

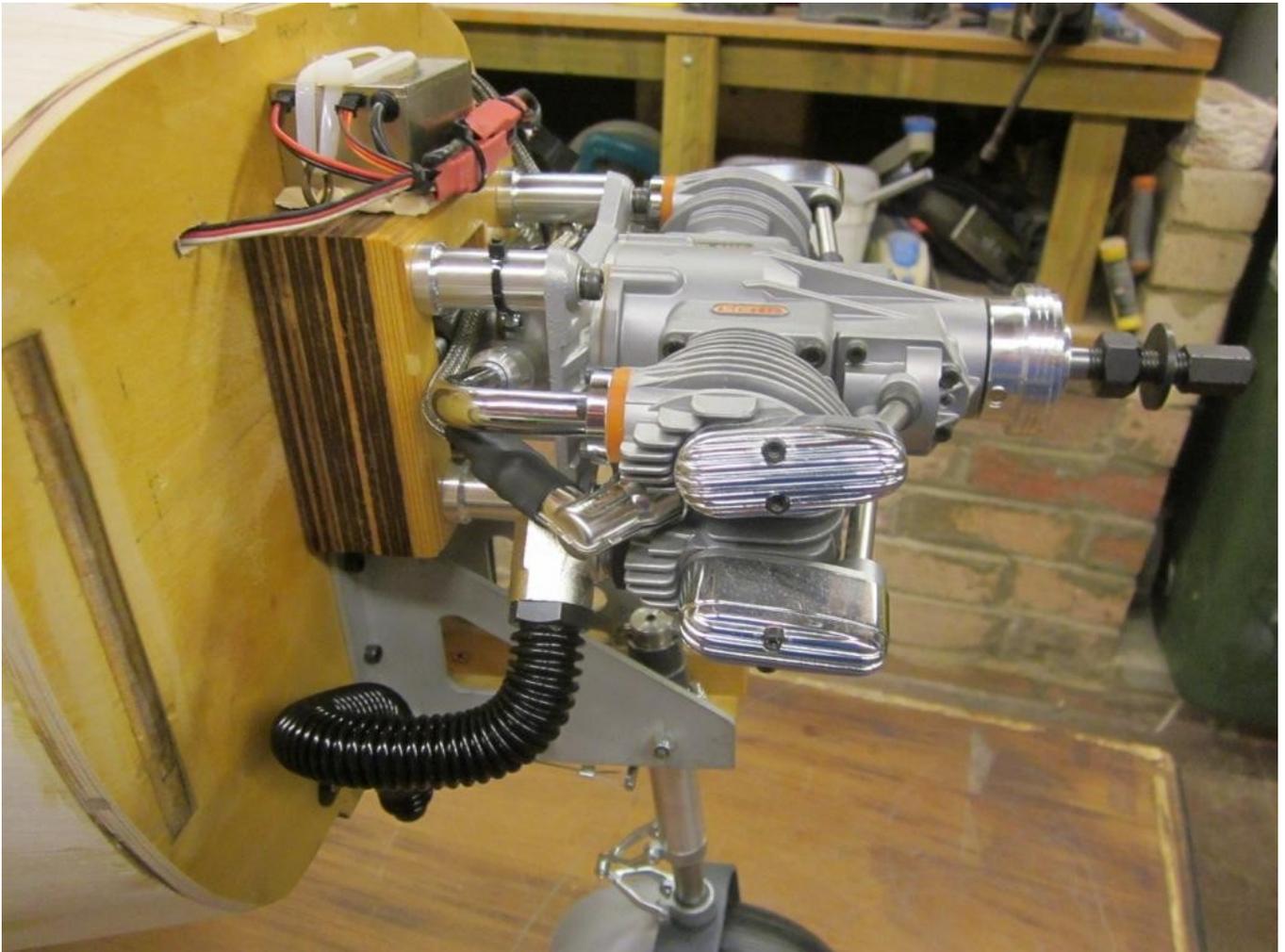
# Building a 33% Scale Piper PA-22 Tri Pacer from the Wendell Hostetler Plans



Final Bits and Pieces before Maiden Flight.

