HMGCC Co-Creation

Challenge: Miniature detectors sought to spot drones

Summary of the challenge

Drone detectors, small enough to fit inside a pocket or a hand, are sought in a new challenge launched by HMGCC Co-Creation.

The use of drones is now common everywhere, including by those intent on harming the UK and its allies. This challenge seeks to find a new way to address some of those risks.

The team wants to hear from organisations who are developing miniature devices to detect drones, also known as Uncrewed Aerial Systems (UAS). We are not interested in devices used to disrupt or effect UAS flight paths.

This is the latest challenge set by HMGCC Co-Creation, which invites applications from industry and academia, to help solve national security problems.

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.

Key information

HMGCC Co-Creation will be hosting a two-stage competition process.

1) Phase 1. The objective is to rapidly assess one (1) page proposals. Those unsuccessful will be informed with feedback. Those successful applicants will be invited to phase 2.
   For further information please see **How to apply – Phase 1.**
2) Phase 2. Following a feedback phase, applicants will be requested to submit a proposal directly to cocreation@hmgcc.gov.uk. For further information please see **How to apply – Phase 2.**

Total budget	£60,000
Project duration	12 weeks
Phase 1 competition opens	Monday 3 February 2025

Phase 1 competition closes	Thursday 20 February 2025 at 17.00
Applicants notified	Friday 7 March 2025
Phase 2 competition opens	Monday 10 March 2025
Phase 2 competition closes	Thursday 27 March 2025 at 17.00

Context of the challenge

There have been high profile news reports detailing the use of off–the-shelf and disposable UAS used in international conflicts as well as to disrupt life here in the UK.

There is constant innovation in the disruptive use of UAS, with motivations including examples such as secret surveillance or even damage leading to casualties.

The first stage to countering the UAS threat, is to detect their presence. To scale this across national security, a miniaturised UAS detector, ideally that fits in a pocket and alerts the user, is required to operate in rural and urban environments.

The gap

There are many large systems to detect and then disrupt the flight path of a UAS, there are even backpack transportable systems used for detection. These are typically developed for military applications.

But there is a national security requirement for a different type of unit to be used by civilian personnel. It must be as small as possible, unobtrusive to carry, pocketable and something that can routinely be used to detect a UAS, with very few false positives.

Example use case

Senior security director, Kathryn has the task of keeping a number of UK facilities, based in another country, secure from possible incursions. This can be a difficult and complex job.

Kathryn has become increasingly concerned about UAS incursion risk, so she starts work to consider how to secure their facilities against this kind of threat. Some of the important factors include the need to secure facilities across a dispersed geographical location, in an urban environment and in spaces without reliable internet or telecoms infrastructure and where there is limited influence over the local government's policy.

Kathryn also wishes to protect her staff. When they are off duty there is a need to provide them with some assurance if a UAS is nearby.

Detection and effector systems (used to disrupt UAS) are considered. However, effector systems are large in size, higher cost, and not easily transported. So, this solution is discounted.

After developments through HMGCC Co-Creation, Kathryn purchases and then deploys a miniaturised UAS detector to all members of staff.

One evening, Anton, locally deployed civilian personnel, is travelling from one facility to another when his UAS detector buzzes in his pocket. It is too dark to see any activity, and he can't hear a UAS. Anton then radios his colleagues to say that a UAS has been detected and an incursion may be occurring live. This is passed onto a local liaison point of contact who follows local procedure..

Following integration of data from the UAS detector, a unique fingerprint of the UAS was captured and shared with the authorities. Analysis also revealed that the detected UAS was a recently released commercial model, emphasising the need for current UAS information and timely software updates. This would allow operational support teams to rapidly update configuration data, enabling them to adapt to emerging threats and stay ahead of evolving UAS capabilities.

Project scope

The focus of this 12-week project is de-risking. Through developing a basic demonstrator, we want to see if it is possible to reduce the size of a UAS demonstrator to enable it to fit in a pocket. This will inform investments into further developing this technology going forward.

To ensure delivery of a demonstrator within 12 weeks, it is suggested that there is a component focus on the electronic hardware and/or low-power software, rather than a full system. Further work with HMGCC teams can advise on antenna, battery and mechanical integration.

This is open to Technology Readiness Levels (TRL) from 4 – 9. It is recommended that, in their proposals, applicants state the current TRL and the TRL they would expect to reach by the end of the 12 week period.

Essential requirements:

- Focus should be on the electronic design and underpinning software.
- Small enough to fit in a pocket.

- Low power, to allow a run time of at least eight hours.
- Low thermal signature as will be carried on a person.
- Radio frequency (RF) silent, ensuring it cannot be detected or jammed.
- A screen display is not required, as this is likely to add to size.
- Feedback to the user, perhaps with haptic feedback.
- Ability to operate in a variety of environments, including dense urban and rural areas.
- A final device must not be cloud or internet connected.
- No defined approach of UAS detection radius, but this should be considered.
- Consider false positives and how this may affect the user experience.

Desirable requirements:

- Ability to interrogate data at a later date, with UAS type and capability.
- Ability to provide directional information.

Not required:

- Horizon scanning or paper study.
- Counter UAS unit that can also jam a signal.
- A full working unit. The solution should focus on the high technical risk element, which is the electronic miniaturisation at low power and underpinning software.

Dates

Phase 1 competition opens	Monday 3 February 2025
Clarifying questions published	Friday 14 February 2025
Phase 1 competition closes	Thursday 20 February 2025 at 17:00
Applicants notified	Friday 7 March 2025
Phase 2 competition opens	Monday 10 March 2025
Phase 2 competition closes	Thursday 27 March 2025 at 17:00
Applicant notified	Friday 11 April 2025
Pitch day in Milton Keynes	Wednesday 7 May 2025

Pitch Day outcome	Thursday 8 May 2025
Commercial onboarding begins*	Monday 12 May 2025
Target project kick-off	Late May/Early June 2025

**Please note, the successful solution provider will be expected to have availability for a 1-hour onboarding call via MS Teams on the date specified 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.

Clarifying questions

Clarifying questions or general requests for assistance can be submitted directly to cocreation@hmgcc.gov.uk, please also copy to Co-Creation@dstl.gov.uk, prior to the cut-off date. 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

HMGCC Co-Creation is working with a multiple and diverse set of community collaborators to broadcast and host challenges. Please follow this link for the full list of community collaborators.

If possible, please submit applications via a community collaborator.

If the community collaborator does not host an application route, please send applications directly to cocreation@hmgcc.gov.uk and also Co-Creation@dstl.gov.uk, including the challenge title with a note of the community collaborator where this challenge was first viewed.

All information you provide to us as part of your proposal, whether submitted directly or via a collaborator platform, will be handled in confidence.

How to apply – Phase 1

Applications must be no more than one (1) page or one (1) slide in length. The assessment panel will only read the first one (1) page or slide if the page limit is exceeded.

There is no prescribed application format, however, please ensure your application includes a brief overview of 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.

Following assessments, the successful applicants will be invited to submit a more in-depth proposal in phase 2. There will be feedback given to the successful applicants to aid their full proposal submission.

How to apply – Phase 2

Applications must be no more than six (6) pages or six (6) slides in length. The assessment panel will only read the first six (6) pages or slides if the page limit is exceeded. The page/slide limit **excludes** 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.

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.

HMGCC 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 HMGCC 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 is part of the NSTIx Co-Creation network, which enables the UK government national security community to collaborate on science, technology and innovation activities and to deliver these in partnership with a more diverse set of contributors for greater shared impact and pace.

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, 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

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.