

432 AND ABOVE EME NEWS

June-July 2022 VOL 52 #6-7

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ON0EME EME BEACON, 1296.000 IS QRV WHEN MOON >10°, SEND RX REPORTS TO WALTER (ON4BCB) on4bc@gmail.com
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CONDITIONS: This summer has been anything but slow:

❖ **Coming up is Prague 2022, the 19th International EME Conference with 136 EMEers from all over the world Registered. It is the first in 4 years and an event you do not want to miss if at all possible! More: <https://www.eme2020.cz> & in FINAL section.**

❖ **Soon after the EME Conference, on 19/21 Aug will be the Polish SHF/EME Meeting in Zieloniec (JO80ei60tj), see more at <https://pk-ukf.pl/60-zjazd-pk-ukf-zieloniec-19-21-sierpnia-2022/>. It's not that far from Prague, has a great SHF flea market, and the bonus of a tour of the amazing SP6JLW EME station.**

❖ There are 3 Dubus Contest weekends to cover this month plus some leftover reports from the 1296 contest weekend. The first is the 3 cm & Up Contest on 28/29 May. Because of poor conditions – high loss and high frequency spreading there were no reports of 24 GHz activity. These poor conditions also affected 10 GHz, but to a lesser extent and there was a generally good turnout. **The SP6JLW group leads the pack with a reported total of 24x22. The OK1KIR group was top dog on 6 cm on 2/3 June with a score of 28x29. On 13 cm, 4/5 June, G3LTF leads with a total of 23x19.**

❖ **The ARRL has done something they don't usually do. They have acted fast to schedule a second microwave (MW) contest weekend this year. The MW weekends for 2.3 GHz & Up are 27/28 Aug and 17/18 Sept. We have 5 bands. It will be very helpful if we can agree on which weekend to be on what bands – see discussion in the FINAL section and a new important rule change for MW stations.**

❖ The first 47 GHz EME QSO in almost 20 years has been completed by DL7YC and DC7KY. See DL7YC's report in the Newsletter (NL) and also from CT1BYM.

❖ DK3WG has worked his 50th State on 70 cm. Congratulations to Jurg. Many more are near completing WAS on both 70 and 23 cm TNX to State dxpedition efforts of KB7Q and this summer KA6U.

❖ Sebastian, DG5CST dg5cst@googlemail.com announced a 70 cm and 2 m EME expedition to Märket Reef OJ0DX (JP90nh) on 25-31 July. On 432 they have a 9 wl M2 yagi and 500 W. Operating plans will be announced after their arrival.

❖ 2 m EME dxpditions that may also include 432 EME options are planned for 4U1ITU and D2TX [in Netnews]. See reports in this NL including by HB9Q and TK/HB9CRQ dxpdition info.

❖ N1AV asks if anyone is interested in another 902 activity weekend? He can be QRV on 902 from his AZ QTH – see Jay's report.

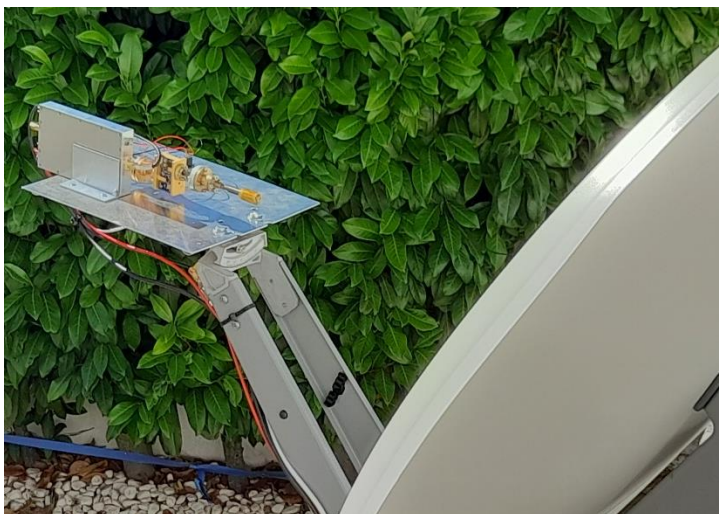
❖ **The next 70 cm CW Activity Time Period (ATP) is on 20 Aug 0100-0300 & 21 Aug 1000-1200.**



DL7YC's resized **47 GHz** TWT (42 W) Hughes 8901HA at feed of his 2.4 m dish – note the size of the actual feed.

REPORTS:

4U1ITU: Chris (PA2CHR) post@pa2chr.nl writes that he along with OM1AM and PA3CMC are putting the ITU (JN36bf) back on the Moon – Our main objective is 144, but we will take 432 gear with us and hope to run on our 3rd moonpass 15/16 Sept on 432. It would be good if stations needing 4U1 on 432 MHz to send me an email. We will be restricted to operation between 1800 to 0600. We will use on 70 cm a single 27 el X-pol yagi (17.8 dBd) and an SSPA. We always TX first period with Q65B preferred. Our station will be located in the center of Geneva where QRM is very high on all bands. But if you don't try, you will never work anyone. Because of a complete renovation of the ITU building, this will be the last activity for at least 6 or 7 years. More details will be on the QRZ.com page of PA2CHR soon.



CT1BYM uses a 90 cm Kathrein offset dish, 1.8 dB NF LNA made by a millimeter-wave Spanish team (EB3FRN, EA3HMJ, EA5DOM), [WR19/WR22](#) waveguide, Kuhne 47 GHz transverter, IC-R8600 and RFSpace SDR-14 with a referenced from an HP GPSDO.

CT1BYM: Miguel miguel.pelicano@gmail.com reports on his first reception of 47 GHz EME signals – The evening of 4 July will forever stay in my mind. I was able to decode 47 GHz transmissions from DL7YC bounced from the Moon. I was using a 90 cm offset dish. Sun noise (SN) was measured at 10 dB before the test (35°C and 37% humidity). The Moon was clearly "visible" at almost 1 dB noise to allow manual tracking. The rotor I am using for these tests is not adequate for automatic tracking, due to backlash. So, I kept looking at SpectraVue while doing all the other things. DL7YC, started transmitting at 1900 with 40 W to a 2.4 m dish. The challenge was to get some decodes with my small dish. With a 90 cm dish, it should be very difficult, but I have very good Sun and Moon noise numbers indicating that my 1.8 dB NF LNA was performing just great! Sure enough, signals were good. I decided to stay configured as "CT1BYM", when Manfred switched to call EA3HMJ. There were no more decodes as "CT1BYM". I changed to "EA3HMJ" and decodes were back. I then changed back again to my call, and there were no more

decodes. Thus, WSJT is very dependent on the callsign entered. We used QRA65E-60. Reports ranged from (16DB to 22DB). After the tests, I did some post processing analysis with the audio files from the evening, and achieved similar results. Libration started at near 860 Hz - very high! I plan to have auto tracking running soon, and a bigger dish is in the works.

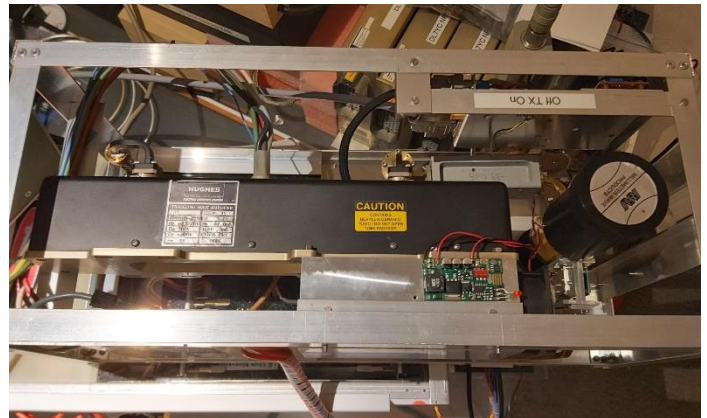
DB6NT: Michael db6nt@gmx.de writes on his 6 cm activity – On the weekend 2/3 July during the DUBUS Contest the weather conditions were very nice. I worked OK1KIR, VK3NX, OK1CA, OH2DG, DL4DTU, OH1LRY, SQ6OPG, IK0HWJ, WA6PY, VE4MA, VE6TA, F5LEN, KL6M, RA3EME, PA3DZL, PA0BAT and SA6BUN for a total of 17x14. I also QSO'd RA3EME and SA6BUN in SSB. I plan to be QRV on 3400 in the 9 cm DUBUS contest. This will be my first time on 9 cm EME.

DK3WG: Jurg's dk3wg@dar.de (JO72gi) continued, regular presence on the Moon has yielded him **WAS on 432!** [still needs to confirm with cards] – I worked initials since my last report near the end May thru the beginning of July on 70 cm using JT65B KC3BVL, K7KQA and N1AV; and using Q65B KA6U(p) in EM24, WC8RK(p) in KY for his 50th State and WAS, KA6U(p) in UT DN41, KA6U(p) in DN21 and W5AFY; and on 1296 CW DL1AT; and using Q65-C TK/HB9CRQ for DXCC #76, BG0DXC, W7JW, KA6U in WY DN41, KA6U in UT DN41, KA6U(p) in NV DN21, KA6U(p) in OR DN05, KA6U(p) in OR DN06, KA6U(p) in WA DN86 and VE7ZD.

