but for any DX station. His location and well-equipped high-power station just south of Texas in Reynosa, has historically had better propagation compared to other northern Mexican states. These factors gave him almost 250

contacts using his 6-element LFA-R, stacked halos and a 3-element LFA fixed west. Most of his contacts were located east of the Mississippi river with a few in the DM grids.

There were other stations participating in different states, but just two of them submitted logs; one from XE1H in DL80 from Jalisco with 4 contacts and XE3N in EL60 from Quintana Roo reaching 12 QSOs.



Raul, CO8ZZ operated as T48K from club station CO9KAA, using 6 meters only. (Photo from XE2K)

From Cuba two stations submitted their logs, showing their enthusiasm and interest in Magic Band contesting. T48K was operated by Raul, CO8ZZ, from the radio club station CO9KAA. The first day of the contest he suffered with no propagation at all, but Sunday the fun started at 1305 UTC with his first station in the log from EM86. He got low rates during the day but provided 117 QSOs with 46 grids mainly from EM and FM areas using SSB and CW. His antenna was a 5-element Yagi driven with 100 W.

This contest does not have a Single-Op, QRP category for fixed stations, but this did not stop Douglas, CO8DM, from being active in the contest using only 5 W to his 5-element homebrew antenna making 23 contacts, most of them on SSB and only 7 on CW.

As noted by K2DRH, there were stations active from the “DX States” of Alaska and Hawaii, too. Kevin, KL7KY, and Ed, KL7UW both turned in a log. From out in the Pacific, Fred, KH7Y, was able to make it across to the mainland, and another island log appeared from the Bahamas as C6ATT worked some 6 meter QSOs. Thanks!

2014 ARRL June VHF QSO Party

Regional Leaders by Category

Boxes list call sign, score, and category (Categories: LP - Single Operator, Low Power; HP - Single Operator, High Power; QRP - Single Operator, Portable; 3B - Single Operator, Three Band; FM - Single Operator, FM Only; UM - Unlimited Multioperator; LM - Limited Multioperator; R - (Classic) Rover; RL - Limited Rover; RU - Unlimited Rover)

