BY THOMAS A. HORNE

Cessna's Citation CJ1—

CJ Step-Up

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Cessna's Citation CJ1—the next-generation CitationJet

PHOTOGRAPHY BY MIKE FIZER

As popular as they were, Cessna has decided to discontinue CitationJet production. The baby Citation that took over the step-up end of the twinjet market from its debut in 1993 has now morphed into a higher-tech iteration. The last CJ, serial number 359, went out the door earlier this year, and with the 360th airplane, production of the next-generation version—called the CJ1—began. The CJ1 is the new, improved CJ, and it reflects input from the CitationJet Owners Advisory Panel. This panel is made up of CJ owners, and its purpose is to solicit comments from the field. Apparently, CJ owners wanted more modern and more capable instrument panels, and just a smidgen more expansion of the airplane's

payload/range envelope. Judging by the 85 CJ1s sold to date, Cessna has once again done a good job of finding and mining yet another market niche.

The Rockwell Collins Pro Line 21

This avionics suite is the biggest difference between the CJ and CJ1. Gone is the CJ's Honeywell SPZ-5000 avionics package, and its flock of round gauges and pair of 5-inch-square EFIS tubes on the pilot's side (the copilot's instruments were electromechanically driven). In their place are the two massive 8-by-10-inch active matrix, color liquid-crystal displays. One, the primary flight display (PFD), delivers flight information. The other, a multifunction display (MFD), shows engine information, fuel flows and quantities, maintenance diagnostics, and serves as a secondary, independent source of four separate navigation displays. A second, copilot's PFD is a $118,150 option that replaces the standard, three-inch electromechanical instruments and includes a second air data computer. That second computer—and second altimeter—is a necessity for any owner seeking reduced vertical separation minimums (RVSM) certification. RVSM allows pilots to fly with 1,000-foot vertical separation over certain high-altitude zoceanic and European routes. In the future, as air traffic becomes more and more congested, we can look forward to more RVSM routes. Some feel that it's just a matter of time before RVSM will be in place in the domestic U.S. airspace system.

The PFD is situated directly in front of the pilot and is extremely intuitive and user-friendly. Vertical tapes show airspeed, altitude, and vertical speed. Between the vertical tapes is the attitude indicator. V-speeds and V_{NE}/V_{MO} (maximum operating speed)/M_{MO} (maximum Mach number) callouts appear at the appropriate spots, and a pink airspeed trend cue points to the airspeed you're predicted to reach in 10 seconds.

Predictive cue markers also appear on the altitude tape. Those new to the airplane will find these predictive markers an immense help in setting airspeeds, setting climb and descent rates, and in configuration control.

As for the navigation display, line select keys—small horizontal buttons on either side of the display screen—are used to call up various pages of displays or input data. For example, you can use these keys to modify the display to show arc or full compass rose indicators, plug

The CJ1 panel has the Collins Pro Line 21 8-by-10-inch displays, and all emergency instruments are lined up across the top center (top). Except for the beefed-up landing gear and instrument panel, the CJ1 is virtually identical to the original CJ.

in up to three navigation sources, or overlay TCAS, weather radar, or lightning-detection returns. Active sources of nav information show up in magenta—this includes data boxes, as well as nav pointers and course lines.

The Pro Line 21's autopilot is as straightforward as they come. Features include one-half standard bank angle for high-altitude turns, flight level and speed change buttons, and a turbulence mode that attenuates autopilot inputs for a smoother ride in rough air.

Driving the Pro Line 21 is the AHC-3000 attitude and heading reference system (AHRS)—a golf ball-size digital quartz sensor that detects changes in rates of the airplane's horizontal and vertical movements. Simple and reliable, the AHC-3000 has a mean time between replacement (MTBR) of 9,000 hours. In testing, one of the units has been running for 16,000 hours—and the clock's still counting.

Front and center

The CJ1's emergency flight instruments are all lined up in a row, right above the MFD and comm radio stack. In the CJ, the backup attitude indicator is in this area, but the backup nav heads—an RMI and an HSI/slaved compass—are down at the lower left of the pilot's instrument panel. Splitting the nav instrument from the attitude indicator means a high-workload scan pattern at a most unwelcome time—when the usual sources of flight information have conked out, and you're down to battery power alone. With the CJ1, all the emergency instruments are lined up front and center, an emergency airspeed indicator and altimeter have been added, and the HSI rounds out the package over to the right, so your scan is focused on one small portion of the instrument panel. It's a much safer setup—especially in single-pilot operations—and a great improvement.

