



Bairrigg Memorandum 36

CO-OPERATION ? AMALGAMATION ?

*Which Path to the Consolidation & Reconstruction
of the European Aerospace & Defence Industries*

Robin Ranger & Tim Ripley

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CDISS RESEARCH PROGRAMME ON EUROPEAN DEFENCE PROCUREMENT

CDISS as a Centre seeks to address a broad range of defence and security issues with a particular emphasis on those that are new and emerging. To provide a clear focus for our work as a whole we organise it in a limited number of ongoing programmes.

At a time when: in the United States a sudden halt has been called to the process of rapid consolidation of the defence and related industries into a relatively small number of relatively large companies; we in the United Kingdom are preparing to follow through the Strategic Defence Review with its emphasis on Smart Procurement; NATO is preparing to enlarge and to promulgate a new Strategic Concept; the widely proclaimed Revolution in Military Affairs has driven the harnessing of new technologies towards the top of the needs list; and the wider issues relating to “weaponry” are subject to increasing political debate, we believe that it is opportune for us to establish a programme of research and publication focused on European Defence Procurement.

The programme will be led jointly by two of our Research Fellows, namely, Humphry Crum Ewing, who will be primarily responsible for the tempo and thrust of the programme as a whole, and Robin Ranger, who will be primarily responsible for the work on the specific subjects addressed. As in the case of other programmes, important contributions will be made, we know, by other members of the Centre. We shall also be inviting contributions, in accordance with our usual practice, from other distinguished experts.

It will be axiomatic to this programme that we believe that these industries in the united Kingdom have to work in with those in other European countries (and vice versa) and that the UK and other European industries, taken together, have to work in with those of the USA (and, again, vice versa), but that arrangements must recognise the fact that there are continuing distinct national interests as well.

The present paper **Co-operation? Amalgamation? Which Path to the Consolidation & Reconstruction of the European Aerospace & Defence Industries ?** is, we hope, only the first product of that Programme. We plan that future Papers will each focus on a specific aspect of the subject area, but will also assess broad general progress in the area as a whole.

Our concern is with the security implications of the evolving process and in our work we shall therefore be aiming to respond to two reciprocal questions: What do changing procurement policies mean for industry? What do changing industrial structures mean for procurement policies?

Humphry Crum Ewing & Robin Ranger
Programme Leaders

Lancaster, July 1998

This study analyses the main developments in the European defence and aerospace industries over the past year and likely developments in the near future.

On December 9, 1997, the heads of the British, German and French governments issued a statement calling on three of Europe's major aerospace companies, British Aerospace (BAe), Daimler-Benz Aerospace (DASA) and Aerospatiale to produce plans for the consolidation of the European aerospace and defence electronics industry by March 31, 1998. During the spring of 1998 the pace of events quickened with British companies, BAe, GEC-Marconi, GKN and Alvis, buying into Swedish, Italian and American defence and aerospace companies. Germany's Krauss-Maffei also announced plans to buy a stake in Spain's state owned tank manufacturer, Santa Barbara.

In France, defence cuts announced in April 1998 will only undermine the precarious economic position of its defence and aerospace industries. Meanwhile, pressure has mounted on the French government to move away from direct state ownership and control of large sections of these industries or risk being left behind as British, German, Italian, Spanish and Swedish companies take the first steps towards meaningful industrial co-operation and consolidation.

The study is divided into five parts. Part 1 provides an overview of the European industry and the main developments in 1998, including the emergence of the proposal for a consolidated European company tentatively known as Euroco. Part 2 provides a more detailed analysis of the changing policies of the French Socialist government of Prime Minister Michel Jospin, the French industry and its role in a consolidated European industry. Part 3 examines Sweden's role in Europe's defence industry. Part 4 considers the past and future patterns of European defence co-operation and consolidation and suggests how Euroco could be created, as well as the obstacles to doing so. Part 5 examines the possible implications of European consolidation on international, particularly trans-Atlantic, industrial collaboration.

The authors focus on the political, financial, industrial and military considerations that are driving European consolidation in the aerospace and defence industries, as well as the related civil aviation and space industries. In particular, they argue that if European consolidation is to be fully effective, the French government will have to change its long-standing policy of protection for, and direction of, its aerospace industry. However, by mid-1998, the French government appeared unwilling to do so and consolidation was proceeding with very limited French participation.

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Robin Ranger & Tim Ripley

with additional contributions from Martin Edmonds,
Humphry Crum Ewing, Jordi Molas Gallart & David Bosdet

Centre for Defence and International Security
Studies, Lancaster University

Bailrigg Memorandum 36

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defence and security issues. In content, they reflect primarily
the views of their named authors.*

About the Authors

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His recent work has included the implications of jointery for defence management, the future of European defence manufacturing and the prospects for Swedish participation and collaboration. He is the author of *Defence Manufacturing Trends within Europe: Sweden's Potential for Co-Operative Development* (CDISS Bailrigg Memorandum 31).

Dr Jordi Molas Gallart is a Research Fellow at the Science Policy Research Unit (SPRU), University of Sussex. He is author of "Military Production and Innovation in Spain", published by Harwood Academic Publishers, and of more than 20 articles and book chapters on topics including the relationship between military and civilian technologies, conversion and diversification strategies, and defence industrial policy. He recently concluded a study for the European Parliament on "Dual-Use Technologies in the Context of European Security and Defence".

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Following the usual industry practice, this study uses the US dollar as its main currency with, for French companies, an exchange rate of 5.9 French francs to the US dollar. The figures for company sales and revenues are quoted from annual reports and press releases but French accounting procedures, especially in the state sector, are inconsistent in their methodology between companies. For example, these procedures have different definitions of sales, income, turnover, revenue and profit. Accordingly, this analysis follows each company's usage of the relevant terms and uses the most recent figures available, where possible, those for 1997.

EXECUTIVE SUMMARY

The message is rationalise or die. It's as blunt as that. The US has shown us the future and our industry must respond or at best stagnate. If we don't get together in Europe, US industry may eliminate all its competition. We [the British, French and German governments] have told the [European] companies: do it quickly and we will help you.

The Rt. Hon. George Robertson MP, UK Secretary of State for Defence, December 9, 1997.

The **Introduction** sets the political and international context for the subject matter of the main study, namely the push and pull between co-operation and amalgamation as the main routes towards the consolidation and reconstruction of the European aerospace and defence industries. This antithesis is illustrated in particular by the place of France and of the French Aerospace and Defence Industries in the prospective realignment of those industries in Europe as a whole. It discusses the overlapping relationship between the two industries - Aerospace and Defence. It outlines the several sources of pressure for consolidation and restructuring. These pressures include those from the businesses themselves; from their customers, the armed services and defence ministries; and from their paymasters, governments balancing off perceptions of national security needs against the commitment of taxpayers' money.

The first section of the main text, **The European Aerospace and Defence Industries in 1998**, discusses the steps taken towards the consolidation and reconstruction of those industries between the end of the Cold War in 1989-90 and the mid-summer of 1998 - the latest practicable date before publication - and it foreshadows some at least of the further likely steps in those directions. It also considers the impact of the rapid and far-reaching consolidation of these industries in the United States resulting in the creation there of three industry giants.

The second section, **The French Aerospace and Defence Industries in 1998**, addresses one of the central subjects of the paper, namely the particular importance of France to the consolidation and restructuring processes within Europe. The section assesses official attitudes there, the evolution of French positions and the likely form of the potential French contributions. The authors believe that the French reasoning, positions and potential contributions are not well understood and that the steps that France has taken are not adequately recognised. This section is therefore seen as contributing to a different and more balanced view of these aspects as well as bringing together information (as additionally tabulated in the Appendices) about existing French participation in the several types of established joint ventures.

The third section, **Sweden and the European Defence Industry**, describes and summarises one of the most important recent changes in the whole pattern of European defence manufacturing and of the European aerospace industry, namely the rapid and progressive integration of the Swedish industries, formerly largely independent, into the mainstream of European developments.

The fourth section, **Past (and Possible Future) Patterns of European Defence Co-operation**, brings together the points developed in the Introduction and the first three sections of the main text and adds to them perceived factors and influences from elsewhere in Europe. It thus seeks to formulate a reasoned picture of a future structure and role for the aerospace and defence industries of Europe as a whole and of its component nations.

The fifth and final section of the main text, **The European Aerospace and Defence Industries and International Consolidation**, completes the circle as it were by setting these processes taking place within Europe in the context of the global developments in those same industries, earlier phases of which have themselves been the main spur to the European responses and processes discussed.

Appendix I sets out in a form that is as simple as practicable information about the complex and often confusing structure of ownerships within the European aerospace and defence industries. It does so in a form which the authors have found useful in their research and analysis and which, they hope, readers will also find helpful. **Appendix II** addresses, in broadly the same manner as ownership is addressed in Appendix I, the even more complex structures of joint ventures, management companies, programmes and their multi-lingual acronyms.

The **Endnotes** cite the sources used in preparing the paper and also detail some of the arguments consideration of which might, in the course of the main text, break the thread of attention to analysis and exposition.

INTRODUCTION

This past year saw the beginnings of an extraordinary transformation of European industry. The decline in the number of vendors world-wide not only continued but in fact accelerated ... the quest for critical mass is inevitable in all businesses since achieving total customer satisfaction requires increasingly massive human, technical and financial investments and technology plays a major role.

Europe finally woke up to this fact in 1997. . . The new shape of European industry will be determined in 1998, not only for Airbus but for the entire civil and military aerospace industry.

Yves Michot, Chairman & Chief Executive Officer, Aerospatiale, May 1998¹

This study focuses on the industrial, financial, military and political considerations that are driving European restructuring and consolidation in the aerospace and defence industries, as well as the related civil aviation and space industries. In particular it focuses on the role of France in shaping the consequent processes, often positively if sometimes apparently negatively.

We need to remember that while these four industries (together with avionics and defence electronics) form, in many respects, a single largely interdependent whole, in other respects they are distinct. It is a particularly valuable quality of the paper, I believe that its authors have succeeded in tracing through both the significance of these separate threads and the essential importance of their combination. In military terms we are moving firmly into an era of combined and joint operations - inter-service and international. Hence the need that equipment of services and of allies should be interoperable and that therefore the supply and service industries should also commit themselves to working together.

The Industrial (and Financial) Pressures

I am sure that the authors are also correct to home in on the pressures for restructuring and consolidation that come from industry itself. It is only the willing acceptance on the part of industry that will give positive effect, quickly enough and constructively enough to the external pressures - military and political. More than that, it is only the evidence of well thought out and well managed restructuring by industry that will enable the ongoing businesses to raise in the market the necessary financial resources. This I believe is one of the most important but most under-recognised consequences of the consolidation process that has been going on among the prime contractors in the aerospace and defence industries in the United States. Those that have come through are characterised by the strength of their balance sheets and the strength of their cash flows. This gives them a sufficiently strong equity base to accept the long-term risks of prime contracting and also the financial foundations

on which to borrow as necessary on fine commercial terms for capital expenditure and working capital.

One of the most striking and to me admirable features of the commercial and financial management of Aerospatiale is its success in paying down over the past five years more than 94% of its funded debt as at 31 December 1992.²

Individual businesses and industry as a whole can perceive that, as the backlog of its order books are worked off and it becomes necessary to address the issues of how to keep design, development and manufacturing teams engaged then financial strength - critical mass as M. Michot correctly designates it - becomes of the first importance. The industrialist's instinctive way to this is to consolidate.

The fact that we can reasonably discuss these issues in terms of "industry as a whole" should not blind us to the fact that there are areas of fundamental disagreement between some of the essential industrial participants in any comprehensive scheme of consolidation and reconstruction as well as much in common between them. Prominent among such areas of disagreement which it may or may not prove possible to resolve are that between British Aerospace (BAe) in the persons of Sir Richard Evans (now Chairman) and John Weston (now Chief Executive) and Aerospatiale as to the implications of the French government's position as a prospectively continuing substantial shareholder in Aerospatiale.³ Similarly there are differences between the currently expressed intention of Mercedes Benz, the holding company of DASA, to retain a block shareholding and the insistence of BAe that this lump of ownership should be fragmented and distributed.⁴ Again there are differences between Alenia's vision of an all purpose aerospace/defence group and the view of other participants that a rationalisation and a reallocation of operating centres is required.⁵

The Military Pressures

The military pressures can be seen as working in two somewhat opposing directions. On the one hand, interoperability is a prime driver. This points to providing all the armed forces of all the allies with as nearly as possible the same equipment, albeit downgraded on a carefully nuanced scale from ally to ally depending on how reliable and generally acceptable each ally is perceived to be. This in turn points to a single unified Euro/Atlantic industry with the strictly European contribution declining to the point where it takes the form at best of sub-contracting to the few US/Global primes. I return below to the objections to this, as the authors also do at several points in their text.

Alongside this is the recognition, particularly amongst senior officers of the armed services, that if they are to be able to buy equipment of the quality and in the quantity which they consider neces-

sary for their forces as the 'Revolution in Military Affairs' rolls on, then in order to stretch their budgets sufficiently they have got to try to pay as little as they possibly can for what they do buy. They are thus (rightly or wrongly) inclined to fasten onto consolidation and reconstruction as part of the formula for smart procurement in order to achieve this result. This is a further issue to which I also return below.

Restrictions on Customer Choice Arising from Consolidation

But there is also another, rather different military view. Financial disciplines in government service are never as pervasive as they are in a well run business. Other things being equal, the military, procurement officials, and defence ministries would rather have a choice of suppliers than be faced by a monopoly. To be a monopoly purchaser (as defence ministries and the military are) is one thing; it is a useful route to persuading industry to supply you with what you want rather than what they want to sell you. To find yourself confronted with a monopoly supplier reverses the situation. Your access is restricted to kit that is, in a manner of speaking, in the catalogue. This may well exclude you from specifying your first choice, and over time deprive you of that choice.

We need to be clear that this is the prospective situation recognised at the last moment by the US Department of Defense (DoD) and of Justice when confronted with the proposed further expansion of Lockheed Martin to take over Northrop Grumman. Put at its simplest the DoD realised that if it chose to buy an aeroplane from Lockheed Martin, then Lockheed Martin, rather than DoD would be in the position to choose the avionics with which the plane was equipped. This is of course directly analogous with the efforts of the US Department of Justice to ensure that when somebody buys a PC with Microsoft Windows 95 installed as the operating system, they genuinely have a choice of Web browser rather than being forced to use the browser provided by Microsoft.

