Build-up around the planet

John Noble Wilford

The Space Station: An Idea Whose Time Has Come. Edited by Theodore R. Simpson. *Institute of Electrical and Electronics Engineers, New York/STM Distribution, Enterprise House, Ashford Road, Ashford, Middlesex TW15 1XB, UK:1985. Pp.295. \$19.95, £18.*

COMING to terms with the proposed American space station in any rational way is little short of impossible, if only because of what it is not. Unlike the Apollo Project, it is not a programme with a specific destination (the Moon) or a clear political objective (a bold challenge to Soviet leadership in space). Unlike the Space shuttle, it lacks the coherence of a single piece of hardware already agreed on and with a single function, which was to make travel to space more routine and perhaps less expensive. (No matter that this latter objective has yet to be realized; it was the project's decisive selling point.) What, then, can be said of or for the space station?

In directing the National Aeronautics and Space Administration (NASA) "to develop a permanently manned space station, and do it within a decade", President Reagan in 1984 offered few details of the station's architecture, capability or purpose. He spoke only of following "our dreams to distant stars, living and working in space for peaceful, economic and scientific gain". And even though NASA had lobbied fervently for the project, its officials had no specific engineering plans ready for carrying out the Presidential order. One of their first acts was to issue contracts to industry to develop space station designs and to identify who might need or want to use such a facility. Nearly two years after President Reagan's speech, the idea has yet to be translated into firm plans.

This much can be said: the space station is supposed to be a large facility in a near-equatorial Earth orbit, about 300 km above the surface. It would be composed of several units, including a control centre and a module for housing crews or as many as ten people. These components would be launched separately from the Space Shuttle. The facility would grow module by module to meet demand for laboratories for microgravity research, materials-processing "factories", remote-sensing platforms and staging bases for missions to more distant orbits and the planets.

Some of the visions and engineering particulars for such a facility are described in *The Space Station*, which is a collection of articles by NASA officials, politicians,

science policy makers and engineers. Although the prevailing view is favourable to the principle of the space-station, the book cannot be dismissed as a propaganda tract. The editor, Theodore R. Simpson, an experienced aerospace engineer, has included several valuable discussions about the history and process of American decision-making in space matters. Several of the contributors are sceptical of the idea.

For those who want a preview of what the orbiting facility might be, two NASA engineers offer a comprehensive discussion of various designs that have been considered. In the book's illustrations, the station is usually characterized as a cluster of cylindrical modules, docking ports for shuttles and the long arms of solar-power panels. Romantics will be disappointed, for nothing resembles the toroidal station in the movie 2001: *A Space Odyssey*. But as other contributors, from the Congressional Office of Technology Assessment, point out, "We would be surprised if NASA's present space station plans were carried through to completion without major change". They suggest that, in the absence of clear-cut goals, "it is simply not yet possible to judge, objectively, whether or not NASA's presently suggested infrastructure elements are truly appropriate and worth their substantial cost".

Similar reservations are expressed throughout the book. The Pentagon's lack of enthusiasm, reiterated in one chapter, must be of particular concern to space station advocates; Pentagon backing is usually essential to big-money space efforts.

Thomas M. Donahue, a physicist at the University of Michigan, who heads the Space Science Board of the National Academy of Sciences, states the opposi-

tion of many scientists to the idea. They doubt that a space station would add significantly to what they can already accomplish with the shuttle and automated satellites. Moreover, they fear that the station's costs will drain money from their own cherished projects. But Dr Donahue seems resigned to the station's inevitability: "We hold that the decision to build a space station will be made for reasons other than its usefulness to space science and applications".

Victor M. Reis, a former science policy adviser in the Reagan Administration, takes this point even further. He acknowledges that each and every one of the projected space station missions could be done well by a judicious combination of shuttles, Spacelabs, automated platforms and satellites. Nonetheless, he argues that there is one "powerful argument" in support of the project, which is, in effect, to assure NASA of a robust future. Mr Reis is probably correct in calling this "the fundamental issue" of the space station decision. But he cautions that a decision to go forward with the project would be justified only if "it can be done in harmony with NASA's other missions and responsibilities". This will not be easy, he notes, because NASA's big manned programmes have a way of consuming the lion's share of NASA's budgets.

The Space Station will not be satisfying to those who seek to win converts to the space-station cause or to those who are its outright opponents. More than most of the authors may have intended, the book reveals why the project has so far had such a cool to mixed reception. □

John Noble Wilford is a reporter on science and space for the New York Times.

Not yet a reality — the concept of a Space Operations Center developed by NASA in 1979.