

CESSNA CITATION II

*The business jet that handles
as easily as a Skylane*

BY RICHARD L. COLLINS



Pilots flying jets have the best of all worlds. They don't have to rationalize good training because it is required. They don't have to get all sweaty over takeoff performance because it's in the book and a departure isn't allowed unless the runway is long enough for a successful conclusion after an engine failure at the worst time. The systems are all redundant, and big margins are built into everything. The airplanes are certified the same as airline aircraft, and the pilots are trained to the same standard. Cockpits and cabins are so quiet and smooth that spending a day aloft doesn't leave pilots and passengers tingling. This deal has made jets the darlings of corporations and affluent individuals.

■ The Cessna Citation II is an "entry-level" jet that has seen years of experience and years of tweaking and that flies on as a staple in the business fleet. The airplane was actually discontinued awhile ago but has been

PHOTOGRAPHY BY MIKE FIZER

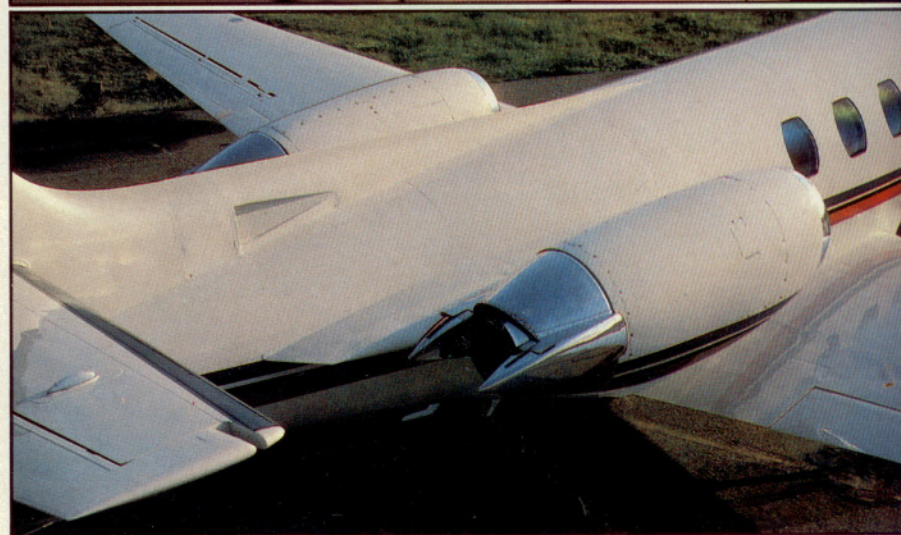
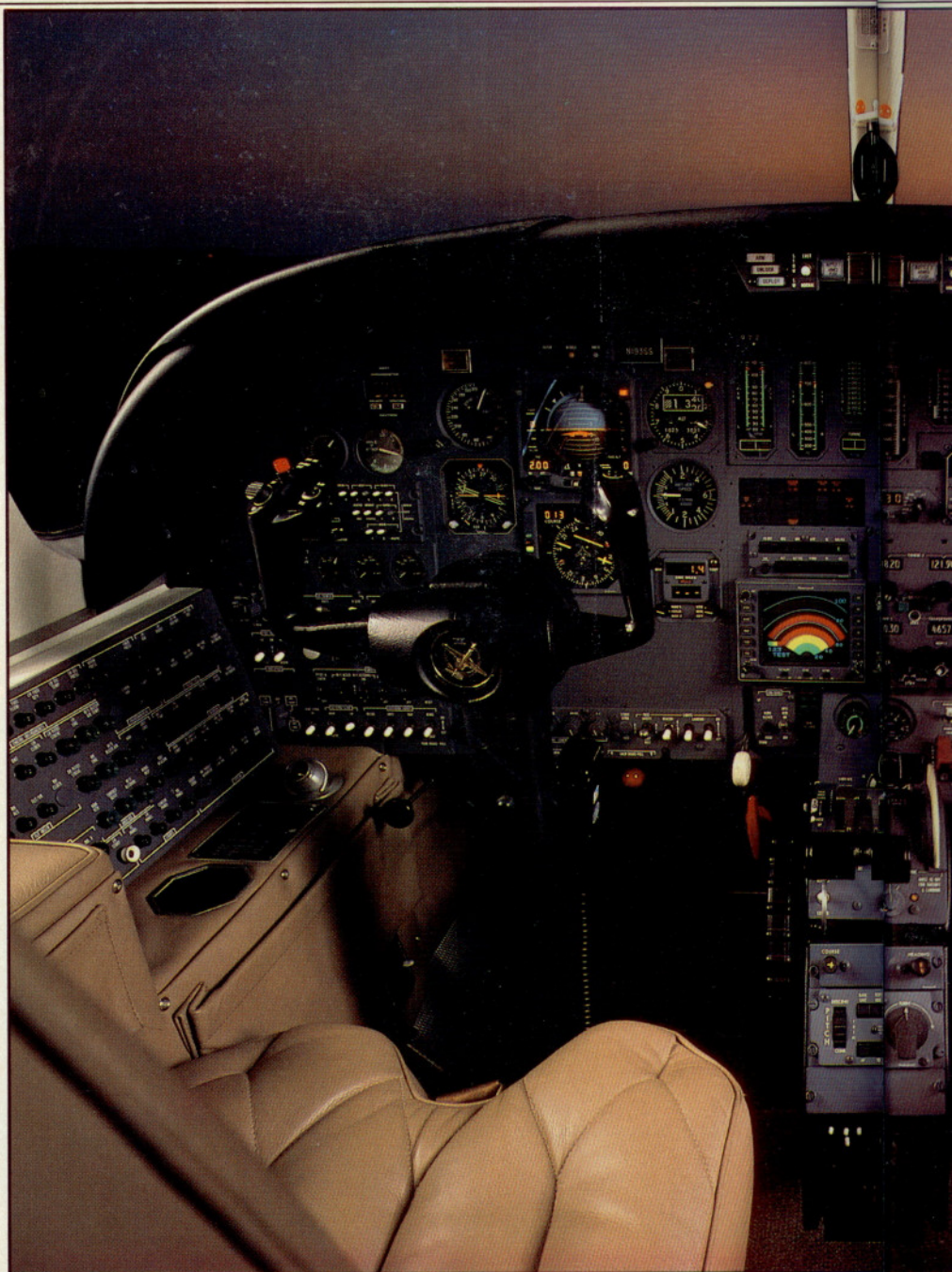
brought back by popular demand. While the blend of performance and economy has made the Citation II popular with number-crunchers, there's more to it than that. The Citation II is an incredibly nice airplane to fly. When the original Citation was developed, handling qualities were given the full measure of attention along with economy and performance. The intent was always to gain approval for single-pilot operation, and the cockpit is so designed. The result is an airplane that puts less pressure on a pilot than, say, a Skylane RG. Example: The only fuel management that would ever be required would be to crossfeed fuel from one wing to the engine on the other side during engine-out operation. Otherwise, each engine has its own 373-gallon supply of Jet A from the wing on its side.

