

## Minutes of the Propagation Studies Committee

Interim meeting by video conference

15 May 2021

### Attendees:

Steve Nichols	G0KYA	Chairman
Dr John Worsnop	G4BAO	Vice Chairman
Chris Deacon	G4IFX	Secretary
Alan Melia	G3NYK	
Ron Smith	G3SVW	
Dr Peter Duffett-Smith	G3XJE	
Prof Barry Chambers	G8AGN	
John Rogers	M0JAV	RSGB Board Representative (pro tem)

### 1. Apologies for absence

None.

### 2. Matters arising from the minutes of the meeting held on 17 October 2020

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

### 3. PSC membership

It was agreed to invite Gwyn Griffiths, G3ZIL to become a corresponding member of PSC.

John Rogers, M0JAV has now stepped down from the RSGB Board but attended the meeting as Board representative (pro tem) because a replacement has not yet been appointed.

### 4. Topics for discussion

#### 4.1. RSGB website update

Following a significant number of changes, as discussed at the last meeting, the PSC web pages are now regarded as stable, for the time being.

#### 4.2. 28/50 MHz beacon lists

The 28 MHz beacon list was extensively updated last year. More amendments are expected during the summer Es season, and updates will be fed to Alan Melia G3NYK on a regular basis.

**Action: G0KYA**

### 4.3. Les Barclay Award

The new Les Barclay award for propagation studies was presented to Jim Bacon, G3YLA at the RSGB AGM, for his work on Sporadic E. Congratulations to Jim.

It is intended that a decision on the 2022 award will be made at the next PSC meeting.

**Action: All - consider suitable candidates for 2022**

## 5. Projects and potential projects

### 5.1. RadCom HF predictions

Another letter to RadCom was received saying that the predictions were too pessimistic. A rational response was produced for publication, but in the end the original letter was not published - possibly because it was rather immoderate in tone.

At this point, it is not planned to change the RadCom prediction format. The intention is also to continue to signpost the more flexible and capable online tools, but the RadCom page also needs to continue because it is particularly useful for beginners.

### 5.2. Personal Space Weather Station (HamSCI)

The PSWS is still under technical development and hardware and software are not expected to become available for some time yet. It is still believed that the National Radio Centre would be a good location for a first UK PSWS, particularly for its educational value. There would, however, be some site owner and RFI issues to be dealt with at the NRC and alternative sites might include those currently hosting web SDR systems. It was agreed to keep a watching brief on the PSWS, for the time being.

### 5.3. GB3RAL beacons

The current state of play, according to beacon keeper Mike Willis, is that RAL is still inaccessible due to Covid and therefore the beacons cannot be retrieved; as a result, no progress can be made on their re-siting and re-licencing. This is very disappointing.

### 5.4. BAA Meteor scatter beacon

G4IFX reported that he had been approached by Brian Coleman, G4NNS, who is a member of the Radio Astronomy Group of the British Astronomical Association. The RAG are interested in establishing a 100 W NVIS beacon at, or close to, 50 MHz for the detection of meteors over the UK, giving the opportunity to combine results from radio and optical observations. The beacon would be similar to that operated by the BRAMS citizen science project in Belgium, [https://brams.aeronomie.be/dourbes\\_beacon](https://brams.aeronomie.be/dourbes_beacon).

PSC agreed that this would be a worthwhile project to support, and suggested that there might be a useful link for RAG with citizen science activities undertaken by The East Anglian Astrophysical Research Organisation (EAARO) <http://www.eaaro.org.uk>

Initial support will be given to work with G4NNS and with Murray Niman, G6JYB (RSGB Spectrum Chair) to explore the options for licensing such a beacon.

**Action: G4IFX**

## 5.5. Other potential projects

None proposed.

## 6. Chairman's report (G0KYA)

### Presentations/Writings

Due to the pandemic, Zoom-based presentations have become the norm. As a result in the last six months I have given a number of presentations:

"New online tools for propagation predictions" – given to CDXC (May 8) and RSGB tonight at 8 (March 1). The latter was subsequently placed on YouTube where it has had 1,200 views.

I also did a propagation Q&A with LEFARS on 29 January.

I took part in the HamSci Workshop on 19th March and the Contest University's Propagation Summit on 23 January.

I also did a propagation Q&A for Norfolk Amateur Radio Club on 12th May 2021.

A feature on FT8 long-range propagation on 10 metres was published in the March 2021 edition of RadCom

I have continued to produce the HF propagation content for GB2RS. My thanks to John G4BAO and Jim G3YLA for their VHF contributions.

### Newark Hamfest, 24/25 September 2021

A decision on the Newark Hamfest will be made in early June. It is my intention to be at the show and man a PSC stand, should it run.

