

PRIME MINISTER

RISING COST OF DEFENCE EQUIPMENT

Before the holidays you asked the Defence Secretary to let you have a paper on this subject.

I now attach a letter from his Office and an accompanying paper.

The MOD ask how you would now wish to proceed.

I attach a minute by the Policy Unit which contains some ideas:-

- (a) that No. 10 should receive copies of the Defence Equipment Policy Committee papers;
- (b) that the Policy Unit should attend this Committee;
- (c) that the Group which was set up after the HARM/ALARM decision (on which No. 10 are represented) to identify technologies in which an indigenous capability is essential for defence purposes should, when they have finished this work, consider two questions:
 - (i) would a more open system of defence procurement lead to better value for money for the defence equipment budget;
 - (ii) how can greater collaboration and standardisation be achieved within NATO?

I can see no objection to (a) and (b) above. As to (c), my impression is that Mr. Heseltine already has some fairly radical ideas about opening up the present rather cosy system of defence procurement - and I doubt whether another Committee is going to do much of value about the problem of NATO standardisation.

Would you like to discuss these ideas with the Defence Secretary when we can find a spare moment? There is no hurry.

*W/S
Please
mt*

A.J.C.

4 October 1983

THE RISING COSTS OF DEFENCE PROCUREMENT

The paper from the Secretary of State for Defence on Real Cost Growth in Equipment puts forward no new thinking on how to tackle the rising costs of defence procurement. It fails to acknowledge that:

- Advances in technology reduce unit costs in defence as elsewhere. Guided weapons achieve more hits at less cost than the systems they replaced. The real problem in defence is the growth of the threat, not the 'cost' of technology.
- Real rises in the cost of items of equipment are not peculiar to defence. They occur in industry, in the health service and in the utilities. Why should this argument make defence a special case?
- Of course, the Warsaw Pact has been spending a higher proportion of its GDP on defence. They have had to because their GDP lagged behind that of NATO. However, they get more equipment for their money than we do, through standardisation. Paragraph 7 refers to the fact that the Warsaw Pact achieve economies of scale and long production runs. Why don't we? It is ironic that the UK in particular and NATO in general fail to exploit the benefits of competition in the one area where our market philosophy should assist us most in our defence against the Soviet threat.
- Foreign competition is excluded from consideration in the draft (eg Paragraph 14). The benefits of collaboration are also understated. A collaboration project may be cheaper than a national project but a foreign purchase may be cheaper still. Tornado cost twice as much as an F16, even excluding the hidden R&D costs.

It was in response to our apparent inability to contain the seemingly inexorable rise in the costs of defence equipment that our earlier papers to the Prime Minister suggested that more radical options need to be considered. This need will be reinforced by any decision to contain the growth in defence expenditure below 3% per annum in real terms after 1985/86.

Following the HARM v ALARM decision, an interdepartmental group with No 10 representation has been set up to identify those technologies in which an indigenous capability is essential for defence purposes. We suggest that, following completion of this remit, the Group should be asked to consider two questions:

- would a more open system of defence procurement lead to better value for money for the defence equipment budget?
- how can greater collaboration and standardisation be achieved within NATO?

We anticipate that the Secretary of State for Defence will advise that these questions are not new and are under continuous review. However, by assessing them together and looking at future prospects over a reasonably long time horizon, it should be possible to form a clearer idea of where Britain's best interests lie and how value for money in the defence equipment budget could be improved.

The covering note to the Secretary of State's paper also refers to the question of the co-ordination of Ministerial decisions on defence procurement. We suggest that it would be helpful for No 10 to receive copies of the Defence Equipment Policy Committee (DEPC) business expected in the following three months, and for the Policy Unit to attend DEPC as appropriate.

DLP.

DAVID PASCALL



MINISTRY OF DEFENCE
 MAIN BUILDING WHITEHALL LONDON SW1A 2HB
 Telephone 01-~~938 7022~~ 218 2111/3

MO 26/2

22nd September 1983

Dear John,

attached

In your letter of 25th July you said that, in discussion with my Secretary of State, the Prime Minister had expressed her concern at the rising cost of defence equipment and asked for a paper taking a preliminary view on this issue. A paper on real cost growth in defence equipment is attached.

