432 AND ABOVE EME NEWS
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NEWS, CONTESTS and DXpeditions

G4DDK

At the Microwave Update (MUD) conference in Vancouver, BC the Don Hilliard award was presented to Sam Jewell G4DDK for his VLNA project and a lifetime dedication to supporting us on the VHF & GHz bands.

Sam's VLNAs are used by very many of us on 23, 13 and 9 cm EME and this recognition is so very well deserved. Congratulations and thank you Sam.

G4DDK receives Don Hilliard award

25 Billion Miles is Serious DX

The team at PI9RD used their 25m dish to receive the 8.4 GHz signals from the Voyager spacecraft. Congratulations from the EME community!
See below for the story.

December 6cm Activity

The activity day, December 14th expanded, as expected, to the weekend and beyond generated a lot of activity. Thanks Jan, PA0PLY, for organising and promoting it. At my count there were 33 stations active from 14 DXCCs including a new one, DU3T. Activity was spread over Q65 and CW plus a few ssb contacts as well. A pretty good turnout considering the December weather, some of us were lucky with unusually calm conditions but others were iced in. It is good to see the activity climbing back to where it was 8 or so years ago.

60 Years Since the First Arecibo QSOs

We were all too pre-occupied last June with the death of Al, K2UYH, to remember and mark this event which marked the actual beginning of EME on 432MHz. I've put together below some background and recollections. We won't miss remembering the second Arecibo activity anniversary, next July, when there were far more stations worked.

Galileo

Please read the recent reflector posts by Dick PA2DW "23cm Bandplan: EME – bandwidth" seeking information and views on the upcoming changes. Reply directly to him at qtc@kpnmail.nl

CONTESTS

We have a break from contests now until February 8th, the DUBUS-REF 70cm CW event.

Results from the Russian EME contest are at: https://eme.srr.ru/results/

and from the Italian Trophy autumn contest here: http://www.eme2008.org/ari-eme/contest2024.html

DXpeditions

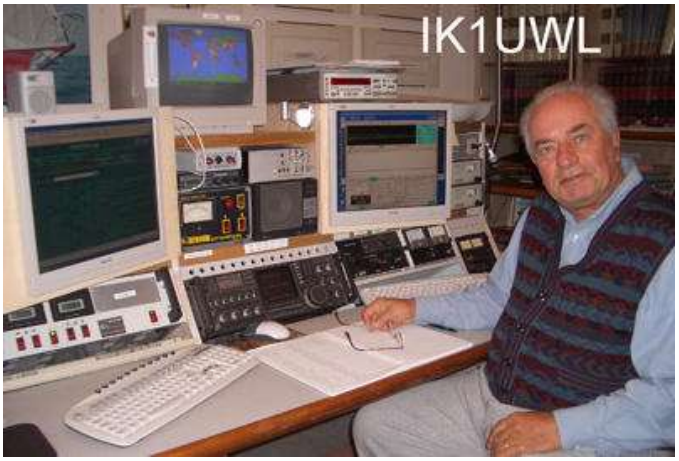
The only one I am aware of is TX7MAS on January 12th – 27th, a 23cm activation of Hiva Oa in the Marquesas Islands CI00LE by F6KJS/P. See the announcement in the November 2024 newsletter: https://eme.radio/432-and-above-newsletter/432-and-above-2024-11

Silent Keys

As we are working on the 2024 end of year newsletter we have learned of the passing of two moonbouncers.

IK1UWL Giorgio

Giorgio was dedicated to EME, coming on 2m in October 2002. He holds 2m DXCC number 35 and 2m WAZ number 19. He was one of the early adopters using the IQ+. He was 91.



IK1UWL Giorgio in his shack

W4HTB Henry

Hank was first licensed in 1954 and worked as an electronic engineer until his retirement in 1998. He worked on the design and construction of the controller used on the MIR spacecraft which sent SSTV pictures via 2 meters. His most recent interest was EME and was active with modest stations on 70cm and 23cm. He passed on Christmas Eve day aged 87. https://www.jvpfh.com/obituary/henry-cantrell

W4HTB Henry Hank Cantrell

2026 EME Conference

Puerto de la Cruz
Tenerife, Canary Islands
http://eme2026.moonbounce.info/
https://www.facebook.com/groups/860229122202148

DC1RDB Robert

This is my first contribution to the newsletter, a big thankyou to all of you who helped me with my first steps in 432 MHz EME.

I had my very first EME QSO with NC1I on March 19th, 2024 with a single hand-positioned cross yagi (loaned from fellow ham) on a tripod with RHCP phasing line (didn't know any better back then), my 22 year old IC-910 barefoot, no preamp and around 60 Watts at the antenna. Thanks Frank, you did all the heavy lifting.

The first improvement was installing a CRuni-NG TCXO in my IC-910, setting up a Yaesu G5500 antenna rotator controlled via Moonsked app, getting my first own YU1CF X yagi, a remotely controlled H/V polarization relay and a used mast preamp with HF vox. All RF cabling was done with Ecoflex 10.

In the next step, I added a second YU1CF X yagi and YU1CF combiners to the rotator.

Then I tried a Gemini 300 Watts PA, but that PA did not work well for me in Q65-60, already overheating during the second TX cycle at 150 Watts in that mode.

Next, I built a compact PWM Az/El antenna rotator controller based on K3NG Arduino code with stand-alone sun and moon tracking function to replace the original G5500 controller and PC interface.

In preparation for the planned BEKO SSPA, I designed and built a sequencer (Arduino based), installed a YU1CF EME2-432 preamp and changed RF cabling to Ecoflex 15.

In November, my trusty old IC-910 went into retirement and was replaced by an IC-9700 with Leo Bodnar GPSDO.

The new BEKO HLV-770 PA was ready ahead of schedule in mid-December and is now part of my station, too. A very quiet PA, guaranteed for 100% duty cycle at full power, works very well for me.

Initials so far: NC1I, HB9Q, OK1VUM, UA3PTW, OE3JPC, W5LUA, DK3WG, W5ZN, GD0TEP, ON7EQ, PA3DZL, PA2V, OZ9AAR, EA5CJ, SM4GGC, K4EME, KD2LGX, UT5DL, K1WHS, DL5FN, DL1VPL, DL8DAU, AG7CM

DL1SUZ Uwe

Firstly a big thankyou to Jan, PA0PLY for organising these 6cm activity days. I'm not so long qrv on 6cm and so it was a great chance to work new stations.

wkd on 13.dec.: PA3DZL, OH3LWP (sqr #17,DXCC #13), IK0HWJ, DF3RU

wkd on 14.dec.: JA1WQF (sqr #18), PA0PLY, PA0BAT (sqr #19), OZ1LPR, DL3WDG (sqr #20), DU3T (sqr #21, DXCC #14), SP3XBO (sqr #22, DXCC #15), G4CCH (sqr #23), SV3AAF (sqr #24, DXCC #16), YO8RHI (sqr #25, DXCC #17), ON5TA, WA3RGQ (sqr #26)

wkd on 17.dec.: OH3LWP

A sked with OH2DG was not complete. I copied Eino with -20 up to -15, but he didn't copy me.

All contacts made in Q65-60D.

I'm still running on 6cm my 3.2m mesh-dish with a septum-feed, preamp DU3T (NF 0,6dB) and SSPA 40W (maybe 20-25W on the feed). Because the beamwidth is 1,1 deg I have still a problem with correct aiming to the moon. Rotator is SPID BIGRAS/HR with resolution 0,1deg (incremental sensors). Next improvement step will be to use a inclinometer.

DL3WDG Charlie

Charlie reports that they really enjoyed the activity session, and many thanks go to Jan for organising it. He writes:

We worked a total of 23 stations, 18 on Q65 and 5 on CW. QMAP worked well for us again, decoding almost everybody in its 90kHz operating bandwidth. Makes identifying new stations very efficient. We also used its wideband waterfall to see where the CW activity was.

We set up a few days before to check that everything worked, and had a failure in the PA. It uses two HB 40W amplifiers combined with HB pcb quadrature couplers. Power dropped off while testing by about 7-8dB. After checking transverter and driver amp, it was evident that the PA was at fault. Turned out that one of the devices has developed a gate to source short, which triggered the protection circuit to remove drain volts from that device, leaving the other side of the amplifier operational. After replacing the device (which involved heating the whole amplifier up on a hotplate to enable the FET to be unsoldered) power was restored to the original level. Fortunately, all the SMT parts stayed put during the operation!

Stations worked were G3LTF (cw), DF3RU (cw), G4CCH (cw), PA3DZL (cw), OK1KIR (Q65-60C) , YO8RHI, OZ1LPR, PA0PLY, JS6UJS, JA1WQF, G4RFR, PA0BAT, ON5TA, SP9VFD, IK0HWJ, SV3AAF, DU3T, DL1SUZ, SP3XBO, PA0JB, DL6SH, WA3RGQ and CT1DMK (cw).

During the week while doing system tests, I also worked PA0PLY, JA1WQF (both with half the PA) and JA1WQF, PE1CKK and DL6SH (with repaired PA). JA1WQF reported a 12dB increase after the PA repair.

Equipment used was HB transverter, preamps, PA, long W2IMU feed with septum, and 2.4m Prodelin offset with 0.8 f/D. Echo level about -10dB/2500Hz.

We did not operate on 5.7GHz during the ARRL contest, so it was great to make up for that.

DL6SH Slawek

I used my 8 m mesh dish with very low efficiency at 5760 MHz, 50 watts at feed and DU3T preamp. I have lot of noise in my location, so my rx is not the best. Also had lot of high wind gusts there, so could be qrv only part time.