{At the meeting, Peter G3XJE volunteered to help Steve by bringing a live demo of WSPR.}

### Action: G0KYA/G3XJE

### Propagation tools

Efforts should be made to ensure that all radio amateurs are aware of the HF propagation tools now available as a result of PSC's work. These include:

[www.rsgb.org/propquest](http://www.rsgb.org/propquest) – FoF2 critical frequency and extrapolated MUFs

[www.rsgb.org/predtest](http://www.rsgb.org/predtest) – ITURHFPROP-powered predictions (G4FKH)

[www.rsgb.org/proppy](http://www.rsgb.org/proppy) – ITURHFPROP-powered predictions (HZ1JW)

[www.rsgb.org/voacap](http://www.rsgb.org/voacap) – VOACAP-powered predictions (OH6BG)

[www.rsgb.org/g0kya](http://www.rsgb.org/g0kya) – At-a-glance hourly VOACAP predictions (G0KYA)

[www.predtest.uk](http://www.predtest.uk) – Predtest ITURHFPROP predictions

[soundbytes.asia/proppy/](http://soundbytes.asia/proppy/) – Proppy ITURHFPROP predictions

[www.voacap.com](http://www.voacap.com) – VOACAP Online

### Videos

The HF propagation video, available on the RSGB YouTube channel and also linked to from the PSC website, has now had 8,600 views and the VHF video has now had 2,000



views. Both figures are very encouraging and show that the videos are meeting a genuine need among the wider amateur population.

## 7. PSC member activity

### 7.1. Chris, G4IFX

At the virtual HamSCI 2021 conference, Chris presented the latest results from his research into the mechanism for VHF reflection from sporadic-E layers. The results show that the observed signals from six different European beacons were almost always elliptically polarised, providing strong evidence that the mechanism for reflection is predominantly magnetoionic, rather than either scattering or specular reflection. A video of the presentation can be found in the recording of the first day of the conference at <https://www.youtube.com/watch?v=xfhAxuViTYQ>, starting at 08:35:00. Chris is now developing two further papers, one describing the full results of the 2018 measurement campaign, and a second examining two particular paths in more detail and attempting to explain the results using ray trace modelling. The earlier paper from this work, describing the measurement methodology, can now be found at <https://ieeexplore.ieee.org/document/9301351>

### 7.2. Peter, G3XJE

After the discussion about Long Delay Echoes (LDEs) at the last meeting, Peter worked with G4IFX to conduct an extensive search for anomalous FT8 echoes on 20m and 60m. Peter developed some very useful software to sift through the FT8 logs for duplicate echoes with different delay times and many echoes were found. Unfortunately, following discussions with the WSJT development team, it seems almost certain that the 'echoes' were actually artifacts of the software. If another signal is present on the same FT8 offset as the target signal, an incorrect latency time can be recorded.

**Action: G3XJE/G4IFX** to consider whether they could write up their LDE FT8 investigation as a 'story' for RadCom.

Peter is also the editor of RadCom Plus and there will be an article about LDEs in the November issue by Alan Goodacre, VE3HX, who detects genuinely long delayed echoes (many seconds) frequently. Peter is always looking for interesting articles from PSC members to go in RadCom Plus.

Finally, Peter is also working with Gwyn, G4FKH to look at a spreadsheet interface to ITURHFProp.

