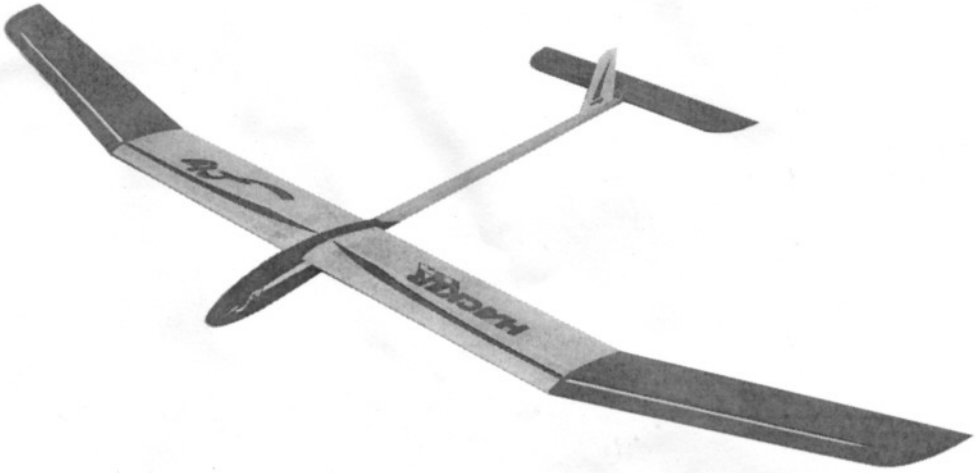
HACKER®
MODEL PRODUCTION

Kat.č./ No. 1107



Rozpětí/ Wingspan	**1440 mm**
Délka/ length	**760 mm**
Váha/Weight	**220 g**

Kluzák kategorie A1

fly

Glider F1H Category

Made in Czech republic by HACKER MODEL PRODUCTION

Hacker Model Production, Zahradní 465, 270 54 Řevničov, Czech republic
www.hacker-model.com, e-mail: info@hacker-model.com
Tel./Fax: +420 313 562 229, 562 258, 564 381

Seznam dílů

číslo dílu	název	materiál	kusů
1	Hlavice trupu	smrk 8x50x270	1
2	Nosník trupu	smrk 2x14x595	2
3	Bočnice trupu	dýha 50x270	2
4	Potah trupu	balsa 2x12x550	2
5	Žebro centroplánu	překližka 3x12x120	4
6	Opěra výškovky	překližka 1x18x30	1
7	Podložka výškovky	překližka 1x12x12	1
8	Ostruha	balsa 3x15x80	1
9,44	Rozpěrka nosníku	balsa 2x5x350	2
10	Směrovka	balsa 2x55x85	1
11	Kormidlo	balsa 2x17x85	1
12	Páka kormidla	překližka 1x7x20	1
13	Doraz kormidla	Al.plech 0,6x4x28	1
14	Vlečný háček	Ocelový drát	1
15	Výplň	balsa 1,5x20x50	1
16	Nosník křídla	smrk 2x5x370	8
17	Zdvojení nosníku	smrk 2x5x150 s úkosem	4
18	Nosník	smrk 2x3x370	8
19,51,59,60	Plastová trubička	2x1mm	1
20	Žebro křídla	balsa2,5x12x100	8
21	Žebro křídla	balsa 1,5x12x100	2
22	Žebro křídla	balsa 1,5x12x100	14
23	Žebro křídla	balsa 3x12x100	4
24	Žebro křídla	balsa 1,5x12x98	2
25	Žebro křídla	balsa 1,5x12x95	2
26	Žebro křídla	balsa 1,5x12x93	2
27	Žebro křídla	balsa 1,5x12x90	2
28	Žebro křídla	balsa 1,5x12x88	2
29	Žebro křídla	balsa 1,5x12x85	2
30	Žebro křídla	balsa 1,5x12x81	2
31	Žebro křídla	balsa 1,5x12x78	2
32	Výztuha lomení	překližka 3x10x70	2
33	Koncový oblouk	balsa 5x5x120	2
34	Náběžka	balsa 5x5,5x370	2
35	Náběžka	balsa 5x5,5x320	2
36	Odtokovka	balsa 2,5x15x370	4
37	Výplň středu křídla	balsa 1,5x80x90	1
38	Výkližek	balsa 3x30x60	1
39, 40	Potahový papír		1
41	Spojka křídel	ocelový drát 3x160	1
42	Spojka křídel	ocelový drát 2x60	1
43	Zdvojení nosníku	smrk 2x5x150	4
45	Nosník výškovky	balsa 2x3x360	3
46	Žebro výškovky	balsa 1,5x8x65	8
47	Žebro výškovky	balsa 14x8x65	1
48	Náběžka výškovky	balsa 3x3,5x320	1
49	Odtokovka výškovky	balsa 2,4x10x380	1
50	Koncový oblouk výšk.	balsa 3x3,5x130	2
52	Zátěž	olověné broky	1
53	Obtisk		1
57	Vlasec	0,3x1400 mm	1
58	Gumová oka	60 mm	5
62	Hliníková folie	30x30 mm	1
	Výkres		1

FLY Construction guide

FLY is a competition model of F1H category. Generally, all structures of your FLY are built directly over the full size plan. To ensure they do not stick to the plan either cover with plastic wrap or rub a wax candle over the areas where frame members meet.

