

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



The basic building box of the fuselage now needs the longitudinal balsa strips and a series of frames at the front of the plane to achieve the rear chines blending into the curved planking in front of the cockpit.

All this is a bit of a guess or by god for although the plans show the position of the chines you are on your own when it comes to making the frames.

My starting point was the cowl as that gave me the shape of the frame where it was to be fixed behind the firewall.



The Tri Pacer fuselage was made from chrome moly tubing covered in fabric up to the engine bay, not much different from our models.

To achieve the scale cross sections I'll plank the front section where it's curved and extend the planking to the back of the cabin. I'll leave the back unframed and use the chines to create the rear cross sections after covering the lot with Solartex.



I marked out where I wanted the frames and the outline of the rear door and then worked from front to back, shaping and fitting each frame.



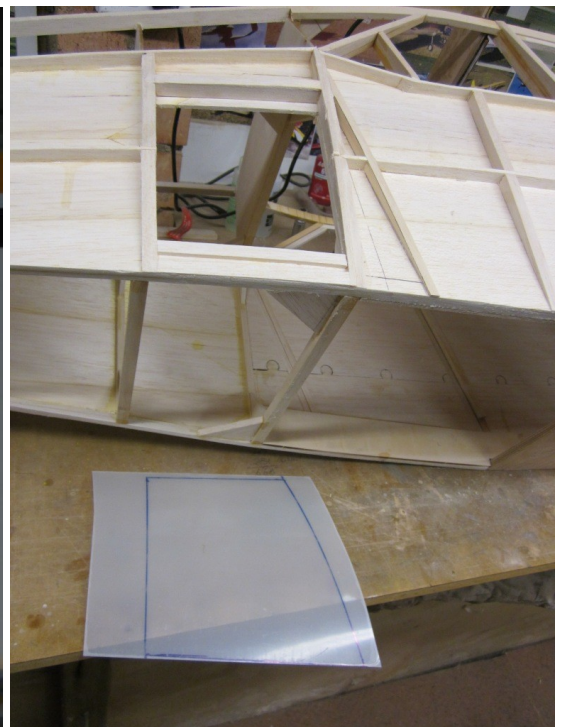
The transition of curves to straight lines was done with a batten bent over the frames to highlight high spots and then hand sanding until the shape was fair. It took me a day to do one side.. This build is definitely not for the impatient!



This picture of a full size Tri Pacer being restored well demonstrates the fabric finish over the longitudinal parts of the frame and fin.

Starboard front framing is now done but I still have to frame and cut out the luggage area. This was a box behind the cabin with a locking door access.

