CARAVAN II

THE TWO-FAN VAN

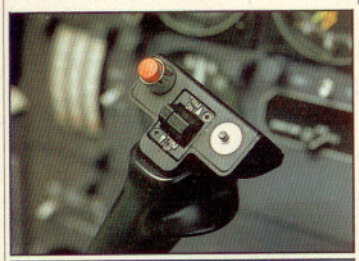
Cessna's Model 406 is both cargo hauler and people mover.

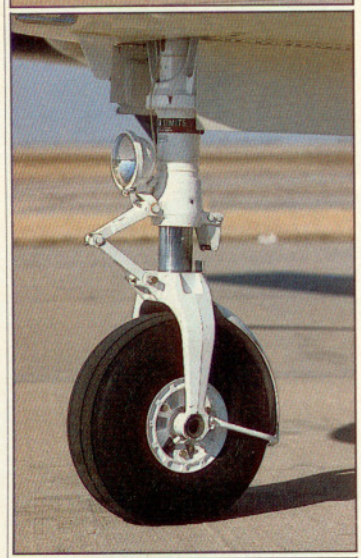
BY RICHARD L. COLLINS

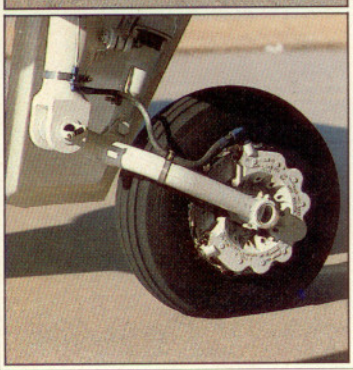
Cessna's new Model 406 Caravan II is an interesting blend. The name suggests a kinship with the successful Caravan I, a huge single-turboprop that is setting reliability records with cargo and small package

PHOTOGRAPHY BY MIKE FIZER

The Caravan II's long row of cabin windows offers an excellent view from inside. A trailing-link main gear makes for soft arrivals. The cruciform tail is a first for a 400-series Cessna.







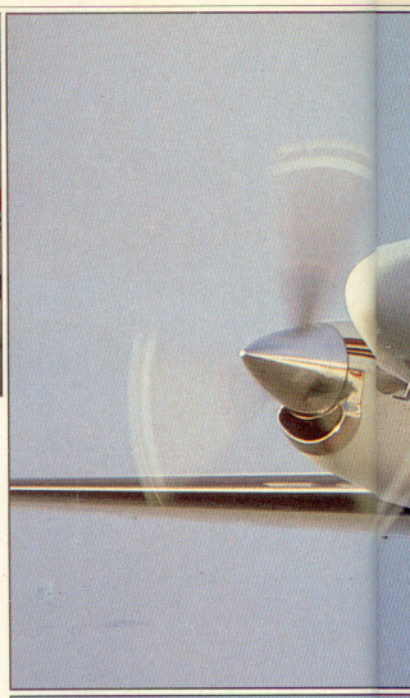
operators, but that kinship isn't even skin-deep. The II is an entirely different concept. Built on a Cessna 400-series airframe, the II is a low-wing, twin-turboprop that lacks the look of total utility, but that doesn't deter the airplane from filling the same role as the Caravan I in life. It is designed to do—and will do—the same things as the big single; it is certified to fly with 12 passengers and a crew of two; it does have a "belly pod" certified so the baggage can go along for the ride. There is also baggage space in the wing lockers and nose.

The Caravan II does have a distinct advantage over the single. It can carry passengers for hire in IFR conditions, a job that is held from the single by archaic and unjustified regulations. This means the II can do unlimited regional airline work. The I is limited to VFR conditions in this application.

