432 AND ABOVE EME NEWS
MAY 2013 VOL 41 #5

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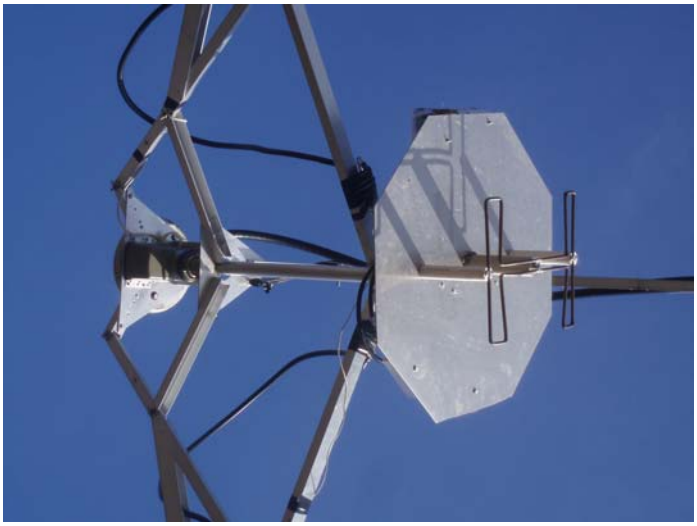
CONDITION: Reports this month are dominated by the 432 CW DUBUS Contest. Reports indicate generally good conditions, except for Sweden where aurora was a big problem. Despite the aurora and a case of the flu, SM4IVE appears the leader with a score of 33x32. This is significantly down from last year, but this was not the case for all reported scores. Some actually found improved activity! There are also some additional 23 cm SSB contest reports this month, but I1NDP is still well in the lead as Top Fun Maker! There were no additional 70 cm SSB logs. There is a lot still scheduled for April: 1) 13/14 April is the DUBUS 3 cm and up contest, 2) 19/20/21 April the 5H1DX and 9G5EME dxpeditions - see below, 3) 21 April 1430-1630 and 2230-0030 the next 70 cm CW ATP, and 4) 20/21 April the ARI's new modes contest. But April is sure to be out done by May. There is the 23 cm contest on the 11/12 May, and the 6 cm contest on 18/19 May, not to mention the 70 cm ATP on **19 May 1300-1500 and 2130-2330**. And if 2013 is like 2012, I am sure there will be some surprises.



Rotable 70 cm feed used SP7DCS in the DUBUS Contest – See Chris' report later in this NL

5H1DX: Bodo (DF8DX) df8dx(x)gmx.de appears on track for 70 and 23 cm from Tanzania. He will be there between 20 and 28 April. Operation on 70 and 23 cm will be with his usual single yagis and 100 W for each band. His operating schedule is still not fixed. It still seems most likely that his first activity will be on 20 April from Dar es Salaam from 2000 to 2200. He will send updates regarding operating times to www.mmmonvhf.de.

9G5EME: Rene's (PE1L) hasperrene(x)gmail.com latest news on his group's (PA3CEE and PE9DX) active from Ghana (IJ95gb) is for 23 cm on 19 April and 70 cm on 21 April. They only plan on one day for each of these bands! They will TX first and RX on their own echo frequency. On 1296 they will have 100 W and a 59 el SHF yagi, and TX on 1296.090. On 432, they will have 100 W and a 23 el DK7ZB yagi, and TX on 432.090. If they have Internet, they will be on the HB9Q logger for last minute freq changes, etc.

CT1DMK: Luiz ct1dmk@gmail.com reports on his Feb SSB Contest results – I had 16 SSB and 1 SSB/CW with 10 multipliers for a total of 330 points. Worked 16 Feb were YO3DDZ (55/42) KN, SP7DCS (44/55) JO, OK1CS (55/44) JO, F5SE/P (55/53) JN, I1NDP (55/55) JN, UA3PTW (55/55) KO, OK2DL (55/55) JN, LX1DB (57/57) JN, N2UO (55/55) FM, G4CCH (55/54) IO, VE6TA (55/55) DO, IZ1BPN (55/55) JN, N0OY (55/55) EM, G4RGK (559/44) IO on CW/SSB, K2UYH (55/55) FN, PY2BS (55/55) GG and I5MPK (55/55) JN.

DL7APV: Bernd dl7apv@gmx.de is temporarily QRT on 70 cm -- After 13 years, my elevation rotor (MT3000) gave up. I have had a problem finding spare parts for this old model, but it appears M^2 will come through with the needed parts. At the present below freezing temperatures and lots of snow, it seems that the repair could take a while. I am QRT until then.

