

This special Farnborough Supplement has been produced for distribution across all Messier-Dowty sites.

Also included after the Farnborough Review is a feature report on the recent inter-site rugby match between Gloucester and Bidos.

MESSIER-DOWTY

FARNBOROUGH '96

Review

A history of technological innovation

An array of landing gear across the decades, from the 1930s to the present day, was the tangible proof of the Messier-Dowty theme at Farnborough '96 – "We supported you then... and we're supporting you now".



Throughout the years, Messier-Dowty businesses have pioneered landing gear technology, with many innovative concepts to provide solutions for advancing aircraft design.

From the Gloster Gladiator's internally sprung wheel of the 1930s to the massive main landing gear for the Airbus A340 of the 1990s, Messier-Dowty's display captured the interest of engineers and enthusiasts alike.

With Messier-Dowty sited alongside "TI Group in Aerospace", there was a seamless join between the two stands and visitors, including a number of VIPs, flowed naturally through the displays.

Officially opening Farnborough '96, Michael Heseltine, UK Deputy Prime Minister, used Messier-Dowty as an



example of the way forward on European integration, when he spoke of the importance of restructuring the European aerospace industry in order to improve our chances of being competitive.

Tony Edwards, Chairman and Chief Executive of Messier-Dowty International, stressed the major

Main picture (above) shows the theme of the stand, emphasising Messier-Dowty's fine history of technological innovation. Pictured (left) is Messier-Dowty's chalet used for customer hospitality.

involvement of Messier-Dowty in the aerospace industry:

"Our presentation at this year's Farnborough Air Show emphasised Messier-Dowty's commitment to the aerospace industry, and the critical role that we have played in aircraft construction from the 1930s to the present day.

Aircraft orders announced at Farnborough represented over \$75 million worth of business to Messier-Dowty.

Our profile was enhanced by the strong presence of our two parent groups at the show".

A History of Technological Innovation...

Each gear on display had a story to tell...



Your worldwide partner in landing gear...

- Affordable
- Complete design, development and manufacture in North America and Europe
- Fully integrated systems
- All types of landing gear
- Innovative engineering solutions
- Forefront of technology and materials R & D
- Over 60 years of technological innovation and expertise
- Global customer support network

The captions that accompanied each display, telling the story, are shown below and opposite...

The internally sprung wheel

George Dowty's unique internally sprung wheel established Dowty as a specialist aircraft equipment supplier. The original wheel first supplied to Kawasaki in Japan, utilised rubber compression springs. A subsequent development of the internally sprung wheel, fitted to the Gloster Gladiator and Westland Lysander, incorporated Dowty's first liquid spring. This was the first successful compact high pressure shock absorber.

The Gloster Gladiator was the last bi-plane fighter to be ordered by the RAF. It entered Fighter Command service in 1937, and will be best remembered for its role in the defence of Malta.

The Westland Lysander entered RAF service in 1938 and served in Europe and Burma. The internally sprung wheel contributed to the aircraft's ability to operate from very rough surfaces under all conditions from thick mud to desert sand, which gained it fame as a special duties aircraft.

Gloster Meteor main landing gear

The Gloster Meteor was Britain's first operational jet fighter and first flew in 1943. It entered service in 1944, defending Southern England against the V1 'flying bombs' and later served on the continent of Europe. Post war, the Meteor was further developed to become the main RAF jet fighter in Europe, the Middle and Far East. A few Meteors remained in use on training duties until the mid 1970s.

The Meteor's main landing gear was the first to shorten on retraction, allowing it to be stowed in a smaller wheel bay in the aircraft wing. This design principle has been developed further over the years to greatly reduce the space needed for retracted landing gear on a wide variety of commercial and military aircraft.

Gloster Javelin nose landing gear

The Gloster Javelin was the world's first twin-jet delta-winged fighter when it made its maiden flight in 1951, and was the last Gloster aircraft built for the RAF. It became the standard RAF all-weather interceptor during the 1950s and served in Europe, the Middle and Far East. It was finally phased out of service in 1968.

The Javelin's nose landing gear features a 360 degree steering/moving body actuator. It was one of the longest nose gears ever produced for a jet fighter, and was designed to permit easy ground manoeuvring for this particularly large and heavy fighter.

AVRO Vulcan main landing gear

The four-engined AVRO Vulcan was the world's largest delta-winged jet aircraft and formed the mainstay of the RAF's nuclear-armed strategic V-Bomber Force from 1957 until the early 1970s. It then became the primary long range, low-level attack aircraft in Strike Command and in 1982 performed the longest range bombing raids in history during the Falkland Islands conflict.

