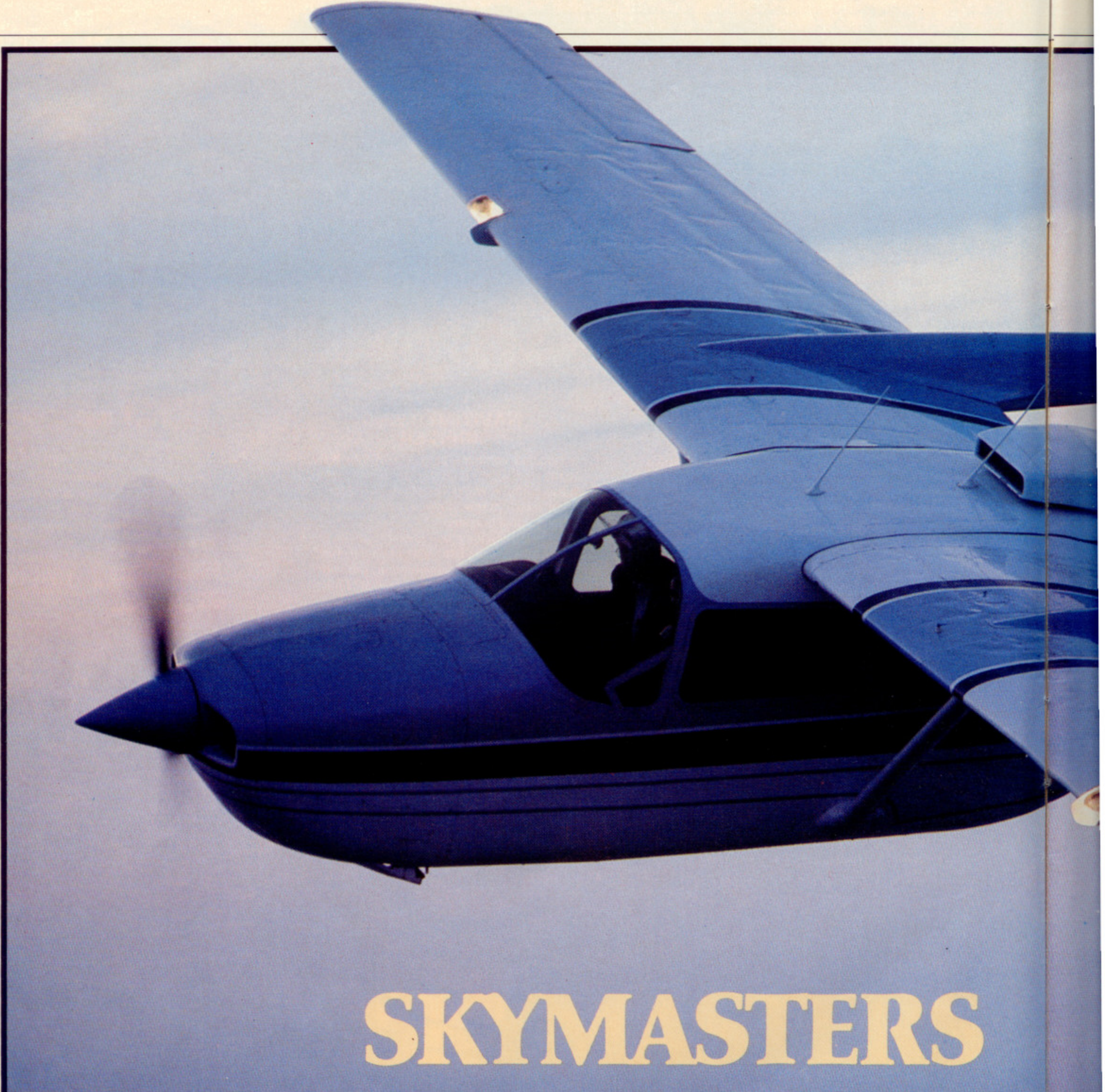

SKYMASTERS

The promise was safety in single-engine operation. The promise was fulfilled; but the Skymaster saga shows that safety, as usual, doesn't sell.

