

## US space programme

# Shuttle faces economic reality

Washington

ANY remaining doubts about the virtuosity of the space shuttle were dispelled by last week's flawless performance of the Challenger orbiter. The seventh mission in the shuttle programme was the most ambitious so far and included the successful deployment of two satellites (for Canada and Indonesia) and the first ever retrieval of a space cargo. Back on Earth, however, the shuttle has yet to prove that it can be a commercial as well as a technical success.

The shuttle programme is running two years late and has consumed \$18,000 million in development costs, 31 per cent more than planned. The National Aeronautics and Space Administration (NASA) wants to capture a hefty slice of what it expects to be a lucrative commercial and foreign market for space services. But that means fighting off competition from Europe's Ariane, also basking in the triumph of a successful mission.

NASA's principal worry is whether it can launch enough flights to satisfy the anticipated demand. Repeated requests for money for a fifth orbiter have fallen on stony ground in the Office of Management and Budget (OMB). Meanwhile, estimates of the number of missions possible with a four-orbiter fleet have plummeted. The original plans (based on five orbiters) called for 560 missions in the 12-year life of the shuttle system. The number has dropped to 311 and may slip again.

Vivid proof of NASA's vulnerability came with last week's decision to have Challenger land at Edwards Air Force base in California instead of Cape Canaveral in Florida as planned. A prudent response to poor weather conditions, the decision could add \$16 million and eight days to the shuttle schedule as Challenger is returned to Florida. Both the eighth and ninth flights (including the launch of Spacelab) are expected to be delayed as a result.

NASA's present goal is to reach 24 launches a year by 1988, 30 by 1990 and 40 by 1992. But a recent study by the National Research Council concluded that the chances of reaching 30 launches by 1990 were "impossible or highly improbable" and would be only "marginal" with the addition of a fifth orbiter. The main constraint was likely to be a shortage of spare parts and a high rate of engine failure.

Another disadvantage for NASA in its competition with Ariane is the belief of many potential customers that the Department of Defense (DOD) will exercise its right to jump the queue for shuttle launches, and play havoc with commercial and civilian timetables. NASA does not expect that to happen, arguing that with 114 of the 311 missions already assigned to DOD the Pentagon will have more launch opportunities than it could possibly need.

Foreign customers may take a less

sanguine view of DOD's role, however. Representative Daniel Akaka (Democrat, Hawaii) told a congressional committee last month that Arianespace had already begun to warn potential customers that a booking on the shuttle could be displaced by DOD at any moment. Akaka also cited a 1982 NASA study which reported that the United States could lose up to 94 launches to Ariane by 1994, at a cost of some \$3,000 million in lost revenues.

It is not only DOD that might encroach on the shuttle. Congress and the administration are enthusiastic about building a permanent space station, although they have not yet given NASA approval to go beyond the planning stage. The project could cause a surge in government demand for space on the shuttle, squeezing out foreign and commercial customers.

Aerospace companies which believe there will be too much space business for the shuttle to handle have been trying to persuade Congress somehow to expand launch capacity. One company, SpaceTran (recently bought by Federal Express), offered to pay for a fifth shuttle orbiter in return for rights to sell space on its missions. Others have advocated freeing space on the shuttle by providing DOD with a separate orbiter of its own. A decision has to be taken soon, before the skilled workforce that builds shuttle components is dispersed and the production lines closed.

Meanwhile, the administration has introduced a new variable into the debate by agreeing last month to private sector arguments that US companies should be allowed to take over the United States' own expendable launch vehicles (ELVs). These rockets, including well-tried workhorses

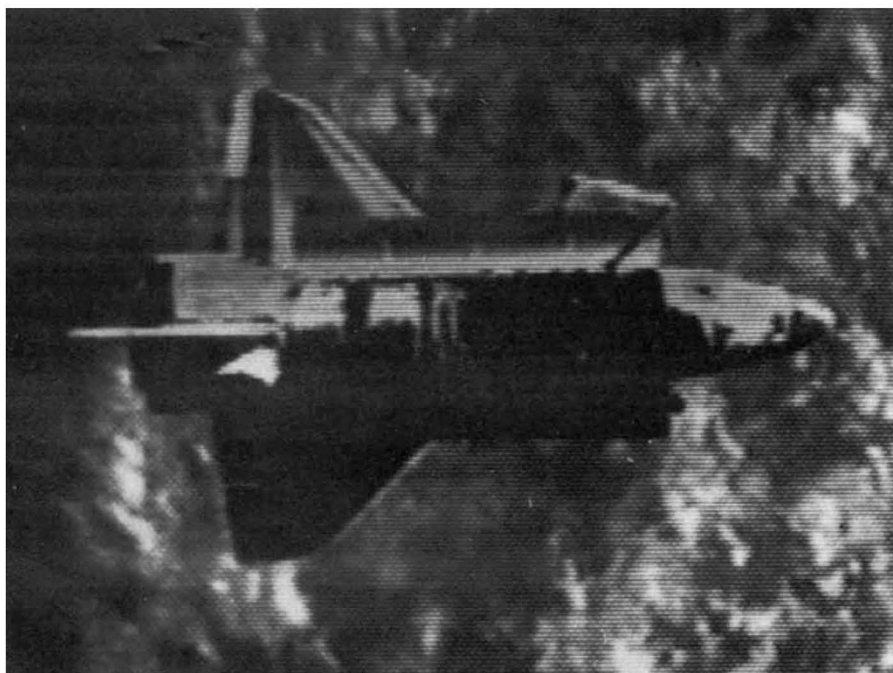
such as Titan and Delta, were to have been phased out with the advent of the shuttle but might now be used to launch commercial satellites into orbit in direct competition with Ariane.

Will they also take business away from the shuttle? That is unlikely, given the vested interest of many aerospace companies in the shuttle's success. Martin Marietta, which will be operating Titan, is believed to earn some \$400 million a year by manufacturing the shuttle's external fuel tanks. But the private sector is already showing signs of wanting to push up the price of shuttle launches so that its ELVs can compete more effectively.

At present, NASA's pricing policy is to recover only "out of pocket" launch expenses. In its latest promotional brochure, NASA claims to be able to launch an Intelsat VI satellite for about \$52 million — less than any other launch system.

The big unknown is whether the hoped-for market for space services will grow as rapidly as expected. NASA and the private sector are optimistic. General Dynamics estimates "conservatively" a need to launch 245 commercial communications satellites between 1986 and 1995, generating about \$10,000 million in launch revenues. SpaceTran puts the commercial and foreign market for space transportation at \$15,000 million between 1983 and 1995, and expects there to be 183 commercial payloads between 1985 and 1995.

Not all experts agree. Members of the Office of Technology Assessment warn that it is always possible that instead of facing more business than they can handle, the shuttle and its competitors will end up with surplus launch capacity. The impact of fibre optics could transform communications economics, in which case the demand for satellite launches could shrivel as quickly as it sprouted. **Peter David**



Challenger as seen from the West German Shuttle Pallet Satellite about 200 feet above the shuttle