AIR FACTS The Magazine for Pilots
February 1950 Copyright 1950

The Piper Pacer
By LEIGHTON COLLINS

DURING the past twenty years, at Bradford, and Lock Haven, and at Ponca City, more than 30,000 Piper Aircraft have taken to the air. As those airplanes left the ground they carried with them the strong conviction of their maker that the main thing was low cost and low landing speed. They dominated what might be termed the Student Pilot's Era of Private Flying.

As we now go into the Fifties, it seems quite clear that we are in a new era in Private Flying, one which might be called the Cross Country Pilot's Era. True, a large part of Private Flying is still essentially local in nature and probably
a large part of it will always be, but to day the percentage of business and professional men who learn to fly and to fly cross-country is steadily increasing, enough now to mark the era, and still growing. It is good, for if private flying is to mean anything of importance it must be related to using an airplane to go somewhere.

Mr. Piper is slightly bewildered by the success of last year's Clipper. To him it is incredible that the fastest landing airplane they've ever built should be the most popular. But he is already willing to admit that this airplane is going to be as important in the Cross Country Era as the J-3's were in the Training Era. It is much to the credit of the Piper organization that they were able to make this transition at the right time and in the right way, and especially that Howard Piper began to think in terms of middle-income range, speed, comfort, useful load, and good flying characteristics as far back as he did. You might be surprised to know how long ago it was that he was flying a 29' span, four-place Cub with a 6-cylinder 125 h.p. Franklin in it. At the time, nobody was much impressed. The Training Era was yet to reach full bloom.

There's one other thing about Mr. Piper and the Clipper, or Pacer. As well as the landing speed disruption, he hasn't yet quite gotten caged on the question of price. He is visibly uncomfortable talking three and four thousand-dollar airplanes. But, of course, there's not much that can be done price-wise these days except to at least try to inflate as fast as the next guy (and hope he busts first). But, seriously, Mr. Piper's attitude on prices is the proper one and certainly it is the wish of every pilot that he keep on thinking as he does.
Meanwhile, from the consumer's standpoint, the Pacers fill the gap beautifully between the two-place airplane and the full-scale four-place. Unquestionably a lot of people during the past year who not long ago would never have dream-

ed of ever owning anything other than a two-place airplane have found themselves flying off for a week-end or on a business trip with two and sometimes three guests aboard. And they're doing it in an airplane they can still push in and out of the hangar unaided, —one that retains that strange personal quality of the really small airplane. There's no doubt that this airplane is one of the most important of our times—especially in the form of the new models. There are three of the Pacers, the "115", the "125", and the "135".

The "115" has last year's 115 h.p. engine and no flaps. The "125" has a new 125 Lycoming and flaps. The "135" is the "125" with an Aeromatic Strato-Cruise propeller, and lists at $4265.00, this price including a manifold pressure and outside air temperature gauge. With this propeller you can set up the power at 24" and 2400 r.p.m. at 5,000' and cruise 135 m.p.h.

These power and propeller variations, however, explain only a little of the important differences between the original Clipper and the new Pacers. It is true that at fifty paces you might be hard pressed to tell a Clipper from a Pacer, but get any closer than that, and especially fly one, and you'll see the Pacers are new airplanes.

The "115" Pacer is priced at $3295.00. That is $300 more than last year's model, but for the additional amount you get the thing the old one needed most of all: a soft gear. This will let the Pacers sell on rough fields where last year some private owners and most operators on such fields passed the airplane up. The new gear has only one loop of shock cord on each side and double-acting oleos. It is not quite as soft as a Stinson gear but otherwise is quite similar in characteristics.

SHORTWINGPIPERS.ORG

The additional $300.00, however, buys more than just the new gear. You get two 18-gallon wing tanks (no fuselage tank), wheel controls, a roomier instrument panel, more soundproofing than last year, a fresh air vent to the cockpit
for hot weather flying, tightly sealed doors, and a much nicer upholstery job.

It is important to note that the 36 gallons of fuel is an increase of 6 gallons, providing, in the "115", a range of from five to seven hours, depending on how high and how fast you fly, and how lean.