DL7YC: Manfred ploetz@snaflu.de sends his end of the 47 GHz story – Back in 2005 the first 47 GHz (6 mm) EME QSOs were established between RW3BP, W5LUA, VE4MA and AD6FP (now K6MG). In 2018, I started thinking about how to establish 2-way EME contacts at 6 mm and get activity started on this band. There are several problems: 1) Is my dish for 24 GHz accurate enough for use on 47 GHz? 2) How to lower the NF (5 dB) of the available preamp? 3) How to generate sufficient power? 4) Is my tracking precise enough for 0.2 deg beamwidth? I then tried to motivated the EME community with some success. At the PA EME conference, I spoke with K6MG and exchanged email VE4MA. Barry sent me info on his TWT HV PSU. I also started a joint LNA project. I bought the MMIC's and JA8CMY (now SK 2021) build the preamps with BIG help from JA1WQF. These LNAs have NF of ~ 2 dB at 47 GHz. W5LUA, PA0EHG, OK1DFC, **OK1TEH** and DC7KY also brought these preamps. Klaus (DC7KY) and attended a small microwave conference in Spain with the topic "Network Analysis" and 47/76 GHz! It was at EB3FRN's home. Together with EA3HMJ and other Spanish hams, we had a lot of fun testing some DB6NT 76 GHz transverters; and for the first time saw 47 GHz power close to 3 W from 2 combined Kuhne SSPAs. Everybody was inspired; but we know that JA1WQF and Yuki had built an SSPA with many WG combiners and many TGA 4046s to get 11-12 W – the minimum TX power expected to be needed... And I felt not enough to attract many partners. I am lazy and didn't want to invest too much effort in combiner mechanics. Therefore, I decided to try a new (in 2019) APN 318 chips from

Northrop Grumman. The preliminary data sheet showed output levels close to 10 W from a single device. There were many problems to solve; in the end it turned out that this chip cannot deliver 10 W. PA0EHG told me there a Hughes 8901 TWTA (42 - 46 GHz) with power supply in Canada. I was able to buy this TWTA with the provision that it had to work upon my test. My "inspection test" was successful, the tube delivered > 30 W @ 47 GHz. This was very encouraging, but I didn't know how much work was to follow. The TWTA was for 110 V and needed to be changed to 230 V. This should have been simple, it was not! Thanks to Barry's who had info on it and some luck, I was able to make the required mods. However, the whole rack was 20 kg and too heavy and big to bring close to the feedpoint. It too courage, but I cut the 19" rack into two pieces: the PSU and the RF stuff. The TWT was built into the feedbox, very close to the WG switch. It turned out that the original heatsink was oversized and a temperature-controlled blower was sufficient. Also, the removal of unneeded WG components increased the output to 42 W!!! In parallel, I found a partner to follow up on the APN 318 project. Two APN318 amps when combined can deliver up to 8.9 W. They are tiny, but the heat spreading problem has been fixed by using water cooling. We are using water-cooler made for a high speed CPU. So, some 47 GHz SSPAs are under production. It seems 4 devices are sufficient to establish a 2-way WSJT-X contact. (I realize the CW purist will not be happy with this statement. I feel the usage of digital communication, RW3PB's 20 year old MWCW program or more modern WSJT-X, is the ONLY way for EME @ 47 GHz. Even the best CW operator cannot HEAR the 47 GHz echoes off the Moon!!! If you don't accept "doodle traffic" you are out of the game to play EME at 47 GHz). Coming back to the situation in 2022: Conditions are worse compared to in 2019 when JA1WQF, DC7KY and DL7YC successful copied W5LUA. Now, at northern dec the Moon is far away at 400,000 km, always. Additionally, at the same time, we have the highest frequency spread ever. Low elevation angles (i.e. < 20 degs) reduce high frequency spreading; but add significantly, up to 4 dB of atmospheric loss both ways. Higher elevation angles reduce this loss, but add more frequency spread (libration). Nevertheless, tests this June/July showed remarkable results. I am transmitting 42 W into a 2.4 m dish and was copied/detected by DC7KY, RW3BP, CT1BYM and EA3HMJ with their very different dishes. CT1BYM has a 90 cm dish and 1.8 dB NF preamp with good reports. (I don't want to comment on the WSJT report numbers because they are too optimistic. The reason is that they are missing noise power from the lower BW edge, i.e., 300 to zero Hz. The program's S/N calculation ends up with a lower value than true). EA3HMJ received DL7YC with a 120 cm dish with a very good preamp. The signal reports show the same numbers as CT1BYM. RW3BP received DL7YC with his 240 cm offset dish using his MWCW program. DL7YC transmitted 300 sec with this scheme for integration. The best true RX report was -19 dB. DC7KY received DL7YC with his 240 cm offset dish using WSJT-X with reports slightly better than reports from Spain and Portugal. With the big dishes (240cm/0.2 deg angle) used at both sides, it is always a challenge to find each other at the Moon

surface. Moon noise tracking is not a good idea, because the Sun induces a hot spot at the Moon surface that shifts with the Moon's period (beginning halfmoon at the right side and ending halfmoon at the left side). This problem does not occur with small dishes that see the whole Moon surface always. Another problem is the Doppler shift. Today, everybody is GPS synchronized and the various programs calculate the Doppler shift to the DX Loc with an accuracy of less than 10 Hz in real time. But, the programs calculates the current frequency shift based on the MOON CENTER. For the big dishes and another Doppler shift adds on. It is not easy to "place" your TX spot exactly at the Moon's center. Any displacement with a tiny fraction of a deg, left or right, results in +/- AF frequency shift of the calculated and shown QRG. WSJT, or any other integrating program has to know exactly the lowest transmitted AF frequency as a reference. If the reference is far off (i.e., 100 -150 Hz) from the expected QRG, which be easily happen due to tracking errors, its very difficult to decode in real time. This phenomenon needs more observation and study. Another observation is a typical SN value is 10 dB/cold sky and a typical Moon noise value is 1 dB/cold sky. These values are valid starting with a 90 cm dish and will not be higher with bigger dishes, because this measurement is of temperature only! Tests with W5LUA and JA1WQF are planned for the more cool autumn. Some additional stations are very close to 47 GHz EME RX status are PA0EHG, OK1DFC and EB3FRN. Thus far, except the QSOs in 2005, only DC7KY and I have completed a 47 GHz EME 2-way contact. It was on 5 July at 1916 using Q65-60E mode (15DB/14DB). As soon as TX power is available, we will see more 47 GHz 2-way contacts for sure.



Repackaged DL7YC 47 GHz 42 W TWT Hughes 8901H

[More about DL7YC's 47 GHz EME story can be seen at https://www.ok2kkw.com/47q/47q_dl7yc2020eng.htm

47 GHz EME will be important topic at International EME meeting in Prague.]

G3LTF: Peter g3ltf@btinternet.com was only active on 13 and 6 cm during the time from the end of May to the beginning of July -- On 27 May I had my 5760 gear in the dish for the TK dxpedition and was delighted to work TK/HB9CRQ on CW for initial #93 and DXCC 39. On 31 May I worked them on 13 cm CW with a really good signal

for initial #154. I was active in the 13 cm Dubus Contest and worked using CW on 4 June JA6AHB, OK1CA, OM6AA, IK3COJ, OK1KIR, PA0PLY, SP7DCS, OK2ULQ, PA3DZL, OH1LRY, SP9VFD #155, G4CCH, OK1KKD, SP6OPN, RA3EME, OH2DG, K2UYH, WA6PY, KL6M and F5FEN; and on 5 June DL4DTU, F5JWF and WA9FWD for a total of 23x19. Activity was quite a bit down on previous years. I copied VK3NX on 2301.98 and also on 2400.0 (a big surprise!) but could not raise him calling in the 2320 segment due to heavy QRM in VK. My 13 cm system can receive in all segments but it needs upgrading to transmit in 2400 and 2301. My activity in the Dubus 6 cm Contest was limited as we had a big family gathering on the Sunday. I worked using CW on 2 July OH1LRY, SQ6OPG, OK1KIR, PA3DZL, RA3EME, OK1CA, G4NNS, DL4DTU for initial #94, WA9FWD, VE4MA, K2UYH and VE6BGT; and on Sunday 3 July SA6BUN for a total of 13 x12. Other stations heard were IK0HWJ and PA0BAT. SN on 2 July was 14.7 dB with SF of 103 and on 8 July 15 dB with an SF of 121.

G4RFR: Julian (G3YGF) Julian@ygf.org.uk reports on the 3 cm operation of his club from May to mid July – In May we were reduced to 10 W while the 200 W TWT PSU was fixed. Using Q65D we still worked **BD4SY (14DB/15DB) in PM01jp**, IK0HWJ (8DB/14DB), G4YTL (15DB/15DB) with a on a 1.8 m dish and IW2FZR (14DB/13DB). We were also heard by UR3VKE (13DB) with a 1.8 m dish and IK0IXO (13DB) with a 1.2 m dish. We copied DL0SHF (4DB). Our echoes were 7 dB S/N in 6 Hz. By the end of May, the big TWT was back, putting out 185 W again. Echoes were back to normal at 18 dB in 6 Hz. We worked using Q65D unless noted **TK/HB9CRQ (13DB/6DB)** and also using the call GB2FRA to mark 40 years since our club was founded, OZ1LPR (559/589) on CW, OK1KIR (6DB/+0DB), WA3RGQ (17DB/7DB), SP6JLW (559/579) on CW, OK1DFC (12DB/+3DB), VE4MA (12DB/12DB), F6BKB (15DB/2DB) and PA0PLY (13DB/1DB). In the Dubus 10 GHz Contest we worked all on CW RA3EME (559/579), OH2DG (559/579), HB9BBD (549/579), SA6BUN (549/569) and WA6PY (319/599) for a score of (5x5). In June/July, we worked using Q65D unless noted DJ7FJ (12DB/+2DB), ON5TA (17DB/3DB), IK0HWJ (11DB/6DB), DL7NN (8DB/4DB), ON4TA (16DB/3DB) again, SM6CKU (11DB/+0DB), IZ4BFA (18DB/3DB) with a 1.2 m dish and 30 W- (Sun noise was 8.5 dB and Moon noise 0.35 dB), ON5TA (15B/2DB), IK0HWJ (9DB/9DB), G4YTL (15DB/2DB), IW2FZR (12DB/2DB), OH2DG (8DB/+1DB), OH2DG (419/569) on CW. We were heard by LZ4OC (8DB) with a 2 m dish and by IK0IXO (7DB) with a 1.2 m dish. Near moonset, at 15 degrees EL when the libration was lower, we heard echoes at 20 dB in 20-30 Hz. CW on CFOM is straightforward - we put WSJT on Tune, and have the key in the audio to the TX - the frequency is the same as for Q65 CFOM. When echo testing, the echo is always spot-on on the IC746 transceiver - the same also works for SSB when the mic is plugged in. We now have 4 PC screens/keyboards - dish tracking, WSJT, SDR-IQ and HB9Q reflector, plus another monitor for the CCTV views of the dish/boresight camera.