Worked between December 12th and 14th:
in cw: G3LTF #, PA0PLY, OZ1LPR, W5LUA, CT1DMK #.

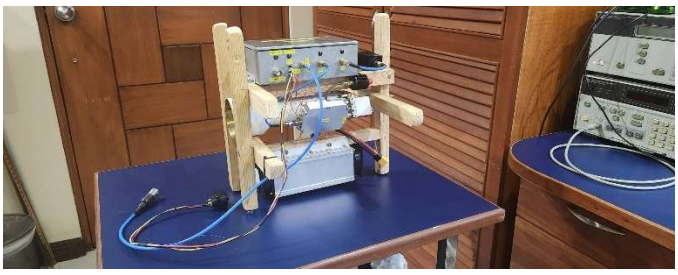
in digital: DL3WDG, JA1WQF #, PE1CKK, OH3LWP #, DF3RU, ON5TA, PA0PLY, DU3T#, PA7JB #, SP3XBO #, G4CCH # and DL3WDG.

In the meantime, I am working on my 10 GHz Station. 2.4 m offset and RX are running nicely already, I'm now working on TX side. Hope to fire up next spring, now is to cold for outside work.

DU3T Ron

We were all delighted that Ron was active in the 6cm activity period December 14/15th. His 4.6m PF dish had the front end mounted inside the 23cm feed. It used a DU3T CLNA preamp (0.6dB NFat feed) and a DU3T CPA50A 50W PA. He had 24 QSOs, 19 Q65 and 5 CW with 11 dxcc, all firsts of course.

Ron reports WLAN interference during sun and moon noise measurements and plans to add a BPF to reduce this. (*I use one of these in my HB transverter, its very quick to build – Ed http://www.g4jnt.com/evanfilt.pdf*)



DU3T Feed Assembly

DU3T 6 cm inside 23 cm

DU3T dish 6cm QSL

F2CT Guy

Some news about my new EME setup on 432 MHz with only 4 x 14el H/V for starting and soon with 8 x 14el H/V. Here is results in November with AZ/EL 20° restriction: OZ9AAR SM4GGC DL8DAU DL5BBH DL5FN DL8GP OK1VUM UA3PTW UT5DL UT6UG RD3FD PA2V SP2WRH GD0TEP VK2CMP VK4EME and my old friend F8DO with his 2 yagis.

I'm free for any sked CW/Q65 - my take off is now free from AZ 0 to 360 and EL 0 to 70°.

On December 14th I will be qrv on 6cm.

(*Unfortunately Guy had bad weather and could not be active on 6cm – Ed*)

G3LTF Peter

I was active in the 6cm weekend, all contacts were on CW. On December 13th I worked DL6SH #101, OZ1LPR and W5LUA. Next day, 14th, I worked DL3WDG, G4CCH, PA3DZL, DF3RU, OK1KIR not completed due to wi-fi QRM in Prague, JA6XED #102 IK0HWJ, PE1CKK, PA0PLY, SV3AAF, PA7JB, ON5TA, only running 25W / 2.4m fully random QSO, CT1DMK, and OZ1LPR.

On 15th I was pleased to work DU3T #103 dxcc 41 followed by OH3LWP #104 and DF3RU. I was very lucky with the weather, it was flat calm for most of the weekend. I missed out on quite a few in the evening sessions but most I had worked previously.

Equipment was 40W to a 6m 0.375 f/d dish, W5LUA HB preamp HB transverter into 144 MHz converter with TS590 at 14 MHz plus noise meter and SDR.

G3YGF Julian

Julian, G3YGF, reports on behalf of the team, John G8API and Tony G3PFM: It has been a quiet period for EME and we have been progressing making dummy loads for the 400 Hz fan driver and TWT supplies. We are still building for 24 GHz and 1.3 GHz.

On 2-10-2024, with 200 W into a 3m6 dish on 10 GHz, we worked GI7UGV -19/-10 1m2/15W and KM0T -7/-03 1m8/50W. On 13-11-2024, on 10GHz we worked HB9DUK -15/-9, F5VKQ -25/-1 (actually -15) 3m/35W, IW2FZR -9/+1 1m8/35W, GI7UGV -15/-4 1m2/15W, IZ4BFA -11/+2 1m5/30W and ON5TA -6/+6. Then on 11-12-2024, in preparation for the activity weekend, on 5.7 GHz we worked PA0PLY -18/-16 and OH3LWP -15/-14

On 14-12-2024 there was a lot of activity on 5760 - over a dozen stations around, but unfortunately we had to shut down early at about 20:30. We worked 8 stations: JA1WQF -14/-12 2m4/100W, DL3WDG -13/-16 2m4/70W, SP9VFD -20/-16 ?6m4/2m?/35W, IK0HWJ -9/-16 2m4/150W, OK1KIR -8/-21, OZ1LPR -8/-15 4m5/70W, PE1CKK -18/-24 1m8/100W and PA0BAT -8/-12 3m6/100W.

We were very pleased to make our 1st JA on 5.7 GHz. Echoes were 12dB in 6Hz, 1.1dB moon noise.

The lower libration is significantly less than at 10 GHz, and we could read CW on our own echoes.

We could do with more events like this on the other bands.

G4CCH Howard

Thanks to Jan, PA0PLY for organising the 6cm activity day. Actually, it ran over into the following day giving opportunities to work the ones I missed. For me it focused the mind into getting my 6cm gear going again even though it wasn't 100%.

My power output was much lower (25 W) than previously, but I managed to work all the stations I could copy. My power output improved later on Saturday, but so far I don't know why, but not the full 40 W that I used to have. I will find it eventually...

The weather was great for EME, with light winds, so my dish wasn't moving off target much. But the small movements were more noticeable on CW with low power stations than on Q65, and especially on my CW echoes.

Activity was high and I managed to work 26 stations - 11 on CW with 3 Initials, 15 on Q65 with 14 Initials. This brings my Initials to CW=61 and DIgi=25.

There were some VERY strong signals on both CW and Q65.

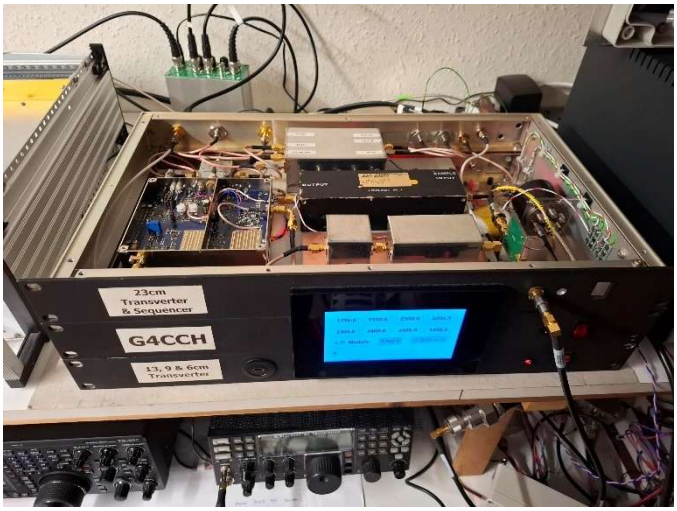
In the log are:

CW - G3LTF, DL3WDG #, DF3RU, CT1DMK, VE6BGT, DU3T # and DXCC, OH3LWP #, PA0BAT, PA3DZL, JA1WQF# and IK0HWJ.

Q65-60D - YOHRHI #, PAOPLY #, SP9VFD #, JA1WQF #, ON5TA #, DU3T #, OZ1LPR #, SV3AAF #, PE1CKK #, DL6SH #, DL1SUZ #, PA7JB #, WA3RGQ #, OH3LWP # and IK0HWJ.

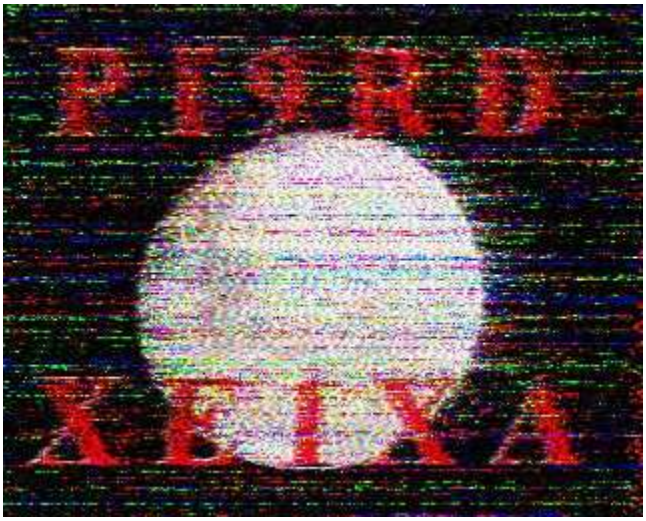
I missed G4RFR, JS6UJS and JA6XED, and a few more...

This was the first time I used my updated multi band transverter on 6cm. It uses a max2870 pll with an RP2040 controller by Colin G4EML as the LO for 13, 9 and 6cm. On 6cm I am now using a 20 dBm mixer. A separate mixer is used for 13 and 9 cm. Just one PHA83-W after the mixer produces approx 20 dBm output which goes up the TX coax to the feed box.



G4CCH multi band transverter

G4CCH 6cm feed with Ferranti SSPA



PI9RD - XE1XA

IK0HWJ Gino

It was a pleasure to participate in the moonpass event 5760 on 14 Dec. The conditions were fairly good and there was a great activity. My AZ Windows at moonrise limited my operation for about 4 hours.