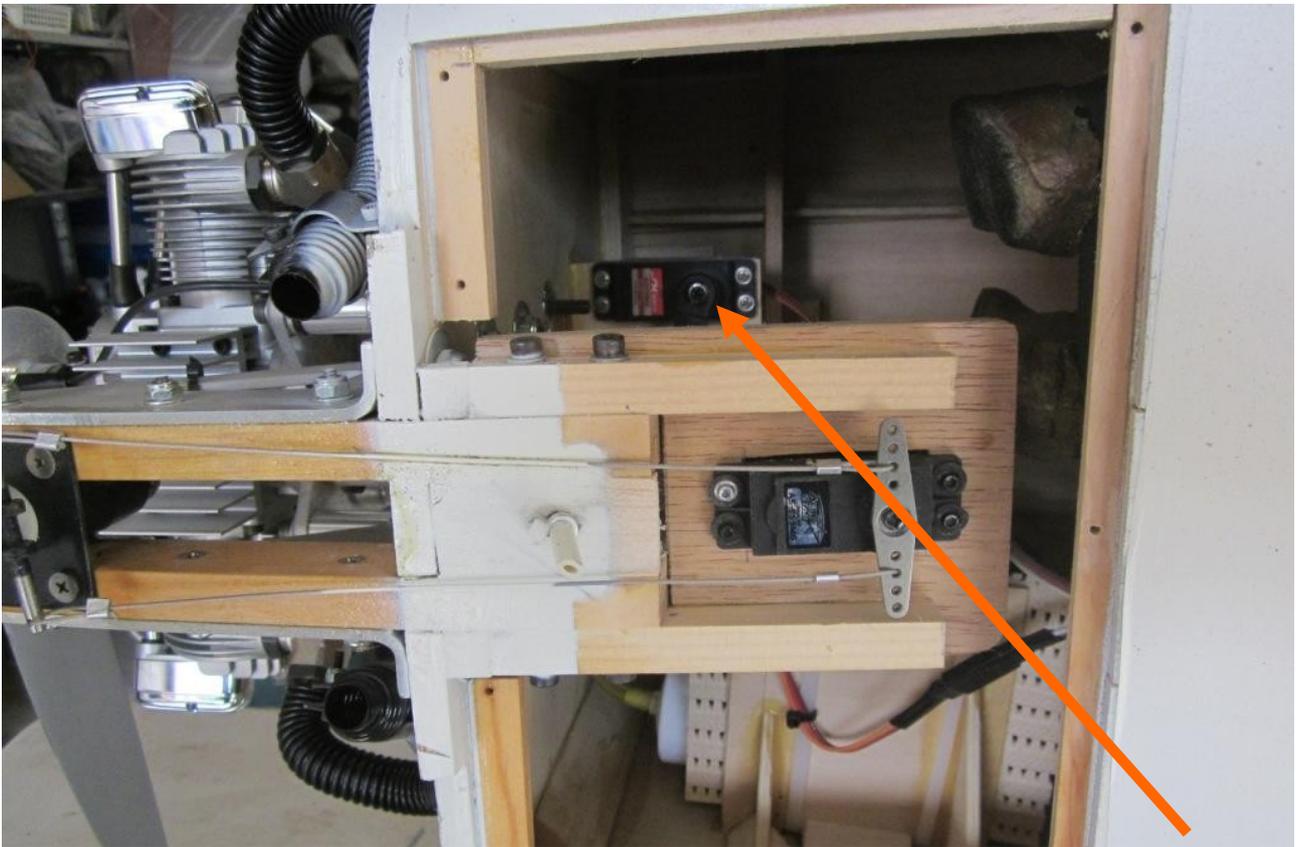
I have to make a hoist for the Tri Pacer in the roof of the garage for easy access so after finishing the plane in the workshop I wanted to take it outside, put the wings on, adjust the struts to length and run the engine.

I ran into a little problem in that it wouldn't fit through the workshop doorway no matter how I jiggled it, sideways upright or on an angle, no go...It was about 20mm wider than the doorway. I was just about to take the door off when after a bit of measuring it looked like I could get it through if I was to remove the nose wheel leg and take the main wheels off and then it would just fit through on its side, phew, bit of a worry for a minute.



So on with the exciting bit, running a new engine for the first time. Wheels and nose wheel leg re-fitted and controls checked OK, fuelled up with 15:1 as per the Saito directions for running in and tied her down with bungee cords around the wheels and a rope around the wing mounts to the side of the house.

I hit her with an electric starter over and over again but not even a kick. I checked the ignition and the fuel and all seemed OK. Unfortunately the carburettor is hidden inside the engine mounting block so I couldn't see the throttle opening and shutting and of course the throttle servo is mounted high up in the guts of the nose so no joy there either. I suspected the throttle was closed as there wasn't much else to stop the thing from ticking over so I advanced the throttle one click at a time while spinning it over and hooray off she went at about 50% of the total stick travel. Absolutely realistic sound from the big twin four stroke idling away but and there's always a but I haven't got enough adjustment on my transmitter to get an even swing from idle to full power.



