



Minutes of the Propagation Studies Committee

Meeting by video conference

11 May 2024

Attendees:

Steve Nichols	G0KYA	Chairman
Dr Chris Deacon	G4IFX	Secretary
Alan Melia	G3NYK	Member
Ron Smith	G3SVW	Member
Prof. Gwyn Griffiths	G3ZIL	Member
Dr Peter Duffett-Smith	GM3XJE	Member
Prof. Barry Chambers	G8AGN	Member
Sam Jewell	G4DDK	Associate Member
Carl Luetzelschwab	K9LA	Associate Member
Bill Liles	NQ6Z	Associate Member

1. Apologies for absence

Apologies had been received from Dr John Worsnop (Vice Chairman) and George Jacob (Associate Member).

2. Matters arising from the minutes of the meeting held on 21 October 2023

These minutes had previously been approved via email and posted on the RSGB website. Matters arising therefrom are dealt with under the relevant agenda items below.

3. PSC membership and roles

It was noted that Prof. Gwyn Griffiths, G3ZIL has agreed to become a Full Member of PSC, and that Dr Olugbenga Olumodimu, Space Project Manager at the University of Portsmouth, has joined as an Associate Member.

It was also noted that Tony Miles, MM0TMZ is now the nominated RSGB Board representative for PSC.

4. Topics for discussion

4.1. RSGB website – PSC pages

PSC webmaster Alan, G3NYK is still updating links on the site. It was agreed that the following updates would be provided to Alan:

Action: G4IFX to provide a suitable link to the meteor beacon (GB3MBA) website.

Action: G4IFX to provide working links to his thesis and publications.



Action: G3SVW to provide updated links for Long Delay Echo reports and research.

4.2. 28 MHz beacons

Steve, G0KYA has just updated the 10m beacon list again. He also reported that the 10W GB3MCB beacon transmitter in Cornwall on 28.215 MHz has now been repaired, and the antennas, which were badly affected by the weather, have been replaced with temporary ones. This may be why it hasn't been spotted for a while. Tip: If searching for it on the RBN use GB3MCB/B. Over the few days before the meeting, it had been spotted in Germany and the USA (NH and PA).

It was also noted that, taking advantage of the recent change in the UK licensing conditions, the Essex-based Martello Tower Group (martellotowergroup.com) now have a cluster of GPS-locked beacons operating in each of the 10 MHz, 28 MHz and 50 MHz bands. Each cluster transmits a continuous multi-mode sequence on a ten-minute cycle, using in turn WSPR, CW, Hellschreiber and FSK (QRSS) modes.

4.3. Les Barclay Award

It was noted that, following PSC's recommendation to the RSGB Board, the 2023 Les Barclay Award was presented to Gwyn Griffiths, G3ZIL for his pioneering work on the use of FST4W to investigate multiple aspects of ionospheric propagation.

Nominations for the 2024 award will be considered at the next PSC meeting.

4.4. Propagation articles for *RadCom*

After a discussion about the importance of providing a supply of high-quality propagation articles for *RadCom*, the view of the committee was that in future PSC should have a role in reviewing (with a deadline) submitted propagation articles. The process would be coordinated by the Chairman, who would seek comments/approval from PSC members with expertise in the relevant areas before responding.

This proposal will be taken forward with the *RadCom* editorial team.

Action: G0KYA

4.5. PSC 'Science Workshops'

There has been no PSC Science Workshop since the last PSC meeting, but it is planned to organise another (which will be the fourth) in the next couple of months. The main topic will be to consider the potential for a UK project based on the new RX-888 receiver, as part of the HamSCI network (see item 5.4 below).

Action: G4IFX

5. Projects and potential projects

5.1. BAA Meteor Scatter Beacon

As noted at the last meeting, the meteor beacon is on the air and has been running reliably, apart from a short recent outage. The associated receiver project is underway and livestreams from the first receiving sites can be seen here:

<https://ukmeteorbeacon.org/beaconclient/> .

The ultimate objective is to be able to centrally capture complex IQ data from multiple receivers, for offline processing. If this was done continuously 24/7, the volume of data to

be fed to, and stored in, the central repository would be enormous, with most of it not being useful. So instead, the plan is to capture data selectively, triggered by the detection of a meteor head echo by one of the receivers – note that this is a challenging thing to do.

5.2. Covid aircraft scatter

John, G4BAO has put the RSGB President in touch with a data analyst and the project is now underway.

Action: G4BAO watching brief

5.3. 24 GHz web SDR

John, G4BAO reported (via email) that this project is moving again, with an alternative site in Kent. Nick, G4OGI and Phil, G0JBA have been helpful in achieving this progress. The plan is to install it late May / June.

Action: G4BAO

5.4. HamSCI 'Personal Space Weather Station'

HamSCI has been focused on its 2024 solar eclipse project and for that it has mainly been using the simpler 'Grape' receiver which is specifically designed for monitoring standard frequency stations. Following the eclipse, a large amount of data has been collected and the analysis will undoubtedly take many months.

