

Pentagon stakes claim on shuttle

Military space use forecast by new directive

Washington

The growing unease over the military's role in the US space programme was hardly calmed last week by a new presidential directive on space policy. Although the directive does not actually establish any new programmes, and consists for the most part of vague generalities, it is the most overt and explicit statement of US military space objectives ever issued by a president, and appears to reverse a long tradition of playing down the military side of American space endeavours.

And while officials of the National Aeronautics and Space Administration (NASA) are taking encouragement from the presidential fanfare that accompanied the directive — including a speech at the 4th of July shuttle landing in which President Reagan extolled the benefits that the space programme has reaped for American jobs, technology and spirit — they clearly would have been much happier had the President offered a firm commitment to future projects in the civilian space programme. NASA had in particular hoped for a go-ahead on a fifth shuttle orbiter and what it hopes will be its next big project, an orbiting space station.

The secret military payload on the recent shuttle flight (which is generally known to have contained the Air Force's CIRRIS infrared sensor, being developed to spot missile launches) was a visible reminder of what all the concern was about. Critics say that the shuttle, with its dual role, has effectively erased the line between civilian and military space missions. And they see NASA's acceptance of a substantial Department of Defense (DoD) role, first in the design specifications and now in the operations of the shuttle, as having been a Faustian bargain: NASA received support for a big engineering project of the sort it thrives on, but is now having to pay the price of sacrificing its civilian role more and more to military interests.

These worries have reached even strong supporters of military space projects. Senator Harrison Schmitt (Republican, New Mexico), a former astronaut, is for example seeking to redress the balance between civilian and military space programmes. The Senate's Commerce, Science and Transportation Committee earlier this year approved his proposal to make DoD increase its contributions to the shuttle by \$409 million. Schmitt says this is nothing more than a requirement that DoD should pay for use of the shuttle at the same

rate as all other users. Under Schmitt's plan, NASA would use this extra money to build a fifth shuttle and to increase its research programmes in space science and aeronautics.

The President's science adviser, Dr George Keyworth, argues that this concern is misplaced. In a briefing for reporters on the new space policy, he pointed out that the military goals set out in the directive — most notably the "development of an anti-satellite capability . . . to deny any adversary the use of spaced-based systems that provide support to hostile military forces" — are nothing new. But he was unwilling to shed any light on why the military space programme was being made so explicit for the first time, or why an inter-agency committee set up to implement space policy under the directive will be headed by the White House's National Security Advisor.

While Keyworth spoke of the Administration's commitment to NASA's scientific mission and its general willingness to maintain NASA's current level of funding, he offered little encouragement for supporters of another big civilian project for NASA. He said a reference in the President's 4th of July speech to "establishing a more permanent presence in space" was definitely not a go-ahead for NASA's space station plans. Although "nothing is excluded", he said, "I have not yet seen comprehensive, well thought out plans for what it [a space station] will do."

Keyworth also took issue with Schmitt's plan to raise DoD contributions. NASA's budget, he said, took into account the military missions that NASA will launch; if

NASA receives an additional \$409 million from the military, then its budget should be cut by an equal amount.

Development of military hardware remains solely in the hands of the military. The new policy does not change that; nor does it affect the substance of those projects, beyond guaranteeing the Administration's commitment to them.

According to defence analysts, Air Force publications and published budget data, these projects range from surveillance efforts — such as the CIRRIS infrared telescope tested on the recent shuttle flight — and other "passive" missions such as navigation and communications to "active" anti-satellite capabilities. Anti-satellite work makes up the bulk of research and development in the military space programme; emphasis now is on the development and testing within the next few years of an anti-satellite "miniature homing vehicle" designed to be launched from an F-15 fighter. This weapon disables a satellite simply by ramming it. According to defence analysts, it is not likely to be able to reach targets above 1,000 km.

Basic research and development on lasers and particle beams, with the ultimate aim of producing a more sophisticated anti-satellite weapon and possibly a space-based anti-ballistic missile system, is also receiving a lot of attention.

