432 AND ABOVE EME NEWS
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THE NL WEB VERSION IS PRODUCED BY W6/PA0ZN AND AVAILABLE AT <http://www.nitehawk.com/rasmit/em70cm.html>

EME 2004 Group

CONDITIONS: Most of the activity this month was done in person at EME2004 and thus the activity weekend (AW) reports are on the low side. What AW activity there was seemed to be on 23 cm. DL0GER generated some 70 cm interest on the post AW. This is a club station call. The next AW is on 4/5 Sept. It has reasonable times and appears an excellent compromise. The following weekend has very similar conditions and should be equally good for EME. It is also the ARRL Sept VHF Contest, which usually attracts NA EME activity. This should definitely be the case this year. Look for NA EME stations wanting to exchange 4 character grid squares for contest points.

EME 2004 CONFERENCE: As one of the hosts it is difficult for me to give an unbiased view. Personally I thought the conference was a great success. I only wish I had more time to spend with everyone. The weekend was too short. Marc, N2UO and his XYL Patty deserve a tremendous thanks for all their hard work. I know their attention to small details was greatly appreciated by the attendees. Joe, K1JT and his XYL Marietta, and my XYL Sally also deserve many thanks for great dinners and much more. Thanks as well to the Mt. Airy VHF Radio Club (Packs Rats) and all who helped make the conference possible. Special thanks to Lief, SM5BSZ who spent most of the weekend conducting with his Transceiver Clinic. A summary of conference activities follows: The 11th International EME Conference took place on 6-8 Aug in the Princeton-Trenton area of central New Jersey. 75 participants from 14 countries attended the technical talks and other planned events. The festivities started on Thursday at around 6 PM at the Amerisuites Hotel in Princeton. Approximately 80 percent of the participants attended the Hospitality Room. Initially planned until 9 PM, the gathering continued will beyond midnight. Beer, wine and food were available. Registration also took place in the same room. The conference package included: Conference Proceedings (printed and in CD), EME2004 T-shirt, Banquet ticket, Door prize ticket, Information folder with maps, Program, note pad, pen, etc, and a surprise present (choice of leather note pad or portable cooler). Various gifts were also given to all family members who took part in the family program. On Friday morning, the conference kicked off with the technical presentations at The College of New Jersey. Food was available early in the morning for those who could not have breakfast in the hotel. Some participants who could not attend the Hospitality Room because they arrived on Friday morning were quickly registered before the conference or during the first coffee break. Coffee breaks were available throughout the day, and lunch was also available at no extra charge. Technical presentations on Friday included "Transceiver Clinic introduction", by Leif, SM5BSZ, "Using the SDR-1000 as a 2 meter EME IF", by Bob, N4HY, "High accuracy Doppler shift computing", by Franck, F5SE, "The W2DRZ Antenna Controller board and software", by Russ, K2TXB, "Small Offset Stressed Dish for Portable 1296 EME", by Al, K2UYH, "Circular polarization feed with septum", by Zdenek, OK1DFC, "500 watt 23 cm Power Amplifier with 2xGI7B", by Marc, Franco N2UO, "EME receiving system optimization", by Paul, WA6PY, "A Modified Dual Dipole Dish Feed for 432 MHz", by Peter, G3LTF, and "You Know You Have Become a REAL VHF/UHF Weak Signal Operator When...", by Doug, K6JEY. On Friday night the participants were invited to attend a reception which included dinner and drinks and station tours at either K2UYH's or K1JT's homes. Saturday morning started with more technical presentations, which extended after lunch. The technical presentations included "Multi-reflector antennas" by Paul, W1GHZ, "Fundamental limits on weak-signal communication", by Joe, K1JT, "2003 JW/SM2BYA 432 MHz EME operation", by Gudmund, SM2BYA, and "Progress toward 47 GHz EME", by Gary, AD6FP. On Saturday afternoon the participants had the chance to use start-of-the-art test equipment (NF meter, Network Analyzer, Spectrum Analyzer, etc.). Some participants displayed items for sale or swap. Several commercial products were also offered. SM5BSZ ran a "transceiver clinic", and some participants had the chance to have their radios measured and to take a closer look at Leif's "Linrad", Linux-based software defined radio. Saturday night was reserved for the banquet, which took place also at The College of New Jersey, with Joe Taylor K1JT as the keynote speaker. Awards were presented to all the participants who took part in the technical presentations. Also, in appreciation to all the international and local attendees, one flag of each country with representation at the Conference was presented to participants from that country. To wrap up the night, a good number of door prizes for hams and their spouses were drawn, all of them donated by generous participants and the Conference sponsors. Sunday featured the EME Forum co-chaired by Peter, G3LTF and Al, K2UYH. Several topics were discussed. Among the most relevant were methods to increase the EME activity and Galileo satellite interference issues. Finally, Dave, DL4MUP, presented a proposal for the next EME Conference to take place in Germany. The participants of the forum unanimously approved the motion.

