ARRL EME Contest 2017 Results

By Rick Rosen, K1DS

Conflicts, Conditions and Comments

Many more hams can now enjoy the thrill of EME with a modest station, even without elevation, by operating at moonrise or moonset, WSJT modes, and various Internet reflectors to track the action. EME contests sponsored by the ARRL and other organizations are great ways to get in on the moonbounce action!

The ARRL EME contest's three weekends were selected a full year in advance with multiple considerations. Despite the variables that went into the date selection process, there were several issues that caused consternation among many of the active and capable EME community operators. The ARRL's Contest Branch Manager, aware of these problems, selected 2018 contest dates to avoid situations that appeared to influence participation and activity levels during this year's contest.

In 2017 there were 148 logs received with a total of 6913 QSOs. Some of the highest scoring stations' results and monitoring reports indicate that there were more than 400 participants. As noted in the past, many stations were active during the contest weekend but for a variety of reasons, choose not to submit contest logs.

Total Reported QSOs by Mode	2016	2017	Difference
Digital	6,048	5,447	-601
CW/Phone	2,616	1,464	-1,152
Total	**8,664**	**6,911**	-1,753
Total Reported QSOs by Band			
50 MHz	0	35	35
144 MHz	4,080	3,696	-384
432 MHz	1,332	837	-495
1296 MHz	2,707	2,202	-505
2.4 GHz	285	130	-155
3.4 GHz	27	15	-12
5.7 GHz	72	48	-24
10 GHz	161	105	-56
Total	**8,664**	**7,068**	-1,596

Overall there were 18% fewer QSOs reported this year than last by those who submitted logs. The biggest difference noted was a 44% drop in the CW/SSB QSOs, likely due to the contest weekends conflicting with terrestrial VHF contests in Europe. I was delighted to see there were 4 log entries with QSOs on 50 MHz, as 6 meter EME activity had been absent from the contest for many years.

(The table of complete results can be found at the end of this writeup.)

First Weekend Challenges

As the first weekend got going, several operators announced their band plans. This has been a problematic issue in the past—having stations miss being on the same band during mutual Moon windows. Ben, SM6CKU wrote this note on the EME reflector, "Bad weather, night time and low declination. All criteria are against participation. Good luck guys!" Mike, KL6M managed only three QSOs due to the low declination and no mutual Moon window with Europe.

Many reports were sent in to the 432 & Above EME News that enabled operators to see how their efforts stacked up against others on the bands. The highest activity was reported for the 13 cm band, followed by the 3 cm band. There seemed to be a reasonable amount of 6 cm activity and, as usual, a few QSOs made on 9 cm.

Guy, F2CT was washed out with very bad weather including heavy rain and unable to use his new solid 4-meter dish. (Photo – credit F2CT)

Juan, LU8ENU reported that it rained practically all weekend, but he managed to squeeze in a few 10 GHz QSOs. Al, K2UYH was satisfied with the weekend, despite the low Moon and reported, "…no significant failures and the weather was fabulous!"

Juan LU9DO of the LU1CGB multioperator team on VHF JT65 with 4 Yagis, and 600 watts. In the bottom photo Adrian, LU1CGB shows off the 3.6-meter dish used on 23 cm with an RA3AQ feed and 250 watts. (Photo – credit LU1CGB)

There were several reasons why the first weekend of activity on the microwave bands of 2.3GHz and up saw limited activity.

1. The Moon was in a more southerly declination and mutual visibility windows were shorter for the most active stations in the northern hemisphere.

2. Weather in Western Europe was problematic.

3. There were other VHF and Up events scheduled that had potential impact on participation.

Operating EME on these bands takes a significant amount of planning, preparation, and power. The power is not necessarily generated output, but ERP (effective radiated power), using a significant-size dish with most accurate azimuth and elevation aiming to the Moon.

One of the stars of the show was Carl, KNØWS with his first entry on 13 cm. Even with some setbacks to his computerized dish-aiming system, he was able to do visual positioning and complete 11 contacts, mostly digital, with a few CW added. Although he was unable to get his 9 cm system transmitting, he learned a valuable lesson about how precise dish aiming needs to be as you go higher in frequency. He found a remarkable signal improvement in reception with a 1 degree move of the dish.