Another major project is the NAVSTAR "Global Positioning System", a package of 18 satellites that will allow a person on the ground equipped with a receiver to determine his position. Receivers could also be installed in missiles.

NASA's involvement in any of these

Severe cuts unsettle Belgian universities

Brussels

Belgium's universities are still reeling from the unexpected severity of the cuts in public subsidies announced by the government last month. One thousand million Belgian francs (£11.7 million) are to be pared from the resources of the already struggling universities.

The centre-right government hopes to save BF8,000 million in the whole education budget as one of many measures intended to reduce its considerable budget deficit. Savings of BF500 million will be achieved by reducing by 25 per cent the subsidies per student and by widespread salary cuts. The universities are expected to pay for teaching, administration and research out of the allocations per student even though they have already made economies.

But the government wants more high-technology research to be carried out for which reason the research and teaching functions in the universities may have to be separated; a move has already been made in this direction with the allocation of the first

tranche of BF500 million for a programme of industrial research and development. It is hoped that the programme will help to win more public supply contracts in such fields as aeronautics, information technology and telecommunications. Hitherto, most of these contracts were given to research centres or companies.

Meanwhile, some Belgian universities are trying to make money from their own research. The Université Libre de Bruxelles, whose annual budget has been cut by 10 per cent, has started up a special unit to help seek outside finance and markets for the university's research.

The cutbacks will also lead to a shake-up among Belgian academics. Professors will retire at 65 instead of 70 as at present, newly employed graduate researchers will be paid less than they are now and promotion will come more slowly and less frequently. The remaining professors may have to work harder, with inter-university chairs being created to allow experts to share their knowledge more widely. **Jasper Becker**

military projects will certainly continue to be limited to getting them up. The chief fear of supporters of the civilian space programme is that with the increased emphasis on these military uses of space, NASA may end up doing little more than running a bus service, and may, as suggested in *Space World* recently, become in effect a "vassal" of the Air Force. The announcement of an 85 per cent rise in the rates charged to civilian users of the shuttle for flights after October 1985 and a scheduled tripling of charges for LANDSAT data this October — not to mention uncertainty over the government's continued support for LANDSAT — have added doubts about the Administration's commitment to the civilian space programme. **Stephen Budiansky**

Franco-Japanese collaboration

Plumbing depths

France is flirting with Japan. Tsukuba, the Japanese "science city" outside Tokyo, is to be named as a twin with Orsay, the complex of scientific institutions and industry south of Paris. At the end of this month, officials from the French ministry of research and technology will be visiting Japan to study Japanese management of science and technology.

M. Jean-Pierre Chevènement, the minister of research and industry has already visited Tokyo twice in his year as a minister. Will he try to model the new ministry of research and industry on its Japanese counterparts?

Philosophical uncertainties apart, one concrete new Franco-Japanese project has been set up — JASP, an oceanographic study of the Japan trench. The objective is scientific, but since the trench involves the subduction zone that causes Japan's frequent earthquakes, there is practical interest in the outcome.

Japan also stands to gain a knowledge of French submersible technology in the form of "SM 97". This new exploration submersible capable of reaching a depth of 6,000 metres is being built at the French oceanographic research institute at Brest, and may be ready by 1985.

The research will take place in two stages, the first in 1984, when the surface research vessel *Jean Charcot* will use a narrow-beam echo sounder (called Sea Beam) to draw a profile of the trench on a scale 1/10,000 to 1/20,000, while Japanese groups make gravimetric, magnetic and seismic measurements. Special study will be made at points where sea-mounts are being subducted and at the point of intersection of the Pacific, Philippine and Eurasiatic plates.

In the second stage, in 1985 SM97 will be sent down to points reckoned from the first survey to be of particular interest. Three transmitting seismographs and an inclinometer will be left behind.