I'm now very glad I made a full width hatch under the nose of the fuselage, at the time it was insurance for any plumbing difficulties.

In the end to reposition the servo horn was no big deal as I could just reach it with a long handled Phillips and then ditto with an Allen key to adjust the pushrod position.

All back together and re-tested and now we're cooking, a nice steady idle at 1600 rpm and peaking at over 6000 rpm. It sure does create a helluva draft.



Last job before we fly is to fit the wings with their allocated struts. The struts have to be partnered with their wing as they are adjustable to correct dihedral differences and also ensure that each wing has the same washout.

At last we are ready to fly if this rotten weather ever gets back to normal, what with stinking heat and now flooding rains I'm inclined to think there may be something in this climate change business.

The plan is to take it out to Vineyard or Windsor for full speed engine runs, range and failsafe testing, taxi tests and then fly.



Finally I've managed to get all the ducks in a row and fly the thing. No more heat waves or floods but a magnificent Autumn day in May for a test flight.

All the pre flight check were done satisfactorily so no more excuses.

The big Saito twin is still running on 15:1 running in fuel but has bags of power and now has a steady idle and transitions beautifully to 6400 rpm on a 22 x 8 Bolly carbon prop



A pause for the compulsory pose picture and then taxi out to the strip.

The Saito at idle sounds so much like the full size..



I had decided to do the test flight at the Vineyard field because of its open nature and I thought might be a bit more forgiving for a large bird. I would have liked to have done it at our field as I am so familiar with it but the thought of having to climb out steeply with an unproven engine and airframe to clear the trees was a bit daunting.



The Vineyard field is the home of the Hawkesbury Club (H.M.A.S) . It's a flood plain with grazing cows included, a few trees and some power lines to keep you on your toes but it is flat..

The field is mowed with two strips, a larger strip for the prevailing wind and a cross strip for otherwise

