



PRIME MINISTER

MICRO-ELECTRONICS

Your private secretary's letter of 11 June indicated that you had doubts about the widely held view that British industry is not embracing micro-electronics technology as fast as its competitors, and wondered whether we could not leave it to the improved business environment to change the situation.

This was my first inclination - both on philosophic grounds and in order the more effectively to support the Chancellor. But I have been convinced:

- a) that we are lagging badly in awareness, application and production of micro-electronics;
- b) that our competitors are ahead, in some cases far ahead, and are spending large sums of public money accelerating their progress; and
- c) that the technology is so imminently pervasive that we should not risk our industries being destroyed by too leisurely an adaptation - despite the unfolding effects that we hope our budgetary and other measures will have - to the micro-electronic imperatives that the market will increasingly impose.

... I attach a further note setting out some of the evidence for these views.

/I ...



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The note also contains further information about the Micro-electronics Industry Support Programme. I agree with the Chief Secretary's suggestion that we should particularly support mobile international projects. But in addition, we need to encourage home companies like Ferranti and Plessey, significant for defence purposes and which have internationally reputable research and development facilities, to invest in more production facilities.

I must emphasise that our industry is not only behind but has to function without the often large support given by competitor countries: the USA via space and defence; the Japanese and our European competitors, through very substantial programmes. The support we are giving is modest by comparison though significant in our terms.

I notice that in his minute of 2 July the Chief Secretary, whilst generally supporting my proposals, expresses doubts about the possible use of public procurement. I agree that this is not easy but what I have in mind initially would not fall foul of the EEC nor would it mean additional public expenditure, since as I have indicated, I would use some of the funds already allocated to the Microprocessor Applications Project; and the objective would be to enable the public sector to operate more efficiently as the result of the expenditure.

I fully accept the Chief Secretary's suggestion that we should concentrate on projects offering really significant advantages; I shall of course keep the programme under close review and will

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be only too ready to switch off support if it appears to be no longer necessary.

I am copying this minute to the Chief Secretary, Sir John Hunt and Sir Kenneth Berrill.

KJ

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13 July 1979

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1. MICROPROCESSOR APPLICATIONS PROJECT (MAP)

1.1 The great and pervasive importance of micro-electronics technology to all aspects of industry and commerce, as well as in education communications and the home, is almost universally accepted; there is much evidence that British industry (which for understandable reasons is lagging in innovation generally) is not applying this technology as fast as its competitors, whether to products or to manufacturing and other processes. The following paragraphs summarize the evidence.

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1.1.1. A number of multi-national micro-electronic device suppliers have told DOI that they find it easier to sell their advanced circuits produced in the UK to customers in Europe and the Far East than in UK.

1.1.2. The balance of trade is deteriorating steadily in equipment and products incorporating micro-electronics - such as computer peripherals and consumer electronics. There is little or no UK supply of calculators, digital watches, audio products, electronic cash registers, robots, machines for inserting electronic components automatically, numerical control systems for machine tools, micro-computers, word processors and other electronic office equipment, and T.V. games (in the last case the first micro-electronic circuits for this burgeoning market were designed and manufactured in UK., but the market here has been so poor that design has been transferred to the US). Many of these products are totally new, and only made possible by micro-electronics.

1.1.3. Authoritative international technical consultants have reported that UK industry's presence in the market for new micro-electronic-based products is far less visible than that of competitors. UK technical consultancies in the field find themselves doing more design work for European firms than for British.

1.1.4. A standard international reference book cataloguing all micro-electronic circuits on the market has sold 20,000 copies in the US, 3000 in Japan, 2,000 in Germany, 1,500 in France - and 350 copies in the UK.

1.1.5. Another pointer is the comparative percentage of electronic component usage accounted for by integrated micro-circuits: an EEC source gives the following figures:-

USA	-	24%
Japan	-	15%
Germany	-	14%
EEC	-	13%
UK	-	9-10%

1.1.6. A DOI analysis in early 1978, based on contacts with supplier and customer industries, widespread discussion with other knowledgeable sources and information gleaned from an EEC questionnaire concluded that at that time only 5% of British firms mainly those already in high technology areas such as defence and electronics were actively applying micro-electronics, 45% were aware



but not actively pursuing applications, whilst 50% were not sufficiently aware of the technical and commercial potential of micro-electronics to be able to assess the opportunities and threats to their own business.

