CESSNA 337 SKYMASTER

JUST SAY THREE-THREE-SEVEN

Yes, this airplane has been called by just about every derogatory permutation of its given name--Skymasher, Skytrasher, and Mixmaster, for example--and a few others making fun of its centerline-thrust configuration--push-me/pull-you and suck-and-blow. The hardy soul arriving in one of Cessna's great multiengine experiments garners sneers from drivers of "real" twins--you know, those airplanes with an engine on each wing and a minimum-controllable number etched on the airspeed indicator. The kind with the occasional foray into uncontrollability when its "real" pilot reacts improperly to an engine-out emergency.

That's not to say the Skymaster has a better safety record than conventional twins. Surprisingly, it does not. We had the AOPA Air Safety Foundation run a report on the 337 series, and the statistics show that as Cessna intended, the Skymaster shows its pilot no untoward qualities with a powerplant shut down. You won't find its name under the heading "stall/spin during engine-out maneuvering." But the 337 has racked up quite a few accidents stemming from fuel exhaustion or mismanagement, and from tangling with weather beyond the capabilities of the airplane or pilot.

It seems freeing the pilot from asymmetric-thrust worries has merely shifted the accident causes elsewhere. Perhaps because the Skymaster is less susceptible to the conventional yaw-spin-boom twin accident, pilots do not take the 337 as seriously as other twins. In a conventional multiengine airplane, pilots are trained to be spring-loaded during certain segments of flight--to be ready to abort the takeoff or secure the offending engine without delay, lest it wander off into the weeds. Skymaster pilots are not concerned with such ditch-darting but are aware that the airplane will not climb out unless properly configured. Good multiengine operating practice remains a necessary ingredient in keeping the 337 in one piece.

So where do we find Cessna's new-think multi 30 years after its debut? It has been described as one of the best entry-level twins, with a robust airframe and fine low-speed and engine-out manners. The airplane's systems and engines--six-cylinder Continental 360s--call for careful shopping, however, to keep from buying a true hangar queen. And the used prices reflect that caution: The 337s are generally less expensive than conventional twins of the same age. For example, a 210-horsepower, 1967 Skymaster runs $29,000, according to the -Aircraft Bluebook-Price Digest. compared to $50,500 for a same-vintage Beech Travel Air (which sports 180hp engines) and $44,000 for a Twin Comanche. Turbocharged and pressurized 337s hold their value better but still are less expensive to purchase than other conventional twins of similar power.

Cessna introduced the original Skymaster with fixed landing gear and normally aspirated 210-hp Continentals. That model, the 336 Skymaster, came to market in late 1963 but was superseded for the 1965 model year by the 337, sporting retractable gear borrowed from the Centurion. (The Skymaster would return the favor later, offering its pressurization system to the new-for-1978 P210.)

Few changes came to the basic airframe between introduction and cessation of production in 1980, save, of course, for the beefing up to accommodate pressurization for 1973. Model history shows more changes in the systems and powerplants than anything else. Starting life with the 210-hp Continental IO-360-A, the 337 would in non-turbo form keep the same basic powerplants to the end, with the major changes dedicated to improving the bottom-end components and solving case-cracking problems. The 337's engines produce their maximum power at a rather lofty 2,800 rpm, which gives off enough of a racket at takeoff to send noise-meter needles a-wiggling. Skymaster owners need to be especially concerned with keeping the airport neighbors happy.

From 1965 onward, evolutionary alterations came to the non-turbo 337. Maximum gross weight started at 4,200 pounds and grew incrementally to 4,630 in 1980. Big news arrived in the form of the turbocharged version in 1967. Fully automatic wastegates and Garrett turbos were grafted onto the Continentals, which became TSIO-360s, still delivering 210 hp. The straight turbo option was dropped at the end of the 1971 run in preparation for the 1973 debut of the pressurized 337.