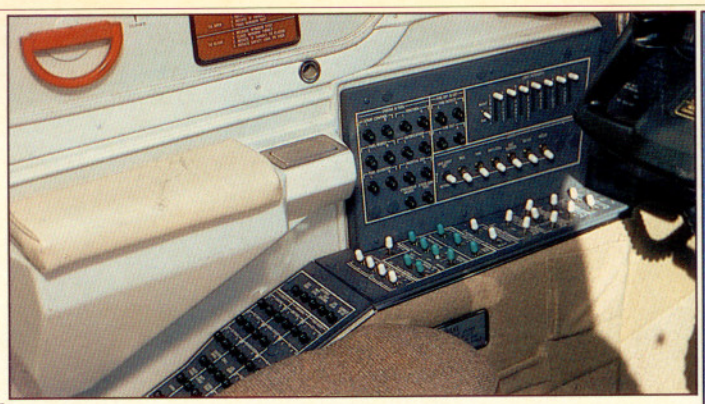
The Caravan II has another distinction. It is built in France by Reims Aviation, a company that was formerly owned in part by Cessna. The airplane was first certified in France by Reims and later certified in the United States by Cessna, with the certificate issued to Reims. Cessna fabricates many of the parts in Wichita and builds the entire wing, but the assembly of the airplane and the construction of other major assemblies is handled by Reims. The engines are Pratt & Whitney Canada PT6s, so this is a true multinational airplane. Marketing here is done by Cessna.

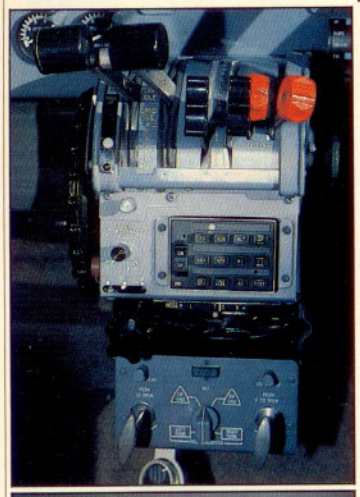
The Caravan II is not new to the European market. It was certified in France in 1984 and has enjoyed success there. Then, recently, Cessna saw a growing market in the United States and started offering the airplane here. As the regional airline business changes, an emphasis has been placed on pressurized airplanes with 30 or more seats. The Caravan II comes back in where the business started, with a relatively small and economical unpressurized airplane that works well for service to smaller communities. Moreover, it is quickly convertible to a night hauler that can take bulky items through a double door with complete forklift access, or that can speedily deliver high-priority packages and pouches.

Weight is the number-one subject when you get to an airplane designed to carry a lot of people or things, and the Caravan II does well here. With standard avionics and the 14-seat (including the two up front) interior, the maximum useful load is 4,343 pounds. Fourteen people and their things should weigh 2,800 pounds; add to that some pounds for the optional belly pod and other accessories and the airplane can easily fly with more than 1,000 pounds of fuel, good for a one-hour stage length with a good reserve. With a cargo interior, the useful is 200 pounds more, so 3,000 pounds of whatever can go for that hour trip with reserves. Lighter loads mean more fuel. The zero fuel weight, above which all the pounds must be in fuel, is not limiting in either case; it is 8,500 pounds against a maximum ramp weight of 9,435 pounds.



The cabin can be stuffed with several thousand pounds of cargo or outfitted with a dozen "Enviroform" seats for passenger flights.





