Serapis Tasking Form

Tasking Form Part 1: *(to be completed by the Authority's Project Manager)*

To:	Lot 4 QinetiQ Plc	**From:**	Dstl
Any Task placed as a result of your quotation will be subject to the Terms and Conditions of Framework Agreement Number: LOT 4 DSTL/AGR/SERAPIS/AII/01			
VERSION CONTROL			
Version 0.a			
REQUIREMENT			
Proposal Required by:	October 21	**Task ID Number:**	AII78
The Authority Project Manager:	[REDACTED]	**The Authority Technical Point of Contact:**	[REDACTED]
Task Title:	Generation after next (GAN) LOS/BLOS and control-by-wireless communications system for future swarms		
Required Start Date:	Nov 21	**Required End Date:**	05/03/2024
Requisition No:	RQ0000001770	**Budget Range**	£300K (Year 1)
TASK DESCRIPTION AND SPECIFICATION			
Serapis Framework Lot	☐ Lot 1: Collect ☐ Lot 2: Space systems ☐ Lot 3: Decide ☒ Lot 4: Assured information infrastructure ☐ Lot 5: Synthetic environment and simulation ☐ Lot 6: Understand		

Statement of Requirements (SOR)

Background

The MOD Science and Technology Strategy 2020[1] highlights that the ultimate goal of Science & Technology (S&T) activity is placing new technology with enhanced capabilities into the hands of the users at the right time. Consequently, experimentation is a vital component of capability development within Defence. S&T experimentation, on early prototypes and proofs of concept. This will be rigorous and the focus of S&T experimentation will be on immature concepts and technologies (with correspondingly low Technology Readiness Levels (TRLs)) to assess the feasibility of exploitation of generation after next research. Prototype or conceptual experimentation will demonstrate the opportunities S&T provides and also give valuable assessment points to change course.

It is against this strategic drive that new facilities and capabilities and know-how need to be developed to enable experimentation of low TRL concepts and ideas to support radio technologies needed for the

[1] MOD Science and Technology Strategy 2020 v1.2 October 2020

next generation of Multi-domain Command & Control, Communications and Computers (C4) needed to enable rapid decisions making and support “Freedom of Access and Manoeuvre” (FOAM).

The future challenges in a C4 environment and develop the technologies and techniques needed for the S&T theme “Deployed Communications Evolving Against the Threat” (DCEAT) include the need for:

- new techniques and technologies that mitigate against rapidly emerging communications threats
- radio systems to operate in an denied, degraded and RF environment due to spectrum congestion and/or interference,
- resilient and robust communications systems (i.e low probabilities of detection, interception and exploitation),
- connectivity to all mobile/static platforms (underwater, land, sea, air and space),
- communications links that can support communications ranges beyond line of sight and short range,
- communications capacities from low to very high data rate systems
- global operations, often infrastructure less environment
- conducting operations that range from disaster relief, peacekeeping, surveillance to military engagement
- interoperability with national and international partners
- low signature networking,
- new architectures/protocols
- systems that are application aware
- satisfying convergence of systems and networks

The Generation after next platforms could include new platforms (from underwater to space) that could be autonomous, intelligent, highly mobile and agile, operating independently (such as a single hypersonic platform) as swarms or as groups of swarms. To enable these systems to be developed, co-operate and be operated efficiently and intelligently, the next generation of communications systems will be required to provide communications within the platform, and with other platforms (of the same or different type) and hence provide the S&T needed by the “Deployed Communications Evolving Against the Threat” (DCEAT) programme.

These new communications system and technologies will be required to facilitate C2 and decision-making both beyond line of sight (BLOS) and within line of sight (LOS) such as within a swarm. There will also be a need to enable Control By-Wireless (CBW) systems where in-platform connectivity is provided wirelessly. CBW systems have the potential to improve efficiency and flexibility, while reducing weight (i.e. minimising cabling), fuel consumption and maintenance costs. Both high and low bandwidth interconnectivity may be required to enable co-operative swarm behaviour and interoperability with other platforms.

Although hypersonic platforms may not operate as swarms, communications to these future platforms will still be challenging, particularly as BLOS communications may be required in a complex plasma environment generated by the platform. These systems may require

A challenge for swarming platforms and other MANET radio-networked swarms will be the cryptographic requirement. This specific area will need to addressed if swarm platforms are to be used securely.