The Political Pressures

The political considerations relative to consolidation and restructuring also work in a number of different directions, some favouring the process, others creating barriers.

Defence Ministers in the present British government, as illustrated by the December, 1997, statement by Secretary of State George Robertson quoted at the start of the Executive Summary, have declared themselves as strongly committed to the process.

The various conflicting political pressures in France are discussed in the main text and I will therefore not repeat them here except to say that the current Jospin (Socialist) government having a year ago initially reversed the policies of the previous centre-right Juppe government can now be seen to have reversed again and indeed to

be going on beyond the Juppe line so far as concerns the "opening" of the French industries is concerned.

Germany, with forthcoming elections (due in September, 1998) and its federal system with the separate *Lander* responsible for protecting employment, has expressed support (as in the December, 1997, joint declaration) but has remained discreetly at arms length from detailed proposals.

Spain and Italy are both concerned to ensure that they are included in everything and excluded from nothing.

I would therefore summarise the balance of political pressures as being overtly in support of consolidation and restructuring while at the same time including behind the scenes some of the most effective and influential resistors.

Global Implications

Outside Europe the global context may be divided into three elements: Russia; the USA; the rest.

I consider Russia first because of the willingness of Russian defence manufacturing units to sell their top-of-the-line products to almost anyone, thus setting an alternative world standard against which the West must be ready to contend if it is to be certain of its security. Hence, for instance, the perceived need for the Eurofighter's weaponry to be enhanced even before it has gone into service.⁶

The USA I see as reflecting two divergent influences. One is to retain its technological lead by minimising the leakage of this to others, whether allies, prospective foes or otherwise. It also seeks at the same time to protect its industrial base - "Buy American". The other influence is the belief that partners should engage in burden-sharing, coupled with some recognition that to such partners burden sharing means much more than just being paying customers. This in turn points towards joint programmes which if openly conducted will lead to just the sort of technology transfer or "leakage" with which the first school of thought is concerned.

The underlying considerations in all of this are very well set out in the US General Accounting Office (GAO) Report: *European Initiatives to Integrate the Defense Market*.⁷

The relevance of the rest of the world is two-fold. First, because it provides a market for European exports not least because they are not American. Second, there is a pressure from them to develop their own productive capacity, a desire which is understandable but which merits a careful but cautious response from European businesses.

Background to the Production of this Paper

One of the authors (Ripley) is a British aerospace and defence journalist who initially presented the view from Europe, based on background conversations with executives of the major European aerospace and defence companies (including Chief Executive Officers), serving military officers, government officials and politicians. The other author (Ranger) is a British-American defence analyst who then developed Ripley's analysis in light of the American experience with defence industry consolidation.

I know that the named authors would wish me to place on record the contribution to their work made by numerous other people. These include several who hold official positions or analogous appointments and who have spoken freely on the basis that their comments would be protected by the strict application of the Chatham House rule. I can however recognise with pleasure on their behalf the valuable comments of Dr Jordi Molas-Gallart of the Science Policy Research Unit, University of Sussex, and the participants in a seminar held by the Centre for Research in International Security, Manchester Metropolitan University. The authors have also benefited from an exchange of views with the London-based Centre for European Reform (CER)⁸, whose Director, Charles Grant, was defence editor of *The Economist* for four years. In 1998, the CER established a working group on restructuring Europe's defence industries and the authors found that their research findings and policy recommendations were in general agreement with those of the CER to date, as noted in Part 5 of this study.

Where do we go from Here?

On the analysis, which I have quoted above, by M. Michot, the Chairman of Aerospatiale, the European aerospace and defence industries are at the end of a period of procrastination, of talk rather than action. At the same time, they are at the start of another period, a period of transformation. On the assessment advanced in this paper, the political, financial and competitive pressures for change, linked with the military pressures for interoperability, will prove irresistible. The consequences however appear less certain. The pressures for rapid change may be resisted and frustrated; in this case I can only believe that these industries, in Europe, will become less significant as generators of technological advance and of skilled and well paid employment, with the European economies consequently becoming less globally competitive and sinking back towards a more inward looking 'fortress Europe'. The same unfortunate effect could well arise through a transformation of these industries into the sort of cosy monolith of work-sharing and bureaucratic centralism which certainly attracts some of the parties. However there can be another outcome, one in which overall efficiency is enhanced by well considered and well managed co-operation regionally and globally but which also retains a sufficient degree of diversity to give Europe its own particular edge.

At CDISS we are concerned with security, in the broadest sense of that term, rather than with beating any particular industrial drum. We therefore plan to monitor future progress on the restructuring and consolidation of the European defence, aerospace and related industries from precisely that point of view, namely: are prospective changes calculated to make the military procurement process more cost effective? Will they provide the armed forces of Europe with the best possible equipment? Will they be conducive to interoperability? How will they work in with threat reduction through arms-control and related international procedures? In this monitoring process we expect to argue *against* a search for exclusively European arrangements per se and *in favour* of increasingly open European-American co-operation and joint programmes. In this respect, that of open joint programmes, we shall be as concerned with the adverse consequences for collective security that flow from "Buy American" pressures and "Fortress America" attitudes as we are with those encapsulated in "Fortress Europe". We hope that our programme will periodically generate a number of papers, each focusing on a specific theme within these areas, but also assessing broad general progress.

Humphry Crum Ewing, July 1998

1. THE EUROPEAN AEROSPACE AND DEFENCE INDUSTRIES IN 1998

The end of the Cold War in 1989-90 caused sharp declines in the defence budgets of NATO countries. According to NATO, the gross defence spending of the 13 European members of NATO fell from a 1990 total of \$186 billion (compared to US defence spending of \$306 billion) in 1990 to \$184 billion in 1997 (compared to US defence spending of \$272 billion), with trends still downward.⁹ Most NATO countries, except for Greece and Turkey, have experienced declining defence budgets and falls in the procurement of new military equipment, resulting in reductions in gross numbers of equipment buys and the extension of delivery schedules. For example, the multinational Eurofighter and the French Rafale fighter will each enter front line service 10 years after the date originally envisaged when their development programmes began. However, defence sales are of varying importance to European companies. In 1996, for example, defence sales accounted for 72% of British Aerospace's revenue (\$8.542 billion of \$11.9 billion), 28% of Dassault's revenue (\$620 million of \$2.2 billion), and 20% of Aerospatiale's revenue (\$1.94 billion of \$9.32 billion).¹⁰

But the main threat to the viability of European defence companies is the decline in funds available for investment in new products to follow-on from those in production or verging on production. National budgets are increasingly unable to fund the research and development (R&D) of modern weapon systems and aircraft or large production runs. Yet without new R&D Europe will gradually lose the ability to produce competitive products as alternatives to American products. A striking example of this problem is the Future Large Aircraft (FLA) project to build a new military airlifter, stalled for five years because of a vicious R&D circle. European governments cannot afford to fund FLA development and production from their defence budgets, while the main European aerospace companies have been unwilling to fund the FLA because of the lack of firm commitments to buy the airlifter from European governments.

Export Sales

For Europe's aerospace industries, having competitive products is also the key to securing vital export orders. The ability to provide modern weapons which are not dependent on American components, and the resultant political and legal export constraints that go with them, is a major selling point for European companies competing for orders in key Middle East and Pacific Rim markets. European defence exports are based on the ability to provide customers with modern combat platforms (aircraft, naval vessels and armoured vehicles) and associated technologies, including guided weapons, propulsion and command and control. From the sale of modern combat platforms flow billions of dollars-worth of business in training, ammunition, electronics, maintenance and

infrastructure construction. For example, Britain has sold more than \$35 billion worth of military equipment to Saudi Arabia after US Congressional vetoes on the sale of F-15 Eagle strike aircraft to Riyadh in the mid-1980s.

But recent devaluations of the US dollar (the international currency of the aviation industry) versus European currencies has significantly reduced the competitiveness of European industry. Even minor drops in the value of the US dollar can force up the price of European aerospace products. France's GIAT Industries reportedly lost \$1 billion on its Leclerc tank sale to the UAE because of currency changes and flaws in the contract (it fixed the price of the deal in US dollars and did not allow for currency fluctuation).

Europe's National Dinosaurs?

European aerospace and defence leaders look enviously at their American rivals who were, until recently, able to consolidate with relative ease, thanks to the support of the US government and regulatory authorities. Compared to the US, Europe's defence industry is seen by many of the continent's private sector executives and government leaders as being hopelessly fragmented on national lines. This prevents the consolidation necessary to achieve significant economies of scale on production runs and in research and development. For example, Europe has ten prime contractors for military aircraft and helicopters (the US has five); four for main battle tanks (the US has one); twelve for missiles (the US has three); and 14 for tracked armoured vehicles (the US has two). Until recently European governments have justified their policy of supporting national champions on the grounds of maintaining core strategic capabilities, protecting jobs and securing a strong position in international co-operative programmes.

Long-Term Prospects

Europe's aerospace and defence industry is becoming increasingly centred on two major projects, the Airbus family of airliners and the Eurofighter combat aircraft. In 1997 the British, French, German and Spanish Airbus grouping generated revenue of some \$11.6 billion. By the turn of the century Airbus aims to secure 50% of the world airliner market and many industry analysts agree with this forecast. Airbus expects to deliver 235 aircraft in 1998 compared to 182 in 1997.¹¹ Eurofighter, which got the final go ahead from the German parliament in late November 1997, should generate at least \$64 billion of revenue over the next 10 to 12 years for the British, German, Italian and Spanish aerospace industries. Exports could double this figure. The programme was formally launched in December 1997 when the participating nations signed production contracts for 620 aircraft.

The current generation of European defence products probably has a 'shelf life' of 10 to 15 years, when new aircraft, guided weapons,

armoured vehicles, naval vessels and other weapon systems will be needed to compete against new generation US, Russian and Chinese equipment. The big question mark revolves around Europe's ability to fund the development and production of the next generation of combat aircraft, transport aircraft, armoured vehicles and the Airbus A3XX 'jumbo' airliner, which is to compete with Boeing's 747.

1997 Developments

The first development was the rapid, continued consolidation of the US aerospace and defence industries that created three giant companies, Boeing, Lockheed Martin and Raytheon, which had 1997 revenues estimated at, respectively, \$48 billion, \$37 billion and \$17 billion. These companies were much larger than the five largest European aerospace and defence companies, BAe, Lagardère, Aerospatiale, DASA and Thomson-CSF which had 1997 revenues or sales of, respectively, \$13.6 billion, \$11.16 billion, \$9.54 billion, \$8.43 and \$ 6.53 billion. (The British General Electric Company, with 1997 sales of some \$18.9 billion, included an electronics and defence sector, GEC-Marconi, with sales of some \$5.95 billion and would thus play an significant role in European industrial consolidation.)

These three American companies would thus be in a much better position than these five European companies to fund the R&D of new systems. This gap between the US and Europe in resources for R&D was being further increased by cuts in European defence budgets for R&D. These had fallen 53% between 1985 and 1997, to only \$10.6 billion, compared to the US 1997 R&D budget of \$37.4 billion.¹² Thus, European companies faced a choice between consolidation on a scale that would enable them effectively to compete or collaborate with American companies, or becoming niche suppliers of subsystems for American systems.

However, in March, 1998 the process of US industry consolidation was significantly modified by a surprise decision by the Departments of Defense and Justice to oppose, in court, Lockheed Martin's acquisition of Northrop Grumman, after the acquisition had been approved by the shareholders of both companies, apparently with the blessing of the government. But it does not change the fact that industry consolidation has gone much further and faster in the US and is a major factor in forcing European industry to consolidate. Even if this acquisition is blocked, as presently seems likely, the US industry will still be dominated by these three giant companies, of which Lockheed Martin will remain the second largest, with 1997 revenues of some \$28 billion. Northrop Grumman, with 1997 revenues of some \$9 billion, is still likely to seek to consolidate many, if not most, of its activities with these three companies, or other US companies, in ways acceptable to the government. In addition, the Clinton administration has stressed

that it still favours continued industry consolidation that does not inhibit competition, as defined by the administration.

The second development was that, while the Europeans had already created a multinational consortium to develop and produce the Eurofighter and the government-subsidised Airbus family of airliners, they agreed, in 1997, to put the Eurofighter into production and to turn the Airbus consortium into a Single Corporate Entity (SCE), a private sector commercial company.

The third development was that BAe and Lagardère agreed, in August, 1996 to merge their missile business into a joint venture, Matra BAe Dynamics (with ownership split 50:50). It would be Europe's largest missile manufacturer, with 1996 sales of some \$1.6 billion, and run on commercial principles instead of trying to protect national work shares and jobs, as the Eurofighter and Airbus consortium had done. Matra BAe Dynamics was thus the first major, fully private sector multinational defence company to follow the model established in the space sector by Matra Marconi Space, formed by Lagardère and GEC-Marconi to combine their civil satellite interests.

The fourth development was that the-then head of BAe's defence sector, (now BAe chief executive), John Weston, led a campaign, supported by many European aerospace and defence industry leaders, for consolidation via the creation of a European company, tentatively called *Euroco* or *Eurocompany* (it will be called *Euroco* in this study). Its main components would be based on four of the seven major sectors of European industry where consolidation is making the most progress: civil aircraft; military aircraft; guided missiles and defence electronics; and space systems. Consolidation has made less, but still significant, progress in the other three sectors: helicopters; armoured vehicles and land systems; and naval construction.

The *Euroco* civil aircraft component would be based on the four Airbus partners: Aerospatiale; BAe; DASA, and Construcciones Aeronauticas (CASA) (Spain). The military aircraft component would be based on the four Eurofighter partners: BAe; DASA; Alenia (Italy), and CASA. The guided missiles and defence electronics component would be based on Matra BAe Dynamics plus the missile businesses of Aerospatiale and Thomson-CSF and perhaps GEC-Marconi. The space systems component would be based on two new companies to be formed in 1998: Matra Marconi DASA Space (formed by a merger between Matra Marconi Space and DASA's space business) and the Thomson-CSF-Alcatel Alsthom-Aerospatiale space company.

Euroco would thus be a new form of European defence co-operation, following the precedent set by Matra BAe Dynamics, rather

than the two established forms of co-operation represented by the Eurofighter and Airbus projects. However, the Airbus transition to the Airbus SCE is also intended to make European co-operation commercially competitive. The French government's reactions to this proposal for *Euroco* changed, in 1997, from initial hostility to limited support, but its policy is still evolving in light of the problems facing the French public and private sector defence industries.