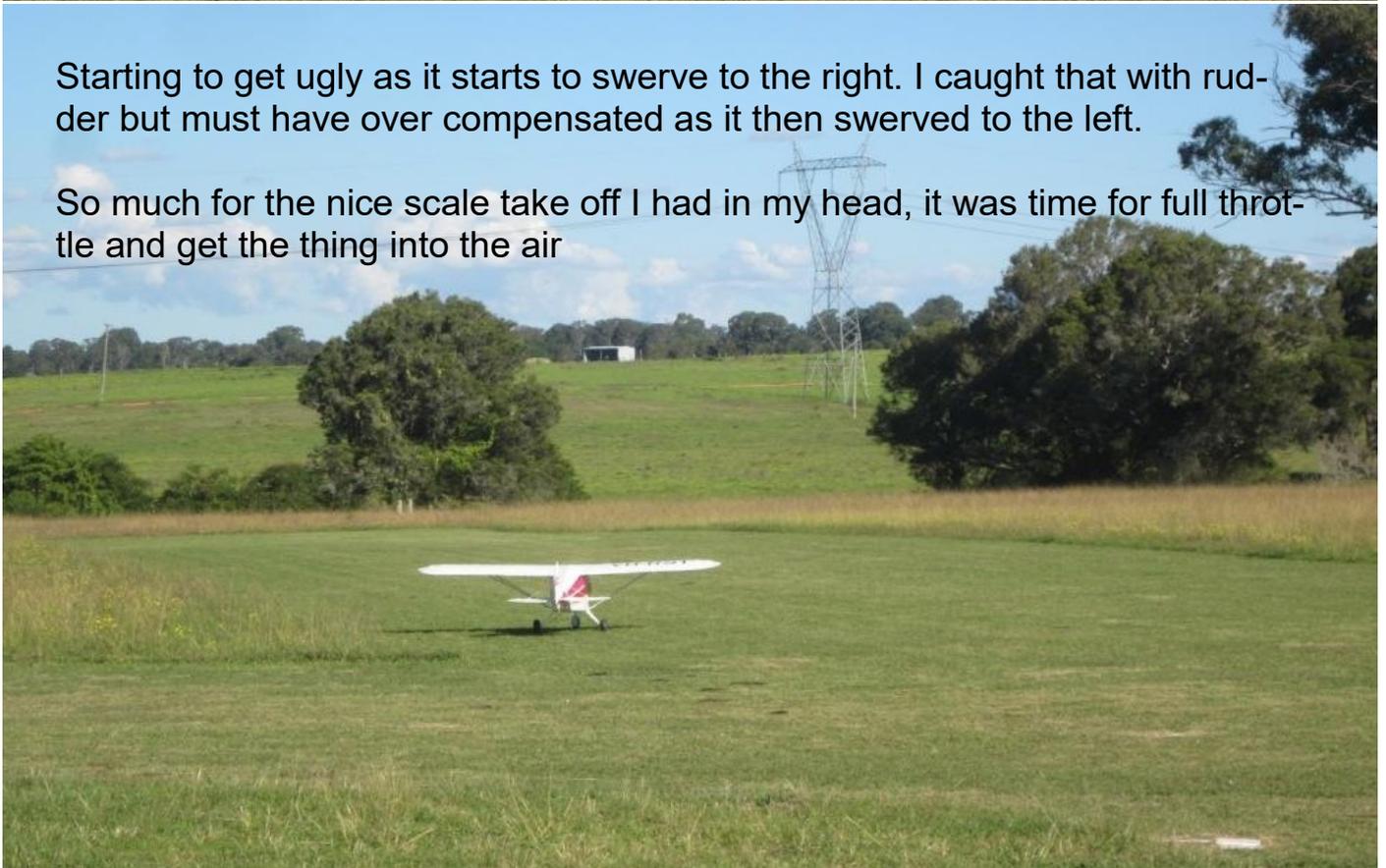


The cows didn't care but I was getting pretty excited and trying to be cool was a challenge.

The picture on the left is a picture of the start of the take off roll



All good so far and picking up speed



Starting to get ugly as it starts to swerve to the right. I caught that with rudder but must have over compensated as it then swerved to the left.

So much for the nice scale take off I had in my head, it was time for full throttle and get the thing into the air



At last we're flying but what a pig I've got here. I had a 10% aileron rudder mix but found I still needed bags of rudder to get a reasonable turn, it was oversensitive in pitch and wanted to fly nose up all the time so a stall was on the cards at any time. Much trimming took place of elevators to get a reasonable attitude but it was obvious that more trimming was needed than could be done in the air. I flew it around for about 8 minutes trying to get a feel for it so I could land it and then came in on the main strip using first flaps.

Very happy to get it down in one piece.



After a little sit down and a bit of scratching the grey matter I decided that the relationship of the tail to wing incidence angles was the main problem among other problems but that was the primary problem. It appeared as if the wing had too much and the stabiliser too little. Unfortunately these are fixed and built into the plane but a bit of old school trimming might minimise the effect. I started with setting the ailerons with 4mm of reflex and then lengthened the rear wing strut to twist the wing to induce a bit of washout.



I increased the aileron differential so the down aileron was less than 50% of the travel of the up aileron and increased the rudder aileron mix to 40%. I added another 5% of down to the elevator flap mix to give me 15% of down with the flaps deployed.

Heart in mouth a bit I filled her up for a second flight. This time I hoped to nail the takeoff so I accelerated slowly paying a lot of attention to the rudder to ensure I didn't get off line. This nearly bought me undone big time as with all the washout and reflex I had less lift. She was still not flat out and still on the ground and fast running out of strip. It was too late to try and abort so I reefed her off before she hit the long grass at the end. She was travelling too slowly and I had used too much elevator in the excitement, she went into a series of four stalls left, right and left and right again, all I could do was to try and get her nose down and give her all the power the big Saito had. To my great relief she finally picked up enough speed to fly on the wings not the prop so straight up to two mistakes high so I could sort myself out. That was as close as you could get to writing off 15 months work and a bucketful of bucks..

Now flying at a safe height in nice big figures of eight at a little over half throttle I took in some big breaths to settle down.

I soon realised she was now much easier to fly and had a much improved sit in the air. Turns were nicely coordinated and things were looking up. The engine was behaving impeccably so I did a few low passes to show off and then took her up high to check on attitude with half and then full flaps. The elevator flap trim settings seemed about right but with full flaps she had an uncomfortable floating feeling with much reduced aileron effectiveness so half flaps will do for the landing. I practised a couple of landing approaches and then committed to land on the shorter cross strip, mistake 1..A scale aeroplane 1/3rd of the size of the full size and weighing 17kg doesn't stop quickly, the balloon tyres rotate freely and don't have much drag. I had touched down long and was fast running out of strip. I thought it would be OK to run into the long grass at the end to pull her up, mistake 2. There was a bloody drainage ditch at the end of the strip hidden in the long grass that knocked off the nose wheel.

So I didn't get to Canberra for the 80th anniversary of Piper aircraft but AI has made me a new nose leg mount and we are ready to go again. It's still a bit of a handful and a heading hold gyro has been ordered for the rudder but that's what it's all about, I was lucky enough to get away with two hairy flight so now can continue to improve the beast with trimming and if necessary alterations until she behaves like the trainer she was in full size real life..

What's next?? Something SMALLER!