CHAMPION'S UGLY DUCKLING

It flies like it looks.

BY THOMAS A. HORNE

PHOTOGRAPHY BY THOMAS A. HORNE

Hey mister, you going to fly the Lancer?" came a voice from a group of kids following us to the waiting plane. "Well, ah, yes," I replied. One kid put his hand to his mouth to stifle what I suppose was glee. Another one ran to get his friend.

I had been dealing with questions like this all week, and now that takeoff time was drawing nigh, they seemed to be increasing in both frequency and intensity. I began to wonder if all Lancer departures were followed with such devout interest.

It was not that the question itself was bothersome, but more the peculiar inflection used at the end of the phrase. The words *the Lancer* nearly always were pronounced in tones an octave or so higher than the rest. You could not just say "the Lancer;" it was always "the *Lancer?*"

If you bring up the word to someone knowledgeable in aviation history, the response comes in even more incredulous tones. "The *Lancer*?" As if to say, "I'm sorry, for a minute there I thought for sure you said Lancer, but I realize that it couldn't be one of those. You must mean 'Lance'—you know, the Piper Lance."

No, I mean Lancer. The Champion Lancer. The Champion Aircraft Corporation is best known for its contributions in the single-engine field, most notably the Champion 7EC (the Champ—rights to which were purchased from Aeronca in 1954) and its subsequent modifications—the Challenger, the Olympia, the Citabria and the Decathlon. However, Champion made a deviation from the norm when it decided to enter the twin-engine market with the Lancer.

The design goal was to produce the

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Most pilots of light twins think they have lost half of their climb capability when they lose an engine. In reality it is more like 80 percent that is gone. But the Lancer never had any single-engine climb capability to begin with.

The tail section of the Lancer 402 incorporates a large rudder with an equally large rudder trim-tab. Note the profile of the horizontal stabilizer and the wire bracing. Scrub brush is situated on the underside.

world's least expensive twin to purchase, operate and maintain. In this regard the company was successful (they cost $12,500 new); but the Lancer must have fallen short in some other areas because production ended the same year it began (1963) after only 26 were manufactured. Thus closed a chapter in Champion's history that few remember. Champion returned to exclusively single-engine production until 1970, when Bellanca bought the firm out and expanded on the basic Citabria design scheme.

External appearances generally exude the essence of any machine or design creation. For example, the Aerostar looks fast, and it is. The Cessna 185, on the other hand, suggests its utilitarian virtues. As for the Lancer, the feeling is that of an airborne Volkswagen beetle: top-heavy, underpowered and slow. However, if you stand back, squint hard, throw your eyes out of focus and let your mind wander, you can almost imagine you are looking at a miniature Rockwell Aero Commander.

The first thing you notice about the Lancer is its high-wing with the engines mounted on top, à la Consolidated Vultee's PBY. The plane looks as though it came from the World War II era, all right. (There once was a rumor that the Navy was interested in purchasing a few Lancers for reconnaissance purposes. But with cruise speeds of 100 mph, the Lancer's utility in the jet age would be limited in a military setting.)

Equally conspicuous is the Lancer's landing gear, which does not retract and is slung underneath the engine pods on spindly-looking legs. They are quite strong, but with that stork-like appearance one wonders.

The airframe is of dacron- and fiberglass-covered metal tubing. The struts, wires and braces on the wing and tail contribute to the plane's antique look.

The Lancer is propelled by two Continental O-200-A engines, which develop 100 hp at 2,750 rpm. Propellers are 69 inch, fixed-pitch McCauleys, the same combination that powers the Cessna 150.

Fixed-pitch propellers, of course,

mean that they cannot be feathered. While this certainly reduces the pilot's workload when an engine quits, it really means a whole lot of drag on the dead engine side because the prop blades always will be in the same position with respect to the relative wind.

This leads one to wonder how the plane performs with one engine out. At just 50 pounds under gross weight, with two passengers and partial fuel (30 gallons instead of 57), the loss of half its 200 hp, coupled with all that parasite drag, surely would preclude any hope of climbing or, indeed, even maintaining altitude. The Lancer's large rudder area seems adequate, though, for the purpose of maintaining directional control.