HB9Q: Dan dan@hb9q.ch sends a summary of the 9 dxpeditions done by the Q-Team thus far with their 1.5 m mesh dish on 23 thru 3 cm including their last to Corsica -- This is an effort to show people how little is needed to work our dxpeditions and to motivate others to do dxpeditions on microwaves bands. After 2 years of planning, designing, building and testing, we finally were ready to do our 1st dxpedition in fall 2017. Now, that we had two stations, HB9Q (our QRO home station) and our small dxpedition station, we named it "little Q". Little Q is packed in 7 professional and flyable transport-boxes with a total weight of just under 200 Kg.



Little Q-Team with professional transport boxes for dxpedition equipment

They consist of a 1.5 m dish with 1x2 mm mesh, HB automatic az/el control; with on 23 cm 100 W and LNA at cir pol feed; on 13 cm 90 W and LNA at cir pol feed; on 9 cm 80 W and LNA at cir pol feed; on 6 cm 80 W and LNA at cir pol feed; and on 3 cm 50 W and LNA at v-pol horn. Our 1st dxpedition was to 3DA0MB with a short 6 and 3 cm stopover at ZS6EME in fall 2017. Then followed by EA6/HB9COG in spring 2018, HB0/HB9DBM in winter 2018, SV9/HB9CRQ in spring 2019, A21EME in fall 2019, OE6V in winter 2020, HB9CRQ JN46je in spring 2020, SV5/HB9COG in fall 2021, and finally TK/HB9CRQ in spring 2022. In these 9 dxpeditions, we made a total of 1451 EME QSOs on the 5 bands generating a total of 346 initials (adding the total initials per band). We have put together the total initials worked per band and split them into digital and CW. Also interesting was the analysis of the station size worked per band. It looks like we can work, on 1296 and 23xx, stations just a bit bigger than we are. On 3400 about our size and on 5760 and 10xxx even smaller than we are. Here is a break-down of the QSOs into the 5 bands and 2 modes: 1296 168 mixed, 164 digital and 20 CW initials, one of the smallest stations worked was G4FUF with 2 x 49 el yagis and 400 W. 23xx 45 mixed, 44 digital and 11 CW initials, one of the smallest stations worked was G4BAO with 1.9 m dish and 210 W. 3400 24 mixed, 23 digital and 11 CW initials, one of the smallest stations worked was PA7JB with a 2.4 m solid dish and 50 W. 5760 41 mixed, 35 digital and 22 CW initials, one of the smallest stations worked was OK1DFC with a 1.8 m offset dish and 110 W. And 10xxx 68 mixed, 67 digital and 13 CW initials, one of the smallest stations worked was VK7ZBX with 0.75

m solid dish and 60 W. Looking at the total initials per band shows how many different stations we already worked. At the same time, it tells us that there are many more stations out there, which are capable to work us! Usually, after the first pile-up is worked, we have a lot of free time to work more stations. Don't miss your chance to work a new DXCC or initial next time little Q is on the moon! Right now we have no finalized plan for our next dxpedition, although we do have 3 invitations to activate 3 nice DXCCs. We follow the Covid-19 development and hope to be QRV again in spring 2023. Please visit our webpage at <https://hb9q.ch> for more detailed information and pictures of our 9 little Q dxpeditions.

IK1FJI: Valter valter_dls@yahoo.it now has his new 3.8 m dish in place – I operated the Dubus 1296 Contest before disassembling my old dish (3.1 m) and mounting the new one. In the contest I worked 44 CW QSOs and 39 mults for 171600 points. Initials were SP6KBL, W2BYP, JF3HUC, SM6FHZ, K3WM, OK1YK and SP9VFD. To bring me to #162. Last year I worked 61 stations. So, activity was down probably due to the Moon being near its apogee. I also had problems with bad libration. Even strong signals had readability problems, and it was much more difficult with the smaller stations. I now have the new dish in operation, but am still optimizing it. I found a nice positive difference compared to the old one. In an initial CW test, I QSO'd DL1AT (559/569), UA9FAD (539/539) and PA3FXB (559/559). My echoes were excellent on SSB. I added on 7 July using CW PA3DZL (579/579), K5DOG (579/579) and K2M (579/569).



IK1FJI's new 3.8 m dish with 1296 feed

IQ2DB: Alessandro (I2SVA) i2sva@i2sva.it sends news on his club station's 1296 activity in May/June – We lost nearly a month of operating do to a problem with our SSPA. It is protected by a 40 A fuse. When the amp would not turn on, we check this fuse visibly and even checked it for dc current at low voltage. It checked OK; and thus looked for another reason for the problem without success. It turned out that when under current demand, it would open. The situation

was very frustrating until we diagnosed the faulty fuse. An ordinary heavy duty automotive fuse fixed it and now all is OK. As we normally operate the station 100% remotely, this made it even worse. We have a nice room and can operate locally (as we do during major contests), but most of the day-to-day operations are remote. As a result in May/June and the beginning of July, we added only 17 initials, 2 DXCC (BY and TK) and 5 States to our totals; and we are very happy for that! In 9 months of operation (first on air 15 Oct, 2021) we have reached mixed initial #226*, 48 DXCC, 30 US States, 23 Zones and 174 Grids. KA6U's travelling thru the US to give us so many new US States is appreciated! The station is based on a 3 m dish with a BigRas-HR rotator (no issues in tracking the moon), a G4DDK 0.28 dB NF LNA and a Kuhne 1000 W PA that usually runs at 500/600 W. For more info on our station see https://www.alessandrovoltaemecomo.com/en_US/.

K4CO: Joe (WA8OGS) gojoe55@gmail.com announces 432 EME operation from KY -- The Northern Kentucky Amateur Radio Club (NKARC) will operate K4CO on moonbounce, Saturday 30 July. This event is part of an education program by WA8OGS and WC8RK to introduce club members to EME. The initial session was a combo in-person/zoom meeting about basic concepts of EME and stations. The field operating event will be set up in Union, KY (EM78) and operate from 1600 to 1900 on 30 July. See www.K4CO.org for more info.

KL6M: Mike melum@alaska.net send news of his 6 cm Dubus Contest results – On Thursday before the contest, I had the RX going with 1.5 dB of Moon noise. The TWTA was on the bench where I had been optimizing it. I got it from 60 W to about 90 W by removing some of the commercial junk. I installed it in the rack and on my first TX my RX died. I checked everything in the shack and found no problems. I have a waveguide switch at the feed with a G4HUP latching relay driver attached. This board failed and so the relay did not switch and blew my LNA. I spent a lot of time trying to find info on the board with no luck. Digging thru my junk, I finally realized that I had bought two of the boards. I swapped it out and also modified my feed test box so I can test all this. As a result, I missed the first day completely. I got on Sunday morning at 0100 at EU moonrise, my moonset. Stations were sparse. I worked only 5 stations. I did have surprisingly good echoes and very little WIFI interference (unusual). The next day, I worked 5 US and VE stations for a total of 10. Not so great. But, as I always say, I consider it a success even if I only work only ONE.

KN0WS: Carl's carlhasbargen@g.com report for early May thru beginning of June -- In early May, I headed north to my 16' dish to try my first 2022 EME from my portable location. I set up on 23 cm in anticipation of giving CW a good try on the weekend during the DUBUS contest. Prior to the event, I was probably a bit foolish in using the dish in spite of significant winds. I had never seen the dish oscillate over a 5 deg path in two dimensions at once! Nevertheless, on 6-7 May I worked using Q65C PA100THALES (14DB), YO2LAM (14DB), IK7EZN (16DB), LU8ENU (21DB),

N0CTR (14DB), FG8OJ (20DB), K3WM (9DB), KB2SA (18DB), JA6AHB (10DB), VK2JDS (14DB), UA9FAD (20DB) and LZ1DX (9DB). I had initials with ON4LX (18DB), DJ7FJ (18DB), N2END (19DB), **EW7CC (20DB)** and G4DDK (20DB). I also worked using CW before the contest with a very patient KL6M. My CW efforts in the DUBUS contest were fruitless. I tried but the ability was not there. I would listen to a station for 30 minutes transmitting CQ, but to my ears and brain, I could only get pieces that changed. By the time, I would figure out it is was OK2DL, he was no longer transmitting. I also decoded SM5DGX and K2UYH. [Libration conditions were reported as poor by many stations during the contest]. At my home location with my 2.4 m dish, I was interested to see how I would do during the TK/HB9CRQ dxpedition. Due to my mother's health issues, I only had opportunity to try 6 cm on 27 May and 13 cm on 31 May. I never saw TK, but using Q65D on 6 cm during my one hour window, I worked PA100THALES (14DB) followed promptly by his PA0BAT (13DB) and had initials with SM6CKU (16DB) and CT1BYM (18DB). On 13 cm using Q65C, I had initials with PA0PLY (22DB) and DL1SUZ (23DB). I had to remove the 1.1 lambda flare from the feed to keep it short enough to avoid the neighbor's fence, so my spillover loss was about 30%. I kept the 13 cm gear in place for the next 3 days to try some pre-DUBUS work on 3 June 3, but I first lost my MAP65, then my TX, then after trying to power down and up my LNA and xverter, I lost RX (trying to experiment under pressure leads to mistakes, and perhaps some transient TX from my xverter without sequencing led to preamp damage), then I lost the Internet on my tablet. I was done before I started!

N1AV: Jay whereisjay@gmail.com is now QRV on his fourth EME band 432 -- After way too many trips up and down the ladder in 40 deg C temps, I am now up and running on 70 cm with 2 x 25 el H and V pol yagis and 700 W. I have full AZ/EL tracking and am looking for skeds on the HB9Q chat page. I have worked thus far using JT65B DK3WG for digital initial {#1}, and using Q65B DL1VPL, DL8DAU, W7JW, K5DOG, W2HRO, **KA6U in multiple grids**, W5AFY, OK2AQ, N9XG, DL7APV, UA3PTW, PA2V, ON4AOI, W7MEM, HB9Q, AA5C, EA5CJ, NN3Y, PA2CHR and ZL3AAD. I am finding there is a lot more noise and that it is much more difficult with than on 144 or 1296. But I am enjoying the learning process on this new band. On 1296 and 222, I have been chasing **KA6U on his multi state tour**. Working him on 1296 has been relatively easy at each new grid/State with his signal running (16DB to 21DB) on average. This is not the case on 222. We have to work for a QSO on this band as we try to complete with 2 x 16 el yagis on both sides. Polarity shift has been a chore to manage. I am glad we both can flip pols when needed. Thanks to Peter for all his patience! Thanks also to N0AKC for a new grid and State on 222 as well. I was also wondering if anyone was interested in another 902 activity weekend? I have here in AZ the same setup I had in HI; a 2.4 m dish, 250 W and an AGO preamp. I would love to try with any and all of you. I was thinking we could get something scheduled for something in the next 7 months, which should give us all plenty of time to get what needs to be adjusted or repaired done?

