SU-29
Building instructions
Please read slowly and carefully!

Thank you for purchasing this kit. It was designed to be an extremely aerobatic and agile indoor (or light wind outdoor) model, optimized for the Aeromusicals category and radical unlimited 3D.

Please refer to the Diagram Sheet while building this model.

You will note, that this time we have made all the necessary cuts for you – no more uncertainty over placement of components. We have indicated the locations of servos by cutting their holes in "dotted line". The holes are sized with respect to the (arguably) most common type of servos, the HXT500, Tower Pro SG50, Hitec 50 or JR DS188 size (and surely many more). If you are using these or equally sized types, cut through the "dotted" lines. If not, customize the holes to your particular servos.

Note: Gluing Depron – there are several different types of glue available. One of them is <u>foam friendly</u> ("styro") CA (Cyano-acrylate). The CA is often used, admittedly making the parts joint somewhat fragile. Our preferred option is contact glue - one brand tested to satisfaction is foam UHU-Por. You have to apply the glue on both parts (one trick is to apply more of it to one glued part and to "stamp" this part to the other one to transfer some of the glue) and wait about 5 minutes, until the glue is almost dry (yet still a bit tacky), then stick the parts firmly together. You have to be precise; once glued, the parts are very difficult to take apart, such attempt sometimes resulting in damage to one or both of them. Sometimes polyurethane glue is used where extra strength is required. One such brand is Purex (available in the Czech republic; equivalents should not be difficult to find). Servos can be also very well glued in by a hot glue.

Any new kind of glue should be always tested on a scrap piece of Depron… you never know…

Note#2: To cut Depron, use a very sharp hobby knife (and a steel straight edge). Depron tends to wear out the edge of the knife quite fast – change your blades often.

Ok, let's start the building…

First, glue the 2 carbon strips (3 x 0.5 x 80mm) into the elevator.

Diagram 1 - 2

Cut a bevel to all edges where elevator meets the stabilizer and ailerons meet the wing (always to both facing parts). The controls are to be top hinged (so make sure which side is the upper side of the respective part)! Attach the controls using clear adhesive tape (we recommend priming the Depron under the tape with a thin layer of contact glue and we like the 3M clear, highly adhesive 15 mm tape). Be sure that your tape holds well on Depron (try on scrap piece first). In case of the elevator, the hinge tape shuld be interrupted in the area of the elevator horn slot (for easy insertion of the horn later).

It is important to keep at least 0.5 mm separation between the parts (you can "see through" the hinge), this will help you have a very easy deflection without twist to the parts and strain to the servo.

Dry assemble the horizontal part of the fuselage (the aft part of the "backbone" now alrady with elevator attached) and the wing halves on a straight building board. The wings are "upper side – up", i.e. not inverted. You can see that the backbone fits the wings in only one way – it is not symmetrical. Glue the wings to the fuselage. Using UHU Por or similar glue, attach a flat carbon strip 3 x 0.5 x 780 mm (shorten the included strip as necessary) across the whole leading edge of the assembly. Finally, glue the front (nose) part of the backbone to the assembly, making sure that it is perfectly aligned with the aft backbone.

Diagram 3

Now is a great time to beef up your plane a little bit for higher survivability. If you are like us, you will keep pushing the envelope and occasional crash is in such case almost certain. By smart strategic placement of few pieces of clear tape (ideally the highly adhesive 3M tape or similar, with the 3M you do not even have to prime the Depron with contact glue first), you will make your plane last much, much, much longer (and you will not have to go shopping with us again too soon… sadly ☺).

Ok, the Diagram should give you the idea where to place the tape. Do the same from both sides – top and bottom. Exact placement is not too critical.

Diagram 4

Turn the whole thing upside down. Glue one carbon strip 3x0.5x80 mm to the bottom side of elevator as indicated. Glue the lower part of the fuselage to the backbone. Install the strut anchor (small cf part, as per the Diagram – first sharpen one 1x30 mm carbon rod, push it into the prepared – partially precut – location in the lower fuselage leaving some 2mm in the open, and glue the anchor on top of this rod).

