

DASSAULT • FALCON • 900

TRIJET IN PIN STRIPES

A 727 for the rest of us

BY RICHARD L. COLLINS

IF you want to impress the other pilots around your airport, ask a friend with a Dassault Falcon 900 trijet to drop in. The stately manner of the aircraft on the ramp, and the high quality of construction that it exudes, makes it one of the ultimate aircraft. People will spend as much time as you will let them inspecting the fit and finish of the airplane, with special attention paid to little things, like the baggage door latch. It is ornate, complex, and perfectly fitted. The leading edge devices are the same way. If you are used to looking at the ones on a Boeing from a passenger window, these highly polished and perfectly fitted full-span slats (with slots on

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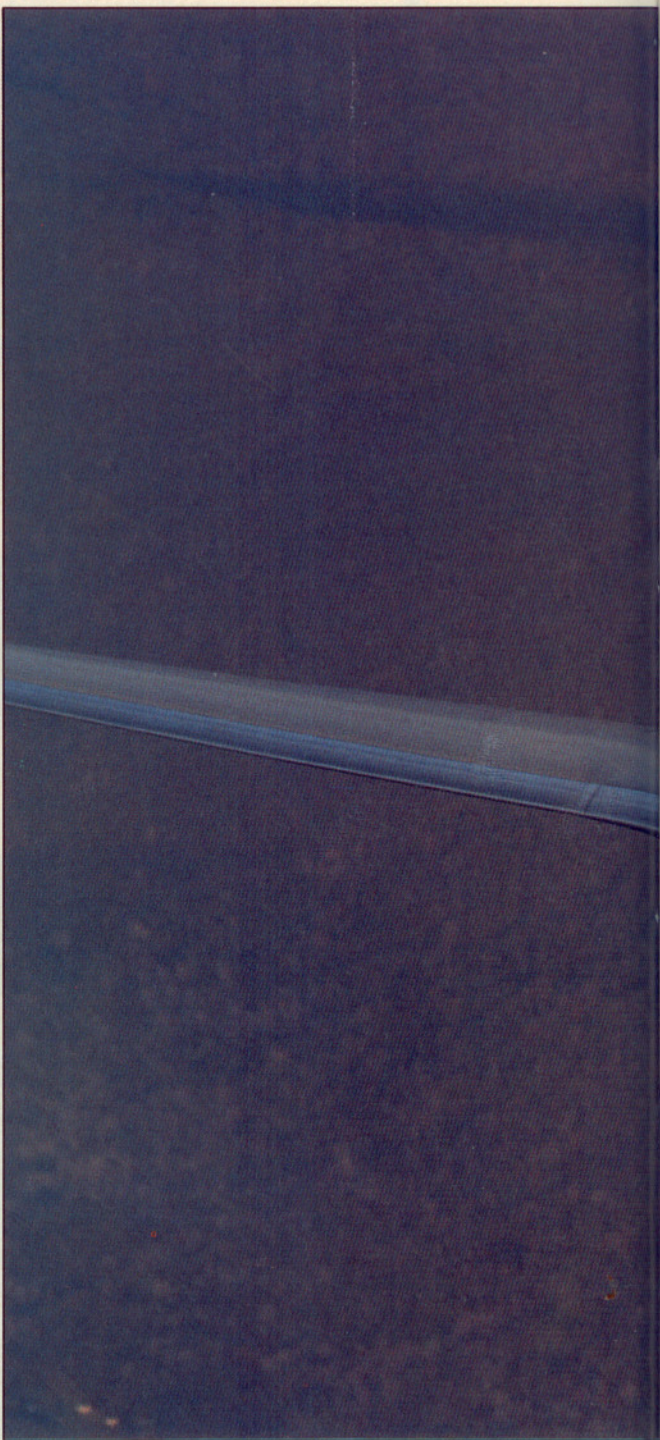
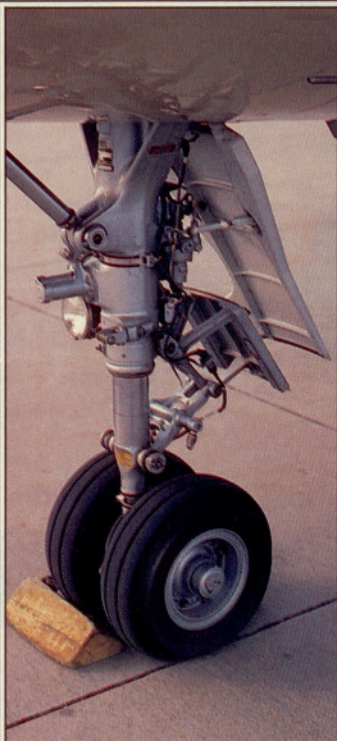
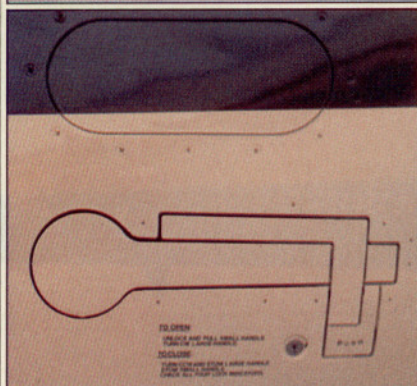


the outboards) are different: They look like the inside of a Swiss watch. The cabin of the aircraft is equally neat, with clustered seating areas so there can be several separate meetings at once. In Falcon Jet's demonstrator, N900FJ, 13 passenger seats are fitted, and everyone has a lot of room. The airplane is currently certified for as many as 19 passenger seats. There is a lavatory aft and, behind that, a baggage compartment (within the pressure vessel) that is accessible through a large outside door as well as from the bathroom. All this sug-

gests a big airplane, and the 900 is just that. On an average-size general aviation airport, its presence on the ramp, on the taxiways, or on the runway is that of an airline-size aircraft.