G3LTF: Peter g3ltf@btinternet.com sends his March report -- Our UK weather has not been very conducive to EME operation, cold and strong winds for much of the time. I did get on for the DUBUS 432 EME contest and worked a total of 24. QSO'd were VK3UM, SM4IVE, OZ4MM, ES5PC, DL9KR, UA3PTW, JA6AHB, SP7DCS, LZ1DX, SP6JLW, OK1CA, UT2EG, OH2DG, SV1BTR, SM2CEW, DK3WG, N4GJV, DG1KJG, VE6TA, NC1I, KL6M, LX1DB, DF3RU and K2UYH. CWNR were IK2RTI and PA3DZL (on both days). I also heard S51ZO, S51CS?, JJ1NNJ (much weaker than usual) and DL7APV. Someone called me on the 16th at about 1710, but I just could not get the call. The band conditions were variable with zero Faraday all day on Saturday until sunset when it changed to 90 deg in 30 minutes. On Sunday Faraday started at zero then from about 1100 onwards frequent displayed changes of up to 90 degs due to intense solar activity. There were sharp polarization peaks both days. Echoes were very strong early on Sunday. Sun noise measured 15.4 dB with an SF=126. Activity was pretty low and mostly from EU. On 18 March, I was delighted to work on 23 cm VK2JDS on CW for initial #370. When my dish cleared the trees, he was (559). The next day, I worked I5MPK on 23 cm. Piero as always had a nice signal for a CW chat. On 24 March, I tried to get some activity going on 13 cm, but the WX in EU was poor and the timing not great. I worked SM6CKU and heard HB9Q (59), and could hear OH1LRY on JT at S4. On 26 March, I put the 6 cm feed in the dish planning to try (at 0300) with VE4MA, but it was clear that he wouldn't hear me (Barry had only 0.3 dB of Moon noise). SM6PGP did show up with a nice (549) signal from 80 W with a 1.8 m dish, but couldn't copy me (22 W on 5 m dish). On 6 cm I have 14 dB sun noise (SF=92) and 1 dB of Moon noise. I am continuing to work on dish profile improvements, but the really cold WX has slowed down progress on outside jobs. On 7 April I was on 13 cm and worked ON5TA on CW and LX1DB on SSB; both had excellent signals. I shall attend the SM meeting in May and look forward to meeting a lot of long time EME friends there.

IZ1BPN: Steve iz1bpn@libero.it reports on his 23 cm SSB Contest results – I operated the contest with IK1EGC and IK1MTZ. We worked on 16 Feb F5SE/P (53/54) JN, SP6JLW (55/54) JO, I5MPK (54/57) JN, I1NDP (59/58) JN, PA3DZL (52/55) JO, OK1CS (53/56) JO, UA3PTW (53/56) KO, SP7DCS (54/57) JO, YO3DDZ (55/55) KN, LZ1DX (53/55) KN, ON5TA (539/55) CW/SSB JO, OK2DL (58/58) JN, DF3RU (55/55) JN, LX1DB (58/59) JN, CT1DMK (55/55) IN, NØOY (58/58) EM, VE6TA (55/56) DO, PY2BS (55/55) GG, N2UO (55/57) FM, K2UYH (57/55) FN, W6YX (549/54) CW/SSB CM, G4CCH (56/57) IO and VA7MM (529/54) CW/SSB CN for a score of (20x2+3)x12 = 559.

K2BLC: Al tubadoc@cfl.rr.com in FL is moving to 1296 after completing DXCC on 144 -- I have a 3.6 m dish on an AZ/El mount with a feed now in place. [He does not say if it is circular.] I am presently manually aiming the dish, but will have it fully motorized very soon. I have already copied the ON0EME beacon (Q5) and I1NDP on JT65, but I could have had an armchair CW contact with him. I have a 150 W PA and expect to be QRV by May.

K4EME: Cowles candrus@mgwnet.com reports on his recent 70 cm activity -- I was QRV on 23 March around 2230. I looked for CW activity, but it was quiet, so I scanned the band and heard a huge signal on JT near 432.069. I copied NC1I on JT65B. He was one of the strongest signals that I have ever heard off the Moon, really moving the S-meter! We worked, and his signal peaked a few times at (0DB)! Last weekend, I made some changes to my station's sequencer, to better protect preamps when I am on CW and forget to switch between the JT and CW modes - usually at 3 AM in the morning when I have had little sleep! The weather combined with unforeseen family responsibilities kept me off the

air for much of the DUBUS 432 EME Contest. On Sunday I did work KL6M (extremely loud) and SM4IVE.

N2UO: Marc lu6dw@yahoo.com sends his SSB contest report -- My SSB contest score was not my best as I had several people in the shack that came to experience SSB EME, some for the first time, and we spent a lot of time talking. Most of the guests operated the station. We worked DF3RU (56/55) JN, UA3PTW (56/56) KO, I1NDP (55/57) JN, OK1CS (55/55) JO, F5SE/P (54/56) JN, OK2DL (57/57) JN, SP7DCS (54/55) JO, CT1DMK (55/57) JN, G4CCH (55/55) IO, VE3KRP (33/55) EN, LX1DB (56/57) JN, IZ1BPN (55/57) JN, K2UYH (56/56) FN, VE6TA (55/55) DO and N0OY (55/55) EM. Conditions were great but we missed lots of stations that we heard, and never had the chance to QSO them. Our final score was 15x2x8 = 240 points. I have just completed an new 400 W SSPA for 1296 using GaN devices. I am very pleased with its performance, although the devices are still a bet expensive for most hams.