N5BF: Courtney courtney.duncan.n5bf@gmail.com sends news on his 23 cm EME activity from 10 May to 3 July -- I worked using Q65C on 29 May **TK/HB9CRQ (26DB/22DB) mixed initial #281* and DXCC 56** with one hour of Moon time left in my window to Corsica; other initials QSO'd were PA100THALES (12DB/11DB) #282*, F4DWB (24DB/32DB) #283*, W7JW (13DB/20DB) #284*, SP7EXY (14DB/15DB) #285*, W1VK (20DB/19DB) #286*, K7EME (15DB/13DB) #287*, K2M (14DB/13DB) #288) - 13 Colonies Special Event Station, OK2AQ (25DB/20DB) #289*, DL6ABC (20DB/20DB) #290* and on CW DL1AT (539/539) #291*. I had been looking for the right opportunity to work Arnfried for many months! **[As of 22 June Courtney is a grandfather to Edward Wallin (no call yet), son of his daughter Katy (KG6HUI) and husband Andy!]**

OK1CA: Franta fr.strihavka@seznam.cz reports on his recent activity -- I planned to be QRV for the Dubus 6 cm EME Contest only on Saturday. But I found out that on Friday **KA6U would be QRV from OR** that I am missing for WAS. Thus, I installed my 23 cm feed on Friday, 1 July and easily worked **KA6U** shortly after his MR. I made two more Q65C digital initials with OH3DP and OK2AQ to bring me to {#138}. Mirek had a really great signal with his 1.8 m dish. I then switched feeds to 6 cm and was QRV for the contest. **I made a total of 21 QSO and 21 multipliers**. New stations were DL4DTU and F5FEN to bring me to initial #86. Heard not worked were K2UYH and WA6FWD. Signals from NA were very weak this time. Out of the contest on using Q65D, I worked JA6AHB and digital initials with PE1CKK with a 1.8 m dish and 35 W, WA3RGQ and VE4MA to bring me to {#19}. I also tried with CX2SC. Ric heard me (18DB), but I didn't decode his weak signal.



N1AV's 432 2 x H & V 25 el yagi array & 222 yagi

OK1KIR: Vlada vlada.masek@volny.cz and Tonda send their EME report for May-June -- During 6 cm operation on 27 May using Q65D we worked at **0722 TK/HB9CRQ (16DB/11DB) for digital initial {#53}**, 0751 CT1BYM (11DB/7DB) {#54} and 0952 PA100THALES (8DB/3DB). Due to terrible WIFI interference, tests with WA3RGQ (24DB/9DB) ended with no contact. Using CW, we did work at 0810 **TK/HB9CRQ (O/O) #118**. We QSO'd during the 3 cm part of the Dubus Contest using CW on 28 May at **0614**

TK/HB9CRQ (429/429) for initial #145; and on 29 May with large spreading F2CT, IW2FZR, OZ1LPR, RA3EME, OH2DG, SP3XBO, G4NNS, SA6BUN, 9A5AA, SP6JLW, OK1DFC, DB6NT, PA3DZL, VE4MA, OK2AQ, OH1LRY, HB9BBD, DJ7FJ, WA6PY, IK0HWJ and G4YTL #146 for a total of 22x22. Out of the contest we worked using Q65D on 28 May at 0427 TK/HB9CRQ (13DB/15DB) for digital initial #224, 0517 GOOLX (17DB/9DB) #225, 0716 G4YTL (12DB/6DB) #226, 0831 OK1DFC (10DB/1DB), 0849 DL4DTU (6DB/+0DB), 0903 DJ7FJ (11DB/3DB) #227, 1012 IZ2BFA (16DB/10DB), 1129 W3SZ (5DB/6DB), 1317 OK2AQ (11DB/11DB), 1352 WA3RGQ (12DB/13DB), 1401 VE6TA (15DB/12DB), 1431 GB2FRA (0DB/6DB) #228 and 1451 SM7FWZ (12DB/5DB) #229. On 29 May we swapped the 3 cm for the 23 cm feed to work using Q65C at 0358 TK/HB9DRQ (20DB/18DB) for digital initial #472 and using CW 0637 TK/HB9CRQ (529/O) initial #505. We were active on 13 cm and worked on 31 May using Q65C at 0655 TK/HB9CRQ (16DB/15DB) for digital initial #386, 0717 F1JR (10DB/9DB) #87 and 0729 using CW TK/HB9CRQ (O/529) for initial #191; and on 4 June in the 13 cm part of the Dubus Contest using CW VK3NX, OK1KKD, OK1CA, OM6AA for initial #192, PA3DZL, IK3COJ, JA6AHB, PA0PLY, G4CCH, SP7DCS, G3LTF, SP6OPN, SP9VFD #193, OH1LRY, OK2ULQ and OH2DG. Unfortunately, a sudden failure of our SSPA forced us to close down 13 cm operation after 1600. We ended with a score of 16x15. Later on 4 June, we installed our 70 cm feed to work using Q65B at 2035 KA6U (16DB/15DB) digital initial #321. We worked on 23 cm using Q65C on 5 June at 1004 JS6USJ (7DB/3DB), 1220 IN3FCK (7DB/6DB) #473, 1533 BG0DXC (8DB/11DB) #474 as new NN field and WAZ zone 23 and 1640 KA6U (20DB/21DB) #475; on 21 June at 0856 DK0TE (21DB/22DB) #476 and 0921 W7JW (5DB/8DB) #477; on 22 June at 0908 KA6U (10DB/12DB) #478 from DN41 in WY; on 23 June at 0752 OK2AQ (13DB/8DB) #479 and 0914 KA6U (13DB/16DB) #480 from DN41 in UT as our new digi State; on 25 June at 1022 KA6U (12DB/17DB) #481 from DN21 in NE; and finally on 26 June at 1112 DL6ABC (9DB/12DB) #482 and 1158 KA6U (12DB/18DB) #483 from DN21 in ID again as our new digi State. We then still on 26 June installed 70 cm to work using Q65B at 1431 KA6U (19DB/20DB) #322. We worked on 23 cm using Q65C on 30 June again on 23 cm at 1425 KA6U (13DB/14DB) #484 from DN06 in WA and 1559 OK2AQ (11DB/9DB), and on 1 July at 1544 KA6U (9DB/13DB) #485 from DN05 in OR and 1602 K2M (4DB/7DB). In 6 cm Dubus Contest (fortunately with no obvious WIFI interference) we worked with CW on Saturday 2 July OK1CA, OH2DG, JA8ERE, VK3NX, DB6NT, SQ6OPG, JA1WQF, JA6AHB, DL4DTU, OH1LRY, G4NNS, SM6CKU, IK0HWJ, PA0BAT, G3LTF, PA3DZL, RA3EME, SA6BUN, VE4MA, WA9FWD, F5FEN #120, 9A5AA, K2UYH, VE6TA, WA6PY and VE6BGT; and on Sunday 3 July only KL6M and SP3XBO #121 for a total count of 28x27. Out of the contest using Q65D, we QSO'd on 2 July at 0811 JA6AHB (8DB/10DB), 1139 PE1CKK (16DB/12DB) #55, 1442 WA3RGQ (14DB/12DB) #56; and on 3 July at 1807 IK0HWJ (6DB/8DB) #57. During the contest we made the swap to 23 cm and worked with Q65C

on 3 July at 1613 KA6U (13DB/15DB) #486 from DN66 in MT; on 5 July at 1807 KA6U (12DB/17DB) #487 from DN86 in ND; and on 6 July at 1856 KA6U (18DB/19DB) #488 from DN85 in SD.

OK1UGA: Martin ok1uga@volny.cz informed us that on 14 July he added a Kumar type collar to the feed of his 6 m dish used for 23 cm. He wrote: Measurements with Canfi by IONAA's Total Power program showed an increase in SN of about 1.5 dB from 16 dB to 17.5 dB at SFU of about 100. I am very happy with this result and consider the dish finally completed. At the same time, I managed to find a problem in my SSPA final stage, which prevented me from using full power. I have not yet calibrated the measurement exactly, but it shows me at 500 W.



OK1UGA's 6 m dish on 23 cm with upgraded feed

OK2AQ: Mirek mirek@kasals.com reports on his activity during the DUBUS Contest on 3 cm -- I arrived at my EME QTH a week before the contest. The weather was nice from the beginning of the week, with only some sporadic showers. But, in next few days it got very cold and the rains increased. After studying the current lunar constellation, it was clear that conditions would be poor with high spreading (200 Hz) for most windows. CW would be very difficult, especially with a small system. I devoted myself to a testing a new program for measuring echo, which works even with a large signal spread. OK2DL visited me on Friday, and we spent a pleasant morning on 3 cm EME. Using Q65, we QSO'd OK1CA; and on Saturday I worked the Corsica dxpedition TK/HB9CRQ (18DB/21DB) for digital initial #103 and DXCC 40. I did not take the contest because of the conditions; however, I did make 6 CW QSOs. Using Q65D, more QSOs were possible. I added 12 QSOs including a fully random digital initial with DJ7FJ (17DB/14DB) for # 104. My log can be seen at https://www.radio.feec.vutbr.cz/esl/files/EME/LOG/EME_L_OG_10G.htm.

