

CITATION

You can't argue with success.

BY RICHARD L. COLLINS

Business jets did not have an easy birth. The first, the MS-760, built by Moraine Saulnier in France and sold in this country by Beech, was a four-place twinjet light airplane. Cessna did a paper copy of that in a civilized version of its T-37 U.S. Air Force jet

PHOTOGRAPHY BY MIKE FIZER



trainer. The first jet actually built by Beech was a single-engine variation of the T-34. (Later, Beech put two jet engines on a King Air and flew it a few times; now it builds the Beechjet, which is a redesigned Mitsubishi Diamond jet.)

For an Air Force transport contract, North American developed the Sabre, which became the civilian Sabreliner. The Air Force competition also led to development of the Lockheed JetStar (originally a twin) and a four-engine McDonnell airplane that still shows up in the odd-picture contests—it looked like a baby DC-8.

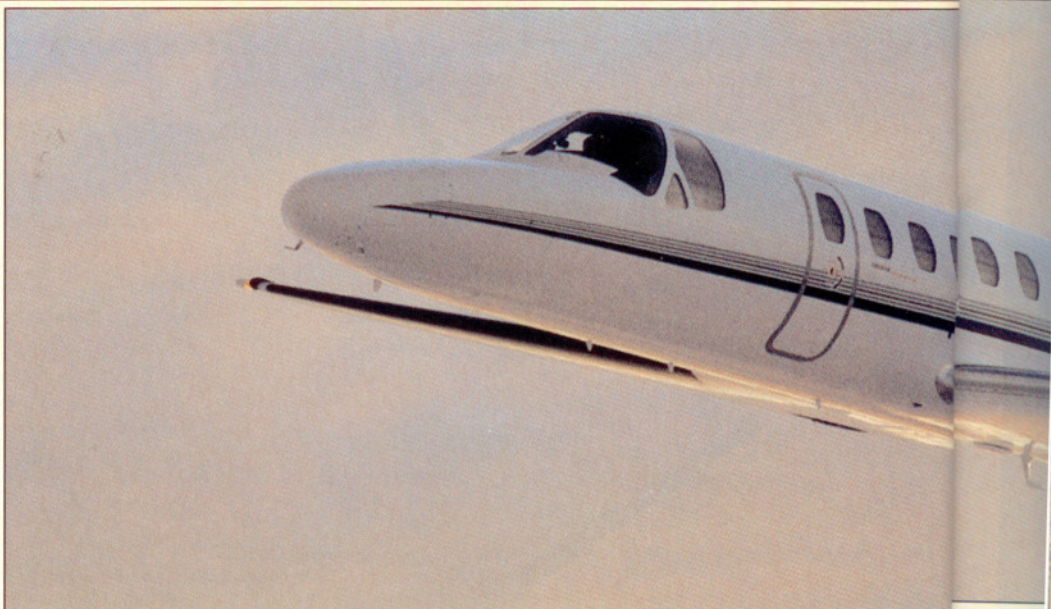
Learjet became the name synonymous with business jets, though it got off to a rocky start. A high percentage of the Lear 23s delivered were de-

