



**RETURN BIDS TO:**  
**RETOURNER LES SOUMISSIONS À:**  
Public Works and Government Services Canada  
ATB Place North Tower  
10025 Jasper Ave./10025 ave. Jasper  
5th floor/5e étage  
Edmonton  
Alberta  
T5J 1S6  
Bid Fax: (780) 497-3510

**SOLICITATION AMENDMENT**  
**MODIFICATION DE L'INVITATION**

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

**Comments - Commentaires**

**Vendor/Firm Name and Address**  
**Raison sociale et adresse du**  
**fournisseur/de l'entrepreneur**

**Issuing Office - Bureau de distribution**  
Public Works and Government Services Canada  
ATB Place North Tower  
10025 Jasper Ave./10025 ave Jasper  
5th floor/5e étage  
Edmonton  
Alberta  
T5J 1S6

<b>Title - Sujet</b> 3D Radar System	
<b>Solicitation No. - N° de l'invitation</b> W7702-196175/A	<b>Amendment No. - N° modif.</b> 001
<b>Client Reference No. - N° de référence du client</b> W7702-196175	<b>Date</b> 2019-01-03
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$EDM-024-11503	
<b>File No. - N° de dossier</b> EDM-8-41207 (024)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2019-01-28</b>	
<b>Time Zone</b> Fuseau horaire Mountain Standard Time MST	
<b>F.O.B. - F.A.B.</b> Specified Herein - Précisé dans les présentes	
<b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input type="checkbox"/> <b>Other-Autre:</b> <input checked="" type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Tiet, Anthony	<b>Buyer Id - Id de l'acheteur</b> edm024
<b>Telephone No. - N° de téléphone</b> (587) 926-1376 ( )	<b>FAX No. - N° de FAX</b> (780) 497-3510
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

<b>Delivery Required - Livraison exigée</b>	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Telephone No. - N° de téléphone</b> <b>Facsimile No. - N° de télécopieur</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/Firm</b> <b>(type or print)</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/</b> <b>de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

Amendment 001 has been raised to answer the following questions and make the following changes:

**REVISED CLOSING DATE OF:**

**02:00 PM MST on 2019-01-28**

- Question 1:** Will DRDC accept something other than a tripod?  
**Answer 1:** Yes, Annex "A", REQUIREMENTS, section 2.1, Deliverables has been amended.
- Question 2:** Can the intended use of the 3 licenses be clarified in order for the Contractor to ensure appropriate licensing, software and equipment is provided?  
**Answer 2:** It is DRDC's intension to use 1 license at a time, the 3 licenses will provide DRDC with the flexibility to use different laptops as needed. These will be non-networked assets.
- Question 3:** Will DRDC accept a radar if the weight is above 30kg while keeping within Canada's Occupational Health and Safety Regulations, in order to gain on coverage and technical requirements?  
**Answer 3:** Yes, Annex "B", COMPLIANCE MATRIX – MINIMUM MANDATORY PERFORMANCE SPECIFICATIONS has been amended.
- Question 4:** Can DRDC provide more details on the concept of employment for the system.  
**Answer 4:** The system is intended to be used for field trials with DRDC for Counter Unmanned Aerial System evaluation and experimentation. Trials are expected to be one or several days in duration at various sites on Canadian Forces Bases. As such, it needs to be able to be shipped to different trial locations, and transportable by vehicle/person to remote trial sites, and reasonably quick to set up for experiments.
- Question 5:** Does the system need to discriminate drone targets from unwanted targets?  
**Answer 5:** Being able to discriminate is desirable but not mandatory, Annex "B", COMPLIANCE MATRIX – MINIMUM MANDATORY PERFORMANCE SPECIFICATIONS has been amended.

On page 13 of 19, under **ANNEX "A", REQUIREMENT**

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**1. Background**

The department of Defence Research and Development Canada, Suffield Research Centre (DRDC-SRC) has a requirement to conduct a series of trials to examine the efficacy of several Counter Unmanned Aerial Systems (C-UASs). To establish a ground truth independent of any examined C-UAS, a man-portable directional radar system is required to be able to identify Unmanned Aerial Systems (UAS) flying as a red team against the given CUAS. Further, this radar system should be able to locate the UAS on a map, specify its velocity/altitude/heading, and allow its raw data for export.

**2. Requirement**

The Contractor must provide a software-defined, three-dimensional radar system with all accessories. This radar is to be of the tactical, man-portable variety and capable of detecting aerial objects in its zone of detection and must meet the mandatory specifications outlined in Annex "B".

## 2.1 Deliverables

The Contractor must deliver the unit as per Annex "B" with the following accessories:

1. 1 x Ruggedized carrying case for radar system with applicable accessories;
2. 1 x Portable, non-permanent field mount (tripod or similar) with applicable accessories;
3. 2 x Mounting hardware with applicable accessories;
4. 2 x All required wiring, power adaptors (for North American 120 VAC power and NEMA 1-15 or 5-15 plug/receptacle standard), data cables, and harnesses;
5. 1 x Laptop or portable computer with the control software;
6. 1 x Software on external media for installation on up to three (3) other Windows OS computers; and
7. 1 x Product manual(s), both digital and print (as applicable).

### 2.1.1 Delivery Date

All deliverables identified should be delivered on or before 2019-03-31. If you cannot meet this, the best delivery that could be offered is \_\_\_\_\_. (please insert if applicable)

### 2.1.2 Delivery Location

The Contractor must deliver the requirement to:

Defence Research and Development Canada – Suffield Research Centre, Bldg 560 Receiving  
Ralston, Alberta  
T0J 2N0  
Canada

## 3. Acronyms

UAS	Unmanned Aerial System
C-UAS	Counter Unmanned Aerial System
COTS	Commercial-Off-The-Shelf
RCS	Radar Cross Section
RF	Radio Frequency
GUI	Graphical User Interface

On page 14 of 19, under **ANNEX "B", COMPLIANCE MATRIX – MINIMUM MANDATORY PERFORMANCE SPECIFICATIONS**

**DELETE:** In its entirety

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A complete list of the minimum mandatory performance specifications are detailed below in the "Compliance Matrix". Bidders are to clearly demonstrate compliance with each mandatory specification.

