Through its engineering design departments, production facilities, the skills of its employees and its product lines, Dassault Aviation offers its customers in-depth know-how, ranging from design to operations, based on strong entrepreneurial values. Dassault Aviation is at the cutting edge of technological innovation and airborne system expertise. The Group aims to provide its customers with innovative and cost-efficient solutions. Through technological development, the concept of the aircraft tends to embody the more realistic idea of complex airborne systems in both civil and military markets. Few companies in the world are now capable of manufacturing these systems that require essential expertise from the design to the production and support stage in terms of coordination, the accounting management of integrated systems and integration. The systems integrator must possess a wide range of skills to take account of all the system’s technical and financial components, while at the same time knowing how to assess the risks involved in its integration.

Dassault’s computer-aided design and manufacturing department, located at the facility at the Bordeaux airport in Merignac, designs and inspects tooling conception, tooling control and retrofitting. This department, under the guidance of Jacky Blasquez, is part of the production department, and is crucially involved in all Dassault’s projects. Blasquez started as a workshop tool and die maker 32 years ago and has worked his way up as a technical illustrator, consequently heading several departments before assuming the leadership of the design and manufacturing department. “At the beginning, most work was done by hand, later migrating to CADAM and CATIA software for surfacing and tubing drawing. The metrology equipment was rather basic then: theodolites, plummets and rulers. For 3D measurements we had to rely on an external partner. Toward the late eighties our Argenteuil subsidiary had already purchased their first Romer articulated arm, and we used to borrow it from them on a per-need basis. Finally, in 1992 we took delivery of our first Romer articulated arm. It was incorporated directly into the tube bending process, and has been in daily use ever since – for more than 15 years. The second ROMER articulated arm was delivered to the department in 2004, quickly becoming our most critical measurement instrument.”

Capable, accurate and dependable

The articulated arm is in frequent use at Dassault. The staff is particularly keen on the G-Scan scanner, which can collect thousands of points per second with extremely high accuracies. The same applies to the G-tube software with its accessories for tube measurement. “ROMER covers 100 percent of our metrology needs,” explains Blasquez, continuing: “The service department also deserves high praise because the
Dassault Aviation’s consolidated orders rose to 4.53 billion Euros in 2005. These orders include the sale of 123 Falcons, an all-time high. The sales turnover for 2005 was 3.43 billion Euros, with the Falcon accounting for 48 percent of the total sales. The net profit was at 412 million Euros, with the Falcon series jet engine, delivered from the Canadian Dassault subsidiary. The part is very shiny in appearance, making it easy to notice any physical imperfections even with the naked eye. A quick scan will quickly let them pinpoint where the imperfections lie so they can implement the necessary modifications in the tooling.

Such part inspections occur daily within the department. With the production start of the Rafale and the F7X version of the Falcon aircraft, new production challenges arose. Dassault has launched a new integrated digitalized network to tackle those two operations. Falcon F7X has established a new standard in terms of product life cycle management standards. The digitized data is frequently exchanged within the production facility, assigning the inspection process with the ROMER arm tremendous importance, both for tooling and part inspection. The finished aircraft needs to comply with the CAD values. Assembly issues are quickly resolved with the articulated arm because the inspection can be done right there on the shop floor, simplifying the correction process. The results are very indicative and leave no room for false interpretation. In example, in the past it was fairly difficult to inspect the correct position of interior paneling alignment. Nowadays, reference points are inspected, a data report is created, and it is immediately clear where the errors lie. This new process allows Dassault to drastically cut inspection times, increasing productivity.

ROMER articulated arms are also essential in all type of tube manufacturing process. The CAD conception and fabrication department under the guidance of Mr. Blasquez digitalizes the tubes and creates their 3D models. With newer tube types, find errors is easy because 3D data exists to facilitate comparison with the tubes coming out of the actual production run. For older tube types, a 3D model first needs to be created by reverse-engineering a reference tube model.

The variety of possible applications for the ROMER articulated arm and the department’s expertise have allowed Dassault to broaden the arm’s use well beyond the Merignac location. Mr. Blasquez has recently been to Little Rock, Arkansas facility, where he used the articulated arm to inspect and adjust complex tooling systems that were apparently out of spec. On the same trip, he also visited a military base where he used the arm to reverse-engineer a complex part that was later replicated and installed without the need to polish the part to assure a good fit. All this was done while substantially reducing costs.

Measuring antique parts

The ROMER articulated arm also instills new life into veteran planes. Periodically, the arm is used at the airplane museum for digitizing vintage parts in order to manufacture one-off spare parts that are otherwise no longer available. So don’t be surprised if you see Mr. Blasquez along with his ROMER arm at a museum near you: a customer may want impatiently to finally get spare parts for his historic airplane. Often, these reverse-engineered parts are the only way to properly restore an old airplane to its former glory.

“With our articulated arm, we always stay within the prescribed tolerances. Reverse engineering is performed with expedience, is effective and accurate,” boasts Mr. Blasquez and concludes: “Unfortunately, too few people are aware of this tool’s existence. The utilization of our ROMER arm is sure to create awareness.”

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**Germany:** Wetzlar: Tel. 064 412 07 0, Fax 06441 207 122 – Munich: Tel. 089 149810-0, Fax 089 149810-59.

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