6 Conclusions

The merger situations

6.1. Under the terms of reference (made under sections 69(2) and 75 of the Fair Trading Act 1973`the Act') dated 11 January 1989 (see Appendix 1.1) we are required to investigate and report whether arrangements are in progress or in contemplation which, if carried into effect, would result in the creation of merger situations qualifying for investigation in that:

(a) enterprises carried on by or under the control of The Plessey Company plc (incorporated in the United Kingdom) (Plessey) will cease to be distinct from enterprises carried on by or under the control of The General Electric Company, plc (GEC), which we refer to below as `the GEC merger situation'; and

(b) enterprises carried on by or under the control of Plessey will cease to be distinct from enterprises carried on by or under the control of Siemens AG (incorporated in the Federal Republic of Germany) (Siemens), which we refer to below as `the Siemens merger situation'.

For this purpose, the terms of reference allow us to consider either the test in paragraph (b) (`the assets test') of section 64(1) of the Act, or the test in paragraph (a) of that section (the `market share test'), but require us to exclude one of these tests if we find the other to be satisfied.

6.2. As is apparent from Table 11 of Appendix 2.1, the value of the assets to be taken over (ie those of Plessey) exceeds £30 million, and the test in section 64(1)(b) of the Act is thus satisfied.

6.3. As we explained in paragraph 2.66, GEC and Siemens created jointly a company named GEC Siemens plc (the joint company) in which each holds a 50 per cent equal shareholding. On 16 November 1988 the joint company announced its intention of making an offer for Plessey and it did so on 23 December 1988. On the making of the reference the offer necessarily lapsed, but GEC and Siemens have confirmed to us that the joint company still intends to acquire Plessey.

6.4. In determining whether, if carried into effect, this would result in the creation of merger situations qualifying for investigation, we have-bearing in mind section 75(2) of the Act-considered the provisions of sections 64 and 65 of the Act and, in particular, of sub- section (3) of section 65. This provides that a person or group of persons able, directly or indirectly, to control or materially to influence the policy of a body corporate, or the policy of any person in carrying on an enterprise, but without having a controlling interest in that body corporate or in that enterprise, may be treated as having control of it.

6.5. Hence companies may cease to be distinct, and a merger situation qualifying for investigation would arise, if a person or group of persons becomes able, directly or indirectly, to control or materially to influence the policy of a body corporate. Since both GEC and Siemens would have a 50 per cent share of the joint company, it appears to us that neither GEC nor Siemens would have control or a controlling interest in that joint company, but each would have a material influence over that company; in turn that company would have control of Plessey.

6.6. We therefore conclude that there are arrangements in contemplation by which enterprises carried on by or under the control of Plessey would cease to be distinct from enterprises carried on by or under the control of GEC and of Siemens. These arrangements, therefore, if carried into effect

will result in the creation of two merger situations qualifying for investigation, that is to say, the GEC merger situation and the Siemens merger situation.

6.7. We have therefore to investigate and report on whether the creation of the GEC and of the Siemens merger situations operates or may be expected to operate against the public interest.

The companies involved

6.8. GEC is the largest electronics company in the United Kingdom, and Plessey is also among the leading United Kingdom electronics manufacturers. The two companies are particularly important as suppliers of defence electronics, and, through the jointly-owned GEC Plessey Telecommunications Holdings Ltd (GPT), together supply a substantial proportion of telecommunications equipment in the United Kingdom, including 90 per cent of digital public switching equipment. Whereas Plessey's activities remain concentrated on defence, telecommunications and electronics (mainly components), GEC is more diversified, its activities also including power systems, consumer goods, office equipment, medical equipment, transportation equipment and industrial apparatus. GEC's sales were some £5.6 billion in 1987/88, and it currently employs 147,000 people world-wide, including 105,000 in the United Kingdom. Plessey's sales were some £1.3 billion in 1987/88, and it currently employs 23,355 people world-wide, of whom 14,725 work in the United Kingdom. In addition, GPT, jointly owned by GEC and Plessey, employs some 24,900 people world-wide.

6.9. Siemens is the third largest company in West Germany. Its activities include automation equipment and systems, power systems, telecommunications and information systems, medical equipment, and electrical and electronic equipment, including components and defence equipment. Siemens' sales were some DM 59 billion (about £18.5 billion)[1] in 1987/88 and it employs some 353,000 people world-wide, including 223,000 in West Germany and 2,500 in the United Kingdom.

6.10. Research and development is important to all three companies. GEC spent some £670 million on R & D in 1987/88 (about 12 per cent of turnover), Plessey £291 million (22 per cent of turnover), and Siemens DM 6,480 million (about £2,025 million[1]) -11 per cent of turnover. Variations in R & D expenditure as a proportion of turnover partly reflect differences in the range of activities carried out. The majority of GEC and Plessey R & D expenditure was customer-funded; as much as 96 per cent of Siemens expenditure was funded from its own resources. Differences in the funding of R & D are partly accounted for by the smaller proportion of defence sales in Siemens' turnover, and the different policies formerly adopted by the telecommunications authorities.

The proposals

6.11. At the time of the reference to the Commission, GEC and Siemens proposed, if permitted to acquire Plessey, to make the following structural arrangements (which we refer to as the original proposals) for the conduct of its business (as summarised in Appendix 2.3(a)):

(a) joint ownership, in equal proportions, of Plessey's *defence businesses* other than in the United States and Canada (where they would be owned 51 per cent by GEC). The Plessey businesses would operate as a free-standing entity constituting a separate source of supply to the Ministry of Defence (MOD) with tendering and marketing activities insulated from influence or control by GEC or Siemens;

[1] At DM 3.2 = £1.

(b) GPT to be owned 60 per cent by GEC, 40 per cent by Siemens, and to be operated under GEC management;

(c) joint ownership, in equal proportions, of *Plessey's component business*, under Siemens' management responsibility; and

(d) joint ownership of *other activities of Plessey, including Plessey's traffic control equipment business*.

It was also intended that GEC would acquire a 50 per cent shareholding in Siemens' defence electronics business.

