

NASA TECH BRIEF



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Control Jet Placement on Spacecraft

The information contained in this Tech Brief describes a method for the efficient operation and configuration design of multi-jet spacecraft control systems. Methods of linear programming are applied to the jet-select-logic problem; i.e., choosing combinations of individual jet burn-times which produce the desired impulses. Minimum-fuel and fuel-time solutions are found.

Methods were developed for evaluating system failure probability and related statistical performance indices. The basic mathematical model is the discrete-state, continuous-time Markov process. A distinction was made between single-efficiency (non-fuel limited system) and multi-efficiency systems (fuel limited system) which expend fuel at different rates in different working states. The single-efficiency systems are represented by a set of linear ordinary differential equations, the multi-efficiency systems by linear

partial differential equations. Redundancy capability is built into the system.

Note:

1. The information contained in this Tech Brief may be of interest to designers and manufacturers of process control systems and equipment.
2. Requests for further information may be directed to:

Technology Utilization Officer
Manned Spacecraft Center, Code BM7
Houston, Texas 77058
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Patent status:

No patent action is contemplated by NASA.

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