A Triumph of Unreason

A Political History of Concorde

by

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Preface

Concorde was far too late in flying to form part of my 'plane spotting days, but as a youthful enthusiast, I am sure I would have been one of its strongest supporters. Even much later, watching its evening final approach into Heathrow against a setting sun from the window of the old library in the Royal Aeronautical Society headquarters, never failed to impress; seeing the fuselage float down the Thames on a barge to a museum resting place was a sadder moment. Even a dispassionate political economist could not fail to be distracted by the beauty and the technical achievement exemplified by Concorde.[1] But, that is perhaps off the point; as I have argued several times before, a successful airliner has to make money for its makers and, where relevant, for those governments disposed to help them.

I first wrote about the politics of Concorde in my 1981 book about British civil aerospace policy.[2] I concluded then that despite its pioneering, and still to be superseded technical achievement, Concorde ended up a serious drain on the pockets of taxpayers in not one but two countries. And what a failure in monetary terms Concorde proved to be. At a cost to the UK and France of over £16 billion in today's money, only 14 entered service with the national airlines of Britain and France. Concorde eventually made money for British Airways – some £500 million over its 27 years of service – helped by a 'sweetheart' deal from the British government that

[1] Agreement on the spelling of Concorde with a final 'e' in the UK only happened in December 1967, when in a gesture to the French the British accepted a single spelling. I have used the French appellation from the beginning to avoid confusion.

[2] Keith Hayward, *Government and British Civil Aerospace,* Manchester 1983

effectively handed over the aircraft for a peppercorn fee. [3] But its glaring lack of commercial success cast a long shadow over decades of British Government civil aerospace policy, severely affecting attitudes to other joint European civil aircraft projects, notably the Airbus.

Sales were undermined by the operational constraints – primarily a prohibition on overland supersonic flights - caused by the sonic boom and engine noise on landing and take-off. More fundamentally, airline interest in operating a costly supersonic airliner faded in the face of a major shift in air transport economics created by the appearance of larger conventional aircraft – the 'Jumbo' age - with lower seat mile costs attracting a mass rather than an elite customer base. And ultimately, a world economic crisis depressing demand for air travel proved the final nail in its commercial coffin. But was Concorde intrinsically a failing project, unsound as a concept sustained only by politics? Was it, as a senior UK Treasury official wryly noted, "a triumph of unreason"? My conclusions tend to reflect this sceptical perspective: while there might have been some intangible and largely unquantifiable benefits, these were insufficient to balance the opportunity costs of its development. [4]

This time, I have been able to use the government records located in the UK National Archives at Kew – and my thanks again to the staff who had to process my applications. My overall assessment of Concorde has not markedly changed as a result, but the interplay of political and bureaucratic interests is more clearly seen and perhaps indicative of how poorly the UK Government machine handled

[3] A total of 20 Concordes were built, but only 14 entered airline service.

[4] The US Boom XB-1 is close to repeating the Concorde experience, albeit with fewer passengers. Its key selling point is that it hopes to irradicate sonic boom effects over land.

complex technology in the mid 20th Century. I am not so sure whether times have changed much in the interim. Costs are expressed in original input terms and usually without inflationary effects. Monetary values are usually expressed in Sterling but, following standard practice, aircraft prices are given in US dollars.

Finally, I would like to express a deep appreciation for the formidable proofing skills shown by Eileen Scholes; not only adept at catching my errors but also deploying her knowledge of the industry to great effect. All the remaining omissions and mistakes are mine, and mine alone.

Abbreviations

AFVG	Anglo-French Variable Geometry
AI	Airbus Industrie
AST	Advanced Supersonic Transport
BA	British Airways
BAC	British Aircraft Corporation
BAe	British Aerospace
BEA	British European Airways
BOAC	British Overseas Airways Corporation
BoT	Board of Trade
CAG	Comptroller and Auditor General
CDC	Concorde Directing Committee
CPRS	Central Policy Review Staff
DEA	Department of Economic Affairs
DOC	Direct Operating Costs
DoI	Department of Industry
DTI	Department of Trade and Industry
DoT	Department of Trade
EEC	European Economic Community
ELDO	European Launcher Development Organisation
EU	European Union
FCO	Foreign and Commonwealth Office
HMG	Her Majesty's Government
HSA	Hawker Siddeley Aviation
IATA	International Air Transport Association
ICJ	International Court of Justice
MoA	Ministry of Aviation
MoD	Ministry of Defence
MoD (PE)	Ministry of Defence Procurement Executive
MoU	Memorandum of Understanding

Mintech	Ministry of Technology
RAE	Royal Aircraft Establishment
PAC	Public Accounts Committee
PDC	Public Dividend Capitalisation
PESC	Public Expenditure Survey Committee
SST	Supersonic Transport

