uk spectrum policy forum

Invitation to Tender (ITT)

Independent study on Spectrum landscape for lunar communications

02/03/2026

Background

Spectrum is the critical enabler of lunar connectivity. Cislunar communications will be enabled by interference-free internationally coordinated access to radio frequencies to function effectively and provide reliable communications between lunar orbit, lunar surface and Earth. Early spectrum policy development will allow the UK to shape international regulations in a way that enables market growth and commercial opportunities, while safeguarding scientific services and ensuring safe, interference-free operations.

The global lunar communications relay market, worth about £1 billion in 2024, is expected to grow rapidly at around 14–17% annually, reaching £4–5 billion by 2033. This surge is fuelled by the rise in lunar missions, the need for robust infrastructure, and growing investment from governments and commercial operators, alongside technological advances and the drive for sustainable lunar operations. The UK-funded Lunar Pathfinder mission, launching in 2026 as the world's first dedicated lunar relay spacecraft, positions the UK at the forefront of this emerging market.

Within this context, the UK has the opportunity to address unresolved gaps regarding how spectrum should be used and managed for lunar communications. Spectrum requirements differ according to lunar mission profiles, ranging from TT&C, payload data, relay services and navigation, to support the diverse mix of civil, commercial and scientific users expected in the coming decade.

Commercial operators, regulators and policymakers require a robust understanding of propagation characteristics on both the lunar surface and orbital environments to support future development. It is also key to assess the potential impact of lunar communication systems on Radio Astronomy Service (RAS) and Space Research Service (SRS) sensors, and to identify practical mitigation measures, such as PFD limits, coordination zones, guard bands and time-sharing approaches, that can safeguard scientific activities while enabling reliable lunar connectivity.

The study should support the strategic planning for the European Space Agency's (ESA) Moonlight programme launching in 2029 and should also consider the ongoing ITU and CEPT preparatory work for WRC-27, in particular Agenda Item 1.15 and the related Resolution 680 (WRC-23), where lunar spectrum allocations will be discussed.

Scope

This work will support UK Government priorities under the Modern Industrial Strategy and the Defence Industrial Strategy, where Advanced Connectivity Technologies are recognised as essential for driving innovation, enabling secure and resilient communications, and strengthening the UK's leadership in both civil and defence domains. By aligning technical innovation with policy foresight, this study aims to ensure the UK remains at the forefront of lunar communications and wireless innovation.

To achieve this, the study will focus on the following key areas, considering work already in progress within international groups[1] identifying commonalities and divergences against UK requirements and any consequential opportunities for UK regulatory leadership: [2]

1. Spectrum requirements for lunar missions and coexistence with other uses (surface-surface/orbital-orbital and orbital-surface):
    a. Identify medium-and long-term spectrum needs relating to human surface and EVA communications: Supports voice, video and data links for astronauts on the lunar surface, including inside habitats, pressurised rovers and during EVAs, with strong requirements for reliability, low latency and safety-critical availability.
    b. Lunar surface networks (local connectivity): Provides short-range communications between surface assets such as rovers, instruments, power systems and landing infrastructure, enabling machine-to-machine coordination and local operations.
    c. Far-side and shielded-zone communications: Enables connectivity for missions on the lunar far side and within the Shielded Zone of the Moon, where there is no direct line-of-sight to Earth. These services rely on dedicated orbital relay nodes and raise specific coordination requirements to protect radio-quiet science activities.
    d. Orbital infrastructure communications: Covers communications between lunar orbiting assets such as Gateway, relay satellites and visiting spacecraft, including proximity operations, rendezvous and crosslinks. These services increasingly support multiple international and commercial users rather than single missions.
    e. Cislunar positioning, navigation and timing (PNT) services: Delivers navigation, timing and synchronisation services around the Moon, supporting autonomous spacecraft, surface mobility and coordinated operations. This is evolving into a shared service layer analogous to GNSS rather than mission-specific navigation only.

2. International regulation and UK leadership:
    a. Identify UK leadership opportunities where the UK (DSIT) and Ofcom, as the independent regulator, can influence international rules (through ITU, CEPT, SFCG, including work under WRC-27 AI 1.15 and beyond)
    b. Analyse potential “best practices” for licensing and coordination.
    c. Identify gaps in the Radio Regulations (RR) on coordination of Lunar missions and the potential solutions.
    d. Propose licence conditions and enforcement mechanisms for lunar communications services, domestically and internationally.

The study will examine how UK spectrum policy can enable efficient, secure, and competitive lunar communications while safeguarding scientific radio astronomy and other strategic spectrum uses. It will focus on mapping spectrum requirements for lunar missions,

[1] ITU-R WP7B, CEPT PTA, Space Frequency Coordination Group (SFCG), Committee for Radio Astronomy Frequencies (CRAF),

assessing allocation challenges across different spectrum bands, and identifying UK leadership opportunities to shape emerging international frameworks.