N2UO's new 400 GaN SSPA for 1296

N6OVP: David n6ovp@pacbell.net that he is getting very close to being QRV on 23 cm -- I now to go with my 3.2 m dish a G4DDK LNA and a 300 W SSPA. I still need workout my Moon tracking, but hope to be hearing my CW echoes soon.

N4PZ: Steve n4pz(x)live.com continues to promote 1296 CW on t the 20 m net and reflectors – This past month I worked on 23 cm CW on 16 March WB2BYP (579) - armchair copy, and on 23 March WB2BYP (579), VE3KRP (559) and IK5VLS (569).

NC1I: Frank frank@nc1i.com sends news on his March activity -- I was able to get on for the DUBUS 70 cm Contest on Saturday (16 March) for a couple of hours. I found activity pretty good and conditions excellent. During the time I was on, almost all contacts were horizontal for both TX and RX. The following stations were worked at starting at 1924 SM4IVE (599/589 – 539 before rotating pol), SP7DCS (559/589), SV1BTR (589/599), DG1KJG (579/579), SP6JLW (569/579), VE6TA (579/589), LZ1DX (589/589), OZ4MM (589/589), OK1CA (579/589), UA3PTW (589/589), DL7APV (599/579 – 579 before rotating pol), N4GJV (569/589, G3LTF (589/579, ES5PC (569/569) and KL6M (559/579). I called CQ for 2 hours during my Asian window, but only heard VE6TA. W1QA activated the station on WSJT the following weekend and added on 23 March at 2222 OH6UW (12DB/10DB), 2244 K5DOG (14DB/11DB), 2258 K4EME (11DB/O) and at 2314 EA4CYQ (22DB/21DB), and on 24 March at 0016 YL2GD (13DB/17DB), and at 0340 KJ6MSU (21DB/12DB). We will be active using both CW and WSJT for April, and will make a special effort to try and work 9G5EME.

OK1CA: Franta strihavka@upcmail.cz was QRV on 432 for the DUBUS Contest, but his operating time was limited by a power supply problem -- My first EME activity of 2013 was the DUBUS EME Contest on 432. I tested my new SSPA with around 800 W out. The power was limited by the power supply. It was -12 degs C and I had ice on my 10 m dish. I made 23 QSO at Saturday when my power supply stopped working after my QSO with NC1I. During the contest, I added initials with LZ1DX, OH2DG, UA2EG, IK2RTI and PA3DZL to bring me to initial #161. My score in the contest was 23x23. The activity on 432 did not seem as high as it was in past times.

SM4IVE: Lars sm4ive@telia.com was on in the 432 DUBUS EME Contest, but not as active as usual as he had the flu – During the contest I did not feel too good, and conditions were terrible due to aurora, which made it hard to copy signals. I had problems with all stations. I went to bed at 2000 due to the flue, but was active from moonrise (~10 degs) until 1000 when the aurora hit making condition no good at my latitude. [I did spend some time on aurora. I worked SM7GVF on 23 cm aurora (55A) and some Russian stations on 432 with very strong signals.] On 432 EME, I QSO'd KL6M (559/579), UT2EG (529/559), JA6AHB (529/599), ES5PC (549/569), VK3UM (569/579), LZ1DX (549/579), OH2DG (559/589), OZ4MM (579/579), UA3PTW (559/599), OK1CA (569/599), SP6JLW (569/589), SV1BTR (569/599), SP7DCS (569/599), G3LTF (569/579), DG1KJG (569/579),SD3F (O/O), DL7APV (589/599), OK1TEH (O/O), LX1DB (559/599), IK2RT (529/579), SM2CEW (549/579), DK3WG (559/579), PA3DZL (529/559), N4GJV (539/579), VE6TA (549/579), NC1I (589/599), SM3JQU (529/569), S51ZO (O/O), OH6UW (O/O) for an initial (#), K5DOG (O/O) (#), K2UYH (569/589), SM7GVF (O/O) and K4EME (549/559). I was called by a station beginning with P, but he was to weak. JJ1NNJ also called but was so weak that I was not sure it was him and we did not complete. I heard DL9KR and DF3RU. I ended with a total of 33x32. If I had more energy, I am sure I would have worked more. Last year I had 52x48.

