



## On-Board Chemical Propulsion Technology

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By Brian D. Reed

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 24 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. On-board propulsion functions include orbit insertion, orbit maintenance, constellation maintenance, precision positioning, in-space maneuvering, de-orbiting, vehicle reaction control, planetary retro, and planetary descent/ascent. This paper discusses on-board chemical propulsion technology, including bipropellants, monopropellants, and micropropulsion. Bipropellant propulsion has focused on maximizing the performance of Earth storable propellants by using high-temperature, oxidation-resistant chamber materials. The performance of bipropellant systems can be increased further, by operating at elevated chamber pressures and/or using higher energy oxidizers. Both options present system level difficulties for spacecraft, however. Monopropellant research has focused on mixtures composed of an aqueous solution of hydroxyl ammonium nitrate (HAN) and a fuel component. HAN-based monopropellants, unlike hydrazine, do not present a vapor hazard and do not require extraordinary procedures for storage, handling, and disposal. HAN-based monopropellants generically have higher densities and lower freezing points than the state-of-art hydrazine and can higher performance, depending on the formulation. High-performance HAN-based monopropellants, however, have aggressive, high-temperature combustion environments and require advances in catalyst materials or suitable non-catalytic ignition options. The objective of the micropropulsion technology area is to develop low-cost, high-utility propulsion systems for the...

### Reviews

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