The $3295.00 price on the "115" will get you out of Lock Haven with a good flying, good performing airplane, but if you're buying for private use instead of renting, you sure want to pay $21 extra for a set of strut fairings, as they not only improve appearance but add about 4 m.p.h. to your cruising speed. You'd also want to be sure and pay $100 extra for a Sensenich or a McCauley fixed pitch metal prop. As compared to the standard wood prop, those propellers give an almost unbelievable improvement in take-off and climb and in addition give about 5 m.p.h. more cruise for the same fuel

consumption. With a metal prop and strut cuffs the "115" should cruise at low altitude with two aboard 110 m.p.h. on 6 gallons per hour or close to 120 m.p.h. on 7 gallons, leaned. That's good performance for $3416.00, especially with that back seat behind you and a couple of hundred pounds extra useful load available if you need it.

It is, of course, possible to go way on up in price on the "115" You'll note that for $196.50 the "115" can have flaps, for $75.00 one of three optional colors (cream is standard), for $4.50 a quick drain gascolator (which is a good investment).

Naturally you will think of the "125" as the new Pacer, and it is. It has still more soundproofing than the "115", still nicer interior trim, flaps, and 125 h.p. This is not the 100 Lycoming tuned to 108, to 115, to 125, but a completely new engine. It has a heavier crankshaft, different case, and a new cylinder, piston, ring and rod assembly. The assembly is not new, however, as it has been well proven in the wartime Culver target ships and subsequently in the auxiliary electric power plants supplied for Large military airplanes. The record on the assembly is excellent. Oil consumption somewhat lower than on the 115 h.p. engine, no troubles, and a gain in smoothness due to closer fitting pistons. As a matter of fact, rather than the 125 being a little rougher as you might expect, it seems even smoother than the 115 due to these closer tolerances.

The price on the "125" is $3795.00, or $500.00 more than the "115". It is as delightfully quiet and as neatly appointed little airplane as there could well be, but what you get most of for your additional $500 over the "115" is performance. This one climbs as you've never seen. Off hand, you would not think only ten more h.p. would make such a difference, but actually more than 10 h.p. is involved. The 115 h.p. engine is largely a figure of speech, as that engine has a normal rating of 108 h.p. at 2600 r.p.m. and that's the way it is used except where you'd have a special prop that would permit 2800 for one minute for take-off. Compared to the 108 h.p. at 2600, the 125 engine is rated 125 at 2600, so for practical purposes there's really a 17 h.p. increase involved and you really know it when you start climbing.

The same power difference is involved in cruising, for when you talk about cruising the 115 h.p. engine at 70% power you really mean 70% of its normal maximum power rating of 108 and not 70% of its 1-minute 115 h.p. take-off rating. On the 125 when you say 70% power you mean 70% of 125 well-rounded horsepower. And you notice that too. With a metal prop and the strut cuffs the "125" will indicate a steady 120-125 at around 2,000' at 2400 r.p.m. with two aboard. At this r.p.m. you are pulling about 75% power with a prop that turns 2600-2650 wide open in level flight close to the ground. At this power the gas consumption will probably be from 71/2 to 8 gallons an hour. The airplane is said to top 143 with gross load, a metal prop, and cuffs. With only two in the ship and cruising say 2250 r.p.m. at low altitude it

should be possible to get 115 m.p.h. on well under 7 gallons. That's low percentage power and good speed too, not to mention all that climb that's in the kitty.

The weight situation on the "125" Pacer is that the permissable gross is. 1800 Ibs. and the empty weight, with a metal prop, is 980. That means, if no extra equipment other than the prop is added, the useful load is 820 Ibs. A simple loading table could be made up and either memorized or better still pasted on the instrument panel. It is on the basis of passengers/fuel/baggage and is: 2/36/245, 3/36/75, 4/18/0. In other words, 2 170-pounders, full gas, 245 Ibs. of baggage; 3 170-pounders, full gas, 75 Ibs. of baggage; 4 170-pounders, half gas, and no baggage. If you had 35 Ibs. of extra equipment in the form of radio, landing lights, and instruments you'd be down to about 15 gallons, or a little less than one of the wing tanks full for 4 170-pounders, and no baggage. It is not as much of a problem as you think in private flying, for most four people don't average 170 and also you spend about 90% of your time either alone or with only one and occasionally two passengers so most of the time the question of exceeding gross weight doesn't come up.

