



Cessna Citation Excel

Operators give high marks to the “simple Citation” with midsize cabin comfort . . . but there’s still some room for improvement.

By Fred George

Paul Bowen Photography

The Citation Excel delivers on the promises made by Cessna when it was introduced during the 1994 NBAA convention, according to dozens of operators contacted by B/CA. Few operator groups surveyed by B/CA have expressed more satisfaction regarding the performance, comfort and utility of their aircraft.

“Every airplane is a compromise. The Excel isn’t the fastest and it doesn’t fly the farthest, but it’s just the best in class. No other airplane in this class compares with the Excel,” explained Jim Peters, Excel chief pilot at Executive Jet.

Single aircraft operators had similar comments. “The performance is just

great. It does everything the Ultra did, but it has a stand-up cabin,” said Lew Kunkel, aviation manager for Sky Night LLC.

“There are faster aircraft. But, we can use county-class airports, the ones with 3,500-foot runways,” explained Steve Richardson, chief pilot for Boston Post Leasing.

The Excel’s short-field performance never was in doubt, because Cessna fitted it with engines having ample thrust reserves. As the Excel’s MTOW increased from 18,700 pounds to 20,000 pounds, Cessna asked Pratt & Whitney Canada to bump up takeoff thrust to 3,804 pounds from 3,640 pounds. And there’s more margin if future thrust increases are needed.

The Excel’s 2.63-to-one weight-to-thrust ratio is a prime reason why it has the shortest runway requirements of any midsize business jet. In addition, the Excel is second only to the Learjet 60 in time-to-climb performance.

The Excel also has more cabin volume than any aircraft priced for less than \$12.5 million. Its 80-cubic-foot baggage compartment, capable of holding up to 14 sets of golf clubs with room to spare, is 60-percent larger than the next closest competitor, according to operators. Want a business airplane with bigger baggage compartment? Plan on spending \$19 million, or more.

But the largest 500-series Citation hardly is a paradigm of cutting edge technology. This is no double-edged sword that wounds its owner while attempting to slash the competition. Quite to the contrary, it’s an arch-typical example of Cessna’s “simple Citation” evolutionary aircraft development philosophy.

The Excel is essentially a scaled-up Citation V with a Citation VII fuselage grafted on top, plus new-generation P&WC turboprop engines. It’s “grandfathered” to the original A22CE type certifi-

cate issued by the FAA in September 1971. Although it's the biggest 500-series Citation yet built, it shares systems design concepts pioneered in the original Citation 500. The cruciform tail, manual flight controls, cockpit layout, and electrical, hydraulic and fuel systems, for instance, are vintage Citation.

While this conservative design approach works well, it's not without flaws, according to operators. Many of their gripes are related to Cessna's decision to expedite Excel's type certification by means of "grandfather" provisions.

Five-Best and Five-Worst Features

Ask Citation Excel operators to name their aircraft's five best features and they respond with TV quiz show speed. Cabin and cockpit comfort, "cavernous" baggage volume, short field takeoff and climb performance, systems reliability and handling ease consistently make operators' top-five favorites list.

"This is the largest cabin [aircraft] we could operate out of a 4,000-foot runway, most of the time," said Lew Fisher of Armstrong Group. In the midsize class, only the Raytheon Hawker 800XP has a larger cabin, but its runway performance is no match for the Excel.

"I'm glad we didn't look at anything else. We operate out of a 3,755-foot runway," said Harry Kuijpers, chief pilot for Gastonia, N.C.-based Cottonair.

The Excel retains most of the Citation V Ultra's systems and avionics, though some, such as pressurization, have been updated to reduce pilot workload.

"It's really just an overgrown 500-series Citation," remarked James Sayers, Universal Enterprise's aviation manager.

The optional APU, new to 500-series Citation operators and available after Serial Number 5021 as a factory option, also received praise for high performance, pre-start heating and cooling. (The APU may be retrofitted to other aircraft in accordance with SB 560XL-49-01.)