1.1.7. In preparing material for the "Awareness" part of MAP DOI had great difficulty in finding more than a handful of examples of successful British applications to use as case studies; a similar exercise by MIT produced a wealth of examples.

1.1.8. The application of micro-electronics in motor vehicles to engine control (with substantial fuel savings) and to driver information has made little progress in the UK compared with the US, Germany, France and Japan.

1.1.9. The UK lags behind the competition in installation of numerically controlled machine-tools and robots, as the following table of numbers installed shows:-

(1977)

	<u>N/C machine tools</u>	<u>Robots</u>
Japan	7,000	<u>20,000</u>
USA	6,400	2,800
Germany	4,000	500
France	650	200
UK	1,000	100

1.1.10. The Advisory Council for Applied Research & Development (ACARD) set up a Working Party in 1978 to study the situation; the Working Party's report, endorsed by the Council (which like the Working Party has a number of industrialist members), was published in July 1978: it quoted the DOI analysis referred to in 1.1.6. above and endorsed its conclusion that the UK is lagging behind its competitors. Though both the DOI analysis and the ACARD report have been public for over a year, and there has been widespread discussion of the subject in the media, the general conclusion has not been challenged.

1.2.1. At the same time as the range and scale of applications is expanding the technology continues to advance opening up totally new applications and markets. Firms (particularly in the US) which have adopted the new technology are now developing the second or even third generation of new products. Typically the lead time for a first application is 2-3 years, but this shortens with experience. Firms which do not start to apply micro-electronics technology in the near future therefore are likely to find themselves up against competitors whose second or third generation micro-electronics-based product is substantially better and cheaper, or whose greater experience of micro-based manufacturing methods enables them to achieve higher quality output more efficiently and more economically. It may well be too late for the laggard firm to retrieve its competitive position which is liable to deteriorate ever more rapidly.



1.2.2. The MAP is a "crash" programme intended to prevent this happening; time is not on our side. There is a real danger that by the time the Government's new macro-economic policies succeed in transforming the risk/reward relationship and changing industry's attitude to innovation, the international competitive position of British industry may have deteriorated irretrievably.

1.2.3. It is for this reason that the next couple of years are considered critical and it is on this period that the MAP is focussed. Awareness is improving; training facilities are being expanded; but direct project support to encourage companies by means of 25% grants to press ahead with specific applications of micro-electronics to their products or their processes is also an essential element. It is intended to cover some 1,000 - 1,500 projects strategically disposed throughout industry: anything on a significantly smaller scale would be unlikely to have the necessary seminal effect.

2. MICRO-ELECTRONICS INDUSTRY SUPPORT PROGRAMME (MISP)

2.1 MISP complements MAP. It is intended to ensure that:

- (a) UK users of integrated micro-electronic circuits have ready and secure access to the latest technology and design and manufacturing capability for the devices they need;
- (b) the UK obtains a reasonable share of the rapidly growing market in Europe and elsewhere for these devices.

2.2. To achieve this, together with an appropriate capability in infrastructure (special plant and materials) and certain associated discrete (as opposed to integrated) circuits, DOI with the Sector Working Party estimated would require investment of some £240M, and that some £70M of Government support would be needed to achieve this: much of the support is destined for internationally mobile projects by international companies, and MISP support has already been successful in getting a number of important projects located here. Without such support much of this investment would certainly be attracted to countries other than the UK whose Governments are offering similar support with the same objective: the great bulk of the £13M so far committed under MISP is for such internationally mobile projects.

2.3 The £70M referred to above is not wholly "additional" expenditure; as much as possible of the investment will be steered to Assisted Areas and therefore much of the support is likely to be provided as normal regional assistance under S.7 of the Industry Act and fall within that category of public expenditure. £8.8M of the £13M already committed falls in this category.