The ship flown first was a "135" Pacer, right off the line and fully equipped, i.e., pants, strut fairings, navigation and landing lights, whip and standard type antennae, GE VHF transmitter and Low Frequency Receiver combination including built in loop (inside the fuselage), dual brakes, dome light and cabin speaker, door locks, primary group, eight day clock, Safe Flight Indicator, rear seat cabin heater (on floor), arm rest for the pilot's left elbow (very convenient and comfortable), manifold gauge, outside air temperature, and clear on to the suit hanger hook in the back. All told, about $4750.00 worth. (But don't forget, you can start at $3295.00 and work up as time, tide, and tax collectors allow.)

SHORTWINGPIPERS.ORG

The first thing you notice on the Pacers, externally, is the balanced elevator. That has the effect of lightening the stick load considerably, even with the bungee springs still used for longitudinal stability purposes. Then there are the flaps, almost unnoticeable, and finally a Stinson type of strap fastener for the engine cowling. Inside the cowling, you notice an oil cooler radiator and that there is an unsaftied oil drain plug at the right rear corner of the oil pan. The big plug is still in the middle as before, but with this additional plug the oil can be drained without having to pay for an hour's labor for removing the cowling —built-in maintenance as one humorous mechanic dubbed it, on last year's model.

On the way back to the cockpit you'll also notice the strut fairings. They are quite aerodynamical looking at the upper end and your first thought is whether they can be put on an old model. They can't. The aileron cables are inside the wing this time and would be in the way of these cuffs.

Article by Leighton Collins for Air Facts Magazine, February 1950
Reprinted with Permission from Richard Collins
By ShortWingPipers.Org

Getting in is, of course, facilitated considerably by the absence of the stick type of control. Somehow, though, you have to resist an impulse to use one of the wheels to pull on while getting in instead of reaching up and around for the piece of tubing behind the windshield that is normally used for an assist hold. You notice the flap lever well down on the floor and take care to step over rather than on it in getting over on the left side.

The trim and upholstery are neat as can be, and the new instrument panel has a neat center section that even suggests shock mounting possibilities. This section has room enough for the standard instruments plus a primary group and manifold pressure. The radio, standard mounted at the left, could be put on the right side, leaving plenty of room for a horizon and directional gyro, and, of course, an omni-range bearing selector, To-From, and Right-Left needle could look mighty good in that space, with maybe the compass on top of the cowling, the manifold pressure taken out, and the gyro horizon and directional gyro put in the middle panel. Isn't it nice for it to be possible to do about whatever you want without rebuilding the airplane?

Before taking-off, both the general appearance of the cabin and the detail attention to the window locks, door locks, trim job, and most everything about the airplane bring to mind what experience is worth. It becomes more and more noticeable what a skilled touch those workmen at Lock Haven have acquired in the process of building so many airplanes. It has gotten to where everything they do about an airplane has a certain neatness to it which can only augment pride of ownership.

The starter button on the Pacers faces forward and is just below the left forward edge of the seat cushion. Along side it there's a master toggle switch sticking out which, however, does not cut off the power to the starter. The starter button is always hot.

The gas selector valve is by your left knee, and sticks out just a little too far from the well-padded sidewall. You want the short tip of the handle pointing forward and slightly down at the left tank mark. It is important that Pacer pilots think in terms of the airplane having only a left wing tank and that the right tank is an auxiliary tank only. There's a placard about the right tank being for level flight only, but the essential point is that the only gas line out of the right tank is attached to the left forward lower corner of the tank and in a steep climb with maybe even as much as half a tank of gas no gas will run into the line and the engine will quit. The left tank has leads out of both the forward and rear inboard corners of the tank which join together just ahead of the fuel selector valve, so that tank will feed in either climb or glide. It is too bad the right tank isn't fixed the same way because for someone somewhere it is a sure source of trouble, and that someone could be most anybody for it is easy to forget to switch, say,
from right tank to left before starting an approach and thereby set things up for a right-tank take-off.