Factory support was frequently named as one of the operators' five favorite features. Maintenance accessibility and low direct operating cost rate high with operators contacted by B/CA.

"We had an S-II and an Ultra before this airplane. It's like owning a Chevrolet," said Richard Smith, chief pilot for Conair Group. "It's a great cabin for the dollar. And it works."

When asked to name the aircraft's five-worst features, however, operators, at times, seemed stumped for answers.

"To be honest, I can't say I don't like anything," said Jeff Conradi, aviation

manager for TCF National Bank, which operates Serial Number 5002, in service since 1998.

Some folks could name two or three shortcomings. Many were hard-pressed to come up with five items. Those who could needed time to search their memories.

After many interviews, patterns of deficiencies eventually emerged. Topping the list of operator gripes was the Excel's overly sensitive but powerful wheel brakes.

"The brakes are too good. We can grease it on, but then [smoothly stopping the aircraft]'s the hard part," said Doug Heigel, chief pilot for Lord Corp. Another chief pilot joked about having to issue helmets to crews and passengers.

The DC-operated power brake servo, carried over from other 500-series Citations, wasn't popular with operators. When operating, it's noticeably audible in the cockpit. More importantly, there's no manual reversion mode for the power brake system, should it fail. Toe pedal braking is not available. If the single-channel power brake system fails, pilots have to revert to emergency pneumatic braking with no anti-skid and no differential braking action.

Generous use of the thrust reversers causes considerable horizontal vibration and buffet, according to operators. "The whole tail, including the feathers, shakes," said Dave Lyall, who flies for EMJ Inc. "I always wonder if I'm leaving parts of the aircraft behind," remarked Jack Hoogervorst, who flies for DMB Associates.

Operators of older serial number aircraft complained that PW545 engine accessory gear cases are prone to oil leaks



The Excel's trailing link, main landing gear received compliments.

where the AC alternators and DC starter/generators are mounted. P&WC has since incorporated a new Teflon seal that solves the leak problem, Cessna officials say.

Many folks said they weren't fond of the hydraulic-actuated, two-position horizontal stabilizer that changes angle of incidence to increase elevator authority when the flaps are extended.

The single-wheel, main landing gear also received criticism. Some operators said the main landing gear tires wear unevenly and excessively. The single-wheel configuration offers no redundancy in case of tire failure. Pavement loading and hydroplaning were also concerns. Operators said that a 20,000-pound-class aircraft deserves dual-wheel main landing gear.



The 55-light master warning panel received some complaints — too busy and too many advisories.

A few said they missed not being able to earn single-pilot operating waivers, as they had been able to do in other 500-series Citations. Others who operate aircraft with internally serviced toilets said the hold tank capacity is much too small for this class of aircraft. Opt for the high-capacity, externally serviced lavatory, operators recommended.

Previous operators of midsize and large cabin business aircraft said the Excel needs bleed-air anti-ice on the tail — not old-fashioned rubber deice boots. And some noted that the Excel's wing is long in the tooth. The aircraft needs more speed, more range and broader Mach-buffet margins in the mid-40s.

The standard vapor-cycle air-conditioning system has anemic performance in hot weather, some operators told B/CA. But a few operators, including one based in Phoenix, said the standard system has acceptable capacity for 120°F-plus summer days.

If you opt for the APU, though, "you can hang meat in the cabin in Phoenix," one operator said, echoing other comments we heard.

B/CA received a wide variety of other production-line-related, quality control complaints that weren't trends. For example, some early airplanes had hydraulic leaks, loose electrical terminals and flight control rigging problems.

Service Centers at Capacity

Cessna has a high quality problem. They've delivered so many Citations during the past decade that their factory service centers are swamped with business. Operators report difficulties getting appointments. Warranty work often takes longer than expected. Some parts are in short supply. Accounting and billing technical errors are encountered.