Aim

The aim of this SoR is to develop LOS, BLOS and CBW technologies, techniques and measurements and simulations to facilitate the design, development and operation of autonomous swarms and autonomous agile single platforms and hence support the S&T needed for “Deployed Communications Evolving Against the Threat” (DCEAT).

The work will support research into:

1. Materials S&T
2. Advanced waveform development:

3. Advanced Antennas and Transceivers
4. New and novel bearers
5. Operational agility

The tools and system developed will drive the development of resilient deployed communications systems to stay ahead of the threat, respond rapidly to new threats and exploit new technologies into MoD spiral development approaches. The ultimate research outcomes will enable MOD to rapidly develop and field new technologies cost effectively, to sustain effective C2 and Communications in the Denied, Degraded, Intermittent and Low-Bandwidth environments.

Requirement

The outline requirements are to develop the RF techniques and technologies (from VHF to THz) needed for communications to agile swarm platforms (from underwater to space) and single agile platforms.

Activities could include:

Year 1

Set-up and Chair a core technical team to provide strategic direction, develop and address (either using resources within the team or by drawing on additional expertise outside the team via SoRs) a backlog of activities. This backlog activities could include:

1. Developing a vision white-paper on how the generation after next swarms and agile platforms may be used to support military operations and the implications of these use cases on communications requirements. This will requirement engagement (e.g. workshops, meetings) with a wide range of stakeholders such as front line commands, to understand their short term needs and workshops, meetings with the wider stakeholder community (industry, academia, government) to shape potential future needs of swarms. The outputs should inform the research backlog.
2. Reviewing the Missile Defence Architecture and it's communications challenges and develop baseline operational-scenarios for swarm communications. This should include the considering Future tactical networking – beyond Link 16, and outline potential options.
3. Highlight/investigate the Crypto requirements and challenges for MANET radio networks
4. Identify the challenges and benefits expected from control-by-wireless (CBW) systems and the wireless technologies and the key architectural components needed
5. Highlight potential international collaborative events and initiates that the work should draw on (e.g. MoU, TTCP) and Identify international wireless standards that could be influenced
6. Outline an approach for BLOS and LOS communications to hypersonic platforms
7. Develop a costed research plan/outline or roadmap, for example, air swarm platforms for year 2 with the expectation of technology demonstrations in Year 3

Year 2

Maintain/review the technical team composition, provide strategic direction and develop and address a backlog of activities. This backlog could include:

1. Development via initial experimentation/simulation of key components
2. Identifying barriers to developing and exploiting the technologies needed
3. Attend exploitation and knowledge gathering events such as conferences and workshops
4. Holding a planning meeting to discuss and plan for the coherent demonstration of the research being conducted.
5. Develop the costed research plan/outline roadmap for future swarm platforms for Year 3 with the expectation of technology demonstrations in Year 3

Year 3

Maintain/review the technical team composition, provide strategic direction and develop and address a backlog of activities. This backlog could include:

1. Demonstrate TRL level 4 technologies developed and techniques
2. Highlight benefits and threats of the technologies to platform development
3. Develop an integration/exploitation roadmap
4. Input work into international standards, or guidance notes
5. Develop a costed research plan/outline roadmap for potential Year 4 activities

Innovation Benefits and Exploitation Plan (IBEP)

By conducting the work the following are anticipated.

1. Innovation – (i.e. what are we building on?)
    a. General know-how and previous knowledge of platform systems
    b. S&T trends
    c. VHF – THz technologies

2. Benefits (i.e. what will the contracted stakeholders get from this?)
    a. Development of new capabilities
    b. Closer defence-sector collaboration
    c. Increased collaboration between industry, academia and government.

3. Exploitation (what are the artifacts that Dstl will get that can be more widely exploited)
    a. Reports and papers
    b. Understanding of technical barriers
    c. Know-how in the wider supply chain for design tools

4. Plan (what's the plan for exploitation)
    a. Integration into C2 processes and procedures
    b. Exploitation and re-use of information for defence purposes

Outputs.

Outputs (or artefacts) of the activities that may be exploited more widely include:

- Reports and white papers
- Prototype system descriptions
- Simulations data and models
- Measurement data
- Conference and journal papers
- Threat information
- Illustrative architectures
- Use case

Deliverables.

Deliverables of the project are suggested in in the Deliverables section and will be agreed during proposal development.