The Falcon 900 is also a lot more than your average New York to Kansas City business jet. In the performance guarantees, the no-wind range with reserves is 3,800 nautical miles with eight passengers and baggage, crew, and catering. (Charles Lindbergh, who was instrumental in connecting Dassault with Pan American in the original Falcon market-

Everything about the Falcon 900 suggests a unity of design and the type of high finish that is simply not found in other airplanes in its class.



ing program, figured New York to Paris to be 3,137 nm, for reference.) So this is a true intercontinental airplane. Fast, too. The cruise speed guaranteed along with the 3,800 miles is Mach 0.75, which would be more than 430 knots at average temperatures and cruising altitudes. Maximum cruise is Mach 0.84.

I have a friend who has been flying Falcons since the first twinjet 20 was delivered, and every time I talk with him he raves on about what wonderful airplanes they are—and he is a customer, not a salesman. I thought about him as I

adjusted the left front seat of the 900. He's right: The outside visibility is wonderful, and the layout of the switches and controls is friendly, but where the attention to detail shines brightest is in the handling qualities of the airplane. Trimmed for 150 knots, power at flight idle, pull the 900 up into a stall. No stickshaker or pusher is installed. When the airplane reaches the stall, it does shake a bit, but full control is available. It doesn't try to roll off or pitch a lot—a perfectly rigged Piper Warrior is no tamer in a stall. With the gear and flaps

down, full aft stick would not induce a stall with the trim still set for 150; we'd have had to trim it for a slower speed to get the stall. All it did was fly at about 90 knots indicated, fully controllable, with a relatively mild rate of descent.

Because the airplane was flown in an area of high traffic density, much of the operation was heads-up, and the 900 is an easy airplane to fly without constant reference to instruments—electronic flight instruments in this case. It is quite stable, and the elevator control feel remains the same throughout the speed





range of the airplane, thanks to a system (they call it "Arthur Q") that adjusts springs in the control system, is slaved to the horizontal stabilizer position, and gives an almost constant stick force per G throughout the airplane's speed range. In the aileron control system, Arthur Q varies the control feel based on airspeed. You really can't imagine an airplane with better control feel, or with less pressure to trim during acceleration, deceleration, and configuration changes. Thirty-degree banked turns are fingertip maneuvers.

But the way an airplane handles is perhaps best judged by the post-frontal conditions we had for some landings on Runway 26 at Martinsburg, West Virginia. The wind was from 330 at 15 to 18 with gusts to 25, and the low-level turbulence was as you might expect. Captain Tim Brennan suggested adding a few knots to the Vref speed for the gusts; 120 was the suggested number. The first



The people who make purchase decisions on jets like this look at a lot of things, and the Falcon 900 shines in every area.

approach didn't get stabilized until rather late, but the speed was about right over the threshold: Power back, take out the drift with a normal amount of rudder, use aileron as necessary, and the 900 flew onto the runway. For all that we do in airplanes, our grade for the flight from passengers comes on landing, and even with a gusty crosswind the 900's handling qualities work hard to make it easy.

Taxiing around, the nosewheel is operated with a control wheel on the console to the pilot's left. It is very effective for normal maneuvering or for sharp turns, and it is also used on the takeoff roll up to about 30 knots—perhaps more if there is a strong crosswind—when the rudder becomes effective.





On takeoff, rotation speed will average between 120 and 130 knots, depending on density altitude and weight, and the initial nose-up pitch attitude is about 14 degrees. In T-tail airplanes, it usually takes a lot more back pressure to rotate and bring the nose up than it takes to keep it there, meaning you have to lead attitude and release some back pressure as it approaches the target. On the 900, which has a cruciform tail, this is not as apparent, and it is quite easy to nail the pitch attitude on the first try. Then add a little nose-down trim, accelerate to 180 knots for initial climb, then to 250 once away from the airport up to 10,000 feet. Once above 10,000 feet, the maximum indicated speed becomes 370 knots or Mach 0.87, whichever is lower. Those are very high limit speeds when compared with other jets, and when flying the airplane at the maximum indicated speed there is no change in handling qualities.

For rapid descents, air brakes are available that help the airplane come down and slow down with only a modest aerodynamic rumble. Runway length requirements are modest. The guaranteed takeoff runway requirement at maximum gross weight is 5,400 feet—this would be much less at reduced operating weights; for our takeoffs it was just over 3,000 feet—and the landing distance at an average arrival weight is 2,270 feet. Reverse is provided on the center engine only, and it couples with very strong (and sensitive) carbon fiber brakes to slow the airplane rapidly.