Cessna is aware of these problems and has embarked on a service center expansion program. Late in 2001, the firm announced its intention to build a major new service center adjoining the Wichita factory. The San Antonio facility, already the largest in the network, will double in size by 2004. A new facility, having twice the area, is slated for Orlando. Sacramento already has doubled in size. Expansions are scheduled for Toledo, Ohio; Greensboro, N.C.; and Long Beach, Calif.

With double the service center capacity in two to three years, operators should have quicker, more efficient service.



The Excel's cabin volume is a selling point.

Checkered paint quality from Cessna was a trend. Despite numerous paint process improvements at Cessna's Wichita factory during the past five years, the plant still does not deliver high-quality paint jobs consistently, according to operators.

A few operators thought Cessna was pushing aircraft through completion too quickly. "The hurried-er they go, the behind-er they get," said Dave Landoll, who flies Wichita-based RAG Enterprise's Excel.

Some folks have taken delivery of their aircraft "green" and then have had them painted by Duncan Aviation's Battle Creek, Mich., or Lincoln, Neb., facility. No one complained about Duncan's paint work.

Operators, though, put the Excel's assets and liabilities into perspective. It may not be a perfect airplane, but it's virtually unbeatable for \$10 million, they told B/CA.

Operator Profile

The first customer aircraft was delivered in July 1998. More than 200 Excel aircraft now are in service. Highly accurate fleet statistics are available through CESCO, Cessna's computerized operations and maintenance tracking system. By the end of November 2001, the fleet had amassed more than 100,000 flight hours. EJA alone has logged more than 10,000 hours since its first Excel delivery in April 2000.

Three out of four Excels are registered in the United States, according to Cessna Aircraft. The remainder is split between Brazil, Canada, Switzerland, Germany, the United Kingdom and Sweden. For the majority of operators, the Excel is the only aircraft they fly. Most fleet operators tend to be small, with few aircraft. The two notable exceptions are a Charlotte, N.C.-

based bank and a Southeastern U.S. "Baby Bell" spinoff, each having multiple aircraft. The largest fleet operator is Executive Jet, with 25 aircraft in service and 25 more on order.

Close to two-thirds of Excel operators previously operated Citation V-series aircraft. Four out of five previously operated Citations, according to Cessna. Historic experience with Citation reliability and Cessna factory support played key roles in the decision to buy the Excel, operators told B/CA.

"We had a Citation II for 11 years and we had no problems whatsoever," claimed Warren Longden of Roaring Springs Ranch.

When folks originally evaluated the Excel prior to purchase, they also looked at the Learjet 45, Learjet 60, Hawker 800XP and even the Dassault Falcon 50EX. But the Excel prevailed because of its combination of cabin and baggage volume, short-field performance, acquisition price and low direct operating cost.

Most Excel buyers specified interiors with a forward, right-side, two-place divan; a central, four-seat club section; and two forward-facing seats in the aft cabin. Some folks ordered their aircraft with a relatively large, two-place divan, flanked by a small cabinet behind the copilot. Others specified a relatively narrow, two-place divan that makes room for a generously sized cabinet or coat closet on the right side. Executive Jet ordered its aircraft with a single, forward, right-side seat, thereby making room for a larger coat closet behind the cockpit bulkhead. Only a few operators ordered the optional jump seat (24 pounds) in the lavatory compartment, providing nine, full-time occupancy passenger chairs.



Lights in the Excel's airstair steps, along with a sturdy folding handrail, help passengers find solid footing and board with ease.



Basic operating weights of aircraft vary widely. Popular options include dual UNS-1 Csp FMS (10.5 pounds), TCAS I/II (44 to 49 pounds), EGPWS (19.3 pounds), Teledyne Controls MagnaStar radio-telephone (27.8 pounds) and Honeywell RE100 APU (108 pounds). The BOWs of early aircraft, particularly those without APUs, range from 12,300 to 12,650 pounds, according to operators. Later models, most of which have APUs, weigh 12,700 to 12,950 pounds, depending upon equipment. The weights reported by operators are consistent with data provided by Cessna for B/CA's May 2001 Purchase Planning Handbook.