First Weekend Successes

The W6YX group focused their attention on 10 GHz and encountered several problems including a balky reference oscillator and multiple power, control, and coaxial cables eaten through by rodents. With their motto of 'never give up,' they got everything temporarily repaired just in time. They missed the European window of the first pass but were able to log a dozen stations by the end of the second. Their website tells the whole story in text, pictures and video.

Jim, WA3LBI's portable 10 GHz station control and computers. (Photo – credit N2EME)

As reported by Rex, VK7MO, on 9 September he and Jim, WA3LBI completed an 18,951-km QSO using QRA64D to extend the existing 10 GHz (3cm) world record of 18337 km by around 600 km held by DL7FJ and ZL1GSG using CW. VK7MO ran 50 watts to a 1.13-meter dish with linear polarization. WA3LBI ran 150

watts to a 2.2-meter dish with circular polarization, mounted on a trailer.

Jim, WA3LBI on the Delaware waterfront with his 2.4-meter trailer-mounted 10 GHz station. He and Rex, VK7MO set a new 10 GHz distance world record during the contest. (Photo – credit N2EME)

Several microwave-capable EME station ops raised the issue of having only one weekend for contest activity on multiple bands. This creates a recurrent hazard of feed changes in the dark, often on a small platform or ladder. Many opted to fix their operations on one band only.

Al, K2UYH changes a microwave feed at night with safety in mind, Jack, K2BMI assisting. (Photo – credit K2UYH)

It was an active hurricane season across the southeastern U.S. Don, WA3RGQ operated the first pass and then parked his dish and guyed it. His 10-foot dish survived hurricane Irma while the winds took down a neighbor's tree that was blocking his EME horizon!

Don, WA3RGQ has a 3-meter dish that survived hurricane Irma and now has a clear horizon when a nearby tree fell in the storm. (Photo – credit WA3RGQ)

The usual suspects were the most active during the first weekend of the contest. One of the regulars, Zdenek, OK1DFC, was not in the mix as he was preparing his microwave gear to travel to Morocco for a DXpedition. This turned into a Plan B operation in Cueta on the second weekend. Another regular, Tommy, WD5AGO had limited air time as he was repairing minor dish damage from a tornado passing through his area and he was involved in automobile drag racing on Friday night.

Second Weekend Challenges

The ARRL EME contest conflicted with the European VHF tropo contest (IARU Region 1). Many of the stations there could not effectively operate EME due to both low declination and the huge number of stations who were active terrestrially throughout the VHF spectrum.

Bernd, DL7APV experienced high winds and stormy weather for two days before the second contest weekend. During the strongest winds, he had quite a scare with winds at 75 mph (124 km/h) and such a big array, trying to hold the antenna in place with a support tube. There was minor damage that was fixed in time for the activity.

Carl, KNØWS had an adventurous weekend with a host of issues that began with rain and mud, a sticky polarity switching shaft, a stripped gear on his dish mechanism, and a balky arrangement controlling transmit and receive switching. To complete the weekend of problems, a

wooden plank of his scaffold suddenly broke in two. Luckily, he was able to catch his balance and avoid a fall. He'll have a series of repairs forthcoming.

Phil, VK4CDI also experienced a pre-weekend glitch as his elevation actuator failed a couple of days before the contest, but he was able to replace it hours before the first pass.

Finally, the team of hams at R1IF on Victoria Island in Franz Joseph Land had to find a better place to operate as they were being menaced by polar bears. They were equipped with EME gear for several bands and a fascinating 1-minute YouTube video from Murmansk-TV features their operation.

Second Weekend Successes

The excitement of the second weekend's activity centered on 70 cm and 23 cm. Stations with large arrays and high power drummed up many contacts using both CW and digital modes, with several SSB contacts thrown in.