I reckon its an ideal place to hide switches and fuelling dots



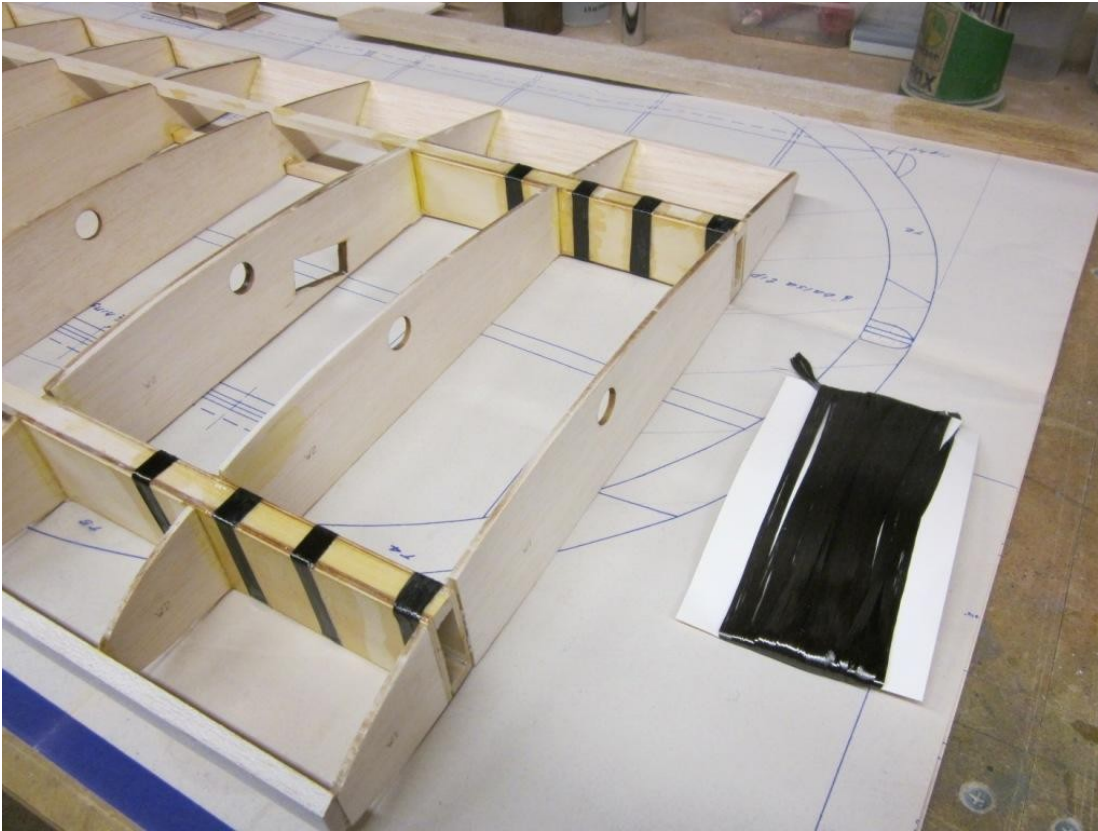


Planking now under way.

I can do the sides and the top of the front but I will leave the bottom open until I have the nose wheel leg and engine mounts sorted. I use both CA and PVA glues for planking

Time to get back onto the wings..





Both wings have been framed up and now need sheet leading and trailing edges and cap strips before fitting flaps and ailerons but first I need to reinforce the wing mount boxes.

The plans call for reinforcing with 1oz fibreglass cloth and I think that would be OK for putting around but the way I fly requires something a bit stronger.

My favourite stuff for making things strong is Dave Brown's carbon tow, it's supplied wound on a card and is 0.1mm thick x about 8mm wide.

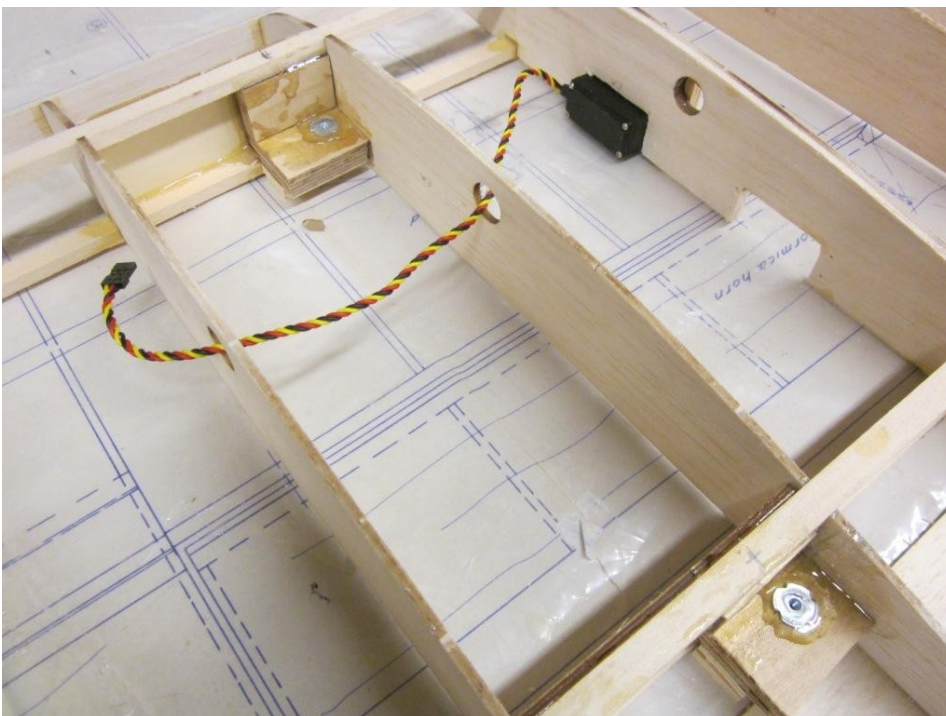
I have used this stuff before to strengthen wings by laminating along the main spars.

