CESSNA·GRAND·CARAVAN

ROOM WITH A VIEW

They don't come any bigger than this.

BY MARK R. TWOMBLY

THE Cessna Caravan was big to begin with; now it is gargantuan. The Caravan is the largest single-engine airplane ever produced by Cessna. Comparing it to a Cessna 182 is like standing a pro basketball player next to a jockey—the 182 is lost in the Caravan's shadow. The latest version, the

Grand Caravan, is even more imposing. It is 4 feet longer than the original Caravan and is the largest single-engine turboprop utility aircraft currently in production. You want big? You got it in the Grand Caravan.

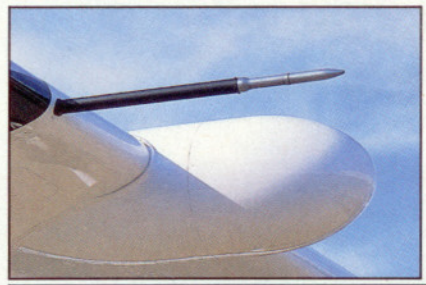
The Grand is a windowed, passenger-carrying iteration of the elongated Model 208B. Because it will have to earn its keep—not too many people will pony up $944,100 (that's the base price; optional equipment can add more than $100,000—N208CC, a Cessna demonstrator, is $1,058,235) for a personal three-wheeled stretch limo—and because the FAA and aviation regulatory agencies in many other countries frown on transporting paying passengers in single-engine airplanes in the clouds, the Grand Caravan likely will find greatest favor in fair-weather climates.

Cessna has produced four Caravan models, plus several variations: a special-missions version available with roll-up cargo door and pod for carrying eavesdropping electronics, a military cargo version, and a floatplane. The Caravan is available with either straight or amphibious floats. The Wipline floats are huge affairs—on dry land, the top of the amphibious float is 40 inches high. Fifteen float-equipped short-body Caravans have been sold. (Floats are not available for the stretch Caravans.)

The prototype Caravan first flew in December 1982. It was intended as a replacement for Cessna 206s, 208s, and other smaller, aging utility aircraft doing hard labor in remote regions of Africa and other places where facilities can be crude and avgas scarce.

Even before it was certified in 1984, the Caravan found a big home in the U.S. Federal Express Corporation ordered a specially equipped, windowless version, the 208A Cargomaster, to expand and extend its overnight small-package pickup and delivery service to medium and small communities.

Cessna's Caravan business has been driven largely by Fedex's needs. (Fedex has taken 249 of the 460 Caravans that have been delivered since 1985. Cessna is sold out of Caravans for the next year, and Fedex holds an option for 100 more.) Letters and small packages don't

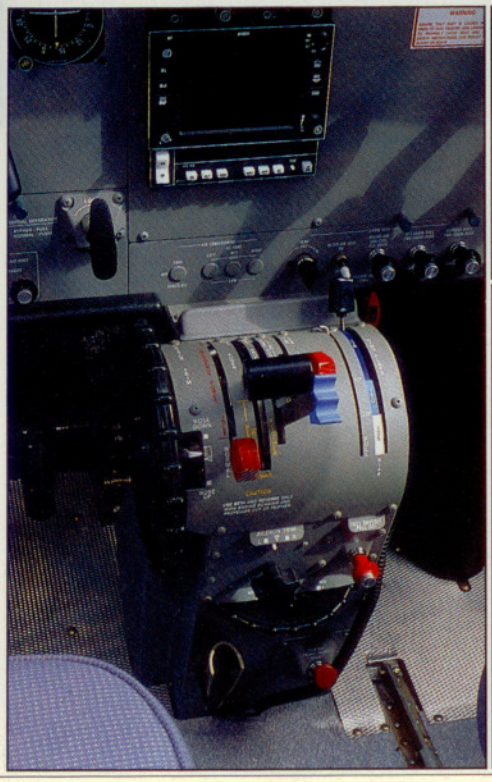


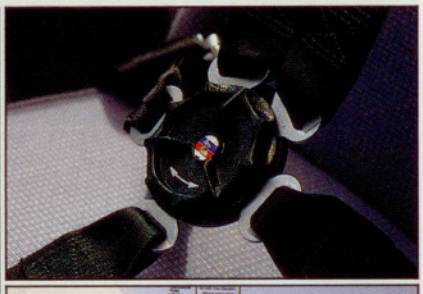
The Grand Caravan incorporates all the best features of the other models, including the more powerful engine.

