



10th INTERNATIONAL AMATEUR RADIO MOON-BOUNCE CONFERENCE

PRAGUE - CZECH REPUBLIC - HEART OF EUROPE - AUGUST 2002

Forum Discussions – Microwave EME Communication

1 *EME on 13cm*

The session on 13cm was well attended; probably about 50 people took part. The discussions were structured around the questionnaire by the conference organisers.

1.1 *Do you support the increase of activity on 13cm?*

The voting was Yes = 30, No = 0, Don't Know = 6. This is encouraging, considering that the total world-wide 13cm activity in the last ARRL contest was 6, and in the last DUBUS contest only 6 entries, 16 stations.

Although the power requirements are not large, 50–100W is adequate, this is less easy to produce than on 23cm. The rest of the system, RX and antenna, is not difficult – plenty of material in the literature.

1.2 *Do you support transmitting on the same offset from the beginning of the frequency band allocated to your country?*

The organization of crossband operation is a significant issue, because there is no common world-wide frequency on 13cm. G3LTF's conference paper describes the problem. To maximize the chances of crossband QSOs, it is important to know where to listen for calling stations.

The recommendation is that if you call CQ on, say, 2304.105 MHz, then as well as listening around your own frequency, you should also listen for crossband replies around 2320.105 MHz or 2424.105 MHz. You will almost always need to listen on only one other frequency, depending on the moon window.

The initial voting was Yes = 25, No = 0, Don't Know = 12. Another vote was taken after the discussion and there was no opposition, so this proposal is **agreed**.

1.3 *To achieve the same offset on three different receiving bands, which technical solution do you prefer?*

G3LTF's conference paper describes the problem. Most EME stations start with 13cm equipment for their own national tropo band, and then they find that they need two more RX converters for world-wide EME coverage. The first solution most people try is a different microwave LO, but this can lead to frequency errors.

The most effective solution is to use a single microwave LO and extract three different IFs at VHF; if necessary, these can then be converted down to a common tuning range with little additional frequency error. (The two stations who work all three crossband receive frequencies regularly, G3LTF and JA4BLC, both use this system successfully.)

The initial voting was 6 for wideband transverters, 15 for another solution and 16 Don't Know... but this may have changed after the technical discussion.



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1.4 *Do you have any experience with crossband operation on 13cm?*

The voting was Yes = 9, No = 26. Hopefully the conference paper and the forum discussion will increase interest. What we now need is some DB6NT or Down East Microwave solution for receiving on three bands, which everybody can buy!

1.5 *What solution do you propose for calling CQ on 13cm, to indicate that you are also looking for crossband QSOs?*

Several methods were suggested, with votes as follows:

CQ 04, CQ 20 or CQ24 indicating the crossband segment	3
CQ X, CQ Y or CQ Z	5
CQ W, CQ EU or CQ JA	5
Other single letter indicating segment	5

After discussion it was decided by a majority vote that the simple **CQ X should be used when also looking for crossband contacts**. In practice the second RX frequency is nearly always obvious from the moon window.

2 *Circular Polarization*

This discussion was about the extension of EME circular polarization standards to the higher microwave bands. Circular polarization is already standard on 23cm and 13cm – for reference, the standard is:

Transmit RHCP, receive LHCP¹

The questionnaire results were as follows. The analysis is in Section 2.4.

2.1 *Should circular polarization be used for EME on all microwave bands from 23cm to 3cm?*

Yes = 41, No = 6, Don't Know = 3.

2.2 *On which bands do you think circular polarization should be used?*

23cm = 8, 13cm = 7, 9cm = 3, 6cm = 4, 3cm = 1.

(There is some confusion about the voting here. Most people understood that question 2 should be answered only if they had voted No to question 1, but some voted Yes to question 1 and then answered question 2 also.)

2.3 *Do you have experience of circular polarization on EME? If Yes, on which bands?*

23cm = 28, 13cm = 14, 9cm = 1, 6cm = 4, 3cm = 7, other = 3. No = 15.

¹ From W2IMU 23cm EME Notes, May 1968. IEEE definition: a wave traveling away from the observer and rotating clockwise is defined as right-hand circularly polarized (RHCP). Note that feedhorn polarizations must be reversed to obtain the correct circularity sense from the dish.



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2.4 *Analysis*

The answer to the question 1 is very clear – a large majority **want** CP to be the standard for **all** microwave bands, up to and including 3cm.

Who says this? The majority of people who voted are not yet active on higher bands, but they are already active on 23/13cm using CP (question 3). Our interpretation is that if/when they move up to the higher bands, they want the **future** standard to be CP.

The main technical discussion was about the technical feasibility of CP, especially on 3cm. Some successful designs do exist, but more effort and publicity needs to be given to low-loss feed designs that are easy to build. Anybody who is already using CP on 3cm should publish how they do it – the more different approaches we all have to think about, the better the next generation of feeds will be.

In the end, of course, the world-wide EME community will 'vote' by what they do on the air.

Peter, G3LTF and Ian, G3SEK

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