Northeast Region		Southeast Region		Central Region		Midwest Region		West Coast Region	
New England, Hudson and Atlantic Divisions; Maritime and Quebec Sections		Delta, Roanoke and Southeastern Divisions		Central and Great Lakes Divisions; Ontario Section		Dakota, Midwest, Rocky Mountain and West Gulf Divisions; Manitoba and Saskatchewan Sections		Pacific, Northwestern and Southwestern Divisions; Alberta, British Columbia and NWT Sections	
WB1GQR (W1SJ, op)	138,171 LP	N3LL	135,975 LP	KL2DRH	241,450 LP	NØLL	80,698 LP	WJØF	35,695 LP
N3RG	119,314 LP	N4QWZ	115,322 LP	W9GA	81,738 LP	W5SXD	48,416 LP	NQ7R	24,644 LP
AF1T	81,900 LP	K2PS	67,734 LP	N9DG	65,836 LP	NØPOH	33,276 LP	WA6OSX	23,700 LP
K1KG	71,020 LP	N4BP	66,944 LP	VA3ZV	38,896 LP	KKØQ	31,944 LP	K2GMY	21,692 LP
K2KIB	42,672 LP	N4Twx	46,750 LP	WZ8T	31,297 LP	WA8ZBT	23,587 LP	N7AT (K8IA, op)	21,112 LP
K1TEO	415,336 HP	W4ZRZ	113,231 HP	WØUC	95,226 HP	K5TR	281,796 HP	N6MU	82,128 HP
K1RZ	258,272 HP	N4WWV	90,117 HP	K9EA	73,320 HP	W5PR	235,840 HP	K6KLY	52,528 HP
W3PAW	115,404 HP	W3IP	84,480 HP	K9CT	61,304 HP	K5AND	143,200 HP	N6VI	34,686 HP
WZ1V	71,694 HP	K4PI	64,640 HP	WA8RJF	50,020 HP	WD5K	122,574 HP	N6KN	34,056 HP
K1TR	64,821 HP	W5MRB	56,772 HP	K8TQK	48,723 HP	W9RM	102,912 HP	N7EPD	27,448 HP
W1MR	23,310 QRP	N4OGW	14,673 QRP	W9SZ	5,763 QRP	WDØBGZ	66 QRP	KB5WIA	10,291 QRP
WB2AMU	2,730 QRP	WØPV	4,895 QRP	WFØT	6 QRP	KK6MC	42 QRP	AF6RR	4,743 QRP
N2SP	2,320 QRP	NV4B/5	3,381 QRP	KX7L/8	3 QRP	NØJK	9 QRP	KE7UQL	1,938 QRP
N3KCM	1,600 QRP	KG2A	2,160 QRP					KD7WPJ	1,624 QRP
KF2MR	1,560 QRP	WA5ZEK	1,333 QRP					N6LB	728 QRP
N3RN	56,048 3B	K1TO	105,376 3B	KØ9A	40,810 3B	AB5EB	138,891 3B	KG6YN	50,304 3B
N1IBM	16,728 3B	K4UB	45,047 3B	K9MU	33,880 3B	AA5AM	94,080 3B	N7IR	26,001 3B
K3UHU	8,000 3B	KM4ID	27,768 3B	NØTF	17,500 3B	K5YG	51,198 3B	N6KZ	7,772 3B
W1DYJ	5,796 3B	KD4AA	12,084 3B	KB8U	14,418 3B	KØNR	22,841 3B	VE7DAY	7,208 3B