SM6PGP: Hannes sm6pgp@telia.com is now QRV on 6 cm EME -- I am new on EME. I worked my first 6 cm CW EME QSOs during Feb/March. My first QSO was with K5GW. His signals were actually the first signals I have ever heard from the Moon on 6 cm. I have also worked W5LUA, LX1DB and OK1KIR so far. I also call K5GW after he had a sked with VE4MA/W7. I have a 1.8 m prime focus dish with a septum feed designed by SM6FHZ and built by me. My power is about 80 W at the feed from an SSPA mounted close to the feed. The SSPA is my own design with two CREE GaN HEMTS (CGH55030) running on 48 V. The driver is a CGH40006. I have done some RX testing on 23 cm with a circularly polarized patch feed in my small dish, and can hear ON0EME and see the signal on the waterfall. I heard some SSB signals during the SSB fun contest that I could identify: OK2DL and LX1DB. My next goal is to build a septum feed for 3 cm and to do some RX during the DUBUS 3 cm EME contest. The 3 cm septum feed is at simulating/building /measuring/modifying state - back and forth - between me and Ingolf (SM6FHZ).

SM6PGP's 1.6 m dish on 6 cm

SP7DCS: Chris sp7dcs@wp.pl reports on his 70 cm DUBUS Contest operation -- Having both 432 and 144 operation in one weekend was a good idea considering activity level. I operated both bands and found it was just enough time for the two bands. I spend about 50% of my time on each. It made the whole weekend much more interesting and fun. On 70 cm I managed to make 22 QSOs, which is a little less than last year. I also had less output power last year. QSO'd with my 6 m dish, rotatable dual dipole feed and SSPA were KL6M, VK3UM, OZ4MM, UA3PTW, OH2DG, LZ1DX, SM4IVE, DL9KR, SP6JLW, OK1CA, JA6AHB, G3LTF, SV1BTR, ES5PC, DK3WG, VE6TA, NC1I, N4GJV, DL7APV, DF3RU, K2UYH and LX1DB. I plan to be on for the 23 cm leg with usual setup, and there is also a small chance that I could be on 13 cm if I can get my rig running by contest time.

VE4MA/W7: Barry ve4ma@shaw.ca is now back in Canada, but before he left AZ made some QSOs on 23 and 6 cm – Using my 5' offset dish on 1296 with 150 W at the feed, I worked N4PZ, W7JM, WB2BYP, K2UYH and VK3UM with decent reports considering my setup. On 5.7 GHz, I have worked LX1DB, W5LUA, OK1KIR and K5GW. I am not entirely satisfied that my preamp is as good as it should be. Before I departed, I have a resked with W5LUA on 5.7, now that I have a pointing error corrected that affected our first QSO.

VE4MA/7 5' dish (1/4 of 10' dish fed offset) with 1296 feed

VE6TA: Grant ve6ta@clearwave.ca sends a summary of my EME activity over the last month -- I participated in the 1296 SSB contest in Feb. Conditions and activity were both quite good. Stations worked were KL6M, N4PZ, W7JM, K2UYH, VK5MC (CW to SSB), JA6AHB, OK2DL, I1NDP, LX1DB, UA3PTW, SP7DCS, OK1CS, F5SE/P, G4CCH, CT1DMK, IZ1BPN, N2UO, NO0Y and I5MPK for a score of (18x2+1)x14 for 518 points. For the DUBUS contest, I waded through 3 feet of snow to get to my dish and change the feed from 1296 to 432. It has been an incredible winter so far for snowfall, and more is forecast. I experienced a circuit breaker trip on my 432 HV supply, so had to use a back up supply for the first pass, which reduced my TX power to about half. But conditions were good enough that it didn't seem to matter that much. Stations worked on were N4GJV, K2UYH, VK3UM, JA6AHB, KL6M, SM4IVE, SP7DCS, G3LTF, UA3PTW, ES5PC for a 70 cm initial (#), OK1CA, SP6JLW, DL9KR, OZ4MM, SV1BTR, LZ1DX, NC1I, DF3RU and LX1DB for at total of 19x19 - of course all on CW. The 432 segment has become quite leisurely for the last few years. It was quite enjoyable actually as it gave me time to work out a few bugs in the shack. I note that I worked only 18 in the last contest, and thus this time managed to do better. Perhaps I will have a chance to set something up to SWL on 3 cm during the DUBUS 10 GHz contest in April.

