

# Sovereign power



Cessna's Citations may be the most popular owner-flown crowd, but the Citation Sovereign is a 380-knot, 1,200-nm, five- to eight-seat Citation X.

Cessna's forte has been

there'd be more


between



# mpower

Coast-to-coast in simple sophistication

BY THOMAS A. HORNE



**C**essna's Citations may have begun life in 1970 as light-light jets strictly for the owner-flown crowd, but today there are nine different Citations ranging from the 380-knot, 1,200-nm, five-seat CJ1 to the firebreathing, Mach-0.92, 3,000-nm, eight-seat Citation X.

Cessna's forte has been mining an array of market niches. You might not think there'd be much demand for a six-seat jet that fits the narrow-range slot between 1,700 and 1,800 nm, but that's the hole that Cessna plugged with the Citation Encore—an airplane positioned between the company's aging Bravo and its newer, larger-cabin Excel.

PHOTOGRAPHY BY MIKE FIZER

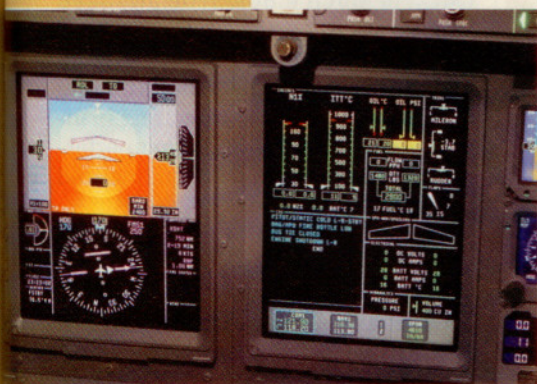








Moderately swept wings, a Citation X nose, dual FADEC-controlled engines, an airstair door, a huge baggage compartment, and a major-league ramp presence distinguish the Sovereign.



The Sovereign's front office features Honeywell's Primus Epic avionics suite. Cursor controls in the center pedestal (left) let pilots call up drop-down menus (above right) and click on buttons to change displays and select ranges and views for weather radar imagery or TCAS targets. The EICAS screen (above center) shows system conditions at a glance. VHF nav and com frequencies, plus transponder codes, are at the bottom of the EICAS screen.

Six years ago, Cessna began eyeing the midsize business jet market. Its last entries in this niche were the swept-wing Citations III, VI, and VII, which were in production from 1983 to 2000. Competitors in this market—chiefly the Learjet 55 and 60, and the Hawker 800 series—were highly successful, with some 600 airplanes sold. But these were older designs, and Cessna felt there would be a need for a new large-cabin, eight-seat jet, one with a Mach-0.80 cruise speed and 2,500-nm range. And something that would be priced less than the \$15 million-plus super-midsize jets such as Bombardier's Challenger 300, Gulfstream's G200 (nee Galaxy), and Raytheon's Hawker Horizon.

The result is the Cessna Sovereign, a 30,000-pound, \$13.5 million combination of the simple and the sophisticated. More than 100 Sovereigns have been ordered, with first deliveries set for the middle of this year.

Although it's "only" a midsize jet, the Sovereign certainly has an impressive ramp presence. It stands tall on dual-wheel main and nose gear; its nose section is virtually identical to that of the Citation X; and its massive vertical stabilizer and rudder (the largest rudder of any Citation) hint at the power of its 5,686-pound-thrust Pratt & Whitney PW306C turbofan engines. The leading edge of its wing has a moderate 16.3-degree sweep; the trailing edge is straight. This makes for a good

compromise in the quest for low drag in cruise flight and high lift in slow flight—the latter translating into relatively short runway requirements.

Construction is mainly of riveted or bonded high-strength aluminum alloy. Composites are used minimally, specifically in certain nonstructural areas like fuselage-to-wing fairings and the radome. Control actuation is equally basic, with the ailerons and elevator moved via pushrods and cables. To assist in banking, a mechanical control mixer begins to deploy roll spoilers after aileron control-wheel movement goes past the 6-degree mark. Ground spoilers increase stopping power after landing, and a rudder bias system automatically kicks in extra rudder force to maintain directional control should an engine fail.

The trip to the cockpit begins at the newly designed airstair door. A series of eight rotating cams locks the door in place, and a set of passive (non-inflating) seals keeps cabin pressure in and wind noise out. Turn left at the top of the stairs, go past the forward refreshment center and coat closet, and there's the front office—and one of the most sophisticated avionics suites in the business.

The Sovereign uses Honeywell's Epic flight deck. This incorporates four 8-by-10-inch active-matrix, color liquid-crystal displays that dominate the panel and feature EICAS (engine indication and crew alert system), FMS (flight management system), Doppler turbulence detection radar, enhanced GPWS (ground proximity warning sys-





tem), and TCAS (traffic alert and collision avoidance system) II functions as standard equipment. The hardware serving the Epic resides in four modular avionics units (MAUs) containing data cards and circuit boards that divide all functions among them; individual black boxes serving dedicated avionics units don't exist.

One attention-getting component of the Epic system is the dual center-pedestal-mounted cursor control devices (CCDs). These are stationary mouselike units with a central trackball and a pressure panel for clicking on various buttons on the Epic's multi-function display. For example, using the CCD you can select or deselect levels of information on the map display to show nav aids, nearby airports, waypoints, weather radar imagery, or terrain shading. The TCAS drop-down menu can be similarly fine-tuned to show different ranges and "above" or "below" views of traffic.

Engine starts are automatic, and only require a single button-push. After that, the dual full authority digital en-

gine control (FADEC) logic kicks in. If there are any abnormalities during the start the FADEC automatically shuts the engine down.