BY THOMAS A. HORNE

Wichita is quiet now, its energy sapped by declining aircraft sales. But in the late 1950s general aviation was so healthy that the Cessna Aircraft Company was inspired to develop an unprecedented concept in a light twin. Light twins were in their heyday then: Piper was selling the Apache and, by 1960, the Aztec; Beech had the Twin Bonanza and the Travel Air. Cessna offered only one twin at the time—the 310.

All these designs basically are alike, except for performance variations. All

PHOTOGRAPHY BY ART DAVIS

can be fitted out to carry up to five, and in some cases, six people. All are capable of flying 700 nautical miles or so and still having 45 minutes' reserve. With an engine out, each poses handling and performance problems to an improficient pilot.

The goal of a newly created Cessna design team, formed in December 1957 under the leadership of Don Ahrens, was to build a twin engine airplane without engine-out vices.

Asymmetric thrust and rusty pilots are the traditional culprits in most light twin engine-failure accidents. Do not allow a conventionally designed twin to fall below that magic airspeed known as Vmc (minimum controllable airspeed). The official definition of Vmc is the minimum flight speed at which a twin-engine airplane is directionally controllable as determined by the Federal Aviation Administration certification criteria. These conditions include: one engine (in airplanes with non-counterrotating propellers, the left, or critical engine) inoperative and windmilling; a five-degree bank toward the operative engine; takeoff power on the operative engine; landing gear up; flaps in the takeoff position; and a center of gravity in its most rearward permissible location. At this speed, the thrust generated by the good engine will cause the airplane to yaw towards the dead engine uncontrollably, even with full opposite rudder.

This yaw can turn quickly into a violent rolling motion, perhaps inverting the airplane or sending it into a spin. This type of accident often

happens during takeoff, when airspeed and altitude are low and power is at its maximum. Extensive studies by the National Transportation Safety Board have shown that the surprised pilot often lets airspeed decay in a fruitless attempt to climb. The aircraft enters the Vmc regime, rolls over and the results are usually fatal.

The Ahrens' team solution to the problem? Centerline thrust. They put one engine on the nose, another at the tail, then made the rotation of the engines opposite to each other. Each engine's torque is canceled out by the other, and all thrust is directed through the airplane's centerline. While rate of climb and service ceiling are diminished with the loss of one engine, directional control is not. Asymmetric thrust and the dangers of the Vmc accident are eliminated.

So went the reasoning behind the development of the Cessna Skymaster Models 336 and 337, better known by a series of humorous monikers such as Skysmasher, Skythrasher, Mixmaster, Huff n' Puff and Suck and Blow.

Cessna felt sure that the Skymaster's safety features would guarantee its success. To paraphrase an early sales brochure, "All the advantages of multi-engine redundancy are yours, with none of the drawbacks."

A good deal of money was invested in the project, and by April 1960 Ahrens and his group had completed the first mockup. The first prototype flew on February 28, 1961, the FAA type certificate was granted on May 22, 1962, and the first deliveries began a year later. The first Skymasters were designated Model 336 (not to be confused with the current Beech 336).

In its zeal to put the 336 on the market, Cessna encountered some difficulties. Management tried to convince the FAA that the Skymaster flew just like a large single-engine airplane and that a pilot would not need a multi-engine rating to fly one safely. This ploy did not work. The FAA declared that Skymaster pilots would have to obtain a special, cen-

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With torque canceled and all thrust directed through the centerline, there are no Vmc problems.

was reduced to its original length.

With gear extension there is—as with most retractable-gear airplanes—a tendency to pitch down, but there is nothing remarkable about this. Gear retraction, though, does create an unusual amount of drag, primarily because of the gear doors' opening and closing and the nosewheel's rotating 90 degrees during the retraction cycle.

One-third flaps are recommended for takeoff; this reduces the ground roll and makes rotation easier. Retrimming during climbout takes very little attention, thanks to the auto-trim function and the trim wheel's gearing. It takes only three-and-a-half turns to go from full nose-up to full nose-down trim. The ailerons are surprisingly light and effective and make quite a contrast to the pitch-heaviness.

While the Skymaster may not cruise as fast as its competitors, power is adequate to make Skymasters well-suited to short-field operations. The turbocharged models are especially sought after by operators who fly into areas where unimproved fields and high density altitude conditions are commonplace.