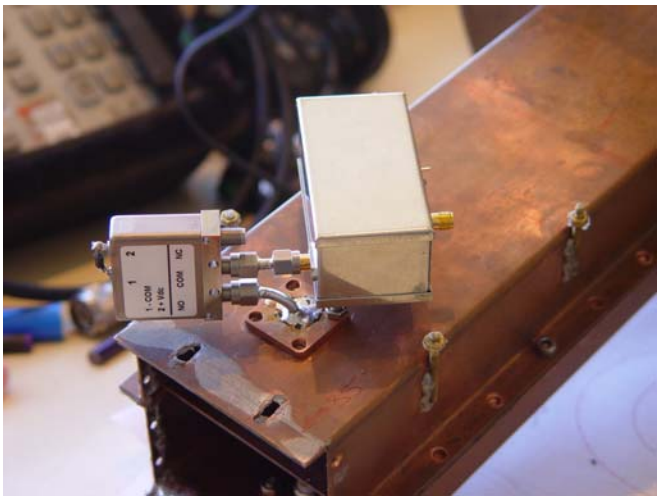
WB2BYP: John storyavenue@hotmail.com report on his recent 1296 activity – I worked on 23 March I5NDP (55/55) on SSB and had a partial with N2UO, on 24 March N4PZ (569/579) and VE3KRP (529/549) and heard IK5VLS, and on 27 March VE4MA/7 (O/O) and TI2AEB (O/O) – all on CW. My spring plans are to switch over to a new feed for 23 cm and change to an improved the azimuth drive in anticipation of use of the dish on higher frequencies. On 23 cm my YL1050 PA is now working very reliably at 700 W with heftier HV PS transformer in place. My receiver still needs to be improved; hopefully in the switchover to a new feed and LNA.

K2UYH: I a.katz(x)ieee.org had a major conflict with the DUBUS contest. It was on the same weekend as the computer festival (TCF2013) that I have chaired for many years. I was able to be QRV for the start of the contest (after the end of my EU window) and worked on 16 March KL6M (559/559), VE6TA (559/559), JA6AHB (559/549), N4GJV (559/559) twice and VK3UM (559/559). I added on Sunday, 17 March UA3PTW (579/579), SV1BTR (579/579), SP7DCS (569/569), G3LTF (569/569), DF3RU (559/569), LX1DB (569/569), LZ1DX (559/579), SM4IVE (589/569), ES5PC (569/569), S51ZO (559/559) and DG1KGJ (559/559) for a total of 16x16. I worked on 1296 on 23 March at 2223 IK5QLO (18DB/O), 2240 YO2BCT (17DB/11DB) mixed initial #429*, 2248 YO2LEL (16DB/11DB) #430*, 2253 partial II5ISS (12DB/-) disappeared after calling and 2308 IK5VLS (17DB/9DB) – all these QSOs were on JT65C. I added on 30 March at 1000 VE4MA (449/555) in AZ for CW initial #341 and #431*. I am planning to be on for the 3 cm DUBUS Contest in April with some of the JT team.

NETNEWS: **G4BAO** is QRV on 13 cm with a 1.9 m dish, 200 W and a 0.6 dB system NF. He can now listen on 2304. Look for John on the HB9Q Reflector. **G4CCH** is working on 6 cm EME and hopes to be QRV for the DUBUS Contest in May. **K2DH** has a new email address K2dh1@frontier.com. **LX1DB** has been QRV this past month on 13 cm (10 m dish and 450 W at feed) and on 6 cm (3 m dish and 245 W at feed). **ON5TA** is QRV 13 cm and looking for skeds. Eric has a 3.6 m mesh dish and about 150 W at feed. **KJ7OG** is listening on 70 cm from (DM42mh) with 2 x 12 el (H/V) yagis. Steve steveb29@comcast.net has no power yet. **SV1BTR** plans to be QRV on 10.368 for the 3 cm DUBUS EME Contest weekend with a temporary QRP test setup using a circular pol feed. My final setup due in autumn will use linear pol and my 4.9 m dish. **WB7QBS** is continuing his 432 skeds with K4EME. **K4EME** worked on 23 Mach KL6M on both JT and CW. **KJ7OG** is working on a 432 500 W PA for 432 EME. **SM7SJR** was on 23 cm CW. **VE5KKZ** is just about ready to start making QSOs on 1296. W5LPL is heard CW signals on 1296 using a 2.2 m dish with a linear feed. Les is waiting for a septum feed to arrive. **VE3KRP** says snow has slowed down his March 1296 activity, but that he QSO'd on 26 March W7JM for initial #81.

FOR SALE: **N4PZ** recommends that anyone needing actuators should investigate **Impakt Products** support@impaktproducts.com. Their tel is 1-614-252-3200. Steve says ask for Bill, and that they have the best prices by far. **K4EME** is now offering for sale a Super 432 LNA that he believes is the best available – see his write up at the end of this NL. **If you are interested contact Cowles at** candrus@mgwnet.com **or call** (540) 294-4590. He has units ready for delivery.