Introduction

Developing Concorde was likened by one British official to 'Europe's Apollo Programme': transporting 100 passengers across the Atlantic at Mach 2 was, to say the least, a challenge to the Anglo-French team of designers and engineers. It was more than a simple step as a follow-on to the VC10 or Caravelle generation of airliners. It required a significant leap in the technological 'state-of-the-art', demanding *sustained* supersonic speeds while serving *carbon bleu* cuisine and champagne to 100 passengers. Of its near contemporaries, only the SR.71 Blackbird spy plane could match the duration at Mach 2 expected of Concorde, and without wearing passengers pressure suits. British and French engineers were working at the frontiers not only of science, but of aircraft design, and at the frontiers of human ingenuity in squeezing a quart of technology into the pint pot that was the Concorde airframe". Kenneth Owen neatly summarises the challenge, "to develop Concorde proved to be a unique achievement in the face of unprecedented technical and organisational difficulties". [1]

George Edwards compared Concorde to developing the VC10 and the Lightning at the same time, a process encompassing the construction of several "substantially different aeroplanes". The prototypes differed from the preproduction aircraft which differed from those

[1] K Owen, *Concorde: A New Shape in the Sky*, Janes 1982, p.59. For the full technical story of Concorde, see Tony Butler & Jean-Christophe Carbonel, *Building Concorde*, Crecy Publishing 2018. This is a superb study using both government and corporate archive material. There is a tale of an SR.71 mission near Cuba being asked to circle while a civilian aircraft passed nearby; at that altitude there was only one possibility, a Concorde flight to the Caribbean. The author was once asked on the BBC *Today* programme what made the Concorde so special? "Didn't aircraft often fly supersonically?" "Not for two or more hours" was my reply. Sadly, the occasion was a broadcast immediately after the Paris crash.

delivered to the airlines. Change to one area of design would immediately have a knock-on effect elsewhere in the aircraft. While superficially Concorde was another supersonic aircraft, it differed fundamentally from a military product in its requirement to fly at high speeds for several hours, and economically in terms of fuel. This placed especially stringent requirements on the design team. As a result, prediction of outcomes was less of a science than an art, a reality that was especially true of estimating costs. Matters were complicated in having to learn how to work with another national team. [2]

Developing the Bristol Siddeley Olympus to produce sustained supersonic speed was perhaps the single most difficult technical challenge. [3] Originally developed for use on the TSR.2, requiring a supersonic performance primarily for 'dash' speed near or over a target the Olympus for Concorde needed an almost total redesign of the engine, increasing thrust and fuel efficiency leading to a substantially heavier engine. A key development was the introduction of variable geometry engine intakes, bringing the improvement in range and payload needed to get 100 passengers across the Atlantic. However, the Olympus was a 'thirsty' engine, and while the cost of fuel remained low, this weas not an issue. The massive increase in fuel prices flowing the Yom Kippur war of 1973, proved to be a key issue in undermining the aircraft's commercial viability. [4]

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[2] Owen (1982), *op cit* pp. 59-69

[3] There were several others, including managing changes to the centre of gravity during flight and dissipating the heat generated by friction. Concorde also pioneered the use of electronic control systems in civil aircraft. See Tony Butler & Jean-Christophe Carbonel, *op cit*

[4] One of the controversies surrounding the engine choice is whether an all-new by-pass engine designed by Rolls-Royce might have been a better option. Higher initial development cost estimates might have been balanced by improved

As a conventional turbojet, using reheat on take-off, the Olympus was a noisy beast. In the early 1960s this was not appreciably worse than the existing generation of airliners and given the relatively few Concordes expected to be in service, this was not expected to be a major problem. However, from the mid 1960s, noise pollution began to emerge as a political issue on both sides of the Atlantic. The arrival of the much quieter high by-pass engine towards the end of the decade also began to focus attention on the noisier early generation aircraft, eventually leading to new and more stringent international standards. Concorde was a standout example of noise pollution, especially as the new generation of quiet wide-bodied airliners came into service. Despite attempts to 'baffle' the sound, by the early 1970s the Concorde was perhaps the noisiest aircraft in service, and increasingly the focus of environmental protest.

The sonic boom proved to be a more challenging issue. The sudden over pressures – audible as bangs or booms – created by a supersonic aircraft are disturbing and potentially damaging to property. This issue was considered from the early days of SST thinking but regarded as a problem to be solved in due time; it never was. Bans on overland supersonic flight had been in place in many countries for some time - in the UK from 1955. Theoretical studies in 1964 implied that the weight of Concorde would produce quite severe sonic effects, confirmed in many respects by trials conducted in 1965 and in 1967. The negative reaction to the last series of trials led to a premature ending of these tests. The French undertook a similar set of trials between 1962 and 1967, but at the time there was no obvious technical

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performance over the longer term and perhaps heading off some of the environmental objections to Concorde operations.