Could the Skymaster's single-engine performance be at fault? No doubt about it. Pull a Skymaster's engine and you are flying a very marginal airplane. But a loss of power translates into more of a sagging feeling than the killer yaw that conventional multi-engine pilots are conditioned to expect.

Moreover the single-engine rates of climb and single-engine service ceilings are equal to, and sometimes slightly higher than, those of comparable light twins. Even the much-maligned 336, according to the pilot's operating handbook, can manage a gross-weight single-engine climb of 355 fpm. And this is what the book refers to as the front-engine-only climb rate. Since the rear (pusher) engine is aerodynamically more effective, the rear-engine only rate of climb is listed as 420 fpm. These figures rose to 360 and 450 fpm for the 337, then sank slightly to 295 and 375 fpm (due to higher gross weight) in the turbocharged 337s. Single-engine climb in the pressurized 337s is claimed as 375 fpm.

Service ceilings also are listed as slightly higher than the competition. As with single-engine climb rates, single-engine service ceilings are higher in rear-engine-only operations.

Handling, climb and performance problems? While the Skymasters have shortcomings in these areas, they are minor and not enough to be the reasons for the airplane's fate. The 337 series cruises only a tad slower than similar light twins, carries comparable loads (there is even an optional 13 cubic foot, 300-pound capacity cargo pod, made available in 1966) and does this while burning a total of no more than 23 gph, at 75-percent power. Not bad, considering the airplane's relatively high empty weight and the displacement of the engines.

Ill-suited for high-altitude operations? This is not the reason either. Oxygen systems are available for all models, and a buyer can choose from turbocharged or pressurized versions.

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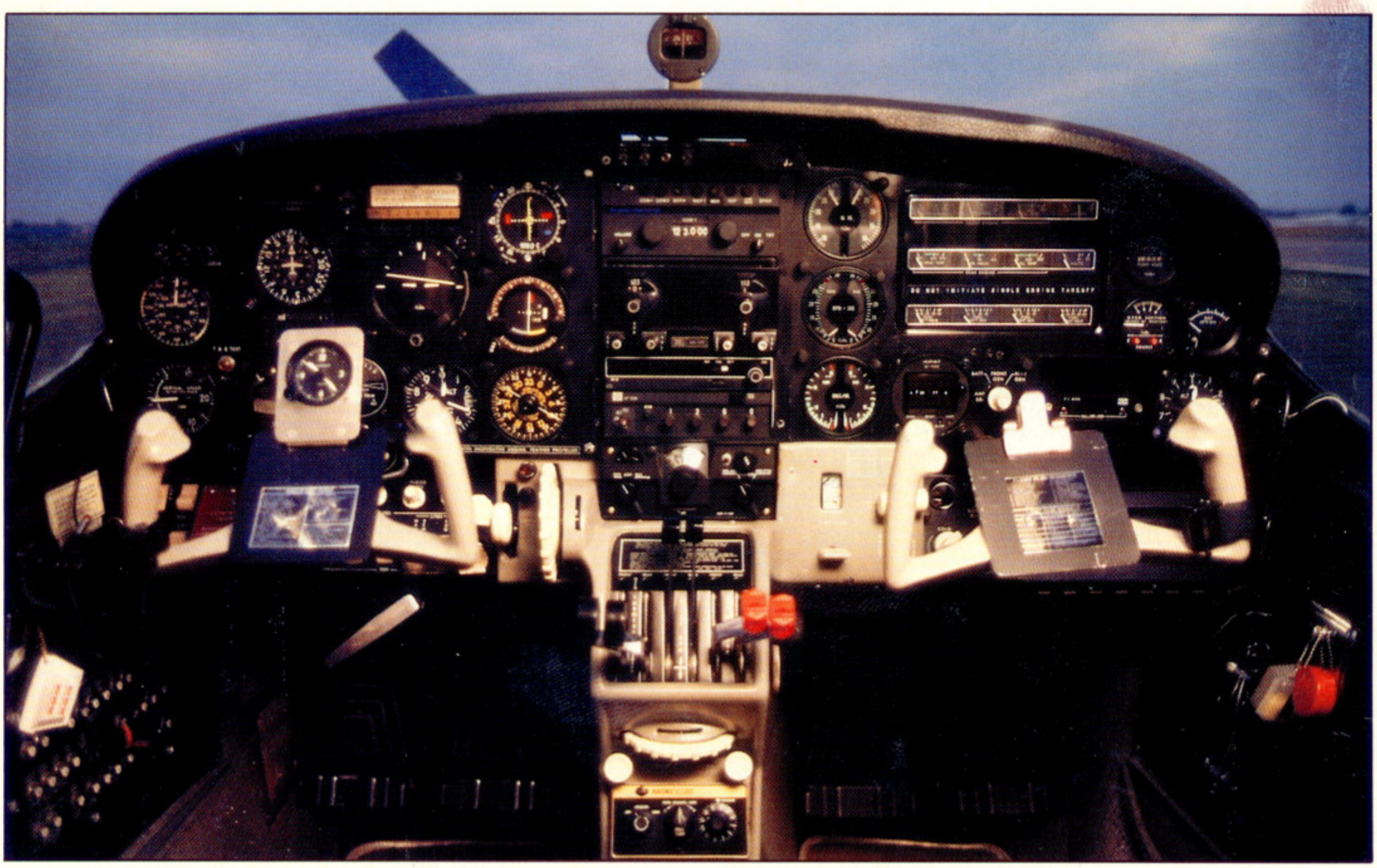

