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13. SUPPLEMENTARY NOTES					
14. ABSTRACT The Aviation and Missiles Research, Development and Engineering Center (AMRDEC) Prototype Integration Facility (PIF) at Redstone Arsenal, AL is designated the prototype development facility to meet the quick turnaround requirements for Aviation and Missile Command (AMCOM). The PIF requested the National Center for Defense Manufacturing and Machining (NCDMM) to review the current processing of the IR Beacon Strobe. The main objective was to implement a new paperless machining process. Paperless machining is a term used to describe the use of the digital 3-D CAD models transferred to Computer Aided Machining (CAM) to manufacture the component. The 4.50" dia., 1.125"-thick Beacon Ring, made of 7075-T6 Aluminum Rod, requires machining from many sides. The current process in use by the PIF required 4 setups and two machines.					
15. SUBJECT TERMS Aviation and Missiles Research, Development and Engineering Center; AMRDEC; Prototype Integration Facility; PIF; Redstone Arsenal; Aviation and Missile Command; Success Stories					
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PROBLEM / OBJECTIVE

The Aviation and Missiles Research, Development and Engineering Center (AMRDEC) Prototype Integration Facility (PIF) at Redstone Arsenal, AL is designated the prototype development facility to meet the quick turnaround requirements for Aviation and Missile Command (AMCOM). The PIF requested the National Center for Defense Manufacturing and Machining (NCDMM) to review the current processing of the IR Beacon Strobe. The main objective was to implement a new paperless machining process. Paperless machining is a term used to describe the use of the digital 3-D CAD models transferred to Computer Aided Machining (CAM) to manufacture the component. The 4.50" dia., 1.125"-thick Beacon Ring, made of 7075-T6 Aluminum Rod, requires machining from many sides. The current process in use by the PIF required 4 setups and two machines.

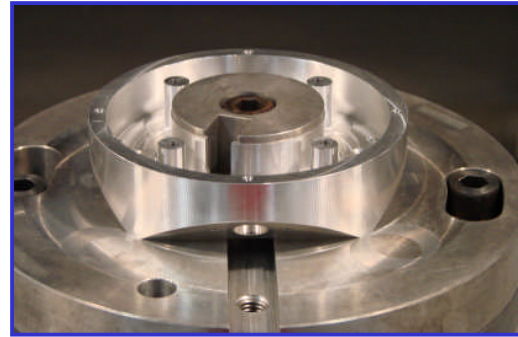


5-axis machine procured by NCDMM from Alliance Partner Haas Automation, Inc.

ACCOMPLISHMENTS / PAYOFF

Process Improvement

The NCDMM utilized their trademarked JUMPEDsm process to develop the solution for the PIF. The machine tool chosen (and purchased) was a Haas 5-axis Trunnion machine with cutting tools from alliance partner Kennametal Inc. featuring advanced coatings and geometries. The JUMPEDsm methodology using the 5-axis machine resulted in an immediate process improvement. The use of the 5-axis machine enabled the IR Strobe to be completed in 2 setups. In addition, the new fixturing configurations produced strong gripping power without distorting the part. The fixtures were



Actual IR Beacon Ring

designed to use minimal clamping, thus reducing time spent handling and relocating the part.

Implementation and Technology Transfer

The implementation of the paperless machining, 5-axis high-speed machine, tooling and fixturing improvements have enabled the PIF to reduce overall machining costs. The machining time for the IR Beacon Ring has been reduced from 3 hours to 50 minutes, a reduction in cycle time of more than three times.

Expected Benefits

In summary, implementation produced:

- Implementation of Paperless Machining
- The use of high-speed machining techniques
- Improved confidence in the integrity of the work holding system, permitting the component to be machined in two setups and one machine
- Reduction per part of \$30 resulting in an estimated cost savings/avoidance of \$30K for an estimated 1,000 piece run

TIME LINE / MILESTONE

Start Date.....July 06

End DateMay 07

PROJECT FUNDING

NCDMM funding \$323K

PARTICIPANTS

Prototype Integration Facility / AMRDEC

CNC Software, Inc. (Mastercam)

COM1 Information Technologies, Inc. (Predator)

Haas Automation, Inc.

Kennametal Inc.

NCDMM

For additional information about the NCDMM visit our website at www.ncdmm.org