means of mitigating these effects. The sonic boom would prove fatal to Concorde's commercial prospects. [5]

This book is an overtly political study of the Concorde, and largely from a British perspective, using the UK official archival record at Kew. [6] It draws heavily on Treasury files, partly because, as UK's the central financial Department, it received key papers and memoranda from all the others, including the Cabinet Office and officials attached to No 10. The Treasury was also the source of the most protracted and often bitter opposition to Concorde. As a result, its officials provided some of the most dispassionate commentary (often darkly amusing) on Concorde's birth, development and ultimate demise as a commercial enterprise. The approach is historical, reflecting the view that "as technology is basically developmental, an underlying descriptive narrative tends to make better sense of an often-bewildering array of projects, both actual and proposed". [7] This is particularly apt when we are also dealing with the industrial, political and administrative systems of two nations, even if, as in this case, details of French policymaking are not covered.

Tracking the complex web of public policy and government decision-making stretching over two decades or more still requires a guide to the main continuing themes. The *leitmotifs* forming the spine of this book are as follows:

- *The legal dimension*
- *European policies*

[5] There were many other major technical challenges, including dissipating the heat generated by friction and developing the electronic control system, a first civil application. See Tony Butler & Jean-Christophe Carbonel., *op cit.*

[6] A discussion of the archival sources used in this book can be found in the Appendices.

[7] A. J. Pierre, *Nuclear Politics,* Oxford 1972, p.4

- *Industrial and technological momentum*
- *Public accountability of large-scale projects*
- *Controlling costs*
- *BOAC (BA) and Concorde*
- *Casting a long shadow*

The strength of the legal constraints, explicit or implicit, imposed or accepted tacitly by signing the 1962 Concorde Treaty protected the project from the first attempts by the UK to cancel the programme in 1965 and lasted in diminishing form until the final decisions to produce just a limited number of aircraft in the early 1970s. The most stringent interpretation of Britain's legal obligations would have had the UK paying the French the balance of the estimated cost of completing development at the point of cancellation. It is a blinding flash of retrospective analysis to suggest that any court order for damages up to the late 1960s might have saved the UK taxpayer a considerable sum.

The political significance attached to European policies, either generally membership of the EEC, or a range of general interests associated with developing or sustaining collaboration with its neighbours also had a continual impact on decision-making throughout the Concorde years. The combination of legal factors and different aspects of a European policy was perhaps *the* saving of Concorde against internal opposition. Had the UK achieved EEC membership in 1963 or 1967, the Treasury might have got a "no' to Concorde before too much money had been spent.

A rather more elusive theme is the role of technological and commercial optimism that lasted, albeit with diminishing force, into early 1970s. Even after Concorde's technical limitations – noise, boom and some performance issues – had undermined its commercial prospects, there was still enough positives for some to promote

further improvements to the basic design and even a Concorde 'Mark Two'. Technology, or rather the technological and related industrial momentum built up as Concorde progressed from idea to physical reality, is viewed as a subsection of 'techno-optimism'. By the late 1960s, and especially into the early 1970s, these factors would become manifest in the form of sunk costs and jobs – perennial considerations for politicians seeking re-election.

The reluctance of BOAC (and Air France) to pioneer supersonic operations, at least without receiving a heavy subsidy from the government, was another persistent theme in the story of Concorde. This was another episode in a longer running history of public policy linking British aircraft manufacturing to the responsibilities (so defined) of the nationalised airlines to 'Buy British'. The Concorde would prove to be the last example of this pernicious and often counterproductive doctrine and was one of the more positive outcomes of the Concorde experience.

The overarching problems of delivering the programme and associated issues of public accountability in delivering large-scale publicly funded projects were clearly manifest in the Concorde programme. Matters were not helped by the shifting locus of official and governmental decision-making over the course of nearly three decades of its development. [8] In many respects Concorde was a classic case of 'closed' decision-making largely escaping external and critical scrutiny. There was, of course, a growing weight of outside criticism,

[8] Officially this would begin with the Ministry of Supply, subsequently the Ministry of Aviation, the Ministry of Technology, the Ministry for Aviation Supply and finally the Department for Industry. In the early 1970s, responsibility for overseeing the contracts with industry lay with the Ministry of Defence Procurement Executive, but the Concorde policy team remained with Industry Department.

but central assumptions of commercial value and industrial worth were rarely exposed to external analysis.

One of the fascinating aspects of the Concorde was the unrelenting yet ultimately failing attempts by the Treasury to cancel the programme. Even as the idea of an SST began to emerge, Treasury scepticism was already primed by the poor record of public investment in civil aircraft development after 1945. However, the mounting evidence of Concorde's commercial failure and seemingly uncontrollable costs generated a persistent, often prescient, and almost always biting condemnation of the public money "wasted" on the aircraft. The Concorde would cast a long shadow over the principle and practice of government support for civil aerospace, nearly ending British participation in the Airbus and especially its world-beating A320 aircraft.