The FADEC also simplifies setting takeoff power. Simply advance the thrust levers to the Takeoff click stop, and wait for a mighty push from the PW306Cs. The system automatically monitors and controls the engine temperatures and fan speeds that you'd normally have to eyeball and adjust yourself in a non-FADEC airplane.

For my Sovereign flight with Cessna's Ed Wenninger, the takeoff numbers said to rotate at 105 knots and climb away at 250 knots until reaching Flight Level 280. After that, the drill is to climb at Mach 0.64. Passing through 280—and with power set to the maximum continuous thrust detent—the rate of climb was 4,300 fpm.

Up at FL370 the power was set to the CRU (cruise) detent, and speed built as the airplane settled into level flight. Airspeed rose to 255 KIAS—just five knots short of redline—and the Machmeter showed us in a Mach-0.78 cruise

( $M_{MO}$  is Mach 0.80). True airspeed worked out to be 452 knots, on a total fuel burn of 1,880 pph (about 280 gph), which was 60 pph less than the fuel burn advertised in the operating manual. Then again, this and other performance numbers hadn't been finalized at the time of my flight.

Stalls turned out to be nonevents. There is a stick-shaker, but no pusher, so to recover just advance power to MCT (maximum continuous thrust) and airspeed soon returns. If you take the Sovereign past the shaker and into the buffet, you'll see little tendency to roll off on a wing and that there's still aileron control in the buffet.

For my landings at Chesterfield, Missouri's Spirit of St. Louis Airport and Wichita Mid-Continent Airport, reference speeds for final approach hovered around the 100-knot mark. That's a pretty slow airspeed for such a large airplane, but those huge wings and large flap deployments (35 degrees is the full-flap extension) make it possible.

One of our landings involved a maximum braking effort. Here the procedure is to pull the thrust levers to idle at 50 feet agl, plant the wheels on the runway, yank the spoiler lever all the way back, extend the thrust reversers, and stand on the antiskid brakes—all in quick succession. The deceleration had me pushed hard against the shoulder harness. Wenninger guessed that our landing distance was about 2,000 feet,



Double-club seating, full-swiveling and tracking seats, and an aft lavatory are standard equipment. Cessna's aim is for the Sovereign to penetrate a midsize market that has traditionally been dominated by the Hawker 700- and 800-series business jets.

## SPECSHEET

### Cessna Citation Sovereign Model C-680

Standard equipped price:  
**\$13.523 million**

#### Specifications

Powerplants .....	Two Pratt & Whitney PW306C, 5,686-lb thrust
TBO .....	6,000 hr
Length .....	63 ft 6 in
Height .....	20 ft 4 in
Wingspan .....	63 ft 1 in
Wing area .....	515.9 sq ft
Wing loading .....	58.2 lb/sq ft
Power loading .....	2.6 lb/hp
Seats.....	2 + 9/12
Cabin length .....	24 ft 4 in
Cabin width .....	5 ft 7 in
Cabin height .....	5 ft 8 in
Max ramp weight .....	30,250 lb
Max takeoff weight .....	30,000 lb
Basic operating weight .....	17,800 lb
Max payload .....	2,500 lb
Payload w/full fuel .....	1,680 lb
Max landing weight .....	27,100 lb
Fuel capacity .....	1,595 gal (10,770 lb)
Baggage capacity .....	1,000 lb, 100 cu ft

#### Performance

Takeoff performance, sea level	
@ 15 deg C/59 deg F .....	3,694 ft
Takeoff performance, SL	
@ 38 deg C/100 deg F.. .....	4,202 ft
Time to climb, FL370.....	12 min
FL430 .....	26 min
Max cruise speed, +/- 3% at ISA,	
35,000 ft.....	446 KTAS
41,000 ft.....	430 KTAS
Range, w/45-min fuel reserves...	2,820 nm
Max operating altitude.....	47,000 ft
Sea level .....	26,500 ft
Landing runway length .....	3,144 ft

#### Limiting and Recommended Airspeeds

$V_{FE}$ (max flap extended)	
7 deg.... ..	250 KIAS
15 deg .....	200 KIAS
35 deg.....	175 KIAS
$V_{LE}$ (max gear extended) .....	210 KIAS
$V_{LO}$ (max gear operating) .....	210 KIAS
$V_{MO}$ (max operating speed—8,000 ft to 30,650 ft).....	305 KIAS
$M_{MO}$ (max Mach number—above 30,650 ft) .....	0.80 Mach

For more information, contact Cessna Aircraft Company, Citation Marketing, Post Office Box 7706, Wichita, Kansas 67277; telephone 316/517-6212; fax 316/517-5658; or visit the Web site ([citation.cessna.com](http://citation.cessna.com)).

All specifications are preliminary and based on manufacturer's calculations.



something he said you could expect at our light landing weight—about 23,000 pounds.

While pilots will love the Sovereign, we all know that the bill payers sit in back. Keeping them happy shouldn't be a problem, what with the standard double-club seating arrangement. There's also a side-facing belted seat up front, next to the refreshment center. All eight club seats swivel and track, and can be fully reclined for

sleeping. Six 110-volt AC power outlets are available to operate laptop computers and other appliances, and there's an aft lavatory with flushing toilet. The cavernous, heated aft baggage compartment also should

**i** Links to additional information about Cessna Citations may be found on AOPA Online ([www.aopa.org/pilot/links.shtml](http://www.aopa.org/pilot/links.shtml)). Keyword search: Citation.

be much appreciated on those full-boat flights.

Cessna seems to have nailed yet another niche. The Sovereign should give the midsize market a shot in the arm, make some competitors nervous, and take some of the hoopla away from the heavily promoted super-midsize jets now in vogue.

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