The research will also explore licensing models and interference mitigation strategies to ensure fair access and create commercial opportunities for UK companies. Lastly, the study should consider the development of cislunar optical communications and how these could affect the use of RF spectrum and demand for it.

Expected deliverables

The UK's evolving spectrum landscape demands a forward-looking approach to policy, regulation, and innovation. As the size, frequency and scope of lunar missions diversify and demand for lunar spectrum intensifies, there is a growing need to explore programmable and dynamic spectrum sharing technologies that can support scalable, efficient, and equitable access.

A report detailing the findings including:

- Lunar spectrum requirements & coexistence assessment: full mapping of medium- and long-term spectrum needs for lunar missions, including human surface/EVA communications, local lunar surface networks, orbital-orbital and orbital-surface links, far-side and Shielded Zone operations, orbital infrastructure crosslinks, and emerging cislunar PNT services, accompanied by coexistence analysis with terrestrial uses (e.g., IMT).
- Spectrum band suitability & gap analysis: evaluation of candidate frequency bands for lunar communications assessing availability, technical suitability, propagation characteristics, and coexistence constraints, alongside identification of regulatory, operational, and coordination gaps, including spectrum sharing opportunities, affecting lunar surface, orbital, and far-side activity, considering existing ITU analysis and known international administrations positions
- Far-side & shielded-zone coordination framework: assessment of connectivity requirements for far-side and Shielded Zone missions, including relay-node dependencies, interference-avoidance considerations, and mechanisms for protecting radio-quiet scientific operations while enabling mission-critical communications.
- Licensing, coordination & regulatory reform package: provide best-practice licensing and coordination models for lunar communications covering mission-specific, shared-access, and multi-user orbital infrastructure alongside proposed licence conditions, enforcement mechanisms, and recommended updates to ITU/CEPT/SFCG processes and the Radio Regulations.
- Identification of UK companies and R&D work in relation to cislunar communications and Mechanisms for industry-government and Ofcom collaboration to accelerate innovation and deployment.

UK international leadership strategy: outlining how the UK (DSIT and Ofcom) can lead global regulatory development, identifying opportunities at ITU, CEPT, SFCG, and WRC-27 and beyond, to shape lunar spectrum policy, resolve regulatory gaps, and support the UK's strategic position in emerging multilateral coordination frameworks.

This study will build on the UK's leadership in spectrum innovation, including sandbox trials, licensing, and emerging research, to identify promising technologies and frameworks that can inform future regulatory planning and industry collaboration.

Cost:

- Total budget is of the order of £30,000 (+VAT)

Timetable:

- ITT issued: 03 March 2026
- Deadline for clarification of questions[3]: 23 March 2026
  Deadline to submit your tender: 26 March 2026

Duration:

- Expected duration of the study: approximatively three months, including delivering the report.
- To enable transparency and more efficient delivery management, it is suggested, at the time of commencement of the report, to establish monthly checkpoint meetings, during which UK SPF could provide updates on the progress and the findings of the research as well as to invite for a mid-point peer review of the final report.
- To bring together the study's insights, we propose organising at least one workshop or presentation—either as part of an SPF workshop or another suitable event—to gather input from members and the wider spectrum user community.

Evaluation:

- The scoring system is as follows:

Criteria	Weight
Understanding the requirements	20%
Relevant experiences	20%
Methodology and approach	20%
Project management	10%
Resources allocated (CVs)	20%
Price	10%

Notes for bidders:

- Individual bidders are not discouraged however given the data requirements we will prioritise organisations/group submitters
- Unsuccessful bidders will receive their scores to help inform future tenders
- The successful contractor will be required to meet (in person or virtually) with the UK SPF drafting group to provide regular updates and feedback
- The successful bidder is expected to work with the UK SPF secretariat to create a press release and publicise the report and its findings
- Interested companies should contact Tales Gaspar at tales.gaspar@techuk.org for Terms and Conditions. Any contract or order awarded as a result of this ITT shall be

[3] If the bidder(s) may wish to seek clarifications concerning the invitation to tender (ITT), please get in touch with Tales Gaspar by 17.00 GMT on the date stated in the timetable

subject to these Terms and Conditions. Any reference to your own conditions of contract/conditions of sale in your standard bid documentation shall be specifically withdrawn.

- Interested companies should submit one electronic copy of their quotation per proposal –including financial and technical proposals – to Tales Gaspar at tales.gaspar@techuk.org by 17.00 BST on the date stated in the Timetable. Your quotation is expected to include all required information, or clearly state the reason for being unable to do so. Any assumptions used in preparing responses should be clearly stated.
- The technical response, covering aspects such as understanding the requirements, relevant experiences, methodology and approach should be limited to a maximum of 5 pages. Your quotation shall be firm, fixed and capable of acceptance.
- Please direct any questions relating to clarification of the ITT by email to Tales Gaspar (tales.gaspar@techuk.org).
- By submitting a response, you accept that you understand the requirement and have sufficiently addressed all aspects of the tender and information provided and that you have checked all stated details, such as prices, to be correct and as intended.