Glue the two Depron strut supports into the wing. Locate 4 carbon rods of 1mm diameter and 250 mm in length. These will make the wing struts. Install them as per the diagram, one end into the wing (there are precut slots) and the other end should rest easily in the corresponding slot in the strut anchor – going on their way through a slit in the strut support. Make sure that the wings are flat on the building board and that the fuselage is perpendicular to the wing plane. If you are satisfied, glue the struts into the wing (styro CA or better Purex, this time no Uhu Por) and into the strut anchor (styro CA or, if you are careful, non-styro CA). Check three times before using the glue, remember that you are fixing the future geometry of the model!

Diagram 5

Locate the two aileron strut supports and insert two sharpened carbon rods 1 x 30 mm into the precut (dotted line) location, leaving cca 5 mm out and gluing them into place. Complete the aileron bracing, using 0.8 mm carbon rods – cut them to pieces as necessary. Glue them into the aileron in the precut slots and on the other side to the free part of the 1mm carbon on top of the supports.

Finish the complete bracing of the fuselage, using 0.8 mm carbon and CA glue. Move from front to back, beginning in the strut anchor. Keep checking the geometry of the whole plane.

Diagram 6

Locate the two 1,5 mm carbon rods – those are your landing gear legs. On one end, CA glue the wheel axle joint as per the diagram. Find the 15 mm long pieces of 1,5mm carbon and glue them into the elongated hole in the joint. The angle of the axle should be 135° with respect to the gear

leg. Slide your wheel and the T-shaped stopper on the axle. Use small drop of CA to fix the stopper on the end of the axle. Repeat for the second LG leg.

Diagram 7
Glue the wheel pants on the T-shaped stoppers. Now you have fully assembled LG legs. Install them in the model as per the Diagram – note the precut slots in both the lower fuse and the backbone. Make sure that your wheels are parallel to the direction of flight and that both wheels are in equal elevation above the building board. If you are satisfied, use CA glue to fix the landing gear in place. Slide the fiberglass reinforcements over the place where the legs enter/exit the fuselage and (styro CA) glue them in place.

Diagram 8
Turn everything around (put the model on wheels). Glue the EPP canopy parts into the upper fuselage (contact glue or CA) and glue the upper fuselage part to the "backbone". Use 0,8 mm carbon rod to support the vertical stabilizer (from one side is good enough).

Diagram 9
Now attach the rudder – but first you have to again cut bevels to the facing edges of the rudder and the fuselage. The fuselage is now a part of the airplane (making the beveling quite difficult) so you may as well do it just on the rudder alone– but the bevel must be cut in a sharper angle, to leave the rudder at least 50° freedom of movement to either side. Prime the Depron parts with a bit of UHU Por or similar, do not forget to leave a gap where the rudder horn will be soon installed.
You may also attach the motor using the included motor mount, or the motor mount that is often included in box with those motors. The motor mount can be glued to the front of the fuselage with contact glue and ideally should be also secured with some of the clear (or glass filament) adhesive tape.

Diagram 10
This Diagram shows how the control horns are to be installed. Note that this systems allows for more precise and longer lasting pull pull control arrangement. Install all your servos (use Purex, Hot Glue, contact glue or your favorite system).

Diagram 11
Make a thin cut in the Side Force Generators and all the other special tabs as per the Diagram. Install the Side Force Generators and all the other tabs (in ailerons, rudder and elevator).

Diagram 12
Install all the linkages. Use your favorite method – the aileron linkages are shown at the Diagram. We recommend the pull – pull system for the tailfeathers. You may need to use the extension servo arms to achieve the desired throws.

Diagram 13
Install the tail skid (carbon 3 x 0.5 x 80) Reinforce the plane with some more, preferably highly adhesive 10 to 15 mm clear tape as per the Diagram. Please do not underestimate the importance of this step – you will be rewarded by much longer lasting airplane. Center of gravity is also indicated on the Diagram.

Diagram 14
Make the EPP cowl by gluing the two opposite edges together (CA or contact glue). We strongly recommend to reinforce the front edge of the cowl by clear tape, too. Slide the cowl onto the nose of the airplane and put on your propeller. Also note the box showing how to use the servo extension arm with the plastic M2 screws to tighten the control line.

Setup of the plane
We expect that you know how to connect the receiver to the ESC and to the servos, the ESC to the motor etc. If not, please refer to the respective instructions or better ask some more experienced friend.