6.12. Subsequent to the reference, on 6 February 1989 GEC and Siemens announced modifications of these arrangements (which are summarised in Appendix 2.3(b)) which received wide publicity. These are subsequently referred to for convenience as the revised proposals:

(a) *Plessey Naval Systems and Plessey Avionics* would be wholly owned by GEC;

(b) *Plessey Radar and Plessey Defence Systems* would be wholly owned by Siemens, except for the United Kingdom *cryptography* operations which would be transferred to GEC. The businesses to be wholly owned by Siemens would be entirely independent of those wholly owned by GEC (although they may have links on a commercial basis);

(c) GEC would be entitled, subject to consultation with the United Kingdom and West German Ministries of Defence and to the requisite regulatory approvals, to acquire an equity participation of up to 35 per cent of *Siemens' defence electronics* businesses, as expanded by the acquisition of those businesses acquired from Plessey (and therefore relevant to our inquiry);

(d) of the *North American defence businesses*, Sippican and Leigh Instruments would be wholly owned by GEC; Plessey Electronics Systems Corporation (PESC) would be owned 75 per cent by GEC, 25 per cent by Siemens and be managed by GEC;

(e) as in the original proposals, GPT would be owned 60 per cent by GEC, 40 per cent by Siemens and under GEC management and there would be equal ownership of Plessey's *electronic components* business, under Siemens' management responsibility;

(f) Plessey's *traffic control equipment* business would be wholly owned by Siemens; and

(g) the remaining activities of Plessey (including the *research facilities* of Caswell and Roke Manor, Plessey Aerospace and Engineering, Hoskyns and some telecommunications activities) would fall within a separate Plessey company to be jointly owned and controlled.

GEC and Siemens confirmed that there was no intention to revive or reintroduce the original proposals for the structural arrangements summarised in paragraph 6.11 and that any renewed offer would be on the basis of the revised proposals.

6.13. We have to consider whether either, or both, of the two merger situations operate or may be expected to operate against the public interest. In so doing it is relevant to take into account proposals put forward by GEC and Siemens as to the future structure of Plessey, were the joint company to acquire it. As described in paragraph 6.12, the companies' intentions altered after the reference was made, from those expressed in the original proposals to those in the revised proposals. GEC and Siemens suggested that our consideration should concentrate on the revised proposals. We recognise that, as the development of the original proposals into the revised proposals demonstrates, no set of proposals as such is, nor can be expected to be, binding on the parties or on the joint company. Circumstances may change and plans may not be (and might in the event not be able to be) implemented as had originally been intended. Moreover, it is right that in any merger investigation under section 75 of the Act, we should take account of developments occurring during the course of the inquiry, including those in the parties' own proposals. In considering the merger situations as a

whole, when proposals fall to be considered, we have therefore concentrated on the revised rather than upon the original proposals. Quite apart from the original and the revised proposals, we are conscious that the two merger situations comprised in our terms of reference could in theory result in a large number of alternative arrangements. We have not attempted to investigate all hypothetical arrangements which are not in the contemplation of the parties, nor would it have been practical to do so.

The Commission's 1986 report

6.14. In 1986 the Commission reported on a bid by GEC for Plessey.[1] Some of the issues examined then are similar to those raised in the current inquiry, but the structure of the present proposals differs significantly from that of the previous bid. It was concluded at that time that the merger then contemplated may have been expected to operate against the public interest, by reason of its effects on the supply of telecommunications transmission equipment, private automatic branch exchange (PABX) equipment, and traffic control equipment, and the more serious adverse effects on defence electronics equipment where it was believed that the loss of competition would be likely to increase the costs of the MOD and reduce the possibility of technical innovative choice. The report also identified the potential loss of competitive R & D that may have resulted if the two R & D research organisations were combined. We recommended that the merger should not be allowed to proceed, and this recommendation was accepted by the Secretary of State. However, the report acknowledged the potential benefits from merging the public switching activities of GEC and Plessey. Subsequently the two companies were permitted to combine their telecommunications activities in GPT, jointly owned and with equal shareholding. The issues as regards telecommunications are therefore quite different in the current reference.

6.15. The involvement of Siemens, and the proposal to restructure the defence activities of Plessey, also present a radically different proposition from that which we addressed in our previous report, and raise a number of different issues with respect to the effect on defence electronics. There has also been a change in the economic environment of the United Kingdom since 1986, with greater emphasis on the development of a more open European market, and on international collaboration in defence. Our previous report still, however, provides a useful background to the current inquiry.

6.16. In considering the present merger situations, we discuss the implications for the effectiveness of the Plessey businesses; the effect on competition in the main markets for defence equipment, telecommunications, electronics components and traffic control equipment; and finally other effects of the merger situations.

The restructuring of the Plessey businesses

6.17. GEC and Siemens argued that the revised proposals would satisfy any concerns as to competition, and would provide significant benefits. They suggested, for example, that the revised proposals would enhance the range of defence equipment supplied by each company, would create an effective partnership between GPT and Siemens in telecommunications, and would increase the effectiveness of the Plessey businesses in electronics components.

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[1] *The General Electric Company plc and The Plessey Company plc: a report on the proposed merger*. Cmnd 9867, August 1986.

6.18. Plessey argued strongly that the revised proposals paid no regard to the linkages between the Plessey businesses: both the `vertical' integration between the production companies, its semiconductor activities and the research facilities of Caswell and Roke Manor, and the `horizontal' integration between the production companies. Plessey believed that it was unique among British companies in its degree of integration, and in this way was in a particularly strong position to take advantage of the significant growth expected in the electronics industry. It pointed to many developments that benefited from this integration (see Chapter 5). One example of vertical integration is the development of Multi-Function Electronically Scanned Adaptive Radar incorporating Plessey's gallium arsenide technology and other research at Roke Manor. Examples involving horizontal integration include the benefits derived by Plessey Naval Systems, Plessey Radar and Plessey Defence Systems from access to the centre of excellence in Man-Machine Interface located in Plessey Naval Systems, and the close working relationships between Plessey Radar, Plessey Defence Systems and Plessey Avionics which allowed them to bring together various major sub-systems in ground and air aspects of defence.

