HMGCC Co-Creation

Challenge: Compact, low-cost GNSS simulator

Summary of the challenge

HMGCC Co-Creation is seeking Global Navigation Satellite Systems (GNSS) simulators to support testing of multiple communication systems at the same time.

In this challenge, we want to hear from organisations which have developed, or can develop, compact and low-cost systems to replicate real-time global GNSS constellations.

Organisations are being asked to apply if, over a 12-week period, they can develop and demonstrate technology to meet this challenge. HMGCC Co-Creation will provide funding for time, materials, overheads and other indirect expenses associated with this challenge.

Technology themes

This challenge has the potential to touch on key areas of technology including:

- communication systems
- electronic engineering;
- modelling and simulation;
- position navigation and timing;
- radio frequency science and engineering;
- space and satellites;
- telecoms.

Key information

Budget up to	**Up to £60,000 (exc. VAT)**
Project duration	**12 weeks**
Competition opens	**Monday 7 July 2025**
Competition closes	**Thursday 7 August 2025 at 5pm**

Context of the challenge

The UK national security and defence community operates globally, often in contested environments and conflict zones. Many communication systems rely on GNSS for position, navigation and timing signals.

To ensure the reliability of these systems, it is crucial to first test them in the most realistic environments possible. Typically, the technology needs to be portable and pocket-sized to meet the requirement. Due to limited access to trials in real world locations, testing is typically carried out in radio frequency (RF) shielded rooms to replicate these environments.

The gap

There is a gap in the market for a compact, full constellation simulator which is lower in cost, compared to other, currently available solutions. To test physical devices effectively, a realistic and real-time GNSS simulation is necessary, which is not limited to GPS but also includes other constellations like Galileo, GLONASS, BeiDuo, QZSS and NavIC.

Example use case

Marianne is developing a tracking product to be used in a contested area where those working for national security could be at risk of capture. In these cases, a product of this type could enable their location to be known. There needs to be a very high assurance that it will operate as intended when deployed.

The test facility has no access to GNSS constellations, so Marianne, a test engineer, needs a GNSS simulator to show how the tracking device would work anywhere in the world. The simulator must be able to use any set of GNSS constellations, not just those available in the UK.

She tests ten of her devices in a shielded container to determine whether the assurance requirements are met using a range of constellations. She is able to remotely programme different global locations dynamically and assure herself that the devices are accurately reflecting real-time GNSS constellations.

Thanks to this capable simulator, processes are easy to follow, efficient and provide assurance to test results.

Project scope

In this 12-week project, applicants should aim to deliver a high Technology Readiness Level (TRL) device. We expect existing technology to be adapted for this

use case, with a focus on building a functional final product that can be purchased at low cost.

There is potential for wider commercial applications in automotive, aerospace, and consumer electronics, and we welcome commercialisation efforts.

This challenge is open to TRLs 6 – 9. We recommend that proposals include both the existing and expected TRL at the end of the 12-week period. The essential, desirable and stretch targets are listed below.

We are open to either:

- All elements within a portable form factor (ideally within the footprint of H 207mm x W 130mm x D 220mm).
- A single transmitter within the shielded environment but with a remotely hosted appliance for signal generation.

Essential requirements for solution:

- Must be as compact as possible.
- Must provide real-time simulation of GNSS full constellations using genuine data.
- Uses standard IP over ethernet interface for networking purposes. Ethernet or RF over fibre are also acceptable solutions.
- Must relay genuine Ephemeris and Almanac data (to enable A-GPS services). TLE data does not meet the requirement.
- Must be powered through UK standard 3-pin plug or by standard USB port.
- Must be either compliant or working towards UK electrical/RF safety standards.
- Has ability to feed NMEA standard data format.

Desirable:

- Scalable to generate up to 100 discrete GNSS signals.
- Trade-off of complexity and final product cost against functionality, e.g. could focus on a single GNSS system if there is an implication on cost.
- Final product cost in the order of £5000.
- Low power solution.
- Avoid containing export-controlled material (e.g. ITAR software/hardware).
- Use of SMA connectors for RF solutions.

Constraints:

- Must operate in a RF shielded room.

This information may be exempt under the Freedom of Information Act 2000 (FOIA) and may be exempt under other UK information legislation. Refer any FOIA queries to the originating department.

Not required:

- Horizon scanning only.
- No virtualisation or digital twinning.
- In a final product, testing data (used for AI training for example) would not be possible to share back with the solution provider.

Dates

Competition opens	Monday 7 July 2025
Online briefing call (link here) / Deadline to submit clarifying questions	Tuesday 22 July 2025 at 11am
Clarifying questions published	Tuesday 29 July 2025
Competition closes	Thursday 7 August 2025 at 5pm (UK time)
Applicants notified	Tuesday 26 August 2025
Pitch day in Milton Keynes	Thursday 4 September 2025
Commercial onboarding begins*	Thursday 11 September 2025
Target project kick-off	Monday 6 October 2025

**Please note, the successful solution provider will be expected to have availability for a 1-hour onboarding call via MS Teams to begin the onboarding/contractual process.*

Eligibility

This challenge is open to sole innovators, industry, academic and research organisations of all types and sizes. There is no requirement for security clearances.

Solution providers or direct collaboration from countries listed by the UK government under trade sanctions and/or arms embargoes, are not eligible for HMGCC Co-Creation challenges.

How we evaluate

All proposals, regardless of the application route, will be assessed by the HMGCC Co-Creation team. Proposals will be scored 1–5 on the following criteria:

Scope	Does the proposal fit within the challenge scope, taking into consideration cost and benefit?
Innovation	Is the technical solution credible, will it create new knowledge and IP, or use existing IP?
Deliverables	Will the proposal deliver a full or partial solution, if a partial solution, are there collaborations identified?
Timescale	Will the proposal deliver a minimum viable product within the project duration?
Budget	Are the project finances within the competition scope?
Team	Are the organisation / delivery team credible in this technical area?