OM6AA: Rasto's om6aa@yahoo.com activity report follows -- After 18 years, I am again back on the Moon! I changed my old 3 m dish to a 3.6 m RFS solid dish, fitted

with my own designed septum feed for 13 cm. My feed is connected to my ham shack with 20 m of 1-5/8" + 10 m of 1/2" hardline. I have solid state PA with 180 W output, Rx is with LNA fitted with SKY67151-396LF (measured noise figure including isolation relay is 0.66 dB @ 2320). I joined 13 cm EME DUBUS contest on 4 June. My Sun noise was about 14.5 dB and my echoes were 3 - 7 dB about noise level. During the contest I QSO'd OK1CA, OK1KIR, PA3DZL, SP6OPN, G3LTF, G4CCH, OK2ULQ, OK1KKD, SP7DCS, OH1LRY, SP9VFD, OH2DG, IK3COJ and WA9FWD for a total of 14x12. All were random CW. Unfortunately the date of the EME Contest was in conflict with EU Microwave Contest. After 1400, I had a lot of QRM from contesters and closed my station. I joined the OM6A contest team on microwave the next day and I did not run on the second day.



OM6AA's new 3.6 m RFS dish on 13 cm

ON5TA: Eric eric.vanoffelen@gmail.com is another returning to EME after a few years of absence -- I'm back on 3 cm EME with a small set-up consisting of a 1.8 m offset dish with 13 W at feed. Sun/CS is about 13.5 dB and Moon/CS is 1.1 dB. Using Q65D, I QSOs similar stations quite easily. I was very surprised to complete a QSO with IZ4BFA who is using a 1.2 m dish! I am now building a 30 W PA, so CW should soon be possible.

PA0PLY: Jan pa0ply@pa0ply.nl sends an overview of his last period activities -- I was QRV during the 13 cm Dubus Contest and at other times too using both CW and WSJT. I worked on 13 May **TK/HB9CRQ (21DB/24DB)** - not as easy as expected, F1RJ (15DB/18DB), PA100THALES (6DB/13DB), DK4RC (10DB/10DB), WA3RGQ (15DB/10DB) XB, KN0WS (18DB/23DB) XB and PA3DZL (8DB/12DB), and on 4 June during the contest SP6OPN (559/559), OK1CA (559/559), OK1KIR (559/559), G3LTF (559/529), OK1KKD (559/559), G4CCH (559/559) and K2UYH (559/559) XB; and out of the contest WA3RGQ (15DB/19DB) XB. My contest total was 7x5. I switched to 10368 on 30 June to work JA1WQF (18DB/11DB) XB, DL7NN (10DB/19DB), ON5TA (17DB/14DB) and VK7ZBX (16DB/16DB). It is amazing to see how easy it is to work small stations with 1.8 m dishes and only 13 W (ON5TA) and 20 W (VK7ZBX). The SM7FHZ feed that I use now

might not be well suited for my 0.3 f/D dish. Therefore, I decided to make another feed with an adjustable Chapparral choke for better illumination of the dish. I visited the Friedrichshafen Hamfest for the first time. It was nice to see so many in *real life* and picked up a 2320 SSPA with 250 W. I am waiting for the delivery of the SAW filters for 2320 and 2400 from DEMI in an attempt to get away from all the spurious on this band. I'm also working on a 13 cm station for PI9CAM. Hopefully they will be active on this band soon with a nice signal. Work on the KLNA's of DU3T is progressing; several units has been produced and spec's are great. I also made some XLNA's as well. I should note that my EME database is updated with the latest information.

PA3DZL: Jac pa3dzl@icloud.com was QRV for Dubus 13 cm EME Contest -- There were great signals from many stations. Conditions were OK too. I made 22 CW QSOs; 19 x 2320/2320 and 3 x 2304/2320 XB. Heard but not worked were JA6AHB (2400), VK3NX (2301) and OH2DG (2320). Working QSOs XB is a challenge and the QRM makes it difficult. I am fortunate to not have QRM on the different segments. I installed my 13 cm feed some days before the contest for the TK/HB9CRQ dxpedition. I worked Dan and the TK-team without problems and added 5 initials to my 13 cm list.

PA100THALES: Gerard gerard.geesink@caiway.nl reveals the story behind this special event station -- Recently the THALES Netherlands company celebrated its 100th anniversary. The company is a manufacturer of defense electronic equipment such as radar systems. A small group of hams employed within THALES-NL decided to form a team and apply for the special event call sign PA100THALES. The company facilitated them to build a radio shack on the company's premises. Strangely enough, all team members are HF operators, none of them is active on microwave. I have been working at THALES-NL for 34 years, and I retired 8 years ago. I was asked to represent PA100THALES on the microwave bands. Because, it's not feasible to move my microwave stuff to the radio shack at the company, I operate occasionally as PA100THALES from my home station. It is located about 40 kms from the company. Activities are mainly on EME (70 thru 1.2 cm) in CW and digital modes, and sometimes on tropo (same bands). The PA100THALES operations will last until the end of this year. For QSL information see QRZ.COM.

SM2CEW: Peter sm2cew@telia.com writes about his microwave and some 432 EME -- For some time, I have been planning to come on 6 cm EME using a DB6NT transverter, W2IMU type feedhorn and a NEC TWTA. My intent was to use my 8 m dish and put fine mesh in the center 3.5 m or so to make it good enough for 6 cm. However, after several attempts to use it, I realized that my tracking with the big and heavy dish was not good enough. There was too much inertia movement when tracking, especially in AZ. So, I've reverted to using my 2m prime focus dish that I normally use for 3 cm, now also on 6 cm EME. After deciding to use the smaller dish, I completely rebuilt the 6 cm feed arrangement to fit it in the 2 m dish. I

also rebuilt the switching and TWT/PSU arrangement as with the small dish, I have to fit the TWT in the feed and the PSU in a cabinet at the back of the dish. To be able to fit the TWT at the feedhorn, I needed to cut the original short cable between the TWT and the original PSU and extend it. For this, I scrounged up a nice cable with enough PTFE insulated wires to do the job. I stripped the cable at both ends and was very careful making the joints well insulated and well soldered. It all looked very professional when finished. Earlier I had checked all the TWTs that were kindly provided to me by SM7FWZ to find out which one gives the best output on 5.7. Late Saturday afternoon when the Moon came around to the SW where I have a clear shot at it, I put everything in place for a smoke test. And smoke there was... indeed! While stripping the cable jacket and the braid covering of the PTFE insulated wires, I must have accidentally made a small cut in one of the PTFE wires. This wire was arcing badly to the braid of the cable. I did notice QRN in my receiver just as I switched the PSU on, and of course this QRN quickly got stronger until it eventually disappeared completely. And the TWT monitor meters that were flickering at first all went to "0". I went out to the dish and could smell the smoke inside the PSU cabinet and noticed the fuses were blown. But instead of doing a rush-job fixing it, I decided to just listen to Moon signals and troubleshoot the TWT PSU at a later time. During some casual listening during the 6 cm contest, I heard and copied the following CW stations on 6 cm: RA3EME, PA3DZL, DL4DTU, WA9FWD, OK1KIR, VE4MA, SA6BUN, WA6PY, K2UYH, OH1LRY and G3LTF. So, all in all, a somewhat frustrating weekend, but also a huge step forward in getting my 6 cm stuff operational. I found it very rewarding to hear so many stations during my short listening sessions on both days. Hopefully I will also be able to transmit in the near future. Recently, I ran a couple of skeds KA7V on 70 cm CW EME. Barry has been off the air for a while due to problems with his relay switching, but is now active again. Barry has a really good signal off the Moon with his 4 x 6 w/ yagis and a Lunar-Link amplifier. He is looking forward to taking part in the coming ATPs.

SM6CKU: Ben SM6CKU sm6cku@jockert.se reports on his 3 and 6 cm operation -- Last week I spent some time on 3 cm and worked DL7NN, a new station on this band. Then, I changed the feed in my 4 m dish to 6 cm. Everything worked well, but the activity level was low. I worked 5 stations on CW and 7 on digi. Worked using Q65D were SQ6OPG, JA1WQF, DL4DTU, OK1KIR, OK1CA, OH1LRY and for a digital initial CX2SC {#}, and using CW were JA6AHB, PE1CKK for an initial (#), VE4MA, WA3RGQ and IK0HWJ. Conditions seemed quite good.

SP6JLW: Andrzej (SP6JLW) and team member Pawel (SQ6OPG) sp6jlw@wp.pl wrote on their webpage about the EU EME Contest on 3 cm. We again QRV in the competition using CW or SSB, but observed a significant decrease in the activity of stations working in the contest. Perhaps this was due to the "confusion" caused by the TK/HB9CRQ expedition. It's a pity that more stations on for the dxpediton did participate in the contest because there

could have been a record turnout. I fondly remember the days of DL1YMK's dxpeditons. Our QSO list was OK1CA, HB9BBD, JA1WQF, OZ1LPR, PA0PLY, DL4DTU, DB6NT, 9A5AA, OH2DG, DL0EF, F2CT, OK2AQ, SP3XBO, PA3DZL, VE4MA, WA6PY, GB3FRA, G4NNS, OK1KIR, OK1DFC, IK0HWJ, IW2FZR, SA6BUN and OH1LRY. We ended with 24 QSOs and 22 mults. [TNX to OK1TEH for translating].

SP9VFD: Raf rgrigorow@gmail.com is now QRV on 13 cm besides 70 and 23 cm -- I was active in the Ref Dubus 13 cm EME Contest. This was my first attempt to touch the Moon on 13 cm. After only few weeks of work to add the new band to my HB 6.4 m dish; my EME system on 13 cm still needed a lot of optimizations. The contest set a deadline for me to finish my transverter, LNA and SSPA. Unfortunately, I didn't time for checking and measurements. My 13 cm system consisted of an RA3AQ septum feed, G4DDK HB preamp, 50 W SSPA modified from an UMTS. All parts were mounted on feed support in the middle of the night before Saturday's moonrise. I run two 1/2" coax lines 45 m long from the transverter in the shack. On 13 cm, I can also TX on 2400, 2320, 2304 and 2301.95. During the contest, I operated QRP with only 50 W peak at the feed. Unfortunately, my power dropped during long transmissions down to about 20 W. The SSPA was not working as expected and needs improvement. Thanks to all for the patience to listen for my weak signal. This may have been contributed by my not having time to align my RA3AQ septum feed for the proper circular polarization. I observed fading similar to 70 cm Faraday rotation but with a much quicker time interval. From time to time my echoes were loud or very weak. It was both an exciting and curious experience for me. However, despite everything, I had 18 random CW QSOs (all of course initials) and 16 mults with SP6OPN, OK1CA, G4CCH, OK1KIR, G3LTF, PA3DZL, SP7DCS, OK1KKD, OM6AA, OK2ULQ, OH2DG, RA3EME, OH1LRY, K2UYH, WA6PY, VK3NX, WA9FWD and KL6M. I also heard IK3COJ, DL4DTU and F5FEN. Thanks to all for a great contest!