Zdenek, OK1DFC was a hero of the second weekend with his operation at EA9LZ from Cueta, a Spanish enclave on the north coast of Africa. He lit up the Moon with contest signals on 432 MHz and 1296 MHz. On 7 Oct, on 432 MHz, he worked 63 QSOs on 432 MHz and on 1296 MHz he made 83 QSOs! He also operated on 2.3 GHz, 5.7 GHz and 10 GHz, enabling stations to work another DXCC entity and the continent of Africa. Zdenek has placed the logs and several interesting pictures of his trip and activity online. Many reported their joy in being able to work Africa at EA9LZ, a new DXCC contact for all.

W7GJ, Lance's 50 MHz DXpedition log from VK9XGJ on Christmas Island in the Indian Ocean totaled 17 QSOs. Check out his online travelogue!

Lance, W7GJ uses this 6M8 Yagi for his DXpeditions. (Photo – credit W7GJ)

Third Weekend – The Charm

CW was king for the EME crew at Stanford. W6YX completed a total of 75 QSOs on from the U.S. West Coast. This is an exciting score as the mutual Moon window for California and the bulk of EME operators around the world is fairly short. In addition, many smaller stations are concentrating on the use of digital modes.

Your author is happy to report being able to get a small 432 MHz station on the air from his winter residence in EL96 (Florida). Using a 5-wavelength Yagi and 100 W he was able to make digital QSOs with most of the strongest signals on the band including NC1I, DL7APV, PI9CAM, HB9Q, UA3PTW, K2UYH, DK3WG, and DF3RU, among others.

A single, vertically-polarized 70 cm Yagi at the K1DS winter QTH in EL96 (Florida). (Photo – credit K1DS)

Several operators have submitted their experiences, using as little as a few watts and a Yagi beam as small as 1-wavelength to contact these QRO stations "off the Moon."

Matej, OK1TEH had a conflict between the ARRL's EME Contest and the Marconi Memorial Contest, a 2 meter CW contest in Europe. When the tropo contest was over he worked 7 stations on 432MHz with his single 23-element Yagi.

Carl, KNØWS ran into problems again on this early November weekend. Despite the earlier date for the contest, he experienced snowfall that collapsed his radio tent just five hours after the starting bell.

Frank, NC1I worked with Bob, W1QA to complete the third weekend on 432 MHz and 1296 MHz. Frank noted there were 22 North American stations in his 432 MHz overall total of 75, an indication of revitalization of the EME activity on this band. Many stations reported several new initial contact stations in their logs.

Serge, VE1KG reported a big pile up on MAP65 calling KL7UW in Alaska from Japan and Europe. That crowd was outdone by the number of stations calling 9M2/JG3TTO in Malaysia.

Cowles, K4EME had a successful weekend as he eliminated the TVI on his wife's VHF television by installing a 432 MHz notch filter in the VHF TV.

Peter, VA3ELE related his frustrations with power supply problems and repairs during the contest. Nevertheless, he found the one needed replacement resistor on an old board in his junk box. He was back on 432 MHz after the repair, but when he switched to CW, he fried a pair of his good preamps! (The culprit was his spare TS-2000 that did not have separate transmit and receive cables for CW.) Fortunately, he was able to find one more preamp, switch back to digital modes, and complete 17 QSOs.

Sverker, SM7THS was back on 432 MHz with a newly-erected 8x25-element Yagi array. Using CW and digital he put 46 stations in his log.

Steve, N4PZ was back in action on 1296 MHz for the third weekend, as he had traveled to Pennsylvania to be one of the guest speakers at the Mid-Atlantic VHF Conference, sponsored by the Packrats. Steve's recollection of his VHF experience and the theory of how the Yagi gets its gain was well-received.

Steve N4PZ and his 4.9 meter dish. (Photo – credit N4PZ)

Les, W2DBL (W2LPL) worked his 1000th initial EME QSO after 8 years with a modest 4x9 setup and 1 kW. He added, "I am very happy, my wife thinks I am nuts." [Luna-tics are we!! – *Ed.*]

Operator Observations

Stig, SM4GGC commented that activity from EU was lower in the second leg when the terrestrial CW 144 MHz contest was ongoing but he was not affected by the activity. Stations in the heart of Europe were busy with the terrestrial VHF contest. For those trying to work EME, the lower end of the band was full of competing contest signals.