The Vulcan main landing gear, designed in the late 1940s used a multi-wheel bogie beam to spread the aircraft load. It also featured the first type of articulating bogie landing gear on a military aircraft. A similar principle is seen on today's Airbus A340 main gear.

Bae-Aerospatiale Concorde nose landing gear

The Anglo-French Concorde remains the world's only fully operational supersonic airliner. The prototype first flew in 1969 and Concorde has now been in daily commercial service with British Airways and Air France for over 20 years, cruising at Mach 2.

The Concorde nose landing gear was the first on a commercial aircraft to be fitted with electro-hydraulic steering. This was a particularly challenging design requirement for a commercial nose landing gear on which a high level of reliability and safety was required.

Airbus Industrie A300 nose landing gear

The first European Airbus, the A300, introduced in 1972 the concept of a wide body commercial transport for short and medium haul routes. By the late 1970's the A300 was recognised as the quietest, most efficient airliner in its sector of the market and it rapidly became an international best seller. Still in production, in greatly improved form, more than 735 A300/A310s have been ordered to date, and the Airbus family has grown to seven aircraft types.

A History of Technological Innovation...



MESSIER-DOWTY
The Landing Gear Company
A joint venture between **TI GROUP** and **SNECMA**

World leaders in landing gear systems ...

- In service on over 14,000 aircraft making more than 20,000 landings/day
- Supplying over 20 of the world's major aircraft constructors
- Supporting 70 airforces, 250 airlines in 90 countries

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Messier-Dowty has been responsible for the design, development and manufacture of the main and nose landing gear systems for all aircraft from the Airbus Industrie stable.

Eurocopter Dauphin main landing gear

This French multi-role helicopter is in production for a wide variety of commercial and military roles from executive and commuter transport to coastguard patrol, search and rescue, border surveillance and military utility operations.

Messier-Dowty produces landing gear for a wide range of helicopters including the Alouette, Puma, Super Puma, Augusta A129 and Tiger. The landing gear is designed to absorb high aircraft sink rates without damaging the structure and, on the Super Puma, Messier provided the first crash resistant landing gear.

Dassault Rafale nose landing gear

Rafale is one of the most advanced multi-role combat aircraft flying today. It features outstanding manoeuvrability, a heavy weapons load and a design which enables it to perform a wide variety of front line duties from air combat to low level attack. The aircraft's shape and materials have been designed to provide a high degree of low observability, or stealth.

Reaching beyond the normal functions of a nose landing gear, Messier-Dowty's system for the carrier-borne version of Rafale not only incorporates the catapult

bar and its operating mechanism, but also the unique 'jump strut' technology in the shock absorber to give the aircraft extra lift at take-off. Rafale's landing gear, nose and main, is especially strong to enable carrier operations under all conditions with a full weapons payload.

Bombardier Global Express main landing gear

The Global Express, which made its debut only last week, is the newest long range business jet and will be capable of flying non-stop for over 6,500 nautical miles. It is expected to make its maiden flight this month and to enter service in the fourth quarter of 1997. With highly efficient new-generation turbofan engines, the Global Express will also be one of the fastest business jets available with a maximum cruising speed of Mach 0.89.

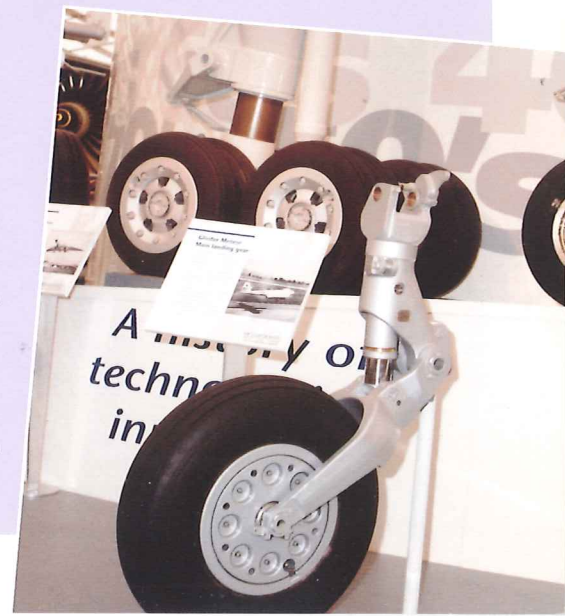
The Messier-Dowty integrated landing gear system is the most complete package ever supplied for a business aircraft and includes the main structural and hydraulic components, wheels, brake system, nose wheel steering and electronic controls. It incorporates numerous advanced features such as 'steer-by-wire' and 'brake-by-wire' and uses ultra high strength steel for major structural components.