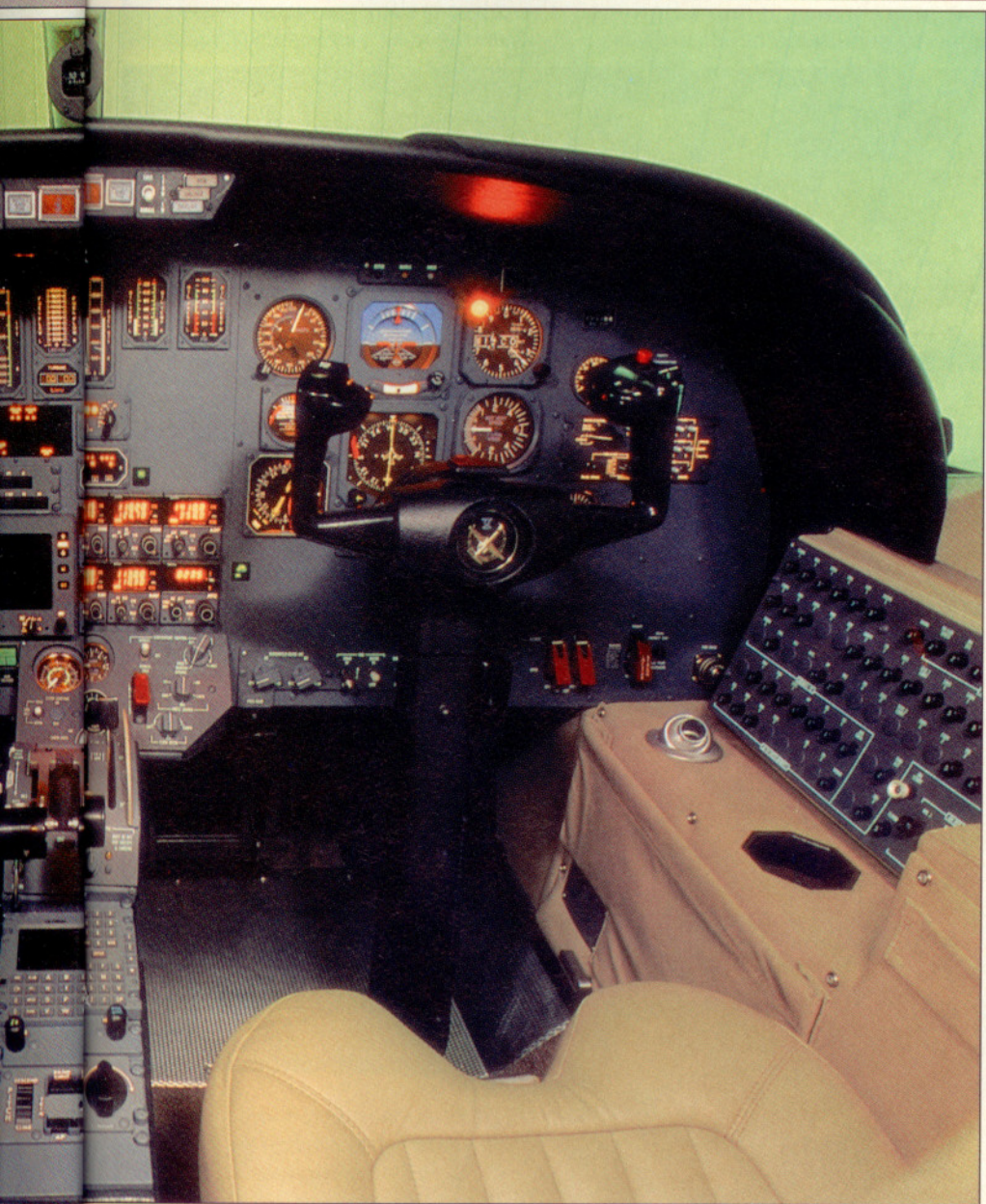
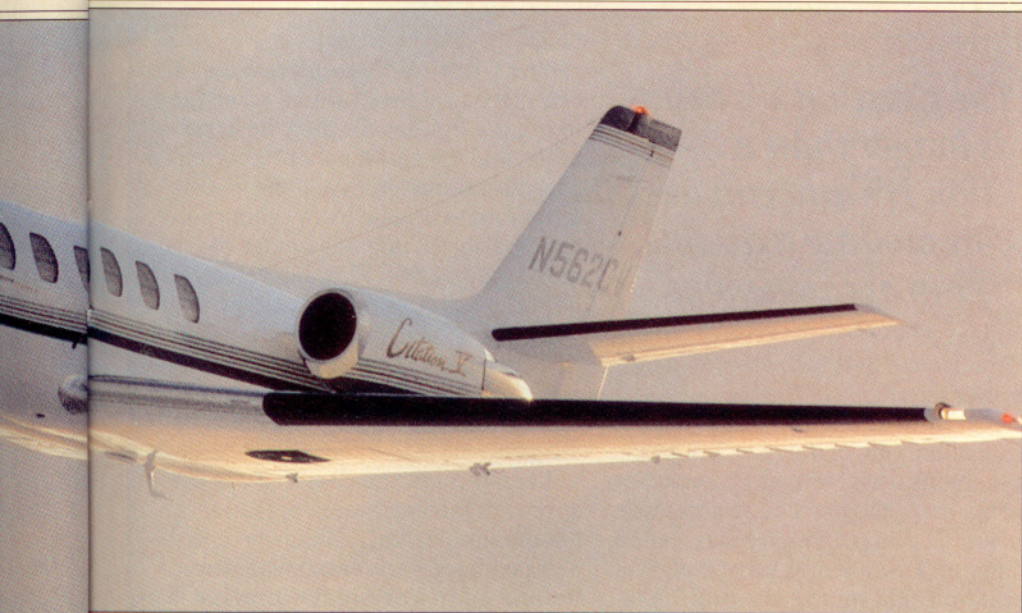
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stroyed in their first year of existence, proof that higher performance on the part of the airplane calls for similar performance on the part of the pilot (50 percent of all 23s ever built have been destroyed or substantially damaged in accidents). The Learjet survived all that and, in successive versions, went on to become one of the most-produced business jets in this country.