2. THE FRENCH AEROSPACE AND DEFENCE INDUSTRIES IN 1998

Changes in French Policy

The four developments described above combined to produce significant changes in the policies of the French Socialist government of Premier Michel Jospin that took office in May, 1997. Initially, Jospin's government favoured a continuation of the traditional French policy of providing financial support to French aerospace and defence companies to support national industries, protect jobs and secure exports. The French government had a 100% shareholding in the Aerospatiale group and a 58% shareholding in the Thomson-CSF group (with 1997 revenues or sales of, respectively, \$9.54 billion and \$6.53 billion), it ran the state naval dockyards (Direction des Constructions Navales - DCN) and the state armament group (GIAT Industries) and had a 97% shareholding in SNECMA, the state aircraft and spacecraft power plant group (with 1997 revenues or sales of, respectively, \$2.24 billion, \$1.13 billion and \$3.53 billion). The two largest private sector companies were Lagardère and Dassault Industries (with 1997 revenues or sales of, respectively, \$11.16 billion and \$3.56 billion). This large government involvement in the French aerospace and defence industry meant that while it is a world leader in some sectors and in 1997 generated some \$38.03 billion in revenue, it is often criticised for being too nationalistic, over-manned, bureaucratic and unprofitable.

In Autumn, 1997 the Jospin government announced an aerospace and defence industry consolidation plan based on the creation of two centres of national excellence. One would be an enlarged, "privatised" (more accurately, a semi-privatised) Thomson-CSF in which the government would retain a shareholding of 43% (instead of 58%). This company would include Aerospatiale's satellite business, the satellite and communications business of Alcatel-Alsthom (a large private sector consumer electronics and power generating company) and Dassault's electronics business. The other centre would be based on the aircraft and helicopter businesses of Dassault and Aerospatiale. Aerospatiale's missile business would then form the core of a European missile business. Thus at the November, 1997 Anglo-French summit, Jospin resisted pressure by British Prime Minister Tony Blair to move towards consolidation via *Euroco*. The British and German governments then agreed to work towards *Euroco*.

At the same time, the initial Jospin consolidation plan was encountering serious problems. The creation of the first centre of national excellence, an enlarged, semi-privatised Thomson-CSF appeared to be proceeding, with privatisation scheduled for March, 1998 (this will be complete by mid-1998 because of the time needed to complete the legal arrangements). But the creation of a second centre appeared unlikely. Jospin's advisers came to realise that, for Aerospatiale, it was crucial to build on the success of its participa-

tion in Airbus, in which it is a 37.9% partner. While they continued to suggest that Aerospatiale's missile business could form the core of a European missile business, it appears that this core has already been formed by Matra BAe Dynamics. Also, Dassault publicly rejected the proposed Dassault-Aerospatiale merger.

More broadly, Jospin and his advisers seemed to have realised, reluctantly, that much of the French aerospace and defence industry could no longer be supported by the state in the traditional manner. With post-Cold War cuts in defence budgets, the costs were too great and national companies were too small to fund the R&D of major products that could compete in international markets. For example, the government had real trouble funding production of Dassault's Rafale strike fighter, making it likely that the Rafale would be the last advanced combat aircraft produced solely in France. Jospin's government was thus willing to join the British and German governments in their December 9, 1997 call for industry consolidation.

The French government was also aware that Aerospatiale's lack of expertise in combat aircraft design and production meant that it risked becoming an unequal partner in any European consolidation involving BAe and DASA. In May, 1998, despite Serge Dassault's opposition to attempts to break up his ailing company, the French government handed over its 45.76% stake in Dassault to Aerospatiale. The government's intention was for Aerospatiale to acquire Dassault's military aircraft interests and expertise whilst allowing the the civil aircraft elements to remain under the control of Dassault Industries.

But, as Jospin's plan for the semi-privatisation of Thomson-CSF shows, his government is still trying to pursue a policy of partial privatisation, instead of former Prime Minister Allain Juppe's policy of full privatisation. Juppe proposed to transfer control of a privatised Thomson-CSF to Lagardère (Matra Hautes Technologies). Since Lagardère had strong links with BAe (including through Matra BAe Dynamics) and DASA this full privatisation was seen by many European industry leaders, including BAe's John Weston, as a starting point for *Euroco*. It remains to be seen whether Jospin's policy of partial privatisation is, or is not, compatible with European consolidation via *Euroco*. But partial privatisation may not be compatible with such consolidation because the French government will retain a great deal of influence on a partially privatised Thomson-CSF and, if it were partially privatised, on Aerospatiale.

Company Structures, Ownership and Co-operation

For French industry, consolidation would be complicated by the existence of three types of companies, with different forms of ownership: privately-owned; state-controlled and state-owned companies. The first type are privately-owned, publicly-quoted

companies, with shares traded on the Paris stock exchange, notably Lagardère and Dassault. They are similar to British and German companies, although the French government also follows the practice of other European countries of keeping so-called 'golden' shares to ensure key companies do not fall under foreign control, as with the 45% of Dassault's shares held by the French government. But Dassault is a special case because:

The Dassault family controls 49.9 percent of the company's shares, the government owns 45 percent, while the remaining 5.1 percent is publicly traded, although the government owns a majority of these shares.¹³

The second type are state-controlled companies, including the two largest aerospace companies in France, Aerospatiale and Thomson-CSF, with control exercised through controlling, or large, share holdings in previously private companies. These companies are supposed to operate as commercial enterprises but there is a widespread view among analysts that these companies often do not publish regular accounts and are lax in defining the value of their assets. For decades these companies have been treated as virtual extensions of the French state and little is known, even within the companies themselves, about the value of their property, their ownership of share holdings in subsidiaries and their intellectual property rights. In many cases corporate valuations have even not been attempted.

The third type are companies where the assets are directly state-owned, DCN, GIAT and SNECMA. Their employees are the equivalent of civil servants, with significant pension benefits and employment rights governed by statute. Currently, there is no legal mechanism to transfer the employment of these workers out of the state sector and this is a major impediment to the privatisation of state enterprises. Because these state-controlled and state-owned companies are such an important and distinctive part of the French aerospace and defence industry, they will be considered first.

State-Controlled Companies: Aerospatiale Group

Aerospatiale was formed in 1970 by a government-chaperoned consolidation of a number of private sector aviation companies. It prospered in the 1960s and 1970s thanks to strong government support, including support for projects such as the Anglo-French Concorde supersonic airliner. Aerospatiale has three main business sectors, aircraft, space and defence and helicopters. While it has a nominal private company structure, Aerospatiale is controlled by the French government's 100% shareholding, has long been considered a French institution and has had difficulty adopting private sector practices. The government made it the French standard bearer in prestigious international projects and gave protection of employment priority over Aerospatiale's commercial interests.

Airbus The core of Aerospatiale's aircraft business is its 37.9% stake in Airbus Industrie, alongside BAe (20%), DASA (37.9%) and CASA (4.2%). In 1997, Airbus and other aircraft activity generated \$5.79 billion of Aerospatiale's \$9.54 billion revenue (space/defence generated \$2.00 billion and helicopters \$1.73 billion.)¹⁴ The Airbus and space/defence sectors were the only parts of the group that returned a net profit in 1996, \$199 million and \$34 million, respectively. Losses in non-Airbus aircraft activity meant the group's profits were only some \$236 million in 1997. In 1997, initial reports indicate the helicopter business turned in a 'small' profit.

Aerospatiale's largest Airbus asset is the assembly plant in Toulouse that has an order book flush with more than 300 airliners. This order book is still growing and Airbus is not suffering from the assembly problems afflicting Boeing as it struggles to meet growing demand in the civil market. Unlike Boeing, Airbus has been able to deliver its aircraft on time and has been able to manage its growth in production better. There is, though, some concern in the company about Pacific Rim customers defaulting on payments as a result of the economic crisis in that region. The Toulouse facility is also home to the Airbus Military Company, which hopes to build the European Future Large Aircraft (FLA) military airlifter. The FLA is intended to compete with the new Lockheed Martin C-130J Hercules and C-17 Globemaster in European and world markets.

Aerospatiale also owns part of the Aero International (Regional) company, along with BAe and Italy's Alenia, which builds the ATR 42 and 72 series of regional turboprops airliners. This alliance has not been a success and it is in the process of being wound-up, with the partners going their separate ways. The Socata light aircraft division of Aerospatiale has built some 17,000 TBM, TB and Epsilon series aircraft.

Helicopters In addition, Aerospatiale has a 70% shareholding in the Franco-German Eurocopter company, created in 1992, and had a corresponding share in the company's \$1.6 billion turnover. The Eurocopter partnership has evolved considerably in recent years. Its product lines and operations were originally based on national industries but the company is now becoming more multi-national in character and less dominated by work-share concerns, especially in the civil sector.

Eurocopter is the prime contractor for the Franco-German Tiger attack helicopter which is intended to be a rival to the Boeing AH-64 Apache. Aerospatiale has a 42.4% work-share in the French, Dutch, Italian and German NH-90 maritime and transport helicopter programme. Both the Tiger and NH-90 received the go-ahead for production during 1997, with orders for a total of 427 Tigers and 647 NH-90s for the participating nations. The Tiger and NH-90

survived when the French Ministry of Defence published in April, 1998, a major report on its future procurement requirements. Eurocopter has also recently secured sales of Cougar transport helicopters in Turkey and Saudi Arabia worth several hundred million dollars. Indeed, more than half of its sales are in the civil market, where it is the chief rival of Bell Helicopters Textron in supplying small civil and oil industry support helicopters.

Tactical Missiles Aerospatiale's tactical missile business is in poorer shape. Its true financial situation is unclear because it is linked in company financial statements with the company's space activity. During the 1970s and 1980s this business had a healthy order book for the Exocet sea-skimming anti-ship missile, Roland anti-aircraft missile, MILAN and HOT anti-tank missiles. But these products are now starting to show their age and generated sales of only \$644 million in 1996, according to the limited financial information available.

This missile business has a number of weapon systems under development, including the French Aster 15 and 30 surface-to-air missile (SAM) as part of the Eurosam Future SAM and Principal Anti-Air Missile System (PAAMS) naval air defence missile projects; the Polyphème fibre optic guided missile; the Hussard fibre optic controlled unmanned aerial vehicle; the Long- and Medium-Range Trigat laser guided anti-tank missile; the Anti Navire Nouvelle Generation (ANNG) supersonic new generation anti-ship missile. For the ANNG project, the company was awarded a \$127 million contract by the French Ministry of Defence procurement agency, the Delegation Générale pour l'Armements (DGA), to develop the VESTA Mach 3 ramjet. This ramjet technology may have an application in the UK's Beyond Visual Range Air-to-Air Missile (BVRAAM) programme. Aerospatiale is already working on ramjets with Hughes (now Raytheon) on its UK BVRAAM bid, known as the Future Medium-Range Air-to-Air Missile (FMRAAM).

The Aster 30 missile is seen as the core weapon system of any future indigenous French and European ballistic missile defence project, if such a programme is given the go-ahead. It is also seen as a rival to the American-German-Italian Medium Extended Air Defence System (MEADS), which is having difficulties gaining funding from the US legislative branch.

PAAMS in both the UK and Franco-Italian variants of the Horizon frigate will employ Aster 15 and Aster 30. Aster 30 has recently completed test firings against missile targets, scoring 'hit to kill' results, according to the company. The first test on 11th December, 1997 hit an in-coming drone at an altitude of 11,000 ft and a range of 30km and Aster 15s have hit sea-skimming drones during tests. Aster 30 may also be further developed (as Aster 30* or Aster 45) to fulfil the ballistic missile defence role.

Space Aerospatiale's space business is still healthy with 1996 sales worth some \$1.6 billion, of which \$593 million was from the Ariane Space Launch Vehicles (SLVs) and orbital infrastructure (hardware for satellites and space stations). Aerospatiale are the prime integrator for the Ariane launcher series, through the company's membership of the pan-European Ariane space group. The company also participates in European Space Agency programmes.

Arianespace launched ten Ariane 4 vehicles into orbit in 1996, generating \$1.065 billion in revenue and \$23 million in profits for the European multi-national group. Some 50% of the group is French-owned and around 22% German-owned, with the remainder owned in small holdings by other European countries. Aerospatiale's satellite business also generated some \$847 million in 1996. Aerospatiale claims both its space launcher and satellite business are 'profitable' but has not issued detailed figures.

Aerospatiale also participates in the systems integration house, Sextant Avionique, formed by a link up with Thomson-CSF. But it is not considered by analysts to have been a success, or profitable, due to poor market conditions.

Future Prospects In March, 1998 Aerospatiale announced its results for 1997, which showed revenue of \$9.54 billion and profits of some \$236 million. But while Aerospatiale's missile technology is highly regarded, the company is suffering greatly from cutbacks in French military research and development spending. Also, a recent French National Assembly Report stated that the company was \$1.7 billion short of the capital needed to provide a proper debt to equity ratio of 30% on its \$8 billion turn over.¹⁵ This means the company cannot afford to fund all its research and development projects without a major injection of capital. The French government has so far refused to approve the injection of major capital into Aerospatiale, except in support of Airbus, so a question mark must remain over the future of Aerospatiale's tactical missile business. (Aerospatiale's ballistic missile programmes generated only \$245 million in revenue in 1996 and the government has delayed the development programmes for the M51 submarine launched ballistic missile.)

To reduce costs, Aerospatiale's missile business announced a major restructuring programme to reduce its workforce from 4,300 to 3,000 and close four of its seven sites. These unprecedented redundancies are possible because of Aerospatiale's nominal private-sector-type corporate structure. They show that the new Socialist government is prepared to bite the bullet and allow the shedding of labour if this is necessary for corporate survival.

Thomson-CSF Thomson-CSF is in many ways the powerhouse of the French aerospace and defence industries, with sales in 1997 of \$6.53 billion, of which some 75% was from military business, and an operating profit of some \$359 million. In 1996 it also funded 31% of its \$1.5 billion research and development from its own resources and currently has an order book of some \$11 billion. The company is seen as being broadly comparable in size and scope to Britain's GEC-Marconi defence electronic group and the two multi-billion dollar companies are regularly seen by some industry analysts as natural partners, although no consensus exists on this idea.¹⁶

Thomson-CSF is heavily diversified and has interests around the world, so it is not overly dependent on the French defence budget. Revenues by activity include 28% from missiles and radars, 27% from aerospace, 17% from communications and command systems, 12% from avionics, 12% from information technology and 4% from components. Aerospace activities also include a significant involvement in French and European space programmes. The company is heavily involved in efforts to digitise the French Army and other armed forces. It also produces the Arabel air-defence and ballistic missile defence radar for the Aster 30 missile system.