Robert Walgate

India to expand space technology

Lucknow

India's determination to achieve self-reliance in space technology is evident from the government's recent approval of a space programme for the rest of the decade to build one satellite and two launch vehicles at a cost of 3,963 million rupees (£240 million). An 800-kilogramme remote sensing satellite will be used from 1985 to provide resource information in agriculture, water management, forestry, hydrology, geology and coastal oceanography.

The launch vehicle projects comprise an Augmented Satellite Launch Vehicle (ASLV) and a Polar Satellite Launch Vehicle (PSLV) whose development will rely on the know-how and the sub-systems already developed for the Indian launch vehicle SLV-3, which during its first developmental flight in May 1981 put a 38-kilogramme satellite in near-Earth orbit. It is hoped that ASLV will launch a 150-kilogramme satellite in a similar near-Earth orbit by 1983.

The second launch vehicle, PSLV, would be able to launch a 1,000-kilogramme satellite in polar Sun-synchronous orbit by 1987.

The Indian space programme has been quite successful. The first Indian experimental communications satellite, Apple, although one of the solar panels did not function, could be used for about 14 hours a day and will be used for conducting a course for teachers in institutes of technology on the use of satellite networks in university education. This project, like those based on communications satellites still to be launched will draw on the experience of earlier experiments in broadcasting to Indian villages direct.

The first functional telecommunication multi-purpose satellite, INSAT-1A, launched on 10 April 1982, is now ready for use in telecommunications, television broadcasting and weather monitoring although non-deployment of the C-band antenna and the continued malfunctioning of solar sails may curtail its useful life. But this may not matter if INSAT-1B, to be launched in July 1983 by the American space shuttle, functions well. The two satellites, INSAT-1A and INSAT-1B, have a total operational lifetime of 10 years with an overlapping period of two years.

By 1990, the Department of Space may have launched and tested INSAT-2, an improvement on the present INSAT satellite. It may then be necessary to have one satellite for telecommunications and television and one for meteorology.

Zaka Imam

Permanent space station

Europe cautious

The European Space Agency (ESA) is cautiously considering an invitation from the US National Aeronautics and Space Administration (NASA) to collaborate in building a permanent manned space station. NASA believes that international collaboration will improve the chance that Congress will approve the \$3,000–\$5,000 million project. But the agency, wary of collaboration since NASA withdrew most of its promised participation in the joint international solar polar mission, will be seeking strict assurances that NASA will not renege on the new project.

NASA has been for some time considering two proposals for a manned space station. The Johnson Space Center favours an immediate start on a large manned facility, built piecemeal from components transported by the shuttle, that would serve as an operating base in low Earth orbit. The Marshall Space Flight Center has an initially modest plan for a series of small unmanned platforms that could be built up later into a large manned station.

NASA has invited US industry to submit by the end of this month proposals to define the space station more closely. One eight-month study will define user needs and six smaller studies will draw up specific aspects of space station design. NASA plans more detailed studies in 1983 and 1984, and will next month be putting a request for \$16 million to finance them to the Office of Management and Budget for fiscal year 1984.

Meanwhile, NASA has invited other countries, including Canada and Japan as well as those in Europe, to consider what use they might make of a space station. Last week, ESA decided to support a study of European needs and to call on European industry to participate with US counterparts on the six detailed design studies. European industry will be looking for ways in which it can contribute expertise gained through building Spacelab, the modular laboratory to be carried on the shuttle. So far, ESA has set aside \$6 million for these preliminary studies.

It will not be easy for ESA to decide whether to accept NASA's invitation. Acceptance would almost certainly mean abandoning ESA's independent idea for an advanced transportation system on which those member states that value independence are keen. Largely stimulated by French proposals, ESA is now considering a partly reusable launcher that would build on experience gained during development of Ariane. Several companies, including Aerospatiale, Erno and Marconi, are conducting feasibility studies for a launch system that would be capable of carrying manned payloads. Next year, the agency also plans to place contracts for studies on