Cessna in the 1950s and 1960s was adding to its line in quite an orderly fashion. The 100s were light singles, the 200s heavier singles, the 300s twins, and the 400s cabin-class twins. The next step was so logical that everyone missed what Cessna was doing. The pointed-nose Fanjet 500 was really supposed to be a turboprop, but where were the propellers? None there, and then the pointed nose was eliminated because it collected ice in a strange manner and fed it to the engines. The refined airplane was given the name of a race horse: Citation. (Winner of the 1948 Kentucky Derby, with Eddie Arcaro up. It's interesting that the 1947 Derby was won by none other than Jet Pilot.)

From the beginning of the development program, the Citation was in-





tended to be an easy-to-fly airplane, one that would be at home on short fields. Even though Cessna did eventually build turboprops with 400 numbers—the 425 and 441—the original Citation was designed to compete in the turboprop market of 20 years ago.

All this led many to ask why Cessna's jet was so slow—bird strikes from the rear and all that. The real question should have been why Cessna's turboprop was so fast.

The Citation started life at about 700 grand, which is 2.1 million of today's shrunken bucks. The original Pratt & Whitney JT15D engines developed 2,200 pounds of thrust each, the balanced field length was under 3,000 feet, and the pedal-to-the-metal cruise was 348 knots. Everyone who flew the airplane marveled at how easy it was to fly and how well it worked on a short field. The first landing I made in a Citation was on what is now the entrance roadway at Colonel James Jabara Airport near Cessna's Wichita headquarters. The second one was at Cessna Aircraft Field, which was then less than 3,000 feet long and about as wide as an average highway. Here was an airplane that looked and smelled like a jet but that was easy to fly. You could even fly subsequent versions without a copilot.

The Citation has undergone extensive evolution over the years. Because the speed of turboprops moved relentlessly upward, to well over 300 knots, it stood to reason that, for the Citation to remain viable, it too had to go faster. A bigger, stretched cabin also was a logical enhancement, and thus came the Citation II. Then there was the S/II, the first Citation based on the original model to flirt with 400 knots. In what may be the ultimate version of the Fanjet 500, Cessna introduced the Citation V (Model 560) at an outdoor extravaganza, including a full brass band and a mock-up creeping out of a smoke-filled room, at the National Business Aircraft Association convention in New Orleans in 1987. Since then, Cessna has certified the further-stretched V and put it into production. In April, Cessna delivered the 100th Citation V to the Cartier company in France.

The first Citation was what some jet pilots referred to as a "slug." The Citation V is a real jet, almost 100 knots faster than its trail-blazing forebear. It still has JT15Ds, but the thrust is up to

2,900 pounds each. Even though the maximum takeoff weight of the aircraft is 50 percent greater than the original spec on the 500 and the thrust is only 32 percent greater, all the performance numbers on the V are very respectable.

At an average cruise weight, the V will cruise at more than 400 knots at every altitude from Flight Level 230 to FL410. The highest cruise speed, 425 knots, is in the mid-30s. At maximum takeoff weight, which includes full fuel (861 gallons), two crew, four passengers, and baggage, the balanced field length for takeoff is 3,560 feet at sea level and 30 degrees Celsius. For landing at an average weight, the approach speed is less than 100 knots, and the required runway length well below 3,000 feet. That distance is a FAR Part 25 number, with all the margins and

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without considering the use of the V's reverse thrust.

Not long ago, I was at an airport dedication. One of the speech subjects was the new and longer runway that would make the town more accessible to jets. During the program, a Citation came in, landed, and turned off just past midfield on the existing 3,230-foot-long runway. If only Citations come to town, who needs more as-

phalt?

