

Serapis Tasking Form

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

To:	Lot 1 Roke Manor Research Ltd	From:	The Authority
Any Task placed as a result of your quotation will be subject to the Terms and Conditions of Framework Agreement Number: LOT 1 DSTL/AGR/SERAPIS/COL/01			
VERSION CONTROL			
00-01 Copied from Dstl original. 00-02 Task form revised to contain only ST6 with significant changes. 00-03 Task form revised after internal review (approved by Stephen Ablett). 01-00 Version 1.			
REQUIREMENT			
Proposal Required by:	09/12/2022	Task ID Number:	C72-06
The Authority Project Manager:	[Redacted]	The Authority Technical Point of Contact:	[Redacted]
Task Title:	ELINT tracking		
Required Start Date:	24/01/2023 or ASAP	Required End Date:	30/06/2024
Requisition No:	RQ0000011301	Budget Range:	£150k
TASK DESCRIPTION AND SPECIFICATION			
Serapis Framework Lot ☒ Lot 1	☐ Lot 2: Space systems ☐ Lot 3: Decide infrastructure environment and simulation ☐ Lot 6: Understand ☐ Lot 4: Assured information ☐ Lot 5: Synthetic		

Abstract

The project aims to develop and improve methods of tracking from electronic intelligence (ELINT) data, including multi-source fusion algorithms. The ELINT data is in this case passive observations of maritime radar.

Background

The [Redacted] has previously worked on tracking targets from classified ELINT detections, funded under R-Cloud. ELINT data may be useful in supporting multi-sensor tracking of events with a Wide Area Motion Imagery (WAMI) sensor.

Stone Soup (<https://stonesoup.rtd.io>) is an open source project for the assessment of tracking and state estimation algorithms. The framework is built in a modular way using an object-oriented approach, enabling construction of algorithms from sub-components. The modularity also enables the same components to be

applied to many different domains, targets, sensor modalities, and fusion architectures. Assessments can be made against simulated, recorded, or live data, and the framework contains tools to generate metrics on how each algorithm performs. The Stone Soup source code is available on GitHub (<https://github.com/dstl/StoneSoup>) and is written in Python. Stone Soup is designed for the assessment of algorithms and as such is aimed at a research-level of code and performance, with tests and documentation for simple scenarios; it is not aimed at operational or real-time use.

Statement of Requirements (SOR)

Algorithm development

The Supplier **shall** develop methods of tracking from ELINT data, in this case passive observations of maritime radar. The tracking algorithms developed **shall** be based on the emitter location and a realistic representation of pertinent radar parameters, including (but not necessarily limited to) frequency, scan period, pulse repetition interval (PRI), pulse width (PW), and the numbers and types of radar typically found on military and commercial vessels. Additional factors to be realistically represented **shall** include mode-switching by individual radars and switching between radars on an individual ship. The methods developed **should** be scalable to a degree practical to be used on thousands of vessels simultaneously in moderate to intense target density. Scalability is expected to derive from improvements to the state of the art in data association, using the radar parameters as distinguishing features.

Dstl will provide a classified ELINT dataset for this task as GFX and the supplier **should** obtain equivalent commercial data under the contract. The suitability of the commercial data obtained **shall** be agreed with the Authority. Both data sets **shall** be used for algorithm development/refinement.

The proposal **shall** include a development plan which **should** include the engineering activities and methodology that will be used for the algorithm development, and a Gantt chart / plan that will then be used as the basis of progress meetings.

The proposal **shall** include the Supplier security point of contact.

Stone Soup

Any new algorithms/techniques **should** be developed in Stone Soup in Python. Additions into Stone Soup **should** consider the overall framework, breaking algorithms down into sub-components; this is to enable alternative forms of algorithms to be implemented via changing the sub-components.

The delivered source code **shall** provide all the components required to run the given algorithm and the associated tests, and all new code **should** be covered by unit and integration tests. Tests **should** be provided to test functionality and also to ensure exceptions are raised or managed appropriately. The existing Stone Soup code base is an example of what is expected of tests; unit tests are required for individual components, integration tests can either be formal tests or take the form of a tutorial or example notebook. Stone Soup test coverage is currently ~95%, and similar coverage is expected from contributions.

All components **should** be documented, describing the class/method/parameters and an overarching tutorial/example/demonstration notebook that provides an overview of the given algorithm in line with the current offering on [tutorials](#) and [examples](#) in [Stone Soup's documentation](#).

