

Annexure A: Technical Specification

Background

The Authority is mandated to locate sources of interference. The Authority requires specialised vehicle mounted re-deployable Direction-Finding devices capable of finding radio frequency emissions from 25 MHz up to 8 GHz frequency bands. The Authority requires re-deployable, vehicle mounted devices so that ICASA teams are not required to leave the vehicle to trace a signal. This is due to Covid-19 risks and security of staff in the field. Due to budgetary constraints the units need to be easily re-deployable to other regions when the need arises. Most interference cases reported recently to the Authority are in the 25 MHz to 8 GHz ranges.

<p>1. General Specification</p> <ul style="list-style-type: none">1.1. Ruggedized portable receiver device1.2. Dimensions of Receiver are not to exceed 40 cm x 40cm x 25cm. Bidder to state the size and weight in the offer.1.3. Operating Temperature Range: 0°C to + 45°C.1.4. Operating Humidity 10% - 90% @ 30°C non-condensing <p>1.5. EMC Standards</p> <ul style="list-style-type: none">1.5.1. <u>Emission</u><ul style="list-style-type: none">1.5.1.1. CISPR Pub 11 Group 1, class B, Group 1 limit of CISPR 11:203/EN 55011:20071.5.2. <u>Immunity</u><ul style="list-style-type: none">1.5.2.1. IEC 61000-4-2,3,4,5,6,11 or equivalent1.5.3. <u>Safety</u><ul style="list-style-type: none">1.5.3.1. IEC 610101: 2001 or equivalent
<p>2. DF Receiver / Analyser that is compatible with DF unit and Antenna</p> <ul style="list-style-type: none">2.1. Receiver Frequency range: 25MHz – 8GHz No gaps2.2. DANL better than -150dBm at 10Hz RBW2.3. RF input 50 Ω N-Type or SMA connector or suitable connector adaptor supplied to connect to SMA or N-Type2.4. Full Spectrum and Spectrogram and Real time analysis display on integral colour screen. <p>2.4.1. Real time analysis specifications</p> <ul style="list-style-type: none">2.4.2. At least 40MHz Real- Time Bandwidth2.4.3. Probability of Intercept at 40MHz bandwidth should be less than 2.5uS <p>2.4.4. Integrated Screen requirements</p> <ul style="list-style-type: none">2.4.4.1. TFT/LCD/OLED or similar Integrated Colour display2.4.4.2. Intensity and contrast adjustment required2.4.4.3. Display size must be at least 120mm measure diagonally across

- 2.5. Panorama Scan. High speed FFT scan across user selectable scan range
- 2.6. Field strength measurement to be on display and in dBuV/m.
- 2.7. Average, min hold and max hold analysis.
- 2.8. IF spectrum display ranges from 1kHz to 40 MHz
- 2.9. Demodulation modes to include AM, FM, PULSE, I/Q, LSB, ISB and CW.
- 2.10. Demodulation Bandwidths of 150/300/600Hz and 1/2/5/10/20/50/100/200/500 kHz is required
- 2.11. User selectable input attenuation up to 30 dB, in steps of 1 dB
- 2.12. The demodulation of audio to be selectable from internal speaker and supplied headphones. (selectable)
- 2.13. Weight of each receiver unit must not exceed 4Kg
- 2.14. Internal storage for recording of measurement data is required
- 2.15. Battery life better than 2 Hours on full charge
- 2.16. 12V Vehicle charger /Adapter must be provided for each receiver unit supplied
- 2.17. Integrated GPS with External antenna connection
- 2.18. Soft carry case for each receiver to be provided.

3. Vehicle mounted Direction Finder Unit and Antenna:

- 3.1. Re-deployable Roof-Mounted Mobile Antenna system without the need for re-calibration
- 3.2. Secure mounting of antennae on roof of ICASA vehicle
- 3.3. Roof Mounted DF Antenna range 800 MHz – 8 GHz**
- 3.4. Bidder to state if antenna range is provided in on or two units
- 3.5. Correlative Interferometer or Watson-Watt method of Direction Finding
- 3.6. Better than 2° accuracy over entire frequency range
- 3.7. DF sensitivity, better than 10uV/m over entire frequency range
- 3.8. Pulse detection – better than 20 ms pulse duration detection.
- 3.9. Digital compass is required

4. Miscellaneous requirements

- 4.1. Cable between antenna/s and receiver and antenna/s should be at least 5m in length
- 4.2. 1 additional battery for each of the receiver devices should be supplied with drop-in mains charger.
- 4.3. Battery life of entire DF unit : > 2 hours continuous operation per fully charged battery
- 4.4. South African Type 15A plug to be fitted to mains cord of charger
- 4.5. Ruggedized carry case for antenna/s and cable must be provided
- 4.6. Ruggedized carry case for Receiver and cables and mounting hardware must be provided
- 4.7. 12V Lighter socket adapter for must be supplied for both Receiver and DF units if applicable

5. Software requirements

- 5.1. Direction Finding software must be compatible with Windows 10 ©
- 5.2. RDF system must be usable with Open Source Maps
- 5.3. PC/ Laptop must be able to control the receiver and DF unit via LAN TCP/ IP 10BaseT Interface.
- 5.4. 2 (off) x 2m LAN cables to be provided
- 5.5. **Software must perform at least the following functions;**
 - 5.5.1. Line of bearing (LOB)
 - 5.5.2. LOB on Map overlay
 - 5.5.3. Geographic North or vehicle direction indication
 - 5.5.4. Recording of audio signals
 - 5.5.5. Prediction of signal source based on multiple LOBs using a heat map or similar display
 - 5.5.6. Recording of measured data and report generator
 - 5.5.7. Field strength directly in dBuV/m (antenna factor data must be provided)
 - 5.5.8. Recording and displaying GPS data
 - 5.5.9. Recording and displaying Electronic compass data

4. Installation, Training and Support

- 4.1. The supplier will be required to provide a complete solution in a single bid.
- 4.2. The supplier will be responsible for the satisfactory testing and commissioning of all equipment and software provided under the contract.
- 4.3. Training at a centralised location taking into account Covid-19 restrictions for 18 persons on the use of and application of the complete DF unit and associated Software.
- 4.4. After-sales support should be provided for and be clearly indicated in the bid document.
- 4.5. The Supplier shall guarantee the operability of the equipment (i.e. both hardware and software – through necessary upgrades), for a period not less than 5 (five) years.

5. Service and Calibration

- 5.1. Bidders shall indicate:
 - 5.1.1. The extent and location of service facilities for the equipment offered.
 - 5.1.2. The extent and location of calibration facilities for the equipment offered
 - 5.1.3. The calibration interval required on the instrument and associated accessories
 - 5.1.4. The extent, limitations, conditions and projected cost of extended warranties available on the equipment

6. Testing of the equipment

This is only applicable to the successful service provider, i.e. final acceptance: Testing must be done after the supply of (2) re-deployable vehicle-mounted Radio Direction Finding (RDF) units. Final acceptance will include testing functionality of devices and will be done in accordance with the standard test procedures and representatives of ICASA and the bidder will sign all acceptance forms.

- **Delivery Details**

To be Delivered to ICASA REGIONS DIVISION

Attention: Sphesihle Zungu, Divisional Assistant Regions +27 12 568 3803

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Eco Park, Centurion**

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