Learjet 60 operators, at times, sound as though they are paid sales staff. They crow about the aircraft climbing directly to FL 410 in 11 to 14 minutes. They say it rivals the Learjet 35 for direct operating cost. They claim it offers more cabin comfort than any previous Learjet they have operated.

These same operators, however, are anything but Pollyannaish about the aircraft’s limitations and production growing pains. Repeatedly, we heard complaints about undersized wings and wheel brakes, and weak batteries. They also say its baggage volume and potty capacity are too small. As for the lack of a Learjet 60 simulator, one operator quipped, “The recurrent training program is more or less a joke.”

We surveyed close to 85 percent of U.S. Learjet 60 operators in May, and they also told us why they chose the aircraft and how they use it. We also asked Learjet what the company is doing to address the concerns of operators.
Today, side-facing seats must meet even-more-stringent crashworthiness regulations if they are going to be certified for use during takeoffs and landings.

WHY A LEARJET 60?
Most Learjet 60 operators are long-term Learjet operators, typically former Learjet 35 or Learjet 55 owners. Many have had Learjets for more than two decades.

Some people told us they didn’t consider buying anything else because they were comfortable with Learjet performance, systems, maintenance requirements and product support. A few operators also have Canadair Challengers in their fleets, and they have been so impressed with product support that they wanted to acquire another aircraft in the Bombardier family.

Most of our survey subjects, though, considered other aircraft at the time of purchase. The closest competitor was the Citation VII, but it fell short because it couldn’t fly coast-to-coast westbound against prevailing headwinds.

The operators also had looked at the IAI Astra, and while they liked its advanced wing design and range, they said it was short on climb performance and passenger comfort, compared to the Learjet 60. They considered Hawker 800 and 1000 aircraft because of cabin comfort, but opted for the Learjet 60 because of better performance and lower operating cost.

A key purchasing factor, according to operators, was low acquisition and operating costs. “You just can’t beat the value” commented one operator.

Another bottom-liner said, “Wallet size is a major consideration [when you purchase an aircraft].”

MISSION PROFILE
The Learjet 60 can fly more than 2,250 nm with six or seven passengers and land with NBAA IFR fuel reserves, depending on how much optional equipment is installed. But, that’s not how most operators fly the aircraft.

Most operators say they typically fly 500 to 600 miles, on “briefcase missions” with four to five passengers. Some operators frequently fill seven seats on such 1.3- to 1.7-hour block-to-block missions. Most aircraft are ordered with a club and one-half seating configuration—four club chairs in the aft cabin and two forward-facing chairs up front. Many operators have purchased a two-seat, side-facing divan that can be installed in place of the right, forward passenger chair.

They told us that the aircraft regularly climbs directly to an initial cruise altitude of FL 390 to FL 410 on such missions—in 11 to 14 minutes. They
PRAISE FOR AVIONICS

The Collins Pro Line 4 received high praise from Learjet 60 operators. The avionics package frequently made the top-five list of favorite features. Some users ranked “avionics” as the best attribute of the airplane.

Early aircraft, however, were prone to water leaks through the gasket of the angle-of-attack probe housing, causing shorted air-data computers and other avionics malfunctions. A few operators also reported some EFIS problems, but these complaints were not widespread.

Customers appreciate the large format, integrated-display EFIS screens—a first for Learjet. Previous models used smaller EADI and EHSI tubes.

The sophisticated avionics, however, requires a few minutes of data input time prior to taxi. The crew cannot set the bug speeds, initial assigned altitude and FMS flight-plan data until aircraft power is on. And, the avionics system “forgets” most of those inputs if electrical power is lost, so flightcrews—in the absence of APU or GPU electrical power—must wait for engine start before programming the system. An upcoming service bulletin will move the FMS power supply to the battery bus, thus continuously supplying it with electrical power needed for its volatile memory.

Users also pointed out that in the event of a double-generator failure, the EFIS, FMS and most Pro Line 4 equipment must be turned off to conserve battery power. However, the batteries can power the standby flight instruments for more than three hours, thereby allowing the aircraft to be hand flown safely, below 38,000 feet, to an emergency divert airport.

Some survey respondents, especially those who fly transoceanic missions, would like to see a third, standby electrical power source, such as an air-driven generator, hydraulically driven generator or an APU certified for inflight use.

Operators were especially enthusiastic about the optional Universal Avionics Systems UNS-1B FMS, but, until recently, the box couldn’t provide access to certain Pro Line 4 diagnostic and service functions. Software version 4.04 fixes that problem.

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OPERATOR SURVEY

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According to operators, fuel economy is yet another of the Learjet 60's strong suits—if the aircraft is flown at the appropriate cruise altitude. They report first-hour fuel burns of about 1,700 pounds and subsequent-hour fuel burns of 1,200 pounds or less. "It burns the same fuel [in cruise] as our old Learjet 35," commented one operator. Combine low fuel-flows with 7,910 pounds of usable fuel, and the result is a comfortable 2,400 to 2,500 nm, operators attest. "Count on seven hours to tanks dry," said one operator.