It is acceptable if the algorithms implemented require changes to the framework, and as such could require modifications to existing Stone Soup components in order to be compatible. Breaking changes **shall** be documented for inclusion in release notes, and this **should** consist of (minimally) a one or two sentence summary highlighting the breaking change and what else might be impacted by the change.

Where algorithms/techniques cannot be developed directly using Stone Soup they **should** be provided as a separate repository as a Stone Soup plugin.

Output and monitoring

Monitoring meetings can be assumed virtual unless explicitly stated otherwise.

A start-up meeting (deliverable D1) **shall** be held within the first week of the project.

The Authority **shall** require regular progress reports (*which are brief reports in the form of slides, not held as meetings*, deliverable D2.n) and quarterly technical and project management review meetings (deliverable D3.n). These reports/meetings **should** include:

- Updates on technical progress, with demonstrations when available.
- Progress report against project schedule.
- Review of deliverables.
- Review of risk management plan.
- Current risks/issues.
- Commercial aspects.
- GFA and supplier performance.

The first progress report **shall** be included in the development plan update meeting (deliverable D4). This meeting **shall** include an update to the development plan that was included with the proposal and **should** include the following additions:

- Background to the algorithms being developed.
- How the algorithms will be developed.
- What improvements the algorithms are expected to offer.
- How the algorithms' performance will be tested.

The primary outputs of the project are the ELINT tracking software as source code and the associated documentation (deliverable D5). The software developed **should** either be integrated into Stone Soup or be provided as a separate repository as a Stone Soup plugin. Note that until agreement is reached with the Authority, the algorithms developed **shall not** be published on the open Stone Soup GitHub repository and instead a local copy of the Stone Soup repository **shall** be used without external access [Redacted] In addition, a report **shall** be produced (deliverable D6) which **should** include:

- Introduction to the goals of the project.
- Background on the algorithms/methods that were developed.
- What improvements the algorithms offer.
- Installation/Build instructions with any dependencies and system requirements.
- A quick start guide to using the tracking algorithms.
- A detailed description of the new techniques and how to use them.
- Evidence of testing and a demonstration of tracking targets using Stone Soup.
 - The methods developed **shall** be demonstrated using the data sets supplied and obtained and should show the benefits (or not) of each data parameter and technique employed.
- Known limitations.
- Examples of usage.
- Advice to users.
- Glossary.

At the end of the project there **shall** be a close-down meeting (deliverable D7), taking place no later than 1 week prior to the end of the contract, which **should** include:

- Lessons identified.
- Future work.
- Benefits.
- Any administrative aspects associated with the end of the contract.

Additional meetings and technical workshops **should** be proposed by the Supplier as required.

Following any meeting, materials and minutes **shall** be delivered to the Authority within 5 working days of the event.

Quality

The Supplier **shall** provide a description of their engineering and quality management systems and how these systems will be applied in the context of the task requirements.

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 *	[Redacted]

* 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

[Redacted]

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)*

<u>Unique Identifier/ Serial No</u>	<u>Description</u>	<u>Classification</u>	<u>Type</u>	<u>Available Date</u>	<u>Issued by</u>	<u>Return or Disposal Date</u>	<u>Any restrictions?</u>

[Redacted]

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)

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SECURITY CLASSIFICATION OF THE WORK
[Redacted]

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

Cyber Risk Level	[Low]
Risk Assessment Reference	[RAR-946272365]

2. [Redacted]

Please ensure all completed forms are copied to [\[Redacted\]](#) when sending to the Lot Lead.

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

To:	The Authority	From:	The Lot Lead
[Redacted] - C72-6 Proposal Reference Technical Response (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)			
PRICE BREAKDOWN			
<i>You are to use the costs detailed in Item 2 Table 1 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.</i>			
Offer of Contract: <i>(to be completed and signed by the Contractor's Commercial or Contract Manager)</i>			
Total Proposal Price in £	£150,696.29		(ex VAT)
Start Date:	12/04/2023	End Date:	15/03/2024
Lot Leads Representative	Name	[Redacted]	
	Tel	[Redacted]	
	Email	[Redacted]	
	Date	20/04/2023	
Position in Company	[Redacted]		
Signature	[Redacted]		

Core Work – Breakdown

[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]

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	27/04/2023
Requisition Number		RQ0000011301
Contractor's Proposal Number		ELINT Tracking (C72-6)
Purchase Order Number		DSTL0000016354
Signature		[Redacted]
<i>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.</i>		