To start the Pratt & Whitney Canada

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fanjets, press the appropriate starter button on the lower left panel, where most pre-start business is done. Introduce fuel when N1 (fan speed) reaches eight percent. Everything else is automatic. Taxiing is as in any Cessna, though a Citation II pilot has to be aware that the main landing gear tread is 17.6 feet, so the taxiing needs to be done down the yellow line if you are on pavement. (The Citation is approved for sod field operations.) The cockpit visibility is superb, though there is a trade-off on this. If you have a lot of window area to better see things, the sun has an equal amount of window area to shine through. For hot-weather operation, freon air conditioning is available as an option. With the standard air-cycle machine, the cabin is warm and the flight deck hot on the ground on a hot day.

Flying jets is a precise business. For the first takeoff in the Citation II, with Robert Fizer, Citation manager of flight operations, the power setting was calculated to be 95.4 percent of maximum fan speed. The takeoff decision speed, V1, was 101 knots. Below that speed an engine failure would dictate an abort. Above it, the takeoff would be contin-





ued. Rotation speed was 102. V2, which would be flown initially after an engine failure, was 109. For best engine-out rate of climb, the airplane would be flown at 143 knots. The elevation was 1,330 feet at Wichita's Mid-Continent Airport, and the temperature a sweltering 35 degrees Celsius. Despite this, at the 12,200-pound takeoff weight the balanced field length was 3,600 feet. With that length runway, all the options were there. Accelerate to 100.9, abort and stop. Accelerate to 101, lose an engine, and fly successfully away. In a jet you are required to consider the worst case before every takeoff. That's one reason the jet safety record is so good.