With a maximum pressure differential of 3.35, giving a 10,000-foot cabin at 20,000 feet, the P337--which was piggybacked onto the turbo 337's type certificate and so also officially dubbed the T337--appeared as a true economy P-twin. With pressurization came more powerful, 225-hp Continentals. The turbo, non-pressurized Skymaster did not reappear until 1978 and, for construction reasons, had the small windows of the P model. All told, 1,867 of the 337 and T337 models were built, along with 334 pressurized versions. Cessna sold a total of 510 M337s (known as O-2As and O-2Bs) to the military--which gained the reputation of being almost literally bulletproof. The Reims plant in France built a total of 109 of the various 337s under license.

As promised by the Cessna design staff way back when, the 337's manners make it the perfect step-up twin for a pilot accustomed to a Skylane or a Centurion. Handling is standard-issue Cessna, heavy in pitch but unflappable and hugely stable in airspeed once trimmed. Aileron response is quicker than the 210 and lighter, but you'll never have an incurable urge to reenact your favorite Blue Angels routine. (Yes, there have been air-show acts with 337s, but you know the guy flying was working hard.) Overall, the 337 follows the Cessna handling hallmarks and carries them to a new level, with the Skymaster being just a bit heavier and faster and more demanding than the big singles below it in the line.

Perhaps the greatest advance brought by the Skymaster was docile engine-out handling. Lose a powerplant on takeoff, and the 337 will not try to head for the weeds. At maximum weight, however, the Skymaster is truly lethargic unless the dead engine's

propeller is feathered. Pilots transitioning to the 337 are taught to monitor the exhaust gas temperature gauges on the takeoff roll to make sure both engines are producing power. If an engine dies in cruise, the usual dead-foot, dead-engine chant doesn't work; you must look carefully at the instruments and be sure to verify your choice before feathering a prop.

Single-engine climb is nothing to crow about on any of the models, falling in the 200- to 400-feet-per-minute range, depending upon installed power and maximum gross weight. These numbers are in line with those of other light twins.

Single-engine service ceiling is very good, better than conventional twins. A non-turbo 1967 model has a single-engine ceiling of 7,500 feet with the rear engine out, and 9,500 feet with the front engine shut down. A 1971 turbo 337 will claw it way up to at least 14,400 feet (17,200 on just the rear engine), while a 1980 P337 can climb to 18,700 feet on just one engine. For most naturally aspirated light twins, the single-engine ceiling is anywhere from 4,000 to 6,000 feet. The difference is, naturally, that the Skymaster can chug along with one feathered without having a huge rudder cocked into the breeze or any of the other aerodynamic compromises inherent in a conventional twin running with an engine shut down.

The big Cessna can be brought down final approach at surprisingly low velocities, too. For the heaviest airplanes, Cessna recommends a normal approach of 80 to 90 knots, with short-field procedures calling for just 78 knots over the fence. The lighter, earlier models can shave about 4 knots off that figure.

Count on optimum cruise speeds for the normally aspirated models in the 165-knot range at 5,000 feet, burning 23 gallons per hour total. That's a bit slower and a bit thirstier than conventional twins packing a pair of 180-hp engines. Cruise speeds of the T337 show a best of 190 knots at 25,000 feet, burning 22 gph total, while a 1980 P337 (225 hp each engine) tops out at 204 knots, using 26.6 gph at 20,000 feet. The later T337 and P337 models are only certified to 20,000 feet, whereas the earlier turbo models have no such limitation, a quirk of changes in the certification standards that took place in the 1970s.

While the 337 is no speedster, at least the cabin has the stretch-out room to make the journey comfortable. Cessna called the 337 a sixplace airplane (and the P337 a five-placer), but to carry a half dozen people means having them hold their luggage on their laps because there's no room left for baggage. (Unless, of course, you find a 337 with the optional cargo pod, which will give you room for three "two-suiters," according to Cessna.) Really, the 337 is a marvelously comfortable four person airplane with room and payload for baggage.

From the cabin, two items stand out as examples of the best and worst traits of the 337. Excellent visibility from the front row of seats is the high point; because the wing is well aft and the windows are large, the pilot and copilot have an almost unobstructed view of the outside. The low point is noise. Engines attached to each end of the cabin create quite

a racket at high power settings. Reducing engine speed helps tremendously, but you'll still want to have comfortable, quiet headsets aboard.

