

PRIME MINISTER

17 December 1986

BNSC - SPACE PLAN

These greatly increased expenditure proposals have been strongly attacked by the Treasury, not only on the grounds of parsimony, but because there are no tests which demonstrate value for money. Ministers have not really been shown how alternative programmes could be tailored to different resources because of the manner in which topics are linked together administratively. A proper menu of choices should be put together and I have made a rough initial attempt below.

My other main concern is management and the extent to which opportunities are missed when development approaches the commercial phase through not obtaining adequate cost recovery over the financially unproductive years. For example, it is not until the very penultimate page of the E(A) paper under Annex D that we are shown four significant satellite contracts with British involvement that our space involvement has already generated. There are other areas where the paper does not exploit its strengths. For example, the overall programme presented shows an increasing UK national programme forming some 72% of the ESA programme by 1989/90 and that is nowhere pointed out.

Alternative Groupings of Programmes

The guiding principle is that what we do should be done well. Limited resources should not be spread thinly over everything. I have therefore tried to divide the programme up into self-contained groupings:

ESA £m (cash)	86/87	87/88	88/89	89/90
Budget & Science Programme	26	31	33	37
Satellite Communications	33	37	33	34
Earth Obs. & Polar Platform	24	40	49	54
Space Station & Microgravity	2	10	19	21
Launch Systems (Excl. Hotol)	8	16	20	27
Technology	-	1	3	3
	93	135	157	176
National Programme £m (Cash)	39	66	95	126
TOTAL	132	201	252	302
HOTOL if proved	-	2	3	22

This expenditure allocation differs from Annex B of the E(A) paper which groups expenditure into administratively separate rather than scientifically separate categories. For example, the polar platform is a natural fit with the earth observation programme but has been accounted as part of the general space station expenditure under the Columbus programme because this is how it is administered. Again, participation in the US space station programme gives access to microgravity work and there is little sense in planning to do one without the other.

Value for Money and Management

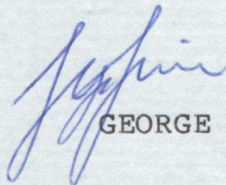
Return on capital projections are a hopelessly inaccurate method of measuring the effectiveness of R&D programmes. Once the underlying plausibility for ultimate wealth creation has been established, one efficiency measure is the expenditure fraction which is actually put into the field, rather than being frittered away on committees and administration. Perhaps a proper measure of this ratio should be agreed ab initio for each research programme and regularly reported. Another useful measure is how much expenditure on other items has been willingly foregone. Note that the major spending departments are very enthusiastic about the space programme but volunteer no expenditure reallocation of their own funds.

Tough professional management is essential when large sums are being spent at the boundary of scientific and technical knowledge. Otherwise there will be delay, waste and inadequate cost recovery from the technical successes. Scientists often ride off on hobbyhorses and dismiss economic issues with either jargon or pious hope. Wittgenstein once remarked that anything which can be said at all can be said clearly and that is a very good maxim when managing scientists!

Recommendation and Key Points

The UK should play a strong role in space development by building on its initial success in areas like satellite communication. If the funding requested is not available then specific programmes should be supported in descending order of importance as shown in my table:

1. A strong positive point is that the UK national share, as a percentage of the ESA subscription, rises over the four years quite markedly from 42 to 72 per cent.
2. It is possible to be selective in space activity but it is important to distinguish those items which are separable in the scientific sense from those that are linked administratively or bureaucratically.
3. The UK is a clear leader in satellite technology. When commercial exploitation is achieved adequate prices must be charged to cover the financially unproductive years of innovation. I suspect this is an area which should not be left to the scientists.



GEORGE GUISE

Attached is an appendix on HOTOL.

HOTOL

This has not been included under launch systems because the idea of a space plane, taking off horizontally and using an atmosphere-breathing engine for the initial part of its flight, is purely conceptual. It began as a joint venture between Rolls Royce and British Aerospace and now BNSC has joined them in a two year 'Proof of Concept' study at a cost of £3m. The study will be complete by the autumn of 1988 when it should be clear whether the technological development of a space plane is an attainable goal. The project is currently a national UK project but if development appears viable it will be funded within ESA.

Any decision on HOTOL is unlikely before 1990. BNSC hopes that HOTOL will ultimately displace the French Hermes from ESA when the balance of funding would probably be 30% BNSC and 70% ESA. Hermes is a shuttle system with vertical take-off and pure rocket propulsion and therefore suffers from the traditional disadvantages and safety risks which were sadly demonstrated with Challenger.

If HOTOL is developed its main use would be the launching of satellites and manned transportation to space stations or other craft in orbit needing service. It might reduce the cost of putting satellites into low earth orbit by a factor of five and the cost of a geostationary replacement by a factor of two. The newspaper stories about ordinary passengers going to Australia for the weekend, although perhaps possible, are not the primary case for HOTOL. Total development cost has been estimated at £3 billion for a small manned capsule with a maiden flight in 1998.