The Citation V is delivered as a complete airplane. A friend asked me to suggest options for the V he has on order, and the list was short. A second encoding altimeter (dual transponders are standard), some extra cabin cooling capacity, an upgraded radar, plus a Stormscope and a KLN 88, which are not on Cessna's option list. The airplane has a two-tube EFIS on the left side, though the presentation in the airplane I flew seemed subpar to me. The colors used appeared a touch on the gaudy side.

Even though the Citation V is not approved for single-pilot operation, it has the simple panel arrangement that allows other Citations to be approved for one pilot. Taxiing the airplane is about like taxiing any other Cessna because the nose gear is mechanically





steered using the rudder pedals. The brakes have antiskid that is active any time the rolling speed exceeds about 12 knots, and as in most jets, you need a little toe time on the pedals before becoming a perfectly smooth braker.

The airplane accelerates rapidly on the takeoff roll and blows through all three takeoff speeds— V_1 , V_R , and V_2 —in a flash because they are close together—93, 103, and 111 knots for a maximum-weight takeoff. Maximum climb rate starts off at 213 knots indicated airspeed. Cruise-climb is at 250. Seventeen minutes and 535 pounds of fuel will get the airplane to FL350. FL390 is available in 22 minutes. After that, the going gets slower; a step-climb is required to get to FL450. The fuel flow at cruise ranges from about 1,700 pounds per hour at FL230 down to just over 1,000 pph at FL410—all against a total of 5,820 pounds. The airplane is certified to FL450, where the 9.0-psi pressurization differential provides an 8,000-foot cabin. If the passengers want to stay at sea level, that is possible up to FL230.

There is good news and bad news regarding the wonderful window area on the Citation V's flight deck. The

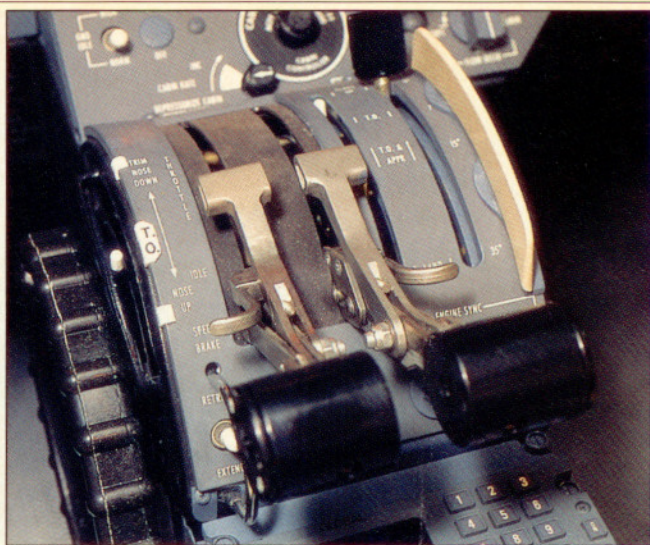


good news is the visibility. It is about as good as it gets in a fixed-wing airplane. You really feel that you can see it all. The bad news is that the sun can see in as well as you can see out. To help, the airplane has a flow divider that allows the crew to proportion the amount of air provided to the flight deck and the passenger cabin.

The limit speeds on the Citation are relatively high: 261 knots to 8,000 feet and 292 from 8,000 to 18,900 feet, where the Mach limit of 0.755 takes over. Speed brakes on the top and bottom of each wing help with descents, though there is a rumble when they are extended. For arrivals, the landing gear can be extended at 250 knots indicated; 15-degree flaps are available at 200 knots and full, 35-degree flaps at 172 knots.

Maneuvering the Citation is a fingertip exercise all the way down to the stall. The airplane has a stickshaker to alert you of the impending stall, but you can pull through the shaker and see about as tame an aerodynamic stall as there is.

The great visibility makes maneuvering around the airport easy as well as pleasant. And it is no problem to fly heads-up because of the V's



excellent stability. On a nice day with a lot of traffic around, it takes only occasional glances at the instrument panel to verify that the speed and altitude are correct.