As presented here, Concorde is an extended case study of British technology policy making, complicated by an international dimension. The chapters are organised chronologically, from Concorde's origins in the mid 1950s to the decisions in the early 1970s to end construction at 20 aircraft. The political story did not end at this point (There is brief coda as an Appendix on hopes of further technical improvements to Concorde and even a Concorde Mark 2) but as the primary focus then centred on the negotiations with the Americans over access to East Coast airports, I am content to let others tell that tale. [9]

[9] The US access battle and talks on possible trans-Atlantic cooperation is well described in Kenneth Owen, *Concorde and the Americans*, Airlife Publishing, 1997. Owen uses archival sources from both sides of the Atlantic.

Chapter 1
Selling the Dream, 1954-62

Origins

Tony Butler and Jean-Christophe Carbonel record the 'birth' of Concorde, or at least a paper antecedent, in a sketch design for a Supersonic Transport (SST) proposed by Miles Aircraft in 1946. The idea disappeared in 1946 along with any hope of an early British supersonic breakthrough following the cancellation of the Miles M.52 research vehicle. [1] However, the concept was later nurtured by the Royal Aircraft Establishment (RAE) at Farnborough and in 1954, based on this initial work, a Ministry of Supply (MoS) committee was formed to investigate prospects for a civil supersonic aircraft. Not a propitious time, given the near contemporary loss of the Comet and its hoped-for lead over the Americans, but the RAE was not going to let this setback prevent consideration of the next generation of airliners. [2] This tentative start gained more substance in October 1956 with the formation of the Supersonic Transport Aircraft Committee (STAC) chaired by RAE's Sir Morian Morgan.[3]

Over the next four years Morgan's team, including representatives of Britain's major domestic aircraft and engine companies, examined the technical and some of the commercial factors that would underpin

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[1] Butler and Carbonel, *op cit,* Chapter 1. The M.52 was cancelled on financial and safety grounds. Subsequently, the UK lagged the US on average by three years in terms of developing and deploying supersonic military aircraft. Even France beat the UK by nearly a year in deploying a supersonic fighter.

[2] Report from the RAE on a Supersonic Airliner, April 1955, NA AVIA 63/6

[3] As Controller Aircraft at the Ministry of Technology (Mintech), Morgan would continue to play an important role in the Concorde story.

subsequent choices. Initially, the STAC considered both a medium range and a transatlantic design cruising at up to Mach 2, but soon decided that only the latter made commercial sense. A faster Mach 3 concept, as later adopted by the Americans, would require titanium structures, a more expensive and, to the British, a less familiar material. They recognised that take-off noise from reheated engines and the sonic boom might be possible problems, but solutions to both were expected to be found during development. [4]

The most important, and most enduring commercial assumption underlying STAC's commercial thinking, was the 'curve of speed', derived from the continual increase in average speeds of air travel since the 1920s. [5] Supersonic speed was the natural 'next step'. Early views on the potential market were "incredibly optimistic", ranging from a Ministry of Transport estimate of 130-210 aircraft to one of 300-500 from Vickers. [6] STAC's deliberations were secret and hidden from external scrutiny or independent validation, but its assumptions would probably have found few naysayers from most contemporary analysts. The team was already forming a powerful lobby encouraging the government to support a campaign to ensure the UK would have a leading role in the supersonic future.

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[4] *Ibid &* Kenneth Owen, *New Shape in the Sky*, *op cit*, Chapter 3

[5] The behavioural scientist Rory Sutherland makes an intriguing case that Concorde was part of a wider social obsession with speed originating in cultural movements like Futurism and other technologically driven ideas of progress. Concorde also fitted in with an exercise in nation building and post-war recovery in the UK, first been exemplified in the enthusiasm surrounding the Comet, but came to be associated with the Concorde as a signal that the UK could still lead the world in a post-Imperialist age. There was certainly much attention paid to the first flights in France and Britain and when Concorde entered service, the anniversary of which Sutherland records in a BBC *Archive on Four* programme broadcast on 28th February 2026.