The engine started readily and the starter seemed to have a little more steam to it than those on the Clipper engine, which is likely to be needed in cold weather. It was immediately evident, too, that this is an exceptionally smooth engine. Maybe the extra soundproofing—overhead, in the sides, in the back, and beneath the carpet,— helped some on this, but in any event a quiet running smooth engine is a delightful thing.

As indicated, this ship had the Strato-Cruise propeller. All that means operationally is a large black knob just to the right of and below your throttle. It is a vernier type knob and can be either screwed in or out, or for large movements the button on the end of it can be held down with your thumb and the knob moved freely.

For take-off you want the knob all the way forward. That gives you a static r.p.m. of 2600, or full rated power, and there's a small amount of automatic pitch control available with the lever forward to keep the prop from over reving in the take off run and in the climb, if you climb within about five miles of the best rate of climb speed of 84 m.p.h. The reason they want you to get in the habit of having the pitch control forward in flat pitch position for take-offs is that even though the prop was put on the ship at Baltimore or Lock Haven, if you went to Denver it would still turn 2600 static if you put it in full flat pitch. But out there in Denver if you should try to take off with the pitch control all the way out, you'd be minus quite a lot of revs and would need a lot of room.

At Lock Haven, though, it doesn't matter whether you take off with the pitch lever forward or backward. If you have it forward you'll get, as stated, 2600 throughout the run and also in the climb if you climb reasonably close to 85. If you climb too flat, say at 95, the engine will over rev, for what you've got at that point is simply a very flat pitch prop with just a small amount of automatic pitch control operative.

If, at Lock Haven, or any place below 3,000', you take off with the pitch control out instead of in, you get 2600 taking off, climbing, and you can even dive it and won't get past 2600. In other words, with the control all the way out you've a standard Aero-matic propeller. On one flight the ship was dived to 170 indicated with the propeller control out and rated r.p.m. was not exceeded.

The nice thing about this prop is that there's nothing you can do wrong with it, at least flying off airports not exceeding 3,000' elevation. If you've been cruising a-round in Aeromatic and approach without pushing the prop control full forward it makes no difference, for in a go-round you'd get rated r.p.m. About all you have to watch is that if you do get the habit of approaching in flat pitch and go round and also in your take-offs in flat pitch, you should watch that you don't over-rev the engine by climbing at above 85 m.p.h. A minor point is that at normal approach speeds the glide path is somewhat

steeper with the prop in flat pitch than it is in Aeromatic, the difference in rate of sink at 80 being about 200 f.p.m. more when you're flat.

On the run-up, in flat pitch, it went right to the 2600 mark and since the wheel wasn't being held all the way back the tail almost lifted. Boy! Talk about straining at the leash. You've also a slight forward eg shift with the Strato-Cruise prop. With the two combined, the throttle was hardly in on the take off when the tail started coming up all by itself and about the time it got half up the ship took off with a couple of SFI toots. You never felt such acceleration in a take off in a small airplane.

The next problem was keeping the airspeed down to 85. You've really got to get that nose up there and keep it up there to do it. Wind and temperature conditions were favorable to good climbing, but even so a steady 1200 f.p.m. on the Rate of Climb is good climbing. With only one person in it this airplane gives the impression of going out of the field higher than some of the more advanced liaison ships.

As you begin to reduce your climb and throttle back some you can either pull the prop control all the way out or simply vernier it to the left to keep the r.p.m. down to where you want it. If you fly it in Aeromatic your r.p.m. will depend largely on where your throttle is set, with, of course, the speed keeping tendency thrown in once the throttle is set.