6.19. GEC and Siemens told us that the businesses they would each wholly own would have access to the R & D carried out in other parts of GEC and Siemens respectively, but would also continue to use the facilities of Caswell and Roke Manor on a commercial basis. Caswell and Roke Manor would be maintained, but would concentrate largely on pre-competitive research work, although other work could be carried out for GEC and Siemens on commercial terms. The close working relationships between Caswell and Plessey's electronics components business would also be maintained and there would be general dialogue between Caswell, Roke Manor and the research facilities of GEC and Siemens.

6.20. We do not call into question Plessey's own management approach and we acknowledge Plessey's considerable success in many of its chosen product areas. We do not, however, believe that there is evidence that GEC or Siemens would be any less capable in managing and exploiting technological development even though they may implement a somewhat different approach to integration. The two companies would have every incentive to maintain Plessey's research and semiconductor capabilities, and the links to the product divisions, and indeed collaboration between the product divisions on a commercial basis if it were useful to do so. There would also be scope to develop equally productive relationships with other parts of GEC and Siemens respectively. We do not therefore believe that the effectiveness of the various parts of Plessey would seriously suffer in the longer term if the revised proposals were implemented.

The effect on defence electronics

Procurement policy

6.21. As discussed in paragraph 3.4, GEC and Plessey continue to account for over 70 per cent of payments by the MOD to major United Kingdom electronics companies (although, as explained, this may somewhat overstate the share of the two companies in defence electronics in the United Kingdom). In the 1986 report we referred to evidence of direct competition between GEC and Plessey in radar and communications and potential competition in other areas including torpedoes and sonar; and also to the competition provided by the two companies in the choice of technological solutions and to the ability of the two companies to compete in separate international consortia. We found that potential competition from other sources was often limited: it appeared unrealistic to expect other companies to develop the range of facilities, skills and experience of Plessey and GEC, while a number of factors, including security considerations and political constraints, limited potential competition from overseas.

6.22. We have examined with the parties and with the MOD the extent to which the general situation of the defence market has changed since our previous report. Competition remains a cornerstone of the MOD's procurement policy, but in many cases it is at present still largely restricted to competition between United Kingdom suppliers. It was pointed out to us that, unlike other areas of economic activity, the supply of defence equipment is in general excluded from the application of the Treaty of Rome and legislation under it. Hence the trend towards free trade in defence equipment is likely to be slower than that for most other manufactured goods.

6.23. There has, however, been some progress towards greater involvement of overseas defence suppliers in bidding for United Kingdom defence contracts. An agreement has been reached with the French Government for wider publication of procurement opportunities and reciprocal purchasing. Similar initiatives are being pursued through the Independent European Programme Group whose objective is to make the most effective use of conventional defence resources by enhancing industrial and technological co-operation, and by creating an open European market for defence equipment. This is regarded as a step-by-step process for a number of years. There has also been an increase in international collaboration.

6.24. In certain categories of equipment, the MOD believes that it has been able to encourage greater competition from United Kingdom suppliers, or, where competition is not possible between prime contractors, to encourage competition between sub-contractors. We believe that the MOD as a monopsonist is clearly in a strong position to stimulate competition both from United Kingdom and overseas suppliers across a wide range of defence equipment.

6.25. Despite these trends some 75 per cent of total defence equipment spending goes directly to United Kingdom firms (compared with 80 per cent at the time of the previous report), 15 per cent to collaborative projects, and just under 10 per cent direct to overseas companies. The MOD told us that, although it did its utmost to encourage overseas competition, there remained security, physical and, on occasion, political constraints on so doing, and it would be a long process before the market in defence equipment became as open as in other areas. It regarded the domestic market for most categories of defence electronics equipment as substantially unchanged since 1986.

Avionics and naval systems

6.26. The proposed acquisition by GEC of the avionics and naval systems businesses of Plessey involves similar issues to those considered in our previous report: namely the effect of the merger on competition, and hence on the cost of equipment supplied and on technical innovation.

Avionics

6.27. The total market for defence avionics equipment in the United Kingdom is estimated at about £430 million per annum for the five years 1983/84 to 1987/88 (see Table 3.5). Over this period GEC's sales in the United Kingdom of avionics equipment averaged about £130 million per annum. Plessey's sales averaged about £20 million per annum although Plessey forecast considerable increase in sales in 1988/89 and later years. The two companies concentrate on different types of equipment within this overall category. GEC's sales are concentrated on aircraft defensive aids and ECM/ESM and aircraft weapons systems; Plessey's on flight data systems, and airborne communications systems.

6.28. Plessey told us that the majority of its United Kingdom avionics sales were won in competition with GEC and quoted to us a number of future projects where it believed no United Kingdom supplier other than itself or GEC would have the capability to compete. Plessey's analysis showed, however, that some two-thirds of bids since 1986 (by value) where it competed with GEC were won by other suppliers (including British Aerospace, Ferranti, Racal and Base 10).

6.29. The MOD believed that competition between GEC and Plessey had to date been relatively limited in avionics although it did expect some future competition between the companies. However, in its view there was adequate other United Kingdom competition available, and the MOD did not therefore have any overriding objection to the merger in this area.

6.30. The MOD said that it was, however, very concerned about the loss of potential competition in one particular project: the United Kingdom Joint Tactical Information Distribution System (JTIDS) programme. JTIDS is a system for transmission of voice and data between military aircraft and ground or shipborne terminals. Plessey also argued that the merger would eliminate competition in the production of JTIDS equipment for the United Kingdom.

6.31. The JTIDS system has been developed in the United States by Singer as prime contractor, with Rockwell Collins as sub-contractor. Singer has also undertaken work on the development of a United Kingdom variant. GEC (as the prime United Kingdom contractor) and Plessey as sub-contractor have been involved in the development work to adapt the system to meet United Kingdom requirements, the relationship between GEC and Plessey being on a `leader-follower' basis designed to familiarise both companies with the system. The MOD had originally intended that this arrangement would enable eventual competition between the three companies Singer, GEC and Plessey for the subsequent production and in-service support of the system, the eventual cost of which could reach some £400 million over a period of several years.