FMS options

The Honeywell KLN-900, a pedestal-mounted, eight-channel GPS receiver, serves as the CJ1's standard FMS. Many purchasers, however, are opting for the Universal Avionics UNS-1K, 12-channel GPS as their FMS, which is a $29,650 option. The Honeywell GNS-X_Ls is also available, as a $35,350 option.

Ordering an FMS is one thing. Learning to operate one is something else. This is where the training from FlightSafety International—initial training for up to two pilots is included in the sales

Leather seats for six are standard in the CJ1 (top). CJ and CJ1 windshields use ducted bleed air for ice and rain protection, with backup from an alcohol anti-ice spray system (below).

price, as is training for two mechanics—becomes vital. Some pilots new to them tack an extra week on FSI's two-week pilot initial, just so they can make peace with their FMSs.

That 200 pounds

The CJ1 comes with a maximum gross takeoff weight 200 pounds greater than that of the CJ. Much of that increased weight allowance goes to the CJ1's useful load. Payload with full fuel is listed as 675 pounds on a standard airplane. A full-fuel CJ, on the other hand, can carry only 530 pounds' worth of payload. So the extra 200 pounds, in theory, lets you board one more passenger or fly another half-hour or so, than if you were flying a CJ.

A look at the CJ1's range/payload graph shows that you can fly a full boat (six passengers plus one pilot) about 900 nm with IFR fuel reserves. Drop to two passengers—a much more typical load—and the airplane can carry enough fuel to fly almost 1,300 nm. These figures assume zero wind, standard conditions,

This CJ1's center pedestal features the Universal UNS-1K FMS, heading and course selector knobs, and autopilot controls.

The Pro Line 21's Primary Flight Display can show navigation information in the arc mode.

and a high-speed cruise at FL410.

This weight increase is made possible by stouter main gear actuator side braces. Cessna is deciding whether to offer this beef-up—and the consequent gross weight increase—as a retrofit to CJ owners. Because of the cost of the new forgings, one Cessna spokesman said that many CJ owners would find the price—yet unannounced—of the gross-weight increase "prohibitive." Especially when you consider that Cessna says owners typically fly legs of only 360 nm.

CJ1 landing gear retains the trailing link design of its predecessor but has stronger components to handle a higher gross weight.

ICT to FDK

Cessna demonstration pilot Daniel J. Grace flew right seat and oversaw my flight from Cessna's delivery center at Wichita's Mid-Continent Airport to AOPA's home base at the Frederick (Maryland) Municipal Airport. That's a 954-nm trip, and we had four aboard. With a 3,200-lb (478 gallons) fuel load, our CJ1 weighed just under 10,000 pounds and could fly nonstop for about 1,150 nm.

After consulting the flight manual, the takeoff V-speeds were plugged into the PFD using the line select keys. Now V_1/takeoff decision speed (107 kt), V_R/rotation speed (108 kt), V_2/takeoff safety speed (111 kt), and V_T (149 kt, and our optimum en route climb speed) are all bugged on the airspeed tape.

Start-up is easy—just the push of a button and advancement of a thrust lever as compressor speed builds. Soon we're

Cessna Citation CJ1
Base price: $3.6 million

Specifications

Powerplants	Williams-Rolls FJ-44-1A, 1,900 lbst ea
Recommended TBO	2,400 hr
Length	42 ft 7 in
Height	13 ft 10 in
Wingspan	46 ft 10 in
Wing area	240 sq ft
Wing loading	44.1 lb/sq ft
Power loading	2.78 lb/hp
Seats	5-6 plus 2 pilots
Cabin length	15 ft 9 in
Cabin width	4 ft 10 in
Cabin height	4 ft 9 in
Typical empty weight	6,605 lb
Maximum ramp weight	10,700 lb
Maximum takeoff weight	10,600 lb
Maximum useful load	3,895 lb
Payload w/full fuel	675 lb
Maximum landing weight	9,800 lb
Maximum zero fuel weight	8,400 lb
Fuel capacity	481 gal 3,220 lb
Baggage capacity, nose	400 lb, 24.4 cu ft
Cabin	100 lb, 4 cu ft
Aft	325 lb, 30.2 cu ft

