ATTACHMENT #1

Statement of Work

Portable Optical Laser Scanning System (Code AV)

July 23, 2015

A. Introduction. NASA Ames Research Center's Aeromechanics Office (Code AV) requires a 3D optical laser scanner that will provide the Revolutionary Vertical Lift Technology (RVLT) Project the capability to generate accurate geometric information efficiently for computational simulation. RVLT requires this 3D measurement system to be handheld and portable to allow measurements of arbitrary shapes at remote locations. In addition, the system must maintain minimum accuracies for both small and large shapes (greater than 10m3). This latter requirement precludes the use of a traditional articulated arm system, and instead requires an optical laser system with dynamic referencing (such as photogrammetry).

B. Background. The NASA Revolutionary Vertical Lift Technology (RVLT) Project is responsible for research activities that directly support the civil competitiveness of the American helicopter industry and the vertical lift requirements of the Department of Defense. The RVLT project addresses all aspects of rotary wing vehicles that directly influence vehicle performance, structural and dynamic response, flight dynamics and control, external acoustics, vibration, and aeroelastic stability.

In particular, the RVLT project uses advanced computational tools to predict rotorcraft aerodynamic, aeroacoustic, and dynamic behavior. These tools require accurate 3D geometries of vehicle components to properly simulate aeromechanic phenomena. Components can include model- and full-scale rotor blades, rotor hubs, small UAV center-bodies, and full-scale fuselages and empennages.

C. Summary of Requirements. The NASA RVLT Project has a requirement to purchase a portable, optical laser scanner, with extendable measurement volume, dynamic referencing (photogrammetry) and very high accuracy. Specific requirements for this 3D scanner include:

1) Handheld and portable, including hand-held probing capability, self-powering kit.
2) System capable of automatic and/or user calibration to maintain system accuracy.
3) Laptop-based 3D data collection, storage, and export capabilities.
4) System capable of dynamically extending the measurement volume to at least $10m^3$ with no loss of accuracy.
5) Dynamic referencing capability (such as photogrammetry), which eliminates the need for realignment.
6) Minimum system resolution of +/- 0.002"

7) Minimum volumetric accuracy of +/ 0.003”
8) Minimum data rate of 36,000 measurements/sec.
9) Minimum stand-off distance of 6-inches.

D. Required Delivery Date: 50 Days After Receipt of Order (ARO)