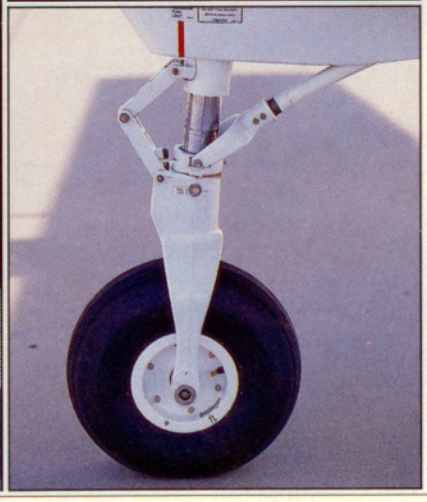
weigh much, and after putting its first batch of Caravans in service, Fedex discovered the airplane was limited by volume rather than weight. Cessna's solution was to add 20 inches to the Caravan's fuselage ahead of the wing and 28 inches behind the wing. The stretch added 34 percent more volume to the fuselage and resulted in the 208B Super Cargomaster.

The 208B will hold 340 cubic feet of cargo. If that still isn't enough, Cessna offers an optional 111.5-cubic foot, 1,090-pound-capacity belly pod. Rumor has it that animals and even people have been carried in Caravan pods—illegally, of course, and without question uncomfortably.

Cessna increased the 8,000-pound maximum takeoff weight of the Cargomaster to 8,750 pounds for the stretched Super Cargomaster (of the additional 750 pounds, 450 pounds is available for payload) but stuck with the same 600-shaft-horsepower Pratt & Whitney PT6A-114 turboprop engine. However, the Super Cargomaster was restricted to 8,000 pounds for flight in icing conditions because of reduced climb performance at the higher gross weight. Cessna corrected the problem by upgrading to a 675-shp PT6A-114A engine.







The Grand Caravan, fourth in the Caravan series, was introduced in October 1990. It incorporates all the best features of the other models, including the more powerful engine, longer fuselage, and cabin hardware that enables it to be quickly converted from a people-hauler to a cargo truck or a combination of the two.

Lovely it is not, although there is a certain stately appeal to the utilitarian, efficient look of the Grand. Because beauty wasn't even on the first page of Cessna's priority list for the Caravan, designers concentrated on features that help the airplane and pilot do their work better. Ease and cost of maintenance also were primary considerations, starting with the propeller, a fat, three-blade McCauley. Originally, the Caravan used a composite Hartzell. The switch was made to metal because it costs half as much to buy and repair, according to

Cessna—which owns McCauley.

The nosewheel is an ingeniously simple design. The strut is filled with oil only. Shock absorption is provided by a long, springy tube—a 172RG main gear leg if you want to know the truth—that extends from the strut yoke back and up into the belly of the airplane. The bumps are absorbed by the tube instead of the nosewheel strut.

Outboard wing spars and the wing lift struts are designed to take the punishment of bush operations. The outer 6 feet on each side of the 52-foot-long wing can sustain damage without it affecting the main wing and spar or the fuel tanks. Each lift strut—they are interchangeable—has double spars bonded back to back, and each spar can carry the load without failing. The main gear legs attach to a tank-like section of reinforced skin. Gear loads are absorbed by the main fuselage structure and by a center connecting tube covered by the belly skin. In the event of a ground roll mishap, each main gear leg is designed to twist back 45 degrees rather than distort the fuselage structure.

Look underneath the Grand Caravan, and you'll see a pair of stout, semicircular metal loops between the main gear legs. They carry the fuselage loads around the main-gear connecting tube, which allows for a flat cabin floor.

The Grand Caravan has four doors: one for each crewmember, a right-side airstair door, and a yawning left-side cargo door. The cabin has 14 seats. There is plenty of room for more, but few countries allow more than 14 people in a turbine airplane without imposing some extensive and expensive additional requirements, according to Cessna. (The FAA permits a maximum of nine passengers and two crew.)

Firing up the Pratt & Whitney is a simple matter of toggling the battery, fuel boost, and start switches. As the gas generator (Ng) speed passes through 12 percent, the fuel condition lever is moved to Low Idle position. At 52 percent Ng, the starter switch goes to Off. Except for cockpit checks, that's it.

Occasional use of the Beta range to reverse propeller pitch keeps the taxi speed to a manageable clip and helps save the brakes, which are very effective. Mash either pedal, and the Grand Caravan will pivot on a main tire.

Pete Hall, a Cessna demonstration pilot and my guide for the day, suggests two notches (20 degrees) of flaps for the takeoff roll. Even though we are about

1,500 pounds under maximum takeoff weight, the initial acceleration is slow, but we don't cover much ground before rotating at 65 knots. Ground roll for a maximum gross weight takeoff in sea level standard conditions is 1,365 feet, according to handbook figures.

Put the nose on the horizon, and the airplane cruise-climbs at 110 knots and between 900 and 1,000 feet per minute. In low-altitude level cruise at 1,900 rpm, the airspeed creeps up to just below the 175-knot Vmo. A more representative scenario is a quieter, more comfortable 1,750 rpm at 6,000 feet. Those numbers should yield a true airspeed of 180 knots on about 415 pounds per hour (62 gallons) of fuel, according to the handbook. A cargo pod would scrub about 9 knots off the cruise speed.