The original 'Personal Space Weather Station' receiver was being developed under the 'Tangerine' project but that foundered because of supply problems with the chosen FPGA chip, and it is now effectively 'dead'. However, a new receiver project, the RX-888, has arisen to replace the 'Tangerine' and about 20 installations are already in place. This new receiver is capable of decoding many simultaneous channels and has large-scale data handling capability - all using dedicated software developed by KA9Q. The hardware and software together give very powerful system, although, unlike the 'Tangerine' design, it does not include a magnetometer. A standard format has been developed for data transfer, and a central PSWS database is now running at the University of Alabama. More information can be found at <https://pswsnetwork.caps.ua.edu/> (free registration required).

Various possible projects were discussed for the possible installation of one or more of the RX-888 receivers in the UK. It was agreed to continue this discussion at the next PSC Science Workshop.

Action: G4IFX

6. Chairman's report - Steve, G0KYA

(items not already covered elsewhere in these minutes).

6.1. GB2RS

Steve continues to prepare GB2RS each week with help from G4BAO, G3YLA and G4DDK (when G4BAO is on holiday). We are now at a crucial point in the solar cycle with many X-class flares and CMEs, almost daily. It is getting harder to provide an accurate forecast for the week, but we can talk generally about propagation trends and provide warnings about disturbed conditions. Don't forget that disturbed geomagnetic conditions are likely to get worse on the downward part of the cycle!

6.2. Newark

Steve is also tentatively thinking about PSC's plans for the Newark Hamfest on 27th/28th September 2024 and would like to ask for volunteers to help man the stand.

Action: All

6.3. Other items

Earlier this year, Steve compiled the annual PSC report for *RadCom* and contributed the HF propagation section for the 2024 yearbook. As well as contributing features to *RadCom* he has delivered several talks to clubs via Zoom and has another coming up for Harwell ARC.

7. Other activity by PSC members

(items not already covered elsewhere in these minutes).

7.1. Chris, G4IFX

Chris' PhD defence was successful, and his graduation ceremony was held in Bath Abbey in mid-January. In March, Chris attended the HamSCI Workshop at Case Western Reserve University in Cleveland, Ohio – an excellent event – and presented an update on his PhD work entitled “Why is sporadic-E propagation so weird?”. Finally, a more ‘popular’ article about the ionosphere, based on part of the literature review from his thesis, has recently been published in the UKSMG journal, *Six News*.

7.2. Peter, GM3XJE

Peter's proposed investigation of Long Delay Echoes is waiting for Heather Nickalls, M0HMO to become available to work on the software. She is currently focused on the meteor beacon project but will hopefully have more time towards the end of June.

Peter is currently the Editor of *RadCom Plus* and the Technical Editor of *RadCom*.

7.3. Gwyn, G3ZIL

Gwyn's article “Identifying 14 MHz propagation modes using FST4W SNR and spectral spread” has now been published in QEX May/June 2024. He has also submitted an article, on the October 2023 eclipse effects on propagation, to *RadCom* (to appear in the July 2024 edition).

At the HamSCI Workshop, Gwyn delivered a talk about propagation during the October 2023 annular eclipse, and in addition he presented a poster on two-hop sidescatter modelling. He also presented an online poster to the American Geophysical Union Fall Meeting on 24 January, but unfortunately the session was a flop - only 3 out of 11 presenters turned up.

Popular talks have included one for the ‘RSGB Tonight @ 8’ series on “Propagation at HF: What can we learn using digital modes WSPR and FST4W?”, and another to Norfolk Amateur Radio Club.

Finally, Gwyn has co-written an article for the Bulletin of the British Vintage Wireless Society on “Wireless on Sir Ernest Shackleton's Endurance expedition 1914-15”, with mention of propagation at 500 kHz from S. America to Antarctica.



7.4. Sam, G4DDK

Sam has been standing in for John, G4BAO preparing the *RadCom* GHz column.

7.5. Barry, G8AGN

Barry has had an article about his 30 THz work published recently in *DUBUS 2/2024* and another, the third in a series, will appear in the summer edition of *RadCom Plus*.

In the context of aircraft scatter, Barry also gave a talk at the Martlesham round table about stealth technology.

7.6. Ron, G3SVW

Ron reported that his search for LDE (Long Delay Echo) articles seems to have dried up now. He will send the full list he has to Alan and Peter before the end of May.

He has also been discussing different fade effects experienced on HF bands with other amateurs to learn if there is value in a QSB-type report. Fade is not identified as such in the SINPO report format, but the long SINPFEMO format makes an attempt at it. There may be interest in RS(T) reports with the addition of a QSB type number.

7.7. Bill, NQ6Z

Bill co-developed a presentation that Phil Erickson gave at HamSCI, about the impact of the movement of the geomagnetic poles on ionospheric modelling. This effect has not yet been taken into account in the major ionospheric models; work is now in progress to explore the implications.

Bill also mentioned that, on a visit to New Zealand, he had seen the Cambridge differential engine - a mechanical analogue computer built from Meccano - at the MOTAT science and technology museum in Auckland. This machine was used by Maurice Wilkes to develop some of the earliest numerical solutions to the differential equations governing ionospheric radio propagation. Bill has also obtained a copy of Wilkes' PhD thesis from the University of Cambridge.

For more details of the differential engine, see here: <https://motat.nz/collections-and-stories/stories/a-meccano-computer-motats-differential-analyser/> .

8. Any other business

None.

9. Date of next meeting

Provisionally Saturday 2 November 2024.

Chris Deacon G4IFX
PSC Secretary