Useful load on the various models runs from 1,500 pounds up to about 1,700 pounds on the early airplanes. It's only when you load the later, large-tank airplanes full of fuel (888 pounds worth), that you really have to watch the weight and balance. The center-of-gravity range is generous.

Most Skymasters have pretty good range, too, with long-range tanks available from the start. Airplanes through the 1972 models had 92 gallons usable standard, with 128 gallons optional. In the long-range airplanes, fuel was carried in two interconnected main tanks in each wing, plus an auxiliary tank between the cabin and booms; the pilot has to switch between the main and auxiliary tanks. Starting in 1973, the auxiliary tanks were plumbed in with the mains, eliminating the need to switch tanks except to turn the fuel off or to crossfeed. Standard tanks for the 1973 and 1974 models remained 92 gallons usable, with a long-range option totaling 118 gallons; in 1975, the extended-range tankage was increased to 148 gallons usable in four interconnected wing tanks a side. Finally, starting in 1976, the standard tanks were reduced in capacity to 88 gallons usable, while the long-range option stayed at 148 gallons.

The fuel system merits discussion because it seems to be the source of the 337's most common accidents. According to a study compiled by the AOPA Air Safety Foundation, during the period of 1982 to 1989, fuel starvation or exhaustion accounted for the largest single category, with 15 accidents. These ran the gamut from failure to change tanks to simply running out of fuel before reaching the destination. Two additional accidents stemmed from fuel system malfunctions, one a fuel leak and the other a jammed selector valve. On paper, the 337's fuel system is not particularly complex and far simpler than, say, a 310's or a 340's.

And while the 337's fuel system has at least been reliable, such praise cannot be lavished upon its engines. Early on, the IO-360s gained a reputation as hot-running, crack-prone powerplants. Before the B-suffix engines were introduced in the late 1970s, there were numerous reports of broken crankshafts and connecting rods. Even today, service difficulty reports point to cracking cases, sheared crankshafts, head-to-barrel separations, and general engine mayhem. The normally aspirated IO-360s have a published time between overhaul of 1,500 hours, but don't bet big money on it. Most operators report needing top-end work enroute to TBO.

Maintenance matters get worse with the turbocharged or pressurized airplanes. The early, 210-hp turbo airplanes do better than the later 225 hp models (which get that power from 37 inches manifold pressure and 2,800 rpm), but neither powerplant will win any longevity awards. Continental lists the TSIO-360s' TBO as 1,400 hours, but once again, savvy owners will not bank on getting to that number without some interim top-end ministrations.

Another systems headache, according to owners and simplified directional facilities, is the gear system. All 337s have full gear doors, and the hydraulic system has been the bane of many a mechanic. We're told, however, by the Cessna Pilots Association, that with proper maintenance, the 337 gear can be reliable and not terribly expensive to maintain. The trick is to get the system debugged first; this is a prime shopping point for any 337 purchaser. Don't even consider putting money down on a Skymaster unless you've had the gear and engines gone through thoroughly, and even then, be sure to budget liberally for the first year's ownership. We are told, also, that the later model years are better as Cessna replaced the engine-driven hydraulic pump with an electric power pack.

The bottom line seems to be that the basic 337 airframe is the strong, simple type, but the airplane's engines and systems can really hog out a checking account. It's been said that there's no such thing as a cheap-to-keep twin, and that may be true; certainly if there were, the 337 would not be at the top of the list.

Still, maintenance problems don't seem to matter much to those individuals who have spent the time and effort to debug their airplanes. For them, the 337 represents a reasonably economical, safe multiengine airplane. They truly seem to love the Skymaster--and will shoot daggers at those nonbelievers who dare call it anything other than three-three-seven.