Peter, G3LTF worked multiple bands from 432 MHz up on CW and SSB giving out QSO points, but didn't enter his log for the contest.

Dan, HB9Q and Frank, NC1I had commanding signals on multiple bands and enjoyed the weekend activities, working new initial station, states and even DXCC entities, providing excitement and scores for others. Tom, MØABA, operating MXØCNS, entered a log with only 2 contacts, but they were both made on 432 MHz with 60 watts and a 3-meter-long Yagi. He had previously used as little as 10 watts or a 2-element optimized Yagi to work one of the larger EME stations.

Arunas, LY2IJ gave us a count of the 144 MHz participants. "I combined both who I was receiving and whom they were calling, removed single decodes and counted 411 different calls on EME 2 meters on 2 weekends!" He turned in a single-band entry of over 1 million points.

Jan, PAØPLY participated without sending in a log but said, "I ran some CW QSOs as well, but had trouble to find the good rhythm, after not touching the key for years!" Jan gives us a very valuable resource with online lists of the active (and some inactive) EME stations.

Jan, PAØPLY made his solid dish part of the local flora. (Photo – credit PAØPLY)

Mirek, OK2AQ was one of three operators who sent in logs for 10 GHz single-band operation. His remarkable homebrew craftsmanship showing a 42-watt transmitter can best be viewed on his website.

Newcomer Notes

WB4YDL was a first timer and having a blast figuring out the somewhat arcane ARRL logging entry method for the EME contest. He modified his previous satellite capable station by adding more antennas, a solid-state PA and sequencer, and made his first few JT65 QSOs on 2 meters. "I was on cloud 9 … or lunar orbit … or whatever ... it's been an amazing experience for this old dog (licensed 1971) who can learn a new trick!"

Oguzhan, TA2NC had made his first appearance on EME June 1st of this year. He sent the following note to the EME reflector, "I had my first EME QSO with I2FAK superstation. With the help of his huge patience…I had no elevation on my antenna... no azimuth rotator… I was transmitting during receive period. I was running up to the roof and checking the position of my antenna thru moon during moon-set. That was the moment I got poisoned by moon-bouncing." He managed 43 contest contacts on 144 MHz despite rainy weather conditions that shortened his operating time.

Alex, DL1KDA was a first time participant and had 108 worked stations. His best contact was with 9M2/JG3TTO with his QRP station, monitoring him a long time and never saw a single trace. "But 5 degrees before his moonset the signal increased obviously with help of ground gain up to -22dB." (The reported signal-to-noise ratio increased to -22 dB – *Ed.*)

Work is being led by Will, KD4FOV and Phil, W1PJE in attempting to start an EME program at 70 cm using the large 150' diameter antenna (42 dBi nominal gain) at MIT's Haystack Observatory in eastern Massachusetts. This system normally is used for ionospheric radar work at high power (2 megawatts peak) under National Science Foundation support, but they are working with the system to reconfigure it for occasional amateur EME operations in conjunction with the Nashoba Valley Amateur Radio Club (NVARC) in nearby Groton, MA. Will got to put the huge dish on the air and reports, "It is not a quick or routine task transforming a UHF 440 MHz 6% duty cycle radar into a 100% duty cycle 432 MHz all mode communications system, but we did." He managed multiple SSB and digital QSOs on the third contest weekend using a transceiver and with transmission line mismatch, estimating power output at 3 watts.

Johan, ON4IQ made it back onto 432 after several decades of absence from EME. Jamie, PY2RN made his debut in the contest and operated JT modes on 144 MHz and 432 MHz completing several contacts using modest

power and single Yagis. He added, “several stations on 432 MHz were audible in my speaker!”

Single cross-polarized Yagis for 2 meters and 70 cm at PY2RN. (Photo – credit PY2RN)

Final Results

Seventeen logs were received from multioperator stations and 132 logs from single operators. There are eighteen entry categories, the most popular was Single-operator, Mixed Mode 144 MHz (45 entries) followed by Single-operator, Mixed Mode 1296MHz (19 entries). Dmitry, UA3PTW outdistanced all entries with a whopping 5.6 million points. His operation included CW and digital modes on 144 MHz, 432 MHz, 1296 MHz, 2.3 GHz and 5.7 GHz. The K2UYH Multi-op team (+ NE2U, K2BMI, K2TXB, K2YY, W2HRO) topped their entry category with 3.6 million points across 7 bands through 10 GHz.

