DEPARTMENT OF THE AIR FORCE
OKLAHOMA CITY AIR LOGISTICS COMPLEX (OC-ALC)
TINKER AIR FORCE BASE OKLAHOMA

Item Description.

A26-013 ET Matrix Array Ultrasonic Testing NDI System

Tinker AFB requests the procurement of a Dolphitech Matrix Array Ultrasonic Testing NDI System with the following specifications:

Dolphitech Matrix Array Ultrasonic Testing (MAUT) NDI system including hardware and software SHALL meet the below technical requirements.

1.0 General System Requirement

1.1 The proposed solution shall be a fully integrated, portable, and battery-operable matrix array ultrasonic testing (MAUT) system. The instrument, transducers, and software must be provided by a single manufacturer to ensure verified compatibility and seamless operation.

2.0 Phased Array Instrument Requirements

2.1 Channel Architecture: The instrument must possess a non-multiplexed, fully parallel hardware architecture capable of simultaneously driving and acquiring data from a minimum of 16,384 (128X128 matrix) individual transducer elements.

2.2 Real-Time Volumetric Data Processing: The instrument must be capable of performing real-time Full Matrix Capture (FMC) and subsequent Total Focusing Method (TFM) processing using the full aperture data from the specified 128x128 element transducers.

2.3 High-Resolution C-Scan Imaging: The system software must generate high-fidelity C-scan, B-scan, D-scan, and 3D volumetric images in real-time directly from the raw data acquired from the 128x128 element transducers. The C-scan image resolution must directly correspond to the physical element pitch of the specified transducers.

2.4 Data Throughput: The instrument must demonstrate a sustained data acquisition and transfer rate sufficient to handle the uncompressed volumetric data generated by a 16,384-element array without down-sampling or data reduction.

3.0 True 2D Matrix Array Transducer Requirements

3.1 Element Configuration: The system shall include two (2) True 2D Matrix Array transducers, each containing no fewer than 16,384 (128x128) individually addressable, monolithic piezoelectric elements arranged in a square grid configuration.

3.2 Frequency and Aperture: The transducer package must include the following:

- One (1) 5.0 MHz transducer with a 128x128 element matrix.
- One (1) 10.0 MHz transducer with a 128x128 element matrix.

4.0 System Integration and Performance

4.1 Verified System Operation: The supplier must provide documented proof that the proposed instrument (Section 2.0) has been specifically designed and optimized to operate the specified 128x128 element transducers (Section 3.0) as a complete, integrated system.

4.2 Acoustic Performance: The system must demonstrate the ability to generate fully focused acoustic images free of artifacts caused by multiplexing or element grouping. The point spread function of the system shall be consistent with the theoretical diffraction limit of the specified transducer apertures and frequencies.

5.0 Deliverables

5.1 The final deliverable must be a complete, field-ready kit including, at a minimum:

- One (1) Dolphitech MAUT Instrument meeting all requirements in Section 2.0.
- One (1) 5 MHz, 128x128 element True 2D Matrix Array Transducer.
- One (1) 10 MHz, 128x128 element True 2D Matrix Array Transducer.
- All necessary software licenses for data acquisition, advanced analysis (including FMC/TFM), and reporting.
- All required cables, power supply, and a rugged transport case.

Contractor shall provide Training at Tinker Air Force Base.
The contractor must meet all the requirements outlined in the Statement of Work (SOW).