Statement of Requirement (SoR)

Reference Number: RQ0000009511

Version Number: 0.1

Date: 6th May 2022

1. Requirement

1.1 Title

TRL5 STAR demonstrator for Land Electronic Defence (ED)

References:

[1] 72/22/R/137/R 'SI Cancellation and STAR Exploitation into Next Generation Land ED Systems – Demonstration Phase Report', Wales S et.al, Roke and University of Bristol, April 2022.

1.2 Summary

This task will develop a TRL5 demonstrator of a composite analogue and digital Simultaneous Transmit and Receive (STAR) system which can be implemented in a next generation Land ED system. Redacted under FOIA Section 26 – Defence

A final report will document an outline system design for a vehicle borne STAR system suitable to be implemented in a TRL6 prototype, and will propose a development plan for technology integration of this in a future LCA-based ED system.

1.3 Background

Dstl requires to work with Industry and Academia to investigate Self-Interference (SI) cancellation approaches and Simultaneous Transmit and Receive (STAR), and the application of these to ED.

The ability to simultaneously transmit and receive on the same frequency has been widely recognised to have potential benefits for both communications and electronic warfare applications. Much of the current focus of research in government, industry and academia has been directed towards the wireless communications application where the motivation is to improve spectral efficiency. A key technology contributing to STAR is self-interference (SI) Cancellation.

Redacted under FOIA Section 26 – Defence

1.4 Requirement

1. A TRL 5 demonstrator system shall be implemented consisting of a composite analogue and digital STAR system targeting a next generation C-IED ECM system Redacted under FOIA Section 26 – Defence

3. Provide a stakeholder demonstration of the system operating in a relevant use-case. This will be an over-the-air demonstration, either in an outdoor site (by preference) or in an anechoic chamber. A stakeholder presentation shall be delivered as part of this event.

4. Document an outline system design for a vehicle borne STAR system suitable to be implemented in a TRL6 prototype, together with a plan to achieve this.

5. Propose an outline technology insertion plan for STAR in a next generation LCA-based ECM system.

1.5 Options or follow on work

A future task will develop this demonstrator system towards a TRL6 prototype. This will be contracted by a separate stand-alone procurement action.

1.6	Deliverables & Intellectual Property Rights (IPR)						
Ref.	**Title**	**Due by**	**Format**	**TRL***	**Expected classification (subject to change)**	**What information is required in the deliverable**	**IPR DEFCON/ Condition**
D1	Two-weekly progress reviews	Approximately two-weekly throughout the task	Teleconference with supporting materials and minutes.	n/a	Redacted under FOIA Section 26 – Defence	Short update report normally by email. Notes and actions provided post-meeting.	DEFCON 705 Full Rights shall apply
D2	Outline TRL5 demonstrator design document and development plan	T0 + 6 weeks	Review workshop, supported by working documents and presentation pack.	N/A	Redacted under FOIA Section 26 – Defence	Working paper outlining the design of the TRL demonstrator and the plan to achieve the demonstration. Review of the feasibility of incorporating EDAPS antennas in this demonstrator system.	DEFCON 705 Full Rights shall apply
D3	Demonstration of STAR applied to the defined Use-Case.	T0 + 30 weeks	Demonstration supported by presentation slides	TRL 5	Redacted under FOIA Section 26 – Defence	Demonstration – open air or anechoic chamber.	DEFCON 705 Full Rights shall apply
D4	Final report	T0+35 weeks	Final paper report, design documents and plans	TRL5	Redacted under FOIA Section 26 – Defence	Document the entirety of the work performed under the Contract and results achieved. Document an outline system design for a vehicle borne STAR system suitable to be implemented in a TRL6 prototype, together with a plan to achieve this. Propose an outline technology insertion plan for STAR in a next generation LCA-based ECM system.	DEFCON 705 Full Rights shall apply

1.7 Standard Deliverable Acceptance Criteria

- All Reports included as Deliverables under the Contract e.g. Progress and/or Final Reports etc. must comply with the Defence Research Reports Specification (DRRS) which defines the requirements for the presentation, format and production of scientific and technical reports prepared for MoD.
- Progress Reports: The report should detail, document, and summarise the results of work done during the period covered and shall be in sufficient detail to comprehensively explain the results achieved; substantive performance; a description of current substantive performance and any problems encountered and/or which may exist along with proposed corrective action. An explanation of any difference between planned progress and actual progress, why the differences have occurred, and if behind planned progress what corrective steps are planned.
- Final Reports: shall describe the entire work performed under the Contract in sufficient detail to explain comprehensively the work undertaken and results achieved including all relevant technical details of any hardware, software, process or system developed there under. The technical detail shall be sufficient to permit independent reproduction of any such process or system.
- All Reports shall be free from spelling and grammatical errors and shall be set out in accordance with the Statement Of Requirement (1) above.

1.8 Specific Deliverable Acceptance Criteria

N/A

2. Quality Control and Assurance

2.1 Quality Control and Quality Assurance processes and standards that must be met by the Supplier

☒ 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 below)

The proposal should include a statement of how quality will be managed in the task. This will include aspects of configuration management, and should reference processes that will be followed for Quality Assurance and Review.

2.2 Safety, Environmental, Social, Ethical, Regulatory or Legislative aspects of the requirement

Standard EW&C Conditions shall apply.

3. Government Furnished Assets (GFA)

GFA No.	Unique Identifier/ Serial No	Description:	Available Date	Issued by	Return Date (T0+)
GFI-1		By mutual agreement; technical information relating to EDAPS antennas	At contract start	Dstl	At end of contract