Balsa cement or cyanoacrylate glue can be used for the majority of the balsa structure.

The following tools and materials will help in building:

1) A flat, soft wood board about 1´x 2´and about 1/2" thick.
2) Straight pins.
3) Plastic food wrap or wax candle.
4) Pliers, preferably long nose type.
5) A single edged razor blade or model knife.
6) A ruler.
7) A soft bristle brush about 1/4" wide.
8) Sandpaper, 200 grit or finer.
9) Balsa cement, or cyanoacrylate glue.
10) Clear cellulose dope.
11) White paint.
12) Cellulose thinner for brush cleaning.
13) Scissors.
14) Tissue paste.

GETTING STARTED

Tape the plan to your building board. Before starting construction, familiarise yourself with the various components in the kit. You may wish to run through the instructions and mark the balsa parts with their appropriate numbers.

CHECKING, ADJUSTING AND TRIMMING

You have taken a lot of time and effort to build your model, do not rush the last and most important part, adjusting and trimming before flying.

Firstly, hold the model facing you and ensure that the wings are flat along the bottom and not twisted or warped, also that the fin and elevator are straight and level. If any surface has been warped during construction, gentle application of heat with a hair dryer or heater will facilitate removal, it may be an idea to unglue the wing struts first if a large error has crept in reglueing after correction.

Balance

The centre of gravity of the model is shown on the plan, hold the model about one third of the way back from the forward edge of the wing, supporting it on your fingertips the model should be level, if the tail drops add lead shots to the nose. Add only enough weight to bring the model level.

Test flying

Choose a calm day and if possible an area with long grass. Always launch the model into the wind. First check the glide, hold the model as near the balance point as possible and launch firmly forward aiming about 20 feet in front of you. Do not adjust until you have made several attempts to ensure that you need adjustment. If the model stalls, that is, the nose rises up and the model falls to the ground, add lead shots to the head. If the nose falls quickly and the model dives into ground, take out lead shots.

1. Glue head **1** and spruces **2** as shown.Cut openings in formers **3,** copy and drill the holes for wires **41** and **42** according the holes in head. Glue formers **3** in place. When dry, sand them around.

2. Between the ends of spruces **2** glue former **9**. Glue in place balsa sheets **4**. Glue the tow hook **14** into the hole on the bottom of the fuselage. Do it exactly like shown on the drawing. Glue the pieces of 1,5 balsa into the rest of hole. For using a mechanical timer prepare the predrilled holes for its installation. Do the same for using the tow hook for whirling tow.

3. Sand to shape control horn **12** as shown. Sand to shape leading edge of vertical fin **10**. Send rudder **11** to the shape as shown. Cut into rudder **11** opening for the control horn **12**. Glue control horn in place as shown. Cut opening into vertical fin **10** for al band **13**. Put Al band **13** into place, fold as shown and glue using CA glue.

4. Make the tubes **39** and **40** for the piano wires from the strip of covering paper. Wind the strip of covering paper 80 x 100 mm round the wire of 3 mm. During winding add the glue. After winding move of the wire in the tube several times in order not to glue together. After approx.15 min you can take out the tube from the wire. Make the same way the tube for the wire of 2 mm from the strip of paper 30 x 70 mm. Make 3 pcs of both dimension.

5. Pass the piano wires **41** and **42** include tubes **39** and **40** through the holes in the fuselage. Put on them the ribs **5** from both sides and glue them with 5 min epoxy to the fuselage. Check the right position of the wires to the side of the fuselage. When dry cut out the overlapped ends of tubes.

6. In the rear side of the fuselage cut holes on the top for vertical fin **10** and from the bottom for the part **8** and glue them in place as shown. Glue on place plywood formers **6** and **7**. Join both parts **10** and **11** with strip of self adhesive tape **55**. The complete vertical fin **10** and tail edge **8** glue to the fuselage. Check the position of wires **41** and **42**, vertical fin **10** and part **6**.

7. Glue part **17** on the part **16** as shown.

8. Select a strip of performed trailing edge **36** and cut the notches for the ribs. Do the same way the notches into the trailing edge **49**.