The Skymaster photographed for this article, owned by Dr. Robert Poole of Washington, D.C., is a 1965 Model 337. The power quadrant can cause confusion at first. The right levers control the rear engine (just remember Right—Rear); the left levers, the front engine.

Cessna went overboard to demonstrate the Skymaster's engine-out directional stability. This 1963 promotional photograph shows a 336 taking off with the front propeller feathered. Such stunts helped encourage some pilots to do the same, with unsuccessful results.

Lack of all-weather capability? Perhaps. Leading-edge deice boots and propeller anti-ice systems are options that are available on all Skymasters. But an approved windshield heating system is not. (One Skymaster manual recommends stretching your arm out the vent window and using the control lock to scrape ice off the windshield.) For this reason, the Skymaster never received approval for flight into known icing conditions. In 1977, weather radar was first made an option. A Bendix RDR-160 could be installed, its antenna housed in a fiberglass pod slung under the right wing. Unless an owner receives a supplemental type certificate, however, the radar option is not available to owners of earlier Skymasters. For these airplanes, Stormscopes have become a popular panel addition. So Skymasters can be equipped to negotiate adverse weather conditions.

Perhaps the answer lies in the Skymaster's systems, safety record, maintenance peculiarities or airworthiness directives.

Until 1973, Skymasters were equipped with engine-driven hydraulic systems. Then a switch was made to a simpler, lighter, electrically driven hydraulic power pack, a heavy-duty derivative of the gear system used in the Cessna 210.

In the pre-1973 Skymasters, a single hydraulic pump is mounted on the front engine. If the front engine fails, the landing gear has to be extended manually, using the emergency pump handle stowed beneath the floor to the right of the pilot's seat. In 1967 Cessna offered an optional, second hydraulic pump for the rear engine. Besides providing system redundancy, this second pump reduces gear retraction time by 40 percent.

A schematic diagram of the hydraulic system looks like a plumber's nightmare. The system uses a complex network of pressure sequencing switches and priority valves, all designed to ensure that the landing gear and their doors operate in the correct order. For all its complexity, though, the hydraulic system never brought about any airworthiness directives and has not generated an unusually high number of service bulletins. The electro-hydraulic system also has had a relatively uneventful service history, having been more or less perfected through lessons learned in its 210 application. Beginning in 1974, Cessna tacked a nitrogen bottle onto the electro-hydraulic system. This prevents the gear doors from falling open when the airplane is unused for long periods of time.

As with the landing gear systems in much larger airplanes, Skymasters with engine-driven hydraulic systems have a gear selector handle that snaps back into a neutral position once the cycle sequence is completed. This indicates that the hydraulic pressure has stopped building and that, together with an amber (Up) or green (Down) indicator light, the gear and their doors are locked in the proper position. A handle that remains in the Up or Down position serves as a warning: The pump(s) is still pressurizing the system and overheating may occur. The pilot should return the selector handle to neutral so that pressure may be relieved.