You also mentioned the question of the co-ordination of Ministerial decisions on defence procurement. Every 6 months or so, Defence Ministers receive a forecast of those equipment decisions needing their approval which are likely to come forward in the following 12 months. These decision points cover the endorsement of Staff Requirements and the start of Project Definition (PD); the start of Full Development (FD); approval of initial and follow-on production orders of £50M or more; and the signature of key MOUs. The last such forecast contained over 50 items.

Apart from the necessary Treasury approvals, the majority of these decisions do not give rise to issues requiring inter-departmental discussion at Ministerial level. Those few that do will normally be discussed by the Defence Equipment Policy Committee (DEPC), which the Treasury, DTI and FCO attend. Representatives of other government departments with other members, receive forecasts every 4 - 6 weeks of DEPC business in the following three months. Therefore, when Defence Ministers take decisions, they will be aware of related projects coming forward for consideration and, when they seek the agreement of the Chancellor and other colleagues concerned, officials of those Departments will have received the DEPC forecast of business. Perhaps you would let us know how the Prime Minister would wish to proceed.

I am copying this letter to John Kerr (HM Treasury), Roger Bone (FCO), Caroline Varley (Trade and Industry) and Richard Hatfield (Cabinet Office).

Yours ever
Mich Evans

(N H R EVANS)

A J Coles Esq

REAL COST GROWTH IN EQUIPMENT

"The great change introduced into the art of war by the invention of fire-arms, has enhanced still further both the expence of exercising and disciplining any particular number of soldiers in time of peace, and that of employing them in time of war. Both their arms and their ammunition are become more expensive. A musquet is a more expensive machine than a javelin or a bow and arrows; a cannon or a mortar than a balista or a catapulta. The powder, which is spent in a modern review, is lost irrecoverably, and occasions a very considerable expence.

The cannon and the mortar are, not only much dearer, but much heavier machines than the balista or catapulta, and require a greater expence, not only to prepare them for the field, but to carry them to it. As the superiority of the modern artillery too, over that of the ancients is very great; it has become much more difficult, and consequently much more expensive, to fortify a town so as to resist even for a few weeks the attack of that superior artillery. In modern times many different causes contribute to render the defence of the society more expensive."

Adam Smith: "An inquiry into the nature and causes of the wealth of Nations"

1776

REAL COST GROWTH IN EQUIPMENT

1. There has been concern for some time over the rise in unit costs between successive generations of defence equipment. This was one of the main reasons for the 1981 review of the Defence Programme which resulted in the White Paper on The Way Forward (Cmnd 8288). The problem and how to mitigate its effects were further discussed in SDE 1982 Chapter 4 (Cmnd 8529).

2. The growth in the real cost of defence equipment is not a new phenomenon. In 1776 Adam Smith had identified most of the factors involved; the impact of a major advance in technology, the increased cost not only of procurement but also of training and support costs and the increased cost of defence against an enhanced threat. However, the problem has become more marked since World War II, with both the Warsaw Pact and NATO countries striving to exploit developments in advanced technology. Recent studies suggest that some 60% of the equipment programme may be susceptible to significant real cost growth. Examples of the increases in costs between generations of equipment are shown in Annex A. The real unit cost of British aircraft has increased at an average rate of 8% a year since World War II.

3. A study in the USA showed that the real cost of their weapon systems had also been rising rapidly since World War II. Examples included annual real growth rates in unit costs of 13% for an infantry anti-tank weapon, 11% for tanks, 9% for destroyers, 8% for aircraft and 6% for aircraft carriers. This means that, for the same amount in real terms, $9\frac{1}{2}$ times as many tanks and $30\frac{1}{2}$ times as many fighter-aircraft could be purchased in 1950 compared with 1983. The French have recently told us that they believed their equipment programme was subject to a real cost growth of 5% a year.

4. We concluded some years ago that a growth rate in equipment and associated expenditure in the region of 6-8% annually, in real terms, would be needed to maintain our role and commitment to NATO and to meet the threat if it kept pace with technological advance. The problem is a major one.

5. Advances in technology consist of three main components:-

- the introduction of entirely new technology into warfare. Post World War II examples include guided weapons, computers, thermal imaging, satellites, laser weapons and nuclear propulsion and weapons.
- major new twists in existing technology. Examples include vertical take-off flight capability for aircraft and developing torpedoes into true guided weapons.
- straight forward cost growth as each mark or generation of equipment is improved to achieve greater effectiveness.