Major accident causes according to the AOPA Air Safety Foundation's General Aviation Accident Analysis Book--For the Years 1982-1989,- the Cessna 337 series had a total of 79 accidents, resulting in 63 major injuries and 33 aircraft destroyed; 56 of those accidents were determined to be pilot-related. Most accidents occurred in the cruise phase of flight, 39.3 percent; of those, 21.4 percent were caused by fuel exhaustion (an additional 3.6 percent from fuel mismanagement), and 12.5 percent were weather related. Landing-phase accidents accounted for 21.4 percent, with 7.1 percent attributed to failure of the pilot to lower the gear, 5.4 percent were hard landings, and 3.6 were overshoots. A total of 8.9 percent of the accidents were related to approaches gone awry, 3.6 percent in VFR conditions and 5.4 percent in IFR conditions. Mechanical mayhem was the primary cause in 10 accidents; two were caused by an engine failure, five by the landing gear or brakes, and three by the fuel system. The accident cause for an additional 13 is unknown.

Richard Bach, Edmonds, Washington
1978 Cessna P337H

N144A (aka "Daisy, The Flying Flower") is a 1978 P33H with 1500 hours TTSN. We bought her for our company, Alternate Futures, Inc., in 1986 and we improve her a little every year. We've found that the Skymaster reputation as a high-maintenace aircraft is deserved if it has been neglected or maintained by shops with little Skymaster experience. Properly cared for, Daisy has proven as dependable as any of the 30 airplanes I've owned in 40 years' flying.

An outstanding instrument airplane, Daisy routinely flies coast-to-coast, cruising in the low flight levels. Her POH-approved ceiling is 20,000 feet; on test flights I have flown her to FL 240, where she was still climbing at 500 fpm. She is pressurized to a 10,000 foot cabin at FL 200. With spoilers extended, she can have a descent rate of more than 3,500 fpm.

When flying with two aboard, we remove the rear seat and expect the airplane to carry us, full fuel (approximately six hours at cruise) and anything we can fit in the back seat and trunk of a compact automobile...a 1400-pound useful load. Daisy cruises at 193-198 KTAS, depending on fuel load, has a 1,000-plus NM range burning 25 gph block-to-block when leaned at altitude to just under 1600 degrees turbine inlet temperature.

Some of her features:

Continental TSIO-360-CB factory remanufactured engines

American Aviation intercoolers.
Slick pressurized magnetos.
Dual 60-amp alternators.
Horton STOL kit.
Spoilers Inc. electric-hydraulic wing spoilers.
Pulse-Light landing light flasher system.
Custom paint and interior in white leather.

Custom-built metal instrument panel and avionics include:

King EHI-40 Electronic Flight Instrumentation System (VOR-LOC, ADF and GPS in Flight Plan, Map, HSI and Expanded Arc modes with RMI/DME/GS and TTS display);
Eventide Argus 7000 Moving Map display with integrated WX-10A Stormscope;

S-TEC 65 autopilot and flight director with electronic altitude preselect;
KLN-90A GPS integrated to EFIS and Shadin fuel totalizer;
King Silver Crown radio including: dual KX-155 Navcom, King KR-65 DME, Narco transponder, King Digital ADF coupled to EFIS and Argue 7000;
Yoke control switches for: Microphone (pilot and copilot), Elevator trim, Autopilot cutoff, Spoiler actuator, Transponder ident, Stormscope/moving-map display toggle, Moving map waypoint data;
Shadin Digiflo digital fuel totalizer coupled to the KLN-90A GPS;
Insight Gemini 1200 Engine monitor (12-cylinder EHT and EGT, TIT, OAT, IAT and computer-accessable engine data);
Dual electronic tachometers;
Bose active noise-canceling headsets for pilot and copilot on NAT intercom;
Davtron digital voltammeter, OAT gage in deg C&F, pressure and density altitude indicator;
Digital clock/timer with GMT, local and elapsed time functions;
ICOM 720-ch handheld nav/com with antenna jack at instrument panel;
Computer access port for King GPS upgrade.

Avionics West, Inc., of Santa Maria, Calif., designed and built the instrument panel and installed the avionics. Most of the airframe and engine modifications were installed by Aero-West Specialties and the Cessna Pilots Association Maintenance Center at Santa Maria.