Operators aren't as impressed with the Learjet 60's runway performance and relatively high V-speeds. "It loves the ground," carped one operator. His comments were echoed by many others.

The Learjet 60's balanced field length performance actually is about average for a mid-size business jet. The Learjet 60's landing distance, in contrast, is decidedly longer than any other mid-size jet, in part because of its relatively high landing reference speeds.

**CABIN COMFORT**

Previous Learjet operators, especially those who fly shorter hops, were enthusiastic about the Learjet 60's main cabin and passenger amenities. One operator commented, "The cabin acts a lot bigger than our Learjet 35, in part because it has much better chairs." Many praised Learjet's Tucson completion center for the quality
FLYING IMPRESSIONS

There are notable differences between Learjet 60-0005, which we flew two years ago, and the current factory demonstrator 60-0048 that we flew in late May with Robert W. Agostino, Learjet’s director of flight operations.

After engine start using a GPU, we noticed the new aircraft’s interior is noticeably quieter because of the improved cabin-air distribution system and upgraded acoustical insulation.

Agostino calculated the takeoff reference speeds for the Learjet 60 weighing 19,000 pounds and departing from Tucson on a 75°F day: 117 KIAS for V₁, 128 KIAS for Vr, and 135 KIAS for V₂ for flaps 20 degrees. The published aircraft flight manual balanced field length (BFL) was 4,390 feet. If we had departed at the 23,500-pound MTOW, in contrast, V₂ would have been 147 KIAS and the BFL would have been 6,830 feet.

Prior to takeoff, Agostino pointed out that setting takeoff thrust only requires the power levers to be pushed ahead to the third click detent; no fine tuning is needed. Once cleared for takeoff, we did just that. It takes several seconds for the engines to accelerate from ground idle, but once the rpm reaches 70 percent, the thrust increases quickly, providing the well-known Learjet shove in the backside.

We were cleared for a direct climb to FL 410, and for most of the ascent the temperature was about 10°C warmer than standard. Twelve minutes after brake release, we leveled off at FL 410, accelerated to 0.77 IMN and pulled the thrust levers back to 1,150 pounds per hour total fuel flow.

Returning to Tucson, we made the final, full-stop landing using maximum reverse thrust. Learjet 60 operators told us the thrust reversers were most effective, and we weren’t disappointed. The deceleration rate is imposing, and the FADECs automatically reduced thrust to idle at 50 knots to help prevent FOD. Agostino advised against using reverse thrust (even at idle rpm) below that speed to prevent FOD ingestion.

We shut down one engine after clearing the runway to avoid excessive use of the brakes while taxiing back to the ramp.

The Learjet 60 has benefited from two years of refinements. It is no loss of a sporty Learjet than when first introduced, but now it’s a more comfortable, economical and practical work tool for its passengers.

batteries as often as every 70 hours,” one user reported. Learjet is testing larger-capacity, lead-acid batteries manufactured by Concorde, and they should be available by the middle of the year.

Learjet now offers an optional APU that provides electrical power during ground operations and virtually eliminates forward-c.g. problems because of its location in the tailcone equipment bay. The APU eliminates the battery problems, provides electrical power for the auxiliary cabin heating and vapor-cycle air-conditioning systems, and allows avionics to be programmed prior to main engine start. (See “Praise for Avionics” sidebar.)

Cabin comfort is one of the frequently mentioned strong points of the Learjet 60, but cabin noise—especially from the air distribution system—annoyed many customers. Learjet now offers an air-duct muffler kit and redesigned windshield piccolo tubes (perforated defog air distribution ducts) as a no-cost upgrade to help quiet the cabin. An upgraded acoustical insulation package—installed as standard equipment in current-production aircraft—also is available at extra cost to soak up four to five dBA of interior sound.

Early production aircraft had pres-
FADEC FIRST FOR LEARJET ENGINES

Pratt & Whitney Canada (P&WC) PW305A engines on the Learjet 60 rank high among operators' favorite features. The turbofans are flat-rated at 4,600 pounds-thrust for takeoff up to 74°F, but APR extends that thrust rating to 88°F.

The full-authority digital engine controls (FADECs)—a first for a Learjet—automate most functions including start, takeoff thrust setting, thrust adjustments for anti-ice bleeds and even automatic relight, should the need occur.

A few of our interviewees noted it is difficult to make small power changes because of the calibration of the electronic power levers—known in techy terms as “rotary variable differential transformers.” The only connections from the RVDT’s to the FADECs are electrical wires.

Operators of early Learjet 60 models told B/CA that occasionally they experienced ENG CMPTR light annunciations, but it seldom caused them to abort a mission. Later model aircraft don’t appear to be as prone to the problem.

