HMGCC Co-Creation

Challenge: Cooling in high power battlefield comms

Summary of the challenge

Tactical radios which can get too hot when used on the battlefield are at the heart of a new challenge by HMGCC Co-Creation.

The team is inviting applications from all those who could help stop high-bandwidth radios from emitting too much heat.

Why is this heat a problem? These radios play a vital role in battlefield intelligence, but heat can create detectable infrared signals and degrade hardware performance.

HMGCC Co-Creation is looking for innovative solutions to enable high-power radios to run for longer, while keeping heat emissions to a minimum.

The solution should be compact and something that can be retrofitted into existing hardware without creating a piece of tech which is too big or too complex.

This is a 12-week, funded challenge which asks applicants to achieve a Technology Readiness Level (TRL) 5 demonstrator in that time.

HMGCC will provide funding for time and materials, overheads and other indirect expenses for successful applications.

Technology themes

Applied research, communication systems, electronic engineering, manufacturing, material science and engineering, modelling and simulation, mechanical engineering, radio systems, systems engineering.

Key information

Total budget (ex VAT), up to	£60,000
Project duration	12 weeks
Competition opens	Monday 6 July 2026
Competition closes	Thursday 6 August 2026

Context of the challenge

Signal congestion and adversary jamming are just some of the obstacles operational staff can encounter when trying to manage secure, battlefield communications.

High-power, portable radio systems are all-important to make safe communications possible. These are relied on to securely enable the transfer of tactical data, including streaming high bandwidth information and intelligence back to headquarters.

However, the increased processing power and transmission levels required for this data can generate significant waste heat. If left unmanaged, this heat can degrade equipment performance, reduce hardware lifespan, and creates a thermal signature that can be detected by enemy sensors.

HMGCC Co-Creation is seeking innovative heat dissipation solutions that can be integrated across a diverse range of software defined radio systems, from existing hardware to future platforms, to ensure operational reliability and personnel safety.

The gap

Managing thermal loads in electronic components is a persistent engineering challenge. While traditional methods, such as thermal interface material, heat sinks, heat pipes, and active cooling (fans or liquid cooling) are effective, they each present significant trade-offs regarding size, weight, power, and reliability.

Because no single ’one size fits all’ solution exists, this challenge seeks a versatile heat transfer method that can be commoditised for broader national security and defence procurement. It should be possible to retrofit this solution into high-power radio systems while remaining adaptable for other critical user cases.

Example use case

Captain Baker is commanding a unit operating in a battlefield where maintaining a low electronic and thermal signature is critical for survival.

To avoid detection and targeting by adversaries, the unit must adhere to strict emission control procedures.

To maintain command control with headquarters, the unit employs a multi-band, multi waveform field software defined radio using Very High Frequency (VHF) and Ultra High Frequency (UHF) bands. The radio is used to send back critical information, including intelligence, surveillance and reconnaissance data transfers. The

equipment is person portable, housed in a portable transit case (approximately 50L), designed for rapid deployment by personnel.

Due to the requirement for sustained high-power transmission at 20W over extended periods of time, the radio generates significant waste heat. If used for too long it can cause drift in frequency, electronic component degradation and a thermal signature that could be picked up be an adversary.

Captain Baker needs a thermal management solution to dissipate heat effectively without needing to make the radio kit bigger in size or compromising power efficiency. Given the operational environment, the solution must be ‘plug-and-play', requiring no specialised maintenance or additional technical training for the operator, ensuring seamless integration with existing field-deployable hardware.

Project scope

The challenge is focused on developing and commoditising heat dissipation methods for high-power software defined radio systems. Although exact models of the radio system will not be supplied, we can direct innovators to relevant similar commercial models during the project.

The outcome should be a demonstrator after a 12-week project, to minimum Technology Readiness Level (TRL) 5 (technology basic validation in a relevant environment).

Essential requirements:

- Must show a working prototype, delivering this to sponsors for independent testing
- Must be small enough to integrate with person-portable, field-deployable radio equipment.
- Must add no complexity to the system from the user’s perspective
- Develop a roadmap to a low-cost solution.
- Must be applicable for a land-based solution.
- Must minimise the thermal signature without reducing electronic power efficiency.

Desirable requirements:

- Low noise solution.
- Could be applicable to maritime and air domains
- Passive cooling methods are preferred however active cooling is within scope.

Constraints:

- The existing radio system fits within a 50-litre portable container.

- The software defined radio operated in the 0 – 40 GHz domain and at 20W continuous and up to 50W for 30 seconds.

Not required:

- A horizon scan.

Dates

Competition opens	Monday 6 July 2026
Briefing call	Monday 20 July 2026
Clarifying questions deadline	Monday 20 July 2026
Clarifying questions published	Thursday 23 July 2026
Competition closes	Thursday 6 August 2026
Applicants notified	Wednesday 26 August 2026
Pitch Day	Thursday 3 September 2026
Pitch Day outcome	Monday 7 September 2026
Commercial onboarding begins*	Friday 11 September 2026
Target project kick-off	Late September 2026

*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 we evaluate

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.

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:

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?
	  ○ 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 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?
	  ○ 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?

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 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.

How to apply

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 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.

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. **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.

8. **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.

9. 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.

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

Please see the UKRI definition for further detail.

11. 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.