Britain's space future in the past as ESA forges on

- "Not a penny more" says UK minister
- ESA decides on long-term programmes

Paris

MINISTERS from West European countries meeting at The Hague on 9 and 10 November cast aside objections from the British government and voted to support a $12,800 million manned space programme until the end of the century. Mr Kenneth Clarke, Britain's Minister of State for Trade and Industry, had expected to find support from other European Space Agency (ESA) members (see *Nature* **329,** 660; 1987) but, when a decision had to be made, Britain was the only country not to agree to the proposals.

"Mr Clarke's position was at least clear", said an ESA spokesman in Paris. Britain will continue to contribute 12.6 per cent (about £85 million) to ESA's overall programme, but, in Clarke's words, "will not give a penny more".

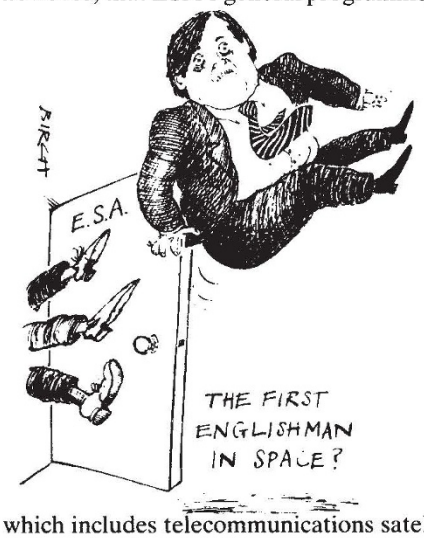
The major elements of the long-term space plan, defined at the last ESA council meeting in Rome in 1985, are the Ariane 5 heavy-lift rocket launcher, the Hermes shuttle and the Columbus 'package', comprising an attached pressurized module for the US space station, a man-tended free-flying laboratory and a polar orbiting platform. Ministers from 12 of the 13 ESA member states gave the go-ahead for Ariane 5 and approved three years of development work on Columbus and Hermes.

The additional cost of these three projects will mean a 5 per cent annual increase in ESA spending, rising from about $1,440 million this year to almost $2,500 million by 1994. Nevertheless, with the exception of Columbus, the projects can be financed almost entirely without Britain's support. Between 80 and 90 per cent of the cost of the three elements has been pledged by France, West Germany and Italy. The French-designed Hermes, criticized by Clarke as "expensive and unnecessary" and "an imitation of a 20-year-old American idea", was oversubscribed by ESA members by 2–6 per cent.

West Germany, ESA's second largest contributor after France, signalled its probable approval of the long-term space plan before the meeting, but tabled a set of provisos. These included a 15–20 per cent cut in the total budget planned for the next 13 years, a three-year postponement of a final decision on Hermes, allowing time for its viability to be proved, and a 'wait and see' approach to Columbus.

As it stands, Columbus is conceived as a part of NASA's space station, but ESA is still not satisfied with the US position with regard to military usage of the station, European sovereignty in the design, construction and use of APM, ownership of new materials manufactured in its laboratories and arbitration procedures. Members want to await the outcome of negotiations with the United States before committing themselves definitely to the Columbus programme.

Members accepted the provisos and the ESA executive is now looking at ways to make the required savings. One possibility, according to Reimar Lüst, director-general of ESA, would be to delay the timetable for some projects. There is some concern among space scientists, however, that ESA's general programme,



which includes telecommunications satellites, microgravity experiments and Earth observation projects, will be squeezed. Britain is a major contributor to this, mandatory, part of ESA's programme and Clarke says that it will remain the most commercially viable sector. He nevertheless exercized his right of veto to prevent a 5 per cent increase in ESA's basic science programme for 1989, but there are hopes within the agency that he may soften before the budget is finalized.

Work on Ariane 5 and the first phase of Hermes will start right away. The first tests of Ariane's rocket motors are scheduled for 1990 and, by that time, major design obstacles must have been solved for Hermes to be adopted. It is then that members will be asked for the most significant increases in annual contributions.

Now that Britain has opted out of a significant role in ESA's long-term plan, questions are being raised about its continued membership. **Peter Coles**

NASA's load to get heavier

Washington

THE National Aeronautics and Space Administration (NASA) announced last week that it was raising the maximum landing weight for future shuttle flights by some 19,000 lb. The change is a result of a three-year analysis of shuttle performance characteristics, and NASA officials are confident that it leaves sufficient safety margins for shuttle operations.

NASA's life sciences division is the most enthusiastic about the higher landing weight, as it will mean that the duration of Spacelab missions can be doubled. Under the old weight allowances, Spacelab was limited to approximately 5 days in orbit before exhausting its fuel cells. Now, sufficient fuel can be carried for a 10-day mission, without exceeding safety margins should a mission need to be aborted.

Landing weight limits are based primarily on analyses of inertial and thermal loads on the shuttle. Gary Coultas, assistant manager of the orbiter project office at the Johnson Space Center in Houston, says that when his office compared design baselines with actual performance data, it became clear that the shuttle could handle heavier loads on landing. For example, the shuttle is designed to withstand forces of 2.5 times gravity during descent, but most shuttle manoeuvres have generated stresses about 1.5-1.6*g*. As maximum stress loads are lower than expected, heavier payloads can be safely returned to Earth. Coultas says NASA now reckons the shuttle will never need to exceed 2.3*g*.

The shuttle had been operating with a maximum landing weight of 211,000–214,000 lb. For future missions, that will increase to 230,000 lb. A bigger problem will be aerodynamic stress associated with trajectories needed to launch heavier loads. The first shuttle flight to use the heavier landing weight will be the ASTRO-1 Ultraviolet Astronomical Telescope, now due for launch in 1989.

Shuttle flights are scheduled to resume next summer, although the hoped-for June launch date appears to be slipping. There will be only four missions in 1988; two will launch tracking and data-relay satellites, and two are Defense Department classified missions. The first scheduled scientific payload will be the Magellan Venus radar mapper, now set for an April 1989 launch. Also scheduled for the shuttle in 1989 are the Galileo mission to Jupiter, ASTRO-1, and the Hubble Space Telescope. The first major scientific mission to be launched by NASA in the post-Challenger era will not fly aboard the shuttle at all. The Cosmic Background Explorer will be launched by a Delta rocket in February 1989. **Joseph Palca**