**State-Controlled Companies:
Direction des Constructions
Navales (DCN)**

In 1997, DCN, the state-run naval dockyards, recorded some \$2.24 billion in revenues but it is unclear from published sources whether it generated a loss or profit due to incomplete published accounts.¹⁷ Its export arm, DCN International, is very active in export markets, generating a great deal of publicity but this has only recently begun to bear fruit. It sells Lafayette frigates with some stealth characteristics, Eridan class mine hunters and Agosta 90/Scorpene conventionally powered submarines. In December 1997 it secured a \$420 million order for two Scorpene submarines from Chile, bringing its exports for the year to \$1.19 billion. In the final days of 1997, DCN secured a \$1.52 billion order for a third Lafayette frigate from Saudi Arabia, although this sale is to be recorded in the 1998 accounting period.

The company's domestic business is seriously threatened by cuts in naval programmes, including the delay in the building of a third and fourth Triomphant-class ballistic missile submarine. France's first nuclear powered aircraft carrier, *Charles de Gaulle*, survived recent defence cuts but there is little prospect of a second carrier getting beyond the drawing board. DCN International are the French leader in the European Horizon frigate project.

GIAT Industries In 1990, this state sector armament group was transformed into a state-owned company but most of its employees retain their civil service status. It produces armoured vehicles, ammunition and associated products (its most famous product is the Leclerc main battle tank) and in 1996 claimed a turnover of \$1.45 billion.¹⁸ Like

the DCN state dockyards, GIAT Industries is a serious financial drain on the French defence budget. In 1997, revenue was \$1.13 billion and the company made a loss of some \$77 million. Since 1993, the French government has injected more than \$2.8 billion in an attempt to keep GIAT afloat. GIAT Industries is now in the process of selling off the FN Herstal small arms division and merging its armaments division with Thomson-DASA Armements (TDA).

GIAT Industries are part of the Eurokonsortium team that won the competition to meet the joint British-German-French requirement for the Multiple Role Armoured Vehicle (MRAV) that could involve total programme costs of \$5-8 billion. Two rival teams, both made up of British, German and French companies, were competing to supply up to 7,500 MRAs. (See Appendix 2, Major European Co-operative Projects, April 30, 1998.) The result of this competition will cause a major shake-out in the European armoured vehicle sector.

SNECMA Group SNECMA is the state controlled aircraft and spacecraft power plant group. It is currently generating good revenues due to the success of Airbus and the upturn in the global commercial aircraft market. The Société Européenne de Propulsion (SEP) space rocket propulsion business has recently been moved by the French government into the SNECMA group to create a centre of aircraft and spacecraft power plant excellence. SNECMA's turnover rose from \$1.46 billion in 1995 to \$1.55 billion in 1996, with revenue rising by 20%, according to the company.¹⁹ In 1997, the group's revenue increased to \$3.553 billion because of the addition of the new elements, and a small profit, \$20 million, was registered. By increasingly turning to civil markets, the group has insulated itself from downturns in French defence budgets, although some analysts claim it may be under-capitalised.

Private Companies:
Lagardère Lagardère is a major player in the European aerospace and defence industries through its defence link-up with BAe via Matra BAe Dynamics, and its Anglo-German satellite business with Matra Marconi DASA Space. Lagardère's defence and space subsidiaries are grouped into the Matra Hautes Technologies holding group, which also includes Lagardère's civil communications and information technology divisions. In 1997, the Lagardère group generated some \$11.16 billion in turnover with a net profit of \$233.89 million. Through its participation in Matra Marconi DASA Space, linked to the UK's GEC-Marconi and Germany's DASA, Lagardère is involved in civil communications, science and civil observation, launchers and manned space flight, military communications and observations satellites. The space business generated some \$1.6 billion of revenue in 1996. A further \$1 billion in annual revenue would be added when DASA's space business is fully integrated into Matra Marconi DASA Space.²⁰

In 1997, the total revenue of the Matra BAe Dynamics missile business was \$1.5 billion, making it number one in Europe and third in the world after Raytheon and Lockheed Martin. When Matra BAe Dynamics adds DASA's Lenkflugkörpersysteme (LFK) missile business, this should boost revenue by some \$490 million, making the company's missile business larger than Lockheed Martin's. However, company insiders estimate that its 'real' profits should be measured in scores rather than hundreds of millions of dollars.

The Matra BAe Dynamics missile business has a series of cutting edge weapons in production and more in fully-funded development. Matra BAe Dynamics' MICA missile is the only active radar air-to-air guided missile in front-line service of a comparable class to the US AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM). A programme is also underway to develop an interchangeable infra-red and active radar guided seeker head for MICA. Matra BAe Dynamics' Magic series of heat seeking missiles are the main market rivals to the American Sidewinder, while its medium range semi-active radar Sky Flash and Super 530D missiles are of a comparable class to the US AIM-7 Sparrow.

Matra BAe Dynamics' Advanced Short Range Air-to-Air Missile (ASRAAM) is under development for the UK as part of a \$1 billion contract. This highly advanced dog-fighting missile has performed well in recent tests, and it looks set to be the main competitor to the future US AIM-9X in European and world markets. Indeed, Australia's selection of ASRAAM in February 1998 was a significant success in Matra BAe Dynamics' ongoing battle with Raytheon in this highly competitive segment of the missile market.

Matra BAe Dynamic's Jernas (Rapier FSC export version) and Mistral tactical anti-aircraft missile systems are in production and continuing to generate sales.

Britain and France, via Matra BAe Dynamics, are jointly developing the Storm Shadow/Scalp EG family of precision guided long-range air launched cruise missile. A production contract was signed in the autumn of 1997 by the French government for the Apache anti-runway version of the weapon, which shares an airframe with the Storm Shadow/Scalp EG. These cruise missiles are of a broadly comparable class to the American Joint Stand-off Weapon (JSOW) and Tomahawk Block IV Land Attack Missile (TLAM) (although the Tomahawk is submarine-launched and not air-launched). The Matra BAe Dynamics long-range cruise missiles will attract considerable interest from export customers if the US government or Congress places export restrictions on products of this class.

Matra BAe Dynamics are working alongside DASA's LFK missile house, GEC-Marconi and Saab on the Meteor project to meet the UK's requirement for a long-range, beyond visual range, air-to-air

missile, known as FMRAAM. Studies underway include a modular stand-off guided weapon (AASM) for the French air force and the ARF future anti-radar missile, powered by a self-modular ramjet.

The company is involved in the UK element of the Principle Anti-Air Missile Systems (PAAMS) programme on the Horizon frigate and the vertical-launched Sea Wolf ship defence missile. Through its British element, Matra BAe Dynamics also have a stake in the Euromissile Dynamics Group (EMDG) GIE to produce the Trigat series of laser guided anti-tank missiles.

In recent years, the company has built up a degree of experience in ballistic missile defence through legacy contracts commissioned by the British and French governments. This work continued after the merger of Matra and BAe Dynamics but was 'ring-fenced' for national security reasons by both London and Paris. The French element of the company was one of the prime contractors in the French Ministry of Defence's EPAMINONDAS extended air defence study. The British element was the prime contractor on the UK ballistic missile defence pre-feasibility study (PFS) and is proposing further work in this area for the UK Ministry of Defence.

Dassault Industries

Dassault is the sole prime contractor for combat aircraft in France, with its Mirage 2000-5 multi-role combat aircraft still in production for the French, Taiwan, Qatari and UAE air forces. Limited production of its Rafale combat aircraft is underway for the French air force and navy. In 1997, total Dassault Industries revenues amounted to some \$3.56 billion and net profits ran to \$230 million, almost double the 1995 figure. The surge in profits was mainly due to the sale of stock in its Dassault Systèmes electronics subsidiary.²¹

The French government's April 1998 cuts in defence procurement were a major blow to Dassault because a long-term production contract was again deferred. While most analysts still expect the French to buy around 300 of the aircraft, the lack of a long-term contract makes it difficult to plan production and undermines confidence among potential foreign customers.

The company did, however, win a competition for a \$2.9 billion order for 30 Mirage 2000-9 combat aircraft for Abu Dhabi in December 1997, which will be a major coup if they can turn the Gulf state's intention to buy into a contract during 1998. Good prospects also exist for repeat Mirage sales to Taiwan if the US vetoes F-16 sales. The Abu Dhabi Mirage sale will be a good omen for future sales of the Rafale in the Middle East when its production comes fully on-line early in the next decade. The company has also sold some 950 of its Falcon series of executive jets, with sales still buoyant and significantly contributing to its increasing profits. The electronics arm of the company produces avionics, aircraft self-defence systems, sensor payloads and some well-respected missile seeker units.

Panhard et Lavassor SA

This small but profitable company is on one of the teams competing to win the joint British-German-French requirement for a new family of European armoured vehicles. Panhard were in the rival camp to GIAT Industries and the company's survival is now in doubt.

Exports

French defence exports took a serious hit in 1996, with new contracts only amounting to \$1.6 billion, a major fall from the \$7.4 billion in foreign orders in 1995.²² This experience was a great shock to the French defence industry and a hammer blow on top of falls in domestic defence spending. Indeed, the resurgence of Airbus civil orders was the only bright spot on the horizon. In the last months of 1997 sales of submarines to Chile, frigates to Saudi Arabia and Mirages to UAE were a real life saver for the French defence industry. For accounting purposes these sales will fall in 1998, giving France a good head start in the export market for this year.

The DGA announced in April that French defence exports for 1997 were worth \$4.8 billion which has given the country's aerospace and defence industry something of a breathing space.

French Defence Spending

French defence spending has dropped sharply since 1990, dropping from 3.5% to 3% of gross domestic product, and it does not look like turning around soon.²³ The Jospin government cut defence spending again in the first few months of assuming power, with total spending falling 3.3% to \$30.7 billion for 1997. This included a 9.7% cut in procurement spending to \$14.7 billion.

The announcement in April 1998 of another package of defence cut-backs was a further blow to French aerospace and defence manufacturers. Procurement spending was cut again to \$13.72 billion in 1998, with the Horus satellite surveillance programme bearing the brunt of the cuts, along with an area denial version of the Apache missile, a version of the Trigat anti-tank missile and the Milas anti-submarine weapon. Overall procurement will fall by \$3.2 billion over the next four years as a result of the cuts package.

The French aerospace and defence sectors continued to be damaged by falls in government military R&D spending, which has declined at a greater rate than procurement spending. In 1998, funding for military research and development is to be only \$4.25 billion, representing 31% of the procurement budget, a 13% fall compared to the 1997 funding of \$4.88 billion.²⁴ Crucially the Rafale combat aircraft programme is still stalled with the first 48 aircraft multi-year production contract yet to be placed with Dassault. Without Rafale in series production, Dassault would be in serious financial trouble and its long-term future as a combat aircraft prime contractor would be further in doubt. If Dassault goes out of the combat aircraft business, France's position as major aerospace and defence manufacturer would be significantly reduced.

What will happen to French industry?

France's aerospace and defence industry is in poor economic shape as a result of declining spending on defence, including the R&D needed to produce new systems, low profit margins and the Jospin government's attempt to continue the long-established French policy of protecting jobs in the industry. The industry's poor profits mean that it cannot make up cuts in government R&D out of its own resources and can no longer afford to maintain a larger labour force than is commercially needed.

Just how poor these profits are is shown by Table 1 below. The bottom line is that the state-controlled, state-owned and private companies have total revenues or sales (as they define them) of some \$37.709 billion and total profits of only \$1.001 billion (it is not possible to determine the profits, if any, of the three state-owned companies). In contrast, the privately owned BAe has revenues of \$13.673 billion and a profit of \$0.956 billion. Thus on revenue just over a third of the total revenue of the French industry, BAe makes a profit only \$45 million less than the total profits of the French industry. These figures show that the French industry will have to make major changes to become as competitive and profitable as BAe.

Table 1
French Aerospace and Defence Sector Revenue and Profits in 1997

	Revenue/sales* In billions of US\$	Profit
State-Controlled Companies		
Aerospatiale	\$9.54	\$0.236
Thomson-CSF	\$6.53	\$0.359
State-Owned Companies		
DCN	\$2.237	?
GIAT Industries	\$1.130	-\$0.077
SNECMA Group	\$3.553	\$0.020
Private Companies		
Dassault Industries	\$3.559	\$0.230
Lagardère	\$11.16	\$0.233
Total	\$37.709	\$1.001
BAe (UK)	\$13.673	\$0.956

The future prospects for these three groups of companies may be summarised as follows. Of the two state-controlled companies, Aerospatiale has very mixed prospects. Its aircraft business (about half its total business) will prosper as part of Airbus, although this business will not be state-controlled after 1999. Aerospatiale's helicopter business is beginning production of the Tiger and may be

able to return to profit if it can secure export sales. But Aerospatiale's missile business is undercapitalised and its products are ageing, so it may not survive. Aerospatiale's space business is generating good revenues, but it is not clear if it is profitable enough. Thomson-CSF is moderately profitable by French (but not by British and German) standards and is diversified enough to be able to survive in its new, 1998 semi-privatised form.

Of the three state-owned companies, two, DCN and GIAT Industries, are not commercially viable. The French government cannot make them viable without massive injections of capital and major job cuts, measures that are likely to be economically and politically unacceptable to the Jospin government. The government is thus likely to provide just enough subsidies to allow these companies to continue in their current form and leave the next government to liquidate them after it takes office three years from now. The other company, SNECMA is generating good revenues but it is uncertain what profit, if any, it makes.

Of the two private companies, Lagardère (Matra Hautes Technologies) appears to be commercially viable. Its missile business is at the leading edge of guided weapon design and production, it is firmly linked to effective European partners and is gradually beginning to cut its high cost-base. Also, its space business, including satellite communications projects has good commercial prospects as part of Matra Marconi DASA Space. But Dassault's military aircraft business may no longer be commercially viable. The French government will almost certainly order about 300 Rafale strike fighters and hope that Dassault can secure sufficient export orders to make the Rafale profitable. But the government and Dassault cannot fund the development of a successor to Rafale and Dassault's survival as a maker of military aircraft is therefore in some doubt.

