Dassault Falcon 20

An affordable classic lives on

BY ROBERT A. SEARLES

THE DASSAULT FALCON 20 is a first-generation, twin-engine business jet that was developed in France in the early 1960s and remained in production until 1983. The all-metal, low-wing monoplane features rear-mounted engines; a swept, full-cantilever wing; cruciform tail; and a retractable dual-wheel tricycle landing gear. Typically, the aircraft accommodates between eight and 10 passengers, plus a crew of two.

Originally, the Falcon business jet was known as the Mystère 20, and the prototype, which first flew in May 1963, was powered by two 3,300-pound-thrust Pratt & Whitney JT12A-8 turbojet engines. The first production Falcon 20, powered by two 4,125-pound-thrust General Electric CF700-2C turbofans, flew for the first time in January 1965 and was certificated by the FAA and French authorities that June.

SPEC SHEET

Falcon 20F-5

Engines | **Two Honeywell TFE731-5BRs, 4,750 lbst each**

Seats | **up to 12**

Max takeoff weight | **29,100 pounds**

Cruise speed | **417 knots**

Balanced field length | **5,170 feet**

Range | **1,920 nm**

Wingspan | **53 feet, 5 inches**

Length | **56 feet, 3 inches**

Height | **17 feet, 8 inches**

Because the United States represented the largest market for new, turbofan-powered business jets, Dassault appointed a respected American company—Pan American World Airways—to market its new corporate jet in the region. Pan Am's Business Jet Division sold the aircraft in North America under the name Fan Jet Falcon or Falcon 20.

Within a few years, Dassault introduced a series of improved models with more powerful engines, along with other enhancements.

The Falcon 20C featured increased fuel capacity, while the 20D had even greater fuel capacity—along with CF700-2D powerplants rated at 4,250 pounds of thrust. The 20E and F models incorporated more powerful CF700-2D-2 engines (rated at 4,500 pounds of

thrust), as well as new high-lift devices—leading-edge flaps—to improve takeoff and landing performance.

The Falcon 20G, which was powered by Garrett AiResearch ATF3 turbofans, was designed to meet a U.S. Coast Guard requirement for a new medium-range surveillance aircraft. Beginning in 1977, the service bought 41 of these jets, which were designated HU-25A Guardian.

The Falcon 20 also was used as a cargo aircraft. Federal Express carried its first packages aboard a Falcon on April 17, 1973. Within a decade, the overnight shipper was using 33 of the twinjets in its air express network.

The Falcon 20 got a new lease on life when the aircraft was retrofitted with more powerful and more efficient Garrett TFE731 turbofans under a Dassault service bulletin. Aircraft equipped with these newer powerplants were designated Falcon 20C-5, D-5, E-5, and F-5, respectively.

In addition, Garrett started a program in the mid-1980s to replace the Falcon's original GE engines with its new 4,400-pound-thrust TFE731-5AR, and later, 4,750-pound-thrust -5BR engines, which nearly doubled the aircraft's range and markedly improved its performance. Garrett and its successor companies performed approximately 125 such conversions. Many of these reengined airplanes also were fitted with new avionics.

Approximately 470 Falcon 20s were built during the aircraft's long production run, but only about three dozen are on the market today. Early model Falcon 20Cs can cost as little as $340,000, while the asking price for Falcon 20-5 airplanes runs between $650,000 and $2 million. **AOPA**

Robert A. Searles is a writer and editor specializing in commercial, military, and general aviation.

SYSTEMS SYNOPSIS: POWER CONTROL UNITS

BY THOMAS A. HORNE

We've all seen old movies showing pilots straining like mad to turn, push, or pull a control wheel in a desperate effort to make the airplane do as commanded. Some of that was dramatic license, some of it wasn't. It can take a lot of force to move an aileron that's located, say, 40 feet away from the yoke; subjected to the aerodynamic loads involved in flying at high airspeeds; and controlled mechanically by cable runs, pulleys, and bellcranks.

That's why FAR Part 25 transport category airplanes use control surfaces that are moved with the assistance of control units that, in effect, boost the pilot's muscle power. These units, unsurprisingly, are frequently called power control units (PCUs) and use hydraulically powered servos. Mechanical inputs from those old-fashioned cables and pulleys are used to open and close servo valves that direct hydraulic pressure one way or the other, according to the pilot's—or autopilot's—commands. Now it takes less force to deflect the control surfaces, sparing the pilot or autopilot wear and tear.

There can be a down side to having "boosted" controls. It can be so easy to move the controls that there's a risk of losing the kind of tactile feedback that pilots rely upon to sense changes in roll response, for example. To take care of that, artificial control feel devices sometimes are added to give pilots a more natural control feel. These could be as simple as center-weighted springs.

Another advantage of having PCUs is that they can serve a damping function. Hydraulic pressure stored in the PCUs can prevent control surfaces from being damaged by gusts when parked on the ramp.

For redundancy, there are two PCUs per control surface. If one PCU fails, the other can do the job. In the unlikely event of a total loss of hydraulic pressure, the crew would still be able to move the control surfaces. But because most POHs prohibit the use of the autopilot should a dual hydraulic system failure occur, it's back to sheer muscle power—and the chance to fly like that old-fashioned pilot in the movies. **AOPA**