

Micro Shuttles. These Aerojet TechSystems engines, with designations LR87-AJ-11 and LR91-AJ-11, yield specific impulse values of 302 and 316 s, respectively. However, it would probably be desirable to modify the engines, in most cases, to provide throttling capability.

Conclusions

The use of Aerozine-50 as fuel and N₂O₄ as oxidizer for the liquid rocket engines of the Mini and Micro Shuttles in the Space Shuttle family appears to be entirely feasible. Although the performance (or specific impulse) of this autoigniting, noncryogenic bipropellant is lower than that of LOX/RP-1, it is sufficiently high to be considered in certain applications of semireusable launch vehicles where ease of handling and storability may be critical. The Mini Shuttle using LOX/RP-1 (with $\frac{3}{4}$ -size Orbiter and ET and full-size SRBs) can deliver a payload of 34,000 lb to low Earth orbit, whereas the Mini Shuttle using N₂O₄/Aerozine-50 (with $\frac{2}{3}$ -size Orbiter and ET and full-size SRBs) can only deliver a payload of about 24,000 lb. In the case of the smaller Micro Shuttles (with fixed sizes of Orbiter), the payload capability when using N₂O₄/Aerozine-50 (with slightly larger SRBs and higher liftoff weight) is 89% of that when using LOX/RP-1 (with slightly smaller SRBs and lower liftoff weight). However, in some military and space-rescue applications, where quick response is necessary, the use of a storable bipropellant may

be preferable to use of a cryogenic fuel and/or oxidizer that provides greater payload capability. Thus, there is reason for the Department of Defense and NASA to consider use of Micro Shuttles with non-cryogenic bipropellants and proven technology in their current or future programs to develop a practical military spaceplane for the Air Force and a safe and reliable, launch-ready crew-return/resupply vehicle for the International Space Station.

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Errata

Near-Polar Satellite Constellations for Continuous Global Coverage

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BECAUSE of an editing error, columns 4–5 and 10–11 in Table A1 should have the symbol " θ " instead of " μ ". AIAA regrets the error.