### 7.3. Barry, G8AGN

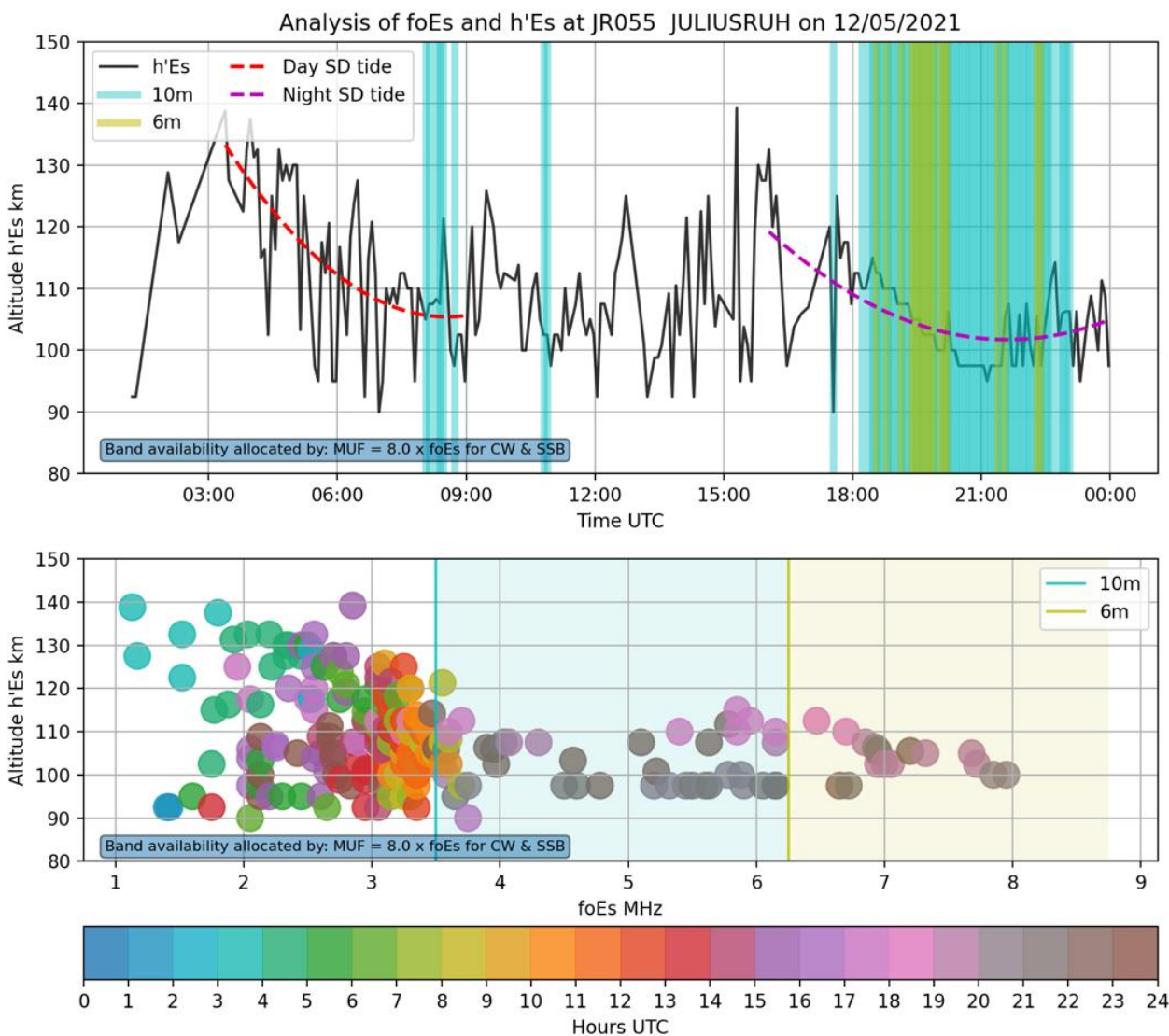
Handheld infrared thermometers incorporate sensitive long-wave infrared detectors, and a group in Australia suggested removing the sensors and using them for communications on 30THz. Barry has built two receivers using these detectors with searchlight mirrors, and also a transmitter based on a metal plate heated to about 300C (with about 300W into the plate) and with a stepper motor to flip the plate to generate CW. An Arduino-based system controls the 'flipper' and also provides CW character shaping. He has achieved a distance of 50m so far using slow CW – needless to say this is now a UK record! Only two 30THz contacts are known to have been made in the world so far, and the world record is currently only 60m. Barry's receivers are sensitive enough to detect thermal radiation from the full moon, provided there are no clouds. This frequency range inevitably suffers lots of interference from thermal radiation from objects in the environment (trees, people etc). Barry also gave a talk to the UK microwave group about 122 GHz. The current UK record on that band is 35km.

### 7.4. Ron, G3SVW

Recent work has been investigating Long Delay Echoes (LDEs). A few test transmissions have been sent out - 14 MHz only for now, but nothing received back so far. If LDEs are rare, then this will be a long-haul study. Further test transmissions are being planned with interested parties. Ron has generated an interest in the phenomenon with others - including an operator in Western Australia. Ron's suggestion on LDEs is that the long-tailed magnetosphere is involved. One of his reference documents is an article by G L Siscoe in the Centre for Space Physics titled 70 Years of Magnetospheric Modelling, in which he talks about Ionosphere-Magnetosphere coupling. Interestingly, two materials of interest go back to 1928 in Wireless World. One is an article by Dr R T Beatty and the other is a letter from Edward Appleton. These old publications have been fascinating to read. Also, at opposite ends of the spectrum, Ron has got some of his Club partners interested in VLF propagation and whistlers, and at 10 GHz another is studying rain-scatter using the beacon GB3FNY at Finningley.

### 7.5. Jim, G3YLA (by email)

There is an extensive article by Jim on Es in the May edition of RadCom Plus. Jim is now working on analyses of Digisonde data to show Es openings (see below).





## **8. Any other business**

It was noted that the propagation e-booklet is still available, made up of RadCom features written by G0KYA and G3NYK.

## **9. Date of next meeting**

Provisionally Saturday 16 October 2021.

**Chris Deacon G4IFX  
PSC Secretary**