Cracked combustion liners, however, are a major source of concern. One high-use operator told us his firm has changed five engines and six liners due to stress cracks near the igniter bosses in the liners. In response, P&WC has issued Service Bulletin 24317, specifying a slimmer-nosed igniter that provides increased clearance from the combustion liner, thereby reducing stress between the two structures when minor thermal distortion occurs. P&WC also issued SB 24349, an updated combustion liner with a double-welded igniter boss and a ceramic thermal barrier coating to reduce heat stress and distortion. Both service bulletins are field updates, and they are covered by the engine warranty or P&WC’s Eagle Service Plan.

The Learjet 60’s contours, including the engine nacelles and pylons, were made more slippery by using NASA/Boeing Tranair software.

Published balanced field length distances by 300 feet.

Brake wear was a problem during the first several months of Learjet 60 operation because the thrust reversers weren’t yet certified for use. Now that use of the thrust reversers is approved, brake wear is greatly reduced, but operators told us they must be careful in using maximum reverse thrust on contaminated runways because of the possibility of foreign-object damage to the engines. The thrust reversers should be stowed at 50 KIAS to prevent possible particle ingestion by the engines.

Operators also had complaints about the cockpit checklist, runway performance data, avionics system limitations and engine hot-section parts. (See “FADEC First for Learjet Engines” sidebar.)

One customer, reflecting on the company’s overall commitment to the Learjet 60 upgrades, said, “Learjet has really worked with us [on these issues].” Most people with whom we spoke shared that belief.

OVERALL SCORECARD

Most of the Learjet 60’s growing pains are related to its unprecedented range...
But there were caveats. “Unlike previous Learjets we’ve operated, you can’t fill up the tanks and fill up the seats.” One reason is optional equipment. Operators frequently order TCAS, GPWS and cabin entertainment systems. For example, the current Learjet 60 demonstrator weighs 500 pounds more than the B/CA equipped weight.

Other survey respondents commented that they wished the Learjet 60 were backed by the quality of product support and technical representatives associated with the Canadair Challenger. The Challenger service center, for instance, assigns a lead person who assumes full responsibility for task coordination and completion of a customer’s airplane.

Brian Barents, Learjet’s president and CEO, doesn’t pull any punches when answering questions about the Learjet 60’s early production-model problems. “The good news is that we’ve already addressed the problems operators have identified.”

Barents said that the firm delivered 22 Learjet 60 aircraft in 1994, and he expects to exceed that number this year. One of the reasons for his confidence is Learjet’s aggressive stance on product improvement.

Specifically, Learjet now offers these upgrades:

- **Group I (No Cost)**
  - SB 60-21-3 Cabin Pressurization Improvement
  - SB 60-21-4 Auxiliary Heating System Upgrade
  - SB 60-21-6 ECS Noise Reduction Package
  - SB 60-21-7 Tailcone Baggage Compartment Heater
  - SB 60-21-1 Pro Line 4 Phase III Autopilot Upgrade
  - SB 60-23-1 Pop-up Radiotelephone

- **Group II (Additional Cost)**
  - SB 60-25-3 Improved Cabin Soundproofing
  - SB 60-27-6 Automatic Ground Spoiler Deployment, $19,200
  - SB 60-34-2 UNS-1B 404 Software

- **In the Works**
  - High-Capacity, Blue-Water Toilet (Fourth Quarter 1995)
  - More Powerful Batteries (Third Quarter 1995)

B/CA is developing a standardized checklist format similar to the Challenger checklist. The pages are larger, systems diagrams are included, and colored index tabs make it easier to identify each section.

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While access to the aft baggage compartment is simple, many operators said they wished the total baggage-volume capacity was greater.

and cabin volume compared to that of previous Learjets. Operators of 20s, 30s and 55s having intra-continental range seldom complained of the lack of an APU, too little potty capacity or the need to program avionics prior to engine start. Without question, the Learjet 60 is stepping up into the intercontinental and trans-oceanic business-aircraft class that historically has been dominated by heavy-iron.

Despite that explanation for the aircraft’s reported shortcomings, operators still believe that the aircraft was pushed into production before it was ready. There has been progress, though. “We’re now getting past some of the early problems,” noted one user.

Don’t mistake all of those complaints as an indication of operators’ dissatisfaction with the Learjet 60. All but a few would strongly recommend purchase of the aircraft to their friends.

“Personally,” an interview subject said, “I don’t think you can beat a Learjet 60.” We also heard, “It’s an excellent value” “try to find something in a mid-size [jet class] that goes faster or performs better,” and “a hell of a good airplane.”

Operators frequently complimented the aircraft for high reliability. Previous Learjet customers found it easy to work on the aircraft. It takes approximately 20 minutes, for example, to remove or replace the optional APU—a must to gain access to the batteries and most systems in the tailcone bay.