The complete tables of the entries can be viewed on the next page of this report. My personal thanks to all of you who were active on the air and provided great feedback about your activity, highlights and the practical and technical issues conquered in order to participate. I appreciate the patience and editing by my XYL Jani as I pursue this obsessional hobby.

The 2018 ARRL EME Contest weekends have been selected to avoid many of the issues that dampened the activity in 2017. Band assignments are still being determined but will be posted at www.arrl.org/eme-contest.

Weekend 1 - September 29-30
Weekend 2 - October 27-28
Weekend 3 - November 24-25

We look forward to seeing many of you again at the 2018 EME meeting, being held in Egmond Aan Zee in the Netherlands from August 16-19.

2017 ARRL EME CONTEST RESULTS

CALL SIGN	SCORE	QSOS	MULTS	QSOS - CW/PHONE	QSOS - DIGITAL	TOTAL QSOs	TOTAL MULTS
SINGLE-OPERATOR, CW/PHONE ONLY, ALL BAND							
WA6PY	288,000	64	45	64	0	64	45
KL6M	259,600	59	44	59	0	59	44
SINGLE-OPERATOR, ALL MODE, ALL BAND							
UA3PTW	5,649,600	321	176	67	254	321	176
YL2GD	2,690,800	217	124	38	179	217	124
EA8DBM	1,732,500	175	99	33	142	175	99
JA6AHB	431,200	88	49	19	69	88	49
KNØWS	364,000	65	56	3	62	65	56
N4QWZ	355,200	74	48	0	74	74	48
VK4CDI	278,400	58	48	8	50	58	48
VE4MA	268,800	56	48	34	22	56	48
K4EME	221,400	54	41	2	52	54	41
WA3RGQ	169,200	47	36	2	45	47	36
4Z5CP	163,200	48	34	0	48	48	34
BX4AP	125,000	50	25	0	50	50	25
LZ4OC	101,400	39	26	0	39	39	26
KG7P	72,800	28	26	0	28	28	26
DL9LBH	52,500	25	21	0	25	25	21
UA3TCF	34,000	20	17	6	14	20	17
YL2FZ	12,100	11	11	0	11	11	11
PY2RN	6,400	8	8	0	8	8	8
AI1K	1,600	4	4	0	4	4	4
SINGLE-OPERATOR, ALL MODE, 50 MHZ							
VK9XGJ (W7GJ, op)	22,100	17	13	0	17	17	13
JG2BRI	9,900	11	9	0	11	11	9
JA7QVI	1,200	4	3	0	4	4	3
K1SIX	600	3	2	0	3	3	2
SINGLE-OPERATOR, ALL MODE, 144 MHZ							
RX1AS	1,365,000	182	75	0	182	182	75
SM4GGC	1,085,000	155	70	0	155	155	70
LY2IJ	1,074,400	136	79	0	136	136	79
LZ6Y (LZ1KU, op)	1,058,400	168	63	0	168	168	63
7K3LGC	685,000	137	50	0	137	137	50
DL1KDA	669,600	108	62	0	108	108	62
NH6Y	604,800	112	54	0	112	112	54
RX3A	589,000	95	62	0	95	95	62
KL7UW	535,500	105	51	0	105	105	51
NTØV	479,400	94	51	0	94	94	51
SP8NR	408,000	85	48	0	85	85	48
LZ1DP	363,400	79	46	0	79	79	46
K7CA	338,400	72	47	0	72	72	47
YL2AJ	335,800	73	46	0	73	73	46
SP2FH	321,200	73	44	0	73	73	44
NØAKC	262,400	64	41	0	64	64	41
RN4AT	256,000	64	40	0	64	64	40
K2TW	221,000	65	34	0	65	65	34
AC7FL	190,400	56	34	0	56	56	34
WØXG	178,500	51	35	0	51	51	35
N4HB	166,500	45	37	0	45	45	37
G8RWG	162,000	54	30	0	54	54	30
KD7UO	160,000	50	32	0	50	50	32
VE2PN	137,200	49	28	0	49	49	28
JP3EXR	136,300	47	29	0	47	47	29
K3MA	126,000	42	30	0	42	42	30
TA2NC	116,100	43	27	0	43	43	27
LA6TPA	97,500	39	25	0	39	39	25
W8TN	89,100	33	27	0	33	33	27