A pilot can use this feature of the engine-driven hydraulic system to make a safe landing when there is not a positive gear-down-and-locked indication. The handbook advises landing with the front engine at no less than 1,000 rpm and with one hand holding the selector handle in the Down position. By keeping high pressure in the

system, this technique can prevent an unlocked gear (particularly the nose gear) from collapsing under the weight of the airplane.

The most frequent complaint about the Skymaster's electrical system has to do with the avionics access panel, located just forward of the windshield. It seems the panel leaked water, shorting out the avionics—usually at the worst possible moment. Cessna service letter ME80-22 gave recommended methods for better sealing the access panel. There are also complaints about the early alternator systems' ability to handle a large electrical load. Prior to the 1967 models, Skymasters have 28-volt, 30-ampere alternators. After that time higher capacity, 38-ampere alternators were made standard.

Electrical load balancing between the two alternators has been a problem for some owners. Skymasters have no automatic paralleling function, which means that load imbalances can occur. With all electrical equipment turned on, one of the alternator warning lights may come on due to an unequal demand on the system. The only way to optimize load sharing between alternators is to keep

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So comfortable and spacious, you can stretch out and relax. So what if the engine just quit?

both voltage regulators adjusted to within .60 volts of each other.

The pre-1975 fuel system also requires special knowledge. The fuel boost pumps work off the main tanks only; fuel from the auxiliary tanks feeds to the engines by gravity. There have been several accidents involving Skymasters whose engines (yes, both of them) simultaneously quit after their pilots switched tanks. Analysis often revealed that the pilots ran the main tanks dry. Switching to the auxiliary tanks may or may not permit a restart once the engines have taken the last of the fuel from the main tanks. Air drawn through the engine-driven fuel pumps can cause cavitation, preventing the immediate transfer of fuel from the auxiliary tanks' lines. To make matters worse, one study revealed that it can take as much as 29 seconds for fuel to travel from the auxiliary tanks to the engines. With no boost pumps to hasten the fuel flow from the auxiliary tanks, the swirling vacuum of air caused by the suction in the engine-driven pumps momentarily can starve the engines. This is why takeoffs and landings must be made with the fuel selectors on the main tanks only.

Design changes relating to fuel problems include an enlargement of the fuel lines' diameters in 1968, the installation of a capacitance-type fuel measurement system in 1970 (float gauges were previously used) and a switch to an interconnected-tank design in 1975. This newer fuel system permits boost pump operation through the entire system, since all tanks share the same plumbing. There is another interesting footnote—both engines cannot share the same tank. Fuel flow is inadequate for high-power conditions.

For these reasons fuel mismanagement is the single greatest cause of Skymaster accidents. A look at the 1978 through 1980 Skymaster accident files reveals no other remarkable trends. During this period there were a total of 74 accidents, 19 involving fatalities; 15 were blamed on misman-