A large door opens wide to admit the pilot to what has got to be one of the most non-standard cockpit layouts ever. There are seats for two, arranged in tandem, with a control yoke in the front and a stick for the rear-seat occupant. Another oddity is the Lancer's heel brakes. Small metal bars mounted above the heel brake pedals provide input to the rudder.

Flaps are manual and located to the left of the front seat. They come down in three increments: eight, 15 and 25 degrees. The flaps are spring-loaded, a novel touch to an otherwise rudimentary construction. For takeoff, one notch of flaps is recommended.

Power controls and electrical switches are found in the upper cabin area wing-roots above the pilots' heads. Throttles, mixtures and carburetor-heat levers are manipulated with the left hand, which can cause problems during the transition to Lancer flight since most of us are accustomed to using the right hand in making power adjustments. There are, of course, no propeller controls or cowl flaps to contend with. The trim controls are at elbow height on the left side of the cabin, and move through a large, 135-degree arc.

Two pairs of toggle switches are aft of the friction locks for the carburetor heat. These are the magneto controls: down for Off, up for On. In the right wing root are the generator and master switches. In the airplane I flew, the right generator had been removed because of weight considerations. Also overhead are the primers, boost pumps, fuel selectors (yes, there is a crossfeed capability) and starter controls. The starters are activated by pulling down on what actually looks like a pair of old lawn-mower recoil starter cords.

Professional Flight Services, located at Friendly, Maryland's Prince Georges Airpark, operates one of the last Lancers in existence. There, in a narrow valley surrounded by 100-foot trees and racked by capricious winds, instructor Skipp Groseclose, AOPA 463187, and FAA examiner-designee Velta Benn stoically process an average of 10 multi-engine students per month using Lancer N9966Y as their training vehicle.

President of the outfit and owner of the Lancer is Larry DiAngelis, who also happens to be an Eastern Air Lines L-1011 captain. He recalled that he bought the Lancer 10 years ago for $7,200. The previous owner was also an airline captain who flew for North Central Air Lines and lived in Indi-

ana. During his ownership a full complement of IFR equipment was installed, and the plane was flown all over the United States and even to the Bahamas.

"He almost cried the day he signed it over to us," Benn said.

Groseclose, an instructor with over 200 hours' experience in the Lancer, was to be my overseer during our impending flight. As he took me through the walk-around, I could not help but be curious about the landing gear. The impulse overcame me, and I grabbed hold of the strut and shook it. "Man, it sure looks like it wouldn't take much to bust these off," I said.

"Oh, they're strong. Don't worry about that. They can take a side load, all right—see those braces?" Then he went into a little story. "One time, though, we had a student drop it in from I don't know how high up, and it drove the strut up through the wing and popped the engine loose. Parts for the Lancer are hard to get, so it was out of service for a while until we could get some parts fabricated. Now *that's* what I call a hard landing!"

Moving around to the tail section, I noticed its ironing-board surfaces and checked the wire braces and control cables. But there was something else. "What's this?" I asked, pointing to the underside of the tail.

"Oh, that's just an old scrub brush we put on there to replace the original tail skid."

"Wait a minute. How come it's all worn away?" Somehow, in a plane like this, considering its age and the kind of use to which it has been put, I was able to deal with the absurdity of seeing a scrub brush on the tail. It was, in a way, in keeping with the whole motif. With all the other drag-producing items hanging off the plane, it seemed logical that one little old scrub brush would not make all that much more difference. But what gnawed away at me was the reason for it being worn like that. After all, it was a tricycle gear plane, wasn't it?

"Sometimes students come in high and fast, and in order to make sure we stop by the end of the [2,580-foot] runway we sometimes have to pull back on the control column until the tail makes contact. That brush will slow you down in time. With the brush on the ground, the landing roll can be as short as 200 feet or so."

Mark Engel, an airport employee, was listening to our conversation. "I remember that time when we had an instructor who was a little on the heavy side.

"One day, when it looked like his student was going for the weeds, he did the old pull-back routine. Only when the tail went down, it stayed down. It took all the power that thing had to drag itself back here to the pumps. I nearly split my side laughing," he commented.