9. On the building plan covered with polyethylene foil assemble the middle part of the wing. Put under spruce **16**, **18** and front part of trailing edge pieces of balsa as shown on the drawing and pin to the plan. Glue all ribs **20**, **21**, **22** and **23** in position on spar and trailing end notches. Glue and pin into place leading edge **34** and ledges **16** and **18** into notches of the ribs. After dry take out the part of wing from the board. The wing tips glue the same way. The ribs **23** are glued in the place of break in the middle and on the wing tips with obliqueness. The slant **7** grades you will assure by using former **61** which you are able to make according drawing from part of plywood or hard paper.

10. After cut off the overhanged ledges, leading and trailing edges, sand the wing tips as shown. Glue the rib **5** to the wing and drill the holes for the tubes **39** and **40**. The wires **41** and **42** put through the holes in head. Put tubes **39** and **40** on them and put the both part of wings on the tubes **39** and **40** and check their position, angle must be same on the both sides. Glue on the several points the tubes in the right position with CA glue to the ribs and spruces of the wing. Than glue the former **43** between the ribs and spruces of the wing. Fill in the space between the former **43** and gloves of the wires **39** carefully with epoxy. The short tubes **40** glue with epoxy to spruce **18**. Glue balsa 1,5 mm **37** between ribs **20** as shown. The space between the spruces **16** fill in and glue with spruces **44** made from balsa 2 mm.

11. In the ribs **23** make the holes for dihedral brace **32**. Check the fit of dihedral brace into each wing half. It should slide smoothly in until the center is reached. Test assemble the wing to assure that the fit of the brace allows the wing root edges to meet perfectly. Leading edges and trailing edges should meet exactly. Use sandpaper to eliminate any binding or to correct alignment. Smear slow setting (30 minute) epoxy on half of dihedral brace and slide it into one half. Coat the wing center faces with a very thin layer of epoxy and coat the other half of the wing brace. Slide the wing halves together until they meet and fit. Be sure that the dihedral brace stays centered. When dry sand the whole wing including the wing tips to shape as shown.

12. Glue the horizontal stabilizer by the same way like wing. When dry sand the horizontal stabilizer to shape as shown. Drill the slant hole of 2 mm for pin **51** in the middle rib **47** as shown. The pin glue with CA glue after covering and painting the horizontal stabilizer.

13. Sand smooth the entire structure to eliminate all rough edges and bumps. The laminates tail surrounds will need carrying with a knife to bring them down to the correct profile. The trailing edges should be sanded down to a near point and the leading edges rounded (similar to the wing section). Sand off the edges where the two surfaces hinge together. Give 2 coats of dope, sanding between each coat to seal the grain. In general, the grain of the tissue should run lengthwise on the piece being covered. Start by covering the top and bottom of both wings, sticking the tissue to the edge of the structure only and gently pulling out the wrinkles as you go. Take care not to warp the wings when pulling the tissue as any warps can be difficult to remove and will seriously affect the flying ability of your model. Shrink the tissue by spraying with water, This can be done with an atomiser or toothbrush. Spray one wing at a time, pinning it down to the building board as it dries. This prevents warps from creeping into the structure. When dry, give the wings a coat of clear dope.

14. Sand smooth the fuselage and give him a couple of coats of dope, sanding between each coat to seal the grain. The front part of fuselage as far as the fuselage spruce you can paint with colour dopes. In place where the fuse is placed glue the strip of aluminium foil **62** with 5 min. epoxy in order not to be burn up.

15. When dry lay the wing centre down on a flat surface, one panel at a time. The panel should lay perfectly flat. After that make the negatives on the both tip trailing edges. The ends you wrench carefully above the cooking stove and twist to correct position and cool. Check the negative on the flat board. The wing tip panel put on the flat board, both tip trailing edges must be high up 3 mm. Similarly, look for twists or curves in the stabilizer and make it perfectly straight.

16. On the right side of horn **12** fix the rubber ring **58**. Next end is fixed with the notches **19**. The vertical fin **11** is moved to the right side. The movement you can change by Al band **13**. On the opposite side of horn **12** is hanged the pushrod **57** which moving the vertical fin while trailing into the neutral.

17. The pushrod **59** hold the horizontal stabilizer in flying position. After the burning of rubber ring **58** the horizontal stabilizer will move approx. of 45 grades. The movement is done by distance **X** between 1 mm long tube 60 and tube 59.

18. The pushrod **57** is hold on tow hook **14** as shown. After finish of towing the pushrod **57** is free and rudder **11** move to the right side.

19. The centre of gravity is shown on the plan. Add only enough weight to bring the model level.

20. Test flying. Choose a calm day and if possible an area with long grass. Always launch the model into the wind. Hold the model as near the balance point as possible and launch firmly forward aiming about 20 feet in front of you. If the model stalls, that is, the nose rises up and the model falls to the ground, add weight to the head. If the nose falls quickly and the model dives into ground, take out weight.

21. Take off with pushrod is shown on drawing

Good luck with FLY wish you Hacker Model Production!