It was for me the opportunity to test the new TX line that carries TWT power to the 240 cm dish.

I used for this purpose a new 7/8 inch cellflex cable. After a long search for suitable N connectors, I managed to achieve the total loss of 3 dB (previously there were 5 dB). New Power at the Feed 150 Watts in Q65 and 300 Watts in CW/SSB.

During the Moonpass on Saturday 14th I worked the following stations:
Q65: DL3WDG - G4RFR - JA1WQF - PA0PLY - DU3T - SP3XBO - YO8RHI - WA3RGQ
CW: CT1DMK - PA0BAT - G3LTF - SP3XBO

In addition worked on 13 and 15 Dec:
13 Dec Q65: DL4DTU - DF3RU - DL1SUZ - PA3DZL - ON5TA
CW/SSB: OZ1LPR
15 Dec -Q65: OH3LWP - G4CCH
CW: G4CCH

IK0HWJ dish

IK0HWJ dish

IK1FJI Valter

Valter reports not much activity since his last report:

I was qrv in the SSTV day (December 11th) from PI9RD (ex PI9CAM) and I got some nice pictures, also I sent some to them with good result.

Then I worked some stations in CW/SSB: PI9RD (ssb) #172, CT1FGW 589/589, and SP3XBO tx 569 rx 579.

Nothing else.

Hope to have more time next month.

KH6FA Frank

I am QRV in Hawaii now on 432 MHz using 2X23 Cross Pole with 450 watts. On 23CM 2.4m dish with 400 watts. Upgrading the dish to 3 meters. I should be on 902 also in the coming months.

KH6FA new 3 m dish

NC1I Frank

I have added the following initials on 70cm: DF6LH, K1OR, HA5OLA, LY1G, G0JDL, ON4PB, WA2NDV, S9Z for a new DXCC (thanks Max!), PA6Y, IV3RYX, SM0LQB, JH1SSX, GM0ICF, OK2VJZ, DO1CTL, 7K3LGC, KA2ENE, KD0BLZ, KB0ZOM, VE3CIQ, DD0VF, SA2SAA, W7YED, KJ7KOJ, KK7EXT, and DL7SEQ. For many of those stations it was their first EME QSO.

On 23cm I added the following initials: UA3MRE, VP2MBM, NX3B, V26AM, PJ7/EA8DBM, PJ5/EA8DBM, W1FKF, FS/EA8DBM, G4KLX, K0DSP, M0LNB, FJ/EA8DBM, SM0DJW, PI4Z, K2TER, JQ3JWF, PJ4MM and KP4/EA8DBM, DM2CFH, IK7UXW, IZ8GGF, and YO5TP. That brings my 23cm mixed initial total to 604. Initial #600 was almost exactly nine years after my 23cm initial #1.

I would like to thank and congratulate Alex EA8DBM and Max N5NHJ (S9Z) for their huge efforts and excellent success activating new countries. I was able to complete 23cm QSO's with Alex from all nine Caribbean countries that he activated. Seven of those activations resulted in new DXCC entities for me. Alex had plenty of challenges but he did not let those challenges stop him. He found solutions to every problem he encountered. On his last few stops everything was working incredibly well and he was consistently -12 and occasionally as strong as -09. Thanks Alex!! Max N5NHJ also did a great job with his S9Z activation on 70cm. Max was as strong as -10 at times with his single 16-element yagi. Unfortunately, I know his amp failed (I believe the second night) before many were able to work him.

Both Alex and Max did a great job. These types of operations have a significant impact on activity, and not just during their DXpeditions.

In November we completed a QSO on 23cm with Martin PJ4MM. Martin was using a single 67-element yagi and a barefoot IC905 with ten watts out. From the image that I saw it appeared Martin had a jumper from the radio (external 23cm box of the IC905) to the antenna feed point that looked to be 2-3 meters long. It seems likely that he only had 7-8 watts at the antenna. The QSO was completed using 120D mode. W1QA was the operator of the NC1I station during the QSO.

I am finally back up to the usual 900-watts at the antenna on 70 cm. Hopefully I do not have any further amp issues.

I hope that everyone had a very nice Christmas and I wish a healthy 2025 to all!

OH3LWP Ari

My new eme system with 4m solid dish is now QRV. System allows fast change between 3cm and 6cm bands. 40W and 70 W respectively.

Missed the main 6cm activity window on 14-12 due to bad weather but was QRV before and after activity window when weather allowed. OH3LWP 5760 MHz eme activity until December 22nd 2024 is as below:

8-12 SV3AAF Q65-60D, OZ1LPR Q65-60D/CW/SSB
10-12 JA1WQF Q65-60D
11-12 G4RFR Q65-60D, PA0PLY Q65-60D
12-12 DL6SH Q65-60D, PE1CKK Q65-60D, IK0HWJ Q65-60D
13-12 DL4DTU Q65-60D, DL1SUZ Q65-60D, PA3DZL Q65-60D
14-12 W5LUA Q65-60D, ON5TA Q65-60D
15-12 DF3RU CW, G3LTF CW, OZ1LPR CW, JS6UJS Q65-60D, G4CCH CW, PA0BAT CW, PA3DZL CW, IK0HWJ Q65-60D, G4CCH Q65-60D, SP9VFD Q65-60D, CT1DMK CW
17-12 DL1SUZ Q65-60D
21-12 PA7JB Q65-60D, ON5TA Q65-60D, LZ4OC Q65-60D, IW2FZR Q65-60D

OH3LWP 10368MHz eme activity untill December 22nd 2024 is as below:
8-12 IZ4BFA Q65-60D, I6YPK Q65-60D, GW3TKH Q65-60D, IW2FZR Q65-60D, CX2SC Q65-60D, KM0T Q65-60D
17-12 IZ4BFA Q65-60D
18-12 K5DOG Q65-60D, ON5TA Q65-60D, I6YPK Q65-60D
20-12 DJ7FJ Q65-60D, ON5TA Q65-60D
21-12 IW2FZR Q65-60D

OK1JG Jarda

I participated in ARRL Contest just to give out points and work new stations but my 4 QSOs are not great, I tried a new connection between PC and TRX with lower pass with isolation transformer. Everything works fine but the only benefit it has on the transmitting path it does not make such a mess when I pull down the volume to zero so no power comes out of the PA. My 70cm LOG: UA3PTW KO93, HB9Q JN47, VK2CMP QF56, YL2GD KO37 all QSOs on Nov. 16th night.

OK1KIR Vlada

After installing equipment for 6cm activity day we suffered again from severe WiFi interference. Peaking Moon noise was actually impossible, so we did trust the prediction of F1EHN tracking program. Trying CW QSO was also out of chance, so we gave up trial with G3LTF. Interfering noise bursts peaking up to equivalent NF of 10dB totally eliminated readability of CW signals. We found interfering WiFi 20MHz wide channel sitting directly on 5760 MHz, but were unable to find its direction with EME dish.

However, WiFi channel was not fully loaded all the time and we discovered that short breaks in between noise bursts being random both in time and length are surprisingly enough to allow Q65 complete sequentially decoding of incoming signal. Great software!

Actually, it took some time and signal report were far below the reality, but done!

During about 3 hours of that tricky game we completed using Q65-60C QSO with DL3WDG (-22/-4 DB) and further using Q65-60D QSOs with JS6UJS (1.6m dish/100W) as #70 in new PL field, PE1CKK (-10/-6 DB), DU3T with 4.6m dish and 50W (-19/-8 DB) as #71 in new PK field and 1st QSO DU-OK on 6 cm, G4RFR (-21/-8 DB) as #72 and OZ1LPR (-23/-5). During the last QSO WiFi interference jumped up, Q65 signal at the level of about 0 DB was down to about -23 DB and less. So, we closed the whole operation.

Wishing to all better times in the new year 2025!

OK1TEH Matej

I originally planned to run the ARRL EME Contest with a new antenna system, unfortunately work duties didn't allow me to do so and so I again run the contest from my home QTH in noisy Prague on 70cm with my old single 23el DK7ZB from OK2BJL workshop, which has a boom length of 5.7m. The intention was to beat my personal record of 34 QSOs (Q65B) for both legs and learn some new Q65 tricks.

In the first round I worked with: UA3PTW, DL1VPL #, PA3DZL, W5LUA, OZ9AAR #, VK2CMP, HB9Q, DF3RU, GD0TEP, K4EME, PA2V, W5ZN #, EA5CJ, VK4EME, PA2CHR, SM4GGC, ON7EQ. In the second leg I added: NC1I, K5N (ex K5QE), KD2LGX, PA6Y (PA2V), DK3WG, W6TCP#, K1OR #, OM4EX #, OT7K (ON4AOI), G4RGK, VE6TA, DM9EE, N1AV, YL2GD, OE3JPC, UT5DL, PA3CMC #(1Y-1Y!), GD0TEP (dupe), SM3LBN #, DL8DAU, SP2WRH #, DL5BBH #, 7K3LGC #. Total 39 QSOs.

I'm personally very happy with the result, the second half was much better in terms of Faraday's lock and I thought the activity on the band was better too. I was very pleasantly surprised by the easy random QSO with PA3CMC, who used only 1x41el M2 15WLA(!), which is only the second 1Y-1Y QSO on 70cm for me. After a big fight I also managed to make a rare QSO to JA with 7K3LGC.