Years ago I tested how strong one length could be by epoxying between two pine blocks and adding weight. I ran out of weights at 35Kg without a sign of it breaking

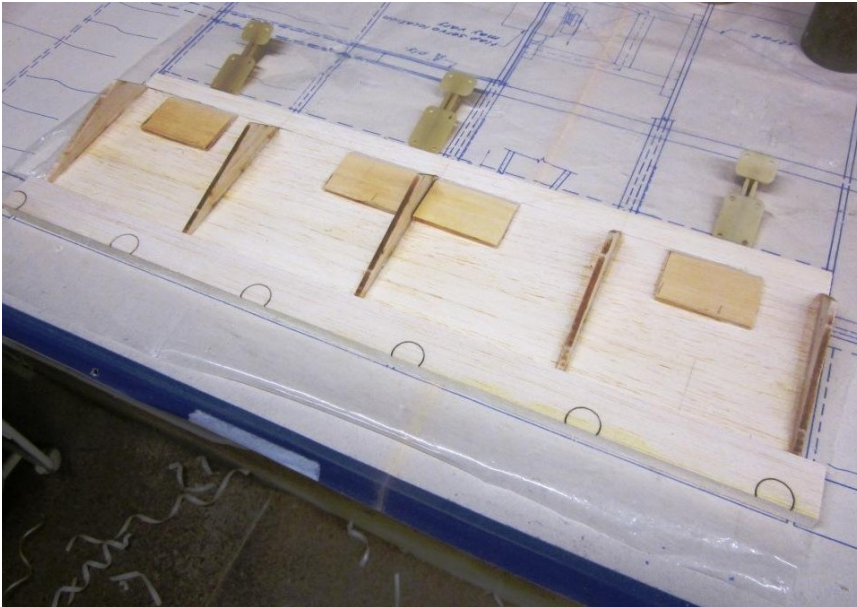


Before I sheet the leading and trailing edges I want to fit the wing strut mount hard points. I wasn't too keen to drill through the main spars as the plan suggests and therefore ended up with an over engineered solution of 1/2" ply sandwiched between the main spars. I'll drill and fit 3mm "T" nuts for the strut fixing before I cover the wings. I reckon this plane will weigh about 15 to 20kg and the wing struts will need to be fully able to take at least that and maybe more.

My logic is that each wing will support half the total weight of the aircraft and the struts and cabin mount will share that load pretty evenly so we have 20kg total



shared between two wings supporting 10kg each and then the 10kg is shared 50/50 with the strut and the cabin mount so each mounting point load is 5kg. I'm guessing that the G forces at the bottom of a loop would be about 4G therefore each wing mounting point will be subjected to roughly 20kg load hence the substantial hard point.



The next job is to set up the flap hinging.

I'm going to use offset hinges to give me a scale slotted flap which will be pulled down by a trusty old HS645MG on each wing. I've made up a pair of flaps but left the top sheeting off until I can get all the angles right and position the horn and hinges.

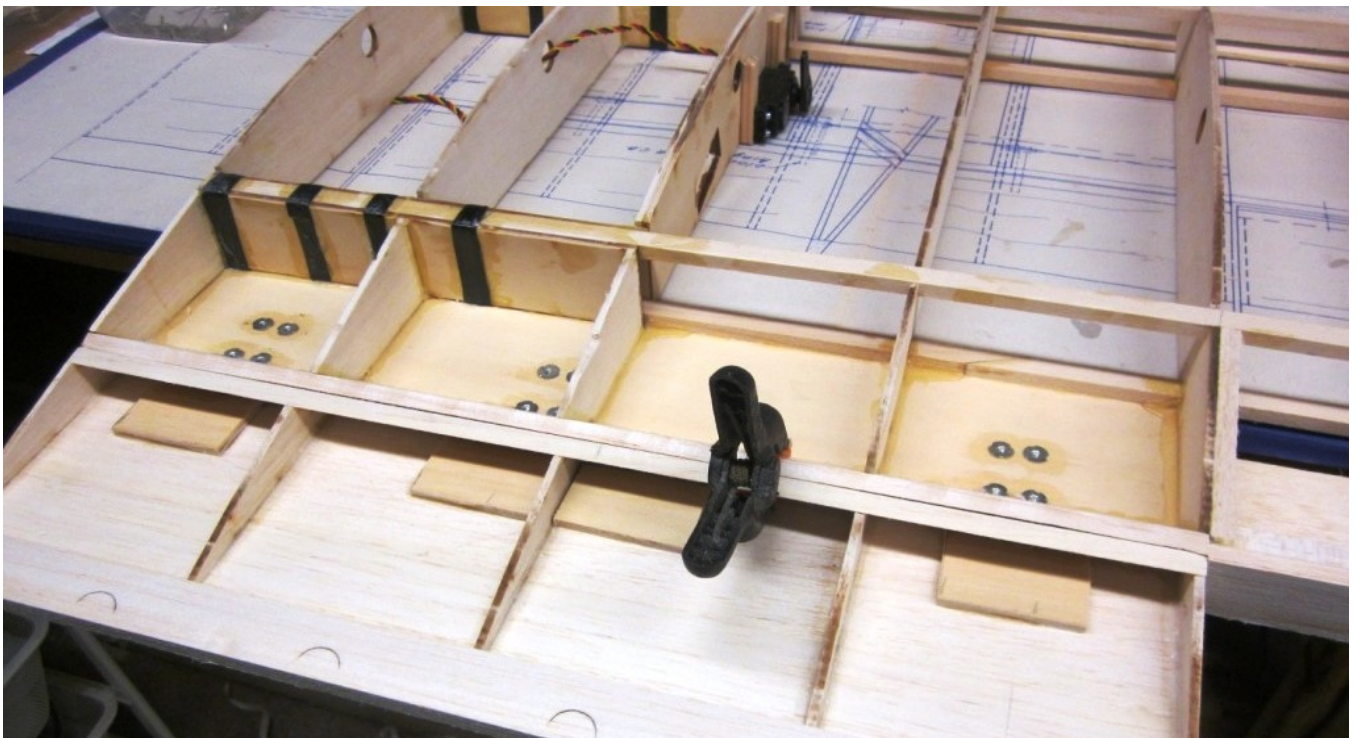
The plan shows the servo arm poking through the bot-