Model	Top Speed (kts)	Cruise Speed (kts)	Stall Speed (kts)	Gross Weight (lbs)	Empty Weight (lbs)	Fuel Capacity (gal)	Range (nm)	Takeoff Ground Roll (ft)	Rate of Climb (fpm)	Service Ceiling (ft)	Landing Ground Roll (ft)
336	159	150	52	3,900	2,320	93	880	790	1,300	19,000	575
337	174	167	55	4,200	2,615	93	922	805	1,200	20,500	757
337A	174	167	55	4,200	2,615	93	922	805	1,200	20,500	757
337B	174	167	57	4,300	2,615	93	922	845	1,250	20,000	590
337C	173	166	58	4,400	2,650	93	922	895	1,200	19,500	600
337D	173	166	60	4,400	2,655	93	920	895	1,200	19,500	700
337E	173	166	60	4,400	2,660	93	922	910	1,180	19,300	700
337F	173	165	61	4,630	2,695	93	920	1,000	1,100	18,000	700
337G	172	169	61	4,630	2,925	90	1,139	1,000	940	18,000	700

SKYMASTER MODS and PARTS

Aviation Enterprises
Whites Creek, TN 37189
Ph 615/ 865-1802 Fax 615/ 865-9164

(back to 337skymaster.com)

STCs for Skymasters:

1. Mechanical cowl flap conversion for 336 and 337
2. Gross weight increase to 5120 lbs
3. Performance Package
4. 40 gallon Auxiliary Fuel tanks
5. Rocket Winglets (performance enhancements)
6. STOL kit
7. Tail boom to vertical fin fairings (large/medium)
8. Flap gap seals for 336
9. Fuel jettison system

Additional Items:

- 3 bladed propellers for all Skymasters
  - 2000 hour TBO
  - 30 lbs lighter per propeller
  - 5 db quieter
  - Up to $2500 trade in credit for your 2 bladed propellers
- Air conditioning for all Skymasters
- 310-375hp engine conversions for all Skymasters
- Inflatable door seals for all Skymasters
- Air stair doors for 63-72 Skymasters
- up to 140 gallon aux tanks
- Intercoolers for T337s
- Composite spinners and bulkheads for all Skymasters
- New replacement cowl flap motors for all Skymasters (Up to $500 trade in credit for your motor. Up to 60% off OEM prices.)
- Turbocharger support brackets for all Skymasters
- Custom STCs

FAA PMA replacement parts for all Skymasters

(better than the OEM parts):

1. Cowl Flap Motors (repaired or exchanged)
2. Glare shields
3. Wing tips, rudder tips, strut fairings, etc.
4. Interior trim parts = All
5. Windows for all Skymasters including the P337
6. Windshields
7. Cargo Packs for all Skymasters
8. Landing gear doors = All
9. Full size Composite **Replica 0-2A Kit**

(Military Version 337)

Call us if you need anything for a Skymaster

If we don't have it, we can get it for you.

310-375 hp Engine upgrades for all Skymasters

ADVANTAGES of better engines:
Marked improvement in single engine performance, rate of climb and cruise speed plus an increase in useful load.

Option #	Engine Options with new 3 bladed propellers	Turn Key Cost for Engine Conversion	
		Rear only	Front and Rear
1	Continental IO 550 310 hp engines	$80,000	$160,000
2	Continental TSIO 520 310 hp engines	$80,000	$160,000
3	Continental TSIO 520 325 hp engines	$100,000	$200,000
4	Continental TSIO 550 350 hp engines	$125,000	$250,000
5	Continental GTSIO 375 hp engines	$110,000	$220,000
6	Lycoming TIO 540 350 hp engines	$125,000	$250,000

If you look at the accident statistics of Skymasters, its record is comparable to other twins with retractable gear. You'd expect better, when you consider that the plane was designed to be very forgiving and easy to fly compared to a conventional twin (without the tendency to yaw over when you suffer a failed engine at takeoff). But it's precisely because of its apparent simplicity, some contend, that problems arise. Too many pilots think they can get in and fly, and you find, for example, an unusually large number of accidents due to simple fuel starvation because the pilot didn't check fuel or because he/she didn't know how the four tanks feed the engines. You see, because of its reputation as a bullet-proof aircraft, some pilots treat the 337 as if it was a simple single-engine aircraft. But it isn't. You don't just get in and fly. If you treat it for what it is - a complex, high-performance, retractable-gear, variable-speed-prop twin - and if you maintain it properly, and if you do thorough pre-flights, and if you stay proficient, then it is indeed a very safe aircraft.