K1JT Addressing the EME2004 Banquet

7M2PDT: Shu pdt_umesan@ybb.ne.jp was active on 432 during the post AW – I worked with KJ7F and KE2N on JT65B. They were initials #152 (WSJT#7) and #153 (WSJT#8). Nothing was heard from DL0GER. My antenna is vertically polarized. This time of year JA's with vertical polarization seem to have a difficult time working NA and EU stations due to Faraday rotation. I will be QRV again 11/12 Sept. Sked are welcome.

9H1PA: Philip philip1@mail.global.net.mt is setting up for 70 cm EME. He presently has 2 x 8.5 wl yagis and 100 W, which should be enough for CW contacts with the bigger stations and possibly JT44 QSOs with smaller stations. He tried to QRV from a portable location in Aug, but ran into time problems, but plans to try again from home.

DL9KR: Jan bruinier@t-online.de reports he worked DL0GER in JN49. DL0GER is running 4 x 29 el yagis and 1 kW. He also caught SV0BTR with a very good signal. Jimmy is now in KM18no and thus a new initial. He is looking for a 100w + brick for HI3TEJ. Jan has been proposing some kind of foundation for the promotion of dxpeditions on 70 cm. [Hopefully we will hear more from Jan on this iea].

ES5PC: Viljo (SM0WCM) was QRV on 2304 in Aug – After many troubles with my new EME setup, it seems to be finally working ok. The new dish is 4.5 m and has full azimuth and elevation control with automatic tracking. The PA can deliver about 400 W into the TX cable (2 dB loss). On RX the NF is about 0.8 dB (the preamp needs to be improved!). I can hear my echoes about 5-6 dB above the noise in an SSB bandwidth. For some strange reason the echoes are much weaker in 2320 band. Skeds are most welcome.

ES5PC 2.5 m dish with 13 cm feed

G3LTF: Peter g3ltf@btinternet.com attend EME2004 but still found some time for EME in Aug -- We attended the EME conference at Trenton and had a really interesting time with a varied and well balanced technical program and enjoyed meeting many old and new friends. The excellent hospitality extended by K2UYH and K1JT, N2UO and their tireless XYLs was greatly appreciated. I came away with even more new projects in the plan! There was just time to get on the moon the following weekend. On 14 Aug I was on 13 cm and worked G3LQR and ES5PC for initial #29 and a new DXCC, and heard SK0UX. I then moved to 432 and worked DL0GER for initial #381, KU4F and SM5IOT. Faraday was a sharp 90 deg – thank goodness for the rotatable feed!

G4RGK: Dave g4rgk@btinternet.com rebuilt his 70 cm array at the end of July. It now has new phasing lines and elevator mechanism. Unfortunately an electrical storm took out one of his preamps and destroyed various other things around the house. After repairs to the system, DL0GER was heard in QSO with G3LTF, so all appears to be working again with a standby preamp.

