

TURBINE PILOT

Bombardier is promising big things from its division in 2013. Its new, composite-fuselage Learjet 85 is set to begin deliveries and this is a big milestone. The 3,000-nm, Mach 0.82 eight-to-10 seater has its various components built among several Bombardier facilities—among them the recently built facility in Querétaro, Mexico. Final assembly, and paint and interior completions, will take place at Learjet's traditional home in Wichita. But Lear 85s won't be the only new airplanes rolling out the factory doors.

At the European Business Aviation Convention and Exhibition (EBACE) in June 2012, Bombardier announced it was doing away with its Learjet 40XR and 45XR models and replacing them with two new derivative designs—the Learjets 70 and 75. Shortly thereafter came the news that the 2,400-nm Learjet 60 would get the axe, with its replacement presumably the Learjet 85.

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SPEC SHEET

Learjet 75

PERFORMANCE

High speed cruise | **0.81 Mach** Long range cruise | **0.75 Mach** Max range, 4 pax | **2,040 nm** Takeoff distance | **4,440 ft** Landing distance | **2,660 ft**

SPECIFICATIONS

Max takeoff weight | **21,500 lb** Std empty weight | **13,890 lb** Cabin length | **19.75 ft** Exterior length | **57.6 ft** Wingspan | **50.90 ft** Max passengers | **2+8/9** Price | **\$13.5 million**

Learjet 70

PERFORMANCE

High-speed cruise | **0.81 Mach** Long range cruise | **0.75 Mach** Max range, 4 pax | **2,060 nm** Takeoff distance | **4,230 ft** Landing distance | **2,660 ft**

SPECIFICATIONS

Max takeoff weight | 21,000 lb Std empty weight | 13,715 lb Cabin length | 17.67 ft Exterior length | 55.56 ft Wingspan | 50.90 ft Max passengers | 2+6/7 Price | \$11.1 million

FOR MORE INFORMATION

www.bombardier.com

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.

and yet the engines boast fuel economies that cut fuel burns by four percent. So while the 70 and 75 may have longer maximum ranges (2,040 nm and 2,060 nm, respectively, when flown at Mach 0.75) similar to those of its predecessors (max range of the 40XR in 1,600 nm; for the 45XR, 2,000 nm), they use less fuel getting there. Meanwhile, the 70/75's maintenance intervals have been set at fixed at 600 flight hours. Together with the performance efficiencies, the company says that fixedinterval maintenance will lower direct operating costs.





THE LEARJET 75 CABIN

(above and below) will feature double-club seating, a refreshment center, and an aft lavatory. Pop-up touchscreens (left) let passengers view videos, as well as control other cabin entertainment elements, such as the bulkhead-mounted flat screens.



All this performance and comfort is nice, but the Lear 70/75's biggest news is in the front office, where Garmin's G5000 Vision Flight Deck steals the scene.

Another change involves the winglets. These are canted two more degrees outward, a design change that should increase the wing's efficiency by two percent. Other than this, the 70/75's airframe is essentially the same as that of the 40XR and 45XR.

The cabin, however, offers a restyling inspired by the Lear 85. A double-club setup is standard, complete with a cabin management system with six seven-inch pop-up display screens, a 12-inch high-definition flat-screen LCD monitor mounted on the aft side of the left forward cabinet, a moving-map system, USB chargers, and five AC outlets. Options include XM radio, a Blu-ray player, and a SwiftBroadband satcom system that uses the Inmarsat telecommunications network.

ALL THIS PERFORMANCE and comfort is nice, but the Lear 70/75's biggest news is in the front office, where Garmin's G5000 Vision Flight Deck steals the scene. Where once Honeywell's four-screen Primus 1000 avionics dwelled, the G5000 and its less-cluttered design now rules. The G5000 set-up features three large, 14-inch-wide displays, two GTC 570 touchscreen controllers, and an integrated autopilot/flight control system. The installation is a big clean-up, and offers much better capability and situational awareness than that of the Primus 1000.

Anyone who has flown a G1000 would feel right at home behind the primary flight displays (PFDs) of the G5000. The same vertical-tape presentations for airspeed, altitude, and vertical speed are there, as are the softkeys at the lower bezels, for customizing display options. Synthetic vision is standard in the Vision Flight Deck, as is a Terrain Awareness and Warning System (TAWS-A, with a worldwide database), a Traffic Alert and Collision Avoidance System (TCAS II, which can deliver climb or descend commands to avoid midair collisions), Garmin's GWX 70 digital weather radar, dual Garmin GTX 3000 Mode S transponders with ADS-B Out capability, Garmin's ChartView electronic charts, and Garmin's SafeTaxi. The latter two come with georeferencing, letting pilots see their airplanes' positions right on the charts-very



helpful when flying approaches or taxiing at unfamiliar airports.