At 3,000' pressure altitude with the throttle back until the manifold pressure was 22" it turned 2250 r.p.m. in Aeromatic and the indicated airspeed was 115 m.p.h. with an outside air temperature of 6°. If the airspeed was right, and they seem to be rather close, this would mean about 120 true on about 60% power. At this same altitude with the manifold pressure moved up to 24" by opening the throttle, it turned 2340 in Aeromatic and indicated 125, which should correct to about 130. The nice part of the controllable feature doesn't become apparent, however, until you get above 3,000'. But first, a few words a-bout a manifold pressure gauge and fixed pitch propellers.

In beginning to think about cruising at altitude, the small plane pilot to-day is just where the airline people were slightly over twenty years ago: we're just before learning that controllable propellers and, later, superchargers, could give even our present airplanes thirty-five or forty miles an hour more cruise.

Most of us have a vague understanding that if you go high you can take either of two advantages. 1) You can cruise your usual 100 on less gas by leaning out and pushing the throttle in as necessary to keep your usual, say 2250 r.p.m. Or you can 2) let it over-rev some and on about the same gas that you burn in normal low altitude cruising you'll go quite a bit faster. Most of us have simply taken the fuel saving advantage because we

don't like to rev them up, and, in fact, have some discomfort at seeing the throttle in so far.

To know how much you want a controllable propeller you have to first get a manifold pressure gauge. You know already about r.p.m. being an index of power output, but you don't know about manifold pressure being an equally important index and variable, because you've never had a chance to see it. Manifold pressure is, in an un-supercharged engine, the atmospheric pressure inside the intake manifold, up past the carburetor butterfly valve. A manifold pressure gauge is simply a standard altimeter vented to the intake manifold instead of the great out of doors like the regular-equipment altimeter.

One of the first things you'll do with a manifold pressure gauge is to begin to associate certain pressures with certain r.p.m. at low altitude. For instance, you will soon notice that usually at 1000' above the ground in your area it takes 23" to get, say, 2200 r.p.m. lightly loaded, and 24" fully loaded. That tells you right off there's a good deal of difference in your range loaded and not loaded.

Then, the next thing you know, believe it or not, you'll be using the darned thing to tell whether you're in a level attitude some hazy day. Isn't it amazing how quickly a pilot will grab at anything in sight that will tell him anything at all? Yes, attitude, because if you're sitting there lightly loaded with 24" and only 2200 r.p.m. at 1,000 feet you're climbing a little. You notice this most when people unfamiliar with the ship fly it. You'll also find that on some days the gauge tells you are flying in an area of subsidence, a mass of slowly setting air, which can sometimes cover quite a large area. On those days you stagger along, nose up, having to use 24" and 2200 to keep your altitude. And finally, on some early morning flight as the ground begins to warm you'll get in an updraft area and can sail along 2200 r.p.m. with only 22" at 1000'. All of which makes you wonder how anyone ever knows how much gas he burns per hour or what he really cruises.

But to get back to the subject, what a manifold pressure gauge tells you about propellers and power is the big item, and you won't experiment much at different attitudes before you start having a feeling that you are flying around with one hand tied behind your back.
You have only two things you can vary to vary power: r.p.m. and manifold pressure. You get used to looking at 23" and 2200 r.p.m. at 1,000'. Tomorrow you cruise at 2,000' and find that 22" gets 2200 r.p.m. And the next day you cruise at 3.000' and find 21" gets 2200. Same r.p.m. but 2" less pressure. You almost instinctively reach for something to steepen the propeller pitch so you can push the pressure back up to 23" and still not exceed 2200 r.p.m. In other words, you want to take the same power out of the engine cruising at 3,000' that you do cruising at 1,000' and you want to do it at your standard cruising r.p.m. of 2200.

Article by Leighton Collins for Air Facts Magazine, February 1950
Reprinted with Permission from Richard Collins
By ShortWingPipers.Org

Then you get mad. You'll get the power anyhow, so at 5,000' on your next trip you push the throttle in till you've got 23" manifold pressure and then you look at your tach. Since yours is a flat pitch take-off prop you are way past the red line. You're trapped. You have to throttle back to some reasonable r.p.m. for cruising and when you do that your pressure goes down and you're back where you started—flying with much less than normal cruising power, and, in consequence, flying more slowly than you should be.

