SCIENCE AND TECHNOLOGY

Providing New Options to the Warfighter

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Technology generation and application, one of the U.S. Army Materiel Command's three core competencies, is critical to Army modernization and provides the soldier with a winning edge on the battlefield. The rapidly accelerating pace of technological change will continue to offer significant enhancements for greater survivability, lethality, deployability and versatility of Army forces. The purpose of this newsletter is to keep the commanders-in-chief and their staffs informed of specific technological efforts pertinent to their missions. The newsletter is published quarterly. This issue of Science and Technology focuses on:

MOBILITY / SURVIVABILITY AND FORCE PROTECTION / SUSTAINABILITY AND REDUCED LOGISTICS FOOTPRINT AND OTHER TECHNOLOGY INITIATIVES

Sustainability and Reduced Logistics Footprint: Universal Static Balancing Fixture (USBF): All Department of Defense (DoD) helicopter main rotor blades must be statically balanced when repairs are more than cosmetic in nature. Static balancing is currently accomplished through use of a teetering system that provides only a rough range and leaves movement of tip end weights to the discretion of the operator. Most existing fixtures are incapable of measuring the center of gravity for the chord of the blades. The Army's Manufacturing Technology Program has developed and demonstrated a prototype, computer controlled, universal static balancing fixture (USBF) capable of balancing any DoD main rotor blade through the use of strategically placed load cells.

The system calculates and correlates span and chord centers of gravity, static and dynamic centers of gravity, and overall weight. The USBF can accommodate the following blade types: CH-47D Chinook (fore and aft blades); UH-60 Black Hawk; SH-60 Sea Hawk; AH-64 Apache; AH-1S Marine Cobra; AH-1W Super Cobra; UH-1 (H/N) Huey; OH-58D Kiowa Warrior; CH-46, CH-53D; and CH-53E Sea Stallion. Developed to support helicopter repair activities at the Corpus Christi Army Depot (CCAD), implementation of the USBF is projected to result in a cost savings of $1.0M per year at CCAD. Over thirty USBF units are also being acquired by other Government helicopter maintenance facilities.

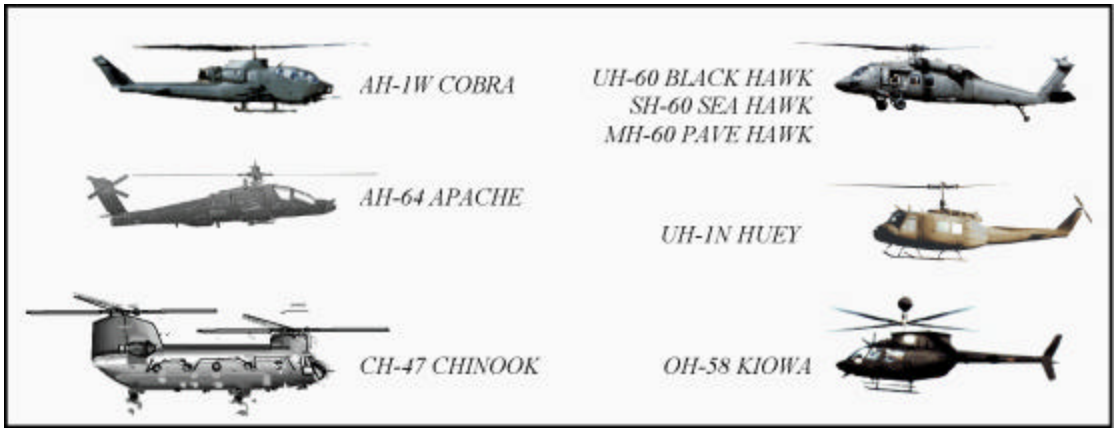
Developer: U.S. Army Aviation and Missile Command, Aviation and Missile Research, Development, and Engineering Center, Redstone Arsenal, AL 35898, Point of Contact: Warren Alford

Sustainability and Reduced Logistics Footprint
(additional information)

Thermal Curing Blanket System (TCBS):

Background:

All DoD helicopter main rotor blades must be statically balanced when repairs are more than cosmetic in nature. There are few blade repair facilities available and static and dynamic balancing capability with respect to a blade type is often restrained by the flexibility of the existing equipment's adaptability and throughput capacity



Problem:

The current method of balancing helicopter main rotor blades is that of a teetering system which provides only a rough range and leaves movement of tip end weights to the discretion of the operator. Most of the existing fixtures are incapable of measuring the center of gravity for the chord of the blades.