6. So far as perceived developments of the threat are concerned, the facts of Warsaw Pact numbers are well known but the qualitative advantages on which NATO has depended to counterbalance the quantitative disparity have been diminishing. There is some evidence to suggest that the Russians themselves have been affected by the problem of real cost growth. In 1975, the previous Soviet Minister of Defence said:

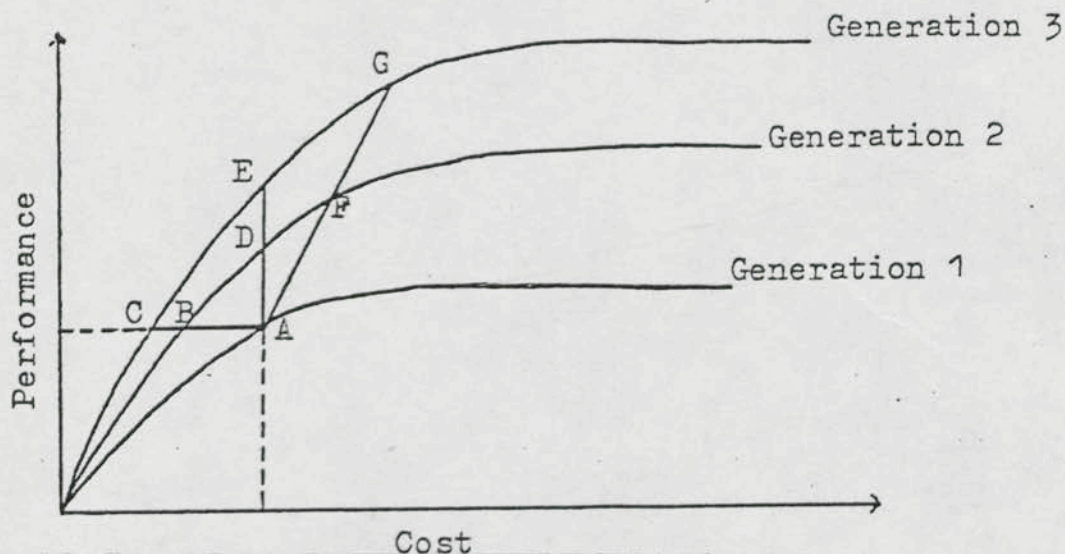
"In just the last 10-15 years, both here and abroad, there has been a replacement of 2-3 generations of missiles; a significant portion of the inventory of combat aircraft, surface ships and submarines have been replaced. This trend is becoming more distinct, in spite of the fact that with the creation of new prototypes of weapons there is a continuous increase in the technical complexity of military-industrial items and of the economic expenditures for that production."

Marshal Grechko: "The Armed Forces of the Soviet State"

The Soviet Union is prepared to accept a very high defence burden in order to meet its military requirements (14-16% of GDP is devoted to defence compared with the NATO average of about 5%). In addition, the fact that the Soviet Union relies on a large and poorly paid force of conscripts means that a relatively large proportion of military expenditure is available for weapons procurement (60% including R&D compared with 37% for the UK and 31% for the USA - see Annex B). In addition, their very large and continuous production runs and commonality of equipment throughout the Warsaw Pact ensures that they obtain maximum economies of scale.

8. NATO has little choice but to counter the Warsaw Pact's improvements. For example, increases in the effectiveness of armour on new generation Warsaw Pact tanks have required enhancements to every form of armour attack; at sea, the increased threat from low altitude, high speed missile attack has demanded improved responses from anti-missile systems, improved electronic counter measures and extended surveillance. Such improvements are expensive.

9. The phenomenon is illustrated in the following graph.



This shows illustrative performance curves for succeeding generations of equipment. Each generation offers an improvement in performance over the one before; each shows the last few per cent of performance achievable at progressively higher marginal cost.

10. Advances in technology make the same performance available at a lower cost (A-B-C) or an increased performance available at the same cost (A-D-E). The need to respond to the threat however tends to push the requirement for performance up the curve (A-F-G) and real cost growth is the result.

Present Position

11. The trend in frontline numbers for major equipments during the period from 1950 is shown in Annex C. Between 1950 and 1970, the decline was rapid with the wasting out of World War II and Korean War equipment. Frontline numbers in the 1970s continued to decline in many areas, reflecting the pressure of cost growth against a largely static budget. But the trend has not been universal and there have been significant enhancements in our capabilities in some areas. For example, the SSN fleet, has increased in size and the infantry has become more mechanised. Nor should it be overlooked that each equipment is more capable and, therefore, may be more cost effective than its predecessor.