TECHNICAL – N4HQ 1296 SEPTUM FEED: In April I included a photo of the 1296 dish feed N4HQ is now offering for sale, but did not include any comments. Lye wrote -- This feed seems to work so much better than the original OK1DFC feed I had built. I only have simple test equipment (simple 1296 SWR bridge and a field strength meter. It tunes real nicely from 1240 to 1300 and has about a 30 MHz bandwidth. Basically it is a mating of the PY2BS's and KL6M's feeds. The only change I made is the tuning screws. The discs were fine, but the brass toilet bowl mounting bolts I use seem to do a smoother job. The probes are 3/16 inch copper tubing (5mm) on N connectors. [N4HQ's feed does not come with a scalar ring. This ring is important for best performance – see my comment in the Final section of the recent March NL. PY2BS also recommends to improve the basic septum, add a simple choke ring -- see http://www.ok1dfc.com/eme/technic/septum/septum_feed_with_ring.pdf. Bruce also suggests minimizing the losses between the LNA and the feed's probe. One way this can be done is to eliminate the connector of the RX port and replace it with a piece of cooper or other material you can solder on it. Then make an L of semi-rigid coax like the RG-402. On one side of it install a SMA male connector for the relay, and on the other side solder the antenna probe directly on the cable's inner conductor.



Septum feed with cable connection to the protection relay

FINAL: The "Expanded Results" for the ARRL 2012 EME Contest are now at http://www.arrl.org/files/file/ContestResults/2012/2012-EME-Web.pdf. Thanks to Rick, K1DS for the great job in preparing the write up. See the following table of highest scores. Congratulations to K5GW for the highest single op score, followed by UA3PTW, while SV1BTR took the top spot for CW only (3rd

highest single op). The highest score was by K1JT's group effort. There are also some very impressive single band scores: Top on 70 cm UA3PTW and SV1BTR CW only, 23 cm OK1DFC and I1NDP CW only, 13 cm SV1BTR, 9 cm PY2BS, 6 cm SV1BTR. (Single band 3 cm and above were not listed).

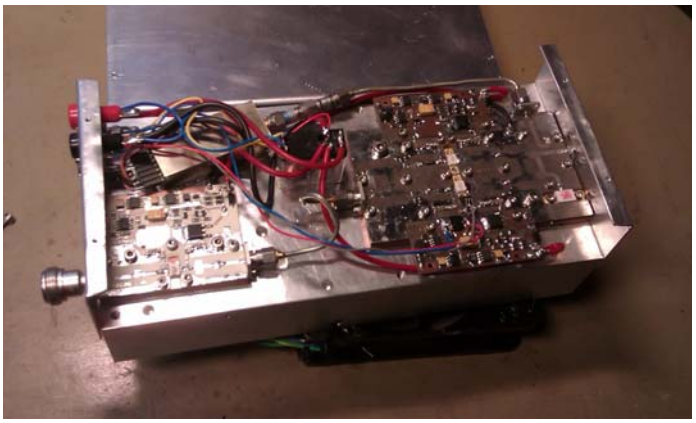
Table 1: Top Three Scores by Category

Single-Operator	*Station*	*Bands*	*QSOs*	*Mults*	*Score*
All Mode	K5GW	BDEFGH	274	159	4,356,600
	UA3PTW	BDE	293	126	3,691,800
	LZ1DX	BDEF	147	100	1,470,000
CW Only	SV1BTR	BDEFH	196	120	2,352,000
	G3LTF	DEFGH	153	90	1,377,000
	OZ4MM	BDEF	134	84	1,125,600
Multioperator	*Operators*				
All Mode	K1JT	BDEFGH	362	167	6,045,400
	(+ K1DS, K2BMI, K2QM, K2TXB, K2UYH, NE2U, K3TUF, W9IP)				
	W6YX	BDE	143	79	1,129,700
	(K2YY, KJ6SDF, AA6XV, W6TCP, KG6NUB, W6RK, N7MH, AD6FP, AD6IW, ops)				
	LU1C	BDE	101	62	626,200
	(LU1AEE, LU1AGR, LU1CGB, ops)				
CW Only	SP7DCS	BDE	103	62	638,600
	(+ SP7MC)				
	S59DCD	EF	80	45	360,000
	(S57O & S5ØX, ops)				
	WD5AGO	EF	66	46	303,600
	(+ KF5NTV & KF5SYP)				

The 13 cm allocation in Australia may have similar troubles to Sweden – see http://www.southgatearc.org/news/february2013/proposed_reallocation_of_2_3_ghz_band.htm. There are also treats to the 23 cm band in Japan and worldwide. We need to get our message out, but it is not always obvious how to best do this. The Australian amateur organization appears to be doing its part to protect the diminutive VK 13 cm allocation. JH1KRC has been representing the EME community in Japan, but troubling times are ahead.

The Third Swedish EME meeting on 24-26 May in Orebro is will be top of the line with presentations by RW3BP on 77 GHz EME and RA3AQ on feeds... Not to be missed if you can possibly attend.

