

SPACE STATION

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The Space Station is being defined as a multi-purpose facility with emphasis in the following areas:

- o Scientific and Technology Research Laboratory
- o Permanent Observatory
- o Spacecraft Servicing Facility
- o Construction and Assembly Facility
- o Manufacturing Facility
- o Transportation Node
- o Staging Base for Future Space Endeavors

The Station complex, in its initial operating capability configuration, includes a continuously habitable manned element, a polar orbiting unmanned platform, and a second unmanned platform co-orbiting with the manned element. All elements are dependent on the Space Transportation System (STS) for initial placement on-orbit and for subsequent logistical services. The manned element will be designed for long duration operations with systems maintainable on-orbit and operationally autonomous from ground control. A major feature of the Station will be its adaptability to evolutionary technology upgrades. And, the Space Station, as a system, is to be designed for maximum ease of use by its Users.

The Station is being designed to requirements principally defined by currently identified potential users, both domestic and international. Future endeavors are less well-defined but are being considered in a secondary manner. It is probable that primary consideration of these potential large-scale future endeavors would place design driver requirements on the Station and, because of

resource limitations, might erode expected accommodations for other Users. Indeed, the development of a Space Station with the currently defined multi-purpose character and growth accommodations as a service facility within the prescribed budget is a major challenge.

A reference Station configuration was developed by NASA as part of the Request for Proposal preparation activity. This currently serves as the Program baseline pending results from the 21-month contractor definition activity initiated in April 1985. Selection and development of implementation technologies are part of this activity and will address specific topics such as:

- o Environmental Control Life Support System -- Closed vs. Open Loop Operation?
- o Automation/Robotics Applications
- o Transparency to Technology Upgrades
- o Artificial Intelligence/Expert Systems Applications
- o Orbital Maneuvering Vehicle/Orbital Transfer Vehicle
- o Growth Accommodations - Extension vs. Replication
- o Power Generation -- Photo-voltaic, Solar Dynamic, Nuclear
- o Servicing Accommodations
- o Module Design -- Size, Radiation Shielding, Configuration, etc.
- o Construction and Assembly Accommodations
- o Long Duration Systems serviceability and onboard maintenance

Currently, NASA is trying to fully understand Space Station requirements. The definition studies underway will converge and select a configuration which, necessarily, will be severely constrained by budget.