

## PEOPLE

Hamilton Sundstrand is responsible for the blue riband of aircraft electrical power systems – the mighty 1.5-megawatt installation in the Boeing 787. Company president David Hess talks to *Brendan Gallagher*

## FACE THE FACTS WITH... DAVID HESS

**Q: How much does aerospace contribute to the overall Hamilton Sundstrand business and how is its share evolving?**

A: Aircraft systems account for about 70% of the total business, space for 10% and the industrial segment for the remainder. All three segments are healthy and are growing in volume while maintaining their respective shares. The aircraft systems side is benefiting from the strong recovery in the industry, and our space activity is expanding because we've been winning a lot of new contracts.

**Q: How does Hamilton Sundstrand compare with other major systems suppliers like Goodrich, Honeywell and Parker?**

A: Goodrich is very strong in actuation and a tough competitor in electric power, but doesn't have an environmental control system (ECS) business like ours.

Honeywell is strong in ECS and APUs, but we compare well with them in electric power. Parker's got great strength in actuation and fuel systems. So we think we excel in the breadth of our product line, and particularly in electrical power.

In the Boeing 787, for instance, we're responsible for generating all the power on the aircraft – 1.5MW in

total and at least three times as much as on today's 767. We're also the largest consumer of power on the 787, through the electrically driven ECS and the hydraulic pumps. Being a member of the United Technologies group – with its ACE quality programme and all the tools that that brings to bear on cost, execution and performance – gives us a powerful advantage across the board.

**Q: Goodrich has reorganised several times in recent years – are you satisfied with your corporate structure?**

A: There's certainly no one right answer. If there were, every aerospace company would have a similar-looking structure. But they vary from the new and more customer-focused Honeywell structure to the Hamilton and Goodrich models, which are more product-focused.

A product-centric structure offers great benefits in terms of accountability, profit-and-loss measurement, technology innovation, allocation of resources and prioritisation of work. But how do you go to market with 10 different businesses all banging on the door of a single customer? So for the 787 we overlaid a high-level structure that gave the customer a single focal point – a VP for the programme, one contracts

person, one aftermarket person. It seems to be working very well, but it's a dynamic thing and I'm sure we'll keep on tweaking it.

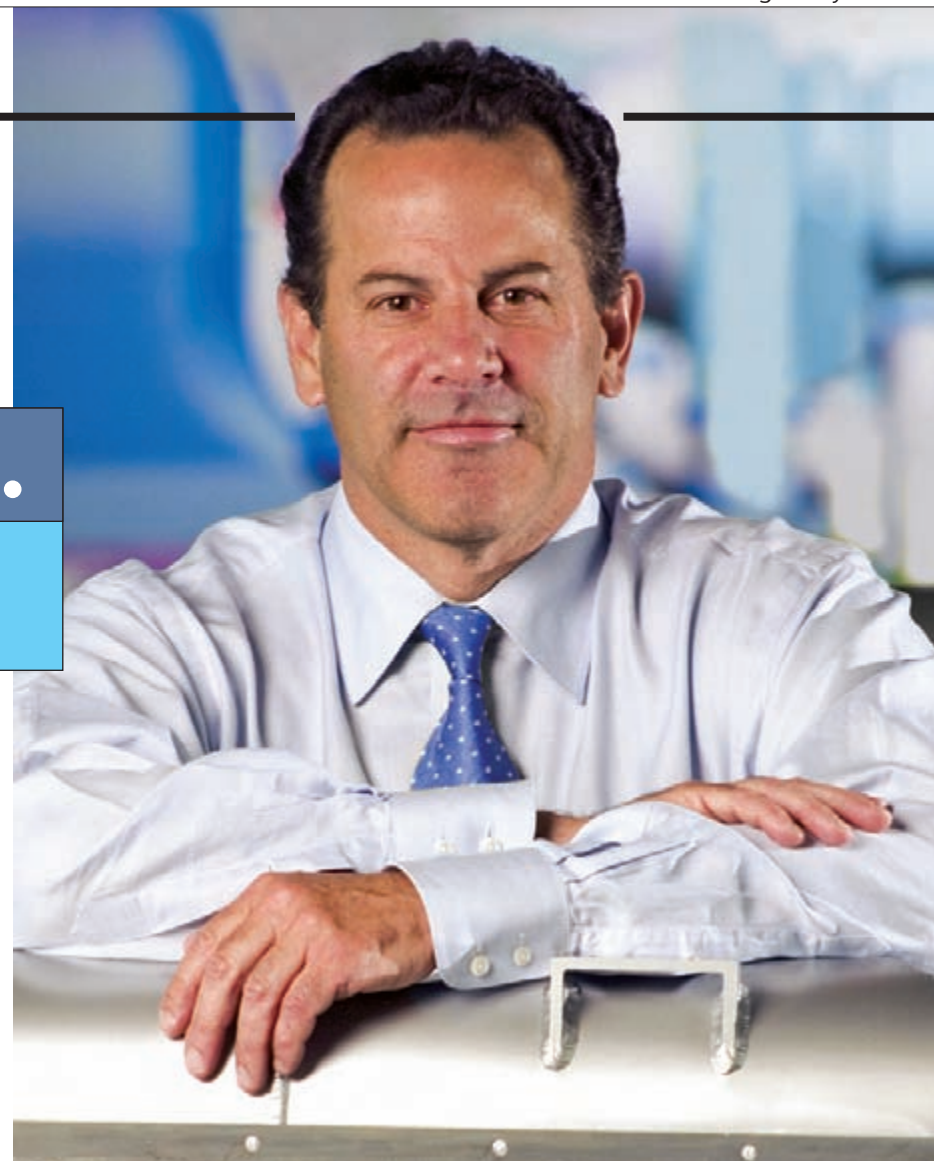
**Q: What do you see as your central technology opportunity?**