An end of FY 22 consolidated report will be required in February/March 2022 highlighting:

- Aims
- Technical Progress
- Achievements

- Exploitable outputs
- Recommendations

Procurement Strategy

☒ Lot Lead to recommend ☐Single Source / Direct Award

Pricing:

☒ Firm Pricing ☐ Ascertained Costs* ☐ Other*

Firm Pricing shall be in accordance with DEFCON 127 and DEFCON 643

Ascertained Costs shall be in accordance with DEFCON 653 or DEFCON 802.

*only at Authority's discretion

Task IP Conditions

Task IP Conditions (Follow the NIPPY guide to identify your information and IP requirements for each deliverable)	**Summary of the Authority's rights in foreground IP (IP generated by the supplier in performance of the contract)**
DEFCON 703 ☐	Vests ownership with the Authority
DEFCON 705 Full Rights ☒	Enables MOD to share in confidence as GFI or IRC under certain types of agreements. Can be shared in confidence within UK Government.
OTHER IP DEFCONS: 14* ☐, 15* ☐, 16* ☐, 90* ☐, 91* ☐, 126* ☐	Generally only suitable for deliverables at TRL 6 and above.
BESPOKE IP Clause ☐ *	Details to be added and agreed by IP Group
* Do not use without IPG advice and approval	
Please state in this text box if MOD or the customer has a requirement a) that one or more Other Government Departments is able to share confidentially with their own suppliers, b) to publish but you do not think there is a requirement to own or control the deliverable, or c) to share under a procurement Memorandum of Understanding (MOU).* *If any of these three issues applies, please contact IPG for advice before completing this form. *Listing research MOUs is not required, but can be a helpful courtesy to the supplier.*	

DELIVERABLES

Ref	Title	Due by	Format	TRL	Expected classification (subject to change)	Information required in deliverable	IPR DEFCON

D-1	Monthly progress reports (MPR)	T0+1 month	Presentation		Official	PORT (progress, opportunities, Risks, Timelines) quad chart presentation pack	705
D-2	*Quarterly Progress and Technical Review (QPTR)*	*T0+3 Months*	*Presentation (.pptx)*		*Official-*	Presentation pack to include but not limited to: • Update on technical progress • Progress report against project schedule. • Review of risk management plan. • Commercial aspects. • Review of deliverables. • Risks/issues. • GFA and supplier performance	*705*
D-3	*First year report*	*February/March 2022*	*Report (Word)*		*Official*	Report to include: • Aims • Technical Progress • Achievements • Exploitable outputs Recommendations	
D-4	Annual progress report (APR)	T0-12	Report		Official	Report to include: • Aims • Technical Progress • Achievements • Exploitable outputs	
D-5	Annual conference presentation (ACP)	T0+12	Presentation		Official	• Presentation to an annual meeting (or conference) attended by a range of stakeholders.	

DELIVERABLE: ACCEPTANCE / REJECTION CRITERIA

Unless otherwise stated below, Standard Deliverable Acceptance / Rejection applies. This is 30 business days, in accordance with DEFCON 524 Rejection, and DEFCON 525 Acceptance.

Standard Deliverable Acceptance / Rejection:-

Yes ☒ (DEFCON 524 Rejection, and DEFCON 525 Acceptance)

No ☐ (if no, please state details of applicable criteria below)

Deliverable Acceptance / Rejection Criteria:-

If there are any other specific acceptance/rejection criteria you would like to apply to any of the deliverables, please state them here.

Government Furnished Assets (GFA)

ISSUE OF EQUIPMENT/RESOURCES/INFORMATION/FACILITIES (*if not applicable, delete table and insert "None" in this text box)*

Unique Identifier/ Serial No	Description	Classification	Type	Available Date	Issued by	Return or Disposal Date	Any restrictions?
Serial no	*Description*	*Official-Sensitive*	*Equipment*	*00/00/0000*	*Issuer*	*00/00/0000*	*Include details here*
N/A	N/A						

QUALITY STANDARDS

☐ **ISO9001** (Quality Management Systems)

☐ **ISO14001** (Environment Management Systems)

☐ **ISO12207** (Systems and software engineering — software life cycle)

☐ **TickITPlus** (Integrated approach to software and IT development)

☐ **Other:** (Please specify in free text below)