	1964 Cessna 336 Skymaster	1965 Cessna 337 Super Skymaster	1970 T337E Cessna Turbo Super Skymaster	1973 T337G Cessna Pressurized Skymaster
Base price new	$39,950	$39,950	$56,995	$78,500
Current market value	$10,600 to $14,750	$13,400 to $18,500	$23,400 to $31,500	$34,600 to $46,000
AOPA Pilot* Operations/Equipment Category	IFR	IFR	IFR	IFR
Specifications				
Powerplants	2 Continental IO-360-A, 210 hp @ 2,800 rpm	2 Continental IO-360-C/D, 210 hp @ 2,800 rpm	2 Continental TSIO-360-A, 210 hp @ 2,800 rpm	2 Continental TSIO-360-C, 225 hp @ 2,800 rpm
Recommended TBO	1,500 hr	1,500 hr	1,400 hr	1,400 hr
Propellers	2 McCauley 2-blade, constant speed, full-feathering, 76-in dia	2 McCauley 2-blade, constant speed, full-feathering, 76-in dia	2 McCauley 2-blade, constant speed, full-feathering, 76-in dia	2 McCauley 2-blade, constant speed, full-feathering, 76-in dia
Wingspan	38 ft	38 ft	38 ft 2 in	38 ft 2 in
Length	29 ft 7 in	29 ft 9 in	29 ft 10 in	29 ft 10 in
Height	9 ft 4 in	9 ft 4 in	9 ft 4 in	9 ft 2 in
Wing area	201 sq ft	201 sq ft	202.5 sq ft	202.5 sq ft
Wing loading	19.4 lb/sq ft	20.9 lb/sq ft	22.9 lb/sq ft	23.2 lb/sq ft
Power loading	9.3 lb/hp	10 lb/hp	11 lb/hp	10.4 lb/hp
Seats	4 (5 or 6 opt)	4 (5 or 6 opt)	4 (5 or 6 opt)	4 (5 opt)
Cabin length	7 ft 9 in	7 ft 9 in	7 ft 9 in	7 ft 9 in
Cabin width	3 ft 2 in	3 ft 2 in	3 ft 2 in	3 ft 2 in
Cabin height	4 ft 4 in	4 ft 4 in	4 ft 4 in	4 ft 4 in
Empty weight	2,320 lb	2,625 lb	2,850 lb	2,900 lb
Gross weight	3,900 lb	4,200 lb	4,630 lb	4,700 lb
Useful load	1,580 lb	1,575 lb	1,780 lb	1,800 lb
Payload w/full fuel				
std (93 gal)	1,022 lb	1,017 lb	1,222 lb	1,050 lb
opt (131 gal)	794 lb	789 lb	994 lb	N/A
Max takeoff weight	N/O	N/O	4,630 lb	4,700 lb
Max landing weight	N/O	N/O	4,400 lb	4,465 lb
Fuel capacity, std	558 lb (552 usable) 93 gal (92 usable)	558 lb (552 usable) 93 gal (92 usable)	558 lb (552 usable) 93 gal (92 usable)	750 lb (738 usable) 125 gal (123 usable)
Fuel capacity, w/opt tanks	786 lb (768 usable) 131 gal (128 usable)	786 lb (768 usable) 131 gal (128 usable)	786 lb (768 usable) 131 gal (128 usable)	N/A
Oil capacity, ea engine	10 qt	10 qt	10 qt	10 qt
Baggage capacity	365 lb, 17 cu ft	365 lb, 17 cu ft	365 lb, 17 cu ft	365 lb, 17 cu ft
Performance				
Takeoff distance, ground roll	625 ft	805 ft	1,000 ft	945 ft
Takeoff distance, over 50-ft obst	1,145 ft	1,435 ft	1,675 ft	1,500 ft
Accelerate/stop distance	N/O	2,300 ft	N/O	2,925 ft
Rate of climb, sea level	1,340 fpm	1,300 fpm	1,105 fpm	1,250 fpm
Single-engine ROC, sea level				
front engine only	355 fpm	360 fpm	295 fpm	375 fpm
rear engine only	420 fpm	450 fpm	375 fpm	375 fpm
Cruise speed, 75% power	150 kt (7,000 ft)	167 kt (5,500 ft)	168 kt (10,000 ft)	190 kt (12,000 ft)
Fuel consumption, ea engine	66 pph/11 gph	69 pph/11.5 gph	72 pph/12 gph	79 pph/13 gph
Range @ 75% cruise, no rsv				
std tank	650 nm (7,000 ft)	665 nm (5,500 ft)	652 nm (10,000 ft)	891 nm (12,000 ft)
opt tank	900 nm (7,000 ft)	925 nm (5,500 ft)	904 nm (10,000 ft)	N/A
Cruise speed, 55% power	107 kt (10,000 ft)	150 kt (10,000 ft)	150 kt (24,000 ft)	178 kt (18,000 ft)
Fuel consumption, ea engine	42 pph/7 gph	51 pph/8.5 gph	42 pph/7 gph	60 pph/10 gph
Range @ 55% cruise, no rsv				
std tank	820 nm (10,000 ft)	812 nm (10,000 ft)	996 nm (24,000 ft)	1,064 nm (18,000 ft)
opt tank	1,140 nm (10,000 ft)	1,130 nm (10,000 ft)	1,347 nm (24,000 ft)	N/A
Service ceiling	19,000 ft	20,500 ft	29,300 ft	N/O
Max operating altitude	N/O	N/O	N/O	20,000 ft
Single-engine service ceiling				
front engine only	8,200 ft	8,200 ft	14,400 ft	18,700 ft
rear engine only	9,500 ft	10,200 ft	17,200 ft	18,700 ft
Landing distance over 50-ft obst	1,395 ft	1,465 ft	1,650 ft	1,675 ft
Landing distance, ground roll	655 ft	575 ft	700 ft	795 ft
Limiting and Recommended Airspeeds				
Vx (Best angle of climb, ⅓ flaps)	63 KIAS	68 KIAS	75 KIAS	63 KIAS
Vy (Best rate of climb)	90 KIAS	96 KIAS	93 KIAS	96 KIAS
Vxse (Best single-engine angle of climb)	74 KIAS	77 KIAS	81 KIAS	78 KIAS
Vyse (Best single-engine rate of climb)	83 KIAS	86 KIAS	87 KIAS	89 KIAS
Va (Design maneuvering)	130 KIAS	130 KIAS	133 KIAS	135 KIAS
Vfe (Max flap extended)	139 KIAS	139 KIAS	139 KIAS	139 KIAS
Vno (Max structural cruising)	165 KIAS	165 KIAS	165 KIAS	165 KIAS
Vle (Max gear extended)	N/A	139 KIAS	196 KIAS	200 KIAS
Vne (Never exceed)	190 KIAS	190 KIAS	196 KIAS	200 KIAS
Vs1 (Stall clean)	62 KIAS	64 KIAS	70 KIAS	70 KIAS
Vso (Stall in landing configuration)	52 KIAS	55 KIAS	61 KIAS	62 KIAS