For first flights, your C of G should be in the position as indicated on the Diagram 13. Set 35° deflections on all controls. Check all systems and go fly. To trim the plane correctly, you have to be indoors or it has to be absolutely calm outdoors. First, trim all controls coarsely to make the plane appear to fly straight. You should need about the same amount of elevator for both inverted and normal flight. If you have enough clearance, you may try vertical dive to trim the neutral elevator.

Your aileron trim should be the same in normal flight and inverted. If it is not, you may have a lateral balance issue. Try to move the battery pack sideways (say to the opposite side of the fuselage), if you can, to fix this problem.

After this, you may play with the thrust line to setup for clean and effortless hover without any tendency to "pull out" to any side. This may take a while and require quite a few tests. This airplane is not too sensitive to the thrust angle though.

Next thing, the C of G. We prefer the plane to fly almost "hands off", just the slightest bit of elevator needed for level flight. Move the C of G vertically (by moving the battery pack) to get a perfect knife edge without any tendency to roll. Our prototype ended up with the battery above the backbone, right in front of the canopy, attached by Velcro tape to the right side of the fuselage – but your best solution may differ.

We will be glad to hear about your experience with our products at info@rc-factory.cz.

Enjoy your new Sukhoi 29.

Your RC Factory team.
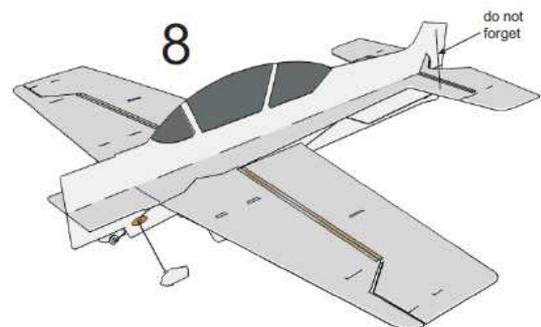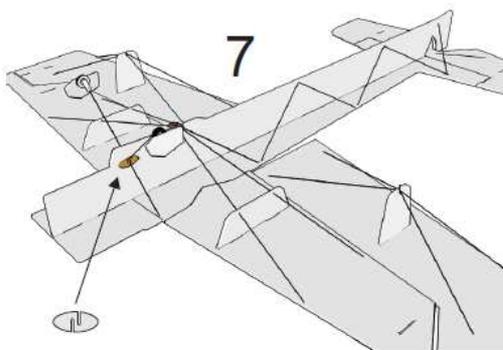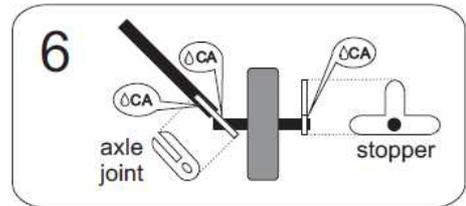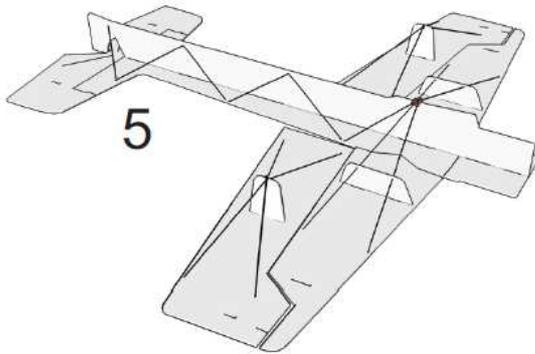
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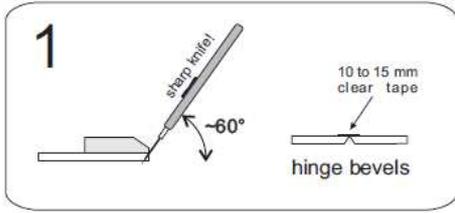Wingspan: 86 cm
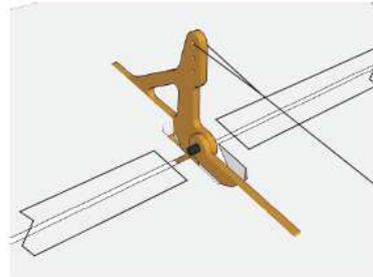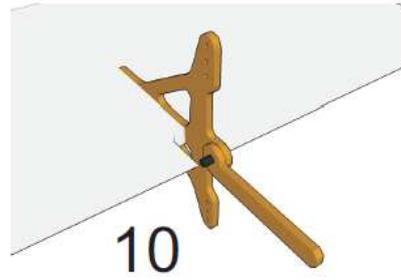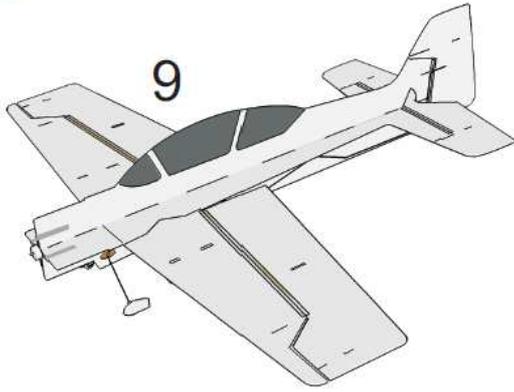AUW: 135 - 165g
Motor: any 18 to 25g type that can produce insane thrust ☺
Battery: 2s 330 to 450 mAh lipo
Servos: good quality 6 g servos (we have realized that the cheapest servos of obscure origin very often do not center well or have a "skipping" motion – if you want satisfactory results, do not try to save here). We prefer digital servos.
ESC: brushless, 8A or more (as light as possible)