Setting the levity aside, the fuel and oil were checked and the starting checklist was begun. A glance at the checklist reveals some interesting facts. The entire range of critical airspeeds is in the span of 18 mph. A stall with flaps down comes at 62 mph, Vmc (minimum control speed with the critical engine inoperative) is 73, Vsse (minimum safe single-engine speed in a twin) is 77 and Vyse (best single-engine rate-of-climb speed in a twin) is 80.

It becomes evident that to do a good job in a Lancer, pitch control must be as exacting as in other multi-engine aircraft. Bearing directly on handling pitch control is the Lancer's stability in the lateral axis, and with those engines on top and those ironing boards in back, well, I just didn't know what to expect.

The original Lancers have their engines mounted on the underside of the wings. But the Federal Aviation Administration disapproved of this. The engine nacelles restrict the pilot's visibility too much, and Champion's engineers were made to move them to their final installation on top. This is the easiest way to tell if a plane is an early Lancer or the final version, called the 402, which 66Y is.

That change and the lengthening of the wing span by 10 feet raised the 402's weight by 90 pounds and brought its stall speed up from 43 mph to 62 mph. With this came a disproportionate decrease in the published rate of climb. It went down from 1,200 fpm to a disheartening 642 fpm.

I kept this in mind as we turned into the runup area. The wind sock was dawdling back and forth, favoring now this runway, now the other.

The funny stuff was over and the realization came home that we were about to take off from a runway with trees at the departure end, winds that were threatening to swing around and give us a tailwind component

Peripherally, I detected the windsock whirl around and fill up just as we reached 65 and lifted off. Oh Lord! It's going to be a downwind takeoff. Somehow, finding and holding 80 was not a problem at that time. . . .

Preflighting the Lancer makes a ladder a necessity. Mark Engel checks the oil level.

and an airplane that only would give us a maximum twin-engine rate of climb of 642 fpm. And that would be on a standard day with an expert test pilot at the controls. Should we be so unfortunate as to have an engine fail on takeoff, the only recourse would be to bore on into those trees, given the plane's inability to climb with one engine.

The magnetos, carburetor heat and ammeter checked out; boost pumps were turned on, trim set and flaps lowered.

And now it was time. We were looking for a rotation speed of 65 mph, and an acceleration in ground effect to the best single-engine rate of climb speed of 80 mph, then, maintain 80 during the climbout. The term best single-engine rate-of-climb speed has, in practicality, little meaning in the Lancer. A better translation of the term would be the single-engine minimum-descent-rate speed.

Throttles forward and the ship began to move. The rudders became more effective and the sensation of speed built fast—we were sitting only a few inches off the ground. Peripherally, I detected the windsock whirl around and fill up just as we reached 65 and lifted off. Oh, Lord! It's going to be a downwind takeoff.

Finding and holding 80 somehow was not a problem at that time, and soon the treetops slid by. A little close, but we cleared them. The rate-of-climb indicator showed 500 fpm. A few minutes into the flight and already I was giving thanks.

In cruising flight the airspeed indicated 105 mph with 2,300 rpm. Synchronizing the propellers is accomplished with the throttles until "the tones" are just right.

The air was slightly turbulent that day, and holding a constant airspeed involved constantly making pitch adjustments. During all but the shallowest turns, the Lancer showed an inclination to overbank. The controls are light, though, and not much pressure is needed to correct the deviations.

What we really were interested in was the Lancer's engine-out performance. With the left (critical) engine pulled back to idle and the right at full throttle, the Lancer descended at what appeared to be 500 fpm when the airspeed was held at 80. It did not

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take much rudder pressure at all to counteract the yaw set up by the asymmetric thrust.

Landings are conventional in most respects. The main thing is to stay on the high side when flying the pattern and to remember that a go-around may not be the most advisable course of action if obstacles or density altitude are factors. Again, the speed of 80 mph crops up. This is the recommended final approach, threshold and touchdown speed. The airplane must be flown right down to the ground.