HB9BBD: Dominique dominique.faessler@vontobel.ch made his QSOs in Aug by the eyeball mode at EME2004, but did submit the following proposal concerning EME contest for consideration -- Contest times seem too long. Spending one full weekend in the shack without sleeping is good for one health. I suggest we shorten contest weekends to one moon pass only. [This is the format of the yearly EME SSB Contest on 1296]. The second moon pass can then be reserved for another band on the same weekend. Furthermore, it will not be necessary to sacrifice the whole weekend to one very active moon pass and then spend the second for a boring 12 hours with very few QSOs.

HB9Q: Dan (HB9CRQ) hb9crq@hb9q.ch writes – After having traveled for almost 4 month it is great to be back on the moon. It was especially nice to work ZS5LEE on 432 with his 2x22 el and 50 W and 9H1ES on 1296 in CW followed by a nice SSB QSO. Our next activity will be on 432 on 5 Sept from approx 0600 until moonset at 1145, and on 11 Sept from approx 0130 until moonset at 1630, and 12 Sept from approx 0230 until moonset at 1700. The frequency will be 432.020 +- QRM for CW and 432.040 +- QRM for JT44. We will be logged-in at the JT-logger at http://www.chris.org/cgi-bin/jt44eme. Depending on activity we may also be QRV on 1296 CW. Please look for us around 1296.016. If you wish to work us, drop us an email so we can arrange for a QSY to 23 cm.

JH1KRC: Mike jh1krc@syd.odn.ne.jp could not attend the EME Conference because of a national job relate conference the same week -- On 8 Aug I operated on 1296.010 from 0020 to 0130. The only signal heard was from OH2DG. Eino had a booming signal and we worked (569/559). No other JA guys were heard. I will be at a JA Ham Fair on 21/22 Aug in Tokyo. Some of the JA-EME ops will have a lunch meeting during the fest.

K6JEY: Doug dougnhelen@moonlink.net is now operational on 1296 – I had an interesting night trying to work K9SLQ on 23 cm. Everything seemed to work well, but we just heard pieces of each other's signals and were not able to make a go of it. I think my PA needs a little more work and we need to try when the declination is higher. The whole set up is portable and this was the first time everything was hooked up and going. We did confirm that everything is working. We were getting 13 dB of sun noise. I am also concerned about feeding a 0.3 f/d dish. There is also some concern that my patch feed has very poor isolation. Does anyone have any experience/suggestions on feeding deep dishes?

K9SLQ: Wayne k9slq@parlorcity.com report nice activity on 1296 during the AW – On 7 Aug I found and worked the following stations: PA3CSG, OZ4MM, G4CCH, OE9ERC, VE6TA and F1ANH. During the following weekend I added G4CCH. I am now am running around 500 W from a 6 tube PA.

LX1DB: Willie WILLI.BAUER@airport.etat.lu reports – Please note that I have a new email address. I have been very busy helping my daughter and son constructing houses. But in the evenings I still work on EME. I just finished a new feed system, transverter and solid state PA for 5.6 GHz that gives 250 W out at the feed. The PA draws 56 A at 12 V and presents the problem as how to bring this much current to the feed point of the dish. I am also working on a new feed system for 10 GHz including a new transverter and transistor PA with 120 W out at the feed. 3400 MHz is also operational on the 10 m dish with 1.2 dB of moon noise and 125 W at the feed with circular polarization. I am using the same feed type as on 1296 and 2304. My SSB echoes are > 10 dB over noise. I am just waiting for other stations to become active on this band. My TX freq is 3400 MHz, but RX is also on 3456 MHz. Years ago I made my first QSOs with WB5LUA and VE4MA.

OZ/OH3CMK: Petri petri.kotilainen@nokia.com is QRV from his new OZ (portable) QTH with a ~19 dBi yagi, 150 W PA and 0.6 dB RX NF. He can operate CW, JT44 or JT65B/C and will take skeds. He does have some moon blockage at this location, but has a reasonable moon window for northern declinations.

SM5LE: Sven sven.o.nordin@telia.com is setting up for 1296 EME -- I am working on a 3.4 m dish for 23 cm. I have a 250 W PA ready, septum feed, LNA and coax switch, etc. I need only to complete the mount (rotator for AZ/el and the dish to be QRV.