*All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, at sea level and gross weight, unless noted. *Operations/Equipment Category reflects these aircraft models' maximum potential. See June 1982 Pilot, p. 92. N/A—not applicable, N/O—not obtained.*

agement of fuel (i.e., both engines quit). Of this number, though, only two accidents caused fatalities. The rest of the accidents ran the usual gamut: continuing VFR into adverse weather, fuel contamination, improper recovery from bounced landings and various mechanical difficulties. Two accidents were caused by pilots attempting single-engine takeoffs (neither caused fatalities), one involved a pilot with no multi-engine or centerline thrust rating, and three were the result of overgrossed Skymasters hauling marijuana (two fatalities). Absent were stall-related accidents. For a fleet of 2,386 airplanes, this is a very good accident record.

Bad news, such as the double-engine failures, travels fast. But in the aviation world, rumors of maintenance quirks and mysterious glitches travel even faster. Ask any pilot and he will tell you that Skymasters leak engine oil all over the place and there is nothing you can do about it.

This leakage usually has three main causes. When you fill a Skymaster's engines to their 10-quart maximum, oil is blown out the breather. Service Letter ME74-2 advised owners to fill their engines to eight quarts instead of ten and to remove the 10-quart mark from the dip sticks.

Another cause is the two-piece accessory case gasket. These gaskets seal the alternator and tachometer drive shafts, but leave a plugged hole between the shafts without a gasket. The solution, according to mechanics, is to install a one-piece gasket that covers the entire area. But, Continental does not make a one-piece gasket for this application, so a mechanic must fabricate a custom-made one.

The last theory that we know of concerns too much use of the high-boost pump. Engine starts should be made with the boost pumps on Low. Too many pilots become impatient if the engine does not fire immediately, then go to high-boost operation. This generates an overflow of fuel, which is vented at the rear of the fuselage, beneath the propeller. Since this fuel has been mixing with residual oil in the intake manifold—the product of piston blow-by—the result is an oily fuselage.

There are other squawks that have become Skymaster legend:

• The engine cases crack, particularly on those engines with front-mounted alternators. With the 337H models, the Skymaster's Continental engines come with heavier crankcases.

• The rear engine *still* overheats, in spite of the 337's larger intake scoop. Intake air is not the problem in flight. Pilots must learn to fly with the rear cowl flaps open at all times; otherwise, airflow over the cylinders will be inadequate. In 1969, the cowl flap controls went to a three-position toggle switch and a pair of blue lights. When the cowl flaps are either fully open or closed, the blue lights will illuminate. While taxiing, the trick is to use the front engine. Its blast of air keeps the rear engine cool. Many pilots are tempted to taxi with the rear engine only—not just to save fuel, but because rear propeller ground clearance is better.