Unfortunately, there were a few more stations on the band that saw me, but it was mostly when the Moon was in low elevation and the band was full of birdies. For example, I missed S56P, DL5FN, SM7SJR, S51ZO. I was also sorry that I didn't catch Jan, DL9KR on the band, it's a great pity that CW traffic was down, I think in contest rules there should be bonus points for these CW contacts. Finally, I would like to thank everyone who called me even though the connection failed and if health and time permits, I will look forward to the next contest.

OK1UGA Martin

I enjoyed ARRL EME contest this year. I'm not interested in contesting so I was giving away points and trying to make new initial squares and countries. I was active on the 2m and 23cm bands. The activity was pretty good so there was still plenty to do. In addition, Alex EA8DBM was active in the 23cm band and he allowed us to make a lot of new countries this year. On 23cm I managed to make 28 new initials, 11 new squares and 3 DXCC, on 2m I made 8 new initials, 5 squares and unfortunately no new countries. In the meantime I managed to make all but one of the destinations from which EA8DBM was transmitting.

OK2DL Marek

The moon rise was at night again which meant I wasn't going to get much sleep. I started the contest at 2 o'clock our time and ran Q65-60c traffic for the first hour, like most stations on the band, switching to Q65-30b from the second hour of the contest. The difference in how it went was telling: 7 QSOs in the first hour, 17 in the second. Q65-30b seems to be preferable, I managed to work stations with small antennas with this operation. After the moon set I slept for about an hour.

There were quite a few stations on the band after moonrise, which hasn't happened much in recent years. At about 2 o'clock our time I ran out of energy and went to bed for 3 hours. I worked until moonset, activity from the west was increased, a few new stations were added, mostly equipped with W2HRO umbrella dish. The final orbit on Sunday was just about the end of the line, most of the stations on the band were already in the log. A total of 129 contacts were made, including 22 new initials. In the second round I tried to be on the band as much as I could

The total for both rounds is 186 contacts and 140 multipliers. Sending the log didn't work via Cabrillo this time, I had to export the ADI file and manually paste it into the window. Total result was: 225 QSOs on 23cm, 41 CW QSOs, 186x digi QSOs, 140 grids = Raw Score of 2 604 000 points. https://www.ok2dl.eu

OK2PE Karel

I am sending some information about the final leg of ARRL contest on 23cm. This month was even worse than usual. But I tried to squeeze what I could out of it.
On Saturday it was 11 QSOs, new init. CT1DMK. Sunday was 6 QSOs, new init. SP3XBO. In total I made 35 QSOs on CW only. Some stations, as usual, did not come out at all. Or they were on the band, but I didn't have the moon, so there was nothing to transmit to.

OK2ULQ Petr

During the first round I made 33 QSOs on 23cm. Unfortunately, I missed the window for America so I paid more attention to it in the second part. The interesting thing was contact with OK1DFC. My antenna was still almost completely shielded by the tin roof of a nearby hangar. I was pleased to see new initials with BG7XWF, CT1WO, CT2GUR, PA3EXV, PI4Z and VK4NFI.

I started the second round unconventionally on Saturday morning, an hour after midnight local time. The moon was already high and the band full of stations. By moonset 20 QSOs were completed in the log. Of these there were 3 new initials K5N, AB6A and K5D. I continued in the evening. The wind picked up quite a bit but it was only a minor complication. I couldn't stay awake until morning but made another 24 QSOs.

And more new stations for me: DF7KB, UA1ALD, HG5BMU, JQ3JWF, BA7NQ, PA1PS, W3TI and SP7EXY. SP7EXY even has a CW modem, that hasn't happened to me in a long time. So the overall result was worse than last year, but I guess it doesn't matter. I enjoyed it as much as possible so thanks to all for the QSOs. And that's about it for me this year on EME.

ON5TA Eric

The 5.7 GHz activity day proposed by Jan PA0PLY was a big success and I hope it will be repeated! I would then suggest extending it to a full week-end. Quite many stations were only active on the 14th, while others had bad weather on that day and could not be QRV. In my case, the moon window is very short to the East and West because of nearby trees and buildings and I missed some stations which did not appear on the next day. A full week-end would bring us more time to search for new initials and test with small stations.

I worked with a 2.4m offset dish and about 25W, just enough power to make some nice random CW QSO's. Using now a DU3T preamp, I normally see 0,6 to 0,8 dB MN. I made 23 QSO's over the week-end, with the following stations:

CW: CT1DMK, G3LTF, OZ1LPR, PA0BAT and PA3DZL

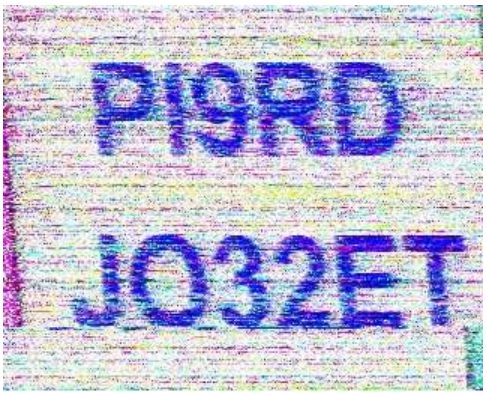
Q-65: CX2SC, DF3RU, DL1SUZ, DL3WDG, DL6SH, DU3T, G4CCH, IK0HWJ, JA1WQF, OH3LWP, PA0PLY, PE1CKK, SP3XBO, SP9VFD, SV3AAF, VE4MA, WA3RGQ and W5LUA

ON5GS Dirk

Was active for the 23cm EME SSTV party. It sure was a lot of fun!

I got some nice pictures from PI9RD, K5DOG and XE1XA. PA3EXV, VE3VXK and G0LBK heard but too weak for a good image.

Thanks team Camras PI9RD for a fine evening! Really liked it.



PI9RD Jan

This year we chose a moment where the moon was very close. (*360,500 km, excess loss only 0.2dB. Ed*) It was a normal weekday, Wednesday December 11, but despite that fact we found a lot of activity! I hope I did not overlook anyone but as far as I know 19 stations joined the party!

PA3EXV, SP3XBO, IK1FJI, IU0BTM, DL1SUZ, F4KLO, W2HRO, KB2SA, CT1FGW, ON5GS, PY2BS, DL6ZG, VE3NXK, XE1XA, CX2SC, K5DOG, N6ZRJ, WA3RGQ and DL4DTU.

We, at PI9RD, sent several times a series of SSTV images in SSTV mode Martin 2 and those images were received by many. And some of the participants also sent images which were received by us. Most of the results people saw were communicated via HB9Q. In that way I collected a total of 87 pictures. We found excellent results! This was clearly the best ever SSTV party we had. Moon distance matters more than we expected!

Next EME SSTV party will be somewhere around July 21 (Apollo 11 moonlanding day)

PA0PLY Jan

Jan reports on his experience in the 6cm Moonpass event: In advance of the 14 Dec happening I mounted the 6cm gear in my dish and made some QSO's:

9/12 SV3AAF-13/-14
11/12 DL3WDG -11/-18 #, JA1WQF -09/-06 #, G4RFR -16/-14, OH3LWP -07/-17#

Then on December 14th:
DL6SH -10/-12, DL6SH 559/559, OZ1LPR 599/569, W5LUA 579/569, CT1DMK 559/559#, VE4MA -10/-15, SV3AAF -15/-16, CX2SC -18/-23#, ON5TA -13/-08, DU3T -13/-14# FIRST DU-PA!!, DL3WDG -11/-12, JA6XED 579/559#, G4CCH -11/-13#, YO8RHI -15/-16, SP9VFD -14/-12#, DL1SUZ -18/-16, SP3XBO -16/-17, IK0HWJ -06/-11, DF3RU 579/579#, G3LTF 579/569.

After this event, on 15th December: WA3RGQ -13/-13, VE6BGT 559/559

All worked fine here, except in the beginning.
By accident I selected NR1 - Noise Reduction on my TS2000. Which actually works fine while running CW QSO's, but in USB strange noise waves appears on the screen. Sometimes WSJTx hangs up and shows similar behaviour, but could be solved by restarting the program. This time I was puzzled where the noise came from. It was not on 6cm as the SDR did not show this effect. Finally I discovered the mistake in the TS2000 setting.

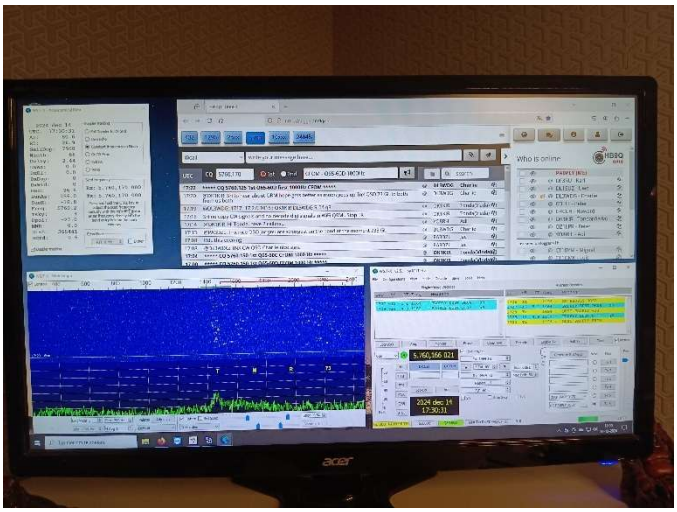
I also installed SDR console to work with an RTL dongle and QMAP. With this it was easily to identify where the activity was.

The CW QSO with G3LTF was really on the edge of my ELE capacity. Moon went to 61 degrees, while my elevation stopped at 60 degrees, but we managed.