A: Power electronics – the technology behind motor drives and high-power electronics is advancing rapidly and was central to Boeing's decision to put its money on a more-electric architecture for the 787. Technologies like pneumatics and hydraulics have matured and are on a flat curve. But power electronics seems to offer a lot of runway for further improvements in generation and distribution, and that's where we're putting our focus.

We've developed a lot of new power technology for the 787 and we think it will give us value on other programmes in the future. Though Airbus hasn't yet embraced a 787-style more-electric approach, there are a lot of European studies of similar architectures that could be used on Airbus aircraft.

**Q: What's the typical business model for the supply of your products to customers?**

A: We have a spectrum of business arrangements, typified by the 787 programme. We can go



directly to the airlines with a variety of offers: from selling parts and doing the overhaul and repair work in our shops, to on-site support agreements under which we provide technical services, manage inventory, supply spares and carry out repairs on a fixed-rate basis.

In the last 12 months alone we've won more than \$2 billion in long-term business with airlines. Most of that is based on by-the-hour programmes, which are a growing trend in the industry. They help the airlines with cost predictability and give us both a reliable revenue stream and an incentive to continue improving the reliability of our parts.

Alternatively, we could participate in Boeing's Gold Care nose-to-tail maintenance programme for the 787. Boeing expects around 60% of its 787 customers to select this, and we're ready to play our part.

**Q: You supply ram-air turbines (RATs), APUs, fuel and other systems for Airbus types from the A300 to the A380. What are your prospects on the A350/A370?**

A: We're talking to Airbus about precisely what that aircraft is going to be, and I do think the configuration is starting to settle down. We've got quite a bit on the A330 today and some of that may carry over to the A350/370, as might systems we are providing for the A380.

**Q: Hamilton Sundstrand is good at RATs and APUs – how are you making them better still?**

A: Again, the 787 is a good example. Our success in winning the 787 APU is largely attributable to our being a United Technologies company. We were able to bring to bear engine technology from

Pratt & Whitney, from our own research centre and from our APU business in San Diego. The result is a world-class unit that's setting new standards in emissions, acoustic performance – this will be the quietest APU in service – packaging and cost. Probably our most impressive RAT achievement is the 2m (6ft) diameter unit for the A380. Developing something of that scale was made easier by the wealth of propeller knowhow we have in the company.

**Q: How much have you benefited from the recent resurgence in the civil turboprop market?**

A: The propeller market is a significant growth area for us, thanks not only to the civil turboprops but also to the upswell of activity in large military turboprops. We're developing the propeller for the Airbus A400M – 5.3m in diameter, eight composite blades, and able to absorb twice as much power as the Hercules C-130 propeller. A couple of years ago we developed a six-bladed composite propeller for the US Navy's E-2 and C-2. This has since been successfully flight-tested on the C-130, opening up the possibility of a very large retrofit market. So propellers are a growing business for us, with some interesting new opportunities on the horizon.



**“In the last 12 months alone we've won more than \$2 billion in long-term business with airlines. Most of that is based on by-the-hour programmes, which are a growing trend in the industry.”**

David Hess

## PEOPLE

The famous eagle of Pratt & Whitney can be seen in abundance around the Farnborough show site. Alan Peaford meets the man who is happy to give his company's detractors the bird.

