

Preliminary Component Integration Utilizing Rapid Prototyping Techniques

Selected Success Stories from the
Marshall Space Flight Center

Ken Cooper

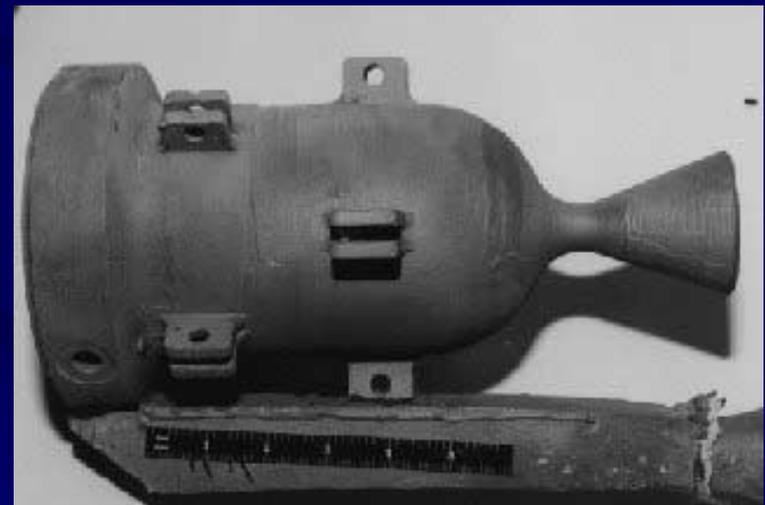
Glenn Williams

Current RP Capacity at MSFC

- Fused Deposition Modeling (2)
- Selective Laser Sintering (1)
- Laminated Object Manufacturing (1)
- Stereolithography (1)
- Laser Engineered Net Shaping (1)
- Ink-Jet Concept Modelers (3)

The Shooting Star Experiment

- Investment casting patterns were fabricated of the engine housing (FDM)
- Patterns were shelled and cast in-house with Inconel 718 in 6 weeks
- Program saved \$290K



Simplex Turbo Pump Project

- STP impeller, inducer and bladed turbine disk were prototyped prior to hardware fabrication, revealing design error in blade assignments
- RP build time 1 week
- Project savings \$360K



Space Shuttle Main Engine

- Design changed on SSME hot gas manifold and drain lines.
- First hardware had error costing \$30K.
- RP models of remaining 6 lines saved \$180K.



Meteorite Patch Kit

- On-going use of stereolithography at MSFC
- Material mixing funnels are produced occasionally
- Requires no tooling or high manufacturing startup costs



For More Information

Ken.Cooper@msfc.nasa.gov

(256) 544-8591

<http://nasarp.msfc.nasa.gov>