[6] Owen (1982) *op cit*, Chapter 3

STAC delivered its final report to the Ministry of Supply (MoS) in 1959, advising the Minster, Aubrey Jones to back a comprehensive research programme. The report stressed the deterministic force of speed in civil aviation:

> "Supersonic flying is bound to come within the next ten years and unless the UK enters this field of development now it will be tantamount to withdrawing our aircraft industry from the civil aeronautics markets. It offers unique way of demonstrating this country's technical skill which could be of great commercial advantage if full use is made of the prestige value of such as venture. Since this country's future will depend on the quality of its technological products and since its scientific manpower and resources will always be less than those of the USA and the USSR, it is important that a reasonable proportion of such resources are deployed on products which maintain our technical reputation at a high level". [7]

This kind of thinking would in time be savaged by the Treasury, but at this juncture, the main audience was the technocrats and industrialists looking to recover a technological lead lost with the Comet disasters. It was also a sentiment likely to capture political imaginations. However, even if the SST was "in the nature of a prestige aircraft", the feeling was that it would ultimately bring economic and operational benefits. Industrial views were divided about the desirability of an SST; but if fully funded by the state, most were in "no doubt that the job will be taken on with some relish". [8]

[7] STAC report and recommendations, April-September 1959, NA AVIA 63/30
[8] MoS Meeting with SBAC, 16th April 1959, NA AVIA 63/30

Government support and first steps towards collaboration

In 1958 much of the aircraft industry would have 'relished' a juicy R&D contract.[9] The government was pressing industry to assume greater responsibility for funding conventional civil programmes on the back of launch orders from the nationalised airlines, BEA and BOAC. The MoS was advised by an official committee that while the aircraft industry should become an export-led, self-funded civil business, the industry should also expect some government help in launching an SST. [10] The SST was thus already regarded as a special case and the government poised to fund the early stages of research.

The STAC's work stimulated brochure studies by several companies. Armstrong-Whitworth put forward three ideas, Avro based its submission on its (cancelled) supersonic bomber, and de Havilland, Handley Page, Vickers, Shorts and Vickers added their penny-worth. The Bristol team, led by Archibald (later Sir) Russell, offered the Bristol 198A, an aluminium, 100-seat Mach 1.8 design, employing the Bristol Olympus engine under development for the TSR.2 bomber. Aubrey Jones duly offered a study contract, sufficient to explore the concept, but without "committing the government at this juncture to any great expenditure". [11] Bristol (later absorbed by the British Aircraft Corporation) was awarded £700,000 to investigate Russell's concept. As the BAC 223, this would become the chosen British design in subsequent discussions with the French.[12] Not everybody in the

[9] Much of the industry was reeling from a round of defence contract cancellations that had culminated in the 1957 Sandys' Defence White Paper.
[10] First Report by the Aircraft Industry Working Party, 18th April 1958, NA AVIA 65/1084
[11] *Ibid*
[12] Butler and Carbonel, *op cit,* Chapters 1 & 2; Hayward (1983), pp.54-5. The SST contract one of the few positive benefits brought by Bristol to BAC; the Bristol

industry was a fan of the SST. Sir Arnold Hall of HSA (a former director of the RAE) was deeply suspicious and even BAC's Sir George Edwards felt that it would drain money away from more conventional projects. However, once Bristol became part of BAC, bringing the SST research contract, Edwards became a powerful advocate for the project.

Even a rough guestimate of the likely cost of a fully developed SST seemed beyond the means of an independent British programme. STAC's first estimate of the likely cost was £68 million: a later MoS guess was £100 million, based on doubling the cost of the Vickers VC10, then Britain's most expensive civil programme. Aubrey Jones mentally doubled the £100 million and other commentators put costs as high as £300 million. At any level, the sums involved were too high for the UK to go it alone. The question would be with whom to cooperate? In September 1959, Jones proposed an approach to the French and the Americans jointly to develop an SST.[13]

The US was well ahead of the UK and the rest of Europe in developing and deploying supersonic aircraft including very high-speed research vehicles and large bomber designs. In February 1960, triggered in part by European (and Russian) work, the US Civil Aviation Board published a case for a domestic SST, worried that if a US programme was not soon underway, US carriers might be forced to buy foreign SSTs. All four US civil suppliers, Lockheed, Convair, Douglas and Boeing were already studying the issue and were prepared to begin development if guaranteed financially by the Federal government. [14]

Britannia was in deep trouble and its development had brought Bristol close to bankruptcy.

[13] Owen (1997) *op cit,* Chapters 1-3; I also interviewed Jones for my first book, Hayward (1981), *op cit*

[14] Butler and Carbonel, *op cit,* Chapter 4

But as became apparent, the Americans were thinking of a faster aircraft than the Europeans using more exotic materials.

The MoS first approached the Americans in September 1958, but the outcome was unpromising; the US was willing to cooperate on operational questions and considered using a Rolls-Royce designed engine for its SST research but their preference for Mach 3 meant that technically speaking the UK had little to contribute. [15] The French had begun preliminary work on an SST at much the same time as the UK, also combining industrial proposals with research conducted by ONERA, the French Farnborough. In December 1959, the French Government tasked Nord and Sud Aviation, and Dassault with its fast jet experience, to work on a feasibility study centring on a medium haul airliner, hoping to avoid direct competition with the Americans. However, Sud Aviation began work independently on a larger, trans-Atlantic concept labelled a 'Super Caravelle', which had some similarities to the Bristol Type 198A. [16]