Solutions

12. The aim must be to constrain or accommodate real cost growth. One obvious way is to increase the resources available for equipment expenditure. As the graph at Annex D shows, the trend of the UK Defence Budget in real terms since the mid-1960s was downwards or at least stable until the end of the 1970s. Since 1978/79, however, the defence budget has grown by nearly 14%; this reflects the UK's commitment to the NATO aim of a 3% a year growth in real terms and the additional provision for the Falkalnds. Annex E

shows that, within the defence budget, the proportion allocated to overall equipment costs has increased from a minimum of 30% in 1971/72 to over 46% this year. This reflects a number of measures to constrain personnel costs; particularly, since 1979, by cutting civilian numbers, which has helped to reduce the proportion of the defence budget spent on civilian pay by a third since 1975/76. Annex F shows equipment expenditure in real terms.

13. Real cost increases within budgetary constraints have also brought about more fundamental changes in our defence picture over the past 30 years. These include the reduction of overseas commitments, the abandoning of (or not proceeding with) some equipments which were beyond our means (such as Inter-Continental Ballistic Missiles, and aircraft carriers), keeping equipment in service longer and the squeezing of support to release money for the front line; in sum, real cost escalation has driven changes in national defence policy. In the last few years, however, more determined efforts have been made to ensure that equipment is more affordable.

14. Areas on which effort is now being concentrated are:-

(a) Competition

MOD policy is to secure competitive proposals wherever this is practicable and reasonable, both during development and production phases. This is not only the surest way to ensure the lowest costs, it also stimulates innovation and enterprise from which Defence can benefit. Even more in the UK than in the United States, however, there are practical constraints on competition such as monopoly and proprietary suppliers. The scope for alleviating the effect of these constraints is rigorously examined and the value of direct purchase by competitive tendering has risen from 15-16% in the late 1970s to 20%. For instance, although in many areas (such as guided weapons or aero-engines) there is only one possible prime contractor in the UK, competition can be introduced for sub-systems. Inclusion of foreign purchases in competitions also offer cost advantages.

(b) Incentive Pricing

In addition, the MOD aims to make the maximum practical use of fixed prices or other incentive arrangements; especially where the competition has not proved possible. Some 75% to 80% by value of the contracts placed in recent years have been on this basis. A cost-plus-percentage method of contracting is only used as a method of last resort. However, getting the right terms and the right specifications -

so as to minimise the risk later of avoidable charges, abortive work and cost growth - must mean that development work on some projects will have to start later than either industry or the Services would wish.

(c) Closer consultation with Industry

Government purchasing policy requires the use of purchasing power to help develop the design, technology and competitiveness of suppliers. Accordingly, MOD consults industry at a very early stage to discuss the most cost-effective method to meet a specific threat and may adjust operational requirements and technical specifications where necessary to enhance sales potential. Existing commercial products may meet the needs of the Services with comparatively little modification; this is cheaper in terms of development costs and allows the MOD to utilise the civilian support system which saves infrastructure and personnel costs as well. It also reinforces the marketability of these products and reduces a firm's dependence on the MOD for its markets and profits.

(d) Avoidance of over-elaboration of Requirements

As the design approaches the limits of available technology a stage is reached in each generation where additional performance can only be achieved at a high marginal cost. Our aim is to maximise force effectiveness by balancing quantity and quality rather than seeking to exploit all the benefits of new technology through maximising, at a higher unit cost at greater risk to development and reliability, the performance of individual equipments.

(e) Sales

At the moment, the UK is estimated to hold nearly 6% of the market for sales. The sale of defence equipment can offer a number of benefits. Not only can it reduce unit costs by increasing the length of production runs, but it also reduces industry's dependence on the MOD for contributions to overheads, provides a return in the form of levies on sales and opens up the prospect of contributions to development by industry in joint venture projects, such as the EH101 helicopter. Consultation with industry, is essential to ensure that export considerations play a more significant part in the development of new equipment.

(f) Collaboration

Like sales, collaboration can offer each partner savings from shared development costs and from economies of scale in production when compared with a national project. The possibilities of collaboration are explored for all major projects; although there are intrinsic problems in harmonising the interests of the relevant governments, industries and operational staffs, which can increase costs, timescales, complexity and management problems.

