

RC-Jupiter build thread

It all started when I was browsing the outerzone Gallery and I stopped by a tiny 36inch/90cm rubber low wing called Jupiter. It was a very little bit like a caricature, the short fuselage, the long legs and that's exact the fact when things come to be art. It's a bit oversubscribed / direction of kitsch but stopped before being kitsch. Same feeling came up when looking at the GeeBees ;-).

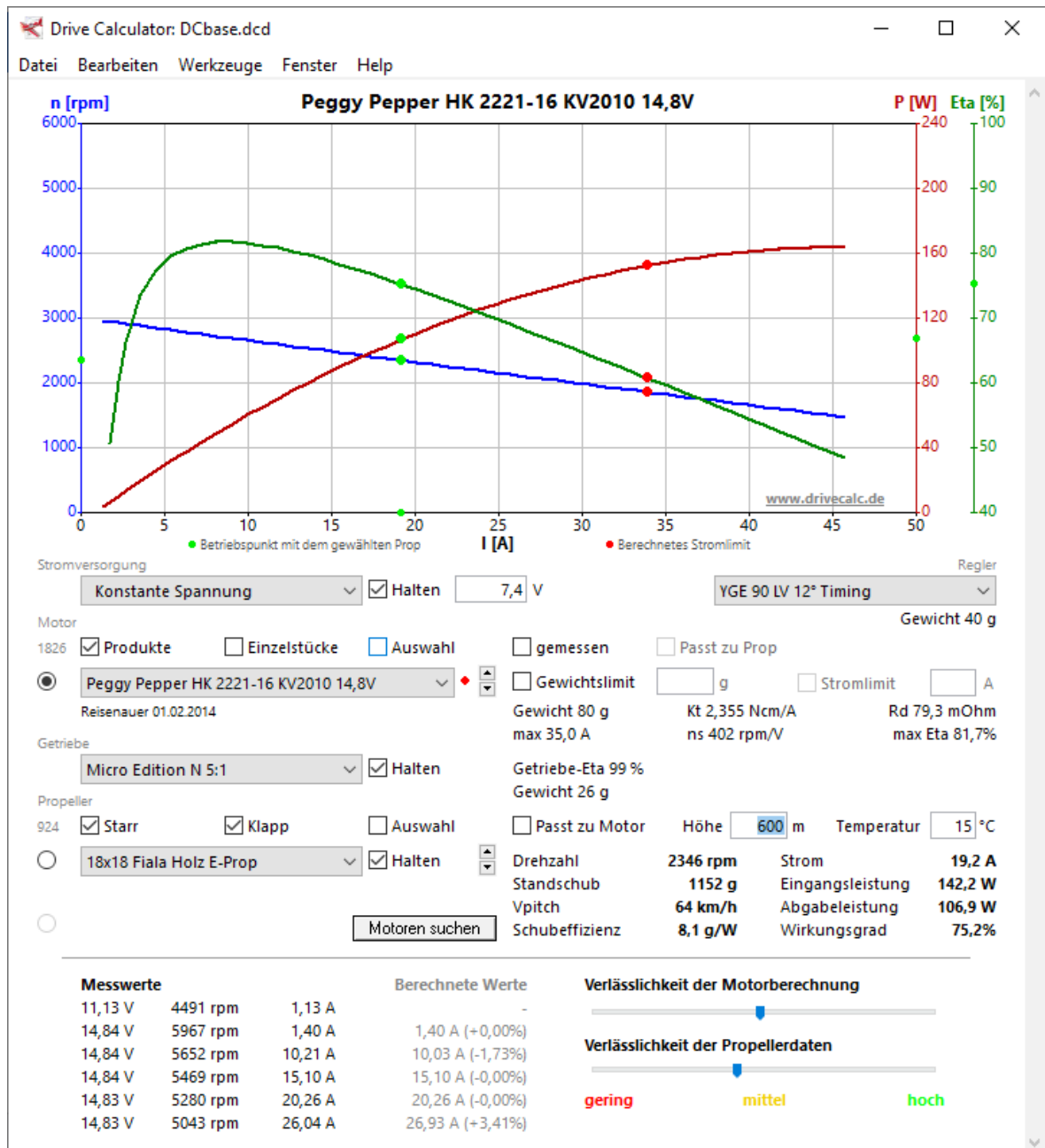
So E.A.Ross did a super design job in 1947 and I felt a bit like Pasiphae or Ganymede, you might have heard of the Jupiter moons, ok there are quite more, coming back from time to time an surrounding the little Jupiter. In my thoughts I was aiming at a slight bigger version, but the characteristic appearance should stay.