SM2CEW: Peter sm2cew@telia.com was on EME during the post AW and worked on 70 cm DL0GER for an initial. He also ran a quick test with 9H1PA but hear nil, and then moved to 23 cm and worked K9SLQ and G4CCH.

VE4MA: Barry ve4ma@shaw.ca reports copy of RW3BP signal on 47 GHz EME. It was only 13 kHz from the expected freq. The signal was weak, but there. He noticed that to copy Sergei's signal that he has to be dead on moon [0.25 deg BW] and the moon noise had to be peaked. There was a big difference on receive if moon noise dropped form 0.6 dB to 0.5 dB in noise. Barry reports that RW3BP has also been heard by W5LUA, VE4MA, AD6FP and VE7CLD. He ran tests with AD6FP (30 W), but nothing was heard.

VE6TA: Grant ve6ta@telusplanet.net was active in Aug on 13 cm and worked ES5PC. During the AW he was QRV on 1296 and QSO'd K9SLQ.

W4SM: Stacey w4sm@keplerian.com is QRV 1296 and made his first QSO in Aug – I am running a 4.5 m Paraclipse dish that I made a totally new mount for. I did all the machining. Likewise, I built septum feeds for 1.2 and 2.3 GHz. These work very well with fantastic RHCP/LHCP isolation. The mount is overkill for the 4.5 m dish. I'd love to find a 20 footer to replace it. The preamp on L-band is a DB6NT with 0.35 dB NF and 35 dB of gain. I get 12 dB of sun noise on 1296 under the current relatively quiet sun conditions. I have a new switching power supplies for my solid state amps, and now have about 300-350 W at the dish feed. I can hear good CW echoes and JT44 echoes even through the trees. I also have K2AH's 2 x 6 cavity PA and am re-working it. The main PA isn't in the cabinet yet, pending leak testing of the rather extensive cooling system. Otherwise, it's ready to go. My re-do is considerably more than cosmetic. Tom is an excellent builder and machinist, but his PA was a "work in progress". The driver amp is working extremely well. It gives 200+ W out with about 25 W drive. As soon as I clean up the transformers for the H.V. supply for the main PA (and make a cooler), I'll fire it up as well.

W5LUA: Al al_ward@agilent.com reports that RW3BP has cranked up his power to 200 W at 47 GHz, and that he has copied him off the moon. Al is receiving 0.6 dB of moon noise. RW3BP is using 2.4 m offset dish.

K2UYH: Most of our QSOs in Aug were made in person at EME2004 and not off the moon. We did contact on 1 Aug at 0410 W4SM (559/549) on 23 cm for initial #228. This was Stacy's for EME QSO. The moon was at near full southern declination and I had more than 50 % of my dish blocked by trees, so you can see Stacy must have an excellent signal. After our CW contact, we also QSO'd on JT44 (-7/11) and JT65C. I should be QRV for the Sept AW, but will be out of town during the postwar.

NET NEWS BY G4RGK (BASED ON K1RQG's NETNOTES: WB7QBS is working on a array for 70 cm EME. **ZS5Y** is pouring concrete for 23 cm dish. **KJ7F** had a partial with 7M2PDT during Aug. He was hearing good echoes, but no other signals. **K5JL** has his dish operational again anis QRV on EME. **W9IIX** is listening on the moon on 1296. **WA1JOF** is getting close. Dish is mounted and the feedhorn is now in place. **OZ4MM** will be QRV next AW on 23 and 70 cm. **W2UHI's** EME system is working well. **NA4N** worked K9SLQ on the 9 Aug. Greg has a new Septum feed for 23 cm. **KU4F** worked during the post AW on 70 cm worked DL0GER for an initial and also G3LTF. **N7KA** is working on a dish for 23 cm EME.