15. In addition effort is devoted to reducing the "through life costs" of equipment i.e. its running and maintenance costs. Improving the design, reliability and maintainability of an equipment is a crucial part of development and the trade-off between capital and support costs is considered from an early stage. Where alternative methods of meeting a requirement are considered through life costs will be a major factor in the final decision.

16. Following discussions as necessary with industry, a number of internal instructions on the implementation of these principles have been issued in the last year or so and will shortly be supplemented by an Open Government Document on defence procurement policy. These instructions emphasise the need for early dialogue with industry, the statement of requirements in broad terms and the avoidance of over-elaboration, encouragement of industry to offer their own solutions (sometimes involving PV funding) and, above all, competition. Experience so far indicates that both MOD and industry are securing the benefits in terms of affordable equipment in realistic timescales, which is more readily marketable overseas.

17. Examples of equipment where real costs have been held or reduced are shown "below the line" in Annex A. The SSN programme is one where, despite complexity and the absence of competition, substantial improvements in performance have been achieved without real cost increases through a sustained programme of product improvement, the radars have benefitted from technological advance, UAF (1) shows the benefits of competition and the Type 23 frigate has been subject to the imposition of a cost ceiling. Savings will also be achieved in running costs. The Type 23 is planned to have a crew of 145 compared with 280 in the Type 22 and the Martello Air Defence radar will require little more than a third of the men to service and maintain them as the previous system.

Conclusions

18. The problems for the defence budget created by the tendency for real cost growth to occur between succeeding generations of defence equipment are well recognised. In the last decade, progress has been made towards mitigating its effects. The share of the defence budget devoted to equipment costs has risen from 30% to 46%. Various policies to reduce costs are being

implemented. Competition, improved contractual arrangements, closer consultation with industry, simplification of requirements, increased exports, and collaboration all have a part to play.

19. If the Alliance is to continue, despite being outnumbered, to offer a credible deterrent, it must maintain a high quality front line. The US are urging on their allies the adoption of emerging technologies, to acquire targets and strike them at greater depth. They should improve NATO's conventional stance; they will certainly be expensive. NATO continues to support the commitment to 3% a year real growth. SACEUR would like 4% to ensure adequate numbers of high quality systems in the Alliance inventory. Despite the progress that has been made in checking real cost growth and accommodating it within the defence budget, the pressures will continue. As the recently endorsed NATO Ministerial Guidance concluded:-

"Optimal use of resources has always been the aim of planners and decisions makers and though new ideas may offer new opportunities, it would already be a great success if through these initiatives it would become possible to reduce the rate of real cost growth in the defence field. The need for real increases in defence expenditure as a pre-requisite for real increases in defence capabilities is, however, not likely to disappear."

EXAMPLES OF REAL COST INCREASES IN THE PRODUCTION
COSTS OF EQUIPMENT

Harrier GR 1	- 4 x Hunter F6
Sea Wolf	- 3½ x Sea Cat
MCV 80	- 3½ x FV 432
Type 22 Frigate	- 3 x Leander
Lynx Mk 2	- 2½ x Wasp Mk 1
Searchwater Radar	- 2½ x ASV 21
LI5 HE Shell	- 2 x 5.5" HE Shell
Hawk Mk 1	- 1½ x Gnat Mk 1
Puma Mk 1	- 1½ x Wessex Mk 2

Trafalgar SSN	- 1 x Valiant SSN
Tornado A1 Radar	- 1 x Phantom AWG 11/12 Radar
Martello Radar	- 1 x Type 85
Type 23 Frigate	- 0.8 x Type 22
UAF 1 ESM Equipment	- 0.8 x UAA 1

ALLOCATION OF MILITARY EXPENDITURE BY PERCENTAGE: 1981⁽¹⁾

	<u>USSR</u>	<u>UK</u>	<u>USA</u>
MILITARY PERSONNEL COSTS	10	23	22
OPERATIONS AND MAINTENANCE	26	37	45
PROCUREMENT OF EQUIPMENT ⁽²⁾	39	23	22
RESEARCH AND DEVELOPMENT	21	14	9
CONSTRUCTION OF MILITARY FACILITIES	4	3	2

(1) Defence budget estimated on a calendar year basis and using the NATO definition of defence expenditure (see Table 2.3 in SDE 83, Vol 2).

(2) Based on NATO definition of "major equipment". R & D costs are identified separately; minor equipment and other items (particularly ammunition, explosives and general support costs) are excluded; whereas both these classes of expenditure are included in the UK definition for equipment costs in Annexes E and F.

