



Speech

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Breaking the Barriers

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Breaking the barriers

Thank's for the introduction John.

I am very honoured to be here and proud to have Sir John Parker on our board. I saw him described in a press article as being

- *A man you want on your side and a man you don't want to cross*
- We have him on our side and the take-over panel won't object to me saying that he has been very helpful on this project.

You will have seen the article in the FT about Ian King and me;

- Yes, this is a chance to unite two great companies that already share common ground
- we could potentially create a world class international aerospace, defence and security group.

But there really isn't anything else to add at this point.

[\[Introduction\]](#)

43 years ago today, Concorde became the first commercial aircraft to break the sound barrier.

- Within eight years, passengers were flying faster than the earth could turn and admiring its curvature over dinner.
- Yet by 2003, it was over.

The golden age of steam spanned over a century. Yet supersonic air transport for went from 23 miles a minute to the history books in just 27 years.

People were outraged by an apparent step backwards.

How could such a thing happen?

[Pragmatic engineering]

Well, perhaps the answer to that lies in the true legacy of Concorde.

- Not a new era of high-speed travel.
- Not even what we learned in terms of the technology and international co-operation.
- But rather, what we learned in terms of the need for more pragmatic engineering.

As Sir Bernard Lovell, of Jodrell Bank fame, put it:
“The simple belief in automatic material progress by means of scientific discovery is a tragic myth of our age.”

In other words, it's not just because the technology makes something possible, that it makes sense.

Concorde was an incredible achievement. But while pushing the complex laws of physics to their limit, it failed to meet the rather basic laws of supply and demand.

- Enormous fuel burn made operating costs and ticket prices too restrictive.
- People were just discovering long haul travel and standard flight.
- And with few big customers for spare parts, suppliers simply stopped making them.

Today, development costs are 10 times what they were for Concorde and this remains a capital intensive, long-term industry like no other. So the stakes have never been higher.

Look at the **products**.

The 747 was in service before some of you were born and the last A380 pilot has yet to be born.

- A new aircraft programme takes 20 years for a significant step change in technology. Production lasts about 25-30 years and the last one will fly for the same again. That gives us an 60-80-year cycle. There are military planes that will be flown for 100 years.

- It also explains why the average games console has more capability than some single-aisle aircraft.
- And why NASA ended up scavenging chips from old computers on eBay to keep the space shuttles flying.

Look at **operations**.

Negotiations across dozens of countries mean that upgrading air traffic control is as much about politics as it is about technology.

- Which is why kids use direct data links to play games, but we still use VHF radio for pilot to ground communications.

And look at the **research**.

It can take decades, not just to develop great technologies, but to identify how best to combine them.

- The Tornados and Brimstones the UK used to support Libya were only available because of investment back in the *seventies and eighties*.

So *big* timescales and *big* investments, but:

- Airline profits and military budgets are so *small* they need the benefits of tomorrow's technology, today.
- Environmental, political and security demands can change in a couple of months.
- And the many other industries that depend on air transport, satellites or cyber security, need to remain competitive and safe in a global economy operating to an entirely different schedule.

[The Challenge]

So how do we deliver on all of that?

How can we achieve a major turning point:

- Not just for our products.
- But for the industrial model to deliver them?

How do we balance:

- 60-80-year cycles for products with four million parts
- And a world where expectations change with an 8-minute Apple presentation?

How do we integrate great solutions from other industries and still safely maintain production schedules that allow us to fulfil our ambition to assemble an aircraft in less than a day?

With Concorde, the technology outpaced demand.

Now we're struggling to keep up.

Breakthroughs like laminar flow, open rotors, turbo shafts, biofuels and tactile technologies hold the key.

But the right solutions don't come fast, they don't come cheap and they certainly don't come easy.

Which is why Airbus' chief engineer, Charles Champion, constantly reminds the chief salesman that:

- Technology can do anything, but it can't do everything.
- There are choices and trade-offs to be made.
- Both in what we want to do and how we want to do it.

[Why aerospace is worth it]

Because aerospace may no longer set the pace for microchips.

- But it does still drive the pace of economic and social development. We were reminded of that when the famous unpronounceable Icelandic volcano interrupted this and there was a cost for our economy.
- And it does still drive engineering and technological advances for the manufacturing sector.

Combined with the defence sector, it also supports over a million highly skilled UK jobs and £22 billion in exports.