N5TM	63,800	29	22	0	29	29	22
YO9HP	46,800	26	18	0	26	26	18
WB4YDL	40,000	25	16	0	25	25	16
RK9JR	38,000	20	19	0	20	20	19
N8AM	32,300	19	17	0	19	19	17
RA6C	25,200	18	14	0	18	18	14
VK4AMG	18,000	15	12	0	15	15	12
UA1OEJ	17,000	17	10	0	17	17	10
OH7RJ	16,000	16	10	0	16	16	10
UA6LCN	9,600	12	8	0	12	12	8
KF2T	7,200	9	8	0	9	9	8
N1EYE	4,200	7	6	0	7	7	6
LZ1VPV	4,000	8	5	0	8	8	5
N1NK	900	3	3	0	3	3	3
YO6XK	400	2	2	0	2	2	2
AG4W	100	1	1	0	1	1	1
SINGLE-OPERATOR, CW/PHONE ONLY, 432 MHZ							
I2FHW	30,800	22	14	22	0	22	14
F6HLC	10,800	12	9	12	0	12	9
DL8UCC	4,200	7	6	7	0	7	6
JA9BOH	3,500	7	5	7	0	7	5
JH4JLV	900	3	3	3	0	3	3
JHØWJF	100	1	1	1	0	1	1
SINGLE-OPERATOR, ALL MODE, 432 MHZ							
DL7APV	323,900	79	41	13	66	79	41
DF3RU	177,000	59	30	15	44	59	30
SM7THS	124,200	46	27	2	44	46	27
VK4EME	96,600	42	23	3	39	42	23
FR5DN	69,000	30	23	0	30	30	23
KA1GT	43,500	29	15	0	29	29	15
JE2UFF	39,600	22	18	1	21	22	18
UB4UAA	18,000	15	12	0	15	15	12
G6HKS	9,900	11	9	0	11	11	9
US6IF	8,800	11	8	0	11	11	8
RWØLDF	8,800	11	8	0	11	11	8
W4ZST	8,000	10	8	0	10	10	8
S51LF	4,900	7	7	0	7	7	7
K1DS	4,800	8	6	0	8	8	6
DG7YBN	1,600	4	4	0	4	4	4
SM5EPO	1,600	4	4	0	4	4	4
S51YL	1,600	4	4	0	4	4	4
MXØCNS (MØABA, op)	400	2	2	0	2	2	2
W5RZ	100	1	1	0	1	1	1
SINGLE-OPERATOR, CW/PHONE ONLY, 1.2 GHZ							
W6YX (AD6IW, op)	270,000	75	36	75	0	75	36
I5MPK	224,400	66	34	66	0	66	34
SP6ITF	198,000	66	30	66	0	66	30
IK1FJI	154,000	55	28	55	0	55	28
SM3AKW	153,700	53	29	53	0	53	29
DL7UDA	135,000	45	30	45	0	45	30
OK8WW	60,800	32	19	32	0	32	19
IK3COJ	54,000	30	18	30	0	30	18
N4PZ	53,200	28	19	28	0	28	19
DJ8FR	23,400	18	13	18	0	18	13
UA3XCR	400	2	2	2	0	2	2
RA2FGG	100	1	1	1	0	1	1
SINGLE-OPERATOR, ALL MODE, 1.2 GHz							
RA3AUB	550,000	110	50	26	84	110	50
RA3EC	508,800	106	48	50	56	106	48
PA3FXB	369,600	84	44	21	63	84	44
ON5GS	194,700	59	33	35	24	59	33