The Falcon 900 shares the same basic wing with the smaller trijet Falcon 50, but because of many aerodynamic refinements, it will fly the same trips on the same or less fuel than the smaller airplane. It is in the shaping of the fuselage that a lot of composites are used in the 900. The pressure vessel is aluminum and round; the shaping ahead of, around, and aft of the wing is done with strong and lightweight composites. The nacelles, ailerons, and a lot of other airframe parts are also composite, keeping the weight down.

Dassault is currently building the Falcons 50 and 900 at their plant in Bordeaux, France. Production on the twinjets 100 and 200 has been suspended. The 50s and 900s sold in the Western Hemisphere are flown green to Little Rock, Arkansas, where Falcon Jet operates a completion and service center. The shape of the airplane you see was crafted in France, the rest is Arkan-





san, and the two are equal in quality.

Falcon employs 850 people in Little Rock and lavishes 27,000 man-hours on each 900 that it completes there. It will do 25 airplanes this year—50s and 900s—and will have from 25 to 30 customer airplanes a month go through the shop for everything from minor work to a complete refurbishment. It takes 80 working days from the time a green 900 rolls onto the ramp at Little Rock until it is completed, and if, looking at the pictures, you admire the cabinet work, be aware that 100 of the employees are cabinetmakers. The Little Rock facility builds all the parts used in-house, and all the production systems used were developed there.

The airplanes go down a production line at Little Rock, moving from stage to stage. The 900s are delivered with the electronic flight instrument system and a basic avionics package installed; additional avionics go in on the production line at Little Rock.

One of the greatest challenges with a big airplane like the 900 is in keeping the weight of the interior down. Customers might look at the size of the airplane and order something like a marble shower, but the folks at Little Rock have a 2,500-pound weight budget they try to adhere to, and that has to cover everything—optional avionics, side panels, overhead, seats, cabinets, carpets—the works. They usually make budget, but if the customer wants that marble shower, well . . .

The complete facility includes a paint shop, and to control quality, Falcon does all its own completions—it won't de-

liver a "green" airplane for a completion elsewhere.

The thousandth Falcon rolled off the line in Bordeaux last year, and the company has recently had exceptional success in selling to governments as well as to corporations. Malaysia purchased a 900 for head-of-state transport; the Royal Australian Air Force has bought five for the same purpose; and the Japanese government bought two for maritime surveillance.

Those utility missions are great, but the Falcon 900 does look best in pin stripes. It is doing business at its best. The people who make the purchase decisions on airplanes like this look at a lot of things, and the Falcon shines in every

area. Its airfield capability is excellent because you have only to consider loss of one third of the power when considering engine-out requirements. It is comfortable, and you can get up and walk around. It is fast, it has long range, it has reliable Garrett engines, and it operates efficiently—all things that make the greenshades of the world happy. But where the Falcon really shines is to two other people. When the boss strides out of Butler Aviation at Washington National, surveys the ramp, and heads for his Falcon 900, it has to be with a sense of deep satisfaction. The other person? The one in the left front seat, because for all its other attributes the Falcon is truly what they call a "pilot's airplane." □

Avions Marcel Dassault-Breguet Aviation Falcon 900

Base price: \$20 million

Specifications		Time to climb, max takeoff weight, Flight Level 390	
Powerplants	three Garrett TFE731-5A-1C turboprops, 4,500 lb thrust each	Maximum cruise speed	M 0.84 (485 kt) at FL250
Length	66.4 ft	Normal cruise speed	M 0.8 (454 kt) at FL390
Height	24.6 ft	Total fuel flow at normal cruise at FL390	2,307 pph
Wingspan	63.4 ft	Max operating altitude	51,000 ft
Wing area	527.44 sq ft	Two-engine service ceiling at 35,000 lb	FL290
Wing loading	86.2 lb/sq ft	One-engine service ceiling at 35,000 lb	12,200 ft
Power loading	3.37 lb/lb thrust	Landing distance, actual, 28,000 lb	2,300 ft
Seats	13-19, plus crew	Required runway length for landing, 28,000 lb	3,600 ft
Cabin length	39.0 ft	Limiting and Recommended Airspeeds	
Cabin width	7.7 ft	Vfe (max flap extended)	180 KIAS
Cabin height	6.2 ft	Vle (max gear extended)	245 KIAS
Empty weight	22,573 lb	Vlo (max gear operating)	190 KIAS
Max ramp weight	45,500 lb	Vmo (max operating limit) from 350 kt at sea level to 370 kt at 10,000 ft	0.84/0.87
Max takeoff weight	45,500 lb	Mmo (max operating Mach number)	0.84/0.87
Useful load	22,927 lb	Windshield wiper operating speed, max	215 kt
Max landing weight	42,000 lb	All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted.	
Zero fuel weight	28,220 lb		
Fuel capacity, std	19,065 lb		
Baggage capacity	127.1 cu ft		
Performance			
Balanced field length,			
Max takeoff weight	5,400 ft		