Airbus Industrie A330/A340 main landing gear

The four-engined Airbus A340 is the largest commercial jet airliner to be built in Europe and was the first wide body aircraft to feature advanced electronic

'fly-by-wire' flight controls. The largest member of the Airbus family, the A340 is currently one of the longest range airliners in service in the world. Over 300 A330's and A340's have been ordered to date.

The main landing gear for the A330/A340 is one of the largest landing gear assemblies in commercial service. Machined from one complex forging, the single ultra high tensile steel main fitting is attached to an articulating bogie, which effectively increases the length of the gear. A shortening mechanism allows the landing gear to be retracted into a reduced stowage volume within the aircraft fuselage and wing.



Focus on People...



1 Tony Edwards, Chief Executive of Messier-Dowty (centre), introduces HRH Prince Edward (right) to Sir Christopher Lewinton, Chairman of TI Group (left).

2 Farnborough '96 was an ideal opportunity for the Chairmen of Messier-Dowty's two parent groups to get together. On the left, Jean-Paul Béchat, President of Snecma and on the right Sir Christopher Lewinton, Chairman of TI Group.

3 Gathered around the Messier-Dowty landing gear on the latest Airbus A319, the Farnborough team who made it all run smoothly – with a smile! Left to right: Ruth Evans, Mary Jackson, Marie-Claudine Thérin, Pauline Harmer, Marie-Pierre Ennoui, Sue Easton, Emma Harrison, Rose Loveridge, Winnie K-Tan, Gail Sterry, Ann Currie, Debbie Oliver, Alex Phillpott and Mina Amlani.

4 HRH The Duke of Kent in conversation with Andy Stevens, Managing Director of Messier-Dowty Ltd (left).

5 HRH The Duke of Edinburgh is welcomed to the Messier-Dowty stand by Tony Edwards (left) and Dominique Paris (centre), Chief Operating Officer of Messier-Dowty.

6 Senior management of Messier-Dowty lined up for the camera (left to right): Michael Steel, Jacques Bouhelier, Brian Walsh, Sir Christopher Lewinton, Jean-Paul Béchat, Dominique Paris, Tony Edwards, Bob Wasson, Geoff Smith and Bruno Van Parys.

7 Tony Edwards in conversation with the Rt. Hon. Michael Portillo MP, Secretary of State for Defence, in front of Messier-Dowty's Airbus A340 main landing gear display.

8 Roger Freeman MP, Chancellor of the Duchy of Lancaster, takes a look at one of Messier-Dowty's advertisements with Tony Edwards.

9 Al Fenwick (left), Vice President of TI Group Inc, Washington DC, and Geoff Smith (right), Managing Director – UK and North America, Messier-Dowty, with Paul Kaminski, US Under Secretary of Defense.

The Farnborough Air Show, like its Paris counterpart, is an international forum for the world's aerospace industry. The many meetings that are held at the Show would otherwise take months to arrange, a high cost and thousands of air miles to achieve. And, because of its importance, it also attracts many VIPs whose visits provide a great boost for the Show's public image and appeal. Then there are the people within the Company – both staff and management – whose efforts made the Show the great success that it was.



Focus on People...



