

are just for the first three or four years of the initial operation of the station, and the list will likely be greatly expanded as the time gets closer for operation.

ESA has not yet decided what equipment would be included in any specific module. As an example, Dr. Ley stated that a materials-processing lab might have facilities for crystal growth experiments, metals processing, fluid science experiments, storage racks, and other equipment. The module might be a "quiet" lab, where there is a minimum of human movement, noise, etc. or a "busy" lab. This will all be determined in the Phase-B studies.

Europe has also started to examine future commercial requirements for space manufacturing. The German aerospace company MBB has performed studies over the past two years concerning future In-Orbit Infrastructure (IOI) with a focus on establishing an automated, independent European infrastructure in low-Earth orbit for commercial applications.

Peter Sharp from the MBB/ERNO Space Division in Bremen reported at the symposium that their study found that materials-processing missions were identified as having the highest interest among technologists, and also placed a high demand on infrastructure, involving frequent visits for servicing and exchanging materials at the facility.

In the MBB study, many options for commercial materials processing were examined. For example, it is possible to outfit the factory with re-entry vehicles which would come back to Earth without relying on the Space Shuttle. Three different re-entry vehicle configurations are being investigated, modeled on the U.S. Mercury, Gemini, and Apollo programs.

The Europeans will also design the facility to be compatible with both an Ariane and Shuttle launch. Because the major reason to do materials processing in space is the microgravity available, automated systems rather than man will be used. This will push forward the development of robotic systems in space.

L. Breton from the French space agency, CNES, described a possible joint ocean remote sensing program, and a presentation by Prof. Ernest Vallerani from Aeritalia explored the great potential of tethered satellite system experiments, under development in Italy, from the Shuttle and Space Station.

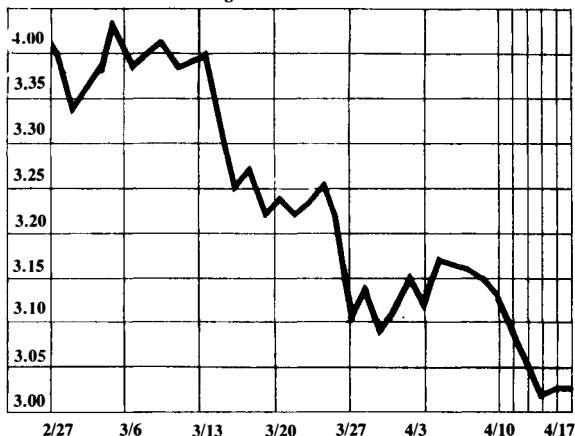
The formal agreements between NASA and Japan, Canada, and ESA are in the process of being signed. The nagging question, however, is: Will the United States keep its side of the bargain, in building the basic structure of the station, upon which everything else depends?

Before the fiscal year 1986 NASA budget left the White House six months ago, the Office of Management and Budget had reduced the Space Station funding by \$50 million. Recently, the House Budget Committee voted to freeze the budget at this year's level. That would mean a nearly \$400 million reduction in the budget NASA expected to have available in FY86.

Currency Rates

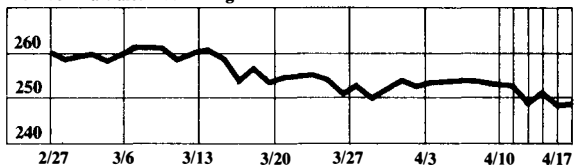
The dollar in deutschemarks

New York late afternoon fixing



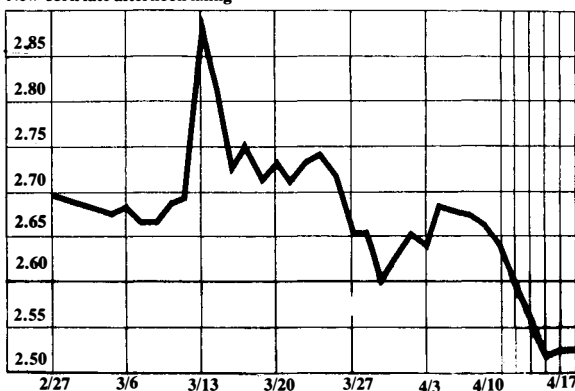
The dollar in yen

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The dollar in Swiss francs

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The British pound in dollars

New York late afternoon fixing