Upscaling to 59inch/150cm was the first goal and the Prop should be 19 inch when keeping the scale exact !!! I called Mr. Reisenauer, a German electric engine and gear producer. He is always helpful and said a Fiala Prop could work on a 2221/16 KV2012 14,8V engine with 1:5 gear at 2300rpm bringing 1152g gr of static thrust and 64km/h pitch speed. Wow, that sounds great, the rotation speed comes down to a number that is comparable to the rubber powered models, this will add further scale impression to the model and so the set was ordered including prop and all you need. I ended up with a span size 1:1 to the prop with 56 inch/142cm.

Pos.	Anzahl	Einheit	Artikelnr.	Bezeichnung
1	1	Stück	M0030010	Peggy Pepper HK-2221/16 2010KV
2	1	Stück	XX000015	Wire-Protection-Bügel für PEGGY-PEPPER Außenläufer
3	1	Stück	ZE000101	Motorflansch M3 / 16mm Lochabstand mit Montagenut 17-2 für Micro Edition
4	1	Stück	ZE000017	TORQUE-Ritzel für Micro Edition 5:1 3,17mm
5	1	Stück	XX000010	MONTAGE: Ritzel aufkleben + Flansch montieren+justieren
6	1	Stück	PS070026	Fiala 18x18 E
7	1	Stück	W0000100	AXi Konusnabe für starre Luftschrauben M10 für Welle 6mm

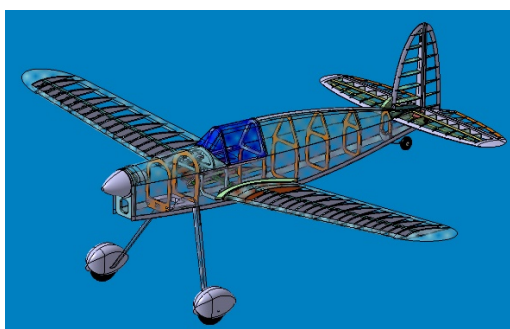
I've done a few projects and have my own way to go. In the beginning I collect all the stuff I can find, this was very easy here, due I found all I need @ outerzone, Thanks Steve for providing us with this mega information which is a huge source of ideas to me. Yes next project is already running when I drop this lines ;-).

So I scaled up the original plan from E.A.Ross in my CAD and started. Don't want to go too deep into construction details, but you can easily spend a few hundred hours at the PC.



Easiest way is to sketch over the original plan, that should be in exact x and y enlargement.

I used a Selig S 7055 flat bottomed low Reynolds Profile on the wing and a HQ Acro 12% for fin and stabilizer. Both behave uncritical and the Selig carries up to 15° before stalling combined with low drag. Here you can see the Jupiter construction, a few things needed to



Change from the rubber model. The wing joiner is from carbon self-made direct in the holm between the belts, the tailwheel is steerable, Spinner bought from Simprop fibre glas fits perfect in the contour and as I wanna keep the dihedral it is only steered by elevator and rudder. I like these old ones without aileron, it keeps the old character.

Once this work was done, we needed a drawing and all parts that should be lasered had to have an dxf-file. A diligent but routine piece of work. You can download the plans here at outerzone. I placed all parts from one material on a sheet that is sized with the measures that are normally used for the boards. With all this done I went to our local hobby shop www.FS-Modelltechnik.de . Frank Schulz started to laser wood some time ago and he is in my eyes a real perfectionist. So to keep up a little I need to add some breaks in the laser lines, so that a.) the tiny parts didn't fall out and b.) the bigger parts that have sometimes tension inside the wood, keep their form until the complete cut is done. I cut some slots for the trailing edges in the fin and stab ribs, but that was too much heat for the sharp ends and burns too much wood. I redesigned that to a single cut, that needs to be sanded wider carefully. Frank is offering this Laser-service to anyone and if you are fancy to build a Jupiter, pick up the dxf-data here and ask. Feedback from anyone who build the RC-Jupiter is requested definitively. If you need held during the build, please ask for advice. Or go to <https://www.fpv-treff.de/forum/index.php?threads/jupiter-von-frog-the-bringer-of-jollity.444/>

The Laser parts overview:

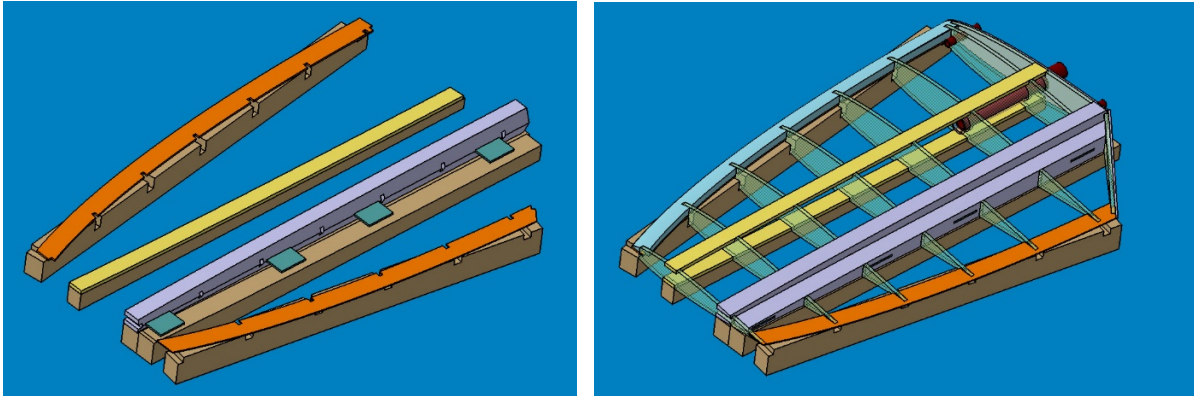


I started the build a few weeks before I got these parts with a foam block for the vacuum canopy, it was 3-d milled to the CAD-step file and glassed with 3 layers of 105gr fibre. Filled and sanded to perfection.

The woodwork is easy due that all parts fit together like a puzzle. Wings and stabs are built on a jig. The jig is enclosed in the laser parts. For the wing the jig is made from 3 Balsa strips numbered from 1-3. The exact location is shown on the plan. The lower belt is placed on Jig2 the lower trailing edge followed by the ribs. I started with No2 and went through the

wingtip. No1 follows, when the wing came to the fuselage to have the exact angle. Outwards from rib 3 the spar webbing is done in alternation with the rib, easiest way not to waste glue anywhere. The spar webbing is done from 10mm Balsa texture vertically. You can reduce it over the wing length to thinner Balsa if you like, I didn't.

The stabs are build in a special way on 5 jig strips. Positions are located on the plan.



To get a possibly light weight design I choose the leading and trailing edge from thin plywood. This lies direct on jig 1 and 5, which have slots to place the ribs in the edges. On jig2 the lower pine strip is places and on jig 3 and 4 the trailing edge from the stab and the leading edge from the elevator are hold together with the hinge dummies. With little skills, you can glue everything together "in the air" and place it on the jigs with some weight for drying. The upper leading edge from balsa is glued only, the lower comes in the next step. Most of the rest is easy for any builder.

The rudder is easily built with the Node on the table, control nothing is twisted.

The fuselage is started with the gear plates, 3 in total, come together with the gear tubes and are fixed at front and rear gear spar. Sidewalls pre glued to the triangular lower cleats find their way beside the gear spars and further spars can be glued in Position. Take care of a symmetrical non twisted body and check at any stage. The fuselage is built really quick and by adding spar 10 you add the complete vertical fin. Be rally vertical and inflight direction. The nose of the fin will be glued to the second/upper roof strip later so keep it free now.

The hatch is built on the fuselage, notice there are 4 location holes and 4 Holes for magnetic closing doubled in the hatch ground and in the fuselage upper cut!

The fuselage is finished by the bottom and the top sheeted and the roof doubling connected to the fins nose.

The Wing joiner is built with the help of 4 Balsa sheets, glued together; don't use to much glue, pressed out to the slots!! Isolate a flat piece of wood with plastic film and glue the balsa block on. Open the upper slot completely, so that you can drop in 5-10 rooving lines, I used carbon, but glass or Aramid is also possible. It should be filled up to the deck. After 24h do the same with the lower slot. Another day later you can grab it from the plastic film and shape it to a quadratic section with slightly round corners. Be aware not to make a bending test at this stage, the Balsa in the middle of the sandwich will broke. Now the joiner is in the shape to put a glass sleeve over. Moisten the surface with Poxxy, slip the sleeve over and tighten it. Pulling in longitudinal direction makes it fit good. Hang a weight below, wipe away superfluous Poxxy and let is dry another day. It sounds like lot of work, but it is not.

After drying you need plug in tubes for the wings. Most people think this does not work on a rough surface. The hardened sleeve must not be shaped, you will damage the tiny filament! Poutlice 2-3 layers of plastic film around the outer arms of the joiner, mark the direction. Laminate 2 layers or 55g glass in same direction. Let it dry for a day and pull the tubes off. The wing joiner is cheap, easily made and will withstand hard maneuvers, it weighs only a few grams.