1. Bidders **must** show compliance by addressing each performance specification in the Compliance Matrix, whether the product offered "meets" or "doesn't meet".
2. It is requested that supporting technical documentation, including but not limited to, specification sheets, technical brochures, photographs or illustrations be provided with the bid at solicitation close and be cross-referenced on the Compliance Matrix for each performance specification to outline where in the supporting technical documentation it demonstrates compliance. It is the Bidders responsibility to ensure that the submitted supporting technical documentation provides detail to prove that the proposed product(s) meet the requirements of the Performance Specification. If published supporting technical document is not available, the Bidder should

prepare a written narrative complete with a detailed explanation of how its bid demonstrates technical compliance.

3. If the supporting documentation referenced above has not been provided at bid closing, the Contracting Authority will notify the Bidder that they must provide supporting documentation within two (2) business days following notification. Failure to comply with the request of the Contracting Authority within that time period, will deem the bid non-responsive and the bid will be given no further consideration.
4. Bidders must address any concerns with the performance specifications in written detail to the Contracting Authority before bid closing as outlined in the Request for Proposal (RFP) document.
5. Failure to meet each performance specification will result in the bid being deemed non-responsive, and be given no further consideration.

**COMPLIANCE MATRIX – MINIMUM MANDATORY PERFORMANCE SPECIFICATIONS:**

Requirement	Manufacturer(s) Offered:	Model Number(s) Offered:
Software-defined, three-dimensional radar system		

Item #	Performance Specification	Status (M) Mandatory (D) Desirable*	Performance Specification Met? Indicate either Yes/No	Performance Specification Offered: Bidder <u>should</u> indicate how they meet the performance specification by recording this information in this column	Cross Reference: In this column, Bidders should cross-reference where this performance specification is indicated in their supporting documents.
<b>A. Radar System</b>					
1	<b>Radar Technology:</b> System must be a software-defined radar, allowing different operational profiles for upload to hardware.	M			
2	<b>Radar Technology:</b> Radar must be a three-dimensional one, meaning it can locate objects relative to it in all three dimensions of space.	M			
3	<b>RF Coverage:</b> Radar generates RF coverage of no less than 90 degrees of arc in both azimuth and elevation.	M			

4	<b>Minimum Detectable Object Size:</b> Radar must be able to detect an object with a RCS of 0.1 m <sup>2</sup> at a distance of 1km. Radar must be able to detect NATO Class I Mini UASs.	M			
5	<b>Minimum, Maximum Target Velocities:</b> Radar must be able to detect objects above the minimum detectable object size (requirement A.4) travelling between 10 and 500 km/hr.	M			
6	<b>Scan Frequency/ Update Rate:</b> Radar must scan its area and update objects and their speeds, headings, and locations at least once every second (1 Hz).	M			
7	<b>Minimum Detection Range:</b> Radar must be able to detect aerial objects from a minimum distance of 200 m.	M			
8	<b>Accuracy:</b> The radar must have a single-scan probability of detection of 90% and a false-alarm rate of no more than 5% for an object with an RCS of 0.1m <sup>2</sup> at a distance of 1km.	M			
9	<b>Two-targets:</b> Radar must be capable of resolving two targets separated by 10m in range when both targets are in the same azimuth / elevation beamwidth.	M			
10	<b>Two-targets:</b> The C-UAS Radar System must be capable of resolving two targets separated by 5 degrees in azimuth when both targets are at the same range and in the same elevation beamwidth.	M			

11	<b>Two-targets:</b> The C-UAS Radar System must be capable of resolving two targets separated by 5 degrees in elevation when both targets are at the same range and in the same azimuth beamwidth.	M			
12	<b>Mass:</b> The radar system, not including accessories, case, or controlling computer, must have a mass of less than the Canada's Occupational Health and Safety Regulations for a 2 person team or 46kg.	M			
13	<b>Calibration:</b> The radar must be self-calibrating.	M			
14	<b>Ranging and Detection:</b> The radar must be able to detect, locate, and range objects automatically via its affiliated software.	M			
15	<b>External Temperature Operational Range:</b> The radar must be rated to operate within the band from -40C to 50C inclusively.	M			
16	<b>Interface:</b> The radar must be able to communicate via Ethernet, RS-422, and/or RS-232 protocols.	M			
17	<b>COTS Status:</b> The proposed radar system must be a commercial off-the-shelf product that is mass produced, not a custom design or one-off.	M			
18	<b>Detection:</b> The Radar System should be able to discriminate UAS from birds or any other unwanted targets.	D*			

<b>B. Radar Data and GUI Requirements</b>					
1	<b>Mapping Data:</b> Map data must be included or software must allow use of user-chosen map data.	M			
2	<b>Raw Radar Data:</b> Radar must provide access to raw data, including all detected objects with their locations relative to the radar, headings, and velocities, for DRDC use and manipulation.	M			
3	<b>Micro-Doppler Data:</b> Radar must provide access to raw micro-Doppler data (if applicable for a given detected object) for DRDC use and manipulation.	M			
4	<b>GUI:</b> Radar provides data presented in real-time to a software map presented on a provided accessory screen (portable computer or laptop).	M			

\*Desirables will not be used as part of the evaluation.

**ALL OTHER TERMS AND CONDITIONS REMAIN THE SAME AND IN FULL EFFECT.**