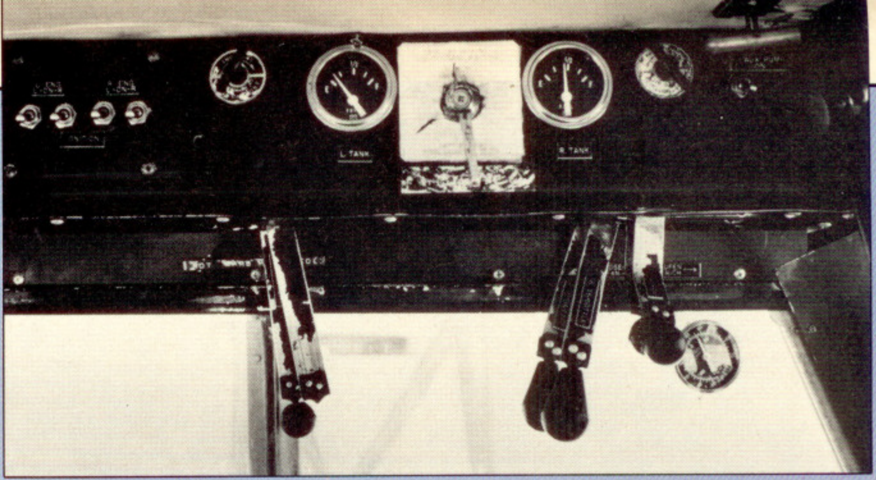
An unusual sensation attendant to the landing process is the "ground rush" as the pavement draws near. Being low to the ground magnifies the feeling of speed, especially near the flare. If you are new to the Lancer, you also will be likely to flare too soon. That is because you have been used to flaring at a higher level, since most seating arrangements put you higher off the ground.

I brought up the 500 fpm engine-out descent rate with DiAngelis and he offered some observations.

"You haven't had much time in the Lancer and that's why you had a descent rate that high. You *must* have the proper airspeed to get the least possible descent rate. At altitude it's possible to achieve a descent rate of 250-300 fpm with the propellers windmilling. Slow the plane down a little more and then the propeller eventually will stop, giving you less drag. With the prop stopped, the descent rate goes down to 100 fpm and sometimes even less when within 1,000 feet of the surface."

He should know. One time, when over the Chesapeake Bay with a student aboard, he pulled the mixture to idle cut-off so that an actual engine-out procedure could be practiced. A hot exhaust stack warped the mixture control cord's metal sheath, preventing any further mixture adjustments and putting out any hopes of a restart. From an initial altitude of 3,100 feet over the Bay, he was able to travel 17 miles to Easton, Maryland's airport, where the flight ended uneventfully. The average descent rate for this journey was 170 fpm.

In its application to the multi-engine training environment, the Lanc-



Powerplant controls are, from the left, carburetor heat, throttles and mixtures.

The panel is dominated by engine gauges and includes a useful checklist platform to the right. Starter cords hang from the overhead and the plane has heel, not toe, brakes.

er's weak points may be its strong points. Its single-engine performance firmly instills in the trainee the notion that a twin with one engine out is a plane in trouble, persuading him to accept the idea of getting on the ground as a priority, rather than attempting to continue a flight with a sick engine.

This has particular significance during certain critical single-engine takeoff and landing phases that may be encountered later in the student's flying career. Many accidents occur in planes with far more horsepower than the Lancer when a pilot fools himself into thinking he can continue a takeoff on only one engine. Depending on variables such as configuration, gross weight and density altitude, a single-engine climb may be impossible. The same thing is true with regard to single-engine go-arounds. A transition from a single-engine approach configuration with flaps and gear extended to climbing flight often is impossible in many light twins.

Some pilots of conventional twins have difficulty resigning themselves to a forced landing as long as an engine is still running. They figure that they have lost 50 percent of their climb capability, but in reality it is more like 80 percent of their twin-engine climb capability that they have lost. But in a Lancer you never had *any* single-engine climb capability to begin with, and in takeoff and go-around situations this thought is always in the back of your mind.

The absence of propeller, cowl flap and gear retraction systems is another feature of the Lancer that perhaps may have more advantages than disadvantages. To be sure, the student will not get any practice running typical multi-engine procedures; but in the Lancer the emphasis is shifted to more basic matters.