The next standard reaction is go and get a cruise prop, which you can do, and at 5,000' it may hit right on the mark: 23" and 2200 r.p.m. but just between us girls you're going to be a long time getting to 5,000' with that prop and on small field take-off's with it you'll have one adventure after another in the summer.

Your last observation with your manifold pressure gauge and fixed pitch prop will be made quite high. With either a flat or steep prop, at some altitude you've put in all the manifold pressure you have— in other words, the throttle's in, the pressure 20" or less and as you go on up slowly your r.p.m. falls off. Without a supercharger there's nothing more you can do about manifold pressure but if, at this point, you could flatten your propeller pitch you could get some more r.p.m. and more power and reach a higher ceiling than other-
wise.

By this time, you're pretty well sold on the idea of having a controllable pitch propeller, and what's sold you is a chance to see one of the power control variables you're never seen in operation before. Along the way, you've learned, too, that at most any average setting if you lower the r.p.m. a little with pitch increase and boost the manifold pressure a little with the throttle you get a good deal more efficiency. High pressure and low r.p.m. means more miles per gallon. Within reason, of course.

As mentioned, it was good to see this Strato-Cruise propeller for it opens the opportunities of altitude cruising to the small-plane owner, and certainly, with so much long-trip business use of such airplanes, he's ready for it. The propeller is exceptionally smooth, adjusting it for any desired static and climb r.p.m. has been simplified down to turning two nuts on the nose. The weights affect only full throttle level flight r.p.m. when in Aeromatic and should never have to be touched after a production installation. And there's no longer any question of having to change the prop setting in any way as a result of buying the airplane at sea level and living in, say, Denver.

Now, more to the Pacer. As stated, you move. The bumps tell you and also the indicated airspeed. Frankly, 135 seems like a lot for this airplane and 24" and 2400 both seem a little on the high side. But even for those somewhat on the slow poke side, 23" and 2250 r.p.m. at 5,000' ought to get a sure 125 at good fuel economy, and at that speed

private flying, or, maybe better, small-plane private flying receives what you might term a stock dividend. Everyone has a different idea about the relative importance of all the different items in the complicated formula of utility. Speed isn't the whole story, of course. But among pilots who really fly cross country a lot it is significant that at the mention of a new airplane their first question is usually "What does it cruise?" It seems too, that somewhere around 120 you knock out most of the potency of the headwind factor that can give you such big variations in elapsed time in really slow airplanes. Up to now, slow airplanes are mostly what the small-plane cross country pilot has had to work with. 125 low-cost cruise is going to give him a new lease on life and get him out of the pioneering-crusading category. It is also going to bring in the hard headed business man, especially if he can be made to feel justified in assuming that the airplane is as safe as it should be.

The assumption is all right on the Pacers. A lot has been learned in recent years about the kind of an airplane it takes to get a good safety record with in the hands of whoever comes along. This airplane reflects the application of virtually all those things.

For instance, power stalls it. With the rate of climb it has you have to get the nose up so high you have to start hunting around looking out the window to find the horizon. As it slows, the nose gets good and heavy, and something entirely new in Piper aircraft: the wheel has to come way back in order to reach the stall. Langewiesche pointed out long ago that stick travel in the stall is of great importance for in that way stick position as well as stick pressure tells you what you should be aware of. In the Pacers you've practically got your thumbs in your vest pockets when it finally breaks.

This one would fall as straight through as an airplane could, and with the wheel held back it would fly back up into another stall. With the wheel still back some turns were made. There's lots of shaking and shuddering due to the high power, which still further precludes inadvertency, but the important thing is that in this extreme situation the ailerons can be used freely and never pull a wing down when they're supposed to pick it up. When you get the ailerons to where they won't bite in stalled turns and skidded stalled
turns, power-on, you've really got an airplane safety-wise, and the Pacers come through all such as this still flying, doggedly at times, but still flying.