SP9VFD is now on 13 cm with his 6.4 m HB dish

TK/HB9CRQ: Dan (HB9Q) dan@hb9q.ch on their Corsica dxpedition follows: We started our activity on Friday 27 May on 5760 just before 0300 when the moon came across the hills. Although we had a lot of wind, at times very gusty, we could operate without problems. The temperature was nice starting at 18C going up to 32° midafternoon. Unfortunately, there was not a lot of activity. Never the less we worked a total of 17 initials in 22 QSOs, 16 using Q65D and 5 using CW. The next day, Saturday 28 May we were on 3 cm. We started at 0320. We had no wind, until an hour before moonset, when it became gusty again. This was of course very nice for 10 GHz activity. The temperature was again very nice starting at 20C at moonrise and going up again to 32° at midafternoon. We had a great time operating, although we often were calling CQ with no takers, probably due to the high CW activity during the contest. The conditions were difficult, very high spreading, this made it harder for us to work smaller stations and CW was really no fun. Never the less, we have worked a total of 28 initials, a total of 32 QSOs, 30 Q65D and 2 CW. On Sunday 29 May, we started our 1296 activity at 0345. This morning again no wind, until three hours before moonset, when it became very gusty again. We could operate all the time with no problems. The temperature was again very nice starting at 16C at moonrise and going up to 27° at midafternoon. We had a great time operating, having enough takers most of the time, often more than one at the same time. The conditions were quite good. Before noon we worked initial #50 with which we completed WAC! We worked on 1296 a total of 69 initials, a total of 75 QSOs, 71 Q65D and 4 CW. Our last activity was on Tuesday 31 May on 13 cm. In the morning we had lots of clouds and only little wind. By noon we had splendid sunshine and only weak wind. Throughout the afternoon the wind picked up and helped a bit to keep us from getting too hot. All equipment was working well and we enjoyed our last activity hours from Corsica. We worked a total of 19 initials, 24 QSOs, 21 using Q65C and 3 using CW. This gives us a total QSO count of 152 for the 4 bands. We are very happy with this result. Many thanks to all who worked us or tried to work us!

UR5LX: Sergey ur5lx@ukr.net sends the following from early June -- The situation in my village is bad. The front is very close. There is no connection, no internet, no electricity. Yesterday they called me. My house is still intact, but the shelling continues. I am now 250 km from my home. My children and grandchildren also fled Kharkov. The shelling continues there too. Shells hit the houses of my sons in nearby hallways. So, their apartments are intact. The situation is the same with the houses of our friends. And two friends are in occupation. Any help is very valuable for me. This is important economically, but also morally. Thanks again! I'm waiting for this madness to end. **[We have learned that Sergey plans to attend the EME Conference in Prague. He has already bought tickets - TNX to HB9DUK for donation!]**

VE6TA: Grant ve6ta@xplornet.com sends his results for the 6 cm Dubus EME Weekend -- I was not actively competing as it's getting much more difficult from this part of the world because of big trees to my east. Stations

worked were K2UYH (was a struggle), OK1KIR, RA3EME for initial #42, WA6PY, DB6NT #43, VE4MA, OH1LRY, OK1CA, SQ6OPG, VE6BGT, KL6M, IK0HWJ #44, LX1DB, PA0BAT, PA3DZL and WA9FWD. It was good to work some old friends and new stations during the weekend. My station remains an 18' dish, 75 W SSPA and IMU CP feed.

WA6PY: Paul pchominski@maxlinear.com reports on his operation during the 23, 3, 13 and 6 cm Dubus competitions – I was QRV in the 1296 Dubus Contest on 7/8 May. I QSO'd using CW K2UYH, HB9Q, OK2DL, SP9VFD, SP7DCS, IK2DDR, IK1FJL, G4CCH, OH1LRY, SM6FHZ, UA3PTW, SM5DGX, DF3RU, 9A5AA, CT1FGW, IK3MAC, W2BYP, F2CT, G3LTF, VE6TA, KL6M, K3WM, VE6BGT, JH1KRC, DU3T, VK5MC, JA6AHB, WA9FWD, LZ2US, OH2DG, N8CQ, F5JWF, VA7MM and OK1CA. Got aways were JF3HUC and VK4AFL – I heard both station in QSO but couldn't find them later. I was calling CQ on western window for over 1 hour without any takers. The next day on my eastern horizon, I called but lost S59DCD and NQ7B. I ended with a total of 34x33. On 28/29 May I was on 10 GHz for the Dubus Contest again and worked on CW SP6JLW, OK1CA, SA6BUN, OZ1LPR, VE4MA, HB9BBD, SP3XBO, OK1KIR, GB2FRA and OH2DG for a score of 10x9. In the 13 cm Dubus event on 4/5 June, I QSO'd SP6OPN, OK1CA, OK1KKD, OH1LRY, G4CCH, SP7DCS, PA3DZL, SP9VFD, G3LTF, K2UYH, WA9FWD, KL6M, VK3NX, F5FEN, OH2DG and DL4DTU. I couldn't get the attention on 2320 of F5JWF and SP3XBO calling X-band. I finished with a total of 16x15. From time to time on 2320, I am seeing an elevated noise floor, up to 16 dB above cold sky, which is up to 10 dB higher than the ground noise. It lasts for 10 -20 minutes. On 2304, I started to have interferences making it difficult to track or calibrate my OE5JFL tracking system using Moon noise. In the past I was getting a stable 0.3 dB of Moon Noise. In the 6 cm Dubus leg on 2/3 July, I QSO'd DB6NT, DL4DTU, K2UYH, KL6M, OH1LRY, OK1CA, OK1KIR, PA0BAT, PA3DZL, RA3EME, SA6BUN, SQ6OPG, VE4MA, VE6BGT and VE6TA. I was called by WA9FWD and gave John an (O) report, but I lost him; and ended with 15x13. I was suffering from a relatively high level of QRM; sometimes I had a hard time to copy even quite strong signals. My OE5JFL tracking system needs corrections for AZ/ EL that I can find only by maximizing my echoes. I plan to be active in 9 cm part of DUBUS Contest at the end of July.

WB5AFY: Dan wb5afy@wb5afy.net had a busy month on 432 EME -- I installed a 70 cm patch feed in my 5 m dish on 21 June in order to follow KA6U on his rove thru the western US on EME. I worked on 22 June KA6U (WY) and N1AV, on 25 June DK3WG, DL1VPL, AA5C, W7JW and KA6U (NV); on 1 July PA2V, N0AKC, DL7APV, KA6U (OR), WC8RK, DK4RC, WA3PTW and N9XG; on 2 July EA5CJ, HB9Q, W2HRO, NN3Y, OH6UW and ON4AOI; on 3 July KA6U (MT) and PA2CHR; on 5 July KA6U (ND); and finally on 6 July KA6U (SD). These QSOs bring my mixed initial total on 432 to #97*. Also, my WAS total is now 48 confirmed on 432 with only PA and HI to go. I am working with W1PV for PA and hope to catch an expedition to HI in the future to complete WAS. My WAS journey has been a

long one as my first 432 EME QSO was with K2UYH in Oct of 1984! I am working to be QRV on 9 cm during the first ARRL MW Contest weekend on 28 Aug. I plan to be QRV on 432 EME in the Oct Contest weekend and 1296 EME in the Nov contest weekend. I am always open for skeds depending on which feed I have currently installed in the dish. **PS: just completed with W1PV on 432 EME for state 49 - anyone for HI?**

WC8RK: Richard gkreute@gmail.com and Joe (WA8OGS) operated portable on 432 EME in KY (EM78) on 4/5 June - - Our search for a suitable EME operating site in KY took all day on 21 April. We visited 5 potential locations, hoping to find a place with AC power and a shelter. The final site on our list was the QTH of a ham (whom neither of us knew). We learned from another ham that he would be willing to host us if we couldn't find something better. Bob's (KA4CTW) QTH turned out to be the ideal site. We could set up our equipment in his garage, with our antennas about 30' away; and the ground sloped down for miles in the direction of moonrise. We would not need a generator as he offered the use of his commercial power. We arrived back and set up the station/antennas on Friday afternoon 3 June. It's good that we did, as we had both WSJT and antenna control software issues. Neither of us are very knowledgeable with laptop software. We had only two decodes, with no QSOs on Friday. The issue was COM port and CAT related. Richard figured out the solutions. On Saturday we arrived at about 1400. All was working OK. Our first contact was 1438 DK3WG on Q65B with the Moon at about 3 degs. Followed by QSOs with UB4UAA, PA5Y, ZS4TX, DL8FBD, UA3PTW, PA2V, DL7APV, ON4AOI, EA5CJ, KP2Z, NN3Y, K5DOG, ES3RF, UT6UG, UX5UL, DL1VPL, G4FUJ, G4YTL, NC1I, W2HRO and N9HF for a total of 22 QSOs. On Sunday, we arrived at 1500. Our first contact was SM7THS again with the Moon about 3 degs followed by DL7APV, DK3WG and DK4RC for total of 4 QSOs before QRT and packing up station. Equipment was 4x15 el 15LFA-JT horiz HB yagis, TAJFUN 1000 running 450-500 W, antenna mounted LNA and IC-9700. One of the visitors during our KA4CTW operation was Jack (AB4WS) Radio Show podcaster. See <https://www.spreaker.com/show/amateur-radio-news-cincy-and-ky>. This was our best operation since we started 432 EME with our first setup at the Voice of America Museum about a year ago.

