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PT 1/4 scale PIK20 built up wings

<https://scalesoaring.co.uk/phpBB3/viewtopic.php?f=12&t=1370>

Re: PT 1/4 scale PIK20 built up wings

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by **Peter Balcombe**

Posted: **09 Mar 2017, 23:11**

Now with control surfaces cut to shape and taped on to see overall shape.

Next tasks are to fit the wingtip and profile the LE.



Top with control surfaces



Bottom with surfaces

Re: PT 1/4 scale PIK20 built up wings

by **Peter Balcombe**

Posted: **06 Mar 2017, 11:34**

Bottom wing skin added and servo hatch openings revealed.

Hardwood LE also glued on and held in place using masking tape.

Flap & ailerons will now be cut from balsa stock sections & prepared for hinging onto the rear spar.



Wing core fully sheeted



Hardwood LE fitted

Re: PT 1/4 scale PIK20 built up wings

by **Peter Balcombe**

Posted: **24 Feb 2017, 20:03**

Minor amendments made to the rib cutting drawings and plan in order to move the airbrake back 3mm and seat it both fore and aft on sub spars, inserted slightly deeper into the ribs - thus ensuring that the brake assembly top is at rib height rather than proud.

Seating the forward edge on the main spar lifts the brake assembly a little too near the wing top surface 🤔

By slightly recessing the sub spars, the brake caps can then be of the skin thickness and can also be sanded to top surface profile.

Almost all internal wing jobs done now, so will be making up sheeting tomorrow & removing the building tabs ready to seal up the wing.

Re: PT 1/4 scale PIK20 built up wings

by **Geoff Pearce**

Posted: **24 Feb 2017, 19:31**

terry white wrote:

Going together well Peter. A very interesting build thread.

I have had both the VEGA and the PiK20 in my time, I enjoyed flying both.

Regards Terry

What at the same time? I know your good but!

Geoff 😄 : 😄 😄

Re: PT 1/4 scale PIK20 built up wings

by **terry white**

Posted: **24 Feb 2017, 00:28**

Going together well Peter. A very interesting build thread.

I have had both the VEGA and the PiK20 in my time, I enjoyed flying both.

Regards Terry

Re: PT 1/4 scale PIK20 built up wings

by **Peter Balcombe**Posted: **23 Feb 2017, 18:11**

Airbrakes arrived quickly, so appropriate length of brake slot removed from the top skin. The brake can then be dropped in to rest on the rear edge of upper main spar and the rear brake support sub-spar.

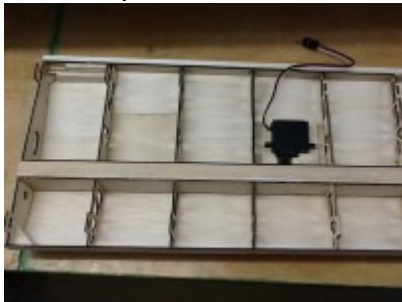
On the wing underside, the rear incidence joiner tube has been added and mounting plates for the brake & aileron servos.



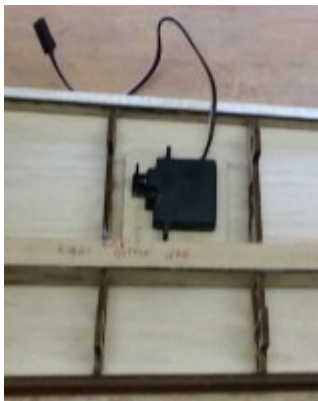
Brake slot in top skin



Brake in place



Incidence tube & brake servo



Aileron servo

Re: PT 1/4 scale PIK20 built up wings

by **Peter Balcombe**Posted: **21 Feb 2017, 14:41**

Upper 1/16" balsa skin now applied and trimmed back to dummy LE & control surface hinge lines.

Now awaiting delivery of some Topmodel airbrake units before lower skin is fitted.

In the meantime, I can fit servo mounts to plates, fit servo hatch supports and install the wiring loom.



Upper wing skin



Internal view

Re: PT 1/4 scale PIK20 built up wings

by **Peter Balcombe**

Posted: **14 Feb 2017, 12:44**

Once the lower spar has been glued in place, the joiner slot can be opened up by taking out the remaining 'tab' material with a razor saw. (If you use 16mm brass joiner box then you will need to take out the slot right down to the spar in order to get it to fit between the two spars).

The brass joiner box is sandwiched between a strip of 1/16" ply one side and 1/16" + 1/8" ply on the other.

Note that the completed sandwich is then inserted into one wing with 1/16" at the front, and the other with 3/16" at the front in order to give 1/8 offset between the wings so that the fuselage joiner tubes can be fitted one behind the other.

I have shown the end of my joiner unit to show the box offset in the sandwich.

The joiner assembly can then be epoxied into the wing slot and voids filled with epoxy/1/16" ply.

Top spar can now be added to close the joiner area. Photo shows spar clipped to the web and small weights added to ensure the building tabs are firmly sitting on the building board.



Joiner slot



Joiner assembly



Joiner assembly added

Re: PT 1/4 scale PIK20 built up wings

by **B Sharp**

Posted: **14 Feb 2017, 10:09**

That seems sensible Peter.

I always use mad ply Barry, it keeps me sane (ish).