6.32. Plessey's take-over of the Electronic Systems Division of The Singer Company in 1988 (now PESC) has already reduced the scope for this competition. The MOD believes that because of the system's complexity and the possible need for further refinement when brought into service, it is advantageous for the companies involved in the development of the system to be involved in its subsequent production. The MOD is also concerned about the need for any potential competitors to acquire access to proprietary technology and obtain production licences from PESC. So far only GEC and Plessey have this access for United Kingdom production. In addition, the granting of wider access to this technology would be subject to the satisfactory meeting of security requirements.

6.33. We consider that in the current circumstances of this project a merger of GEC's and Plessey's avionics businesses would further reduce the number of established competitors for the supply of JTIDS equipment in the United Kingdom and could increase the cost of this equipment. However, we believe that the merger would have such an adverse effect primarily because of the present restrictions on access to proprietary technology and production rights. We believe that if GEC and Siemens, as owners of PESC, were required to make the necessary licences and access to the technology for production of the equipment available to other competitors specified by the MOD, the MOD would have the opportunity to stimulate alternative competition for the production of this equipment, whether from United Kingdom companies, United States contractors or European companies. Siemens, which is involved in the supply of an earlier and different version of JTIDS equipment in West Germany and in the development of a more advanced successor system called MIDS, is one possible competitor. Such an outcome is clearly less favoured by the MOD, andin view of the need for new entrants to become familiarised with the United Kingdom systemmay impose some additional cost or delay on the MOD. We believe, however, that if the necessary licences and access to technology were to be made available, this would provide the conditions in which effective competition could be developed. On the other hand, should competition in this one project fail to develop, the MOD is, we believe, in a sufficiently strong position to impose contract terms on GEC which would limit the effect of the merger on total project cost, albeit less effectively than if competition had been maintained.

Naval systems

6.34. Sales of naval systems in the United Kingdom averaged about £300 million per annum over the five years 1983/84 to 1987/88. GEC's sales in the United Kingdom of naval systems equipment over this period averaged about £190 million per annum. Plessey's sales averaged some £90 million per annum. GEC's sales are concentrated on torpedoes (£169 million per annum, virtually all United Kingdom purchases, but including a substantial element sub-contracted to other suppliers), and sonar data handling and display. The bulk of Plessey's activities are in sonar equipment (where Plessey has some 60 per cent of the market).

6.35. Although there is at present little direct competition in sonar, Plessey pointed to a recent competition for production of the Type 2075 sonar between Plessey and GEC, and other competitors,

as an example of potential competition in this area. The MOD told us that a linking between Plessey and GEC would have only a limited effect on the competitive base in the United Kingdom and indeed the two companies had collaborated in competition against other suppliers. Dowty, Ferranti and British Aerospace were all becoming increasingly active in this field and there were a number of overseas contractors who could also compete. The MOD did not therefore believe that a merger would have an adverse effect on competition in supply of sonar equipment.

6.36. The MOD was, however, concerned about the effect of a merger on competition in the production of the Spearfish torpedo. For the last ten years GEC has been the sole design authority and the sole United Kingdom prime contractor for production of torpedoes in the United Kingdom. During the course of our inquiry Plessey notified the MOD of its firm intention to compete for the prime contract for production of the Spearfish torpedo, developed by GEC. The MOD told us that only United Kingdom companies could act as prime contractor, although overseas sub-contractors could be used: it believed that Plessey, with its experience both of project management and of underwater systems, was well suited to compete for this project and therefore argued, as did Plessey, that a merger would substantially reduce competition for the contract to produce Spearfish. [

Details omitted. See note on page iv.

] The project is, however, to be spread over several years.

6.37. We believe that this exaggerates the consequences of a merger. It is uncertain how effective a competitor Plessey would be without assistance from the MOD. Plessey has not itself produced torpedoes for many years, and GEC would be at some advantage from having developed Spearfish over several years to the point of initial production. Plessey itself would use an overseas sub-contractor to supply essential systems knowledge and up to 85 to 90 per cent of the production work could be sub-contracted.

6.38. The MOD will, however, be able to encourage new competitors and is prepared to make its production drawings and equipment as well as certain production and testing facilities available for potential competitors. It is also significant that, during the course of our inquiry, competition has developed and a number of other United Kingdom companies with the capability for such a project have expressed interest in competing for the prime contractorship, and could, we believe, particularly with encouragement from the MOD, provide effective competition. In our view, the Spearfish project is an instance where the MOD could use its considerable strength to generate potential competition from a wider range of alternative suppliers than the two prime contenders which it may have considered in the past. The role of prime contractor is primarily one of assembly and systems integration and testing, in which production line management is a key factor, albeit of a highly sophisticated piece of equipment; Plessey may be well suited to compete for Spearfish, but the merger may itself stimulate other firms with relevant capabilities to enter the competition, possibly in collaboration with overseas suppliers.

6.39. We do not therefore believe that with other suppliers in the field a merger of the GEC and Plessey naval businesses would be likely to have a serious adverse effect on competition for production of Spearfish. Furthermore, although this outcome may be somewhat less favourable to the MOD than to maintain competition between prime contractors, should alternative competition fail to develop, the MOD as sole purchaser of this and other defence electronics equipment in the United Kingdom is well able to impose effective competition between the sub-contractors on this programme who will account for up to 85 to 90 per cent of production work, to ensure that the benefits of competition between sub-contractors are passed on to the MOD, and to control the overall costs of the project. In all these circumstances we do not believe that the effects of a merger on this particular project would be such as to operate against the public interest.

The effect on avionics and naval systems

6.40. In both avionics and naval systems, therefore, we believe that the activities of GEC and Plessey have to date been complementary rather than competitive and that there is competition from other suppliers in the United Kingdom and, in the longer term, overseas. We do not therefore believe that a merger would have a material effect on competition in supply of the bulk of avionics and naval systems equipment. In our previous report we expressed concern about other potential competition

between the two companies in sonar and torpedoes. During the current inquiry the MOD has been less concerned as to the effects of a merger in sonar equipment, but has expressed concern about the effect on competition in two specific projects: the JTIDS avionics programme and the Spearfish torpedo programme. We do not believe that the merger would be detrimental to the public interest in relation to the Spearfish torpedo programme. Although we do, in the current circumstances of the project, believe that the merger may be expected to operate against the public interest in relation to the JTIDS programme, we believe that these adverse effects can be remedied if the merger proceeds.