• In 1968 voltmeters and ammeters were replaced by idiot lights. They come on and go off when they are not supposed to. Their diodes and transistors have a reputation for burning up. Check the sealing on the avionics access panel.

• The book says to start the rear engine first, to ensure that people will not walk into the propeller after the pilot shouts "Clear" with the front engine running. But in cold temperatures, the battery cannot power the rear engine through more than a few turns. Long-time Skymaster owners know to start the front engine first under these conditions. The battery is on the front firewall; too much juice is lost through the long cable to the rear engine.

• There is no proper way to load and secure baggage. It was not until 1971 that Cessna came up with optional tie-down latch plates and seat-rail attach points for cargo restraint. Those who have not installed these fixtures must leave baggage unsecured.

As for airworthiness directives, the Skymasters have few of substance. AD 71-17-8 calls for increasing the rear engine's idle rpm. At idle, it is difficult to hear the rear engine while wearing earplugs or a headset and there is always the danger that a pilot unknowingly may attempt a takeoff using the front engine only. This is why the handbook advises beginning the takeoff roll by leading with rear engine power. This is a way to check that the rear engine is running.

Along the same line, AD 77-8-5 requires a placard stating "Do Not Initi-

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The optional cargo pods expand the Skymaster's utility, but cost you speed and looks.

ate Single Engine Takeoff." This is ironic, since early promotional photographs showed a Skymaster being pushed into the air on one engine. Accident records have shown that Cessna may have set a bad example.

AD 78-9-5 and AD 81-13-10 R1 are potentially the most expensive directives. The former requires an inspection of the wing front and rear spar lower caps for cracking. The latter mandates an inspection or replacement of certain tachometer and oil pump drive gear assemblies.

An objective analysis shows that no one shortcoming can explain the popular stigma attached to the Skymaster. Rather, it is an unfortunate combination of marketing strategy and attitudes. Priced to undercut the twin-engine competition as a new airplane, it was apparent that customers wanted to have more speed and a conventional design rather than safety at a bargain price. Many purchasers were undoubtedly drawn to the speedier Mooneys, Comanches and Bonanzas. Anything but be caught dead in an airplane with the looks of a Skymaster, even if it is a twin.

The same holds true today. As used airplanes, Skymasters can be bought for a song. The 336, probably on its way to an Edsel-style revaluation as a rare cult object, can be purchased for about $10,000 to $15,000. Blue book values climb slowly through the years and top out at between $72,000 and $90,000 for a 1980 pressurized 337.

The Skymaster's biggest single obstacle to public acceptance appears to be rooted in the very design goals that brought it about in the first place: safety. Macho types look down on them. What good is a big, powerful—yet unthreatening—twin-engine airplane? If it denies you the opportunity to pose as a pilot with the Right Stuff, ready and able to prevent a deadly spin should an engine fail on takeoff, what psychological value can such an airplane have?

Skymaster freaks, of course, are immune to this logic. They lavish great care on their airplanes, take pride in owning such a unique machine and even may fit their airplanes out with the very popular Robertson STOL (short takeoff and landing) kit. Owners also may share news, run advertisements and give maintenance advice to their brethren through the *337 Newsletter*, published three or four times a year by O.R. Whitaker. To be included on the newsletter's mailing list, write Whitaker Enterprises, Incorporated, Post Office Box 1274, Liberal, Kansas 67901. There is no charge, but contributions are appreciated.

Thirteen years after the Skymaster was introduced, the National Transportation Safety Board issued a special report entitled "Light Twin-Engine Aircraft Accidents Following Engine Failures, 1972–1976." The report showed that, within the space of four years, there were 21 fatal accidents following engine failures in Piper Apaches and Aztecs, two such fatal accidents in Twin Comanches, 16 in Beech Travel Airs and Barons and 10 in Cessna 310s. Skymasters had only six such accidents.

Ahead of its time in many ways, the Skymaster, like the Cessna Cardinal, was billed as an airplane of the future. But no one was convinced except Cessna's higher-ups and the type of customers who buy old two-stroke Saabs or Dodge Valiants. In a contest between glamour/speed and ugly/practical, there is only one choice for the buyer who wants to invest in such an emotional object as an airplane. ☐