Objective:

This objective of this Army Manufacturing Technology (ManTech) Program effort was to develop and demonstrate a prototype Universal Static Balance Fixture (USBF) that can support multiple DoD main rotor (MR) blades. The prototype fixture should allow for adjusting the blades to a tighter tolerance within the existing requirements range on the span-wise center of gravity, measure the chord-wise center of gravity, and determine overall weight of each blade. The following blade types will be developed for this project: CH-47D Chinook (fore and aft blades), UH-60 Black Hawk, SH-60 Sea Hawk, AH-64 Apache, AH-1S Marine Cobra, AH-1W Super Cobra, UH-1 (H/N) Huey, OH-58D Kiowa Warrior, CH-46, CH-53D, and CH-53E Sea Stallion.

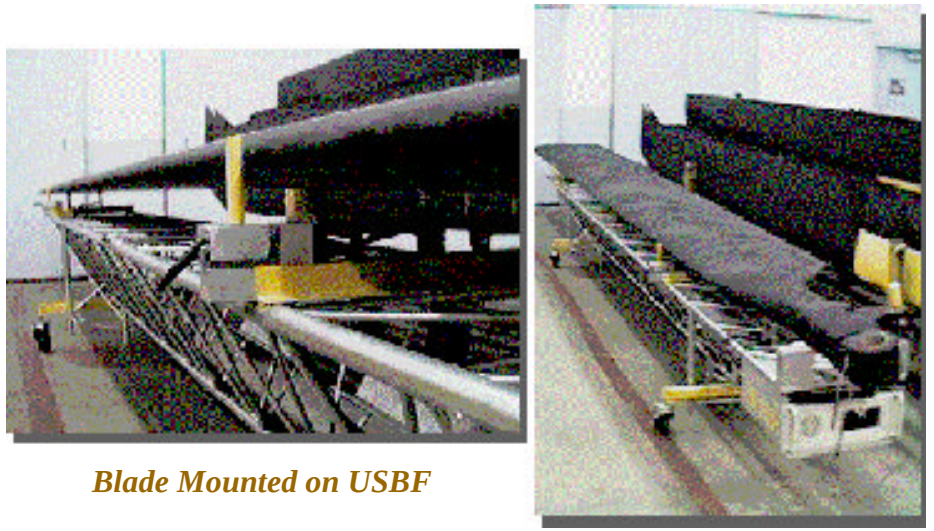
Accomplishment:

The Army's ManTech Program has developed and demonstrated a prototype, computer controlled, universal static balancing fixture (USBF) capable of balancing any DoD main rotor blade through the use of strategically placed load cells. The system calculates and correlates span and chord centers of gravity, static and dynamic centers of gravity, and overall weight. The USBF can accommodate the following blade types:: CH-47D Chinook (fore and aft blades); UH-60 Black Hawk; SH-60 Sea Hawk; AH-64 Apache; AH-1S Marine Cobra; AH-1W Super Cobra; UH-1 (H/N) Huey; OH-58D Kiowa Warrior; CH-46, CH-53D; and CH-53E Sea Stallion.

Universal Static Balancing Fixture

Benefits:

Developed to support helicopter repair activities at the Corpus Christi Army Depot (CCAD), implementation of the USBF is projected to result in a cost savings of $1.0M per year at CCAD. Over thirty USBF units are also being acquired by other Government helicopter maintenance facilities.



Blade Mounted on USBF

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