EXAMPLES OF TRENDS IN EQUIPMENT NUMBERS

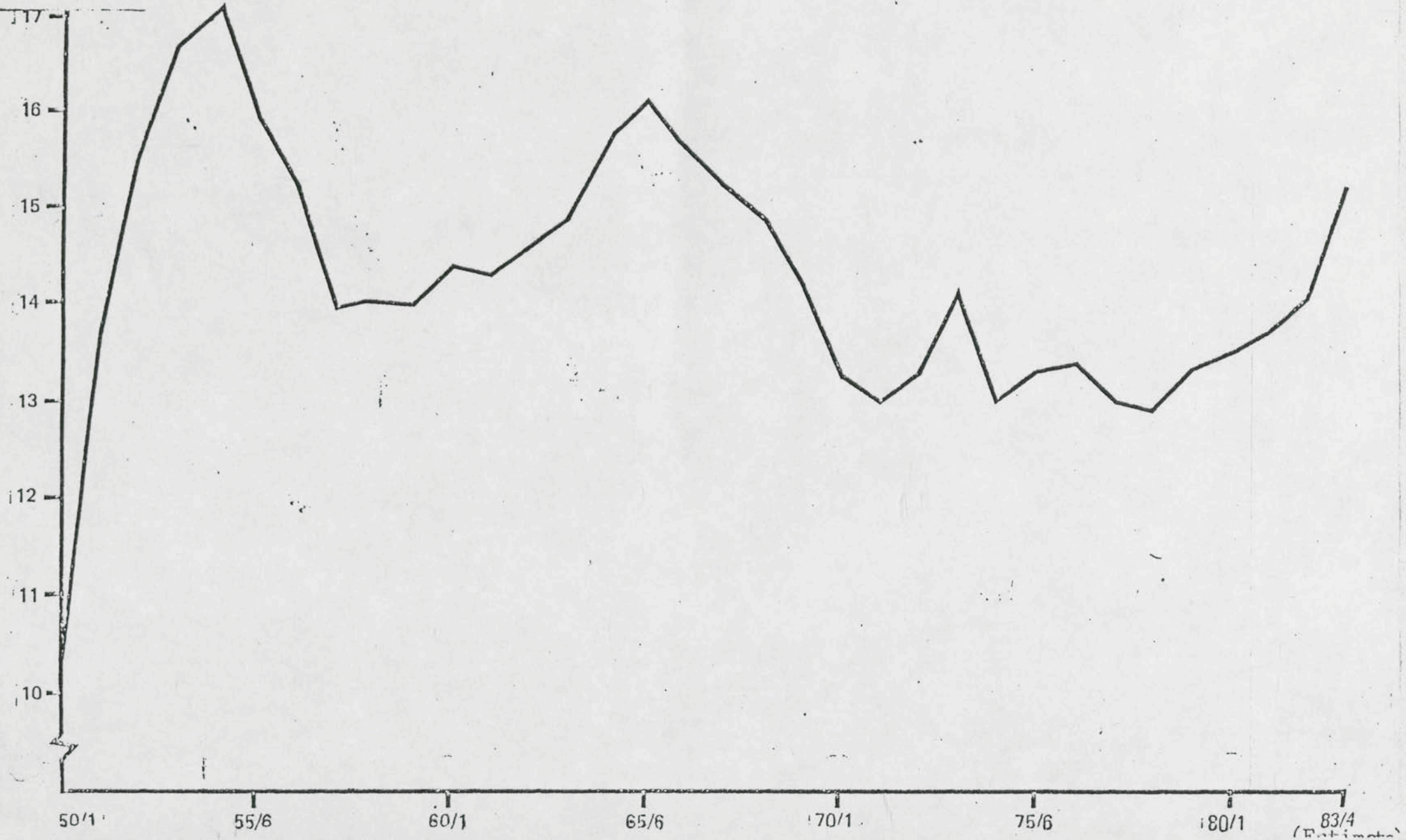
	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>
DD/FF, Cruisers, Carriers etc	4.6	2.5	1.3	1
DD/FF, Cruisers, Carriers etc (active only)	2.4	1.7	1.4	1
Submarines	3.9	3.3	1.7	1
Submarines (active only)	2.9	3.1	1.9	1
Nuclear (Fleet) Submarines	-	-	0.3	1
Bombers and Strike Attack Aircraft	1.4	2.0	0.9	1
Fighter, Ground Attack, etc	5.1	2.1	1.1	1
Tanks	1.5	1.0	1.0	1
Armoured Cars, APCs, etc ⁽¹⁾	0.6	0.5	0.6	1
Army Helicopters	-	0.2	1.2	1

(1) Increasing mechanisation of infantry battalions.