## THE EAGLE'S NOT STRANDED

Stephen Finger doesn't have the look of a worried man. His office in Hartford, Connecticut is just a few miles from the house where Mark Twain penned some of his greatest work including the immortal line: "The report of my death was an exaggeration."

For Finger and his beloved Pratt & Whitney, Twain's response to speculation on his demise is rather apt. For some time the rumblings about the 'Big Three' engine manufacturers needing to be reduced to the 'Big Two' has been linked with P&W's reversals in the civil market.

But Finger, who is notoriously less than keen on media speculation, has heard it all before and now as president of the United Technologies (UTC) engine maker he is determined that the message gets out that Pratt & Whitney is very much alive... and kicking.

Finger has spent the past 36 years within UTC, 33 of them with Pratt and the other three heading up Sikorsky, which "was a lot of fun - I really enjoyed that," he says. But when the call came to return to Hartford, there was no doubt this was where Finger's heart is.

"It's interesting being away for a few years. You come back with a different perspective. It's amazing: the Pratt & Whitney eagle is everywhere."

Finger emphasises the 'everywhere'. "The neat thing about the business now is our portfolio. Just think about it - the commercial business is strong, the MRO business is very strong, the military business is very strong, Pratt Canada and its turbo-prop helicopter and business jet activities are very strong. The PT8 has come back very nicely, and the rocket business after the acquisition of Rocketdyne by Pratt & Whitney last year, very, very strong.

"If you think about it, we are the only propulsion

company in the world that has all those elements, that breadth of development. We have those six segments all the way from little engines to big engines, from ground-based to rocket engines, from military to commercial. It's a great business."

The revenues are also impressive. Last year the company recorded \$9.3 billion - the highest in its history. "This year we are on track to generate over \$10 billion in revenue, which once again will be the biggest year in the history of the company," Finger says.

But it is no longer all about manufacturing. "There are different kinds of ways to slice the business. One is an OEM (original equipment manufacturer) side of the business. The other is an MRO (maintenance repair and overhaul) side of the business.

"I like to call us an OEMRO and it almost works out that way. We are about 50/50," he says.

It was the move to a greater emphasis on MRO that fired shock waves through the industry in February when Pratt declared the formation of its Global Material Solutions (GMS) business with a "customer-led" intent to build and sell 55 spare parts for rival CFM's powerplant, the best-selling CFM56-3.

"We are the only company that is truly focused on the entire MRO business - not just on our engines but on other guys' engines as well," says Finger. "It's a philosophy we started 6-8 years ago when we bought the Braathens facility that we now call Norway Engine Center. We have several shops around the world that work on other engines beside Pratt & Whitney.

"We have literally thousands of repairs that we have developed for components for non-Pratt & Whitney engines. Of

course we also have tens of thousands of repairs for our own engines."

Finger is keen to demonstrate how the new Pratt & Whitney is breaking the mould. "There's more focus on the line maintenance part of the MRO business and in particular -and we are going to be highlighting this at Farnborough this week."

One such is P&W's Ecowash, an environmental friendly water wash that doesn't require taking the engine off the wing. "You don't have to pull it away from the gate even," says Finger. "You can water wash the engine on wing, in place, in a minimal amount of time, and it is showing substantial and impressive results. It is not only environmentally friendly in capturing the effluent through the water that comes out of the engine, but it is environmentally friendly because it restores significant fuel burn so that you burn less fuel."

### Positive

Finger discounts any suggestion that the commercial side is suffering. "We exceeded \$2 billion of revenue on the MRO side and on the OEM business we are seeing some really positive results there.

"The V2500 of which we are a major partner of IAE continues to sell extremely well. We just announced not too long ago the V2500 Select, which is an enhancement to the product both for fuel burn and durability.

"The GP7000, which is our Engine Alliance Pratt & Whitney and General Electric team together for the A380, is exciting."

Finger believes the investment the company is making in its research and technology will pay dividends. "We have been working on the geared turbofan for some time now. The original concept was 12-15 years ago. We have matured it.

"We have evolved the



configuration and believe that the geared turbofan uniquely provides a fuel burn advantage over an advance turbofan or any other concept, and a significant noise advantage, so we think the time is right for that. We think the new next generation single aisle is the right aircraft for that."

Finger shrugs off a suggestion that the GE-Rolls-Royce progress with a competitor engine for the Pratt flagship for the Joint Strike Fighter (JSF) might dampen his enthusiasm.

"The military business is doing great. The Pratt & Whitney F135 is the lead engine for the JSF. We have delivered the flight test engines, we are prepared and the engine is ready for flight later this year.

"But that's not all. The F-

22 with our F119 engine has entered operational service, and the US Air Force is very happy with it. Of course we also power the C-17 with the military version of the PW2000, the F117 engine.