Radar and military communications systems

6.41. Under the revised proposals, the Plessey radar and military communications activities would be owned by Siemens. As part of these arrangements GEC would be entitled to acquire a shareholding of up to 35 per cent in Siemens' defence activities. We have to consider the supply of this equipment in the United Kingdom, and the implication of both merger situations as a whole.

Radar

6.42. The market for radar equipment in the United Kingdom is estimated at about £330 million per annum over the last five years. Over this period GEC's sales of radar equipment averaged about £190 million. Plessey's sales averaged about £50 million. Siemens does not sell radar equipment in the United Kingdom; its product range moreover tends to be complementary to that of Plessey.

6.43. To an extent GEC and Plessey specialise in different types of radarthe bulk of GEC's sales are of naval tracking radar and airborne radar which are not supplied by Plessey. Several categories of equipment are, however, supplied by both companies, and our previous report referred to both actual and potential competition in a number of areas of radar equipment (for example, Plessey's success in gaining orders for its 996 naval radar). Plessey and GEC are at present involved in the development of alternative multinational approaches to multifunction radar.

6.44. The MOD told us that it expected the two companies to compete in certain radar markets, that alternative competition for radars was limited, and hence that it would view with extreme concern any erosion of the competitive base that any merger between GEC and Plessey would cause.

Military communications systems

6.45. Sales of military communications equipment in the United Kingdom are estimated at about £300 million per annum over the last five years. GEC's sales of military communications equipment averaged some £65 million over the period, Plessey's some £150 million. Together the two companies now account for some 60 per cent of United Kingdom sales. About two-thirds of Plessey sales in this category were of army strategic radio, notably Ptarmigan equipment, of which GEC sales were only limited; but there are several categories of equipment provided by both companies. Siemens has no sales of this equipment in the United Kingdom.

6.46. The previous report referred to several examples of competition between GEC and Plessey in radio and communications equipment, for example Plessey's success in winning the contract for the Oakhanger communications station. The MOD expects future competition in, for example, Bowmana new system of combat net radio to be introduced in the mid-1990s at a cost of over £1 billion; further development and production of Ptarmigan equipment; and satellite communications systems. Alternative competition is regarded as limited; and the MOD therefore objects strongly to any merger of Plessey and GEC interests in this area.

The effect of the GEC merger situation

6.47. The evidence we have received during the current inquiry suggests that the United Kingdom markets for both radar and defence systems are largely unchanged from the time of our previous report. Our previous report referred to direct competition between GEC and Plessey in both radar and defence equipment; and although there has been relatively little new direct competition between the two companies in the short period since that report, the two companies are expected to compete in a number of substantial projects in the future, including projects in which they are separately involved in the exploration of competing technological alternatives. In both areas, potential competition from other suppliers is at present regarded as limited. We therefore conclude that the acquisition by GEC of such material influence over the ongoing Plessey activities in this area, or any weakening of the effectiveness of the Plessey businesses, may be expected to reduce competition, and thereby to increase the cost of equipment, and reduce the possibility of choice in technical innovation. Leaving aside GEC's proposed acquisition of a shareholding of up to 35 per cent in Siemens' defence activities, the implementation of the revised proposals would exclude this material influence.

6.48. The revised proposals would include the right for GEC to acquire a shareholding of up to 35 per cent in Siemens' defence activities, including those acquired from Plessey, but subject to agreement with the United Kingdom and West German defence agencies and regulatory authorities. Such a shareholding would in principle give GEC the ability to block important decisions, although this could no doubt be modified or avoided by agreement between GEC and Siemens. GEC confirmed, however, that it would intend to use a shareholding of such a size to take an active interest in Siemens' defence business (although not necessarily to participate in day-to-day management or control), rather than as a passive investment. We consider that the holding would give it the ability materially to influence policy. GEC told us that this would be a further step in cementing a relationship with an appropriate European dimension, and would assist in further collaboration between itself and Siemens. The Department of Trade and Industry (DTI) also regarded pan-European co-operation, as in joint ownership, as a natural response to the removal of barriers to trade within Europe. The MOD, on the other hand, argued that the acquisition of such a shareholding and the influence it would bring would reduce competition in the supply of radar and military communications systems and we accept this. If, however, our recommendation in paragraph 6.85 is accepted, no such shareholding could be acquired without the approval of the regulatory authorities at least in the United Kingdom, who would be able to weigh up at that time the balance between any detriments to competition and any countervailing benefits that the shareholding would bring.

The effect of the Siemens merger situation

6.49. Siemens' involvement in the supply of radar and military communications equipment in the United Kingdom is very limited; and the acquisition by Siemens of Plessey Radar and Plessey Defence Systems would therefore be expected to maintain competition. The Siemens merger situation does, however, raise issues of United Kingdom national security.

National security

6.50. Plessey told us that a significant proportion of the activities of Plessey Defence Systems and Plessey Radar involves highly classified work with implications for national security. Plessey argued that, given the restriction on access to classified material, the effectiveness and competitiveness of these Plessey businesses would suffer if they were foreign owned. It suggested, for example, that it would be difficult to compete for projects with a highly classified element; and also that the need to restrict access to classified material would jeopardise the efficient management and planning of the business and the awareness of customer requirements.

6.51. We were told by Government departments that the cryptographic activities of Plessey in particular were vital to national security. Cryptography, although a small market with sales of less than £20 million in the United Kingdom, is essential to secure communications. Subsidiaries of both GEC and Plessey develop and produce cryptographic equipment, and other subsidiaries design and fabricate the components of cryptographic equipment (see Appendix 4.1). The Government

departments which are customers for these products told us that, for reasons of national security, it was essential that an industrial capability to design, develop and produce cryptographic components and equipment should continue to be vested in a firm or firms based in the United Kingdom, and under United Kingdom ownership and management. Under the revised proposals, Plessey Crypto would be owned and operated by GEC; but we were told that further safeguards would be necessary, in respect of other cryptographic activities of Plessey subsidiaries.