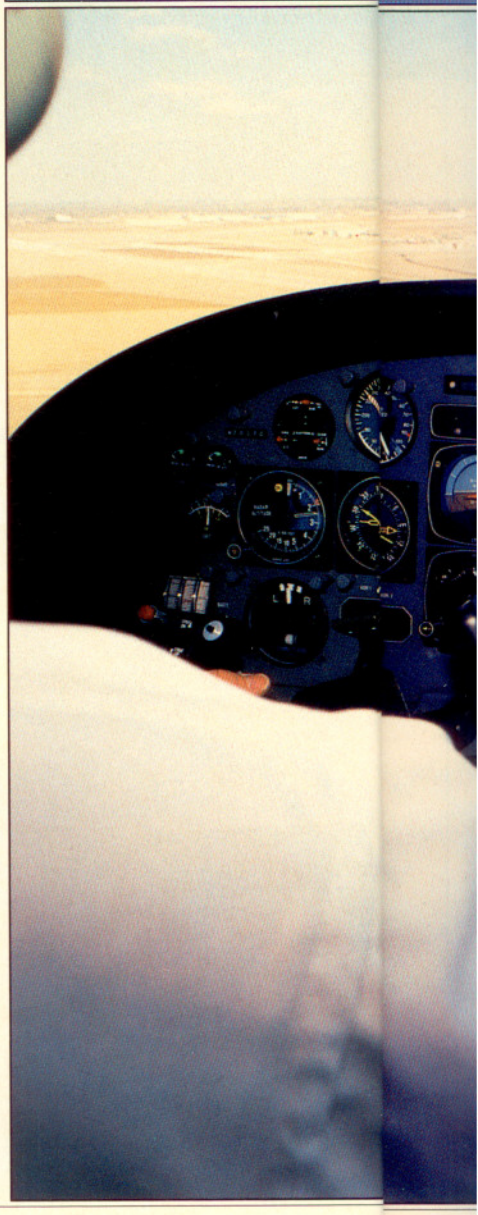
There is an interesting twist to the Caravan II's certification. It comes in under SFAR 41, a rule that was written to allow the certification of larger airplanes without total compliance with the Transport category Part 25 rules. SFAR 41 applies to aircraft with a maximum takeoff weight of more than 12,500 pounds or with 12 or more seats (including crew). Previously all the airplanes certified to SFAR 41 have fallen under that rule because of the weight limitation. The Caravan II is well below the weight limit but with 12 passenger seats had to be SFAR 41 certified. There are a number of different requirements from Part 23, under which most personal airplanes are certified, one of which is the consideration of field length versus weight and temperature and a requirement to be able to stop or fly away after an engine failure. As an example of the performance available from the Caravan II, at sea level, 20 degrees Celsius, maximum takeoff weight, with an engine failure just prior to 98 knots, the airplane will fly on and clear a 50-foot obstacle 4,025 feet from the start of the takeoff roll.

Walking around the Caravan II, the most obvious visual difference from other Cessna 400s is in the tail. Where all previous airplanes had a fuselage-mounted tail, the Caravan II sports a cruciform tail with the horizontal stabilizer mounted about a fourth of the way up the vertical stabilizer. This puts the horizontal tail above the propeller wash, reducing vibration as well as the effect of the power pulses on the tail structure itself. The stabilizing fins on the tail are a distinctive Caravan II feature.

Another strong visual item is the window line. Viewed from the outside, the windows appear high on the fuselage and not particularly large. Inside, the impression is the opposite. The windows are in just the right place, and the visibility is nice.

The airframe itself is virtually identical to that of the piston-powered 404, but the PT6 engines are flat-rated to 500 shaft horsepower where the 404 had 375 horsepower. Because it shares a name with the Caravan I, a comparison of the two when they are side by side in the hangar is inevitable. The single appears much more massive, and there is no visual similarity—sort of like a linebacker and his sister. As far as internal cubic feet go, the stretched Caravan I is larger inside than the II. But don't go away. The Caravan II will cruise at more than 230 knots at non-oxygen altitudes, whereas the I is good for only 184.

Inside, the II with 14 seats appears to have more furniture on board than is found in an average New York City apartment. But rather than appearing cluttered, it has the look of clean efficiency. Cessna's 400-series cabins were dubbed "wide oval" early on; the space emphasis is on width instead of height, so the walk up the aisle is with your body well bent over. Once seated, the cabin seems large and everything in the correct proportion. With 12-passenger accommodations, the




N7037C

seat pitch is 28 inches, about the minimum for human habitation. Cessna's futuristic "Enviroform" seats make the most of the space, and the short-haul role the airplane would play with the maximum number of seats installed would mean relatively short rides.

The front end of the Cessna 400s has always been a pleasant place to work, with as good outside visibility as is found in anything short of a helicopter (or the Optica). The view is absolutely expansive. The panel is neat, too, with all things arranged in a manner that is friendly to the single pilot, and the airplane is approved for single-pilot operations. Virtually all the switches are on the left console; even without the electronic flight instrument systems that have simplified the panels of many turboprops and jets, the Caravan II's panel appears pristine.