- That's not just with the big players like EADS, BAE or Rolls Royce. It's with a network of suppliers who provide up to 70% of the products' value.
- Spillover benefits mean that every £100 million invested in R&D is actually worth twice that to the UK economy; that goes for other economies too.
- And that's before you even start getting into the many other industries, policies and humanitarian efforts that depend on us.

So we connect lives, we save lives and we make lives better.

Or as John puts it - we are just one great big traction engine.

But sharing the benefits should also mean sharing the investment and sharing the risks.

In fact, many of you here today are in a similar situation. From engineering companies that could help jump start the economy.

- **If** we get the right support from government.
- ***If*** we can change attitudes to engineering.
- And ***if*** we ensure better co-operation between different companies and technology cooperation between different sectors.

So what can we do about it?

1. [Support from Government]

Let's start with government support.

- A recent survey looked at what 40 nations have done in the last decade to improve their innovation capacity.
- Both the UK and Europe were in the bottom half.
- With Europe already expected to account for just a tenth of the world's economic weight by 2025, that can't continue.

Now the UK government invests significantly less in aerospace R&D than some of its European neighbours. But it is getting a much bigger bang for its bucks.

- It's the third biggest producer of research, after the US and China.
- And the second biggest in terms of quality.
- So there are definitely some lessons to be shared in terms of spending smarter rather than just spending more.

I'm on thin ice here, I'm quoting a survey and there may be other surveys, but the audience in the UK will like this one; there are often complaints that things are bad, but not in aerospace; in aerospace you're still doing well.

It sounds like the Aerospace Growth Partnership is a good example, thanks to the leadership of Ministers from the Department of Business and Marcus Bryson from GKN.

Some of the results explain how the UK is able to redress that R&D spending gap.

- Wider co-operation with Typhoon partners Italy, Germany and Spain, to share expertise and drive exports for missiles, radar and defence systems.
- Investment in facilities like:
 - The £60 million UK Aerodynamics Centre announced by the Government at Farnborough,
 - The Airbus North Factory opened last year by the Prime Minister.
 - And new RAF simulators to improve both military and industrial capabilities.
- Not to mention funding for 500 Master degree places.
 - This Academy and the Royal Aeronautical Society are doing a great job of ensuring alignment with the partnership's long-term vision. I find that outstanding, also because I compare it with neighbouring countries like France, Spain and Germany.
 - And I'm particularly proud that virtually the entire team at EADS Innovation Works here in the UK are sponsoring Phds.

This kind of public-private co-operation is vital and we're making progress. But there's a lot more to do.

- Sure, the politicians have a role to play.
- But so do we.
- This partnership a golden opportunity and we need to grab it with both hands. It can also be a model for closer cooperation with other countries.

2. [Change attitudes to engineering]

It has to start with changing attitudes towards engineering. Without that, any investment in education, facilities and partnerships will never be fully effective.

- So, we need to attract the right people.
- We need to persuade them to stay throughout their career. It's one thing to attract them, another to retain them. A few years ago we lost quite a few to investment banking; not that I have anything against them; a prominent investment banker is sitting in the front row now. But interest in engineering is growing again; I can see that in my kids.
- And we need to share the knowledge, expertise and passion of the current generation before they head for the golf course. We need to learn from the nineties,

when we sent many people to early retirement because governments were co-funding it.

To give you an idea of the urgency.

- Up to a third of aerospace engineers are close to retirement.
- But only one in five school kids achieve proficiency in the core science subjects.
- Universities only produce around three quarters of the aerospace engineers we actually need.
- And only 40% of them follow non-engineering careers after graduation.

When you also realise that just a third of science and technology students are female.

- And that less than 10% of them pursuing careers in engineering.

Again, government and academia have a role to play in addressing those issues.

But, ladies and gentlemen, so do we.

First, we can show kids why engineering is such a great choice. Not just as a career, but as a way to shape the world. Their world.

- For many people, the loss of Neil Armstrong marked the end of an incredible era of progress.
- Guys like Armstrong or Chuck Yeager went to the moon and broke the sound barrier with less computing power than the smartphone in your pocket.
- But they didn't just break barriers to speed or space.
- They broke through *mental* barriers to what people thought was possible.
- They inspired a whole generation of us to work in aerospace and engineering.

I'm proof that you don't need to be an engineer to be bitten by the aerospace bug.

- And once you're hooked, you don't want to do anything else.
- That's why great engineers like Jenny Body retire from Airbus, only to end up becoming President of the Royal Aeronautical Society.