6.52. The MOD also confirmed to us the importance of national security considerations in the supply of other defence electronics equipment in the United Kingdom. However (subject to a few specific exceptions which required similar safeguards to cryptography), these considerations were generally not such as to require United Kingdom ownership of the facilities. The MOD had regularly dealt with United Kingdom subsidiaries of foreign-owned companies and would have no difficulty in purchasing from Plessey after the acquisition by Siemens, as long as standard procedures were implemented; for example, that access to more sensitive information was restricted. Both the MOD and Siemens were confident that such procedures could be implemented without difficulty, and without any risk to the effectiveness of the businesses acquired from Plessey.

6.53. Unless agreement on the security procedures to be adopted is reached, the Siemens merger situation may be expected to conflict with United Kingdom national security requirements, and thus reduce the competitiveness of the Plessey activities acquired by Siemens. The revised proposals go a considerable way to meeting these concerns, but further safeguards are necessary. GEC and Siemens told us that they would take such steps as may be necessary to remedy any adverse effect of the merger situations on national security.

Research and development in defence electronics

6.54. We also considered whether competition between the Plessey radar and communications businesses acquired by Siemens and those of GEC would be inhibited by the joint ownership by Siemens and GEC of Plessey R & D facilities and its semiconductor activities. In some product areas Plessey relies heavily on the links between its production companies and its R & D facilities. More generally, it was put to us that maintaining and promoting competition in R & D was essential to maintaining competition in the supply of the final products. It was argued that competition, particularly in defence electronics, depended on companies being able to offer different technical solutions to problems and that the revised proposals would lead to collaboration on R & D which would seriously weaken that form of competition.

6.55. We recognise the importance of R & D as a driving force in the markets we have considered. We would be concerned if we thought that any of the operating companies would have less ready access to R & D facilities than exists at present. We do not, however, consider that they would be disadvantaged. We believe that the Plessey businesses acquired by Siemens would be able to maintain the links with the Plessey R & D facilities and with the semiconductor business. Where the success of a Siemens-owned business in competing in defence electronics depended on these links we consider that it would be in Siemens' interests to ensure that joint ownership of certain facilities did not stand in the way of that success and that access to R & D was maintained. Furthermore if Siemens' interests were put at risk it would have access to its own extensive R & D facilities which would enable it to compete effectively.

6.56. In our earlier report we concluded that the previous bid by GEC for Plessey would put at risk the development of competing technological solutions. The present proposals would (subject to the considerations discussed in paragraphs 6.48 and 6.53 above) maintain competition in the development of radar and communications systems; and in general we believe that adequate competition to secure alternative technical development is available in the supply of naval and avionics systems.

6.57. A further concern in our earlier report was that the merger then proposed would reduce the number of potential British participants in international consortia. In the current merger the Siemens acquisition of the Plessey radar and communications businesses would maintain an alternative participant to GEC in collaborative projects in these areas; and other United Kingdom firms are available for collaboration on the bulk of avionics and naval projects.

Other markets affected by the merger

Telecommunications

6.58. The United Kingdom telecommunications market is estimated at some £1,600 million per annum, the largest element of which is public switching equipment, over £500 million per annum. As discussed in paragraph 6.8, the telecommunications activities of GEC and Plessey were recently combined to form GPT. Under the proposals GPT would be owned 60 per cent by GEC, 40 per cent by Siemens, and be managed by GEC, but with a requirement for agreement on major decisions. GPT supplies about 65 per cent of public switching equipment in the United Kingdom, but about 90 per cent of digital (Systems X and System Y) equipment supplied to BT. Siemens does not supply public switching equipment in the United Kingdom, but it is among the largest world suppliers of public switching equipment, and its EWSD system is installed, or ordered for installation, in 33 countries throughout the world.

6.59. A merger would not therefore directly affect competition in the supply of public switching equipment in the United Kingdom. BT argued to us, however, that the proposals could adversely affect the United Kingdom public interest, since the acquisition of such a shareholding by Siemens in GPT could preclude collaborative arrangements with North American public switch manufacturers which BT regards as preferable in order to obtain access to North American technology. BT was also concerned that GPT and Siemens would rationalise their product range, with emphasis on the Siemens EWSD switch rather than System X. It also felt that there would be insufficient investment in the further development of System X, and that the price of public switching equipment could be increased as a result of the merger.

6.60. BT is clearly right to be concerned on this issue; given its commitment to System X, the present proposals are likely to have a major influence on the future development of public switching equipment to be used in the United Kingdom. However, we find it difficult to accept BT's argument that the position of BT or its subscribers would be worsened by a merger. Collaboration with Siemens, as the Director General of Telecommunications also acknowledged, would offer GPT advantages, given Siemens' success in telecommunications and its wide product range and experience. Information provided to us by Siemens suggests that its technology is comparable with that of North American manufacturers. More relevantly, however, we do not believe that we can assume that, in the absence of a merger, any preferable means of collaboration would be implemented. It is uncertain whether, should the present proposals not be implemented, GEC and Plessey would embark on the particular course preferred by BT; the availability of other parties in collaboration is also far from guaranteed. As the major customer of GPT, with some albeit limited scope to introduce alternative systems into the United Kingdom market, we also believe that BT would still be in a strong position to influence GPT even if the present proposals are implemented, particularly having regard to the assurances given to BT by GEC and Siemens.

6.61. Siemens supplies private exchange equipment (PABX) in the United Kingdom, a market of over £150 million per annum. Following the merger of the telecommunications interests of GEC and Plessey, GPT accounts for some 56 per cent of PABX equipment supplied in the United Kingdom, Siemens for about 5 per cent but with a larger share of medium capacity PABX equipment. Competition from other suppliers is growing in a market that is becoming increasingly open and competitive. We do not believe, given the relatively small increase in market share, that GPT or Siemens would, as a result of the merger, be in any stronger position to increase prices, or reduce the reliability of the systems or services provided, without suffering a significant loss of market share. We therefore conclude that the merger situation will not adversely affect the United Kingdom telecommunications market.

Electronics components

6.62. Plessey is a supplier of certain electronics components in the United Kingdom; in three sectors, integrated circuits (ICs), microwave components, and surface acoustic wave devices, GEC or Siemens also supply the United Kingdom market. Under the merger proposals, GEC and Siemens would jointly own the Plessey components business.