In the power off stalls, if you approach them slowly, you're likely not to stall at all but simply find yourself flying along wheel-back with good control, with the indicated airspeed in the forties and the stall horn blowing. You aren't stalled, you're just flying slowly, with a high rate of sink and good control. It is interesting to note how many pilots will see a thing like that and say "Gee, you could sure mush this down1 into trees if you had to." If so many say it, many more must think it. But don't ever try it. 50 or 60 feet from the ground in that condition a gradient wind can cause the airplane to stall

and enter a recovery dive which will connect you with the ground and there's nothing you can do about it after it starts. This is the one point that doesn't seem to have been gotten over to pilots generally as more highly spin and Stall resistant airplanes have been built. It isn't always a case of the pilot stalling an airplane. Sometimes, due to gust and gradient effects, the airplane just stalls itself, with the pilot in it. If you fly too close to the stalling angle of attack going down into a slower moving wind layer this can happen. So don't get any all-the-way-down-wheel-back ideas in the Pacers even though they are completely convincing on this score at altitude. You're getting enough out of their superb stall and slow-flight control characteristics in having the possibility of an inadvertent stall put so very far out of reach and any possibility of aileron control reversal eliminated,-that's enough to ask of the machine.

When the idea of flaps on Pacers was first heard of it seemed silly. Slow them up a little and they'll come down. And to make room for the flap, wouldn't the aileron have to be shortened so much that its down travel would have to be increased which would let the cat out of the bag laterally? As just indicated, the ailerons are as good and possibly even better than they were last year. And the flap is quite desirable. It gives the airplane a lot of that tendency to go where it's pointed and also lowers the landing speed a few miles.

As you come around for an approach and close your throttle it is probably best not to trim at all, or at most not over one turn of the crank. This will leave the airplane rather nose heavy as you hold back enough on the wheel to slow to 80, but once you get the flaps down then it will be trimmed just right for the glide. As you lift the flap lever you find it maybe a little harder to pull than you might like and that as you lift it the ship tries to nose up considerably. So you want to momentarily hold some forward pressure on the wheel during that initial change in downwash over the tail as the flaps are put down. Once they're down everything balances out and your cruising trim leaves you an 80 m.p.h. trim flaps down. In good air, you'd most likely want finally to trim for 70. The ship feels good flaps-down and you're quite happy gliding along with the flaps down at a speed about 5 m.p.h. less than you'd likely glide with them up.

SHORTWINGPIPERS.ORG

In the landing, it might not be noticeable to a person not used to a Clipper, but if you are a (little slow in your rate of flare you may find yourself not quite getting flared before touchdown. There at the last there's lots of back travel left in the wheel and it tends to make you think you can flare as fast as necessary at the last, but the rate at which it will pitch the airplane is low. It's not critical. Just interesting. The same thing often shows up in landing a Stinson when you're not used to one. And you get the same gentle sort of wheel-tail business and then settle on 3-point. The gear is very nice and a big improvement, both on and off the runway.

With the flaps down in the roll the air seems to blow down and hit the runway and then bounce back up under the tail, or at least something makes the ship a little inclined to

lift its tail with heavy brake application. The old one wouldn't quite do that without an awful lot of brake pressure. Again it's something that isn't critical but just one of those differences you notice. At any rate, for your maximum quickest stop it would help to let the flaps up as you started really pouring on the brakes.
The flaps have two positions, maybe about 15 ° and then around 40. 40° flap would not be desirable for take-off, but there is a worthwhile gain in using 15° flap. The problem though is getting to the flap lever in time once you get the throttle open. If you don't watch you'll take-off before you can get to the flap. The flap lever could, of course, be pulled up to the first notch before take-off, but it's more fun to feel it lift off with a tug on the flap handle. All in all, the flaps are quite nice. They were added not so much because the airplane needed them particularly for one reason or another, but because of CAR 50 provisions that in an approved flight school a commercial student must have time on a ship with flaps, manifold pressure gauge, and controllable propeller. But, like anything that can be put on an airplane, you're happier with them than without, especially when it comes to approach control.