"Meanwhile Pratt Canada is very strong in the smaller end of the business. They have produced 60,000 engines and there are 40,000 of those still in service, 179 aircraft models with 9,000 operators in 190 countries. Talk about a breadth of customer base."

With the drive to push ACE - the UTC operating process - through the business, Finger believes there will be even greater successes.

"Every single one of the very talented group of employees here has learned to focus on listening to the

customer. This is what it is all about.

"If you look at some of the things we are doing - like the GMS and in every one of our segments like the Eclipse - it's about listening to the customer and trying to provide exactly the product and the service that they want, whether it is an Eco power wash all the way to RS68 and the J2 for NASA.

"We are here to listen to what the customer is telling us and make sure we get the right answer for what they need."

So the demise of Pratt?

"Far from it," says Finger. "This is a neat time to be in the business, and especially if you look over the next few months, there are a lot of neat things that are going to happen.

"We are going to have our first FT8 operation in China within the next month or so, the Eclipse gets certified, and delivers with the Pratt Canada 610, the A380 will make its first GP7000-powered flight, the Space Shuttle returns to flight, there's the first flight of the JSF later this year, and early next year the first A318 with the PW6000 will enter service.

"That's a lot of things. Just look around - the eagle really is everywhere." And taking off by the look of it.

Finger, who is notoriously less than keen on media speculation, has heard it all before and now as president of the engine maker he is determined that the message gets out that Pratt & Whitney is very much alive... and kicking

## PEOPLE

## FACE THE FACTS WITH...

# JUDITH MORETON

**Q: Your career so far has covered many aspects of the aviation industry. What attracted you to Bombardier?**

A: I think many people in the industry want to work for an OEM at some point. It's fascinating to work for a company that offers MRO and charter services. It also manufactures, sells, helps to manage aircraft, looks after operations, finds businesses to support customers as well as helping to manage their aircraft. I enjoy the process of helping customers when they need support from going from charter to fractional then on to owning an entire aircraft.

**Q: How is Skyjet going?**

A: Business is booming. Year-on-year revenues are up from 32% last year to 40%. We're finding that in Europe Middle East and Asia-Pacific our jet card

Judith Moreton's career has seen her rise from check-in girl at Danair to managing director of one of Bombardier's key divisions. Last year she oversaw the company's transition from Flexjet Europe to Skyjet International, an integrated global charter services provider. *Liz Moscrop* caught up with her at Bombardier's spanking new Farnborough base.

product is strong because the economy is strong in those regions. In terms of the global economy, international companies continue to do business when they're travelling – ie in flight. After 9/11 people realised the need for business aviation. We've seen most growth in Western Europe over 2005-6, followed by the Middle East and Asia-Pacific.

**Q: Skyjet International set out to consolidate Bombardier's Flexjet Middle East and European programmes and strengthen US ties.**

**In the 18 months since its inception, we've seen it strengthen its presence in Asia-Pacific, Russia, Dubai and IndoPakistan. Where are you planning to expand in the near future?**

A: We might expand into one new territory next year. Obvious potential territories would be Russia and South America. There are also new opportunities for our Asian customers. We need to offer our product in a relevant way for the Asian market. The next step for us is to think about what do for our new customers and

ask what do our existing customers need.

**Q: Which aircraft do customers go for most often in Europe and why?**

A: In Europe, the Learjet 40 and Learjet 45 are our two most popular aircraft. They can carry two to three people across the short distances that people usually travel. They're a high profile product and very fast. People like to avoid long international check-in times. Everyone appreciates time saving, as well as being very security conscious. Getting in and out of Heathrow can be a nightmare and there are often slot issues at international airports. Outside of North America, we're finding that Europe is the second largest region for business aviation growth.

**Q: What attracts your customers to use your service?**

A: We have a young fleet, less than five years old. We also provide the latest in business technology satcomms, including fax, telephone and conference calls in flight. Passengers can also run presentations through the main screens as well as relaxing. They can play the latest films and DVDs or listen to music – escape with high

spec tech if that's what they choose to do.

**Q: What do people most want to see on board?**

A: In North America and short flights for business travel, it's technology. For private users on longer international trips, a bed comes high on the list of requirements. In terms of décor, in Europe customers go for neutral light wood veneers. In the Middle East, clients prefer gold-plated taps and marble finishes. In the Far East, the business aviation market is still quite new and there are fewer aircraft, so it is difficult to pin down a trend.