In July 1959, the British Cabinet considered the SST question for the first time. Aubrey Jones explained the dilemma facing the government,

> "To embark on such a project would be costly, particularly in relation to the small market this country could offer for such an aircraft. On the other hand, not to embark upon such a project would be tantamount to the exclusion of this country from the field of advanced civil aircraft design." [17]

[15] *Ibid,* Chapter 4, p.85
[16] *Ibid,* Chapter 3
[17] Memorandum from Minister of Supply to Cabinet, 2nd July 1959, NA PREM 11/4612

Jones described how his initial contacts with the French had gone well despite his having to apologise on behalf of BEA for rejecting the Caravelle, even though it had a large British content. He told the French that it was important to recover from this "unfortunate experience" and to harmonise "our future projects to prevent a repetition of this unhappy state".[18] Jones might have had private doubts about the more optimistic estimates of the project's costs, but he had clearly swallowed the case for going ahead. Harold Watkinson, the Minister of Transport, and responsible for BEA and BOAC, was less enthusiastic, reporting that the airlines were largely lukewarm about an SST, wanting "at least a decade" to absorb the latest generation of conventional jet airliners. But if there was to be research on an SST, it ought to be together with the Americans. [19]

As for working with the French, his colleagues "laughed to scorn" the very idea. Despite the potential problems, even his officials preferred a joint programme with the US, suggesting that it would be "absurd" not to cooperate with "our obvious rivals" (the Ministry clearly felt that there were no "rivals" across the Channel). In their view, a European partnership would inevitably "lead to difficulties and delays". Less accurately, the MoS believed that the French had little to offer technically and their interest in collaboration was motivated by the limitations of French civil aeroengines. The Cabinet Office shared this opinion, advising Prime Minister Macmillan that "British cooperation with the Americans is more attractive, since they have greater technical and financial resources and would command a larger part of the limited potential market for the aircraft". Cabinet Officials suggested that "an early governmental approach to the Americans

[18] Exchange of letters between French and British Governments, 10th July & 6th August 1959, NA AVIA 63/20
[19] Note by Minister for Transport and Civil Aviation to the Cabinet, 22nd July 1959, NA PREM 11/4612

would be desirable". If trans-Atlantic cooperation proved "practicable, then presumably we should not continue negotiations with the French". But, hedging their bets, "in the meanwhile, we should try to keep the issue open with (the French)". [20]

For the moment, the Cabinet decided to put cooperation with France into cold storage, pending discussions with the Americans. Some on the French side were equally cool about the idea of working with the British, doubting the willingness or the ability of the UK government to spend the necessary money developing an SST. They had also detected a less than enthusiastic response from BOAC about the idea. Despite this equivocation, neither side ruled out the possibility of cross-Channel collaboration, noting that "French firms could immediately join the British in feasibility studies" should the opportunity arise. [21] For the British, however, one clear and powerful reason to throw their SST lot in with the French was emerging and it would introduce the most enduring case for Concorde – Britain's bid for membership of the European Economic Community (EEC). The SST could be a means to persuade the French of the bid's merits demonstrating British commitment to Europe.

A dowry for EEC membership

Within a year of the Cabinet's decision to put the idea of joint work on an SST with France on the back burner, Britain's 1960 decision to apply for EEC membership transformed the balance of collaborative SST options. From the outset, the French President Charles de Gaulle was deeply sceptical whether the Atlanticist British had discovered the 'European spirit', and he would take some convincing that the UK was

[20] Cabinet Office Note to the Prime Minister, 17th November 1959, NA PREM 11/4612

[21] Letter from M. Blanchard French Air Ministry to Aubrey Jones, and reply; 10th July and 6th August 1959, NA AVIA 63/20; Butler and Carbonel, *op cit*, pp. 57-8

really serious about the EEC. To London, cooperating on an SST would symbolise Britain's commitment to Europe. Duncan Sandys, the newly minted Minister of Aviation, was tasked to pick up talks with the French on the SST and other possible joint projects. The two sides exchanged information on their respective work on the SST, revealing that in many areas, the UK was indeed ahead of France. The French preferred a middle range aircraft, whereas the British had already decided that a trans-Atlantic airliner was the only commercially viable concept. The British also wanted Industry to contribute to the cost of development and to recover some of the government's contribution from a levy on sales – an approach the French felt to be unrealistic. Despite these differences, the first meeting ended with a sketch of possible collaborative arrangements.[22]

Another ministerial level meeting was held in April 1960, paralleling the first formal contacts between Sud Aviation and the newly created British Aircraft Corporation (BAC). Earlier in March 1960, BAC had revealed a detailed brochure/feasibility study based on the BAC 223 including a picture of how the SST might be developed as a collaborative venture involving several firms. Based on a Mach 2.2 design using conventional materials, the BAC 223 was aimed definitively at North Atlantic routes, costing £50.37 million. BAC also reported that contacts with American manufacturers had proved "negative and unenthusiastic"; as a result, collaboration with the US "does not appear to be possible". Talks with Sud had been more productive, with considerable similarities in design concepts and "proposals for collaboration were warmly received". Although there were technical differences between the approach adopted by the BAC and Sud there was sufficient convergence for the two firms to reach