Taxiing is typical Cessna, and pulling the power levers back to the ground idle position keeps the speed down without a requirement to ride the brakes. Acceleration on takeoff is exceptional at light weight, and the airplane flies eagerly at 98 knots with only light aft elevator pressure required to lift off. There is no need to use the elevator earlier in the takeoff, because with no propeller wash it is relatively ineffective until flying speed is reached.

The Caravan II has an interesting blend of control forces. The elevator forces are very light, and an old Cessna pilot might be prone to overcontrol a bit a first. The rudder forces are what you would expect, but, especially at slower speeds, the ailerons are a bit less effective than on the other Cessna 400s. On a bumpy day with some crosswind, the ailerons get quite a workout at normal approach speeds.

One of the nice PT6 features is relatively high prop drag when the power is reduced to flight idle. This means you can stay at the 108-knot blueline, a good and safe speed should an engine fail, until the flare begins and still make a short landing. Even with forward center of gravity, plenty of elevator power is available for a tail-low landing. The propeller reverse makes for short stops.

The landings can be quite nice, too, thanks to the trailing-link main landing gear. If a pilot does a half-right job of flying, it just rather settles onto the runway with a gentle sound of the tires beginning to roll.

Reims and Cessna see the airplane as having a number of specialized applications. A skydiving version is available, with bench seats to accommodate as many as 11 jumpers. It will get them to 10,000 feet in six minutes, and jumps are allowable at indicated speeds from 110 to 140 knots. It is also offered in a maritime surveillance version, with target towing equipment, in a medical evacuation version, and with a specialized cargo interior. Or it can be a luxurious executive transport with as many as eight seats. Where the Caravan I found its success mainly in one area, cargo operations, the II is a different breed that will be used for its share of boxes and packages but that will do a lot of other things as well. □

Cessna 406 Caravan II

Base price: $1,395,000

Specifications

Powerplants	Pratt & Whitney Canada PT6A-112 free turbines, flat-rated to 500 shp at 1,900 rpm
Propellers	McCauley constant-speed, full- and auto-feathering, reversible, three-blade, 7.75-ft dia
Length	39.02 ft
Height	13.15 ft
Wingspan	49.50 ft
Wing area	252.77 sq ft
Wing loading	37.03 lb/sq ft
Power loading	9.36 lb/hp
Seats	14
Cabin length	18.74 ft
Cabin width	56 in
Cabin height	51.4 in
Empty weight	5,092 lb
Max ramp weight	9,435 lb
Max takeoff weight	9,360 lb
Useful load	4,343 lb
Max landing weight	9,360 lb
Zero fuel weight	8,500 lb
Fuel capacity, std	475 gal, 3,182.5 lb

Performance

Takeoff distance, ground roll	2,121 ft
Takeoff distance over 50-ft obstacle	2,635 ft
Accelerate-stop distance	4,227 ft
Accelerate-go distance	3,864 ft
Rate of climb, sea level	1,851 fpm
Single-engine ROC, sea level	396 fpm
Cruise speed/range w/45-min rsv, std fuel (fuel consumption, ea engine)	236 kt/1,027 nm (291 pph/43.4 gph)
10,000 ft	
Max operating altitude	30,000 ft
Single-engine service ceiling	16,200 ft
Landing distance over 50-ft obstacle	2,485 ft

Limiting and Recommended Airspeeds

Vmc (min control w/critical engine inoperative)	91 KIAS
Vx (best angle of climb)	102 KIAS
Vy (best rate of climb)	112 KIAS
Vxse (best single-engine angle of climb)	102 KIAS
Vyse (best single-engine rate of climb)	108 KIAS
Va (design maneuvering)	162 KIAS
Vfe (max flap extended)	180 KIAS
Vle (max gear extended)	180 KIAS
Vlo (max gear operating)	
Extend	180 KIAS
Retract	180 KIAS
Vmo (max operating limit speed)	230 KIAS
Mmo (maximum Mach number)	0.52
Vr (rotation)	98 KIAS
Vs1 (stall, clean)	95 KIAS
Vso (stall, in landing configuration)	75 KIAS

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. □