

US space station

Japan reassured on military uses

Tokyo

A MAJOR obstacle to Japanese participation in the US space station project seems to have been overcome this week with assurances from Mr James Beggs, administrator of the US National Aeronautics and Space Administration (NASA), that the station would not be put to military use.

Mr Beggs arrived in Tokyo on Sunday to offer the Japanese Government a chance to join in the project to put a station, permanently manned by a crew of seven or eight, into orbit by the early 1990s. Discussions with Prime Minister Nakasone and the Space Activities Commission — the highest space policy body in Japan — took place on Monday. Because the Japanese constitution specifically forbids the maintenance of armed forces, it would be almost impossible for the government to make a commitment to a space station that might be used for military purposes. But Beggs stated that the US military has no desire at all to participate in the development of the station. It would, he said be launched into a low-inclination orbit (28.5 degrees, 300 km elevation) that would not take it over any of the high-latitude areas which might be of interest to the military. Should the military later want to use space station technology for their own high inclination orbit station, they would not have an automatic right to use technology developed by Japan for the station. Rather, Japan's "intellectual property" would be protected in a way satisfactory to Japan. But Beggs hoped that all work done on the project would "in the NASA tradition" eventually be published and made common property.

With the Japanese Government apparently satisfied on that score, the pressure is on the Japanese to decide quickly to what extent they are willing to participate financially.

Although an official of the Science and Technology Agency said before Beggs' arrival that it was unlikely that a decision could be made before the end of the year, Beggs made it clear that the project will be starting to move rapidly by the last quarter of this year. NASA would like to see the station operational by 1992 and is preparing to invest \$8,000 million in the initial development period. By the spring of 1985, some \$30 million will have been spent and a decision made on the basic form of the station. Expenditure will then rise rapidly to \$150 million by 1985-86 and \$400-\$500 million by 1986-87.

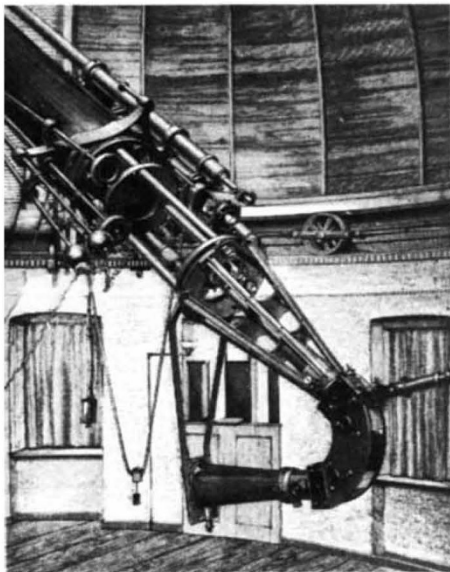
If Japan is "not well on board by the end of this year", Beggs said, "then doors will start to close". This deadline is particularly important because Japanese engineers hope to design totally one of the modules that would be clustered together to make the station. For this, Japan must join in early so that the module interface requirements can be decided.

The United States would like Japan to contribute an amount equal to 10-15 per cent of the US investment, to be added to the 20-25 per cent asked of Europe and Canada. If all countries participate as asked, the development budget will be near the \$11,500 million dollar mark, allowing a far more sophisticated programme than the United States could accomplish on its own. Beggs stressed that the money spent should be viewed as an investment: space projects, he said, can return substantial sums both in direct returns on satellite launches and in high technology spin-offs, and the aim is to make the space station a commercial and industrial success.

But with the Japanese Government already struggling to find funds for its own ambitious space programme (*Nature* 1 March, p.3), it is hard to see where the money will come from. Beggs said that the United States is not insisting on a 10-15 per cent investment from Japan — each nation will have to decide for itself how much it wants to invest. All Michiyuki Isurugi, director-general of the Science and Technology Agency, is prepared to say so far is that the meeting with Beggs has "deepened interest in the project", but discussions of more concrete plans have not yet begun. **Alun Anderson**

Phaenomenal colours

THE early history of the spectroscope since 1666 when Isaac Newton "...procured me a Triangular glass-Prisme, to try therewith the celebrated Phaenomena of Colours" is covered in a new exhibition which opened last week in Cambridge, England, and runs until 7 December. The exhibition is at the Whipple Museum of the History of Science, part of the University of Cambridge. A catalogue and illustrated history of the spectroscope are published to accompany the exhibition. The engraving below shows a two-prism spectroscope fitted to an 11-inch refractor at Potsdam Observatory. □



Commercial space

Poor outlook for Landsat sale

Washington

COMPANIES interested in buying all or part of the United States' Landsat satellite remote sensing system have until 19 March to submit their bids to the Department of Commerce. The Communications Satellite Corporation (Comsat), the Radio Corporation of America (RCA), Fairchild, General Electric and a new company called Space America have already expressed interest. But the proposed sale is regarded by many outsiders as an unpropitious start to the commercialization of space.

Part of the problem is financial. What little market exists for remote-sensing data consists mainly of government departments. As the proposal to commercialize the system has creaked through Congress, even enthusiasts for private sector investment in space have questioned the wisdom of the government selling a system and buying back its products. A proposal by the Reagan Administration to include government meteorological satellites in the sale was rejected outright.

But many in Congress, prompted by the Office of Technology Assessment (OTA), fear that sale of the Landsat system will also jeopardize the diplomatic interests of the United States. An OTA technical memorandum published this month says that Landsat has been used over the years to advance important foreign policy objectives — notably preserving the principle of the free international flow of information and helping developing countries see the American use of space as an opportunity rather than a threat.

The commercial interests of a private buyer may well conflict with such objectives, OTA warns. On the other hand, any constraints the Commerce Department intends to place on a sale to ensure that Landsat data remain available to developing countries at an affordable price threaten to make the enterprise unprofitable.

The OTA memorandum points to several other problems raised by the sale. For one thing, the defence and intelligence communities are the biggest users of Landsat data within the federal government. Unless there were safeguards on a privately-owned system, these communities might find it necessary to build and operate their own systems, a course that would probably cost the government more than it would save by selling Landsat.

OTA also questions whether a private owner would be far-sighted enough to develop remote sensing technology at the pace necessary to allow the United States to keep ahead of foreign competitors. The European Space Agency (ESA) and several individual countries have well-advanced plans to launch their own systems and to