Now with the joy, a touch of sorrow. The villain is W. T. Piper, Jr. Home for a few days, he was on a busman's holiday—at the airport, and suggested a competitive climb to 2000' and then a race. He chose a "125" with a Sensenich fixed pitch metal prop that would turn 2325 on the ground and almost 2700 wide open. The pitch on this prop is 59" as compared to the 50" pitch which was standard for the metal props on last years's Clippers. 9" is a big pitch increase and shows there must be a considerable speed difference. But the prop he had was still a little on the take-off side.

It was humiliating. From a standing start he got 'off about the same (you can't take off looking sidewise) and by the end of the field was about two hundred feet farther ahead and about a hundred feet higher and seemed to be increasing the advantage rather steadily right up to the 2,000' level. During the take-off and climb the "135" was kept at 2600 and not allowed to overrev.

Levelled off alongside, at the full throttle signal the "125" pulled away. How much is purely a guess. Probably not less than 5 m. p. h.

Having mentally bought one of the Strato-Cruise props because of its many fine features this was all quite disappointing. The reason is not because of any lack of validity in the controllable features, but because of the difference in blade efficiency. Those thin metal blades have very low drag. In addition, the wood-plastic-covered blades on the controllable have that step-down behind the metal leading edge covering that would certainly contribute nothing to smooth airflow over the balance of the blade.

After the first competition, ships were exchanged and the "125" still out climbed and outran, so this eliminated any possible difference in handling.

Article by Leighton Collins for Air Facts Magazine, February 1950
Reprinted with Permission from Richard Collins
By ShortWingPipers.Org

It was not possible to stay longer, but later in the day the two airplanes were flown fully loaded side by side. The "125" still climbed better and at 3,000' still had a speed advantage, but above that the Strato-Cruise began to gain in climb and at 11,000' was still climbing 300 f.p.m. At 5,000' it is reported to have had from 5 to 10 m. p. h. more cruise at 2400 and 24" than the "125" had turning 2400. The "125" had no manifold pressure gauge so that the actual power being taken could not be computed. At any rate, you wouldn't want to cruise it over 2400. It seems to boil down to this, performance wise: up to 3,000' the controllable is a little behind, at 3,000' they are about equal, and from there on up the controllable outperforms and has a considerably higher ceiling. If it had a metal blade it would win all the way through, just like the text-books say. With the hydraulic control and automatic r. p. m. control features so highly refined now it is hoped that Kopper's won't let blade efficiency confuse the issue and will eventually make the additional investment necessary to get either a metal blade or in some way counter-sink the metal tipping. In the meantime, it is difficult to imagine what a person would do with any extra performance in take-off and initial climb in excess of what either of these two propellers now gives.

Having switched over to the "125" its stall and control characteristics were tried and found to be the same as those of the "135". At 3,000' pressure altitude it would indicate 125 at 2350 r.p.m., and at 2250 r.p.m. would indicate 115, these r.p.m. being estimated as 60% and 70% power respectfully.

In a series of landings, the gear was found to take the bad right along with the good, and somehow with the flaps down it seems less prone to settle in hard when levelled off too high than it does with the flaps up. For those who know Lock Haven, in approaching towards the factory into about a 10 mile wind it was possible to land and turn off at the first taxi strip without too excessive use of brakes. That's about as short as you can turn off the runway with most anything that flies in those parts, so, as least lightly loaded, the Pacer is still very much a Cub.

All in all, it seems that the Pacers with their considerably quieter cabins, more comfortable seats, and noticeably stepped up performance will stimulate the 1950 market as much as the original airplane did in 1949. With their increased speed especially, it could be that they will mark a turning point in cross country flying, and particularly in that it comes in such a well behaved, comfortable, extremely pleasant to fly airplane. Given airplanes like these and private flying can't help but go forward.

SHORTWINGPIPERS.ORG

Article by Leighton Collins for Air Facts Magazine, February 1950
Reprinted with Permission from Richard Collins
By ShortWingPipers.Org