tom of the wing with a fully external pushrod but by moving the servo to within 50mm of the front spars and inverting the servo arm I found that I could hide the arm and most of the pushrod inside the wing for a much more scale look.

The bottom wing sheeting in front of the flap was sheeted with 1/8" ply so I could mount the hinges directly on the face.

I clamped the flap in position and drilled and fitted 4-40 "T" nuts for the hinge mounting. I have used CA to hold them in place until after the wings are covered and then I hope I can find them again.

Ply reinforcing was glued to the leading edge and the bottom sheeting of the flap for the hinges and the horn but I'm thinking I might leave the final hinge boring until I have covered the wing and established the gap between the wing and the flap.



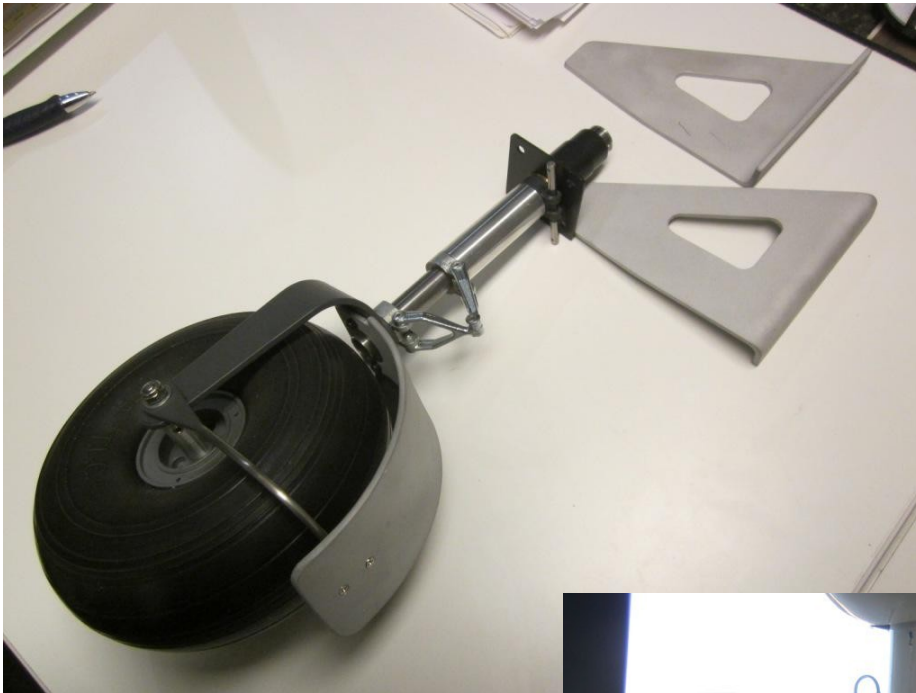


L.E. Sheeting on underside in place. These cheap Chinese plastic clamps make life easy.



