KIOWA PORTABLE ALIGNMENT SYSTEM (KPAS)

PROBLEM / OBJECTIVE

Existing procedures for alignment of helicopter airframe components require bulky and heavy fixtures for precision. Field repair using manual templates leads to misaligned components and structures, reducing platform performance and leading to early structural component failures. A lighter weight portable alignment system for servicing helicopters was needed.

The objective of this Army ManTech effort is to develop alignment tools, processes and techniques for precision assembly of components and structures to Kiowa and potentially other aircraft platforms.

ACCOMPLISHMENTS / PAYOFF

Process Improvement: This project demonstrated a lightweight alignment system using state-of-the-art laser tracker and portable Coordinate Measurement Machine arm measurement technology. This provided maximum system flexibility to enable the transfer of these devices/processes to other systems with similar requirements. This system allows the maintainer to align dynamic components more accurately and consistently.

- **Custom software with intuitive human-machine interfaces**
- **Collects and records measurements more precisely and efficiently**
- **Completed alignment modules:**
  - **Engine to transmission alignment**
  - **Tail rotor drive shaft alignment**
  - **Dynamic components alignment**
  - **Oil cooler deck replacement**
  - **Position check modules for stations 205 and 181 (relative to the transverse beams)**

Implementation and Technology Transfer:

The system requirement document was completed; initial system prototyped and tested and user training developed. KPAS Acceptance Test Plan draft was delivered to the program office and Aviation Engineering Directorate (AED).

The KPAS is planned for transition to the Kiowa Program office in 2014. The PMO will develop additional sub-systems and through a limited user evaluation, finalize the configuration, operation and procedures and implement the system to the field.

Expected Benefits and Warfighter Impact:

<u>The KPAS allows the maintainer to</u>:

1) Align the aircraft without the use of large bulky fixtures
2) Conduct more than one alignment at a time with one KPAS toolkit
3) Increase accuracy of collected data
4) Decrease alignment time
5) Use a more simplified measurement process

This technology approach has developed an integrated system to perform high accuracy alignment procedures for repairs of OH-58D aircraft in the field and depots. KPAS is applicable to depots that repair systems that require precision mechanical alignment.

TIME LINE / MILESTONE

Start Date	FY 11
End Date	FY 14

FUNDING

U.S. Army ManTech	$1.6M

PARTICIPANTS

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National Center for Defense Manufacturing and Machining (NCDMM), Latrobe, PA