[22] Note of meeting between UK and French officials, 27-8th October 1959, AVIA 63/16; Butler and Carbonel, *op cit,* p. 97

an outline agreement on a joint programme. [23] A similar presentation from Bristol Siddeley accepted that while a Rolls-Royce design (the RB.171/2) might be quieter, a derivative of the Olympus engine under development for the TSR.2 bomber would be cheaper. [24]

At the political level, Sandys and his French colleague agreed to take the discussions further. Sandys noted that the UK was not yet fully committed to the SST and was mindful of the risk of being first into the field, "losing a lot of money" in the process, but he was also aware of the importance of moving forward on the SST for the future of the industry.[25] However, hints of an alternative Anglo-American programme, no matter how vestigial, raised alarm in Paris. In February, the British Civil Air Attaché in Paris reported that the French might view talks with the US as further evidence of "perfidious Albion", with detrimental effects on potential military cooperation as well as the EEC application.[26] The UK Government had finally to make up its mind and to focus on one or other of the collaborative options. For the present, however, despite wider political interests building what would eventually prove to have an irresistible momentum towards working with the French, the government remained undecided whether to commit to an SST programme at all, let alone with whom.

In July 1960, the Cabinet considered memoranda about the SST from Sandys and the Chancellor, Derick Heathcote-Amory (replaced soon

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[23] BAC, *Supersonic Transport Aircraft – International Collaboration*, 6th July 1961, NA BT 242/154; Note from Chancellor of the Exchequer to Minister of Supply, 6th July 1961, NA PREM 11/4612

[24] BAC, *Supersonic Transport Aircraft – Feasibility Study*, March 1960, NA BT 242/270

[25] Meeting between Duncan Sandys, UK officials and French team to discuss general collaboration, 12th April 1960, AVIA 63/16

[26] Note from Civil Air Attaché Paris, 6th February 1960, AVIA 63/16

after by John Selwyn Lloyd). Sandys described progress to date based on the feasibility studies awarded earlier that year. He now favoured selecting one airframe and engine company to carry out a £1 million contract, mainly funded by the government, with the total cost of development estimated at £100 million. [27] Heathcote-Amory feared the exercise would be a wasteful and expensive enterprise and was "very much inclined to doubt whether we ought to consider going in for a project of this magnitude at all, except on the basis of collaboration with the Americans, and if they were willing to bear a large part of the development cost". Moving on to the next stage should be subject to the proviso that there should be no automatic commitment to go further. But he conceded that,

> "Unless British firms undertook these studies it would be impossible for us to explore the possibility of a joint project with American and perhaps with French firms. We could not afford to proceed with the development and production, as a solely British venture, of an extremely expensive aircraft for which the total world market would be very restricted."

Nevertheless, it was agreed to go ahead with further study, ready to have "a competitive basis for negotiations with a view to co-operation with the United States, or continental countries, on whatever project might eventually be agreed".[28]

With the first explicit intimation of a commitment building up behind the programme, Heathcote-Amory warned: "It will be increasingly difficult to abandon (the SST), and the government might find themselves committed to immense expenditure without having had full opportunity to consider the implications for the national

[27] Cabinet Minutes & Memoranda, 20th and 21st July 1960NA CAB/128/34
[28] *Ibid &* Owen (1997) *op cit*, pp. 20-29

economy". [29] Macmillan was also cautioned how "a small and relatively innocuous step carried a risk that the project will build up its own momentum and as time goes on it will become increasingly difficult to back out without the usual "disruption of skilled teams" and loss of national face". However, "the supersonic airliner project could be used as a card for entry (to the Common Market) (rather like Blue Streak if we develop it for space research) for closer political relations generally." [30] This political counterpoint would quickly come to dominate government thinking, overriding concerns about its cost.

And then there was one (partner)

At least the choice of a collaborative partner was becoming clearer. Further talks with the Americans early in 1961 confirmed their determination to develop a faster aircraft than envisaged by the British. It was also evident that American firms "seemed most reluctant to cooperate with each other, let alone a foreign competitor". Indeed, US industry and some of the American officials were downright hostile towards the idea of international collaboration. By 1961, the US was close to launching a full-scale study based on a domestic programme and there was little enthusiasm on the part of the new Kennedy Administration to open up the programme to outsiders.[31] Meanwhile, in October 1960, the British Government announced details of BAC's contract. With an American link fast disappearing, minds concentrated on collaboration with the French. In January 1961, Sud proposed a common R&D programme for a long and medium haul design using the same engine (the Olympus) and

[29] *Ibid*

[30] Cabinet Office Note to the Prime Minister, 13th July 1960, NA PREM 11/4612. The Blue Streak was originally under development as a nuclear armed ballistic missile, and had been cancelled in 1960, but was successfully proposed as the first stage of for the Europe Launcher Development Organisation rocket.