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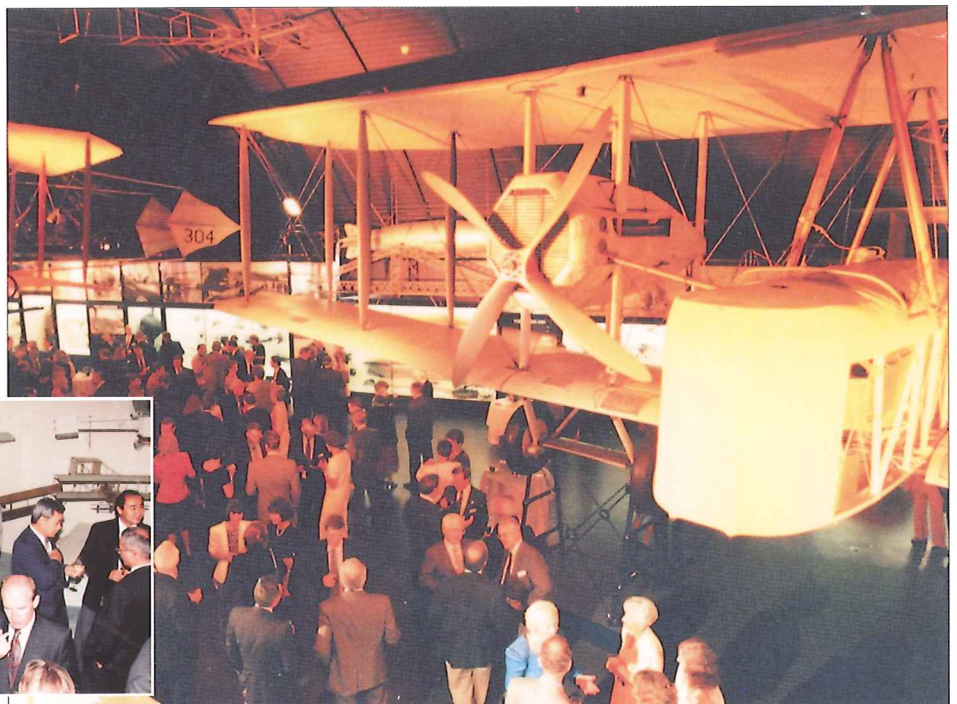
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- 10** Geoff Smith gives a briefing to Cheryl Gillan MP, Parliamentary Under Secretary of State for Education and Employment.
- 11** Anglo-French alliance – Mary Jackson (left) from Gloucester and Marie-Pierre Ennoui (right) from Bidos teamed up to welcome visitors to the Messier-Dowty stand.
- 12** Geoff Smith, together with Martyn Hurst (right), Messier-Dowty's Director of Product Support, in conversation with James Arbuthnot MP, Minister for Defence Procurement.
- 13** One of the many delegations visiting the stands was that of the European Chiefs of Air Staff, hosted by Ron Nailer, Director of Business Development, TI Aerospace (centre background).
- 14** Andy Stevens, Managing Director of Messier-Dowty Ltd (left), explains the features of the new Bombardier Global Express main landing gear to Michael Scholar, Permanent Secretary, Department of Trade and Industry.

Historic Lift-off at the Science Museum...

On the eve of the Air Show, Messier-Dowty and Dowty Aerospace held a cocktail reception in the Flight Gallery of the London Science Museum.

The reception was steeped in aviation history appropriately linking it with the theme of Messier-Dowty's display at the Show. With some 350 people in attendance, our week was off to a flying start.



Behind the Scenes... Vital Customer Support



Throughout the show, Messier-Dowty's product support engineers maintained a base in the flying area to provide the crucial back-up for Messier-Dowty and Dowty Aerospace products, to ensure they were always in peak condition for the demanding flight displays.



(Left) Alain Leccia of Messier-Dowty's Customer Support Centre at Vélizy checks over the nose gear of the Dassault Rafale

(Far left) Dean Wheeler, Messier-Dowty Product Support Engineer specialising in Eurofighter 2000, gives the aircraft's landing gear a thorough inspection with Adrian Harling of BAe, before its next flight display

In the News...

A variety of media was at our disposal to heighten our profile to the target audience at the Show and to increase awareness of our presence. As well as achieving coverage in the editorials and news columns of the Show Dailies, Messier-Dowty ran an advertising campaign based on the series launched at Farnborough '94. "We supported you then... and we're supporting you now." A one minute Messier-Dowty commercial also appeared on the Farnborough Television station FI TV '96 during the trade days.

Flight Daily News
6 September 1996



Every picture tells a story

Messier-Dowty's chalet is doubling as an art gallery thanks to the Guild of Aviation Artists, whose paintings have pride of place on the walls. The Messier-Dowty link is that all 20 aircraft depicted are fitted with the company's landing gear.

Messier-Dowty chairman and chief executive officer Tony Edwards (left) is "pictured" with well-known aviation artist Michael Turner, president of the Guild, beside a painting of the Sea Fury.

The speed at which the U.S. aerospace industry is rationalizing following the end of the Cold War is an example to its European counterparts on how to adjust to new circumstances, UK Deputy Prime Minister Michael Heseltine told a news conference here yesterday.

On a related subject Heseltine, himself UK defense secretary at the time the Eurofighter project was launched, said he believed the EF2000 program is very important in terms of achieving the integration of the European industry.

"They (the U.S.) are now putting their companies together very rapidly to achieve the efficiencies which are now on offer and we have to move at the same speed," Heseltine said.

There were "encouraging signs" and a general awareness now in Europe that it needed to be done, he added. Even within Eurofighter, he said, "We are still in a situation where small compa-



UK Deputy Prime Minister Michael Heseltine

Heseltine cited the BAe-Matra missile merger and the Messier-Dowty venture in landing gear as examples of the types of full-scale, international, intra-European mergers that have to take place.

Similarly, the more integrated the European industry is, the better it will be able to take advantage of the "huge opportunities" expected when rising aerospace industries along the Pacific Rim begin seriously seeking partnerships.

Regarding yesterday's

decision from the other three partners "as quickly as we can get it." But he conceded this was likely to take "some time."