Avionics options include a takeoff and landing performance database, a flight data recorder, a second DME, dual ADFs, and Garmin's GDL 69A datalink receiver for XM WX Satellite weather. Those flying overseas can order the Garmin GSR 56 satellite transceiver, which can pick up datalinked weather information over the Iridium network. Another option is electronic aircraft and operations manuals, which obviate the need for carrying paper documents.

Garmin has been selling touchscreen controllers for some time, but the GTC 570 and the G5000 are among the first business jet applications. They will also be used in Cessna's upcoming Citation Ten, Latitude and Longitude. The 570 (so named for its 5.7-inch diagonal screen size) doesn't use mechanical pushbuttons. Instead, an infrared grid hovers over the keypad complex. Press on a "key," and the infrared field completes a circuit that activates the function you've selected. Although there's no sensation of depressing a conventional pushbutton, the result is the same and Garmin paid special attention to the issue of touchscreen use in turbulence. The fear of making erroneous entries as fingers flail has been a concern, but the infrared technology won't permit an entry if, say, you happen to hit two keys at once-or hit a key off deadcenter. This, the graphic icons labeling each key, and rubber strips mounted at the 570s' bezels (to steady your hand while making entries), go a long way toward minimizing turbulence-induced entries. An audible "click" tone can also be used to provide confirmation of a dead-center entry; hit two keys at once and a "donk" tone reminds you that you've fat-fingered the keyboard.







THE G5000'S THREE SCREENS can be split to give a total of six screen views. In flight (top left), the pilot's PFD shows TCAS data at the left portion of the screen; the MFD shows engine-, moving-map, and XM weather; and the co-pilot's screen shows the default PFD view plus a zoomed-in moving map display. On the PFDs, the split view gives 40 percent of the screen over to such information as electronic charts (above left) and TAWS information (above right). The MFD (above center) can be configured to show systems synoptics in this case, the fuel system. The Lear 70/75's G5000 will also come with systems synoptic pages for visually checking screen views of fuel, electrical, hydraulic, ice protection, and flight control system schematics. There are electronic checklists, as well as a performance page that lets the G5000 calculate V-speeds and show real-time fuel status and time-speeddistance information. Garmin says the GTC 570's software is designed to support future changes, including compliance with Future Air Navigation Systems (FANS) provisions such as controller-pilot datalink communications (CPDLC).

THE LEAR 70/75'S G5000 is undergoing certification tests in a Learjet 40XR and a Learjet 45XR. The first of the test flights was in August 2011, so the program is well under way. Two test aircraft have logged 135 flights amounting to more than 230 flight hours. Two other test vehicles will be used to certify the winglets, engines, interior, and cabin management systems.

I flew the Lear 40XR testbed airplane to sample the new avionics. The GTC 570s are very intuitive to operate, the G5000 autopilot/flight control system was exemplary (it stayed rock-steady even as flaps and gear were extended), and pilot workload was more than manageable—even for a neophyte to the Lear 40XR. The G5000 autopilot comes with beefed-up torque motors to deal with the heavier aerodynamic loads of the Learjet—this is a purpose-built flight control system, not a transplanted GFC 700 of the kind accompanying the G1000 installations in light airplanes.

Perhaps the most impressive part of the flight was putting up six screens' worth of information on the G5000's MFD and PFDs. To split the screens, you use rotary mode selector knobs on the center pedestal. Once split, you can call up the views you want using the GTC 570s, then shuttle the views to the left (in the case of the pilot) or the right (for the co-pilot) sides of the PFDs. Want to show TCAS information on the left 40 percent of the captain's PFD. show electronic charts and a moving map on the MFD, and have datalink weather on the right 40 percent of the right-seater's PFD? Not a problem. Of course, engine information and crew alerting system (EICAS) data will always appear on the left portion of the MFD.

The Lear 75—the heavier, nine-seat model—will be the first of the pair in service, which Bombardier says will come in mid-2013. One thing's for sure: Garmin's on the march. It began by making handheld GPSs, but now it's edging its way into a role as a mainstream provider to the turbine market. **AOPA**

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CURRENTLY, a Lear 40 is being used as a test article for the G5000. Its bare-bones interior is done up in monitoring equipment. No leather seats or lavatory here!