I was very pleased with the amount of participants, in a total of 33, if I am not mistaken.

Ron DU3T gave birth on a small new feed (6cm) mounted as a kangaroo baby in his 23cm feed. After some starting issues we managed to run his first 6cm QSO and our first DU-PA. Then he appeared on the HB9 Logger and off it went with a serious pile up and many firsts. Attached a screen copy of my DU-PA first.

I thank again all participants and wish everyone happy Holidays and a healthy start of 2025.



PA0PLY DU PA first

PA3DZL Jac

Date Dec. 16th to Dec. 18th : 432 MHz Initials worked in Q65B: 4X1AJ and KH6FA

Rig used: 4m dish, Ringfeed H+V pol., PWR 1kW @ feed and 0.3dB NF

Date Nov. 22nd to Dec. 12th : 1296 MHz Initials worked in Q65C: KH6FA, KØDSP, YO5TP and K1WHS

Rig used: 4m dish, RA3AQ feed CP, PWR 800W @ feed and 0.3dB NF WD5AGO Cavity preamp.

Date Dec. 13th to Dec. 15th : 5760 MHz, nice activity, not only on Saturday but also before and after. On Saturday my time was limited because of a family commitment

Worked in Q65D: JA1WQF, DL4DTU, DF3RU, DL1SUZ, OH3LWP #initial, IKØHWJ, OZ1LPR, WA3RGQ, SV3AAF, SP3XBO and DU3T #initial and new DXCC

Worked in CW: G3LTF, DF3RU, DL3WDG, DU3T, JA1WQF, G4CCH, OH3LWP and ON5TA

Rig used: 3.7m Solid Andrew dish, CT1DMK/LX1DB squeezed feed CP, PWR 110W @ feed and 0.6dB NF DU3T Preamp. Many thanks to Jan, PLY for organizing this 5760 MHz event.

PA3FXB Jan

My dish is 2,91 m but for the ARRL contest weekends on 23 cm I always make it 3,5 m with wood, pvc electrical tubing and some chicken wire. It gives me about 1,5 dB better RX and that helps to pull the real weak CW signals out of the noise. My CW skills are not very good so I need every dB I can get.

Conditions during both weekends were very good and that helped too.

In total I had 141 QSO's on 23 cm. That's the highest number I ever had… Activity has increased a lot on 23 cm over the years!

During the first ARRL contest I participated in 2007 I had 23 QSO's in two weekends. What a difference!

2024 was a great year for 23 cm EME. Alex EA8DBM activated many new DXCC's (Thanks Alex!)

My total score is now:
112 DXCC's
451 grids
701 initials

I would have considered those numbers as science fiction when I started EME on 23 cm in 2006 😊

S9Z 432 MHz EME from São Tomé

N5NHJ / I8NHJ Max

When Tom, N4XP, invited me to join the 2024 São Tomé DXpedition, my mind immediately raced to the possibility of incorporating 432 MHz Earth-Moon-Earth (EME) activity. A quick web search revealed that while some EME operations had taken place from São Tomé (S9), 70 cm was uncharted territory. The opportunity to introduce this new band to the DX community was too enticing to pass up.

The idea was warmly received, with the understanding that the EME station should not interfere with other planned operations, including HF and satellite activities.

With the green light, we began assembling the station. ICOM, our major sponsor, generously loaned us a brand-new IC-9700. For antennas, preamplifiers, and accessories, we reached out to several companies for support. Thanks to InnovAntennas, we secured a 16-element LFA, while Antennas Amplifiers provided a 432-EME preamplifier with Bias-T. Leo Bodnar contributed a stabilization kit, and the antenna support structure was sourced from Max-Gain Systems—a fiberglass military tripod with a 3-meter telescopic pole, previously tested in other EME setups.

However, finding an amplifier proved challenging. After several rejections and unanswered requests, Marco, KC9FFV, came to our rescue, offering a brand-new Gemini 70-1K amplifier straight from the box. Our shopping list was complete!

The team convened in Lisbon on November 7. At the airport, we were greeted by a mountain of equipment—big boxes and Peli cases—ready for the 7-hour flight to São Tomé. We landed late in the evening, eager to get started.

The weekend was a whirlwind. While setting up four HF and six-meter stations, the weather dampened our spirits—literally—with persistent rain. I scouted for a suitable spot for the EME station, which would be set up temporarily and dismantled between sessions.

Eventually, I found the perfect location atop a 50-meter hill, far from the main facility. The climb, involving 100 cement-filled truck tire steps, was grueling, especially with equipment in hand. But the reward was a 360-degree view, 180 degrees of unobstructed sky, and blissful silence—no human-made noise to contend with. The drawbacks? Mosquitos and sharp volcanic rocks.

On Monday, we began assembling the EME station. A balky balun caused a brief panic, but a quick replacement had the antenna fine-tuned and ready by nightfall. We decided to wait until the next day to launch operations.

On November 12, as the moon rose, we announced our presence on the HB9Q reflector and began calling CQ. At 21:21 UTC, Frank, NC1I, completed the first-ever 432 MHz QSO with S9Z. The single-yagi setup performed better than expected, with strong signals, and we logged six QSOs in under an hour before shutting down for the night (those mosquitos were relentless).

The next evening brought mixed fortunes. Faraday rotation played tricks on us, making signals elusive for an hour. But once conditions stabilized, we enjoyed a productive run, adding eight more stations to the log. Then disaster struck—our amplifier emitted fireworks and smoke. A failed capacitor ended our high-power operations, leaving us to rely on 100 watts for the rest of the expedition.

Despite this setback, we pressed on. Over the following days, we scheduled contacts with stations confident in making QSOs with our reduced power. Though we missed VK4EME due to a tight window, we successfully logged HB9Q on November 15, marking the end of our EME activity.

In total, we completed 15 QSOs on 432 MHz EME. While the amplifier failure was disappointing, the experience proved that even a single yagi, with careful preparation, can achieve remarkable results. Signal reports showed we were often just 2 dB below the stations we worked — a testament to the setup's efficiency. Our best signal was -18 from DG5CST, the worst -27 from ON4AOI. The best signal we received was -11 (NC1I), the weakest -25 (several).

As an added bonus we decided to utilize the LFA for a couple of RS-44 passes before teardown. One of the operators had brought his Arrow antenna in case the opportunity presented itself. We used the 2M portion of the Arrow along with the LFA and the preamp on 3 passes of RS-44 working 18 very surprised operators delighted to get the new one in the log.

Congratulations to everyone in the EME log! Logbook of the World (LoTW) will be updated soon. For direct QSLs, my QRZ address is the place to go.

This experience reinforced the importance of attention to detail and adaptability in DXpeditioning. I look forward to the next adventure and hope to work even more stations next time. For more details, visit https://S9Z.org

Thank you for following along—see you on the Moon!

Total of 15 QSOs: NC1I S-11 R-21, OK1VUM S-20 R-24, PA3DZL S-22 R-19, UA3PTW S-20 R-22, OK1DFC S-18 R-22, PA0BAT S-25 R-25, OK1KIR S-17 R-21, ZS4TX S-19 R-24, DG5CST S-17 R-18, ZS6JON S-22 R-23, ON4AOI S-25 R-27, PA2V S-22 R-26, PA2CHR S-25 R-27, ON7EQ S-23 R-25, HB9Q S-23 R-25

S9Z Final Antenna Tuning

S9Z NC1I in the log

S9Z EME setup on RS44

SP2WRH Rafal

I had good wx conditions during the final leg of the ARRL contest. It was better than year ago when there was 10cm of snow on the antennas. Still using 4x27elem H Yagi by DK7ZB but it is set up for 8 antennas that means I have two main lobes and efficiency of the system is not so good as should be. I'm waiting for summer when four more antennas will be installed.

Mainly my QSOs were with EU, VK, JA stations, a few stations from US have been heard but only one QSO was done with Larry KD2LGX (-21). I have made 26 QSO and few new initials, with Matej OK1TEH (-24), Gerd DL5BBH (-19) and Guy OT7K (-18).

During December I have made a two new QSO on 23cm with 38 elem Loop Yagi antenna and 20W power with PI9RD and DL0SHF. Now a QRO 50W amp, hihi, is installed and G4DDK LNA . Rx side works well I can hear many stations. I have also small 13cm station ready for EME test, consisting of LNA + 100W + 67 elem Yagi in H pol – welcome for sked.

I wish for All Merry Xmas and HNY with good health and less QRM than in this year.

SP6ITF Greg

Was active in ARRL EME Contest on 23cm CW and worked 49 contacts for 205 800 points.

SP9VFD Raf

I have added 6cm band and now I'm active there besides 70cm / 23cm / 13cm / 9cm. I finished my 6cm setup at the end of July, few days before last leg 6cm Dubus EME Contest. My 6.4m homemade dish doesn't work perfectly on 6cm. Its caused apparently due to mesh holes diameter 8x8x0.8mm which aren't suitable for 6cm when feed sees ground noise leaking through the mesh. Measured on July 28th CS/SUN 13dB.

Using still very useful VK3UM EME Performance Calculator software I was able to estimate that my homemade 6.4m dish should have a high TSys 134.50K on 6cm. No doubt it decreases Rx efficiency.