Brian. 😊

Re: PT 1/4 scale PIK20 built up wings

by **Peter Balcombe**

Posted: **13 Feb 2017, 21:26**

Brian,

I have just looked at Pat's original build instruction sheets for the PIK20 & Vega as they both show the option of TE brakes, despite the fact that only the Vega had these on the full size. Also Pat's sketch of the TE brake is the same on each drawing despite the fact that the PIK used a 2" stock TE and the Vega used 1.5" TE stock.

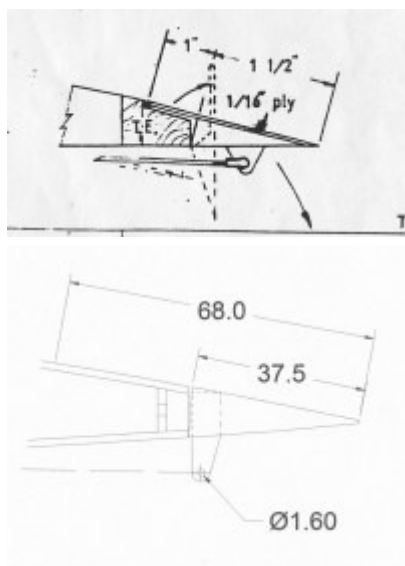
Looking at the 3 views in Martin Simon's book I calculate the overall width of the Vega TE brake as 68mm (pivoting at 37.5mm from TE at Root and 56mm (pivoting at 25mm from TE) at the outboard end.

Thus the pivot point is on the edge of/within the TE stock in both cases if made to scale.

Pat's TE brake sketch shows a 1/16" ply top, the forward part recessed into the top wing skin forward of the pivot point as shown below.

I also show a section of the new Vega wing design at Rib 3, dimensioned up to show the TE flap size at the root end.

The wing skins are made from 1/16" balsa. Therefore if a balsa support strip was added beneath the rear upper skin from forward of the upper skin rebate to the flap hinge spar and flush with the top of each rib, the upper skin could then be locally removed to allow the 1/16" ply TE brake to sit into the recess, making the top/rear surface of the TE brake flush with the wing. I therefore suggest that the modification could be easily implemented if required by the builder without any change to the new design parts.



Re: PT 1/4 scale PIK20 built up wings

by **Barry_Cole**

Posted: **13 Feb 2017, 21:24**

Never upset 1/16" ply.....



BC

Re: PT 1/4 scale PIK20 built up wings

by **B Sharp**

Posted: **13 Feb 2017, 21:07**

When I built my Vega way back in the dim and distant I built the over and under swiveling option. The top surface of the flap was mad of 1/16 ply and extended chordwise and let into the top surface of the wing. The flap/brake ran the full length of the flap area. It was possible to ease in a few degrees of flap to help with winch launches without getting a braking effect. However when deploying the brake fully the effect was very positive without being in any way extreme.

Brian. 😊

Re: PT 1/4 scale PIK20 built up wings

by **Peter Balcombe**

Posted: **13 Feb 2017, 17:54**

Hi Brian,

I have used the simpler stock TE type flaps on the Vega wing design at the moment in conjunction with provision for upper surface brakes.

However, I am sure something could be done to allow the full size type swivelling brake to be implemented if Cliff wants to offer that as a further option for the built-up wings.

Pat's original instructions showed a sketch of the swivel option and commented that a 2ft length proved effective even though the full size brake went to the root.

Note that I am pretty sure the surface could only simply swivel to act as a brake only, not flap & brake as on the full size.

Re: PT 1/4 scale PIK20 built up wings

by **B Sharp**

Posted: **13 Feb 2017, 16:15**

When you are doing the Vega wings will you be doing simple flaps or replicating the more complicated swiveling trailing edge with flap below and brake Above?

Brian. 😊

PT 1/4 scale PIK20 built up wings

by **Peter Balcombe**

Posted: **13 Feb 2017, 12:41**



Cliff wants to be able to offer a built-up wing option for his PT model range, so this is a new wing design proving build for the first of the alternative wing designs. (The 156" PT Vega wings are also in development.)

All of the built-up wings are being designed to be able to be used as direct replacements/alternative build options to the standard foam cored types. In general, they use the same hardwood LE, stock TE & aileron features, but built onto a wing core using laser cut parts and overall sheeted in 1/16" balsa.

The spruce main spars are strengthened by a full length 1/16 ply interlocking spar web. Dummy LE and TE strips also engage into rib end tabs to form an interlocking wing core structure. Two lower building tabs on each rib also assist ensure correct build alignment. The wings also employ a brass joiner tube to match that in the fuselage, thus avoiding the need to fix the steel blades into the wings as on the original design.

Finally, all wing control servos are mounted in the wings, rather than have a fuselage mounted flap servo. The option is also included to fit either servo operated airbrakes or servoless equivalents.

The wing parts go together very quickly and I managed to put the basic structure of the first wing together over the plan in an afternoon - even with the use of Aliphatic glue rather than

Cyano.

The pre-built lower spar was added next, after lying the wing structure on its back. Note that the spars taper both in width and thickness from the wing taper change point in order to some "meat" is left at the tip rib to attach to.

Once the lower spar is in place, the structure is turned over again to add the root end rear spar web, which again notches into place. Note that the front & rear spar webs, together with the top & bottom spars, form a complete box around the joiner area, allowing this to be later filled with hardwood/epoxy to give a rock solid attachment to the main spars.

The dummy trailing edges will later be supplemented with 3/16" balsa to provide the same 1/4" control surface hinging thickness as on the foam wings, with the top & bottom skins going from the dummy LE to the rear of the hinging strips.