[31] Owen (1997) *op cit*, pp.29-34

other common equipment. These preliminary contacts went well and in June 1961, BAC and Sud announced an outline agreement based on a common prototype to be developed into two operational versions. [32] In July 1961, with the British Government confirming officially that it was applying for EEC membership, the impetus and political backing to open formal negotiations with the French on SST collaboration was given a conclusive boost. Even if working with the US was still not entirely ruled out, given the fundamental divergence on technical details and the way the political winds were blowing, it was an increasingly unlikely option.

With the European breeze now strongly favouring cooperation with the French to build an SST, the Treasury became concerned that any robust analysis of commercial viability would be ignored.

> "There is a clear danger that if no decision to abandon the supersonic airliner is taken during the next few weeks, HMG will then be confronted with an Anglo-French project commanding the enthusiastic support of both industries and both ministries. It will undoubtedly be represented as a striking example of European or Common Market co-operation and may be a great deal harder to resist than any purely British programme." [33]

Coming so soon after the introduction of a new government scheme for supporting civil aircraft development, the SST would add to an increasing commitment of public money to the aircraft industry. The Launch Aid scheme, introduced in 1960 to support industrial rationalisation, authorised the MoA to advance a proportion of the non-recurring costs of developing a civil aircraft or engine (capped usually at no more than 50% of the initial estimate), to be repaid from

[32] Butler and Carbonel, *op cit*, Chapter 5, pp.96-100
[33] Treasury Memoranda, 31st July 1961, NA T225/1743

a levy on sales. The government hoped that this formula would also apply to the SST. As Chancellor Selwyn Lloyd observed,

> "The MoA believe it has standing obligation to advance £15 million a year to aircraft industry. Any assistance was given to aid rationalisation and ease contraction towards a self-supporting basis. The SST is a test case of how matters will proceed. There is no reason to suppose that this proposition will be economically viable nor is it likely that, unless we win the day on the basic issue of policy, we shall be able to refuse assistance for other proposals as they come along". [34]

Lloyd and his officials were determined the SST would not be smuggled in by the MoA as a special case, believing that the SST would clearly be a "great risk and will not measure up to the very strict criteria that will have to be applied to all proposals for assistance to industry". He wanted a full inter-departmental study before "we engage in further governmental discussions at any level with the French about it".[35]

The SST would of course be subject to a full review prior to any major commitment. But Peter Thorneycroft, now Minister of Aviation, was already clear on the issue of risk. "Restricting investment to safe proposals is a complete illusion. This is a highly speculative industry in which great risks have to be taken. There is no safe or secure corner in it". [36] Nonetheless, the MoA team felt the Treasury was undermining their negotiations with the French, who seemed prepared to go ahead independently. This fear gained credibility

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[34] Exchange of letters between Chancellor and Minister of Aviation 17th August 1961, NA T225/1743

[35] Letter from Chancellor of the Exchequer to Minister of Aviation. 4th August 1961, NA PREM 11/4612

[36] *Ibid*

when the French announced formal support for the programme. The MoA wanted something similar, and urgently. Thorneycroft warned: "There is a serious danger that unless we are able to agree something of this kind, the negotiations with the French will break down, and that we shall lose the opportunity of sharing the cost of a supersonic airliner project with them". He also played what was emerging as the MoA's trump card, noting that "delay might also negatively affect the Common Market application". [37]

Collaboration with the Americans was now formally closed down – although wistful glances across the Atlantic would linger for a few months yet; and would periodically return to tempt ministers throughout the early years of Concorde development. In July 1961, MoA officials concluded that "investigations into the possibility of collaboration with the USA have been fruitless". They said the US had made it clear that if the UK was to be a partner, "it would be so subordinate as to be unacceptable to us". BAC had reached similar conclusions in talks with American firms. In short, the MoA concluded that "collaboration with the US could be dismissed". Moreover, officials believed that suggestions from the Americans that there might be opportunities for cooperation might be attempts to head off potential competition was the 'European' SST would be in service earlier than the more advanced US aircraft. [38]

On the other hand, talks with France were "more promising", with reason to believe that a "satisfactory arrangement could be arrived at". Nevertheless, "collaborative arrangements could clearly be most profitable if the manufacturers on both sides of the Channel could agree on a common airframe", reflecting continuing French preference for a medium-range SST. This was a problem as the longer-

[37] MoA briefing, 8th March 1961, NA SUPP 2967
[38] MoA Paper, summer 1961, NA AVIA 63/33