RC factory

1

sharp knife!

~60°

10 to 15 mm clear tape

hinge bevels

2

carbon 3 x 0.5 x 80

top side of wing

carbon 3 x 0.5 x 780

recommended clear tape reinforcements

3

wrap around the trailing edge

4

nose

carbon strip 3x0,5x80mm

5

6

CA

CA

CA

axle joint

stopper

7

8

do not forget

9

10
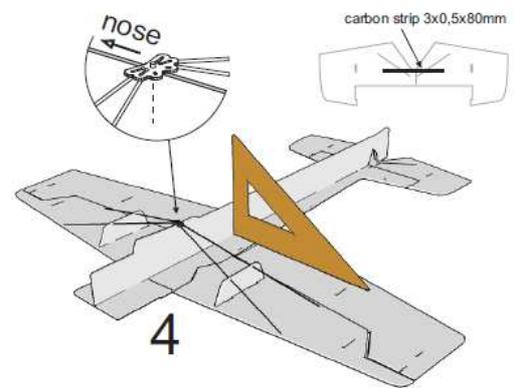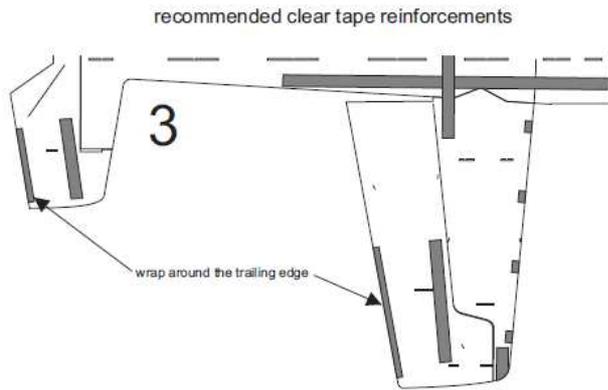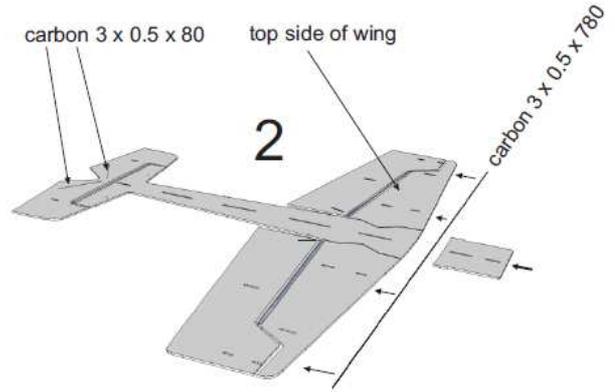
11

aileron tab 2x

cut here

SFG 2x

cut here

elevator tab 2x

cut here

rudder tab

cut here

12

carbon 1.2x180

CA

aileron
servo

13

center of
gravity

112 mm

wrap around
the edge

carbon 3x0.5x80

ca 20 mm

more clear tape reinforcements

CA

CA

14

EPP cowl

clear tape
reinforcement