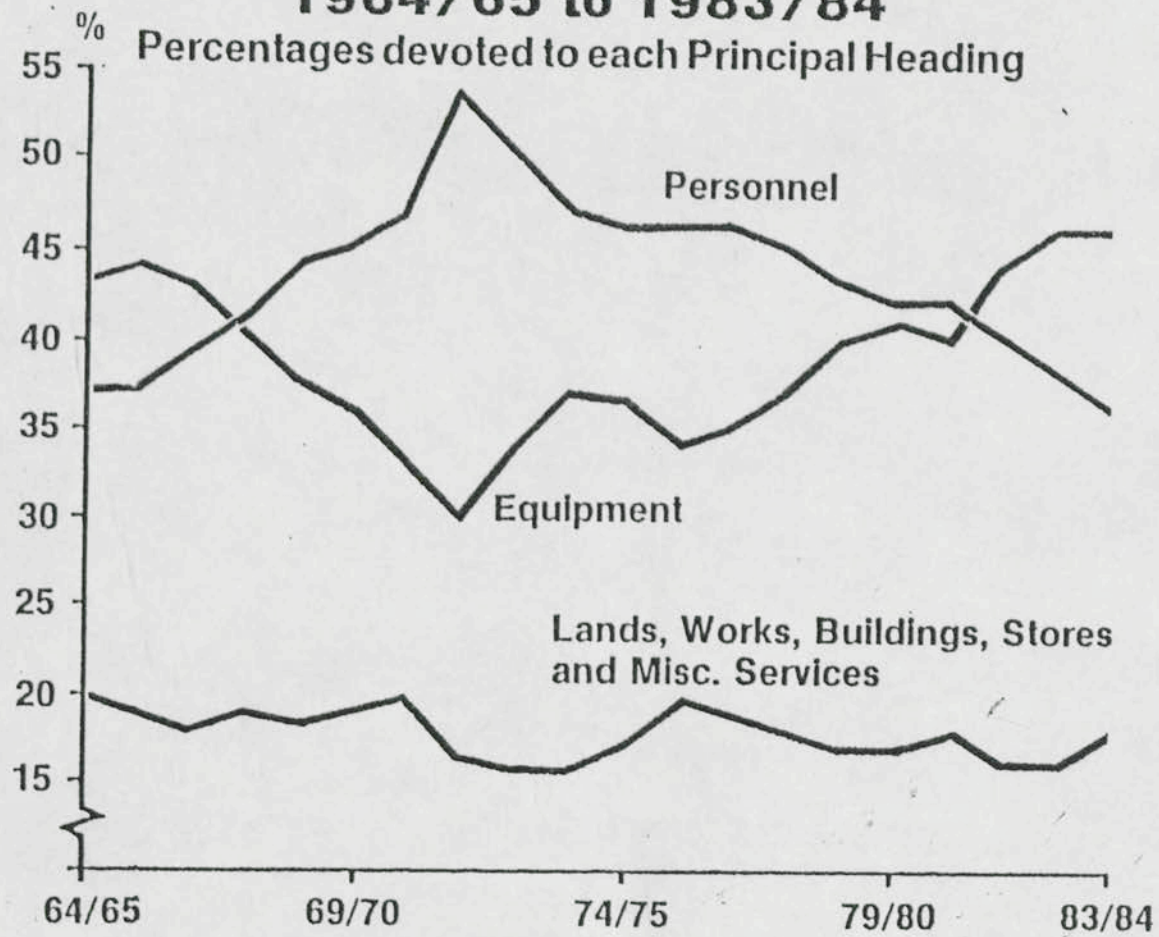
THE DEFENCE BUDGET 1950/51 to 1983/84

At LTC 1983 Prices

ANNEX D

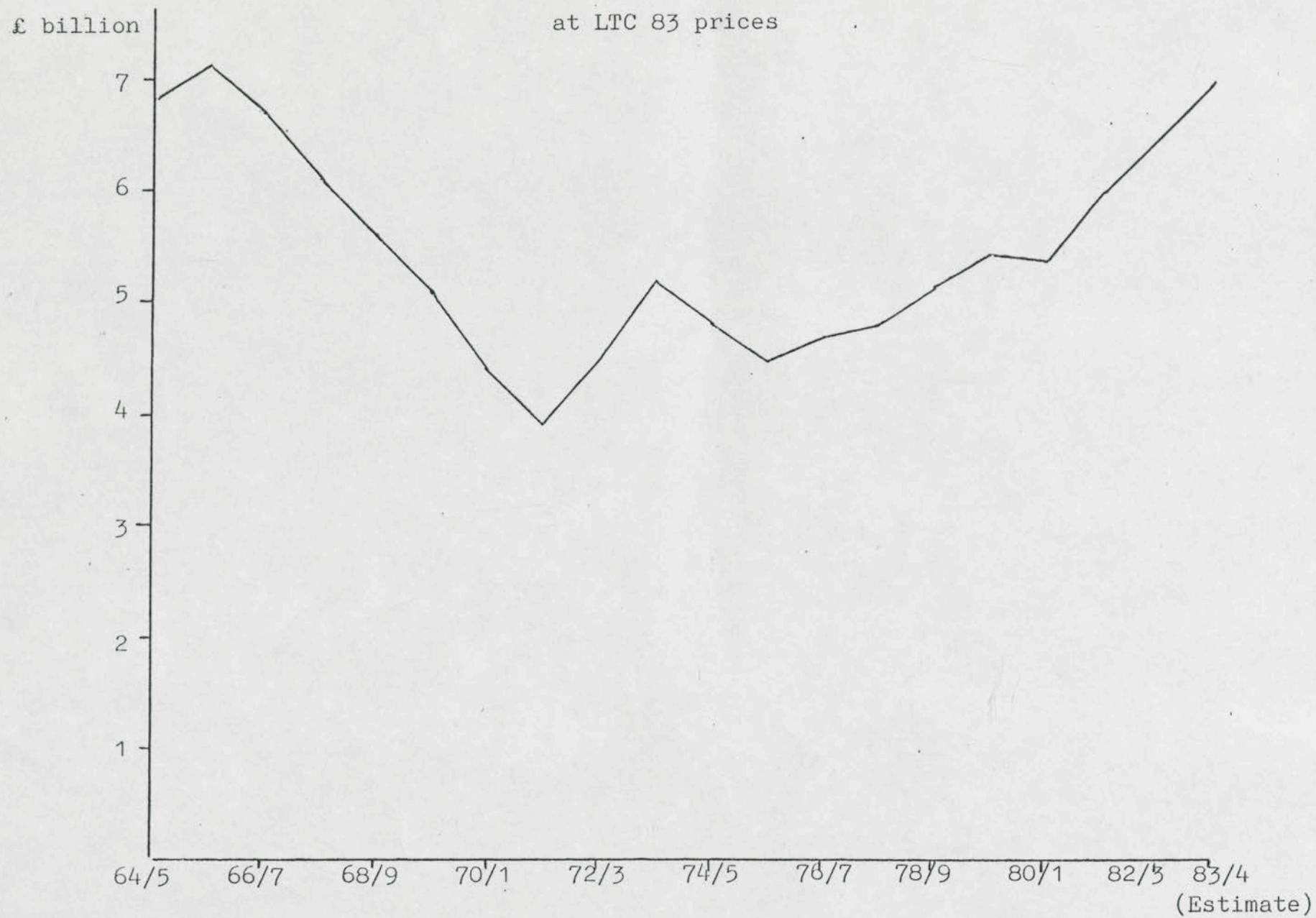


THE DEFENCE ESTIMATES 1964/65 to 1983/84

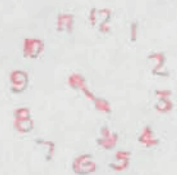


DEFENCE EQUIPMENT EXPENDITURE

at LTC 83 prices



2 - SEP 1983



CONFIDENTIAL



MR FLESHER

bc FM

10 DOWNING STREET

From the Private Secretary

5 October 1983

AJC ✓ WOL 10

Meeting arranged
for 1700 on 25/10.

The Prime Minister has seen your letter of 22 September and the accompanying paper about the rising cost of defence equipment. R

She would like to discuss with your Secretary of State how work on this matter can be carried forward. We shall arrange a meeting in due course.

A. J. COLES

N.H.R. Evans, Esq.,
Ministry of Defence.