In spite of overall poor system efficiency I had six 6cm CW EME QSOs at the end of July 2024:

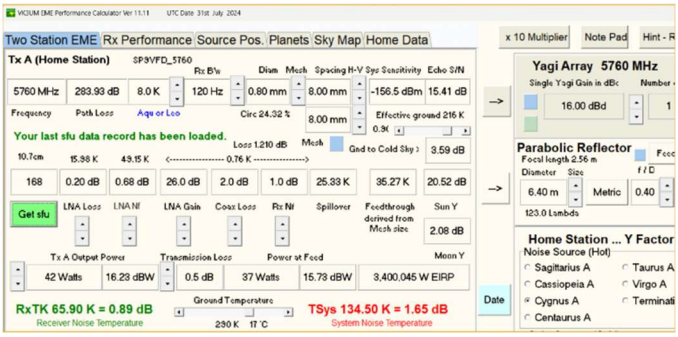
PA3DZL 559/559, UA5Y 559/559, OZ1LPR 529/559, OK1KIR O/RO, SP3XBO 539/559, G3LTF 559/569

I was also active in the December 6cm EME party arranged by Jan PA0PLY and had Q65D QSOs with:

OZ1LPR -14/-01, JA1WQF -10/-08, G4CCH -12/-14, PA0PLY -14/-12, YO8RHI -22/-19, DL3WDG -15/-10, G4RFR -20/-16, OH3LWP -12/-03, PA0BAT -12/-02, ON5TA -12/-13

My recently finished 6cm rig consist: RFDesign septum feed, DU3T LNA 0.68dB NF 26dB gain, MKU 57 G4 Kuhne TRV, 40W SSPA

In first quarter of 2025 I will be finishing new EME system with Gary's N8CQ controller and 3m solid dish which seems be much more suitable for 6cm EME operation and 3cm as well. I have collected most parts for 3cm operation and looking around for 10 GHz SSPA only.



SP9VFD VK3UM calc

SP9VFD feed

SP9VFD feed in dish

VE4MA Barry

Since my last report it has been a busy period. There has been many portable operations by KA6U, NX9O and KB7Q on 902 MHz EME and I am now up to 46 USA states worked towards WAS. The plans for 902 operation have conflicted with some ARRL contest operations, so I did not operate for some of those events.

On November 16 I operated on 70 cm with my 3m dish and worked 9 stations. I am only running ~300W digital with my old K2RIW PA but am in the process of completing an SSPA that should allow close to 1 kW.

On November 17 I operated on 902 MHz for the benefit of 7 USA contest stations.

In my last report I mentioned testing out a new 10 GHz feedhorn design from W1GHz. This was a 1.88WL W2IMU feed that gave me a solid increase of 0.5 dB sun noise. In November I tested a 24 GHz version of this and it gave me a 0.2 dB increase in Moon noise to 2.7 dB. I was unable to check sun noise with the low declination of the sun and “ground clutter” at 15 deg elevation. Paul W1GHz has an article on this coming out in the next DUBUS and should have an earlier version on his website now. See: https://www.w1ghz.org

On December 14 I did operate on 5.7 GHz and worked OZ1LPR and VE6BGT on CW and 4 others on Digital. I worked all that seemed to be active in the NA window, although I did not spend a lot of time looking in the CW window. I would encourage all operators to make their presence known on HB9Q, no matter what mode you are using. I did not operate on 5.7 on December 15 because I understood that 5.7 was only going to be on the 14th (an activity DAY vs an activity Weekend).

On December 15 and 16 I operated on 10 GHz and QSO’d GI7UGV # (1.2m dish and 20W) and I6PYK (1m & 25W). Greg K6QPV was active with his 1.8 m dish & 150+ W (-5 report). Mike KM0T was -6 which is great for his 1.8 m and 50 W. I also worked 6 other stations.

I have been spending time making repairs and upgrades to the 24 & 47 GHz station. I had problems with both Varian VPW2931 TWT 13.8 kV power supplies. Both problems were related to metal film resistors going open in different circuits. I had a problem of no control of the TWT on state on 24 G which gave me high noise through the waveguide switch during my last operation back on June 8th. On 47 GHz I was losing Helix voltage and the tube was tripping off.

I have reconstructed my GPS based 10 MHz clock and distribution system and reduced the phase noise dramatically. I had been using an OCXO to feed the 47 GHz system but it may have been off frequency during the July 47 GHz tests.

VE6BGT Skip

The weather here turned warmer and I got the 6CM feed and gear installed on Friday for the next night. I tested things and my echoes were quite strong.

I have recently rebuilt my Visual Basic Controller (old I Know) and tested out the new "Nudge" feature I added to it. Seemed good but I have discovered other things that get affected so it's a work in progress like most things in this hobby. Anyways the next day when the moon finally rose and cleared my bushes I heard and worked OZ1LPR and we made a good QSO contact and then switched over to SSB. I didn't expect too much with this mode but was surprised to hear him quite well actually.

After that I worked VE4MA and then finally G4CCH. That was about all as the timing in Europe I suspect was very late and we like our sleep time, I do for sure.

So the next day I was going to remove all the 6CM equipment off the dish as it was warmer again but then Jan, PA0PLY emailed me and said that he missed me and wanted to try it this following evening.

So I kept everything hooked up and echo tested and called CQ on and off between working on things on the bench waiting for Jan to wake up and meet me on the sked time. No problem, we worked each other and that was that. No matter how many contacts I make or just hearing my echoes I enjoy the fun of it all.

WA3RGQ Don

First of all, I would like to thank PA0PLY for organizing the 5760 activity day, or in my case, activity weekend. I had my 6 cm rig ready to go for the 2024 EME contest. Unfortunately, shortly after the start of the contest, something failed, no TX or RX, so I had to concentrate on the other bands. After the contest, I began to troubleshoot and found a failed 12 volt power supply. I added a fan and did a few other tweaks.

I wanted to get the rig in place, tested, and prepared for the activity day. But then I saw the PI9RD slow scan TV event. I had never worked that mode, so it interested me. The 1296 feed was in place and working well, so I decided to give it a try. I was not able to load the software until the day of the event. Amazing, I received remarkably good pictures. Everybody should have a 25 meter dish in their backyard. So what about transmitting? I quickly skimmed through the user guide and decided to give it a try. PI9RD acknowledged receipt of my picture.

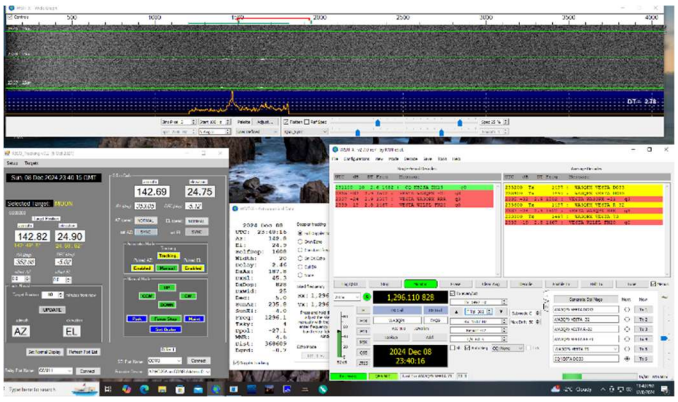
So now it is time to move on to the 6 cm activity day. I was short on time but since I had just used the dish for 5760, I thought I could do it. But then I discovered that I had changed the leg length for 1296. By the time I fixed that problem, I had lost the sun. The activity day started. Signals were weak. I tried to adjust pointing on the fly, but as everyone on 6 cm knows, that is a hard thing to do. I decided to wait until the next day and sunrise. Sun rose and I peaked the pointing. Moonrise. Peaking must have been pretty good. I worked 14 stations with good to excellent signal strength: PA3DZL, OZ1LPR, PE1CKK, YO8RHI, SV3AAF, SP3XBO, G4CCH, DL3WDG, DL1SUZ, IK0HWJ, ON5TA, PA0PLY, JA1WQF. Thanks everyone.

WA3QPX Paul

I worked Grant VE6TA on December 8th for Grant's number 50 WAS after him trying for 26 years.

My station is converted 12 foot TAVRO dish, KL6M septum feed, Downeast preamp with saw filter, Q5 transverter, PE1RKI amp with 200w at the feed, BigRAS azel rotator, and Flex 6300. I got a lot of help from Al Katz over the past three years. He answered all my questions about getting on 23m eme and was only a phone call away.

WA3QPX 12 foot dish



WA3QPX VE6TA QSO

YO8RHI

I was very happy to participate in the moonpass event on 5760 MHz on December 14th, using 37W to my 3m dish I managed to work the following stations: DL3WDG, G4CCH, OZ1LPR, JA1WQF, PA0PLY, SP9VFD, DU3T, PA7JB, DL1SUZ, SP3XBO, SV3AAF, PE1CKK, IK0HVJ, WA3RGQ, and next day OH2DG.

I made happy those who didn't have YO in their 5.7GHz EME Log, and others made me happy because I managed to add 4 New DXCCs in my EME Log: DU3T, SP9VFD, SV3AAF, OH2DG.

I also participated in the last moonpass event on 10368 MHz using 20W to my 3m dish which brought me many DXCCs. Thanks to Jan PA0PLY for these initiatives. We are waiting for the next moonpass events.

I am currently working on the setup for 24 Ghz EME, 2.2m PF dish and 14W. I hope that next year we will all participate in a 24Ghz moonpass event.

73 & HNY 2025 by Adi YO8RHI KN37SD

Super DX from PI9RD

The PI9RD team have used the 25m radio telescope at Dwingeloo to receive signals from the Voyager 1 spacecraft. Only a few telescopes in the world, (like the 85m Goldstone dish) have received these signals, which are very faint due to the distance of Voyager 1: almost 25 billion kilometers, more than four times the distance to Pluto.

