HMGCC Co-Creation

Challenge: Detecting hostile RF emitters in a battlefield

Summary of the challenge

Can your technology help identify radio frequency (RF) emitters within a crowded and complex electromagnetic environment?

This is the latest 12-week, funded challenge from HMGCC Co-Creation and it's now open for applications.

Modern electronic warfare environments contain growing numbers of RF emitters operating across many different frequency bands, waveforms and protocols. Identifying signals quickly and reliably in a crowded spectrum is a significant challenge, especially when transmissions are brief, infrequent or deliberately designed to avoid detection.

This is an ambitious challenge. Successful projects should deliver a prototype software capability to a minimum Technology Readiness Level (TRL) 4 within 12-weeks.

HMGCC Co-Creation will fund successful applicants time, materials, overheads and other indirect expenses.

Technology themes

App development, artificial intelligence, communication systems, data science and engineering, machine learning, radio frequency science and engineering, signal intelligence, software development.

Key information

HMGCC Co-Creation will run a two-stage competition.

> Phase 1: We will quickly assess one-page proposals. If your proposal is unsuccessful we will let you know and provide feedback. If successful you'll be invited to phase 2.
> For further information please see **How to apply – phase 1.**
> Phase 2. Successful phase 1 applicants will be asked to submit a proposal directly to Co-Creation@dstl.gov.uk and cocreation@hmgcc.gov.uk.
> For further information please see **How to apply – phase 2.**

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Total budget (excluding VAT)	£60,000
Project duration	12 weeks
Phase 1 Competition opens	Monday 2 November 2026
Phase 1 competition closes	Monday 23 November 2026
Applicants notified	Monday 7 December 2026
Phase 2 competition opens	Monday 7 December 2026
Phase 2 competition closes	Thursday 7 January 2027

Context of the challenge

The UK defence and national security community supports its allies through a range of capabilities, including electronic warfare.

Electronic warfare can include various techniques to jam, misdirect or spoof over-the-air radio frequency (RF) communications and satellite navigation systems.

The first step in disrupting enemy communications is identifying the RF emissions they use.

Current approaches often struggle when operators encounter large numbers of RF emissions from friendly forces, civilian infrastructure, commercial technology and adversary systems all at once.

Traditional digital signal processing, which identifies RF emissions by matching their signals against a library of known examples, is no longer effective given the volume of information available.

HMGCC Co-Creation is looking for technology that can help operators detect and classify enemy RF emitters within a crowded RF environment.

The gap

Operators need to identify enemy assets and their RF communication protocols, but face several challenges: high levels of RF congestion, short or infrequent transmissions, variable operating conditions, unknown or changing signal characteristics, and the practical constraints of portable field equipment.

We need:

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- reliable detection of target signals in congested RF environments
- fast scanning and signal classification
- technology that works on portable, remote hardware with limited computing power
- a system that can be easily adapted to detect new emitters and different RF environments.

Example use case

Captain Guarnieri and their team are deployed in a highly contested area. The team specialises in electronic warfare and aims to disrupt enemy capabilities, identifying assets ranging from drone swarms to command and control systems.

They are operating close to a civilian urban area and, near friendly forces, trying to analyse enemy signals. Even with capable sensors collecting data, finding the one emitter they need to worry about is difficult.

Intelligence suggests an enemy command and control system is operating nearby. The target emitter only transmits briefly and unpredictably, making it hard to identify and locate.

Captain Guarnieri uses a portable, lightweight software defined radio (SDR), that runs a machine learning algorithm on a Field Programmable Gate Array (FPGA). The system continuously monitors the spectrum, analyses incoming signals and compares them against known patterns and signatures.

When it detects a transmission, the software immediately alerts the operator, shows the supporting evidence, assigns a confidence score and logs the signal data for further analysis.

With this new capability Captain Guarnieri can cut through the RF noise and focus on just the signals that matter.

Project scope

The outcome should be a demonstrator delivered after a 12-week project, reaching at least Technology Readiness Level (TRL) 4 (basic technology validation in a lab environment.)

Deliverables:

- a working prototype demonstrated on a commercial software defined radio (SDR) and Field Programmable Gate Array (FPGA) architecture

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- a software prototype handed over to the sponsors
- a detailed technical report

Essential requirements:

- techniques used to identify RF classifiers must go beyond traditional digital signal processing
- the solution must show how rapid emitter identification can be completed on a deployed SDR with limited resources
- the solution must cover bandwidths from 1KHz to 1MHz within the SDR and FPGA constraints
- include a roadmap towards operational deployment and future development.