K2UYH: I (Al) alkatz@tcnj.edu was QRV for all 3 Dubus Contest weekend and the TK dxpeditions, but did have some problems - I worked on 27 May with my new 3D printed feed on 5760 using Q65D at 1110 TK/HB9CRQ (13DB/17DB) mixed initial #73* and DXCC 36, 1137 WA3RGQ (14DB/15DB), 1145 DL4DTU (11DB/9DB), 1202 PA3DZL (6DB/10DB), 1207 PA100THALES (4DB/8DB) for mixed initial #77* and 1215 SM6CKU (9DB/16DB). I planned to use another 3D printed feed on 3 cm for the Dubus Contest, but Murphy struck. On 28 May, while adjusting the position of my 3 cm feed for best SN, I used only one clamp to save time between position changes... I will never learn! Somehow, it slipped and all fell about 30' to the ground. What a mess. I was able to get things working with a different feed (another 3D) to work at 1306

TK/HB9CRQ (17DB/21DB) using Q65D for mixed initial 70* and DXCC 34, but *nothing* was working as well as before. I tried to make some CW QSOs in the contest and only made a partial with OZ1LRP (539/579); and on 29 May gave up on CW to work using Q65D at 1414 PA0PLY (16DB/15DB) #71*, 1420 VE4MA (14DB/16DB) and 1430 OK2QA (15DB/17DB) - it was very disappointing. I was QRV again to QSO on 31 May using Q65C on 2304 at 1442 TK/HB9CRQ (11DB/17DB) for mixed initial #133* and DXCC 37 and 1450 F1RJ (10DB/13DB) #134*; on 4 June in the Dubus 13 cm Contest at 1756 OH1LRY (559/579), 1802 SP7DCS (569/589), 1808 SP6OPN (569/559), 1811 OK1CA (569/579), 1814 OK1KKD (569/579), 1820 OK2ULQ (559/579), 1816 PA3DZL (569/579) XB, 1850 SP9VFD (549/569) for initial #112, 1859 WA9FWD (589/559), 1904 G4CCH (579/579) XB, 1916 PA0PLY (559/559) XB, 2004 PA100THALES (589/579) #113, 2014 G3LTF (569/569) XB, 2025 WA6PY (579/579) and 2041 KL6M (559/569); and 5 June at 2022 at 1816 OH2DG (579/579) XB, 1915 DL4DTU (579/579) #114 XB, 2011 F5JWF (559/579) XB and 2035 F5FEN (569/579) for a score of 19x17. I worked after switching to 5760 to test my new feed on 9 June at 2100 DL4DUT (559/559) - only a partial due to drift problem and 2200 G4CCH (559/569); then on 432 on 12 June at 0445 N1AV (18DB/23DB) using JT65B for mixed initial #1070*; and on 13 June using Q65B at 0019 W8Y (16DB/22DB) #1071*, 0037 NN3Y (18DB/21DB) #1072* and 0148 W8Y (12DB/19DB) again. I switched back to 5760 for the Dubus Contest on 2 July to work using CW at 0117 VE6TA (559/569) also earlier with weaker sigs, 1633 G3LTF (559/549), 1647 PA3DZL (579/569), 1706 SA6BUN (569/529), 1711 RA3EME (579/559), 1723 OK1KIR (569/559), 1748 WA6PY (559/O) and 1833 SQ6OPG (O/O) for a total of only 8x8. Something was not right. I called many stations including VE4MA, WA9WCD, OK1CA with no reply. I was unable to spend any time on the Moon on Sunday because of a family event. I will not be able to QRV for the 9 cm contest either as I will be leaving early for the EME Conference in Prague. I will try to be QRV on 9 cm the week before the contest, if anyone would like to work me there.

NET/CHAT/LOGGER NEWS: CX2SC was very disappointed to not QSO TK/HB9CRQ in May. Ric was sick with a high fever, but it was never confirmed as COVID. **N6OVP** is looking for help getting WSJT-X working on a MAC? Dave has a few questions and can be reached at n6ovp@pacbell.net. Is there anyone who could help him? **D2TX** will be QRV from Angola on 12-16 Aug on 2 m EME, but may also be active on 70 cm. See D2TX's QRZ.com page for more info. **W5AK** is preparing for 1296 EME and is looking for about a 3 m dish. **OK1CS** is temporary QRT on EME due to the rebuilding of his EME dish.

FOR SALE: DL1SUZ is looking for a 9 cm septum type feed. If you have something, contact Uwe at dl1suz@dar.de. **DK7LJ** has for sale 2 TWTAs ready for 10 GHz use. One is a Siemens with 100 W out and the other a Nortel DASA with 300 W out. If interest please contact Per at per@per-dudek.de. **N8CQ** has added features and improved performance to his WinTrak EME Tracking

System now for Windows and Linux. He has ported his RazTrak software to Windows 10 and designed the WinTrak I/O board for VA3TO. WinTrak connects to PCs using a USB port and provides the necessary interfaces for motor controls including speed control using built-in BTS-7960 modules. The encoder bus uses the US Digital SEI bus to communicate with many popular encoders. Absolute and Incremental encoders are supported using MABMPU encoder boards. SDD-3 Slew drives and many rotary quadrature encoders are supported using the MABMPU v2.0 encoder boards. For those preferring to DIY their own custom solution, I am making the WinTrak I/O board available also (including the PC software). Project files, installers, schematics, notes are available in this dropbox: <https://www.dropbox.com/sh/whkxgeb9phkxxml/AACNyqsVDBglm04AA3MCG3dRa?dl=0>. Please contact Gary at gabercr@gmail.com for more information. **K6PF** has for sale considerable microwave test equipment. If interested contact Bob at k6pf@sbcglobal.net. **W5AK** is looking for a 3 m or slightly smaller dish for use on 1296. If have something contact Dick at rbeersr@att.net. **UR3VKC** has for sale a 24 GHz WG switch. Info can be found at https://linkprotect.cudasvc.com/url?a=https%3a%2f%2fwww.ky.com%2f016uM2c.&c=E,1,JdUERA8du359D4gFAuyK1m_VkpM9Dwiyksx2eCEH-rfJ9k5j1FDVJ-BRcWZytYGMW6sHcxsDI00Diol79BCnsk16i0qd9N1CiCiMak_acWa_WhLoLDni1PfG0g.,&typo=1. **W2BVH** is looking for info on an NEC TWTA module that appears out of a bigger piece of equipment. The tube is a LD4389A and the RF deck number is 92005A with an integrated power supply marked 90916C. Please contact Lenny if you can provide any information lennyw@comcast.net. **PE1LTW** has for sale the following G4DDK LNAs: 70 cm kit, 9 cm kit, 23 cm built and 13 cm built; plus for 2 m at 0.2 dB NF VE3KH LNA. Contact Jergen at pe1lwt@me.com for price and more info. **OK1TEH** ok1tehlist@seznam.cz has still for sale his robust 3 m DISH and cheap (290Eur), OK1FPC's 2 m to 10 GHz transverters, see more info at: https://ok2kkw.com/next/ok1fpc_10g.pdf - already a few pieces were sold and more are being preparing for sale at the EME Conference.

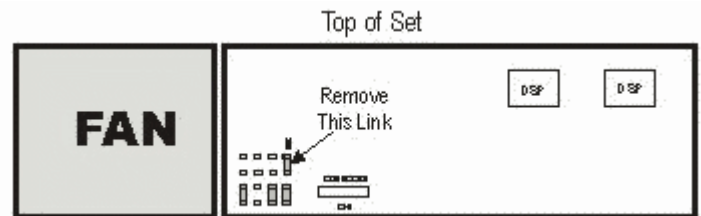
TECH INFO FOR TS2000X: With Israeli stations limited to 23 cm operation around 1268 MHz, it is useful to know that the TS2000X operates with no modification from 1260 to 1300 MHz. The frequency range of other bands can be extended as shown in the following article: TS-2000 Freq Mod by M0DZO & G4KUQ.

- Disconnect power cord and antenna from the transceiver.
- Remove the top and bottom covers.
- Remove the top screw from each side of the front panel assembly.
- Loosen the bottom screw from each side of the front panel assembly.
- Carefully rotate the front panel forward to gain access to the control board(X53-3910-11). This board is mounted vertically against the body of

the transceiver. It is not the board that is mounted in the front panel assembly.

- Locate and remove resistor R53 from the control board.
- Assemble the transceiver then perform the CPU reset procedure by holding the A=B button in while turning on the power.

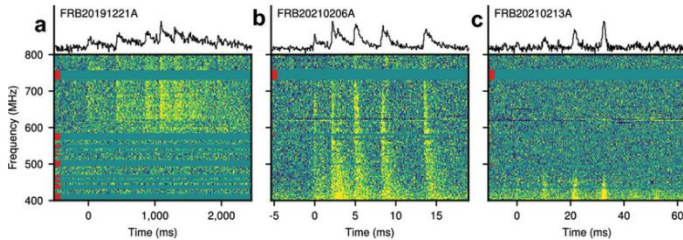
Transmit Range: 1.705-30MHz, 49-54MHz, 142-152MHz, 420-450MHz, 1240-1300MHz.



TECH Q65 QUESTION: The OK1KIR group has observed trouble with Q65 decodes at *frequency jumps*. It seems Q65 can cope well with small frequency changes; however, higher sudden jumps in frequency, such as the 20 Hz tuning steps of the Kenwood TS790 often prevent decoding, probably due to interrupting synchronization. The increased use of automatic Doppler correction (CFOM) at higher Doppler rates (Hz/s) has made this glitch more troublesome. If a radio responds in higher frequency steps, a particular QSO can be delayed by the repetitions or completely disrupted. It can be quite annoying for both parties even if the other station's radio tunes in 1Hz steps. Possibly, it can be fixed by sending the frequency change request to such radios (according to "hamlib" choice) only during the "decoding" gap at the end of each RX and TX session to prevent violation of TX and RX messages. [G3WDG writes – My experience with Q65 is that unless the signal is very close to the decoding threshold, this type of problem only occurs when the step happens close to mid-period. The robust error correction scheme built into Q65 means that it will decode with considerably less than a full period. Chances are that you would be very unlucky for this to happen in the next period, so probably you would only lose one period decoding.]