3. SWEDEN AND THE EUROPEAN DEFENCE INDUSTRY

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In April 1998, the European Union leaders made it abundantly clear that they expected the major defence manufacturers to come down off the fence and start taking effective initiatives towards a European-wide restructuring and reorganisation. To some extent, this evident political directive echoed initiatives that had already been in train for some time though less on a European-wide basis than bi-laterally between particular manufacturers looking for greater synergy and efficiency in an ever diminishing, yet competitive, market. It is something of a paradox that Sweden, a late arrival within the European Union, should also be the state with leading defence manufacturers that were already ahead in this trend towards wider European rationalisation and integration. It would be helpful in the debate about the future of European defence manufacturing to elaborate why this has been the case.

The Legacy of Neutrality

Throughout the Cold War, Sweden was determined to remain neutral and not become involved in the East-West military and ideological confrontation. Politically, Sweden was firmly in the liberal-democratic camp, but recognised that any evident bias one way or the other - Sweden was an affirmed social welfare democracy - would upset the delicate 'Nordic Balance' that had dictated the foreign policies of its neighbours Finland and Norway. Neutrality, however, was not a passive policy. It required Sweden to adopt a proactive defence policy that dictated that the country, in time of tension or war, would be required to deny its territory and geostrategic assets to either side in the conflict. In turn, this necessitated a sufficient defensive capability that would enable Sweden to defend itself against attack and to deter both NATO and Warsaw Pact forces from attempting to invade.

This level of sufficiency determined that Sweden had to meet two requirements: the first was that it had to have forces in sufficient numbers to make the prospect of foreign occupation untenable. This was achieved through the creation and development of a 'total defence system' involving the population as a whole. The second was that these forces had to be equipped with weapons that were equal to, or even superior to, those at the disposal of potential adversaries. Furthermore, as far as possible, those weapons had to be developed and manufactured indigenously in order to reduce dependence on foreign supply. In some measure this was made easier by the fact that the particular operational requirements of the Swedish armed forces, that of territorial defence of the country and its archipelago, were almost unique. Weapons acquired from overseas manufacturers

would not suit their specific needs. In sum, Sweden's defence manufacturing base was built around the need to be technologically advanced and product specific, characteristics that have strongly influenced its development over the past forty years.

These requirements imposed a considerable burden on the Swedish economy and high levels of spending on weapons research and development came under severe criticism, including the argument that maintaining a high technology defence manufacturing capability had become as important, if not more so, than the final military product.²⁵ The capacity of the Swedish economy to sustain high levels of defence expenditure reflected a conviction that the neutral foreign and defence policy was right for the country and that these burdens were acceptable and part of Sweden's social democracy.²⁶ The style of social democratic government, however, levied personal and corporate taxation to a level where, by 1983, public expenditure accounted for 70% of GNP; part of that expenditure was on high technology military equipment although defence expenditure in the 1980s accounted for only 3.3 % of GDP.

Economic Decline & EU Entry

The paradox during this time of expanding public services was that Swedish industry, predominantly in private hands, not only thrived but was also highly competitive on the international market. Leading manufacturers included those with a defence orientation, such as Ericsson, Volvo, Saab, Saab-Scania, Bofors, and Kockums, most of whom today are still leading defence manufacturers in the international defence market. This state of affairs might well have continued had not two things happened: the first was that the Swedish economy could not continue to support this 70% (and above) level of public expenditure indefinitely. The IMF and OECD estimate that 40% tax levels are about the limit before inflationary pressures and diminished competitiveness set in. The Swedish government's devaluation of the currency in 1982 helped to stem the inflationary trend, but not for long; the most serious impact was the decline in competitiveness and zero growth.²⁷ By the mid-eighties, Sweden's 'comfortable' social welfare way effectively collapsed and "by 1989 capital voted with its feet as industrialists invested wholesale in the European Community"²⁸. Though Swedish economic and political policy changed thereafter, the precedent had been set; large Swedish enterprises were already looking for new partners and markets. Entry into the European Union was soon to follow.

The 'Peace Dividend' & Swedish Industry

This experience coincided with the end of the Cold War, a time when the public demand to reduce defence expenditures throughout Europe increased to secure a so-called 'peace dividend'. The market for defence equipment decreased dramatically and put pressure on manufacturers everywhere to reduce their levels of activity, rationalise and seek ways of staying in business

by diversification or conversion. In the defence manufacturing sector, the latter two options proved both difficult and unsuccessful, leaving the two strategies of seeking 'niche' defence equipment markets and rationalisation as the preferred ways forward. It is in these respects that the Swedish defence manufacturers, despite the poor performance of the Swedish economy, found they had a comparative advantage.

The policy of 'neutrality' dictated that the Swedish defence manufacturers' market was primarily domestic; the export of arms and military equipment was generally restricted to those states that were non-aligned or themselves neutral. Not only did this limit export potential, but the specifications for Swedish military equipment seldom met the requirements of other states and even if they did, the price tag was invariably prohibitive. In sum, the overall market for Swedish military equipment had always been both limited and small. Unlike manufacturers in countries, such as the US, that had a large domestic defence market, Swedish manufacturers had no large scale or long term production orders from which to effect efficiencies. Consequently, the requirement was for the defence manufacturers to be efficient, lean and cost-effective, those attributes that other states seek in 'smart procurement' practices. In other words, private advanced technology Swedish defence manufacturers such as Saab, Ericsson and Bofors were already manifesting the sort of efficiencies that manufacturers throughout Europe were either seeking to achieve or were looking to join.

The Search for Partnerships

As the Swedish domestic market, already small, declined still further after 1990 and the national defence budget available for equipment diminished, it became evident that either these manufacturers would have to go out of business, or they would have to change radically those policies that had set the parameters within which they had had to operate over the previous forty years. Although not abandoning a policy of neutrality entirely, the act of joining the European Union immediately identified Sweden with its foreign and security policies. As a member of the EU, a new, larger, market opened up for Swedish defence manufacturers though the problem of distinctively Swedish weapons specifications would have to be addressed. To advance its defence manufacturers' access to a wider, European, market, and to open up further opportunities for collaboration, Sweden has become an observer at the Western European Armaments Group (WEAG).

A number of strategies were open. One was to attempt to market and sell Swedish military equipment in competition with other European defence manufacturers, but here difficulties were encountered. Essentially, Swedish defence manufacturers had very little experience operating in an international arms market that was becoming more competitive and cut-throat. Some items of equip-

ment were competitive - with the possible exception of price - such as the Saab Dynamics RBS 15 anti-shipping missile, the Bofors ship-mounted guns and the Kockums submarines. Other, more expensive items, such as the Saab Gripen fighter, however needed the assistance of experienced collaborative partners. In looking for a partner with whom to market and sell their aircraft, Saab found British Aerospace, with whom it had already been co-operating since 1983, to be the most suitable and helpful. The two companies agreed to collaborate in 1995.

Collaboration, however, can take many forms, ranging from bilateral co-operation through combined marketing efforts to full-scale collaboration covering design, development, production and testing. Swedish manufacturers have explored most of them. Currently there are in excess of twenty collaborative projects between Swedish defence manufacturers and European or American partners²⁹. These have been entered into partly to keep overall costs down through sharing, and partly to improve production efficiency through large scale production and to gain access to bigger markets. Joint ventures between Swedish and other European manufacturers involving holding companies or cross shareholding include the Bofors/DASA 'Taurus' stand-off munitions venture and the 'Bonus' smart munitions venture between Bofors and GIAT.

Collaboration in marketing is a relatively new venture, especially when two or more manufacturers are essentially promoting only one partner's product. Significantly, that product, the Gripen, is the only fourth generation multi-role fighter in service and available on the export market. British Aerospace is also involved in helping Saab to modify and upgrade the aircraft to meet potential customers' requirements. One such area where modification could be crucial is in re-engineing the aircraft to obviate any embargo that the US company, General Electric, which makes the Gripen engine, could impose.

The Saab Story

Another distinctive feature of a number of Sweden's defence manufacturers is that they are wholly owned, or owned in part, by Investor AB. This includes Ericsson, Scania, Saab as well as more civilian market oriented companies such as Electrolux, Astra, SKF, SAS, and Atlas Copco. Investor AB was one of the financial companies that led the flight of Swedish capital into Europe in 1990 when the Swedish economy got into difficulties. It should therefore be no surprise that in the light of calls for a rationalisation of the European defence manufacturing sectors rationalisation, Investor AB should attempt to adopt "a strategy to broaden ownership of Saab AB and strengthen the company's long-term potential"³⁰. Investor put 50% of its holding in Saab AB up for sale; British Aerospace, which had been looking to expand its holdings within Europe as part of an aggressive rationalisation policy, immediately took up the offer and now has a 35% ownership of the company.

From the statement of the Investor and Saab AB Chairman, Mr Anders Scharp, it was clear that the release of Saab's shares was done in anticipation of the British Aerospace purchase:

*With one of the leading players in the European aerospace industry among its owners, Saab's opportunities to take part in forthcoming industry restructuring are further enhanced.*³¹

And that is not all: since Saab AB are also owners of Saab Dynamics, British Aerospace has now acquired a 35% ownership of that subsidiary. When put alongside British Aerospace's 49% ownership of the missile manufacturers Matra BAe, a second step along the path to European missile manufacturing restructuring has been taken. Of note is the Memorandum of Understanding that Saab Dynamics signed with Matra BAe Dynamics, Alenia, GEC-Marconi and Lenkflugkorpersysteme (LFK) for the development of a new air-to-air missile, the Meteor.³²

Further along the line, Saab is a 60% joint partner with Ericsson of Space, a division within Saab that produces on-board computers, antennas and other electronic equipment for the space industry and which has contracts with Astra 1K, the world's largest telecommunications satellite.³³ They also have joint ownership of another Saab division, Avionics, which produces systems for electronic warfare, display and surveillance. These two divisions now lead BAe into a partnership with Ericsson. The path has been made possible, and to some extent easier, by the fact that Sweden's defence manufacturers are in the private sector. Through cross-shareholding and share transfer, mergers and partnerships can be created where synergy and technological compatibilities can be found. The opportunity for industrial rationalisation between private defence manufacturers and state owned defence companies is a more hazardous undertaking and may well have to be limited strictly to co-operation and joint venture rather than structural rationalisation.

A Lesson for Europe?

The Investor Group, which is now the major shareholder in, rather than owner of, Saab also owns Ericsson; it has set something of a precedent in having BAe become part owner of Saab. The group's strategy is initially to work closely with BAe in anticipation of greater participation in the restructuring of European defence manufacture.³⁴ Through association with British Aerospace not only Saab but also the Investor Group, with its ownership of companies with high technology products, and a record of efficiency and product flexibility, have contributed significantly to the process of European industrial restructuring. They have done this most recently through cross-shareholding, arguably the most promising way forward. Initially, this has been in the aircraft, missile and avionics fields. It is possible that Ericsson's defence

interests could be the next in the electronics fields as far as Swedish national security restrictions will allow. Bofors have already moved down the path of joint ventures and Kockums have been involved in collaborative ventures in Australia.

Once outside the mainstream of European defence, Sweden is now, as a matter of commercial as well as government policy, very much involved in the process of European defence restructuring. Indeed, it is capitalising on its technological assets and its commercial structure. The two combined have made Swedish defence companies attractive prospective partners in the process of European defence restructuring.

4. PAST (AND POSSIBLE FUTURE) PATTERNS OF EUROPEAN DEFENCE CO-OPERATION AND CONSOLIDATION

Cross-border European defence industry co-operation has, in the past, taken two main forms: management companies and Groupements d'Intérêt Economique (GIEs). Both these arrangements are usually used for specific projects, or related projects. (The most important of these co-operative arrangements are summarised in Appendix 2, Major European Defence Co-operative Projects, April 30, 1998.)

A management company is formed by the participating companies in one of their home countries and it manages the project(s) on behalf of the partner companies. These management companies do not usually hold any assets in the partner companies and develop corporate strategies only for this specific project(s). Two examples of management companies are the Panavia and Eurofighter Jagdflugzeug companies (GmbH) formed in Germany to manage the Tornado and Eurofighter programmes.

A Groupement d'Intérêt Economique (GIE) is the French term for a Grouping of Mutual Economic Interest. These GIEs are cross-border alliances, not independent legal entities, and have no corporate assets or employees beyond small headquarters, marketing and administrative staffs. Profits, losses and taxes are born by the partners in their own countries in proportion to their share in a programme, while the corporate laws of the partners' host countries apply. The best known GIE is Airbus Industrie where participation is divided between Aerospatiale (37.9%), BAe (20%), DASA (37.9%) and CASA (4.2%).

Both these forms of co-operation, joint venture companies and GIE partnerships, are inefficient and have been unable to produce internationally competitive products without government subsidies (either declared or disguised). One important cause of their inefficiency is work-share agreements that establish strict work-shares between participating countries and companies and are enforced by the participating governments. These agreements push up costs, reduce business efficiency and greatly restrict management freedom. Other important causes of their inefficiency are that their organisations are top-heavy with superfluous joint venture companies and management layers, while national politics frequently influence the selection of manufacturing sites and components suppliers. For the Eurofighter, these inefficiencies are thought to have increased the unit cost of each aircraft by some 20%.

However, a third form of European co-operation has emerged with the establishment of Matra BAe Dynamics that probably represents,

in structural terms, the model for the future of European defence consolidation: a completely private sector multinational defence company that is internationally competitive. However, while the company has, as noted below, won its first order from an international competition, it is experiencing difficulties in producing the efficiencies that might be expected from a merger, partly because the former Matra elements are reluctant to release their most advanced technology to the new company.

The UK and French governments had to approve the merger and national legal constraints still exist concerning nuclear weapons technology and foreign export regulations. But these are not considered to be major obstacles to the significant management changes and production rationalisation that are now underway. This approval by the British and French governments was also important because they, like the German governments, hold "golden shares" in their main defence companies or have legal powers to prevent foreign ownership of defence companies. These "golden shares" are a special form of share holding that give government power of veto over strategic issue such as ownership, appointment of key personnel and some aspects of product development. These governments have said that they will only modify their holdings of golden shares to form a pan-European company.