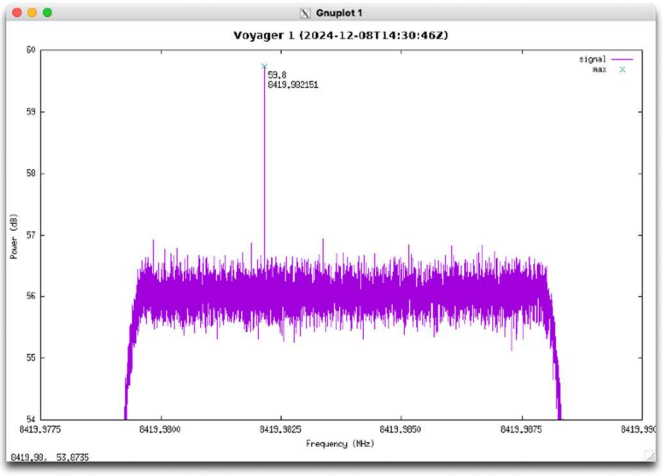
Voyager 1 is currently the most distant and fastest human-made object, traveling in interstellar space. Its radio signals, traveling at the speed of light, currently take 23 hours to reach Earth.

Since the Dwingeloo telescope was designed for observing at lower frequencies than the 8.4GHz telemetry transmitted by Voyager 1, a new feed was fitted.

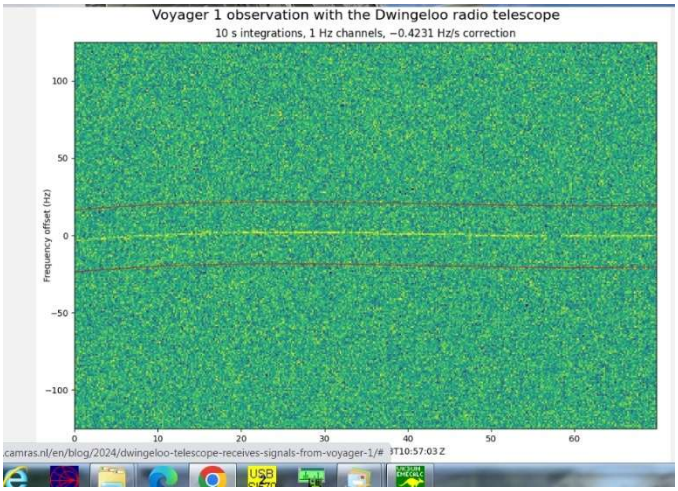
At that frequency, the mesh of the dish is less reflective and more leaky, severely impacting G/T, even so sun noise measurements indicate a G/T of 39dB. Note also the beamwidth is 0.1 degree!

To find the very weak carrier signal in the noise, the team used orbital predictions of Voyager 1 to correct for the Doppler shift in frequency caused by motion of Earth and Voyager 1. By doing so, the signal could be seen live in the telescope observation room. Later analysis confirmed that the Doppler shift corresponds to that of Voyager 1.

A great achievement, well done team PI9RD.



PI9RD Voyager 1 signal



PI9RD Voyager Doppler History

PI9RD 8.4 GHz feed

Tracking Using Astronomical Telescope Software

OK1TEH Matej

Mitsuo, JA1WQF sent us interesting information about his new tracking system for 47 GHz EME. Mitsuo is using a 2.4 m diameter Cassegrain dish, which on this band according to the formula:
Alpha = (70 / Diameter in cm) * lambda [cm]
gives a main lobe width of 0.19 deg for -3dB.
With such a narrow antenna beamwidth it is no longer possible to use the familiar OE5JFL system with a 12bit encoder, which operates with a resolution of 0.1 deg.

The traditional JA Microwave Meeting was held in November 2024, where Mitsuo presented his system for optical tracking using astronomical telescope software. The rotation of the antenna is handled by stepper motors. The software also solves the usual problem of backlash between the rotator gears or even mast eccentricity and automatically tries to correct it. In conditions where stars are visible the program selects a default star and uses it as a position reference. The system now operates with 1/100 deg accuracy and Mitsuo is currently working on further refinements.

The entire system can be seen in the JA1WQF videos posted on the web:

https://www.ok2kkw.com/47g/ja1wqf_tracker_2024.mp4

https://www.ok2kkw.com/47g/ja1wqf_47g_2024-10.mp4

Finally, I would like to point out that the problem of accurate lunar tracking is also being addressed by the team around EA3HMJ see:

https://github.com/EA3HMJ-Tracking-Software-Suite

https://qlfecv.wordpress.com/2022/09/18/tracking-accuracy/

and a custom system has also been developed by Alex, HB9DRI, who also sells 16 bit encoders:
https://www.linkrf.ch/AnTrack.html
which was presented at EME Conference 2024 in Trenton.

In conclusion: it can be said that OE5JFL systems with cheap 12 bit encoders can continue to be used for bands up to 10 GHz, but at 24/47/76 GHz more accurate tracking systems are a necessity. In addition, in the 47 and 76 GHz bands, a lunar noise reference cannot be used for fully accurate lunar tracking because, while at lower frequencies the thermal-noise emission is independent of the phase of the Moon, since the electromagnetic waves are emitted from regions below the surface where the temperature is fairly constant, at 47 and 76 GHz it is emission from a thin "hot" layer on the surface. This fact, by the way, was very well documented in RW3BP's talk on EME at 76 GHz from the 2014 EME Meeting in Brittany.

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60 Years Since the First Arecibo 432 MHz Contacts June 14, 1964

G3LTF Peter

The first EME QSO was made between W1BU and W6HB on 1296 MHz just 4 years before and although it fired up everyone who was interested in UHF weak signal working there was little chance to replicate it, mainly because it was impossible to obtain the power (big klystrons), and very difficult to make a good parametric amplifier.

432 MHz looked like the next best bet, even though echoes with the same parameters (power and dish diameter) would be 9dB weaker, and I started out in about 1961, working with Johnny, G3CCH, each building large arrays of helices (opposite polarities) with the aim of working each other off the moon. G3CCH had an array of 8 x 13 ft long helices and I had 4 x 10 ft ones.

The USA had a 50 W power limit on 432 MHz at that time but I'm sure we were not alone in trying to get 432 EME to work. We never got the helix arrays to work properly in an array (30 years later, involved with an airborne helix array at 1.6 GHz I found out why!) and so in 1962 we changed over to building dishes. Our text-book was the MIT Radiation lab series, Vol 12, Microwave antenna theory and design by Samuel Silver. My dish was 15 ft, 0.3 f/D built with a wooden frame and Johnny's was 13 ft built of wood and steel. Mesh was 1" chicken wire. Both used polar mounts (so you got the moon ephemeris from the nautical almanac in the local library, just the transit time and the declination for the day.)

Feed was a slot balun dipole and circular plate reflector fed by about 15 ft of RG213 equivalent but with a solid outer sheath. PA was a 4X250B in a cavity. driven by a tripler from 144 MHz. We were limited to 150 W DC input. LNAs were triodes and a point contact diode mixer, but transistors were coming on fast and I had an AF139 preamp that was slightly better than the best tubes and we both had paramps that were better than the transistor, that is when you could tame them. The multiplier chain started at 8 MHz, Johnny had his crystal buried down a hole for stability. The converter fed into a R1475 at 14 MHz, an ex RAF receiver with some modifications like a Q-multiplier and a 100 Hz wide audio filter centred at 700 Hz. The drum style tuning scale was very easy for tuning weak signals. Frequency accuracy was another challenge with 1 MHz oscillators set up against WWV and multiplied up to 432 MHz. We were probably achieving +/-2kHz. I can't find any records of my Sun noise. We tried for echoes and also to hear each other but without success.

By the start of 1964 I was ready, I just needed a big station to work!

The first ever 70cm echoes were achieved by K5KDN and W5SDA on Jan 6/7th 1963 with 800 W and a 30 ft dish but the first actual 2-way QSO took place on May 20th 1964 between KP4BPZ and W1BU, (the station of Sam Harris W1FZJ) which ran 15O W into a 28 ft Kennedy dish.

A bulletin was put out by ARRL a few weeks before announcing the tests from Arecibo on 432.000 MHz on June 14th 1964 and 144MHz the following day. I recall that some people thought it wasn't serious.

I remember it was a nice calm summer evening but with no moon visibility. The moon was at 19 degrees declination (easy to set accurately on our polar mounts) and KP4BPZ transmissions started at 18:42Z and minutes later they worked W1BU, followed by W9GAB in Beloit, Michigan. He used a 15 ft polar mounted dish and a paramp. After some CQs HB9RG called and the first NA to Europe QSO on 432 MHz was made. I could not hear any signals, I was using the transistor preamp rather than the paramp, but at 19:31 G3CCH copied them having aimed his dish more accurately with a visual sighting and better calculations. I had no GHA scale, the counterweighted dish was held in place by ropes (as at W9GAB).

After getting the news from G3CCH that they were indeed there I got my then XYL to sit at the receiver (our 2 and 4 year old daughters were fast asleep!) and tune slowly back and forth +/- 5KHz while I went up on the roof and slowly scanned the dish through where I thought the moon was (this is a big advantage of a polar mount, if you know the declination is correct you only need to scan one axis). Fairly quickly we heard good signals (audible outside on the shack roof) and I peaked the dish, tied it down and went back down into the

shack and started to reply to the CQ. Remember we were all crystal controlled on a nominal 432.000, no "netting on the echo" and so you relied on the other end finding your signal. I think they found me at about 3kHz hf. KP4BPZ was transmitting CP so there was no problem of polarisation alignment of our dipoles or of Faraday rotation.