The pre-takeoff check list is no more complex than that of many light airplanes. Where you might turn on auxiliary fuel pumps in a piston airplane, in a jet igniters are turned on to make certain that should the fire try to go out, it will be rekindled.

Despite a crosswind from the left, the Citation II wanted to track straight and true. I brought the power up to near the proper value, and Fizer trimmed to the exact number. That would be a time when a pilot flying solo (the aircraft is certificated for single-pilot operations) might feel the need for another pair of hands and eyes. The acceleration in a jet is always pleasing, and when it reached 102 knots, slight back pressure on the wheel made the airplane fly away. It is flown with light pressures; the only time you are rushed to trim is as it accelerates after takeoff. The trim speed should have been 102 at liftoff to keep from having to apply a lot of pressure in either direction at and immediately after liftoff. Acceleration to 180 knots for a good climb speed requires substantial retrimming, which can be done with the electric trim or, if you are an old fud like me, with the manual trim wheel.

If anything about the Citation is intimidating, it is the avionics system. The airplane flown (not the one pictured) had a Honeywell electronic flight instrument system, with all the usual flight director functions, plus a global navigation system. The capability of this package is enormous, and it would require a substantial amount of detail training to take advantage of the full capability of the system. It would actually take the training to be able to operate the airplane safely because the confusion factor would be high without full knowledge. The Citation II, as an airplane, is more "user friendly" than the



avionics systems because it is simpler.

With many airplanes a rigid climb-speed schedule is followed, but Fizer said the Citation II isn't critical—the climb speed might well be dictated by wind. Climb at a slower speed to get up into a big tailwind more quickly. Climb at a faster speed to make better groundspeed with a strong headwind.

In turns it is quickly apparent that a Citation is quite stable: You can take your hands off the wheel, and if properly trimmed, the airplane just keeps on doing what it was doing.

Slow flight and the approach to a stall are tame. With the landing gear and flaps down, power off, slowing the airplane to about 80 knots brings on a rumbling burble. Drop the nose slightly and the burble goes away. The ailerons are fully effective throughout the maneuver.

I did notice one item that might make a pilot miss an altitude by a hundred feet on a level-off. While billed as an "instantaneous vertical speed indicator," the instrument lags, and to really nail an altitude, the altimeter itself is the best indicator that the climb or descent has actually ceased.

Descents can be enhanced through the use of speed brakes. They cause a rumble, and passengers should be informed in advance lest they be startled by the change in sound and feel. Should a pilot use and forget the speed brakes, they stow automatically when power is increased past 80 percent of N1.

The good visibility is a real asset in the traffic pattern, and the airplane can be

The Citation II helps a pilot master the many different disciplines of jet flying by placing few other demands on him.

flown slowly enough that it doesn't whiz by slower airplanes. Approach flaps and the landing gear are extended on downwind, three-fourths flaps and 60-percent N1 on base, full flaps on final, 102 KIAS, power to idle approaching the threshold lest the airplane float, a slight flare, and the Citation lands. It's easier than in a Skyhawk. If the pattern is flown at the correct height and the configuration is changed at the proper time, once the power is set at 60 percent, it need not be changed again until time to flare and land. And it's possible to have that down pat by the third landing.

On a missed approach after an ILS, I was reminded that in jets you do get the nose up as power is added. Going to max power with the nose down will only serve to propel the airplane toward the ground. The flight director will command the proper nose-up attitude, or 15 degrees will do just fine.

Touch and go landings on a 4,251-foot runway at Hutchinson, Kansas, were quite comfortable. On one go, Fizer pulled the power back on the right engine just after liftoff. The required rudder pressure to hold the aircraft straight



HONOR ROLL

Citations are found at the head of the class.



Contrary to the Roman numerals suffixed to its surname, the Citation II actually is number three in Cessna's fanjet family tree, following the original Citation 500 and the Citation I. Two more have been added since, the S/II and the III. Cessna also built 15 T-47s, a clipped-wing derivative of the S/II, for the U.S. Navy, which uses them for low-level radar intercept training. A sixth civil model, the Citation V, currently is undergoing certification trials. (A Citation IV is planned, according to Cessna.) The II, however, has been the mainstay of the clan. Since production began in 1978, 529 have been delivered, compared to 349 of the original Citations 500s, 342 Citation Is, 149 S/IIIs, and 149 IIIs.