**Future Patterns:
Consolidation via Euroco?**

In principle, the most important parts of European defence consolidation seem likely to proceed in 1998-99 along the lines suggested by John Weston's proposal for *Euroco* and to follow the pattern set by Matra BAe Dynamics, that is, the establishment of a number of completely private sector multinational defence companies that are internationally competitive. However, in practice, consolidation is likely to be rather less tidy than suggested by Weston's proposal, or the proposals European industry submitted in March, 1998, for three reasons. The first is that there remains an important division between two different governmental and corporate views on how consolidation should occur. On one hand, the British government and corporate view, shaped by industry's experience of former Prime Minister Margaret Thatcher's policies of commercialisation, is that consolidation had to produce commercially competitive groupings, relatively free from government interference to preserve jobs and national industry assets. This view is largely shared by the current German government and industry. On the other, the French government and corporate view is that while consolidation should produce more commercially competitive groupings, they should continue to receive as much government support as can be afforded to protect jobs and preserve national assets. The Italian and Spanish governments and industries have taken a similar view in the past, although they are now indicating a preference for private sector solutions.

The second reason is that, as the statement by the then BAe Chief Executive Sir Richard Evans quoted at the start of this study shows, it will be extremely difficult to work out arrangements to consolidate privately-owned and state-owned (or state-controlled) companies. But the form the *Aerospatiale* shareholding in Airbus takes in the SCE may set a precedent for future arrangements. The third reason is that while the basis for consolidation clearly exists in Airbus, Eurofighter, Matra BAe Dynamics (missiles) and Matra Marconi Space and Thomson-CSF-Alcatel Alsthom-Aerospatiale Space, the basis for consolidation in other sectors of industry are not so clear. Indeed, some sectors and companies may, for a variety of reasons, be unable to participate in consolidation.

**The Civil Aircraft Component:
Airbus**

The civil aircraft component of *Euroco*, based on Airbus, is the most advanced and should be in place by 1999. The Airbus Groupement d'Intérêt Economique (GIE) in which *Aerospatiale*, BAe, Daimler-Benz Aerospace (DASA) (Germany) and Construcciones Aeronauticas (CASA) (Spain) are partners (with, respectively, 37.9%, 20%, 37.9% and 4.2% partnerships) will be converted into a Single Corporate Entity (SCE). Negotiations establishing the SCE are to be completed by the September, 1998 Farnborough Air Show and the SCE is to be operating by mid-1999. The Airbus SCE will be so large (in 1997 its revenue was \$11.6 billion) that within a few years most European civil aircraft manufacturers will be its partners or subsidiaries. In addition, the Airbus Military Company would develop the Future Large Aircraft (FLA) military airlifter if the British, French and German governments can ever agree on their requirements for the FLA, which seems unlikely.

Since the French government has a 100% shareholding in *Aerospatiale*, it will have to decide how to transfer *Aerospatiale*'s 38% share in the Airbus partnership to the SCE. This transfer will have a major effect on *Aerospatiale*, since the majority of its civil aircraft revenue is generated by its participation in Airbus, in 1997, \$5.79 billion out of total revenues of \$9.54 billion. The government may thus be forced to consider breaking up part, or all, of the remaining *Aerospatiale* so that its component businesses can join consolidated European industry groupings.

**The Military Aircraft Component:
Eurofighter**

The military aircraft component of *Euroco* will clearly be based on the four Eurofighter partners, BAe, DASA, Alenia (Italy) and CASA. BAe and DASA have done extensive design work on the Future Offensive Air System (FOAS), the intended Tornado replacement. It is understood that BAe has tentatively agreed with DASA to exchange 10% of its holdings in Airbus for a share of DASA's military business, another step in consolidation. BAe and Dassault have been closely involved in studies on future combat aircraft technology. The French company is keen to develop close

links with BAe as a way to maintain its long-term capability to design and built combat aircraft. BAe is also partnered with the team led by Lockheed Martin that is developing the Joint Strike Fighter (JSF). This suggests that other partnerships between European and American companies may be possible, even if the European companies are also part of a consolidated industry consortium.

The two main potential additions to the Eurofighter consortium in the medium-term would be Dassault and (perhaps) GEC-Marconi. Whilst neither the French government nor Dassault have shown any signs of wishing to end their relationship, Dassault's survival in the military aircraft business has been under threat ever since it became clear that France no longer possessed the resources to develop its own FOAS-type aircraft to replace Rafale. Given this economic logic, the French government's wish for Dassault's military aircraft interests to move under the wing of state-owned Aerospatiale seems unlikely to offer an industrially viable solution. The only alternative if Dassault is to survive in the military aircraft business may therefore be for the company to join the Eurofighter consortium.

GEC-Marconi is the largest British defence electronics company. The merger of BAe and GEC-Marconi has been discussed for a long time but has not occurred because of disagreements over the financial terms and personal rivalries at the CEO level. GEC-Marconi have also made repeated attempts to merge with a privatised Thomson-CSF and are still seeking to join with other European, or even American, defence companies. In April 1998, GEC-Marconi made perhaps its first consolidation move when it bought the US defence contractor Tracor, but there is little indication to date of their next move. Accordingly, GEC-Marconi are likely to seek participation in an enlarged Eurofighter consortium, or the guided missile and defence electronics component of *Euroco*, or both.

The Guided Missiles and Defence Electronics Component

The third component of *Euroco*, guided missiles and defence electronics, is likely to be based on Matra BAe Dynamics and the missile businesses of Aerospatiale and Thomson-CSF, plus, perhaps, GEC-Marconi. In 1997, Matra BAe Dynamics bought 30% of DASA's LFK-Lenkflugkorpersysteme GmbH missile business and is likely to exercise its option to buy up to 49% of LFK, which had 1997 revenues of \$441 million. In 1998, Matra BAe Dynamics is expected to buy the German Bodenseewerk Geraetetechnik GmbH (BGT) missile company, which had 1997 revenues of \$187 million. If BAe and GEC-Marconi were to merge, GEC-Marconi's guided weapons division would probably become part of Matra BAe Dynamics. Saab AB's missile division would also play a major part in any pan-European missile grouping.

Another major catalyst for the consolidation of the European missile industry is the UK Ministry of Defence's requirement for a Beyond Visual Range Air-to-Air Missile (BVRAAM) for its Eurofighters. The competition to supply this BVRAAM will be decided in late spring, 1999 and is between two teams. One is led by BAe Matra Dynamics and includes Alenia, CASA, GEC Marconi, LFK and Saab. The other is led by Raytheon and includes the Northern Ireland company Shorts (owned by Bombardier of Canada), Thomson-Thorn Missile Electronics of France, Diehl of Germany, Fokker Special Products of the Netherlands and Atlantic Research of the US. The winning team is also likely to secure large additional sales of BVRAAM to both European and export users of the Eurofighter.

The Space Systems Component

The fourth component, space systems, is likely to be based on two new companies to be formed in 1998. One is Matra Marconi DASA Space, to be formed by a merger between Matra Marconi Space and DASA's space business. The other is the new Thomson-CSF-Alcatel Alsthom-Aerospatiale space entity proposed by the French government in Autumn, 1997. The two groups may later consider merging, especially since both participate in Arianespace, which produces the Ariane family of Space Launch Vehicles (SLVs) and in satellite communications projects. (Matra Marconi DASA Space are partners with Motorola in the Celestri project and the Thomson-CSF-Alcatel Alsthom-Aerospatiale space entity is partnered with Loral, Mitsubishi, Toshiba and Spar Aerospace in the Skybridge project.)

Helicopters, Armoured Vehicles and Land Systems, and Naval Construction

Consolidation is less advanced in the other three main sectors of European industry, helicopters, armoured vehicles and land systems, and naval construction, making it more difficult to predict how this is likely to proceed, or whether it will proceed. Three partnerships exist for helicopter manufacture, all run on the basis of sharing the work between the partners on an agreed basis, rather than on the most efficient basis. The first is the French and German partnership in the Eurocopter company. Aerospatiale and DASA have concentrated their helicopter activities in this company and own, respectively, 70% and 30% of this partnership.

Eurocopter's French element had an annual turnover of \$1.73 billion and became, in 1997, the largest helicopter manufacturer in the world. It is the prime contractor for the Tiger attack helicopter (through Eurocopter-Tiger GmbH) and has recently secured major sales of Cougar transport helicopters to Turkey and Saudi Arabia. The second is the French, German, Dutch and Italian partnership in NH Industries, which runs the NH-90 maritime and transport helicopter programme. The partners are Eurocopter SA, Fokker Aerostructures NV (the Netherlands) and via Agusta SpA (Italy). The third is the British and Italian partnership in European

Helicopter Industries, which runs the EH-101 maritime and transport helicopter programme. The partners are GKN Westland Helicopter Ltd (UK) and Agusta SpA.

These partnerships could form the basis for a European helicopter manufacturing consortium similar to the Airbus Single Corporate Entity and Matra BAe Dynamics, that is, run on commercial lines to produce internationally competitive products. This consortium could be formed by Aerospatiale and DASA transferring their interests in the Eurocopter partnership to it and having GKN Westland and Agusta join it. However, for this to happen, three major issues would have to be resolved. First, these companies would have to decide how to rationalise their production of competing helicopter types. For example, they produce three competing attack helicopters, the Eurocopter Tiger, the GKN Westland version of the US Apache (produced under license) and the Agusta A-129. Second, the French government would have to decide how the French government-owned Aerospatiale's 70% share in Eurocopter could be transferred to a commercial consortium. This would be an especially complicated issue as Aerospatiale is guaranteed, through Eurocopter, 42% of the work of the NH-90 partnership. Third, the British and Italian helicopter industries would have to decide how they would participate in a European helicopter manufacturing consortium.

Italy's Agusta and Britain's GKN made the first move in European helicopter consolidation when they announced in April 1998 a proposed linking of their helicopter operations. However no clear time table for such a move has yet to emerge, and it remains unclear whether the final link-up will take the shape of a full blown merger or a joint venture.

Consolidation in armoured vehicles and land systems is in its early stages. The British, German and French Ministries of Defence have established a joint requirement for a new Multiple Role Armoured Vehicle (MRV) and are expected to order respectively, 3,000, 2,000 and 1,000, while the Dutch may order 1,000. A total of 7,500 MRVs may be built at a cost estimated at some \$5-8 billion. Two teams, both of British, German and French companies (see Appendix 2), competed for this contract. In April, 1998, Euroconsortium (GKN (UK), GIAT Industries, Krauss Maffei, Rheinmetal and Wegmann) was selected as the winning team. The contract award for MRV is expected to be made in late 1998 after the German parliament has approved the order. Meanwhile:

Industry sources say the German government is determined to lead the land defence systems business in Europe and Krauss Maffei, which has already agreed to merge its defence operations with those of Wegmann, is seen as the pivotal player in achieving that dominance There has been speculation that GKN will now merge the [its] armoured vehicle business with Krauss Maffei or Rheinmetal.³⁵

However, Britain, France and Germany seem likely to maintain their single national tank manufacturing companies because they have no requirements for new tank design and production for the next 20 years. Each national company will thus be occupied with maintaining and upgrading existing tanks, including those exported. Each company will also attempt to secure additional export orders.

Limited consolidation is taking place in naval systems integration, electronics and Anti-Aircraft Warfare (AAW) systems via two European AAW frigate programmes. One is the British, French and Italian development of the Common New Generation Frigate (CNGF), Project Horizon, plus the Principal Anti-Air Missile System (PAAMS) for the CNGF. However, continuing differences in national requirements have delayed both the CNGF and PAAMS because the projected 22 CNGFs are to be identical, except for specific, negotiated items, such as the main radar. The other is the Dutch, German and Spanish Trilateral Frigate Co-operation (TFC) programme to build 12 frigates. This is more flexible, allowing for substantial variations to meet differing national requirements. For example, only the Dutch and the Germans are collaborating on the AAW system but Canada has joined them in the development of its APAR radar, to be used in Canada's mid-life update of its frigates. Spain is buying the US Aegis radar and Standard missile system.

Euroco: How Far and How Fast?

The economic and political arguments in favour of the consolidation of the European aerospace and defence industry via *Euroco* are compelling: it is the only way in which the major European companies can effectively compete, or collaborate, with the three major American companies, Boeing, Lockheed Martin and Raytheon on anything like equal terms. In industry competition, as in warfare, it remains true that "Size has a quality of its own". The fact that the Jospin government has recognised, however reluctantly, the logic of these arguments, even though they go against both established French policies and the government's Socialist policy preferences, shows how compelling they are.

From government and industry statements, it is clear that the report presented to the three governments in March 1998 was not a 'big bang' because it is clear that major differences remain between the major players at a governmental and corporate level. The main stumbling block for British and German industry is the French government's unwillingness to privatise Aerospatiale. However none of the parties said the consolidation process was over and it is clear that negotiations are still very active.

During April and May 1998, the British and Germans began to move ahead without the French in order to line up as much of European industry as possible on their side. In April, BAe bought a

35% stake in Swedish aircraft and missile group Saab AB. This is clearly a major step in bringing all Europe's missile interests - bar those in French state ownership - into the orbit of Matra BAe Dynamics.

The Spanish and Italians have come out squarely behind the British and Germans, agreeing to privatisation of important parts of their defence industry through mergers with foreign companies. GEC-Marconi is to link up with Italian defence electronics firm Alenia Difesa and GKN is to link up with helicopter manufacturer Agusta. German armoured vehicle companies are also to take a major stake in the state owned Spanish defence company Santa Barbara.

Corporate link-ups are expected to continue, bringing many of the elements of *Euroco* together without French participation. However while this in the short term serves to put pressure on the French, the British and German industry and governments clearly want the French on board, because the French defence market is one of the largest in Europe, French technical expertise is needed in many areas, and they want to avoid a damaging political rift.

However, it also seems likely that, for the reasons already noted, the consolidation to establish the four main components of *Euroco* is likely to be limited by a number of factors. The most important limit will probably be the difference between the British and French government and industry defence business cultures. It will be very difficult for countries where the French culture of government protection of, and support for, industry is dominant to adjust to the British culture of competition in the domestic and international markets. These countries include France and Italy, plus Spain. Indeed, one British industry view is that the French defence business culture is about 10 years behind the British in its understanding of what is needed to be competitive. The issue of government versus private shareholdings is likely to be the major sticking point in the consolidation process.

Three French government and industry decisions are thus likely to be important indicators of how far they are prepared to go in becoming competitive. The first will be the way in which Aerospatiale's partnership in Airbus is transferred to the Airbus Single Corporate Entity (SEC). If the French government really recognises the need for its industry to become competitive, it will make a transfer that will enable the Airbus SCE to operate as independently of government as any company its size can be and become fully competitive. The second will be the way in which the government privatises Thomson-CSF and the remainder of Aerospatiale. This privatisation will only make these companies competitive if the government is prepared to allow them to make decisions on a commercial basis.