At 20:20 we made the contact with reports of 459 each way. In my log it simply says "Via Moon!" I continued to listen until 21:25 when I called again with a report of 569 but that QSO wasn't completed. G3CCH was not able to attract them but happily made a QSO a year later when they came back on. KP4BPZ worked some other calls using the stations on W1BU and W9GAB but there were only 4 stations worked on that day. Their signals were heard by some other NA stations, K5KDN, 20 ft dish, W4HHK, 18 ft dish, W5SDA, 13 ele yagi, WA6QQI, and K8HRR. Interestingly W9GAB also detected W1BU's signal. A month later W1BU worked W2UK/KH6 setting a new record of 5000 miles.

This day in 1964 really lit the fuse under 432 EME: many people started to build big arrays and dishes and by the time Arecibo came on again in July 1965 there were far more stations to work (they had 25 QSOs) and QSOs between the bigger stations were starting to happen.

432 MHz remained the focus of EME activity and 23 cm only started to gather momentum again in about 1967/8 when WB6IOM published designs for two parallel 3CX100A5s that one could build simply from sheet metal and K6MYC came up with the idea of water cooling them so they produced about 200-250 W.

Sources for this material, apart from my files, are the OK2KKW archive:
http://www.ok2kkw.com/eme1960/eme1960eng.htm

The Short Wave Magazine Archive
https://www.worldradiohistory.com/UK/Short-Wave-UK/60s/SWM-1964-08.pdf

I have tried to find any other survivors from this day's operations but without success. I'd love to hear from anyone who was involved or indeed to receive any photos.

G3LTF Galleywood 432

QRP EME - OK1TEH Matej

For those interested in QRP EME, I would like to give a few more hints about the possibility of improving RX. For reception I use an old FT847 from 1998 which has a number of modifications including separate RX/TX, improved RX path impedance. From the dipole antenna I use a 3m long Andrew CellFlex 1/2". In the box I use a CZX3500 with LNA with ATF54143 homemade by OK1VPZ (selected from 6 pieces by it's robustness of local nearby TV BC tower) with measured noise figure of around 0.4dB.

For signal processing, I primarily use an old 2008 ThinkPad R500 Core2Duo with 8GB RAM with Windows 7 64 bit, integrated sound card and WSJT-X v2.5.4. This configuration is about the minimum that can be used in a reasonable time for decoding, however, it is necessary to limit the filter width to 500Hz, as this width is directly related to computational demand (FLOPS).

To increase speeds during the contest I experimented with a Creative Sound-Blaster X-FI USB sound card connected to the FT847 DATA port and further connected to a Thinkpad X220 I7 16 GB RAM Win7 XP running with the latest version of WSJT-X v.2.7.1. This second computer allowed me to decode the full 2.4KHz width of the SSB filter in a reasonable time. Understandably, I was most interested in how reception would vary when decoding the weakest signals at around -30dB using a 100 or 20 Hz filter.

Here I have to say that in the vast majority of cases the signals were decoded with the same strength and only about twice I found out that the external USB soundcard was able to decode the signal, while this did not happen on the older Thinkpad R500. This feature helped me especially with borderline weak signals QSOs with N1AV and 7K3LGC. Basically, the most difficult part is finding the exact location of the station (WSJT10 SpecJT is missed), then it's just about the apply of narrow filter. Unfortunately, on 70cm it's common for many stations not to use TRX with the LO locked to GPSDO, so even if the oscillators are stable and the stations are using CFOM, it's no guarantee that the signal will be exactly where on the waterfall you're looking for. In this regard, I think the easier situation is on 23cm, where GPSDO lock is standard. It is a great pity that the latest version of WSJT-X isn't available as an easy to install APT-GET package for Debian/Ubuntu Linux, I think it has helped bring many older computers back to life..

2025 Moon Ephemeris

Here is the Moon Ephemeris chart for 2025 prepared by our dear friend JJ, F1EHN, before his illness. These extremely useful charts were originated by Frank, F5SE (SK) and after he died JJ took on the task and that's what we have today. There is no possibility of accessing the software and so we are looking for someone who can replicate the chart in such a way that it can be reproduced for 2026 onwards.

DUBUS-REF CW/SSB Contest 2025

70 cm ..... SAT Feb 8 (24h).....DL7APV Memorial
13 cm ..... SAT March 8 (24h)
23 cm ..... SAT+SUN Apr 5+6 (48h).... VK3UM Memorial
9 cm ..... SAT May 3 (24h)
1.2 cm ..... SAT June 21 (24h)
3 cm ..... SUN Jun 22 (24h)..... K2UYH Memorial
6 cm ..... SAT Jul 19 (24h)

CW Initial List

https://www.g4rgk.co.uk/Initials

Sun & Extraterrestrial Noise List

http://www.ok2kkw.com/next/nl_k2uyh/sun_table.xls

DL0SHF Beacons –

DK7LJ per@per-dudek.de
3cm 10368.025 MHz
1.2cm 24048.025 MHz

EME Directory by Jan PA0PLY

https://www.pa0ply.nl/directory.htm

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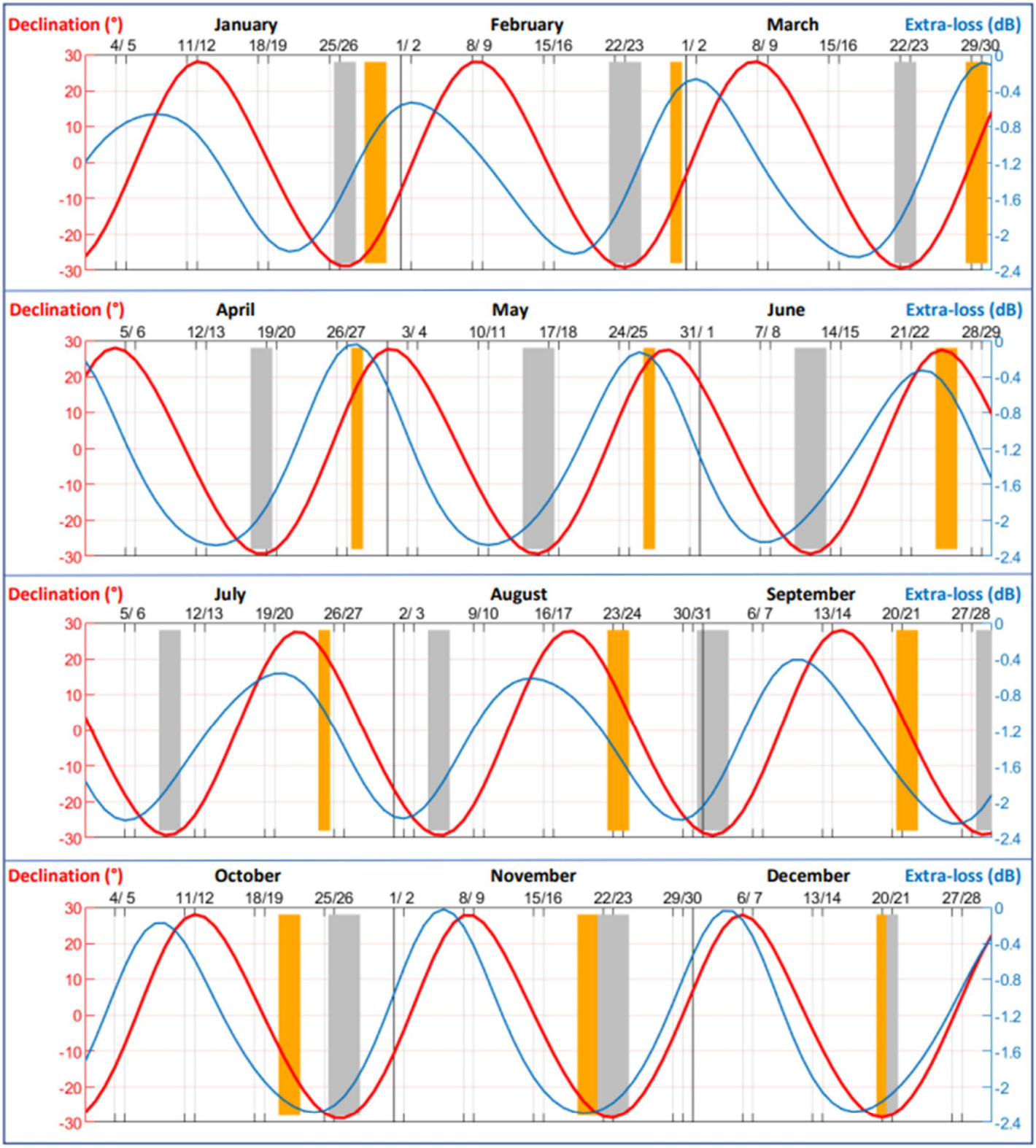
Please send newsletter contributions to Peter G3LTF

MOON EPHEMERIS OVERVIEW FOR THE YEAR 2025, BY JJ F1EHN



- Vertical grey bars show the days where the sky temp is high and could degrade the system temperature.
- Vertical orange bars show the days where the moon is close to the sun (<10°). Near the new moon dates.
- Extra-loss is the range extra-loss in dB compared to the minimum pathloss at Moon perigee
- The WE dates are displayed at the top of ephemeris graph. The declination is plotted as red curve and extra-loss as blue curve.

Panorama of EME setup at S9Z – top picture is on the left and bottom picture on the right (for newsletter formatting)

Errata:
01 Jan 2025 – ON4TA corrected to ON5TA