On average, operators fly 387 hours per year and their average mission is 1+04, according to CESSCOM. The average passenger load is three to four passengers, but many operators told B/CA they fill all available seats on occasion.

Excel operators climb their aircraft directly to FL 390 to 410, even on such short average missions. The Excel can climb to cruise altitude in 14 to 16 minutes under standard-day conditions. Warm temperatures add four to five minutes to climb time. After level off, it cruises at 415 to 420 KTAS and burns 1,200 to 1,300 pph on such missions, operators said.

The longest mission operators feel comfortable flying is 4+00 to 4+30. Under no-wind conditions, the Excel can fly four passengers 1,657 nm and land with NBAA IFR reserves. A few operators reported flying more than 1,900 nm on the longest trips when the destination airport weather was quite clear.

Operators said they climb directly to FL 390 to FL 410 on long-range missions, with a first-hour fuel burn of 1,700 to

1,800 pounds and a speed of 410 to 415 KTAS. The second hour, they climb to FL 430 and fuel flow drops to 1,200 to 1,300 pph. Third hour fuel flows drop to 1,100 to 1,200 pph. If maximum range is a concern, they'll climb to FL 450 after two to three hours, reducing fuel flow to 1,000 to 1,100 pph. Speed drops to about 400 KTAS at FL 450, according to operators.

The Excel's PW545 engine performance is sensitive to warmer-than-standard outside air temperatures at cruise altitude. In ISA+10°C to ISA+20°C conditions, for example, FL 450 may not be a usable cruise altitude when the aircraft is heavy.

In addition, cruise speed drops 10 to 15 knots, according to operators.

Report Card and Cessna's Response
B/CA asked operators to grade their aircraft in 20 categories, encompassing the airframe, engines, avionics, individual systems and paint. By far, "A" was the most frequent grade awarded by operators in most categories. A few operators gave the Excel a straight "A" report card. Some long-term veteran operators, though, particularly operators having flying experience in more expensive aircraft, gave "B" grades to Excel.



Kudos for 'Team Excel'

Operators laud Cessna for making available Team Excel technical expertise. Paul Martin, Bob Young and Mike Lill frequently were praised by operators for troubleshooting and solving problems with AOG urgency.

"I give Team Excel hotline an 'A' grade. They have fantastic people on the other end [of the phone line]," Conair's Richard Smith told B/CA.

"I can get key information right now," Hesco's Larry Wayland said.

"The support is out of this world," added Capital Excel's Keith Hershberger.

Most operators lauded the performance of the engines, Honeywell Primus 1000 avionics and Honeywell RE100 APU. Operators like the simplicity and reliability of the Excel's systems, particularly the fuel, electric, flight control, pneumatic and cabin pressurization systems. They were especially complimentary about the Excel's trailing link, main landing gear in light of their previous experience with the Citation V's notoriously stiff, "straight-leg" oleos.

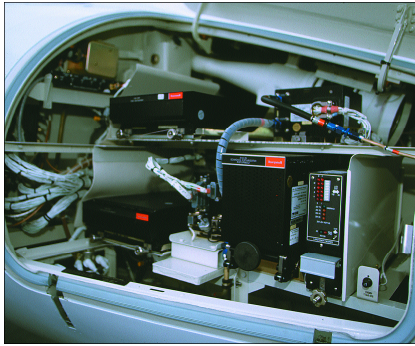
Excel's shortcomings, noted by "C," "D" or "F" grades, were sparse. Its overall GPA places it well ahead of its midsize competitors. But the sales star of the Citation family still has a few warts, operators told B/CA.

The 55-light master warning panel received some complaints. Some folks said it is too busy and provides too many advisories, such as illumination of the HYD PRESS (hydraulic system), TAIL DEICE PRESS (de-ice boots) or FUEL XFEED (fuel cross-feed) annunciators when the associated systems are functioning normally.