Like maintaining that 80 mph engine-out speed and keeping directional control with the rudder. These are the primary concerns that any multi pilot must deal with first when an engine quits, and in the Lancer the trainee can devote more attention to them.

The simplicity of the simulated engine-shutdown procedure enables an instructor to simulate engine failures one after another, if need be, to ingrain in the student the proper initial responses that need to become reflexive and committed to memory. In complex twins more time is taken up in the secondary, clean-up-and-secure phases, which can waste time and clutter the learning process by not adequately reinforcing the first, crucial control-and-identification steps in an engine-out situation.

And with the Lancer's great sensitivity to control inputs, the concentration needed to establish a constant airspeed only can implant good habits in a student, who no doubt later will transition to a complex multi with a wider range of critical airspeeds. In short, it is a demanding task to fly the Lancer well, and the workload centers on the basics. If you can fly it proficiently, then in comparison other planes probably will be no problem.

In spite of the Lancer's weird looks and marginal performance, students from all over the United States come to Friendly to get their multis. Even a missionary from South America once made the pilgrimage. After all, in the FAA's eyes a multi-engine rating earned in a Lancer is as good as one earned in a Duke and allows a fledgling pilot to legally fly any twin up to 12,500 pounds once passing a checkout in type.

The day I was there Al Holbert, AOPA 686158, a Can-Am race driver and winner of the 1976 and 1977 IMSA (International Motor Sports Association) competition circuit, was finishing up his multi training in the Lancer. Why, I wondered, would someone accustomed to the speeds and sensations encountered in machines like the Porsche Carrera and 935 Turbos go in for a multi-engine experience in the Lancer?

"It's just an unusual airplane that puts you close to the real basics of flight. It's kind of nifty in a way, and a thrill to fly," was his answer.

What one person describes as a thrill may be what the next calls a feeling of imminence. If you have the kind of personality that allows you to explore these subtle distinctions, then your life's experiences and your flying karma will be incomplete unless you investigate the realm of Lancer flight. □

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"The Lancer? It couldn't be one of those. You must mean 'Lance'—you know, the Piper Lance."

Champion Lancer, Model 402
Price New $12,500

Specifications

Engines	2 Continental O-200-A, 4 cyl 100-hp @ 2,750 rpm TBO 1,800 hr
Propellers	McCauley MCM1A100, fixed-pitch, metal, 69-in
Wing span	34 ft 4 in
Length	22 ft 3 in
Height	10 ft
Wing area	170.22 sq ft
Wing loading	14.39 lb/sq ft
Power loading	12.25 lb/hp
Passengers and crew	2
Empty weight	1,790 lb
Equipped empty weight (as tested)	1,832 lb
Useful load (basic aircraft)	660 lb
Useful load (as tested)	618 lb
Payload with full fuel (basic aircraft)	318 lb
Payload with full fuel (as tested)	276 lb
Gross weight	2,450 lb
Fuel capacity (standard)	57 gal (52 usable)
Oil capacity (ea engine)	6 qt
Baggage capacity	100 lb

Performance

Takeoff distance (ground roll)	500 ft
Rate of climb (gross weight)	642 fpm
Single-engine rate of climb (gross weight)	N/A
Maximum level speed (SL)	130 mph
Cruise speed (75% power, 7,000 ft)	118 mph
Fuel consumption (ea engine)	13.6 gph
Cruise speed (65% power, 10,500 ft)	110 mph
Fuel consumption (ea engine)	12 gph
Range at 75% cruise (with 45-min reserve)	450 sm
Range at 65% cruise (with 45-min reserve)	500 sm
Service ceiling	10,500 ft
Single-engine service ceiling	N/A
Absolute ceiling	14,500 ft
Stall speed (clean)	64 mph
Stall speed (gear and flaps down)	62 mph
Vmc (minimum control speed with critical engine inoperative)	73 mph
Vxse (best single-engine angle-of-climb speed)	77 mph
Vyse (best single-engine rate-of-climb speed)	80 mph
Vx (best angle-of-climb speed)	70 mph
Vy (best rate-of-climb speed)	75 mph
Vne (never exceed speed)	160 mph

Based on manufacturer's figures