FOR SALE: EME2004 – We have a few extra tee shirts ($US15 + shipping and conference disks $US8 available. Let me know a.katz@ieee.org, if you wants some. **NA4N** has for sale an RF Concepts 4-310 432 MHz 100 W SSPA + preamp brick. He also has a 2 m brick (FM/CW) and a couple of 432 preamps available. Contact Greg at na4n@direcway.com. **WB7QBS** is looking hardware to attach "N" connector brackets to a yagi boom. **NA4N** is looking for another GS15B cavity.

F5SE accepting the flag for France

W4SM's New 1296 PA

EME PROCEDURES AND PRACTICES RECOMMENDATIONS: This forum was attended by about 40% of the 75 who registered for the conference, the topics discussed were displayed on the web site and on Moon-net and two additional topics were received. In this report, the topic question is reproduced followed by a summary of the discussion and actions agreed.

1. How to Increase Activity… What can we do to increase the regular EME activity? ***There is no doubt that it has fallen off in the last few years especially on 432 and 1296 MHz. Should we change the criteria used to select "activity weekends" with more regard to "sociable hours" and less regard to lowest path loss (perigee)? What is the best role for digital modes as a method for increasing activity and for developing station capability? Can we make use of the presence of "Big Guns" on these bands to increase activity?*** There was a wide-ranging debate on this issue; there does not seem to be one, or even a few, key reasons for why we are seeing a drop in activity especially above 432 MHz. In fact, one might single out 432 MHz as the band where the effect is worst. Digital modes have boosted 2 m activity and the availability of solid-state power devices and >3 m dishes have increased 1296 activity to an extent. The present non-concurrence of high declination, moon perigee and sufficient sun separation means that the Activity Weekend (AW) does not stand out as *the* weekend to be on the air! There was a general feeling that we need to get a better wider and earlier awareness across the EME community of the dates that are chosen as the AW. Several ways of doing this were proposed: Current methods are The 432 and above News Letter, QST, RSGB Bulletin, DUBUS; New methods suggested are Add the information on the date to the monthly email shot which announces the issuing of the 432 and above NL. This goes to a very wide list. Add moon-net to this list so that the information is posted there simultaneously. There was a strong call for a website on which intended and planned activity, skeds etc, can

be advertised. This area of the site should be segmented by band so that people can easily find out what is likely to be happening. It was pointed out that the W6/PA0ZN site already includes some of this capability. There was also a call, particularly from EME newcomers, for a section on the site, again segmented by band, which would answer the question "How do I get going on xxx MHz EME?" and also have an FAQ section. This should not discourage stations from putting skeds, planned activity up on moon-net. Some people have trouble with spam and unwanted messages but there are ways around (my own ISP strips off 95% of the spam). Al, K2UYH, undertook to look at how the existing capability might be enlarged to include this. On the question of slanting the choice of AW to try to favor those weekends, which had hours that are more "sociable" rather than seeking perigee and other favorable moon conditions, the feeling was that we should try this in the next AW selection that is made. This is normally published in the December NL with a request for comments… Please participate in this process next time. Use of Digital modes: It was noted that there had been an increase in 2 m EME activity specifically due to JT65 operation, but there was no consensus view as to whether or not stations that entered EME operation with the help of JT65 capability subsequently increased their station capability and added CW as an option. With the decrease in CW as a license requirement JT65 offers a route to EME for non-CW operators. The presence of "Big Gun" stations on 432 and 1296 can be of most use if they advertise in advance when they are likely to be on the air by one or several of the methods discussed earlier. An issue concerning EME contests was also discussed at this point. Dom, HB9BBD, proposed that instead of beginning the contest at a set time worldwide, 0000 hrs for example, it should start at the local moon rise of the station concerned and that the contest duration should last for one moon pass rather than two as at present, with the second pass being used for another band. Adverse weather is an obvious factor against this proposal, but it was felt that it deserved wider debate in the community.