The landing technique is typical of most jets. Try too hard, and you will arrive with a mighty thump. I remember once helping a pilot learn to land a jet—using a Beech Duchess. This pilot was trying to land the jet like you land a 150: Hold it off, hold it off, and make a full-stall landing. That is not the best way to do it. Most jets—and a Duchess does this, too—pitch slightly nose up when the power is reduced. If, and it is a big if, the attitude, power, and airspeed are correct as the airplane crosses the threshold and there is no crosswind, the best landing comes if you smoothly reduce power to idle and sit real still. Maybe a slight nose-up pitch adjustment will be required if the airplane doesn't slide smoothly onto the runway as the power is reduced, but that is all. The threshold speed on a Citation V at very light weight is only 88 knots. The brakes are powerful, and the reverse works well, so runway length should not be critical as long as about 3,000 feet is available—except with extenuating circumstances like ice, snow, water, or a good crosswind. There is no drag chute available for the Citation V.

The ride in turbulence is helped by the yaw damper. The airplane gives the impression that the wing is relatively stiff—you can feel the bumps. If it gets icy out there, the inboard section of the wing, the engine inlets, and the windshield have bleed air anti-icing; the outboard section of the wing and the horizontal tail have deice boots. (The S/II, the V's predecessor,

Cessna 560 Citation V
Base price: \$4.438 million
Specifications

Powerplant	Pratt & Whitney JT15D-5A turboprops, 2,900 lbst ea
Length	48.9 ft
Height	15 ft
Wingspan	52.2 ft
Wing area	342.6 sq ft
Wing loading	46.41 lb/sq ft
Power loading	2.74 lb/hp
Seats	9 standard
Cabin length	22.6 ft
Cabin width	4.9 ft
Cabin height	4.8 ft
Empty weight	8,950 lb
Max ramp weight	16,100 lb
Max takeoff weight	15,900 lb
Useful load	7,150 lb
Zero fuel weight (std)	11,200 lb
Zero fuel weight (opt)	11,950 lb
Max landing weight	15,200 lb
Fuel capacity	5,814 lb
Performance	
Balanced field length	3,200 ft
Rate of climb, engine out	1,332 fpm
Cruise speed, max	425 kt
Endurance, max cruise FL390, w/45-min rsv @ 5,000 ft	3.8 hr
Max certified altitude	FL450
FAR Part 25 landing distance	2,560 ft
Airspeeds	
V ₁	96 kt
V _R	103 kt
V ₂	111 kt
V _{LO} (retract)	200 kt
V _Y	213 kt
V _{MO} (sea level to 8,000 ft)	261 kt
V _{MO} (8,000 ft to 28,900 ft)	292 kt
M _{MO}	M0.755
V _{LE} (extend)	250 kt
V _{LO}	292 kt
V _{FE} (15°)	200 kt
V _{FE} (35°)	172 kt
V _{REF} (13,500 lb)	100 kt
V _{SO} (15,200 lb)	82 kt

For more information, contact Cessna Aircraft Company, Post Office Box 7704, Wichita, Kansas 67277; telephone 316/946-6000.

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. □

has a TKS weeping-wing system that has proven none too effective on that airplane.)

The direct cost of operating a Citation V is given as just over \$600 per hour. Not counting acquisition (\$4.438 million), the total annual cost for 600 hours would be just over a half-million dollars, or \$2.41 a mile. Given that some airline fares are more than \$1 a mile per seat now, a well-utilized Citation V compares quite favorably—to say nothing of the value of being able to set your own schedule.

If flying jets is fun, so is riding in them. The Citation V's stretched cabin is one window longer than a Citation II's and can accommodate a double-club arrangement. Because the cabin is round, tall passengers will likely take advantage of the side-moving seats to move toward the center of the circle. Like the cabins of most jets, the V's is quieter the farther forward you move. Fanjets tend to make a grinding sound the closer you sit to them.

The first pilot reports on the Citation hit the magazines 20 years and two months ago. Since then, Cessna has sold almost 1,600 of the 500-series Citations (as well as almost 200 Model 650 Citation IIIs). The Citation line is up for further expansion, too, with Citations VI, VII, and the Mach-0.9 X in development, along with the all-new Williams-Rolls FJ44-powered Citation-Jet. That'll put six jets in the Cessna stable—seven if you count the II, which will likely give way to the VI. Three are straight wing and three swept wing. Speed ranges from Mach 0.7 to Mach 0.9 and maximum takeoff weight from 10,000 to 31,000 pounds. No manufacturer has ever fielded such a diverse line of business jets before. □