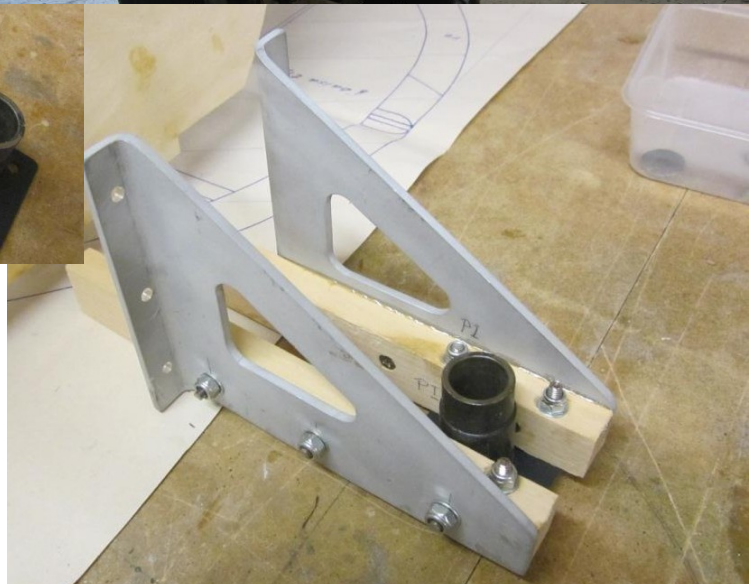
The wings are well on the way now, next job is LE capping and shaping, trial fit ailerons and flaps, fit nav and landing lights. I have cut out a section of the leading edge for landing lights and will need to cut a path for nav light cables

While I wait for more balsa, I cant believe how much I'm using. There is a lot of 3/8" in this design and of course this hasn't translated to a common metric size. I have been getting a large quantity of the house or garden stuff from Bunnings but they don't carry 9mm so fire up the computer and wait for a week or so.

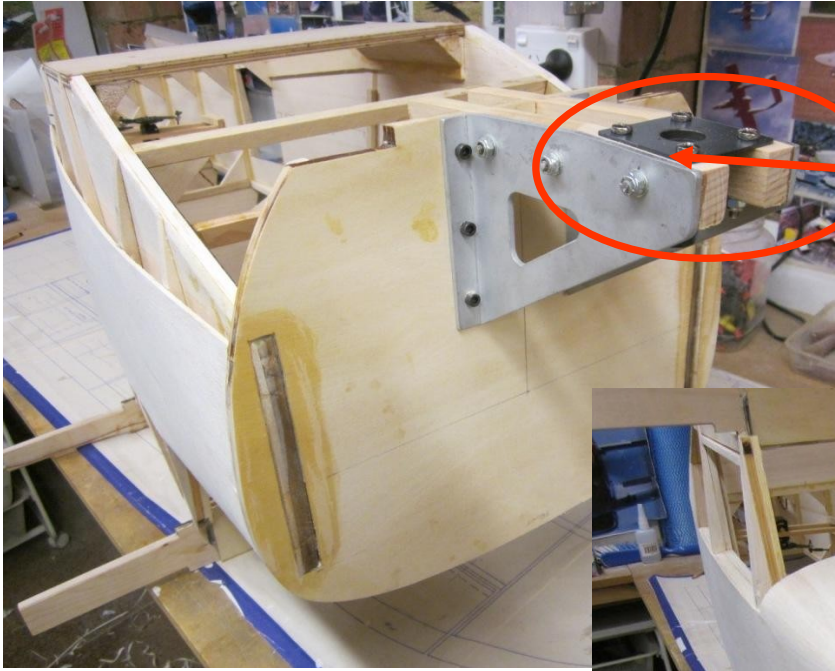


In the mean time AI has dropped by with my nose leg which is a work of art, especially the addition of the stone guard that on the full size protected the fabric under body from getting ripped by stones when operating on rough dirt strips. Full size below.

Good one Al...