SECURITY CLASSIFICATION OF THE WORK

The highest classification of this SOR

OFFICIAL ☐ OFFICIAL-SENSITIVE ☐ SECRET ☐ TOP SECRET ☐ STRAP ☐ SAP ☐

The highest expected classification of the work carried out by the contractor

OFFICIAL ☐ OFFICIAL-SENSITIVE ☐ SECRET ☐ TOP SECRET ☐ STRAP ☐ SAP ☐

The highest expected classification of Deliverables/Output

OFFICIAL ☐ OFFICIAL-SENSITIVE ☐ SECRET ☐ TOP SECRET ☐ STRAP ☐ SAP ☐

Is a Security Aspects Letter (SAL) required? *(A Security Aspects Letter (SAL) will be required for each Task above Official-Sensitive and above)*

Yes ☐ No ☐

TASK CYBER RISK ASSESSMENT. *(In accordance with DEF STAN 05-138 and the* Risk Assessment Workflow)

Cyber Risk Level	[REDACTED]
Risk Assessment Reference	[REDACTED]

ADDITIONAL TERMS AND CONDITIONS APPLICABLE TO THIS CONTRACT

Please ensure all completed forms are copied to DSTLSERAPIS@dstl.gov.uk when sending to the Lot Lead.

Tasking Form Part 2: *(To be completed by the Lot Lead)*

To: The Authority	From: The Lot Lead

Proposal Reference _____ **(attached)**

Delivery of the requirement:

The proposal <u>shall</u> include, but not be limited to:

- A full technical proposal that meets the individual activities that are detailed in Statement of Requirements (Part 1 to Tasking Form).
- Breakdown of individual Deliverables, with corresponding Intellectual Property rights applied.
- Breakdown of Interim Milestone Payments, with corresponding due dates.
- A work breakdown structure/project plan with key dates and deliverables identified.
- A list of required Government Furnished Assets from the Authority, including required delivery dates.
- A clear identification of Dependencies, Assumptions, Risks and Exclusions which underpin your Technical Proposal.
- Sub-Contractors Personnel Particulars Research Worker Form and security clearances (if applicable)

COMMERCIAL

[REDACTED]

At the Authority's request we have included a Limit of Liability for years 2 and 3. Each Firm Price created (that draws on the Limit of Liability) shall be undertaken via a mutually agreed Contract Amendment Form. Whilst these individual Contract Amendment Forms detail a separate package of work, it is linked to (and shall reference) this Tasking Form. It is understood that the scope of the work being undertaken using the LOL is not yet defined, and will be done so at the time of each Contract Amendment Form.

[REDACTED]

PRICE BREAKDOWN

You are to use the costs detailed in Item 2 Table I in the Schedule of Requirement and at Annex E Table 2 of the Serapis Framework Agreement. Please also provide a price breakdown which should include, but is not limited to: Lot Lead Rates, Sub-contractors costs and rates, travel and subsistence. In support of your Proposal you are requested to provide clear details of all Dependencies, Assumptions, Risks and Exclusions that underpin your price.

Offer of Contract: *(to be completed and signed by the Contractor's Commercial or Contract Manager)*

	£195,435.37 for the core work in FY21/22 £945,946 for the Limit of Liability in years 2 and 3. Year 2 option total £464,517 Year 3 option total £481,429		(ex VAT)
Start Date:		**End Date:**	

Lot Leads Representative	Name	[REDACTED]
	Tel	[REDACTED]
	Email	[REDACTED]
	Date	27th January 2022
Position in Company	Assistant Commercial Manager	

Signature	[REDACTED]

Core Work – Breakdown

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Core Work – Milestone breakdown costs

Proposed Milestones Payments

Your TMS bid costs shall be included in milestone 1.

The final Milestone must reflect the actual cost of the deliverable, and be greater than 20% of the Task value, unless otherwise agreed with your Commercial POC

Please duplicate the template per milestone table format below as necessary, and rename milestone number accordingly.

[REDACTED]
[REDACTED]

Total Cost	£195,435.37

Future Tasks – Summary
[REDACTED]

Tasking Form Part 3:

To be completed by the Authority's Commercial Officer and copied to the Authority's Project Manager.

1. **Acceptance of Contract:**		
Authority's Commercial Officer	Name	[REDACTED]
	Tel	[REDACTED]
	Email	[REDACTED]
	Date	04/02/2022
Requisition Number		RQ0000001770
Contractor's Proposal Number		Serapis Task AII78_GaN_Swarming_Comms-Technical_Proposal Ver 3.0
Purchase Order Number		DSTL0000000353
Signature		[REDACTED]
Please Note: Task authorisation to be issued by the Authority's Commercial Officer or Contract Manager. Any work carried out prior to authorisation is at the Contractor's own risk.		