Cessna officials, though, said a basic Excel program design goal was to provide maximum commonality with other 500-series Citations in order to speed the certification process and hold down costs.

Cessna developed a comprehensive brake system bleeding procedure and special training program for technicians that solves the problem of overly sensitive wheel brakes, according to Excel program officials. Most operators were quick to add that the Excel's stopping power, due to its high-capacity carbon brakes, is excellent, and per-landing brake wear is minimal.

Cessna retained the 500-series, single-wheel main landing gear design to contain cost. To address tire wear concerns, Cessna upgraded the aircraft with more-robust tires, having improved rubber compound and stronger sidewalls, at Serial Number 5088. The single-wheel design, though, makes wheel alignment and proper inflation important issues.



The nose equipment bay is sparsely populated with standard equipment, providing ample room for avionics options.

Cessna has published revised procedures for inflating the tires with weight on and off the wheels to ensure proper inflation.

While some operators were concerned about the thrust reversers inducing a pronounced tail shake, Cessna claims it "will have no long-term effects on the empennage." Some folks B/CA interviewed also didn't like the two-position, variable incident horizontal stabilizer mechanism. Both are related to the Excel's cruciform tail, borrowed from the Citation V as a cost-saving measure. The two-position tail ensures adequate pitch control authority with flaps extended for optimum runway performance.

Some operators said they would have preferred a bleed-air heat, leading edge anti-ice system for the horizontal tail. Cessna officials commented that the additional bleed air needed for the system would have hurt engine thrust output when the system was in use. This would have increased the Excel's takeoff field length when the system was in operation, a tradeoff Cessna found unacceptable.

As for the Excel's small, internally serviced lavatory's holding tank, Cessna is developing a service bulletin, due for release early this year, to install a larger holding tank. Operators with externally serviced lavatories expressed no such complaints.

Hydraulic leaks have been a problem

for some early Excel operators. Cessna traced the problem to threaded couplers. Changes were made to the fittings and a backup O ring was added to stop the leaks.

Very early aircraft were prone to producing an odor in the cabin that smelled similar to burning rubber, thereby alarming passengers and crew. Cessna traced the problem to sub-standard air distribution ducts. Upgraded ducts, available through a service bulletin, solve the problem, Cessna officials said.

Some operators said too many service bulletins have been issued for the aircraft.

"It's just sick, when it comes to service bulletins," said Armstrong's Fisher. "It's fast, but it's not fast enough to outrun the service bulletins," quipped Warren Longden, who flies 5009 for Roaring Springs Ranch.

Cessna officials countered that it's been the firm's long-time policy to issue recommended and optional service bulletins for older aircraft to make sure they can be upgraded to the latest production configuration standard.

Operators also complained Cessna did not have sufficient parts in inventory for such recommended and optional service bulletins. Cessna pointed out that, at times, service bulletins are published before all the parts are in stock as a planning tool for operators' future shop visits.

Finally, consistent, high-quality paint work continues to be a challenge for Cessna. The firm is aware of the problem and hopes to eliminate paint quality problems in the next few months.

Would They Buy Another?

Loyalty to the Excel and the Citation family is as predictable as the report card results. With very few exceptions, operators say they would buy another Excel without reservation.

"It's a damned good airplane. We're really happy with it, we're prejudiced towards it," exclaimed Capital Excel's chief pilot Keith Hershberger, who gave the Excel all "A" grades except for one "B+."

"They can't make them fast enough. There's just nothing else that will do the job. There isn't a trip that goes by that the boss doesn't smile," TCF National Bank's Conradi said.

"We're going to keep it for 10 years. I want to retire in it," said Lord Corp.'s chief pilot Doug Hiegel.

"Cessna really does listen to operators," echoed Lowell Longenette, chief pilot for 456JW Co.

But some operators weren't likely to buy another Excel. Most of them are planning to trade in their Excels on Cessna's new Citation Sovereign on order. B/CA



Cessna claims any thrust-reverser-induced tail shake should have no long-term effects on the empennage.