2. Galileo - *Galileo is a satellite based positioning system, similar to GPS, being built under already committed EC funding and intended to be operational in about 2008. As well as using the current GPS allocations on a compatible basis, it also uses spectrum from 1260 - 1300 MHz. This appears to lead to the possibility of interference both to the user equipments form amateur operations and from the satellites to sensitive receiving systems such as EME operation.* Peter, G3LTF, explained the outline of the problem. Interference to EME operation could result in ~ 14 dB increase in noise in 500 Hz as one of the satellites passed through the beam of a 6 m dish. The effect would be 30 dB worse for a 0.5 MHz noise-measuring receiver. Interference to the ground based receivers is not easy to estimate as the precise nature of the signal processing used is unknown, but it could be significant. Marc, N2UO, suggested that weak signal operation could be move to a null in the spectrum, which appears to be at 1300 MHz. Everyone was encouraged to try to find out whether their national societies were active in confronting this problem, which will affect all operations on 1296 MHz, not just EME.

3. Activity on the 13 to 3 cm bands - *How can we increase activity on the higher bands, specifically 13, 9, 6 and 3 cm? Separate activity weekends, sun-moon separation is less important on these bands? More publicity for current activity? Better availability of information on how to operate cross band? How do we live with the increasing level of commercial QRM on these bands?* Unfortunately, there were only a few representatives of operation on these bands at the forum, but it is clear that we need more publicity for what goes on in terms of skeds and activity arranged outside the AW. (For solution, see 1. above) Some publication of methods to build cross band operating systems for 13 cm would be helpful; JA4BLC has recently built a 3band single LO transverter. The presence of 2.4GHz "new technology" systems in the US makes the possibility of a common frequency in the 2424 MHz region totally impracticable and so we are stuck with cross band operation. The separate contest weekend for these bands, Oct 30-31st was welcomed.

4. Polarization standards above 13 cm - *Polarization standards above 13cm…are they a help or a hindrance?* Zdenek, OK1DFC has presented a paper at the conference with designs up to 3 cm, the view of the forum was that with this solution to the problem there was no real reason not to adhere to the circular polarization standard.

5. Standings - *How should the "standings" be configured to reflect the emergence of digital modes on EME?* All agreed that there should not be separate tables for digital and non-digital modes and that we should avoid divisions. The proposal was made that a similar scheme to that used by the ARRL for VHF standings should be adopted which is that if a stations total includes states or grids worked by EME then the total has an asterisk beside it. There was vigorous debate on this topic but on a show of hands, the proposal was agreed and Al, K2UYH, undertook to speak to HB9CRQ who maintains the 432 MHz and above standings to implement it.

6. EME Hall of Fame: Al, K2UYH, spoke of the great contribution made to EME techniques by Peter, OE9XXI, who passed away in June this year and is greatly missed by the EME community. He proposed that we should set up an EME Hall of Fame (on the web page of W6/PA0ZN) to recognize highly significant contributions and achievements in the field of EME and that Peter, OE9XXI, should be the first elected. This proposal received unanimous support. Al further proposed that a committee be set up to propose rules for selection and to subsequently nominate up to 5 additional members to be confirmed at the next EME conference in 2006. The committee members proposed were KL6M (who, being present, volunteered as chair) DL9KR, JA4BLC, HB9BBD and VK3UM. Mike, KL6M, will progress this proposal.

7. Next Conference Venue: Dave, DL4MUP, on behalf of Rainer DF6NA, gave a presentation describing the attractions of Wurtsburg, Germany as the 2006 venue. Everyone was impressed, especially by the descriptions of the beers, and the proposal was accepted with unanimous acclaim. The Chairman complimented DL4MUP on his excellent command of English! [Dave is originally from the UK].

Spouses at EME2004

Test Area where SM5BZS ran his transceiver clinic

EME2004 Banquet

FINAL: The most important part of the conference was the forum on Procedures and Practices summarized in the last section. Considerable time was spent on finding ways to increase EME activity. There will be more emphasis on publicizing the dates of the AWs. And in the future the AWs will be selected with emphasis on weeks with moon times that will be "user friendly" - attract participation! I hope the formation of an EME Hall of Fame Committee will have a positive impact on our unique part of amateur radio. 2006 and will come very soon. I am looking forward to seeing you all there and off the moon during the coming AW. 73, Al – K2UYH