Integrated circuits

6.63. The United Kingdom market for ICs is estimated at nearly £700 million per annum; the world market at about £24 billion per annum. As discussed in Chapter 3, the bulk of the market in the United Kingdom as elsewhere is in `commodity' ICs, produced in volume. Taking ICs as a whole, the combined share of GEC, Siemens and Plessey in the United Kingdom is less than 10 per cent. The market is highly competitive, with competition from major world suppliers.

6.64. GEC, Siemens and Plessey have pursued highly divergent strategies in developing facilities for integrated circuits. GEC manufactures ICs primarily to meet the requirements of systems manufactured by GEC companies, such as systems for space, defence and telecommunications. Siemens is the leading producer of ICs in Europe. It has recently invested with Philips £700 million in what they term the `Megaproject' for development of 1 megabit and 4 megabit DRAM ICs in which Siemens believes it is now competitive with Japanese producers of standard ICs. Siemens also supplies Application Specific Integrated Circuits (ASICs) in the United Kingdom but not in any volume. Plessey has developed facilities for production of ASICs, both for use within Plessey, and for supply to other companies. These different strategies reflect divergent views about the development of the IC market. Plessey believes it can continue to be successful by specialising in ASICs which, in its view, may eventually grow to 50 per cent of total IC sales, and that its involvement in development and manufacturing of ASICs will be to its benefit in the development and production of electronics systems. Siemens has argued that investment in standard ICs is necessary to succeed in the longer term but it too is a leading producer of ASICs as well as standard ICs. GEC is prepared to rely on other suppliers for a significantly larger range of its component business than is Plessey.

6.65. The United Kingdom market for ASICs is estimated at some £150 million per annum, of which Plessey and Siemens account for 23 per cent and under 5 per cent respectively. The merger would therefore have little direct effect on competition in this market in the United Kingdom. Although the two companies are the leading European-owned companies in the particular area of silicon bi-polar technology, we believe there is considerable actual and potential competition from many other world producers.

6.66. Concern was expressed about the effect on Plessey's customers of any dislocation of supply of ASICs if, for example, the Plessey facilities were to be absorbed into those of Siemens in Germany. A close working relationship is important to the design, marketing and use of ASICs. For this reason alone, but given also the potential competition from other world suppliers, we believe it would be in the interests of both Siemens and GEC to maintain their present customer base. We therefore conclude that, on all counts, a merger will still leave customers with effective competition for the supply of integrated circuits; we discuss other aspects of the merger in this area in paragraph 6.81.

Other electronics components

6.67. The market for microwave components in the United Kingdom is estimated at about £100 million. GEC and Plessey have a share of some 15 per cent of microwave components sold in the United Kingdom and there are many other competitors in the market. The merger would therefore have little effect on the competition in this market.

6.68. The United Kingdom market for Surface Acoustic Wave devices is estimated at less than £10 million per annum. Plessey and Siemens have a combined share of some 34 per cent of the

market for Surface Acoustic Wave devices, but to an extent specialise in different product areas. Given the number of other competitors in the United Kingdom market, including Sanyo and Toshiba, we do not believe that the merger would significantly reduce competition.

Traffic control equipment

6.69 Sales of traffic control equipment in the United Kingdom are estimated at about £35 million per annum. In our previous report we concluded that a merger of the traffic control activities of GEC and Plessey may be expected to operate against the public interest. Subsequent to that report there has been some increase in competition from other manufacturers of traffic control equipment. The two companies' combined share of this market has declined slightly, but remains at about 75 per cent. Within that total, Plessey's share of the market has increased and GEC's has decreased sharply. It was suggested that market shares in part responded to temporary changes in the quality of equipment supplied indicating the effectiveness of competition between the two main suppliers. GEC and Plessey are also in separate consortia for the development of an `Autoguide' system, a computerised traffic system for use in vehicles.

6.70. In this reference, the DTI argued that the United Kingdom market was too small to support the present number of suppliers, and indeed believed that the original proposals for a merger of GEC's and Plessey's activities would not have adverse consequences in the United Kingdom. The Department of Transport (DTp), and other organisations from which we heard, took the contrary view, and believed that any merger of the GEC and Plessey activities would reduce competition, including competition in the development of Autoguide, and would be to the detriment of some of the smaller firms in the industry.

6.71. Given the substantial market share that would result, we believe that a merger, as originally proposed, of the GEC and Plessey activities in this area may be expected to reduce competition, with further adverse effects on price and standards of service. Under the revised proposals, however, Plessey's traffic control activities would be acquired by Siemens.

6.72. While the DTp expressed concern about Siemens' already dominant position in this field in the EC, Siemens does not at present supply traffic control equipment to the United Kingdom although it is involved in the same consortium as Plessey to develop Autoguide. The acquisition by Siemens of the Plessey traffic control activity would not therefore affect the structure of the market in the United Kingdom or affect competition in the United Kingdom. Concern was expressed to us that Siemens may relocate Plessey's production in Germany, and concentrate in the United Kingdom on maintenance or installation. Siemens told us that it had no intention to do this and, given differences in technology in particular markets, it would not be in its interest to do so.

Other effects of the mergers

6.73. We considered whether the proposals could have effects relevant to the public interest besides those on competition.

6.74. GEC and Siemens are confident that the arrangements could have significant benefits on their defence businesses primarily through enhancing the range of equipment supplied, for example of radar equipment in the case of Siemens, naval systems in the case of GEC. Both companies also believe that the development of European alliances, as incorporated in the present arrangements, will assist the development of the European electronics industry and enable the participants to take advantage of the single European market. This was a view shared by the DTI.

6.75. The national officers of trade unions with members in GEC and Plessey to whom we spoke also took the view that the merger should, in the longer term, improve employment opportunities in the electronics industries in the United Kingdom. Local representatives of Plessey's employees were, understandably, extremely concerned about the effects of a merger on employment prospects in the United Kingdom as a whole and in particular locations which they feared may be put at risk.