But now we're faced with a generation who consider it *banal* to watch images from Mars. So, we've got to find a way to ignite that spark.

- One of our young engineers, Rhys Phillips has gone as far as setting up a radio show called '*Pythagoras' Trousers*' to get kids hooked on engineering.
- But it can be as easy as offering internships, which are very important to warm up young people, or building school talks into a business trip.

Second, we can share our expectations in terms of matching grades and abilities. Apprenticeships are a great way into engineering and manufacturing. In fact, that's how Lord Hinton started on the railways.

- But we need to put the right kids in the right placements for it to work. For them and for us.
- Like so many aspects of engineering, the quality matters more than the quantity.
- But the results can be great. One of our A380 Customer Programme Directors, a guy called Steve Martin, started as an apprentice with BAe here in the UK. Now he also passes on that spark with kids coming for work experience in parallel with his normal job.

And that is closely linked to my third point. That we can help recognise the real value of engineering and rebuild its standing in society on a par with investment bankers, doctors or lawyers.

Again, the Academy is doing a great job of pushing this. But there are also some easy wins we can look at closer to home.

At EADS we offer engineers a choice of career paths to ensure help retain their passion.

- One of the biggest mistakes we made was to force people up the management ladder and they didn't like it. There were some who didn't enjoy managing people, they preferred to develop products. But we more or less forced them
- Now they have different career paths they can opt for. They can take the traditional management route or advance as engineering specialists, with equal recognition.
- It avoids frustrating people who want to stay hand on and still develop their career.
- And it means we can keep their experience and knowledge where we need it most.

- Interesting work, motivation and pride – engineering must be one of the few careers that can offer that right now.

3. [Wider co-operation]

All of which brings me to the last area we need to tackle: co-operation.

It's no great secret that there is a limited pool of real engineering talent, resources or investment.

Or that competition and economic cycles can shift even quicker than Chris Hoy on a carbon one!

Which means that British and European industry need to make better use of what they **do** have. That means co-operating. Wherever and whenever we can.

- Believe me, if Airbus can co-operate with Boeing, then anything is possible when it comes to sharing specialist expertise, generating growth and tackling the big-ticket items like safety or the environment.

And this is one area, where the people in this room - more than anybody else - can make a difference.

Just look at the number of different companies, sectors and countries we cover between us.

We need to make better use of opportunities available through organisations like this Academy and the Technology Strategy Board.

The Board's "*Catapult*" centres are there to help to drive cross sector co-operation. So pretty much everybody in this room can help bridge the gap between industry, academia, research and government.

[Pivotal technologies]

For over 200 years we've seen regular cycles of economic crisis turned around by a breakthrough in technology. Steam, textiles, steel, rail, jet engines and microchips were all pivotal.

There's no reason to think the same can't happen this time.

A whole host of new displacement technologies are just about to break through.

- with right support from government.
- with fresh attitudes to engineering.
- with better co-operation.

Take 3D printing.

- Unfortunately EADS didn't invent it, but we've been able to help adapt it to provide huge advantages for manufacturing.
- With materials like titanium in short supply, this could reduce waste from 90% to just 5% in aerospace production.
- It is going to be a manufacturing revolution.
- But it's hard to think of many aspects of industry that won't feel the effects of this technology.

The same applies to things like nanotechnology. Some of the guys working on it reckon that:

- With *chicken wire* thinner than a hair and lenses smaller than a decimal point.
- You will be able collect and share the energy from any window or surface. Without a grid.
- Free energy. Any time. Any place. It is not yet here, but just around the corner.

[Conclusion]

When Armstrong died the Mars Curiosity flight director tweeted that: “We will try to carry on your legacy.”

- But if you really intend to go to the moon, or break sound barriers, or solve energy or economic crises, or inspire a generation of engineers.
- You don’t try.
- You do it. Failure is not an option.
- So the risks must be managed, but they must be taken.
- *Not tried*.

This is an important point for me; we don’t try hard enough, as previous generations did, with greater risks, but they knew the risks and they took them.

That means we need debate and decisions on:

- What each nation sees as their priorities.
- Where they will stake their claim for industrial growth.
- How they intend to deliver.

Because breaking the sound barrier with Concorde was great.

- But breaking the barriers to education, innovation and co-operation,
- And delivering the kind of pragmatic engineering that drives responsible growth, improves people's lives and captures their imaginations.

Now, that, ladies and gentlemen, would be a legacy to be proud of.

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