RADIOASTRONOMICAL CORNER OF OK1TEH: Hello, this time I'd like to point out the interesting Fast Radio Burst (FRB) 20191221A and the interesting theory of the origin of Supermassive Black Holes (SBHs) better known as Quasars. **The CHIME radio telescope detected an extremely strange signal, similar to a heartbeat.** This reception that initiated the exciting saga of FRBs, has another chapter. We still don't know how these fast radio bursts originate. We have found individual bursts (short time), and cases where bursts have repeated over much longer periods. We've known of them for a little over 10 years. It was challenging at first, but radio astronomers have now detected hundreds of these remarkable bursts. But we haven't seen anything similar to FRB 20191221A. A typical fast radio burst is really fast. It lasts just milliseconds. The Canadian Hydrogen Intensity Mapping Experiment (CHIME) radio telescope has detected the "fast" flare, designated FRB 20191221A, which is about a thousand

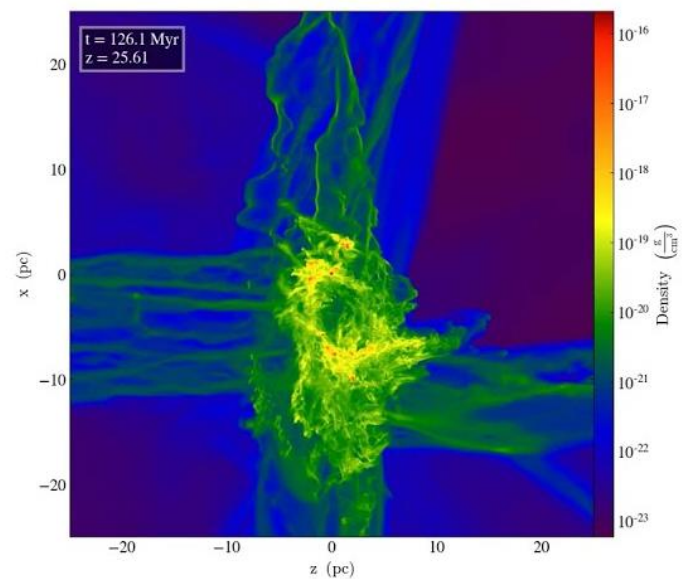
times slower. It lasts a few seconds. To make it even weirder, it involves a cycle with a period of about 0.2 seconds. Near a heartbeat rate but a bit slower. This behavior is unique for FRB. Research leader Daniele Michilli of Canada's McGill University and the US-based MIT Kavli Institute for Astrophysics and Space Research confirms that they have not come across anything similar to this before. It is the first known periodic "fast" radio burst.



Periodic and quasi-periodic bursts detected by CHIME/FRB. FRB 20191221A (left) is a remarkable event, lasting for nearly 3 seconds and showing 9 peaks separated by a strict period of 216.8 ms. It also shows a high level of scattering. [credits researchgate.net] What could be the source of this strange behavior? Researchers believe the culprit could be the same as the prime suspects in most the other observed radio bursts. Either a pulsar or its exotic magnetar variety. But there's a catch. The signal of FRB 20191221A's is about a million times brighter than anything we've seen from our home pulsars or magnetars in the Milky Way. Michilli believes that the explanation for the exotic nature of not only this but some of the other fast radio bursts may lie in the extreme environment around the pulsar or magnetar. We know that some pulsars are inhabited by very turbulent clouds of gas and dust, which are usually the remnants of the supernova that created the pulsar in question. In the case of FRB 20191221A; however, it would have to be a pulsar (or magnetar) in a really extremely turbulent cloud. Whether or not this is the case, researchers will wait for any further radio bursts of this strange object to learn more. (See <https://www.researchgate.net/publication/353343999>

Sub-second periodicity in a fast radio burst). This can lead to the question: **Were the first quasars born in the wild currents of cold gas?** Which could be a real astrophysical bomb. If confirmed, it solves one of the most painful mysteries of contemporary astrophysics that has been stressing scientists for about two decades: How did the first SBHs that we observe in the very young Universe, form? The answer is surprisingly poetic - they are the children of the cosmic web. Today, we know of about 200 quasars, which we observe at only about a billion years after the Big Bang. At their center (as with all quasars) are supermassive black holes. And that's quite a problem, because it's not very clear how giant black holes could have formed so quickly. Daniel Whalen of the University of Portsmouth, now claims that quasars were born "in the turbulent and turbulent conditions of rare gas reservoirs in the early universe" (a literal translation of the accompanying press release). A few years ago, simulations carried out on supercomputers showed that early quasars could have formed at the junctions of strong flows of cold gas. In a volume of space a billion light-years across, only

a dozen such flows existed in the simulations, but that was enough to form a black hole of 100,000 solar masses. That's many orders of magnitude more than black holes formed by the collapse of burned-out stars - (they have masses of units of Suns, tens at most). But, in the case of the first quasars, they certainly wouldn't have grown from such a small initial mass. Astrophysicists have previously suggested that in the early universe, stars could have masses of 10,000-100,000 Suns. These stars could then also have been the source for the first black holes/quasars. The lifetimes of giant stars were very short, collapsing into black holes in as little as a quarter of a million years. But, there remains at least one problem: such stars, if they formed at all, could only form in exotic, precisely "tuned" environments, such as a strong ultraviolet background or supersonic flows between gas and dark matter. Moreover, these environments are nothing like the turbulent clouds in which we find the oldest quasars.



Supercomputer simulation of the first quasar. Credit: University of Portsmouth.

The new model combines the above theories. It argues that the supermassive stars in question could have formed from cool, dense gas flows, with no special conditions or unusual environments needed. In the new simulation, the cold jets caused turbulence in the cloud that prevented the formation of normal stars until the cloud became so massive that it collapsed catastrophically under its own gravity, forming two gigantic primordial stars - one with a mass of 30,000 Suns, the other 40,000. These stars would then quickly form their respective black holes; further calculations suggest that a few hundred million years could be enough to form a black hole of up to a billion Suns. The fact that quasars could form quite easily would then also explain why we see so many of them from the early universe.

FINAL: Now with 2 MW EME Contest Weekends (WEs), we need to decide on which bands to operate on which WE. Most of us agree we should limit activity to 3 bands per WE. During 27/28 Aug there is a little lower path loss and libration/spreading. These conditions are most beneficial for higher bands. However, 3 cm is probably the most

popular MW band. Also, the Moon - Sun spacing is smaller on the first WE, so 13 cm may be a bit tricky for smaller dishes. It is, thus suggested that 27/28 Aug be for 3 cm, 6 cm and 1.25 cm; and 17/18 Sept be for 13 cm, 9 cm and 3 cm. 24 GHz will be difficult because of the high spreading; only higher power stations will be capable of CW QSOs this weekend.

► **ARRL MW EME CONTEST SCORING FLAW:** [This problem appears to be corrected in this year's rules. According to W5LUA the rules now state: "Multiband entrants will also be listed in the single band tables, and are eligible for those awards"]. Vlada and Tonda of the OK1KIR group observe that the added MW weekend do not correct the major fault with the ARRL Contest's rules. There needs to be a separate scoring class for multiband MW operation. As soon as a MW station operates on more than one MW band, they are scored as a multiband station; and thus, are competing with stations operating on 2 m up. There is no way they can be competitive. When logs are submitted for two or more MW bands, a station is prevented from competing for individual band awards. There is no motivation to compete in more than one MW band. In fact, some stations do not report contacts made on more than one MW band, even if they make contacts on them. [Last year, K2UYH lost points for some MW band QSOs. If a station does not report QSOs for a particular band, those contacts are automatically subtracted from the other station's score!].

► **ARI EME Contest (Trophy 2022)** results are for 432 mixed class OK1VUM; 1296 mixed class cat. AM IQ2DB and cat. BM IK5VLS; 1296 CW class cat. A IK1FJI and cat. B DU3T; 10 GHz OK2AQ. The next contest (Autumn session) is 24/25 Sept. TNX Enrico (I5WBE) for sending results.

► **ON0EME BEACON** - Eddy (ON7UN) reports that a 12" slewing gear has been ordered to install on the ON0EME 1296 Moon beacon. It will take a number of weeks to arrive. Then we need to lift the antenna off the mount and make modifications to the mechanics to match the slewing gear. We hope to finish by the end of the summer.

► PA0PLY suggest the following website, which is oriented to MW operation but also covers some EME - www.ghz-europe.com.

► **EME Conference 2022 Prague is less than month away** <https://www.eme2020.cz>. All is on track for a great meeting! Zdenek writes on our website there is an updated table with the schedule of lectures at: <https://linkprotect.cudasvc.com/url?a=https%3a%2f%2fwww.eme2020.cz%2ftext-eme-&c=E,1,40CjeDU4VrsaAb6gPuyJyxj8D0E6H3qYn-TdcEm92U95bEEk6lqyg19aiujoVWrnwaAchB4xEbvcdktTijlIMHGBEYy5Obng5ZPDd8D48fA,&typo=1> 2020-peakers/. We have ordered and prepaid all required services. Some services have been made more expensive, some have remained almost unchanged. The highest price increase was for transportation to our accompanying programs. I

would like to inform you that a total of 135 people will be attending the conference, 24 people have cancelled their attendance for a variety of reasons. Over the next few days, I ask those attending to watch the website at:

https://linkprotect.cudasvc.com/url?a=https%3a%2f%2fwww.eme2020.cz&c=E,1,G9xGM7yfySDM3ogJslooMJ_h6z8oRF3dfz7wSR5BsB1N4Uwsc5-ob9xbZGanRxFXKEOXysBjObVpVwDK_kJtYu3pcCQS00SCgMftDomRCPMiu6M,&typo=1 where there will be info on hotel registration and some more details on how to get to the hotel, transportation from the airport, etc. We look forward to seeing everyone in Prague.

► The 3 Dubus Contests in little more than a month are over and reported on here, but there is still one to go for 9 cm on 30/31 July – try not to miss it. Then there is the 19th EME International Conference in Prague. We hoping to see many of you there. At the conference will be a special session of 48 GHz EME; becoming of high interest. **73, AI – K2UYH and Matej – OK1TEH**

REMEMBERING: W1GHZ writes -- In the July QST on page 92, there is a scene I remember from over 50 years ago: Dick Knadle, K2RIW, showed up at our Antenna Measuring in NJ and put together his 12' stressed dish to measure at 1296. In the photo, a skinny Dick is aiming the dish. Looking on is Dick Turrin, W2IMU. On the dish is the first example we had seen of the now famous IMU dual-mode feed. RIP, Dick and Dick