On the other hand, consolidation seems likely to proceed fairly far and fairly fast in the guided missile and defence electronics and space components of *Euroco*. The missile sector is so far the most advanced and can be expected to see fairly rapid movement over the coming months.

One important factor that is hard to predict is the position GEC-Marconi will take. If the recommendations for consolidation include the merger of GEC-Marconi and if, with British government support, this is accomplished, then it would create a company between the size of Raytheon and Lockheed Martin.

5. THE EUROPEAN AEROSPACE & DEFENCE INDUSTRIES AND INTERNATIONAL CONSOLIDATION

As this study has underlined, there is little doubt that a strong economic rationale exists for a much closer collaboration among Europe's aerospace and defence industries. The aerospace industry produces complex products that require ever increasing up-front R&D investments and fixed production costs; it can therefore only face stagnant markets through consolidation and the removal of excess capacity. The limits of European national markets to sustain a competitive aerospace and defence industry, and the cost of duplicating research and production facilities across several European countries have long been recognised; yet the evolution towards the international integration of European defence industrial capabilities has been a drawn out affair.

The renewed sense of urgency over defence restructuring in Europe owes much to the brisk pace of defence industrial consolidation in the United States. This concern was expressed at the highest political level in the joint instruction issued in December 1997 by the UK prime minister, the German chancellor and the French president and prime minister to their countries' aerospace executives to produce an international plan to restructure their aerospace and defence activities. The plan was submitted, as required, by March 31, 1998. This instruction, and the response it generated, has focused press scrutiny on the supplier side of the required restructuring of European defence industrial capabilities, while diverting attention from the lack of progress in the customer side (i.e. the construction of a single European market for defence products and its harbinger: the development of a Common Foreign and Security Policy). Instructing companies to come out with plans in the absence of substantial progress in the construction of an European defence market was unlikely to result in decisive measures; and, according to all accounts, it has not. The resulting report, *European Restructuring in the Field of Aerospace and Related Defence Industries*, has not presented a clear strategy for integration, but rather maps the different ways forward facing decision-makers.

Aerospatiale, Daimler-Benz Aerospace and British Aerospace have different internal structures and, more significantly, very different shareholding structures. Aerospatiale is state-owned, Daimler-Benz Aerospace is a wholly-owned subsidiary of Daimler-Benz, and British Aerospace is a publicly-quoted company with no shareholder owning over 10% of the firm. Under these circumstances, the form under which a potential merger will take place is crucial to determine how control of the future company operations will be shared. Henri Martre, honorary chairman of the European Association of Aerospace Industries (AECMA), and ex-CEO of

Aerospatiale, wrote in an article in the *Financial Times* that the process of consolidation will be a gradual one and that "the original shareholders will maintain their national identities and control during our lifetime".³⁶

For an informed, independent view of this process of consolidation, a recent article by Charles Grant, Director, Centre for European Reform is particularly valuable. In "Europe Outgunned" (*World Link*, March/April, 1998, pp. 38-42) he notes, as we do, that "... for several years, the European companies have realised that unless they too merge among themselves they will end up being out-gunned by the Americans." and that "so far, only one coherent plan has emerged, that of BAe's joint managing director, John Weston. He argues that, for a start, Aerospatiale, Dassault, Dasa and BAe should pool their assets into a single 'Euro-co'. The defence industries of Italy, Spain and Sweden could join later." Grant adds that "Europe's defence companies are complaining that governments should be doing more to encourage restructuring; meanwhile, the governments say that industry should more clearly specify what they need to do. Both are right, but the companies more so."

Underlining the problem with what we call the demand side of the European defence industry, Grant points out that "the principle economic problem is not so much that America's defence market is bigger than the EU's, but rather that there is no single market in Europe. Even today, governments still foster national champions by feeding most procurement to home producers." And he adds that while France and Germany are officially committed to restructuring their industries, "in practice, their governments are hindering that goal."

Grant's reading as to whether defence partnerships will take on a Pan-European or transatlantic form is that a single European aerospace and defence entity is unlikely to come about. The reason for this, he argues, is two-fold. "One is that French firms will find it much harder than their British or German counterparts to work closely with the Americans. The other is that there may not be enough common weapons programmes to justify the creation of a Euroco It is more likely that two rival groups will emerge, one centred on BAe and Dasa, the other built around state-dominated French companies."

British companies, Grant believes, would do well to work with their American counterparts because "America is far ahead of Europe in what defence buffs call the 'revolution in military affairs', which is about huge advances in the gathering, processing and transmission and display of information about a battlespace America's weapons are now markedly more accurate and lethal than they were a decade ago. The Europeans are mere bystanders

in this military revolution - and they cannot afford anything else." In contrast, the message from France is that collaboration with the US is anathema. As Grant notes, "Thomson-CSF, Aerospatiale and Dassault may steer clear of the network of alliances that Dasa, BAe and Matra are stitching together."

Grant concludes by cautioning that further delays by European industry could prove damaging in the long term. "Lockheed Martin, Boeing and Raytheon will not sit politely on the sidelines while the Europeans discuss what to do," he asserts. "Fierce competition among the Americans is driving them overseas, as they hunt for new business." And while it is inevitable that "the Americans will form strategic partnerships with European defence firms, though not, on current form, with those in France," it is likely that "Americans will be the dominant partners in the future transatlantic teamings."

We would hope, however, that the accelerating pace of European consolidation may produce the basis for a more balanced set of transatlantic partnerships. In late spring, 1998, BAe bought 35% of the Swedish aircraft manufacturer Saab. Defence electronics giant GEC-Marconi also declared its intention take over US Tracor and set up a joint venture with Italy's Alenia Difesa. The Italian government's decision to privatise its defence industry has opened the prospect of a link-up between the helicopter manufacturer Agusta and Britain's GKN Westland Helicopters, while German companies look set to buy a large stake in the soon-to-be privatised Spanish armoured vehicle manufacturer, Santa Barbara.

Although all the companies concerned deny these moves are part of a strategy to put pressure on the French to privatise the state owned giant Aerospatiale, they have undoubtedly placed down some important markers. Essentially they have indicated that Europe's consolidation train has left the station, and there is now no going back.

The French Defence Minister Alain Richard announced in June 1998 that plans were to be made for the floating of Aerospatiale. However, he subsequently qualified the situation by saying that a link up with either BAe and DASA was not in France's interests in the first phase of any European consolidation. This was taken as a coded reference to French plans to draw Alenia Difesa and Agusta away from their British suitors. Italian sources at the June Eurosatory Defence Show in Paris indicated that they would rebuff the French approaches. France's isolation thus looks set to continue.

When such company mergers dominate the news, it is worth recalling that industrial consolidation is a process rather than the outcome of a single episode. European defence industries have been engaged in cross-border collaboration for some 40 years, and

have established complex nets of agreements, consortia, joint ventures and international companies. Mergers, on the other hand, may be implemented in many different ways, not all of which result in a sound integration of facilities and decision-making procedures. International mergers may neither be a necessary nor a sufficient condition in a process of cross-border industrial consolidation. For instance, even if an 'European Aerospace and Defence Company' (EADC) was to be created tomorrow, the resulting holding would still need to be operated to a large extent on the basis of national 'business units', at least until national practices in defence procurement procedures and requirements planning are 'merged' into an European defence market. With the Common Foreign and Security Policy still at its infancy national governments remain the main customers, and the development of a common European defence market will necessitate new inter-government agreements on defence programmes and defence contractual procedures.

On the supply side, there are many alternatives to the organisational structure of a future EADC. One possibility is the three-layer structure proposed by Henri Martre, with a holding company on top, and the (national) parent-holding companies in the middle layer, controlling a number of subsidiaries organised along product lines. In contrast, BAe for instance has been reported as preferring a single multinational private company with separate multinational divisions responsible for the activities in different product areas. Little agreement has been generated in this front. Meanwhile, the evolving shape of the European defence industry will continue to be defined by the accumulation of ongoing and future collaborations, acquisitions and mergers, rather than by any publicly defined strategic plan.

APPENDIX I

OWNERSHIP OF WESTERN EUROPEAN AEROSPACE AND DEFENCE INDUSTRIES, 30 APRIL 1998

This appendix is intended for use as a road map of the major Western European aerospace and defence companies. It quickly becomes apparent that ownership in Europe is a complex and confusing issue.

Notes

The company titles in bold refer to core companies and below them are subsidiaries, with the company's equity holding in them, base of operation and main activities listed.

Unless otherwise noted companies are publicly listed.

The companies have been grouped by the geographic location of their core elements.

The fragmented and disorganised nature of the European defence industrial base makes it very difficult to group companies by products or markets.

PAN- EUROPEAN

Matra BAe Dynamics (50% BAe plc(UK), 50% Matra Hautes Technologies SA (France)) (guided missiles/UAVs)
30% Lenkflugkorpersysteme (LFK) (Germany) (guided missiles)

FRANCE

Aerospatiale SA (France) (100% French Government-owned)
(civil aircraft prime contractor, guided missiles, space launchers, satellites and UAVs)

70% Eurocopter SA (France/Germany) (helicopters)

37.9% Airbus Industrie GIE (UK, France, Germany and Spain)
(civil aircraft)

34% Sextant Avionique SA (France) (systems integration)

SNECMA Group (97% French Government-owned)

100% SNECMA (aero engines)

50% CFM International (France/US with GE) (aero engines)

100% Société Européenne de Propulsion (SEP) (France) (space boosters)

100% Hispano-Suiza (France) (eros engines)

50% Techspace Aero (France, US with Pratt & Whitney and Walloon Govt) (maintenance)

100% Socata (France) (aeros engines services)

100% Messier-Dowty (France) (aero engine components)

50% Messier-Bugatti (France) (aero engines components)

Thomson SA (100% French Government-owned)
Thomson CSF (58% French Government-owned, to 43% by 7/98, with 16% to Alcatel, 6% to Dassault and 4% to Aerospatiale)
 (defence electronics, systems integration and guided missiles)

100% Hollandse Signaalapparaten BV (Netherlands)
 (defence electronics)
 100% Redifon Mel Ltd (UK) (communications systems)
 100% Thomson Thorn Missile Electronics Ltd (UK)
 (guided missile sub-systems)
 100% Thomson Training & Simulation SA (France)
 50.1% Thomson Marconi Sonar SA (France/UK) (sonar)
 66% Sextant Avionique SA (France) (systems integration)
 50% Thomson-DASA Armements SA (France/Germany)
 (possibly reducing to 30%) (armaments/ammunition)
 50% Pilkington Optronics Ltd (France/UK) (optronics)
 50% Shorts Missile Systems Ltd (UK) (guided missiles)
 27% Elettronica SpA (Italy) (to 49% by 1999) (defence electronics)
 25% Indra SA (Spain) (holding to decrease to 13%)

Direction des Constructions Navales (DCN) (part of French Government Sector) (submarines, conventional and nuclear warships)

GIAT Industries (part of French Government sector)
 (armoured vehicles, armaments and ammunition)

92% FN Herstal (Belgium) (being sold to Walloon Government)
 (small arms)
 50% CTA International (France/UK) (artillery ammunition)
 33% RGR Armement GmbH (Germany) (ammunition)
 40% (Proposed) Thomson-DASA Armements (France/Germany)
 (armaments/ammunition)

Lagardère SCA (France)
 (2.5% GEC (UK) and 2.5% DASA (Germany))

100% Matra Hautes Technologies SA (France)
 51% Matra Marconi Space SA (France/UK) (satellites)
 50% Matra BAe Dynamics SA (France/UK)
 (merger with DASA space business complete in 1998)
 (guided missiles/UAVs)
 27% Bodenseewerk Geraetetechnik GmbH (Germany)
 (guided missiles)

Alcatel-Alsthom SA (France)

50% GEC Alsthom (UK) (civil electronics & engineering)
 100% Chantiers de L'Atlantique (France) (naval systems)

Labinal SA (France)

100% Turbomeca SA (France) (aero engines)
 50% Rolls-Royce Turbomeca Ltd (France/UK) (aero engines)
 33% MTR GmbH (Germany) (aero engines)

Dassault Industries SA (France)

49.9% Dassault Aviation SA (France)
 (45.76% French Government stake to be transferred to Aerospatiale)
 (military aircraft prime contractor and executive jets)
 59.7% Dassault Electronique SA (France) (to join with Alcatel in a 25% holding in Thomson CSF by 1998) (defence electronics)

CMN (France)

(small warships)

Sema Group (France)

50% BAe SEMA (France/UK) (naval systems)

Panhard et Lavassor SA (France) (armoured vehicles)

UNITED KINGDOM

British Aerospace plc (UK)

(£1 golden share owned by UK Government)
 (military aircraft prime contractor and civil aircraft)

100% Siemens Plessey Systems (UK) (to be part BAe plc)
 (defence electronics)
 100% Royal Ordnance (UK) (ammunition, armaments and small arms)
 100% Heckler & Koch GmbH (Germany) (small arms)
 50% CTA International (UK/France) (artillery ammunition)
 33% RGR Armement GmbH (Germany) (armaments)
 50% Matra BAe Dynamics (UK/France) (guided missiles)
 49% STN Atlas Elektronik GmbH (Germany/UK) (defence electronics)
 51% EGA SA (France) (defence electronics)
 20% Airbus Industrie GIE (UK, France, Germany and Spain)
 (civil aircraft)
 50% BAe SEMA (UK/France) (naval systems)
 30% Archer Communication Systems Ltd (UK) (digital battlefield)
 35% Saab AB (aircraft prime contractor, guided missiles)

Racal Electronics plc (UK) (defence electronics)

30% Archer Communication Systems Ltd (UK) (digital battlefield)

Vosper Thornycroft plc (UK)

(small warships)

Alvis plc (UK) (armoured vehicles)

100% Hagglunds Vehicle AB (Sweden) (armoured vehicles)

GKN plc (UK)

100% GKN Defence Ltd (UK) (armoured vehicles)
 100% GKN Westland Helicopters Ltd (UK) (helicopters)
 50% European Helicopter Industries Ltd (UK/Italy)

General Electric Company plc (UK)

- 100% GEC-Marconi Ltd (UK)
(defence electronics/systems integration)
- 50% Alenia Difesa (Italy) Link to Alenia to be complete by 1998
(defence electronics)
- 100% GEC Marine (UK) (ship & submarine building)
- 100% Yarrow Shipbuilders Ltd (UK) (warships)
- 100% VSEL (UK) (warship, nuclear submarines and artillery)
- 49.9% Matra Marconi Space SA (UK/France)
(merger with DASA space business complete in 1998)(satellites)
- 49.9% Thomson Marconi Sonar SA (UK/France) (sonar)
- 80% GEC Alsthom (UK) (civil electronics & engineering)
- 100% Chantiers de L'Atlantique (France) (naval systems)