Except for the III, all Citations are variations of the original Model 500, introduced in 1972. A true entry-level business jet, the six-place 500 featured performance and price that fit neatly between turboprops and the reigning smaller business jets of the day, notably the Gates Learjet 24.

In 1976 Cessna announced its intention to produce a family of Citations. The Model 500





would evolve into the Citation I, with a longer wing span for better climb and cruise performance and better fuel efficiency. The Citation II would be its bigger brother, with a stretched fuselage to carry two more passengers and 300 pounds more thrust from each of the Pratt & Whitney JT15Ds. The head of household would be the Citation III, a 10- to 13-passenger, swept-wing jet with the speed, range, high-altitude capability, and aesthetics to compete in the medium-size business jet marketplace. The Citation I was introduced in 1977, the II a year later, and the III in 1982.

Cessna continued to tinker with its success, and in 1984 the Citation S/II debuted. With no increase in thrust, the S/II flies higher, farther, faster, and with more payload than the II. All of that was accomplished by slightly reconfiguring the airfoil, adding a swept cuff to the wing root leading edge to smooth airflow and increase fuel capacity, redesigning the flap system and engine pylons, adding gap seals, and using lighter-weight composites in the ailerons and flaps.

The S/II was only a temporary successor to

the II. In 1987, after a three-year hiatus, the II was put back in production. Whereas the S/II offers a performance advantage, the II, at about \$900,000 less, once again is the most affordable Citation.

At the same time it announced it would be bringing the II back, Cessna said it had developed a plan to reintroduce the Citation I. The company would buy used Model 500s, strip them of paint, interior, wiring, and avionics, and rebuild them to Citation I specifications. The engines would be overhauled and zero-timed. The price for the completed "good as new" airplane was forecast to be \$1.5 million. Cessna later concluded, however, that rebuilding older Citations would be more expensive than originally thought, and the project was dropped.

The Citation V will be based on the S/II airframe, but with an additional 20 inches in the fuselage to provide more stretch-out room for passengers. The big difference will be in the engines. The Pratt & Whitney JT15D-5A turbofans will produce 2,900 pounds of thrust each. The same engines

power the T-47 and BE400 Beechjet. The Citation V is expected to climb and cruise faster and higher than the S/II, which likely will be phased out of the Citation product line.

When the littlest Citation first appeared on FBO ramps 16 years ago, some pilots of *real* bizjets, which were almost 100 knots faster, greeted it with tongue lodged in cheek. (Question: Why do screens cover the exhaust end of a Citation's engines? Answer: To protect against bird strikes from the rear.) But the Citation could boast of feats unattainable by the competition. Its fanjet engines were far quieter and more fuel efficient than the then-standard turbojets, it could operate out of short fields and unpaved runways, it cost far less to operate, and, beginning with the Citation I, with special certification it could be flown by just one pilot. All of the siblings of the original Citation have continued those traditions. Cessna has enjoyed the last and most satisfying laugh, however; as of mid-1988, 1,519 "sensible Citations" have been sold, more than any other type of business jet.

—Mark R. Twombly



was reasonable and the climb rate good. At 400 feet above the ground (as read off the radio altimeter), takeoff flaps were retracted and the airplane was flown to its best rate-of-climb speed, where we had about 1,000 feet per minute. It was a

far cry from, and far easier than, the fire drill and marginal performance that follows an engine failure in a piston twin. The yaw damper can be used to provide the rudder inputs required in an engine-out situation, which simplifies the en-

gine-out landing. As power is reduced on the good engine for landing, disengage the yaw damper and you have a properly trimmed airplane.

The Citation II was flown VFR the few miles back to Wichita from Hutchinson,

OLIVE BORGATTI

Off she goes into the wild blue yonder

When Olive Borgatti climbs out of her Cessna Citation II—the aircraft pictured in this issue—your first thought probably isn't that she has just exited the left front seat. In fact, the 71-year-old Borgatti doesn't fit the picture most people—pilots and nonpilots alike—paint of a Cessna Citation owner and pilot. But the owner of Spag Supply, Incorporated, a Shrewsbury, Massachusetts, department store, bristles at the suggestion that there's anything unusual about her type rating in the business jet and rejects the idea that she should relinquish control to a pair of hired hands up front. After a moment's conversation, it's clear that she enjoys flying the Citation too much to leave piloting duties to someone else.