**Q: How have you found the office move from London to prestigious new space overlooking the ramp at Farnborough?**

A: We're in the best working environment, which is totally connecting our staff with the business itself. With the business out there on the ramp it is difficult not to be excited. Everybody is much more engaged. Our financial team is sharing offices with our operations staff. That means everybody talks to everybody else. People ask

what is our next success?

We share that too. We socialise together sometimes. Everybody now feels ownership and pride in the business. My team can see my enthusiasm and willingness to share success. That motivates me personally.

**Q: Given the enormous challenges the industry is facing in terms of user fees and shifting regulations, how important are organisations like EBAA?**

A: It's so important for the industry to have a political business aviation body that is unbiased. There is definitely a need for that. Without a joint voice we cannot move business aviation forward on a political platform. It is crucial that EBAA keeps key voices engaged with organisations. I'd love to get involved in EBAA.

**Q: How valuable are the big airshows to the industry?**

A: They are an opportunity to showcase business and network with other operators; discuss the development of the business and where it is all going. They're great for meeting customers and a great opportunity to get PR.

## ADVERTISEMENT

### ANTONOV-148 completed its tests on fail-safe feature



In June the AN-148 regional jet completed an important stage of tests on determination of the aircraft compliance with airworthiness requirements while simulating failure of hydraulic, fuel, flight control, other systems, engine and APU. Within this stage AN-148 prototype performed 23 flights with a total duration of 30 hours. As a result, it was proved that according to the modern airworthiness requirements AN-148 design provides safety completion of a flight in case of any important system failure. It was reached due to redundancy and reservation of main systems as well as timely disclosure of failures occurred and change the channels with reserve ones.

In July AN-148 strength tests to be completed. After that it will be tested at the extreme modes including flights with MTOW, with maximum fuel weight, with maximum allowable speed, etc. Completion of these tests is scheduled for August. Till that time two AN-148 prototypes will perform more than 600 flights. In the third quarter of 2006 it is planned that Aviation Register of the Interstate Aviation Committee and State Aviation Service of Ukraine will issue the Type Certificates for AN-148. The documents will confirm AN-148 compliance with certification basis comprising the CIS aviation rules AP-25 and European CS-25.

Simultaneously with the tests completion SE Kyiv Aviation Plant Aviant constructs AN-148 for Kazakh "SCAT" airlines to be the first operator of such type aircraft. Seven aircraft are in production. They to be delivered to Kazakhstan till the end of 2007. Construction of

the first serial AN-148 airframe was almost completed till the end of June. Wing centre-section and outer wings were installed. Tail unit, high lift devices and controls were prepared for installation. Purchase of the vendor items is in process. In cooperation with Ukrainian enterprises Voronezh Aircraft Building JSC (Russia) takes part in the aircraft production. Units for three aircraft were constructed in Voronezh and part of them were delivered to Kyiv. Antonov ASTC participates in serial production as well. It makes elements of passenger compartment interior, titanic piping of the anti-icing system, elements of doors and hatches, etc.

On customers' requests ANTONOV ASTC designs the whole family of AN-148 aircraft including cargo versions with the side door and tail cargo hatch. At Farnborough 2006 for the first time ANTONOV presents AN-148T version intended to transport military cargoes, material support, foodstuff and medicaments arranged on standard pallets and containers, self- and not-self-propelled vehicles, military personnel, sick and injured persons on stretchers. A cargo of a total weight of up to 20 t will be accommodated in the cabin with dimensions of 13.29 m in length (without a ramp), 3.1 m of floor width and 2.7 m in height. The aircraft meets all the modern ICAO requirements to the civil aircraft, in particular its noise level and emission meet Chapter 4, Appendix 16 of ICAO Convention. The possibilities embodied in the aircraft design provide regular operations of AN-148T from/to concrete and unpaved airfields, including operations in autonomous mode for a long time. Russian airlines Volga-Dnepr and Poliot, AF of Russia and Ukraine expressed their interest in AN-148T.

Besides, AN-148 regional could be considered as the most actively developed international aviation programs. The leading firms of Ukraine, Russia, Great Britain, France, Germany, USA, Italy, Switzerland are involved in it. Among them are: SE Kyiv Aviation Plant Aviant and JSC Motor Sich from Ukraine, Voronezh Joint Stock Aircraft Building Company, JSC Aviapribor-Holding from Russia, Litex, Goodrich, Hella Aerospace, Hawker, PALL Corporation GmbH, Monogram System from Germany, Deut, Filotex, Thales, LIEBHERR from France, Rockwell Collins, ASCC from USA and the English Raychem.

**"Business is booming. Year-on-year revenues are up from 32% last year to 40%. We're finding that in Europe Middle East and Asia-Pacific our jet card product is strong because the economy is strong in those regions."**