Performance

Takeoff distance	3,280 ft
Rate of climb, sea level	3,250 fpm
Single-engine ROC, sea level	838 fpm
Cruise speed/alt/fuel burn/range w/45-min rsv	
@ Max cruise, 9,000 lb	380 kt/29,000 ft/ 975 pph (146 gph)/1,200 nm
@ Long-range cruise, 9,000 lb	323 kt/41,000 ft/564 pph (84 gph)/1,400 nm
Maximum operating altitude	41,000 ft
Landing distance	2,780 ft

Limiting and Recommended Airspeeds

V_{MCA} (min control w/one engine inoperative, air)	92 KIAS
V_{MCAG} (min control w/one engine inoperative, ground)	95 KIAS
V_{FE} (max flap extended)	200 KIAS
V_{LE} (max gear extended)	186 KIAS
V_{LO} (max gear operating)	
Extend	186 KIAS
Retract	186 KIAS
V_{MO} (max operating limit, SL to 30,500 ft)	263 KIAS
M_{MO} (max Mach number, above 30,500 ft)	Mach 0.71
V_{SO} (stall, in landing configuration)	86 KIAS

For more information, contact Cessna Aircraft Company, Post Office Box 7706, Wichita, Kansas 67277; telephone 316/517-6449; fax 316/517-6640; or visit the Web site (www.cessna.textron.com).

All specifications are based on manufacturer's calculations. All performance figures are based on standard atmosphere, sea level, maximum gross weight, and zero wind conditions unless otherwise noted.

ready for taxi, which can be brisk because of the CJ1's residual thrust. To slow the airplane, thrust attenuators—small paddle-shaped deflectors that extend into the exhaust stream—pop out automatically when the thrust levers are pulled back to flight idle when on the ground.

Takeoff was with 15 degrees of flaps, and after a brisk shove we blow past V_1 and V_R, consuming 3,480 feet of runway in our initial climb. Air traffic control restrictions prevented us from climbing directly to our planned cruise altitude at FL410, the CJ1's maximum operating altitude. Instead, we leveled at FL370 and settled into a 347-KTAS cruise. It was ISA minus 3 degrees, according to the information posted along the lower edge of the PFD, and the MFD showed us burning 380 pph (about 57 gallons) per engine. Our groundspeed was 412 kt.

Thunderstorms and cumulus build-ups became a factor in central Missouri. But by superimposing the Collins RTA-800 weather radar imagery on the PFD's navigation display it was easy to pick our way through a 100-mile-wide swath of convection.

Near the Vichy, Missouri, VOR we checked the Universal FMS for our fuel status: No problem, the box reported. We could fly for 1,280 nm and three hours, seven minutes more. Furthermore, we'd land with a fuel reserve of 1,112 lb. (166 gallons). Grace said that a good rule of thumb was to count on burning 900 pounds of fuel the first hour of flight, 700 the second, and 500 during the third hour.

Two hours, 31 minutes after takeoff we were in the pattern at Frederick. After a visual approach flown on final at a reference speed of 99 kt, I made an acceptable touchdown and taxied up to AOPA's ramp in the style to which I am not accustomed.

At a base price of $3.6 million, the CJ1 is a pricey entry-level jet. Pricey, but the only game in town when it comes to a new, single-pilot certifiable, FAR Part 23 airplane that's been built to conform with the much more stringent FAR Part 25 regulations. And it's not as pricey as some other competing designs—Raytheon's Premier I is set to debut with a $4.5 million price tag. Even so, the customers keep lining up, and Cessna keeps cranking out more and more new models. Next up: the Citation CJ2, a 410-kt, $4.4 million growth version of the CJ1. First deliveries of that airplane are set for the end of the year, and we'll be sure to keep you posted. □

Additional information on the CitationJet may be found on AOPA Online (www.aopa.org/pilot/links.shtml). E-mail the author at tom.horne@aopa.org