Borgatti always flies with company pilot Peter Woiciechowski, with whom she rotates pilot and copilot duties, on her rounds to retail merchandise shows for her company. Before the Citation, she toured the eastern United States in a Commander 840 turboprop and before that a Shrike Commander. She says both were capable workhorses—she flew the 840 for four years and nearly 560 hours—but neither can match the panache of the Citation.

The Citation's high-altitude, high-speed capabilities swayed her into trading in the latest Commander. "It gets me above the kind of weather we had to ride through in the

Commander," she says. And of the Citation's prodigious speed advantage over the turboprop she says, "I can load up my staff, take



Most corporate pilots just want to guarantee the top brass a smooth ride, but Peter Woiciechowski gets to share the flight deck chores with his boss, Olive Borgatti.

off for a merchandise show in Chicago from Massachusetts at eight, and be there before the show opens at 10. There's no way we could have done that in the Commander."

Beyond mere speed and altitude capability, Borgatti says she also much prefers the way the Cessna flies. "It's so easy. There's less to do than on the Commander. I own a Cessna 182 and the Citation is just as easy to fly." But much faster, she says with a laugh. Clearly, though, the Citation's handling qualities are what makes her smile. "It feathers on the runway wonderfully. With the Commander it was a sometime deal, I didn't always get the landing I wanted. With the Citation, every one is perfect."

Borgatti takes flying the Citation seriously, too. When she bought the jet she attended the FlightSafety International school with her company pilot to make sure both were up to speed on the Cessna's systems and capabilities. "They do a great job," she says of FlightSafety. "I took the courses when I had the Commanders, too." Typically she flies about 100 hours a year on business; she has just over 2,000 hours, and Woiciechowski has accumulated more than 5,000.

And while Borgatti admits that she doesn't fit the usual Citation pilot profile, she is no less enthusiastic in her praise for the twinjet than any other pilot with Citation II time. "I love it," she says.

—Marc E. Cook

and because it was hazy and there is a lot of traffic in this area, the cruise speed was held to 150 KIAS. At Wichita the tower first assigned Runway 19 Right and then switched to the Left. The side-step and establishment of a stabilized approach on short final to the other runway was easy to handle. After this landing I tried the reverse, which is quite effective. (Published landing distances are based on the use of brakes only.)

There is a lot to learn in jet flying. High-altitude meteorology, high-altitude physiology, the aircraft systems—including avionics and autopilot—and the air traffic control system all have to be mastered. The Citation helps a pilot do all this by placing few other demands on him—which is why the airplane has enjoyed such an excellent safety record that it was awarded the Collier Trophy a couple of years ago. □

Cessna 550 Citation II

Base price: \$2,495,000

Price as tested: \$3,011,620

Specifications

Powerplants	Pratt & Whitney Canada JT15D-4, 2,500 lb thrust
Length	47.2 ft
Height	15 ft
Wingspan	52.2 ft
Wing area	322.9 sq ft
Wing loading	41.2 lb/sq ft
Thrust to weight ratio	2.66 lbst/lb
Seats	8-12
Cabin length	20.9 ft
Cabin width	4.9 ft
Cabin height	4.8 ft
Empty weight, as tested	8,187 lb
Max ramp weight	13,500 lb
Maximum takeoff weight	13,300 lb
Useful load, as tested	5,313 lb
Max landing weight	12,700 lb
Zero fuel weight	11,000 lb
Fuel capacity, std	5,008 lb
Baggage capacity	1,150 lb, 63 cu ft

Performance

Takeoff distance, balanced field length	2,990 ft
Rate of climb, sea level	3,370 fpm
Single-engine ROC, sea level	1,057 fpm
Max level speed, sea level	262 kt
Max level speed, 25,000 ft	385 kt
Cruise altitude/Range w/45-min rsv, std fuel	
43,000 ft	1,594 nm
Max operating altitude	43,000 ft
Single-engine service ceiling	25,200 ft
Landing runway length	2,270 ft

Limiting and Recommended Airspeeds

Vy _{se} (best single-engine rate of climb)	143 KIAS
V _{fe} (max flap extended)	176 KIAS
V _{le} (max gear extended)	176 KIAS
V _{no} (max structural cruising)	

262 KIAS to 30,500 ft, then Mach 0.705

V _{so} (stall, in landing configuration)	82 KIAS
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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. □