With 332 gallons of usable fuel, the Grand will fly for 4.6 hours at maximum cruise power with a 45-minute reserve, according to specifications. Our demonstrator for the day, N208CC, is loaded with most of the options on Cessna's list, including Bendix/King KFC 150 autopilot/flight director system and RDS 81 radar, yet it could still take on full fuel and 1,715 pounds of payload. Reduce the fuel load to half and the power to best-range cruise, and you can carry 2,800 pounds of people and cargo and cruise for three hours at 147 KTAS on 47 gallons per hour.

If there is no comparison in size between a Grand Caravan and a 182, there is in flying qualities. In fact, once you acclimate to the height and the spaciousness of the cockpit, you tend to imagine yourself in a smaller Cessna.

It's remarkable that the Grand Caravan can take on two tons of fuel and payload and still handle like a much smaller airplane. Long, single-slotted flaps that incorporate leading edge vortex generators and trailing edge angles (to keep airflow attached and thus maintain the effectiveness of the flaps) enable the Grand Caravan to easily beat the 61-knot stall requirement for singles.

Long flaps mean short ailerons, so the Grand Caravan has spoilers to augment roll control. Roll forces are light considering the huge wing, and there is almost no adverse yaw.

The pilot has excellent control over the entire speed range of the airplane. To demonstrate, Hall has me transition from cruise to approach by pushing the prop control full forward, pulling the power back to the stop, and selecting full flaps. The airplane noses down as if

we are on a ski slope, but the airspeed lounges at around 80 knots. You can pretty much pick the patch of ground you want to plunk down on, even if you're high and close in to the runway.

We have fun shooting spot landings at Maize, a 2,100-foot-long grass strip within sight of Wichita's Mid-Continent Airport. We try everything—no-flap landings and takeoffs, short- and soft-field approaches and departures, and slips to landing. I quickly feel very comfortable aiming the big airplane at the little strip. From there, we return to Mid-Continent and are given a place in line with arriving jet traffic. Tiny Maize or expansive Mid-Continent—the Grand Caravan is at home in any environment.

Over the years, Cessna has proven adept at designing, manufacturing, and selling airplanes of all shapes, sizes, and purposes. They've had winners in all categories, from trainers to business jets to family wagons. With the Grand Caravan and the entire Caravan utility series, Cessna is expanding its scope and extending its streak. □

Cessna 208B Grand Caravan
Base price: $944,100

Specifications

Powerplant	Pratt & Whitney PT6A-114A, 675 shp
Propeller	McCauley metal, constant-speed, full-feathering, reversible, three-blade, 106-in diameter
Length	41.58 ft
Height	14.83 ft
Wingspan	52.1 ft
Wing area	279.4 sq ft
Wing loading	31.3 lb/sq ft
Power loading	13 lb/hp
Seats	14
Cabin length	21.3 ft
Cabin width	5.2 ft
Cabin height	4.3 ft
Empty weight	4,103 lb
Empty weight, as tested	4,641 lb
Max ramp weight	8,785 lb
Gross weight	8,750 lb
Useful load	4,682 lb
Useful load, as tested	4,103 lb
Payload w/full fuel	2,458 lb
Payload w/full fuel, as tested	1,879 lb
Max takeoff weight	8,750 lb
Max landing weight	8,500 lb
Fuel capacity, std	335 gal (332 gal usable) 2,249 lb (2,224 lb usable)
Oil capacity	14 qt

Performance

Takeoff distance, ground roll	1,365 ft
Takeoff distance over 50-ft obstacle	2,420 ft
Max demonstrated crosswind component	20 kt
Rate of climb, sea level	975 fpm
Max level speed, 10,000 ft	182 kt
Cruise speed/endurance w/45-min rsv, std fuel (fuel consumption)	
@ max cruise power 10,000 ft	182 kt/5.1 hr (379 pph/56.6 gph)
@ max range power 10,000 ft	157 kt/6.6 hr (297 pph/44.3 gph)
Max certified altitude	25,000 ft
Service ceiling	22,800 ft
Landing distance over 50-ft obstacle	1,660 ft
Landing distance, ground roll	875 ft

Limiting and Recommended Airspeeds

Vx (best angle of climb)	83 KIAS
Vy (best rate of climb)	104 KIAS
Va (design maneuvering)	148 KIAS
Vfe (max flap extended)	175 KIAS, to 10 degrees
Vmo (max operating)	175 KIAS
Vs_1 (stall, clean)	63 KIAS
Vso (stall, in landing configuration)	48 KIAS

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. □