As noted at the beginning of this NL, this is an exciting time. April and May are chock full of EME contests and dxpeditions, plus a list of new stations coming on board. I hope to work all of you off the Moon. Keep those reports coming! 73, Al – K2UYH



SM6PGP's 6 cm 80 W GaN SSPA

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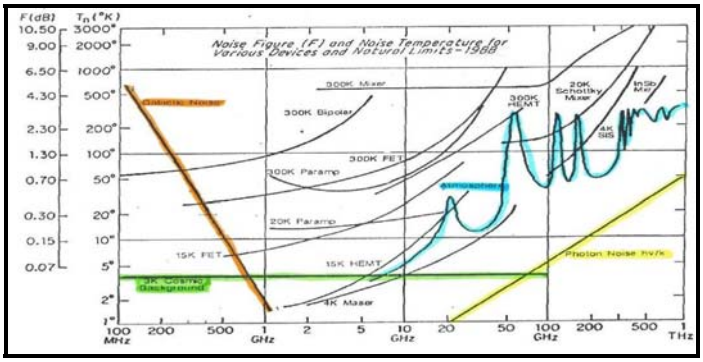
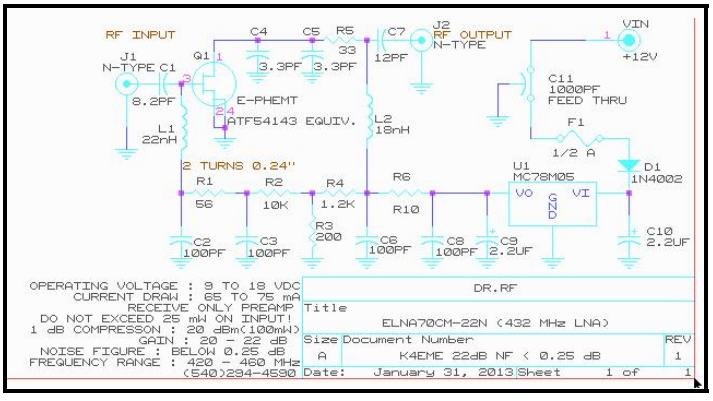
ELNA70CM-22N 432 MHz EXTREMELY LOW NOISE PREAMP

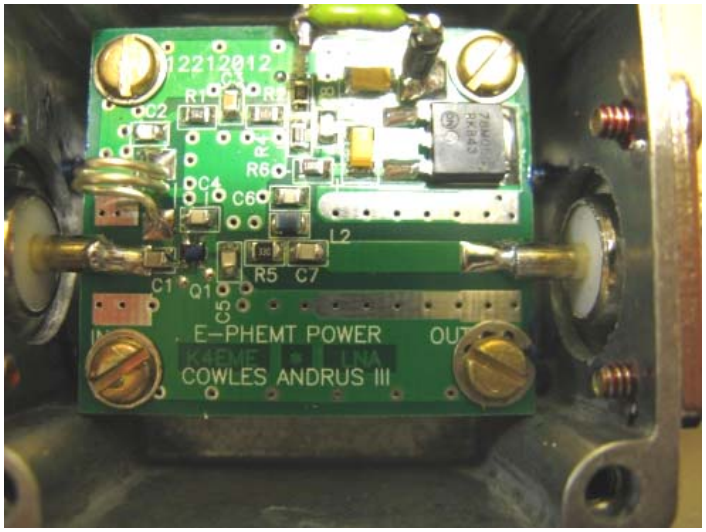
This product is for the serious Ham Radio Operator who is looking to hear **extremely weak signals**, such as **EME**, **terrestrial** and **satellite** type communication. Without cryogenics, this type of preamp has the lowest NF available at this time. Signal-to-noise improvement of 6 to 14 dB can be expected even with current high end radios such as the Kenwood TS-2000 or the Yaesu FT-847. I have heard clearly echoes off the moon using one FO-22 yagi and this preamp attached at the antennas feed point! This preamp is designed around a device that uses E-PHEMT, Enhancement mode Pseudomorphic High Electron Mobility Transistor technology, which is currently state of the art. Every unit is tested for NF and gain with a HP-8970 NF meter. All preamps have to measure less than 0.3 dB NF, and the actual measurement is printed on the back of the preamp. There is some uncertainty associated with measuring NFs as low as this preamp has. Agilent Technologies has covered errors in measurements well on their NF Meter Web Page. One question from a lot of people is how are you able to achieve this low of a NF? The answer I give is that when the PHEMT device is operated with Ids = 60 mA it has a minimum NF of only 0.076 dB. There is however a little loss matching the device to 50 ohms, which does add to the total NF, however I incorporated a very low insertion matching network to get the best noise match I could get. The devices input impedance is ~ 70 ohms + j40. I used a match that was first used by Filip, VK3FLP, in one of his preamps, except instead of using a low-Q higher loss surface mount inductor, I used a high-Q silver plated air wound inductor and a very high Q capacitor. Also Filip used an ATF-54143 HEMT device, instead I used a similar device except with a slightly better NF at 432. I would also like to give YU1AW some credit for a great cavity type preamp build around a HEMT device, which may not give any better sensitivity or NF, but more selectivity. I ran across YU1AW design actually before Filip's design, however Filip's was closer to what I was looking for as far as size. With the high 1 dB compression point of 20 dBm, (100 mW), and the third order intercept of over 30 dBm, (1watt), of the PHEMT, I figured that unless you are sitting on top of a UHF TV station, you may do just as will without the input cavity and with a much smaller preamp package. If you really need the selectivity, please consider using YU1AW design. Most anyone doing EME or weak signal work is familiar with how to switch high power around a preamp along with using a sequencer. The specification on the active device says it will except up to 50 mW without damage. I would not recommend anything more than 25 mW as for a design guide line. I have and sometimes run the legal limit on 432, and have used the ELNA70CM-22N and its prototype for over a year with no issues. It is by far the best preamp I have ever owned, and I have bought and own a lot of preamps. Some include two amateur built cavity type preamps, one stripline preamp, and a SSB-Electronics and ARR preamp. All offer good performance, however none of them measure better than 0.4 dB NF except for one built by Filip, and Sam Jewells, G4DDK, which measured 0.34 dB on my NF meter, while the ELNA70CM-22N always measure under 0.3 dB NF! If you need a more than 22 dB's worth of gain, maybe Sam's preamp is better suited for your situation; it's a great little preamp! You would need to do a complete system's NF calculation to find out which would serve you better.