N5BF	171,500	49	35	16	33	49	35	
OK2DL	156,000	52	30	28	24	52	30	
ES6FX	112,500	45	25	10	35	45	25	
OK1YK	92,400	44	21	13	31	44	21	
SP5GDM	72,600	33	22	0	33	33	22	
VE4SA	58,900	31	19	16	15	31	19	
LA4ANA	43,700	23	19	1	22	23	19	
K5DN	42,500	25	17	12	13	25	17	
VE4MA/K7	39,600	22	18	5	17	22	18	
EW1AA	38,400	24	16	0	24	24	16	
WA3GFZ	25,500	17	15	1	16	17	15	
IØNAA	24,000	16	15	0	16	16	15	
UA9FA	16,500	15	11	0	15	15	11	
DL1SUZ	14,300	13	11	0	13	13	11	
W3HMS	9,000	10	9	1	9	10	9	
SINGLE-OPERATOR, ALL MODE, 2.4 GHz								
OK1CA	37,800	21	18	18	3	21	18	
SINGLE-OPERATOR, ALL MODE, 3.4 GHz								
LZ1DX	3,600	6	6	6	0	6	6	
SINGLE-OPERATOR, ALL MODE, 10 GHz								
OZ1LPR	33,000	22	15	9	13	22	15	
OK2AQ	9,900	11	9	0	11	11	9	
UR5LX	7,000	10	7	4	6	10	7	
CALL SIGN	**SCORE**	**QSOS**	**MULTS**	**QSOS - CW/PHONE**	**QSOS - DIGITAL**	**TOTAL QSOs**	**TOTAL MULTS**	**MULTIOPERATOR CALLS**
MULTIOPERATOR, CW/PHONE ONLY, ALL BAND								
SP6JLW	369,000	82	45	82	0	82	45	(+ SP6OPN, SQ6OPG)
SP6OPN	36,000	20	18	20	0	20	18	(+ SP6JLW)
MULTIOPERATOR, ALL MODE, ALL BAND								
K2UYH	3,596,400	243	148	76	167	243	148	(+ NE2U, K2BMI, K2TXB, K2YY, W2HRO)
LU1CGB	790,400	104	76	15	89	104	76	(+ LU8ENU, LU9DO, LU1AGR, LU1AEE)
OH1LRY	281,200	74	38	30	44	74	38	(OH3MCK, OH3LWP, ops)
OZ9KY	121,800	42	29	0	42	42	29	(OZ1GWD, OZ1FKZ, OZ3Z, OZ5KM, OZ5TG, OZ1DLD, ops)
MULTIOPERATOR, ALL MODE, 144 MHz								
S55OO	1,297,500	173	75	0	173	173	75	(+ S5ØP, S54KM, S53RM)
F6HEO	80,000	40	20	0	40	40	20	(FØEUI, F5UNH, ops)
K4SQC	60,000	30	20	0	30	30	20	(+ WG8S, W4ZST)
MULTIOPERATOR, ALL MODE, 432 MHz								
S59DGO	2,500	5	5	0	5	5	5	(S56OA, S56FQC, S51LF, ops)
MULTIOPERATOR, ALL MODE, 1.2 GHz								
VA7MM	198,000	60	33	21	39	60	33	(VE7CMK, VE7CNF, ops)
IK5VLS	158,600	61	26	23	38	61	26	(+ IK5AMB)
MULTIOPERATOR, ALL MODE, 2.4 GHz								
WD5AGO	4,200	7	6	7	0	7	6	(+ KG5SSI)
MULTIOPERATOR, ALL MODE, 5.7 GHz								
SQ6OPG	8,800	11	8	11	0	11	8	(+ SP6OPN, SP6JLW)
MULTIOPERATOR, ALL MODE, 10 GHz								
OK1KIR	39,100	23	17	10	13	23	17	(OK1DAI, OK1DAK, ops)
N9JIM	11,000	11	10	5	6	11	10	(+ KG4UHM, AD6FP, KG6NUB, AI6VU)
N4EME	10,800	12	9	0	12	12	9	(WA3LBI, N2EME, ops)