Desirable requirements:

- operation in near real time
- confidence metrics and supporting evidence for classifications or detections
- the ability for government technicians to retrain the model on other data sets

Constraints:

- the sponsors will provide example waveforms, such as FSK, PSK and LoRa, but will not supply real or synthetic training data
- the final deployable model must work on a remote platform without regular internet access or extra computing resources
- the model should run at the edge, on a SDR with a small FPGA System-on-Chip (SoC), for example 20-80k logic cells, 60-200 DSP blocks, without relying on additional CPU or GPU resources

Not required:

- hardware development is not the primary focus of this challenge
- offensive electronic warfare effects
- a framework for integrating the signal classification tool with other applications
- large-scale fixed infrastructure deployments
- horizon scanning without a working demonstrator

Dates

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Phase 1 competition opens	Monday 2 November 2026
Clarifying questions deadline	Wednesday 11 November 2026
Clarifying questions published	Monday 16 November 2026
Phase 1 competition closes	Monday 23 November 2026
Applicants notified	Monday 7 December 2026
Phase 2 competition opens	Monday 7 December 2026
Phase 2 competition closes	Thursday 7 January 2027
Applicant notified	Monday 18 January 2027
Pitch day in Milton Keynes	Thursday 28 January 2027
Commercial onboarding begins*	Wednesday 3 February 2027
Target project kick-off	February 2027

*Please note, the successful solution provider will be expected to have availability for a one-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.

How to apply – phase 1

Please submit your application on the HMGCC Co-Creation website. Any queries please email Co-Creation@dstl.gov.uk and cocreation@hmgcc.gov.uk.

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

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

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Phase 1 applications will be assessed using the following scoring criteria:

Desirability	• How closely does the proposal directly address the challenge?
	  ○ does the proposal achieve all essential requirements?
	  ○ how many desirable requirements are achieved?
	  ○ is this something the user's want?
	• How well is the benefit for government and dual-use described?
	  ○ is the benefit to the user's well described?
	  ○ have the applicants identified dual-use markets?
	• Ambition of the proposed solution?
	  ○ does the solution provide an incremental step in capability or significant leap?
	  ○ does the solution introduce a new idea?

Following assessments, 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

Following a feedback phase, successful phase 1 applicants will be requested to submit a proposal directly to Co-Creation@dstl.gov.uk and cocreation@hmgcc.gov.uk.

Applications **must** be no more than six pages or six slides in length. HMGCC Co-Creation reserves 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.

Phase 2 applications will be assessed using the following scoring criteria:

Feasibility	• What is the technical credibility of the minimum viable product proposed?
	  ○ is it technically possible?
	  ○ are there key technical risks overlooked?
	• Likelihood of the minimum viable product reaching or exceeding the minimum required Technology Readiness Level (TRL)?
	  ○ does the proposal aim to reach the minimum TRL?

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	○ assessors' confidence in the proposal from technical perspective? ○ will the proposal exceed the minimum TRL? • Credibility of the team regarding technical and project management skills? ○ does the team have all the relevant expertise? ○ how experienced are they? ○ have they delivered something similar before?
Desirability	• How closely does the proposal directly address the challenge? ○ does the proposal achieve all essential requirements? ○ how many desirable requirements are achieved? ○ is this something the user's want? • How well described is the benefit for government and dual-use? ○ is the benefit to operators well described? ○ have the applicants identified dual-use markets? • Ambition of the proposed solution? ○ does the solution provide an incremental step in capability or significant leap? ○ is the proposed solution unique to the applicants?
Viability	• How well is the exploitation route described? ○ is the proposal just aiming to deliver the minimum for the project? Or have they got a project plan post phase 1? ○ are they thinking about commercial exploitation routes? ○ are there rough costings for future work? • How well does the proposal demonstrate value for money and are the costs broken down and justified? ○ how much time and resource is spent on a project for the cost? ○ is there a perceived high ambition for the cost? ○ is there a robust costing plan? • How well is the project delivery described leading to the minimum viable product? ○ is there a Gantt chart or similar? ○ are there proposed outcomes after each sprint? ○ are the applicants experienced in Agile methodology?
Budget	• Are the project finances within the competition scope?

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Invitation to present

Successful phase 2 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.

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.

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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, any questions (and answers) will be captured and published after the event. The call itself is not recorded and use of AI notetakers is not permitted.

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.

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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.

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