N1JD	4,324 3B	KD5CKP	10,660 3B	AC8HU	11,730 3B	K5KBV	5,668 3B	N7RK	6,930 3B
W2EV	1,650 FM	W2EBB	216 FM	WB8RFB	4 FM			KI6JJW	616 FM
KB1YSK	423 FM	N1LF	176 FM					N9VM (N1VM, op)	510 FM
N2PEQ	203 FM							W7AIT	418 FM
KD2DLL	156 FM							KA6AMB	200 FM
								KK6DCM	126 FM
W3SO	411,554 LM	W4IY	466,880 LM	N8ZM	95,632 LM	K5QE	483,448 LM	WA7JTM	35,154 UL
K2LM	294,756 LM	W5ZN	269,028 LM	W9RVG	24,633 LM	N5RZ	49,842 LM	K7UI	26,910 UL
W2LV	133,224 LM	AA4ZZ	217,074 LM	N8BI	23,594 LM	NR7T	23,108 LM	N5CR	17,514 UL
N2NT	113,687 LM	W4NH	61,480 LM	KC8AAV	4,233 LM	K5LRW	11,900 LM	NI6E	15,624 UL
K2BAR	53,390 LM	N3MK	61,320 LM	VE3RB	2,368 LM	NØEO	11,880 LM	AA7A	8,375 UL
W2SZ	1,093,902 UM	AD4ES	80,808 UM	N2BJ	30,212 UM	KBØHH	136,960 UM	W6TE	88,328 UM
W3CCX	521,260 UM	K4MM	55,080 UM	VE3WCC	27,636 UM	NØSZ	109,392 UM	W6TV	82,176 UM
K1WHS	257,570 UM	N4OX	41,778 UM	AJ9C	13,510 UM	K5NZ	56,056 UM	N7CW	58,656 UM
WE1P	87,176 UM	W4COV	30,624 UM	KF6A	9,782 UM	WQØP	41,021 UM	KBØZO	55,198 UM
KE1LI	23,025 UM	W4UAL	28,122 UM	K9ZM	6,076 UM	KC5MVZ	12,789 UM	KE7SW	19,520 UM
WA3PTV	50,676 R	K8GP	295,317 R	VE3SMA/R	127,641 R	K5GJ/R	27,540 R	W6TTF	70,416 R
NN3Q/R	42,186 R	K4SME/R	45,652 R	VE3OIL/R	125,704 R	WØETT	12,636 R	N6ORB/R	16,830 R
K1DS/R	28,152 R	AG4V/R	43,888 R	VE3WJ	41,107 R	KØAAX/R	5,700 R	N6TEB/R	13,130 R
NJ1F	19,665 R	KS4YX	858 R	W9SNR/R	32,307 R	W7QQ/R	5,499 R	KEØQR	12,160 R
AA1VR	10,950 R	W3TMZ/R	60 R	KØPG/R	7,348 R	KCØP/R	4,564 R	N6TR/R	2,835 R
K2QO/R	39,624 RL	WB4OMG	1,904 RL	ACØRA/R	146,692 RL	AL1VE/R	32,120 RL	WW7D/R	40,140 RL
N2ZBH/R	11,628 RL	WBØPOH	1,196 RL	W9YOY/R	27,664 RL	KD5EUO/R	27,972 RL	N6GP	29,625 RL
WB2SIH/R	4,773 RL	N4TZH/R	910 RL	K9PW/R	12,648 RL	KØBBC/R	8,976 RL	KE7HG/R	10,350 RL
W1PL	4,040 RL	K6PFA/R	589 RL	K9ILT/R	6,536 RL	KCØSKM/R	8,924 RL	K7ATN/R	5,340 RL
AB2YV/R	3,813 RL			K8WTF/R	5,292 RL	W3DHJ/R	7,134 RL	AF6AV/R	3,825 RL
W3HMS	18,678 RU	WA5KBH/R	756 RU	K8DOG/R	1,813 RU	AF5Q	10,375 RU	K6EU/R	15,768 RU
N2QIP/R	2,046 RU								