6.76. Both GEC and Siemens told us that they had no intention of reducing employment as a result of the implementation of these proposals, and that employment prospects would be enhanced although they were not in a position to guarantee employment, given the uncertainties particularly in defence contracting. Siemens told us that it had a commitment to maintain and develop any facilities it acquires in the United Kingdom.

6.77. We take the view that the opportunities in the longer term provided by these proposals should balance out any threats to employment (see also paragraph 6.81). The association with Siemens should be of considerable benefit in exploiting the opportunities that will develop in the increasingly more competitive European market of the next decade.

6.78. We also considered a more general argument that a merger could threaten the maintenance both of electronics R & D activity and of semiconductor technology within the United Kingdom. Plessey is clearly confident that, without a merger, it could maintain its success in `niche' markets, particularly in ASICs, and believes that the preservation of this `enabling' technology is essential for any successful manufacturer of electronics systems.

6.79. As we discussed in paragraphs 6.20 and 6.55, we do not believe that the merger would put at risk the effectiveness of Plessey's R & D activities. Siemens and GEC intend to maintain these facilities. We believe that both companies recognise the importance of R & D. Siemens has shown particular commitment and success in its R & D in the semiconductor field, as indeed has Plessey. We see no reason to expect any decline in the amount or quality of R & D undertaken at the Plessey facilities as the result of a merger. The Plessey facilities may indeed benefit from the association with GEC and Siemens.

6.80. Siemens told us it believed that in order to survive in future any major electronics group must have an all-round capability in ICs, and that ASICs will eventually need to incorporate memory and processing elements, for which experience in commodity circuits will be necessary. GEC held that electronics systems manufacturers do not necessarily require their own semiconductor technology, but told us it wished to see an all-round British capability in this area, which it believed would require the amalgamation of all existing United Kingdom activities and an alliance with a major firm such as Siemens.

6.81. Plessey and its employees believe the proposals could lead to the absorption of its semiconductor facilities within Siemens in Germany. Siemens and GEC both confirmed their intention to maintain these facilities in their present location. We believe that it would be in their interests to do this, particularly given the shortage of electronics skills and the quality of the Plessey facilities. On balance we do not believe that there would be a detrimental effect in these activities, but see considerable opportunities for Plessey's semiconductor business which could result from the association with Siemens.

Conclusions and recommendations

6.82. We have considered the effects of the merger situations on defence electronics, telecommunications, electronics components, traffic control equipment and their other effects on employment and R & D. We do not believe that their effect on telecommunications, electronic components, employment or R & D may be expected to operate against the public interest but believe that the wider associations would produce benefits in these areas. The main area of concern relates to their effect on defence electronics. In the case of the GEC merger situation, as mentioned in paragraph 6.47, an unconditional merger, or indeed the original proposals in which ownership of Plessey defence activities would be equally shared between GEC and Siemens, would raise similar problems to those considered in our 1986 report. The MOD, whose direct purchases from GEC and

Plessey amount to over £1 billion per annum, would be totally opposed to any unconditional merger of their defence activities, and we accept that this may be expected to result in a loss of competition, leading to increased prices, and a reduction in technical innovation. Similar effects may be expected on traffic control equipment. The Siemens merger situation, in the absence of safeguards, may also be expected to conflict with United Kingdom national security requirements.

6.83. The revised proposals recognise these concerns and go some way to alleviating them, but in some respects do not go far enough. We believe that, in the light of our conclusions set out in paragraph 6.82, it is appropriate in the circumstances of this case that the relevant part of the revised proposals, and our further recommendations in paragraph 6.84, should be secured under the provisions of the Fair Trading Act. We therefore find that the merger situations may be expected to operate against the public interest, and to do so by reason of the following particular effects:

(a) The GEC merger situation, by which GEC would acquire material influence or control over Plessey Avionics, may be expected to have the adverse effect of reducing competition to produce JTIDS equipment for the MOD, with further adverse effects on the price of that equipment to the MOD (paragraph 6.33).

(b) The GEC merger situation, by which GEC would be in a position to acquire material influence or control over Plessey Radar and Plessey Defence Systems, may be expected to reduce competition in the supply of radar and military communications systems equipment to the MOD with adverse effects on the price and technical development of that equipment (paragraph 6.48).

(c) The Siemens merger situation, by which Siemens would acquire material influence or control over Plessey Radar and Plessey Defence Systems, may be expected to conflict with United Kingdom national security requirements, thereby also reducing competitiveness of the Plessey businesses acquired by Siemens (paragraph 6.53).

(d) The GEC merger situation, by which GEC would be in a position to acquire material influence or control over the traffic control equipment activities of Plessey, may be expected to reduce competition in the supply of that equipment in the United Kingdom, with adverse effects on the price and development of that equipment (paragraph 6.71).

6.84. We have therefore to consider what action if any should be taken to remedy or prevent these adverse effects. The merger situations we are now considering are, we believe, very different from that which we considered in 1986 when GEC alone planned to acquire the whole of Plessey. At that time, serious concerns were expressed about the effect on competition over a wide range of defence electronics equipment, and we were unable to recommend any remedy other than to prohibit the merger. By contrast, the adverse effects we have identified in the current merger situations can be remedied by the measures we recommend below, most of which correspond to the revised proposals.

6.85. We therefore recommend that:

(a) GEC and Siemens should undertake to ensure that access to the technology and the licences for production of JTIDS equipment be available on terms satisfactory to the MOD to competing companies designated by the MOD;

(b) GEC should undertake not to acquire any interest in or influence or control over the management of the Plessey Radar and Defence Systems businesses and Plessey's traffic control activities; and

(c) GEC and Siemens should agree undertakings with the Secretary of State as to the ownership and management of the defence, R & D and semiconductor activities that would satisfy United Kingdom national security requirements. Suggestions made to us by Government departments are reproduced at Appendix 6.1, together with our comments.

6.86. We therefore conclude that, while the merger situations would in the absence of appropriate undertakings produce detriments in relation to competition and national security requirements, these

adverse effects would be remedied or prevented by the actions we have recommended in paragraph 6.85.

M S LIPWORTH (Chairman)

F E BONNER

P H DEAN

P K R MANN

G C S MATHER

C A UNWIN

S N BURBRIDGE (Secretary)

10 April 1989