On the specter of any partner dropping out of the four-nation venture, he noted that "ever since we began the Eurofighter negotiations in 1983 we've had that question of 'what if?'"

"I can remember very bleak moments when the program was going to fall apart." Citing one particular crisis when German Defense Minister Volker Rühr suggested that Germany was about to pull out, Heseltine said, "I never thought for one moment the Germans would do that and I don't believe it now."

The deputy prime minister who, when minister of defense, had overseen the negotiations that led to the huge Al Yamamah arms deal with Saudi Arabia, said he hoped that Britain would build on relationships that now existed and

Messier-Dowty's parent groups, TI Group and Snecma, were strongly represented at Farnborough '96. TI Group's stand was located alongside that of Messier-Dowty, whilst Snecma had a major presence in the French pavilion in Hall 1.

Farnborough Programme

Messier-Dowty, a joint venture between the TI Group plc of the UK and Snecma of France, is now the world leader in the design, development and production of aircraft landing gears. With over 14,000 aircraft in service equipped with its landing gear systems, making a total of more than 20,000 landings every day, the Anglo-French joint-venture company has firmly established itself as the market leader since the merger between

Advertising campaign based on...
"We supported you then... and we're supporting you now."

Gloucester – Bidos Return Match

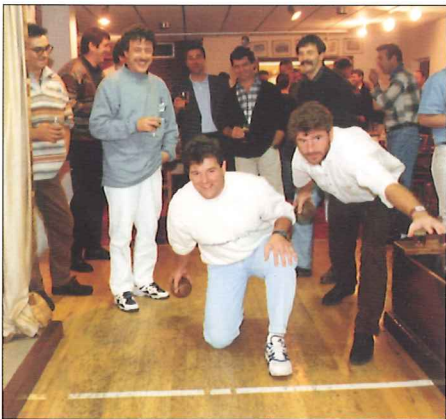
The week end of 4-6 October saw Gloucester hosting the return rugby match with Bidos. Some of you may recall last November a party from Gloucester travelled to Bidos for the inaugural match. Several months of planning went in to organising the weekend for our French colleagues.

A coach was despatched from Gloucester with a small welcoming party to meet the French at Gatwick on the Friday afternoon. After a much delayed journey they arrived at the hotel at around 7.30pm.

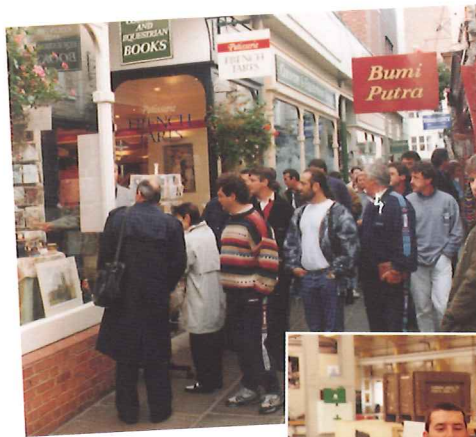
From there they went to Arle Court Clubhouse for a game of skittles, together with a buffet and copious amounts of local beer and cider. The plan was to try and put them off their game due to hangovers – but it didn't work!



(Above) The victorious Bidos team and (below) the Gloucester team



The Saturday commenced with a guided tour of Gloucester Cathedral and its surroundings. This was followed by an impromptu shopping trip, as it appears that Doc Martens are very expensive in Bidos. This was followed by a guided tour of the factory, lunch and the game, which was played at the Sports and Social facility at Staverton.



Return Match – Second Half!

Ah yes, the game! Suffice to say that despite a good initial period of sustained pressure we were unable to breach the French defence. The game was very tight with many close personal battles going on in both the backs and forwards. The game continued to be played to a very high standard throughout the second half with Bidos coming out on top 17 points to nil.

The match was followed by a formal dinner attended by Tony Edwards during which the Trophy and Man of the Match awards were presented by Dominique Paris. Nick Brown from Stores/Despatch, was presented with the Gloucester Man of the Match trophy by Patrick Sequineau, the French Captain, and commented "This has been another tremendous experience and despite losing I felt that we gave a better performance this time compared to last. If we prepare more carefully for the next match there is no reason why we could not win!!"

Following the dinner a disco and dance was held which gave an opportunity for supporters and employees to join the teams to celebrate the occasion.

As the evening wore on, many people were amazed at how well they could communicate despite the lack of a common language!



Mark Tunstall, the Gloucester captain, commented, "Everybody involved in these games firmly believe that they've been of tremendous benefit, with many strong friendships being forged between both players and organisers on both sides. It is hoped that these annual matches will continue into the future."