Vickers plc (UK)

- 100% Vickers Defence Systems (UK) (armoured vehicles)

Rolls-Royce plc (UK) (£1 golden share owned by UK Government)

- 100% Allison Engine Co (USA) (aero engines)
- 80% Rolls-Royce Turbomeca Ltd (UK/France) (aero engines)
- 33% MTU Turbomeca Rolls-Royce (MTR) GmbH (UK/Germany)
(aero engines)

Pilkington plc (UK)

- 50% Pilkington Optronics Ltd (UK/France) (optronics)

Bombardier Inc (Canada)

- 100% Short Brothers plc (UK) (guided missiles/aircraft structures)
- 50% Shorts Missile Systems Ltd (guided missiles)

GERMANY**Daimler-Benz AG (Germany)**

- 100% Daimler-Benz Aerospace (DASA) AG (Germany)
- 50% Thomson-DASA Armement SA (Germany/France)
(possibly reducing to 30%) (armaments/ammunition)
- 37.9% Airbus Industrie GIE (UK, France, Germany and Spain)
(civil aircraft)
- 30% Eurocopter SA (France/Germany) (helicopters)
- 100% Motoren und Turbinen-Union GmbH (Germany) (aero engines)
- 33% MTR GmbH (Germany) (aero engines)
- 57.5% Dornier GmbH (Germany) (aircraft/UAVs)
- 20% Fairchild Dornier Luftfahrt GmbH (Germany) (civil aircraft)
- 100% Eurobridge GmbH (Germany) (bridges)
- 70% Lenkflugkorpersysteme (LFK) (Germany) (missiles)
- 100% Siemens Defence Electronics Group (Germany)
(to be submerged in DASA in 1998)

Rheinmetal Industrie AG (Germany)

- 100% MaK Systems GmbH (Germany) (armoured vehicles)
- 100% Mauser Werke Oberndorf Waffensysteme GmbH (Germany)
- 26% STN Atlas Elektronik GmbH (Germany/UK)
(defence electronics)
- 51% EGA SA (France) (defence electronics)
- 33% RGR Armement GmbH (Germany) (ammunition)
- 100% NwM de Kruihoorn Bv (Netherlands) (ammunition)
- 100% Nico-Pyrotechnic Hans-Jurgen Diederichs (Germany)
(ammunition)

Thyssen Industrie AG (Germany)

- 100% Henschel Wehrtechnik GmbH (armoured vehicles)
- 100% Blohm & Voss Industrie GmbH (warships)
- 100% Thyssen Nordseewerke (warships)

Pressag AG (Germany)

- 100% Howaldtswerke Deutsche Werft AG (submarines)

Mannesmann AG (Germany)

- 49% Krauss-Maffei & Wegmann GmbH
(armoured vehicles & self-propelled artillery)

Diehl GmbH & Co (Germany)

- 78% Bodenseewerk Geraetetechnik GmbH (Germany)
(guided missiles)

Wegmann & Co GmbH (Germany)

- 51% Krauss-Maffei & Wegmann GmbH
(armoured vehicles & self-propelled artillery)
- 100% SP Aerospace and vehicles (Netherlands)

KUKA Wehrtechnik GmbH (Germany)

- (AFV turrets and systems)

SPAIN**State Holding Company (100% Government-owned)**

- 100% Construcciones Aeronauticas (CASA)
(military and civil aircraft prime contractor)
- 4.2% Airbus Industrie GIE (UK, France, Germany and Spain)
(civil aircraft)
- 100% Bazan SA (Spain)
(warships/submarines)
- 100% Santa Barbara (Spain)
(small arms, armoured vehicles and munitions)
(Krauss Maffei, Rheinmetal and Wegmann
to buy 40% stake in 1998)
- 75% Indra (Spain/France)
(25% Thomson-CSF holding to decrease to 13%)
(defence electronics).

ITALY**Finmeccanica** (63% Italian Government-owned)

100% Agusta SpA (Italy) (helicopters)

50% European Helicopter Industries Ltd (Italy/UK)

100% Alenia SpA (Italy)
(military and civil aircraft prime contractor)50% Alenia Difesa (Italy/UK)
GEC-Marconi link to be complete by 1998
(defence electronics)

100% FIAR SpA (Italy) (radar)

100% Oto Breda SpA (Italy) (armoured vehicles)

47% Elettronica SpA (Italy) (defence electronics)

Fincantieri SpA (Italian Government-owned)
(warship/submarines)**Fiat SpA** (Italy)

100% Alfa Romeo Avio SpA (Italy) (aero engine)

100% Fiat Avio SpA (Italy) (aero engines)

100% BPD Difesa e Spazio (Italy) (ammunition)

100% Iveco SpA (Italy) (armoured vehicles)

SWEDEN**Investor AB** (Sweden)65% Saab AB (Sweden)
(aircraft prime contractor / guided missiles)

50% Ericsson Saab Avionics (Sweden) (defence electronics)

27% Incentive AB (Sweden)

3% LM Ericsson AB (Sweden) (defence electronics)

Ericsson (Sweden)

100% Ericsson Microwave (Sweden) (defence electronics)

33% Ericsson UNIMOR (Poland) (defence electronics)

50% Ericsson Saab Avionics (Sweden) (defence electronics)

40% TERMA Elektronik (Denmark) (defence electronics)

50% NFT Ericsson Communications (Sweden)
(defence electronics)

40% Saab Ericsson Space (Sweden) (space)

Volvo AB (Sweden)

100% Volvo Aero Corporation (aero engines)

Celsius AB (Sweden) (28% Swedish Government-owned)
(In a corporate shake-up to take effect early 1998 the individual subsidiaries will be merged into Celsius AB as single corporate entity)100% Bofors AB (Sweden)
(armaments, ammunition and underwater weapons)

100% Celsius Tech Electronics AB (Sweden) (defence electronics)

100% FFV Aerotech AB (Sweden) (maintenance)
100% Kockums AB (Sweden) (submarines/warships)
100% Hawker Pacific (Australia) (aircraft repair)
49% Australia Submarine Corporation (Australia)
15% Raufoss Technology (Norway) (ammunition)**OTHER SMALL EUROPEAN COUNTRIES****Kongsberg Gruppen ASA** (Norway)

(51% Norwegian Government-owned) (guided missiles)

Raufoss Technology AS (Norway)

(50.3% Norwegian Government-owned) (ammunition)

15% Celsius (Sweden)

Patria Industries (Finland) (100% Finnish Government control)

Patria Vehicles Oy (armoured vehicles)

Patria Lapua Oy (ammunition)

Patria Finavitec Oy (aircraft support)

Patria Vammala Oy (artillery)

Steyr-Daimler-Puch Spezialfahrzeug (Austria)
(armoured vehicles)

Oerlikon Bührle Group (Switzerland)

100% Oerlikon Contraves AG (Switzerland)
(air defence, space, electronics and UAVs)

100% Pilatus Aircraft Ltd (Switzerland) (training aircraft)

100% Oerlikon Aerospace Inc (Canada) (surface-to-air missiles)

APPENDIX II

MAJOR EUROPEAN DEFENCE INDUSTRY CO-OPERATIVE PROJECTS, 30 APRIL 1998: PROGRAMMES, MANAGEMENT COMPANIES AND GROUPEMENTS D'INTERET ECONOMIQUE.

Management Companies

Combat Aircraft	Tornado Combat Aircraft: Panavia Aircraft GmbH British Aerospace plc (UK) DASA (Germany) Alenia SpA (Italy)
	Eurofighter Combat Aircraft: Eurofighter Jagdzeugflug GmbH British Aerospace plc (UK) DASA (Germany) Alenia SpA (Italy) Construcciones Aeronauticas SA (Spain)
	Eurofighter Engine: Eurojet Turbo GmbH Rolls-Royce plc (UK) Motoren Turbinen Union GmbH (Germany) Fiat Avio SpA (Italy) Industria de Turbo Propulsores SA (Spain)
	Future Large Aircraft: Airbus Military Company (This company is dependent on the FLA programme being authorised) British Aerospace plc (UK) DASA (Germany) Aerospatiale SA (France) Alenia SpA (Italy) Construcciones Aeronauticas SA (Spain) Tusas Aerospace Industries (Turkey) Flabel (Belgium) Industria Aeronautica de Portugal SA (Portugal)
Helicopters	Tiger Attack Helicopter: Eurocopter-Tiger GmbH DASA (Germany) Aerospatiale (France)
	NH-90 Maritime and Transport Helicopter: NH Industries Eurocopter SA (France/Germany) Fokker Aerostructures NV (Netherlands) Agusta SpA (Italy)
	EH-101 Maritime and Transport Helicopter: European Helicopter Industries GKN Westland Helicopter Ltd (UK) Agusta SpA (Italy)

Horizon Frigate	Horizon International Joint Venture Co. Ltd GEC-Marconi Naval Systems Ltd (UK) Direction des Constructions Navales (France) Orrizzonte SpA (Italy)
Missile for UK Horizon Frigate	UKAMS Consortium GEC-Marconi Ltd (UK) Matra BAe Dynamics (UK) BAe/Siemens Plessey Defence Systems (UK)
Armoured Vehicles	Future European Armoured Vehicle Two Competing Teams: Team International and Team GTK Team International Alvis plc (UK) Vickers Defence Systems (UK) Henschel Wehrtechnik GmbH (Germany) KUKA Wehrtechnik GmbH (Germany) Panhard & Levassor SA (France) Eurokonsortium/Team GTK GKN Defence Ltd (UK) Krauss-Maffei & Wegmann GmbH (Germany) GIAT Industries (France) TRACER Future Scout Vehicle Project (UK/US) Two Competing Teams: Team SIKA and Team Lancer Team SIKA GEC Marconi (UK) GKN Defence (UK) Raytheon (US) United Defence LP (US) Team Lancer BAe (UK) Vickers Defence Systems (UK) Alvis plc (UK) Lockheed Martin (US) ASCOD Armoured Vehicle Santa Barbara (Spain) Steyr-Daimler-Puch (Austria)
UK Digital Communications System	Archer Communication Systems Ltd (UK) 40% ITT Defence (US) 30% Racal Electronics plc (UK) 30% Siemens Plessey Systems (UK) (part of BAe from 1998)

Drevel UAV	Eurodrome STN Atlas (Germany) Matra BAe Dynamics (UK/France)
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Groupements d'Interest Economique (GIEs)

Airbus Airliners: **Airbus Industrie**
British Aerospace plc (UK)
(to be replaced by the Airbus Single Corporate Entity (not a GIE) in 1998-99)
DASA (Germany)
Aerospatiale SA (France)
Construcciones Aeronauticas SA (Spain)

Hot, Roland and Milan Tactical Missiles: **Euromissile GIE**
DASA (Germany)
Aerospatiale SA (France)

Trigat Anti-Tank Missile: **Euromissile Dynamics (EMDG) GIE**
Matra BAe Dynamics (UK-France)
DASA (Germany)
Aerospatiale SA (France)

Future SAM (Surface-to-Air) Missiles and
Principle Anti-Air Missile System (PAAMS): **Eurosam GIE**
Thomson-CSF (France)
Aerospatiale SA (France)
Alenia SpA (Italy)

ENDNOTES

1. *Aérospatiale: 1997, the year in review*, May 1998 (afterwards cited as *Aérospatiale: 1997 Review*).
2. *Aérospatiale 1997 Financial Statement*. Table on p.6. The debt has been reduced from FF 16,550 million to FF 939 million during this period improving the debt equity ratio from 2.84 to 0.15. The differences between national accounting methods and procedures which the authors highlight at p.21 serves in this case, in my view, to understate the profitability and thus the "value" of *Aérospatiale* certainly in comparison with that of BAe, based on the accounting methods and procedures which the latter uses.
3. See, for example, the report by *Reuters*, February 19, 1998, quoting Sir Richard Evans: "In London, [the-then] BAe chief executive Sir Richard Evans said it was not certain that the call for the restructuring of the European defence industry would succeed..... the main stumbling block was that while BAe and DASA have private shareholders, the French industry led by *Aérospatiale* was "a state-owned entity, totally dominated by government departments."
4. Whereas the whole of the share capital of *Aérospatiale* is (at present) owned by the French Government and the whole of the share capital of DASA is in a single set of hands, namely the German public company Mercedes Benz, the share capital of BAe is widely spread amongst investors and there is no block shareholding. In any amalgamation of the three as they are now organised there would be two large and thus influential shareholders, namely the French Government and Mercedes Benz, whereas there would be no BAe shareholding block of similar influence. BAe management therefore argues the need to break up these two other blocks. The view that the DASA block should be distributed is on the agenda of *Aérospatiale* as it considers proposals to open its capital as well as being effectively a *sine qua non* for BAe.
5. For the Alenia view see for instance the statements by Pier Francesco Guargalini, Chairman of Alenia Difesa *Jane's Defence Weekly (JDW)* 17 June 1998, p.26.
6. The enhancement sought is to replace the Advanced Air-to-Air Missile (ANRAAM) with a beyond visual range Air-to-Air Missile (BVRAAM). The essence of the competitive tendering process for this is whether one contender (Meteor) will be accepted primarily on the basis that it is presented as a European candidate, developed by the same consortium that builds the platform or whether the other proposal, possibly better and certainly more proven, is preferred despite the fact that it is led by an American company (Raytheon).
7. *European Initiatives to Integrate the Defense Market*, United States General Accounting Office Report to the Secretary of Defense October 1997 GAO/NSIAD-98-6. 26 pp, 6 Tables, 3 Figures and Appendix. US General Accounting Office P0 Box 37050 Washington DC 20013 Fax (202) 512-6061. First copy free further copies \$2 each; VISA and Mastercard accepted; also available via Internet (<http://www.gao.gov>)

The authors strongly commend this report as a clear, systematic and helpful description and appraisal of events up to the date of publication and for the insights which it provides into the division which I have described in US views.
8. The Centre for European Reform is funded principally by industry and describes itself as paying "close attention to the business agenda ... favours a competitive, outward-looking Europe [and] represents a younger generation of professionals, business people and academics." Prime Minister Tony Blair describes the CER in its promotional literature as "a valuable source of constructive and independent thinking on the future of the European Union."

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