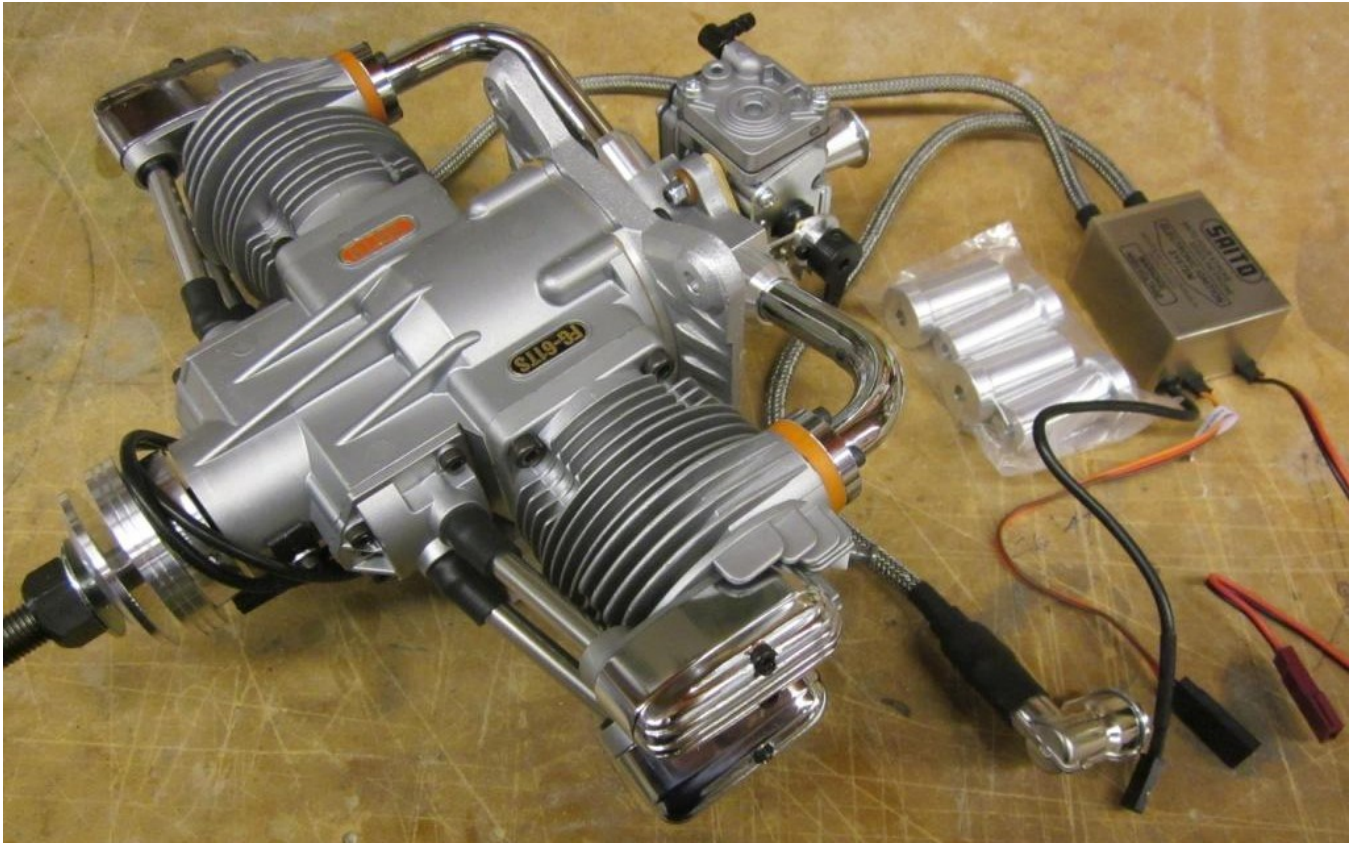
The mounts have five degrees of forward rake built in so all I had to do was attach some Hoop Pine wood bearers, mount the base of the leg and after measuring a thousand times fit to firewall.



Five degrees of forward rake.



There are some long levers here so its going to be more important than ever to touch down on the mains first.



I had to bite the bullet sooner or later and buy an engine. For too long I watched the Oz dollar hover around the 70c mark without much sign of improvement so I gave up and bought the engine from HHQ. It is the latest version of a Saito twin four stroke running on petrol. It's 61cc and matched with a Bolly 22 x 10 will probably never need to run harder than half throttle. The exhaust noise of the four stroke will be more realistic than the originally planned DLA56 from my P40 prang.



I need now to trial fit the engine, nose leg and the tail feathers to get a rough idea how the plane will balance, I'm betting it will be substantially nose heavy. I foresee batteries down the tail but you never know.

We'll see in a couple of weeks

Cheers
Stan