Another thing is the build of the pants the 5 sheets are just glued together, but before think about the fixation on the wire or to the leg. I chose to glue in some collets that can be clamped to the 3mm wire including some soldered arms to fix it in the balsa walls. Before gluing the 5 sheets it might be easier to shape the inner circle of plate 2 and 4. Therefore paint the contour of plate 3 to their neighbors , shape it in a direct blend first and if you have a special spherical tool for the "Mini-drill" a little convex! This helps to fit in the wheels later.

The legs are shaped by hand from basswood. I bought a piece, that covers the upper profile and start to shape the trailing edge on the complete length of the strip. Once this was done, I cut into the 2 pieces needed. Now you can do the conical job and sew the leading edge the way that the profile is shorter at the wheel end. Round the Nose as needed and thinner the profile at the lower end at least. This way leads to 2 compare able and identical legs. It's a bit of a dusty job, but creating things is always fulfilling.

When I did all these jobs it took me 17 days until all single parts were exhausted. It is always fun and motivation to put things together:

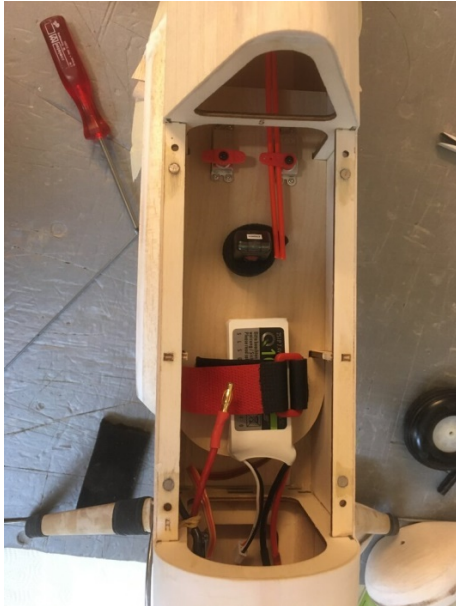


Well, if you are used to build from balsa the Jupiter-job can be done in 2 Month from the very beginning to the Maiden flight.

Some word to the RC integration: The inner sidewalls have openings for rudder rope and elevator Bowden cable. Don't forget to open these after the outer wall is glued! I forgot that before the back was closed so if that happen use a lamp from the inside to locate the holes.

The tailwheel is fixed by a collar through the sidewall, you need some tries to locate it.

At this point I scheduled where to locate Servo etc. to have the CG at the right position. The thing was to locate them as far to the rear as possible so I ended up with the Servo head



screw at the end of the canopy. The good thing is, that the batteries can take place directly in the gravity center and so you can choose which TOW (takeoff weight) / with which battery is the best for yourself.

This comes due to the electric engine, gearbox and huge prop and spinner in the front and additionally the gear weight.

I started with some older 1000mAh 2s 40C Lipo cells, very light (80gr) and good for the first try. Up to now I flew up to 2200mAh 20C (130gr). The smaller ones last for 5 minutes of flight the 2200 is easy to stay 10min in the air or longer. The weight change was not sensitive. Make your own choice.

The plane was covered complete in Oracover stick, and the design was taken from the lovely original one you can find here on Outerzone. It was Love at first sight that gives the ignition to start up with all of this, so a must to complete in that finish:



The day was not really over so I decided spontaneously to go out and test fly. The first take off was from tarmac after 3-5m and the plane was minimal nose heavy, easily trimmed with a

few clicks. The low sun gives a romantic background for this first handful of starts and landings. The flight behavior was uncritical and near fly by are bringing the jollity.



The bringer of Jollity relaxing in the last glow of the day after the Maiden.

This is the point to say good luck if you are fancy to build your own one. Be aware, the result will be worth any work. For a good help you can browse all of my pictures from the build here: https://outerzone.co.uk/files/RC_Jupiter_pics/

Last not lease I always cover my planes for transportation in tailor-made bags from "Cordura" and so this time, too. I took out the legs, placed them in 2 little bags to isolate them from marking the balsa wood beside the fuselage, I sew some protectors for the prop.



The wings are covered in "Trittschallisolierung" an all you need on the field is inside that bag including a little tool bag with wing joiner, rubbers an all you need. So as I get older I will hopefully never forget a part at home ;-)

As I always say:

We still have the most beautiful flights ahead of us!

Matthias Möller, 7th April 2021