One final point is yearly costs. Aside from interest, insurance, hangar/tie-down and fuel costs, which are fairly straight-forward to determine, what should you assume for maintenance costs (including engine/prop reserves and the cost of the annual inspection)? Paul Sharp (above) and others use an estimate that such costs are roughly equal to fuel costs (so an aircraft flown 150 hrs per year at 20 gal/hr and $2.50 per gallon, would have maintenance costs of about $7500). I use a different estimate: $30 per hour plus $5,000 per year (the basis for the $5,000 is that an aircraft will have maintenance costs even if it's not flown). For the 150-hour-per-year use we assumed here, my number is $9,500, a little higher than Paul's $7,500. But for 300-hour-per-year use, my number is $14,000 and his is $15,000. So take your pick, or choose in between the two numbers.

A big advantage of a pressurized Skymaster is noise, or the lack thereof. One remarkable thing about this aircraft is the fact that 'pressurizing' actually DECREASES the ambient noise level. The DB level is, in fact, LOWER than many single-engine airplanes (and, of course, substantially lower than most twins) because of pressure seals, double

soundproofing, double pane windows, and due to the hollow rubber door seal that fills with pressurized air through small holes and compresses itself around the door opening. Note that I don't use fancy noise-canceling headsets

Another advantage of the pressurized 337 - aside from the quiet comfort - is performance. Since you can get to a maximum certificated operating altitude of 20,000 feet, where you can operate the aircraft in thinner air (read: less drag) but with the turbo giving back the power you lose in the thinner air, the aircraft is FAST. In one of the articles written about the P337 by William D. Thompson, in his book "Cessna - Wings For The World II", he makes the claim: "To our pleasant surprise, this airplane was almost as fast at 24,000 feet as the much-more-expensive C-340." By the way, the difference in speed was roughly 23 knots - 228 for the C-340 and 205 for the C-P337 - and the difference in price was large - around $200,000 for the C-340 and $130,000 for the C-P337, both new in 1976 dollars. And, of course, since the C-340 is turning TSIO-520N engines that develop 310 bhp and the Cessna P337 is turning less expensive powerplants of 225 bhp, the pressurized Skymaster has considerably LOWER fuel flows. I'd rather give up the 23 knots difference, keep the $70,000 cash, keep the lower fuel bills, keep the lower engine-overhaul bills, take the safety of centerline thrust with no VMC, and still retain the stability and visibility of the Cessna "High-Wing" design.

Probably the best advice I could give you, is DON'T be in a hurry. You're dealing with a complex machine, and besides the logsbooks and published information for any one particular airplane for-sale, it is necessary to develop a keen sense of awareness of what and who you're dealing with. As one example, a recently advertised 1975 normally aspirated Skymaster with "FRESH" overhauled engines, something like 110 or 200 hours SMOH on each end, had a rear engine failure that resulted in a slam-dunk hard landing to the runway and because the rear prop was in the vertical position, it struck the pavement. In any event, when the engine was tore down it was discovered a non-VAR crankshaft was installed, and of course the AD requires that they be removed upon tear down (should have been done during overhaul when the cases were split). As a result Teledyne-Continental motors wouldn't accept the core engine as a credit on a reman or newly built engine ... the VAR cranks run about $2,100, and a core credit can amount to $8,000 or more, so as you can see this can get real expensive real quick. So a word to the wise, be slow and methodical ... and ask questions ... and just because its advertised with "FRESH" overhauled engines doesn't always mean what it says. By the way, I think if I were the owner of the airplane I just described, I'd be talking with a good attorney, because somebody messed up big-time ... it's called negligence and fraud.

Get the plane surveyed - no ifs ands or buts. Do it by someone who knows the Skymaster well (the ADs on the crankshaft, fuel strainers and mags) and who knows the difference between a thorough survey and an inspection. Check that the solenoids (master switch, landing gear, etc) have been changed. Fly the plane and check the avionics (including the autopilot) while you're at it.