Invitation to present

Successful applicants will be invited to a pitch day, giving them a chance to meet the HMGCC Co-Creation team and pitch the proposal during a 20-minute presentation, followed by questions.

After the pitch day, a final funding decision will be made. For unsuccessful applicants, feedback will be given in a timely manner.

Clarifying questions

Clarifying questions or general requests for assistance can be submitted directly to cocreation@hmgcc.gov.uk and Co-Creation@dstl.gov.uk before the deadline with the challenge title as the subject. These clarifying questions may be technical, procedural, or commercial in subject, or anything else where assistance is required. Please note that answered questions will be published to facilitate a fair and open competition.

Routes to apply

Please send applications directly to cocreation@hmgcc.gov.uk and co-creation@dstl.gov.uk including the challenge title with a note of the collaborator network where this challenge was first viewed.

All information you provide to us as part of your proposal will be handled in confidence.

How to apply

Applications **must** be no more than six pages or six slides in length. HMGCC Co-Creation reserve the right to stop reading after six pages if this limit is breached. The page/slide limit excludes title pages, references, personnel CVs and organisational profiles.

There is no prescribed application format, however, please ensure your application includes the following:

Applicant details	Contact name, organisation details and registration number.
Scope	Describe how the project aligns to the challenge scope.
Innovation	Describe the innovation and technology intended to be delivered in the project, along with new IP that will be generated or existing IP that can be used.
Deliverables	Describe the project outcomes and their impacts.
Timescale	Detail how a minimum viable product will be achieved within the project duration.
Budget	Provide project finances against deliverables within the project duration.
Team	Key personnel CVs and expertise, organisational profile if applicable.

Co-Creation terms and conditions

Proposals must be compliant with the HMGCC Co-Creation terms and conditions; by submitting your proposal you are confirming your organisation's unqualified acceptance of Co-Creation terms and conditions.

Commercial contracts and funding of successful applications will be engaged via our commercial collaborator, Cranfield University.

HMGCC Co-Creation supporting information

HMGCC works with the national security community, UK government, academia, private sector partners and international allies to bring engineering ingenuity to the national security mission, creating tools and technologies that drive us ahead and help to protect the nation.

HMGCC Co-Creation is a partnership between HMGCC and Dstl (Defence Science and Technology Laboratory), created to deliver a new, bold and innovative way of working with the wider UK science and technology community. We bring together the best in class across industry, academia, and government, to work collaboratively on national security engineering challenges and accelerate innovation.

HMGCC Co-Creation aims to work collaboratively with the successful solution providers by utilising in-house delivery managers working Agile by default. This process will involve access to HMGCC Co-Creation's technical expertise and facilities to bring a product to market more effectively than traditional customer-supplier relationships.

FAQs

1. **Who owns the intellectual property?**

   As per the HMGCC Co-Creation terms and conditions, project IP shall belong exclusively to the solution provider, granting the Authority a non-exclusive, royalty free licence.

2. **Who are the end customers?**

   National security users include a wide range of different UK government departments which varies from challenge to challenge. This is a modest market and so we would encourage solution providers to consider dual use and commercial exploitation.

3. **What funding is eligible?**

   This is not grant funding, so HMGCC Co-Creation funds all time, materials, overheads and indirect costs.

4. **How many projects are funded for each challenge?**

On average we fund two solution providers per challenge, but it does come down to the merit and strength of the received proposals.

5. **Do you expect to get a full product by the end of the funding?**

It changes from challenge to challenge, but it's unlikely. We typically see this initial funding as a feasibility or prototyping activity.

6. **Is there the possibility for follow-on funding beyond project timescale?**

Yes it is possible, if the solution delivered by the end of the project is judged by the HMGCC Co-Creation team as feasible, viable and desirable, then phase 2 funding may be made available.

7. **Can we collaborate with other organisations to form a consortium?**

Yes, in fact this is encouraged, and additional funding may be made available. Please see the maximum budget of the individual challenge.

8. **I can't attend the online briefing event, can I still access this?**

If a briefing event is held, which varies challenge to challenge, then yes. Either the recording or the transcript will be made available to view at your leisure after it has been broadcasted. This will be made available via the HMGCC Co-Creation community collaborators.

9. **Do we need security clearances to work with HMGCC Co-Creation?**

Our preference is work to be conducted at OFFICIAL, we may however, request the project team undertake BPSS checks or equivalent.

10. **We think we have already solved this challenge, can we still apply?**

That would be welcomed. If your product fits our needs, then we would like to hear about it.

11. **Can you explain the Technology Readiness Level (TRL)?**

Please see the UKRI definition for further detail.

12. **Can I source components from the list of restricted countries, e.g. electronic components?**

Yes, that is acceptable under phase 1 - feasibility, as long as it doesn't break UK government trade restrictions and/or arms embargoes.

Further considerations

This information may be exempt under the Freedom of Information Act 2000 (FOIA) and may be exempt under other UK information legislation. Refer any FOIA queries to the originating department.

Solution providers should also consider their business development and supply chains are in-line with the National Security and Investment Act and the National Protective Security Authority's (NPSA) and National Cyber Security Centre's (NCSC) Trusted Research and Secure Innovation guidance. NPSA and NCSC's Secure Innovation Action Plan provides businesses with bespoke guidance on how to protect their business from security threats, and NPSA and NCSC's Core Security Measures for Early-Stage Technology Businesses provides a list of suggested protective security measures aimed at helping early-stage technology businesses protect their intellectual property, information, and data.