Division Winners by Category

Division	Category	Call	Score	Division	Category	Call	Score
Atlantic	Single Operator, Low Power	N3RG	119,314	Northwestern	Single Operator, Low Power	KEØCO	14,025
	Single Operator, High Power	K1RZ	258,272		Single Operator, High Power	N7EPD	27,448
	Single Operator Portable	N2SPI	2,320		Single Operator Portable	N6LB	728
	Single Operator Three Band	N3RN	56,048		Single Operator Three Band	WB7FJG	3,300
	Single Operator FM-Only	W2EV	1,650		Single Operator FM-Only	K7GEN	3
	Limited Multioperator	W3SO	411,554		Limited Multioperator	N5CR	17,514
	Multioperator	W3CCX	521,260		Multioperator	KE7SW	19,520
	Rover	WA3PTV	50,676		Rover	KA7RRA	1,696
	Limited Rover	K2QO/R	39,624		Limited Rover	WW7D/R	40,140
	Unlimited Rover	W3HMS	18,678		Pacific	Single Operator, Low Power	WA6OSX
Canada	Single Operator, Low Power	VA3ZV	38,896	Single Operator, High Power	K6KLY	52,528	
	Single Operator, High Power	VA7FC	9,516	Single Operator Portable	K85WIA	10,291	
	Single Operator Portable	VE3AAQ	527	Single Operator FM-Only	K16JW	616	
	Single Operator Three Band	VE7DAY	7,208	Limited Multioperator	K7UI	26,910	
	Limited Multioperator	VE3RB	2,368	Multioperator	W6TV	82,176	
	Multioperator	VE3WCC	27,636	Rover	W6TTF	70,416	
	Rover	VE3SMA/R	127,641	Limited Rover	AF6AV/R	3,825	
	Limited Rover	VE3KGC/R	675	Unlimited Rover	K6EU/R	15,768	
	Single Operator, Low Power	K2DRH	241,450	Roanoke	Single Operator, Low Power	WB8TFV	34,133
	Single Operator, High Power	WØUC	95,226	Single Operator, High Power	W3IP	84,480	
Single Operator Portable	W9SZ	5,763	Single Operator Portable	N4QX	161		
Single Operator Three Band	K09A	40,810	Single Operator Three Band	KM4ID	27,768		
Single Operator FM-Only	WB8RFB	4	Limited Multioperator	W4IY	466,880		
Limited Multioperator	W9RVG	24,633	Multioperator	W4COV	30,624		
Multioperator	N2BJ	30,212	Rover	K8GP	295,317		
Rover	W95NR/R	32,307	Limited Rover	WBØPOH	1,196		
Limited Rover	ACØRA/R	146,692	Rocky Mountain	Single Operator, Low Power	NØPOH	33,276	
Single Operator, Low Power	WBØHHM	3,000	Single Operator, High Power	W9RM	102,912		
Single Operator, High Power	WØGHZ	59,500	Single Operator Portable	KK6MC	42		
Single Operator Three Band	ACØTA	2,368	Single Operator Three Band	KØNR	22,841		
Limited Multioperator	NØEO	11,880	Limited Multioperator	NR7T	23,108		
Multioperator	KCØNFB	4	Multioperator	NØSZ	109,392		
Rover	KCØP/R	4,564	Rover	WØETT	12,636		
Limited Rover	KØBBC/R	8,976	Limited Rover	W3DHJ/R	7,134		
Delta	Single Operator, Low Power	N4QWZ	115,322	Southeastern	Single Operator, Low Power	N3LL	135,975
	Single Operator, High Power	W5MRB	56,772	Single Operator Portable	WØPV	4,895	
	Single Operator Portable	N4OGW	14,673	Single Operator Three Band	K1TO	105,376	
	Single Operator Three Band	KD5CKP	10,660	Single Operator FM-Only	N1LF	176	
	Single Operator FM-Only	W2EBB	216	Limited Multioperator	W4NH	61,480	
	Limited Multioperator	W5ZN	269,028	Multioperator	AD4ES	80,808	
	Multioperator	NSUXT	14,016	Rover	K4SME/R	45,652	
	Rover	AG4V/R	43,888	Limited Rover	WB4OMG	1,904	
	Unlimited Rover	WA5KBH/R	756	Southwestern	Single Operator, Low Power	WJØF	35,695
	Single Operator, Low Power	WZ8T	31,297	Single Operator, High Power	N6MU	82,128	
Single Operator, High Power	WA8RJF	50,020	Single Operator Portable	K6ACJ	297		
Single Operator Portable	WFØT	6	Single Operator Three Band	KG6IYN	50,304		
Single Operator Three Band	K88U	14,418	Single Operator FM-Only	KE6PLA	36		
Limited Multioperator	N8ZM	95,632	Limited Multioperator	WA7JTM	35,154		
Multioperator	KF6A	9,782	Multioperator	W6TE	88,328		
Limited Rover	K8WTF/R	5,292	Rover	N6TR/R	2,835		
Unlimited Rover	K8DOG/R	1,813	Limited Rover	N6GP	29,625		
Hudson	Single Operator, Low Power	K2KIB	42,672	West Gulf	Single Operator, Low Power	W5SXD	48,416
	Single Operator, High Power	WA2MJP	12,648	Single Operator, High Power	K5TR	281,796	
	Single Operator Portable	WB2AMU	2,730	Single Operator Three Band	AB5EB	138,891	
	Single Operator Three Band	WB2LEB	3,080	Limited Multioperator	K5QE	483,448	
	Single Operator FM-Only	N2PEQ	203	Multioperator	KBØHH	136,960	
	Limited Multioperator	W2LV	133,224	Rover	K5GJ/R	27,540	
	Multioperator	WE1P	87,176	Limited Rover	KD5EUO/R	27,972	
	Rover	NJ1F	19,665	Unlimited Rover	AF5Q	10,375	
	Limited Rover	N2ZBH/R	11,628				
	Single Operator, Low Power	NØLL	80,698				
Midwest	Single Operator, High Power	KFØM	20,757				
	Single Operator Portable	WDØBGZ	66				
	Single Operator Three Band	KØCQ	3,600				
	Multioperator	WQØP	41,021				
	Rover	KBØQGT/R	3,780				
	Limited Rover	AL1VE/R	32,120				
	New England	Single Operator, Low Power	WB1GQR (W1SJ, op)	138,171			
		Single Operator, High Power	K1TEO	415,336			
		Single Operator Portable	W1MR	23,310			
		Single Operator Three Band	W1DYJ	5,796			
Single Operator FM-Only		KB1YSK	423				
Limited Multioperator		KV1J	39,867				
Multioperator		W2SZ	1,093,902				
Rover		AA11/R	10,950				
Limited Rover		W1PL	4,040				