The Graph above shows how much a preamp with a certain NF may help you in receiving weak signals due to other natural noise sources. As you can see, at 432 a systems noise floor down to around 0.3 dB would be very useful. At that point Galactic Noise starts to contribute to the total system's noise, so less NF below this point does not buy you much, or does it? Remember any insertion loss before the preamp contributes to the total system's noise, so insertion loss associated with feed lines, antenna combiner's loss, and relay loss before the preamp need to be minimized. So even with the best system, a lower noise preamp helps, at least on 432!



Preamp Specifications: Operating Voltage: 9 to 18 volts DC, Nominal 12 VDC, Current Draw: 65 -75 mA, Maximum input without damage: 25 mW, Operating Temperature: -40 to +140 Degrees F (-40 to +60 C), Gain: Nominal 21.5 dB (See measures on back of preamp), NF: Below 0.25 dB @ 75 degrees F (24 degrees C) (See measures on back of preamp), 1 dB compression: 20 dBm, 3rd order intercept: 30 dBm, Weight: 5 oz.



Microstrip impedance controlled quality printed circuit board with a very Hi-Q low insertion loss input matching circuit.

WARRANTY AND CONTACT INFORMATION

I will warranty any failures due to workmanship on this product for 1 full year after purchase date free of charge except costumer pay shipping cost in both directions. After the 1 year warranty expires, I will be glad to repair the unit for $25 for another year. This price may have to increase after two years due to part cost increases and the extent of the unit's damage. This unit is designed to be water resistant; however it is not water proof. Please locate this preamp out of the weather, in a weather proof container if possible to keep it from being exposed to direct rain, snow, or ocean spray. Do not put in an environment of that the temperature would exceed 140 degrees F. This warranty does not apply to acts of God, such as Lightning or voltages surges exceeding 18 Volts to the power input. Please observe proper polarity, and never exceed 25 mW of RF to input or output of the preamp. With care, this preamp should provide you with many years of great signal to noise enjoyment!

"THE QUIETER YOU BECOME, THE MORE YOU CAN HEAR"
RAM DASS

Contact information: Cowles Andrus, III (K4EME), 73 Hundley Mill Rd.,Staunton, VA 24401, Tel: (540) 294-4590. candrus@mgwnet.com
http://cowlesradio.webs.com/DRRF.html

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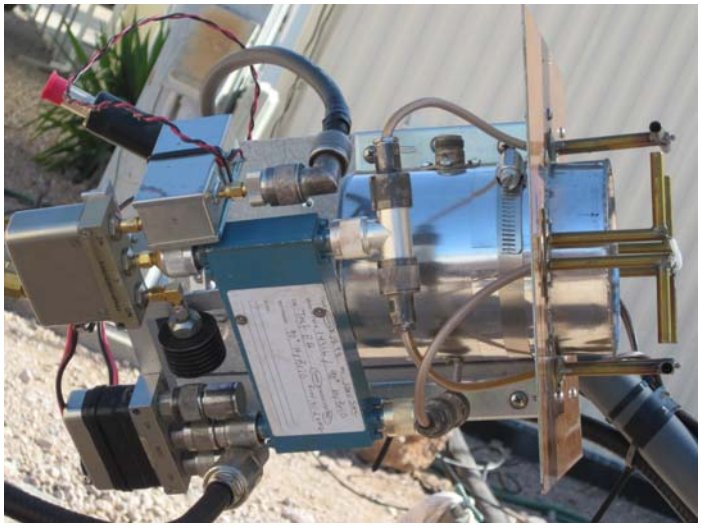

VE4MA/7 1296 feed and preamps

1296 Septum feed with sclar ring added