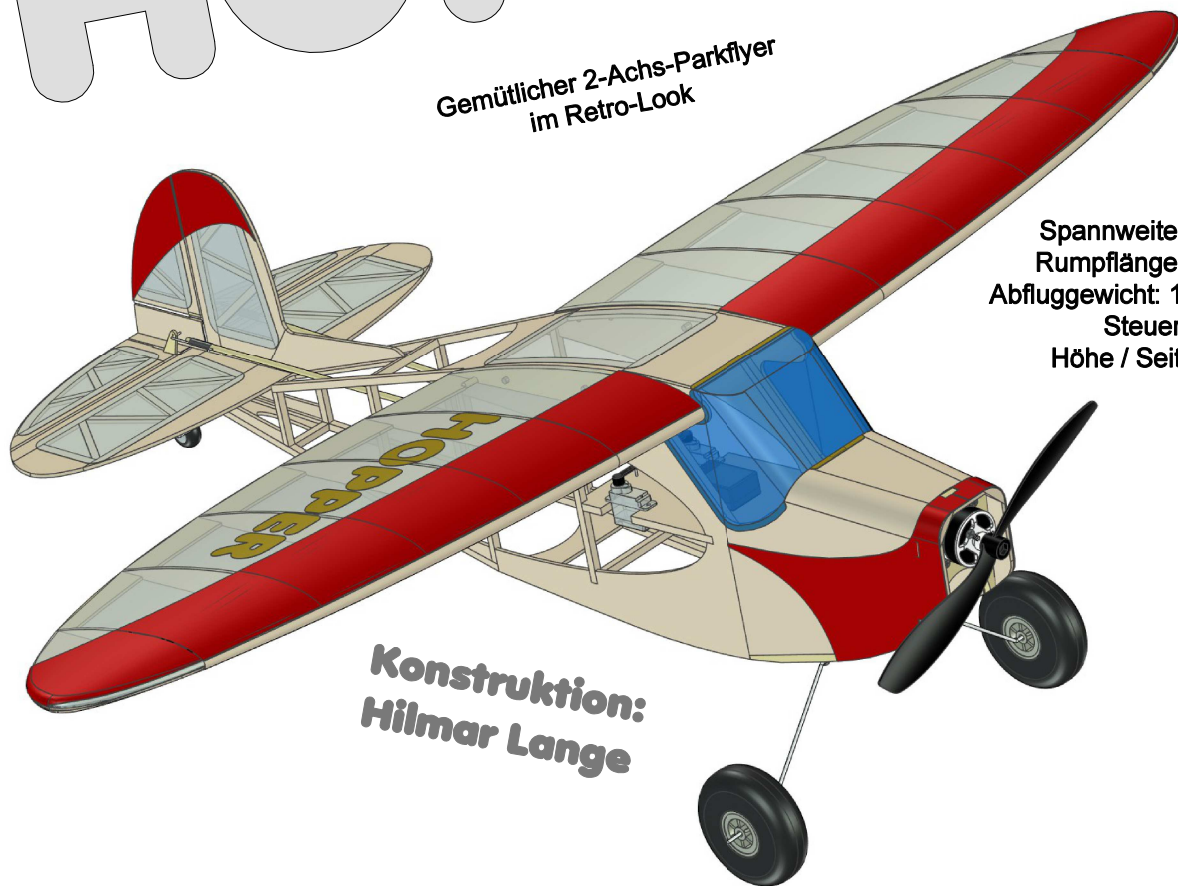


# HOPPER

Gemütlicher 2-Achs-Parkflyer  
im Retro-Look



Spannweite: 792 mm  
Rumpflänge: 572 mm  
Abfluggewicht: 170-190 g  
Steuerung über  
Höhe / Seite / Motor

Konstruktion:  
Hilmar Lange

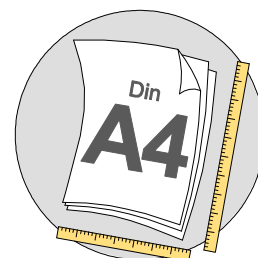
## benötigte Materialien:

Ø 0,8 mm Stahldraht (ca. 27 cm)  
Ø 1,5 mm Stahldraht (ca. 32 cm)  
Ø 1,5 mm Messingdraht (c. 6 cm)  
Ø 2 mm ABS-Rohr (innen-Ø 1 mm) (ca. 10 cm)  
Ø 4 mm Messingrohr (innen-Ø 3,1 mm) (ca. 20 cm)  
Ø 3 mm CFK-Stab oder Rohr (194 mm)  
Schrumpfschlauch Ø 4,8 mm (10 ~ 20 cm)  
8 Neodym-Stabmagnete Ø 3 mm x 6 mm  
6 Vlies-Scharniere  
4 Blechschrauben, ca. 9 x 2,6 mm  
1 Blatt Klarsichtfolie  
ORALIGHT Bügelfolie (Vorschlag: transparent und rot, jeweils 0,5 m)  
ORASTICK Bügelfolie für den Schriftzug (Vorschlag: orange)

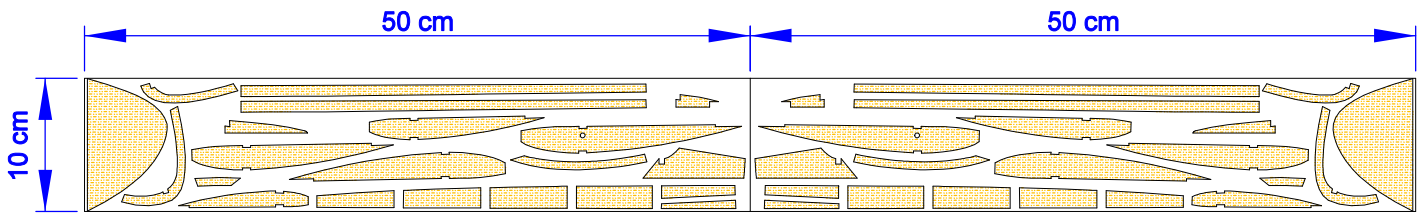
## RC-Komponenten / Bauteile:

2 Servos à 4,8 g, z.B. Hitec HS-40  
BL-Motor, 15 g / 2202-32 / 2300 KV  
Regler 12 Ampere  
Propeller 8x4" Slowfly  
(alles zusammen auch erhältlich als  
Antriebsset "Crack Wing" / RC-Factory)  
Empfänger mit mindestens 3 Kanälen  
2S LiPo 300 mAh  
Haupträder Ø 60 mm: Aero-Naut #735333  
1 Heckrad, Ø ca. 15-17 mm

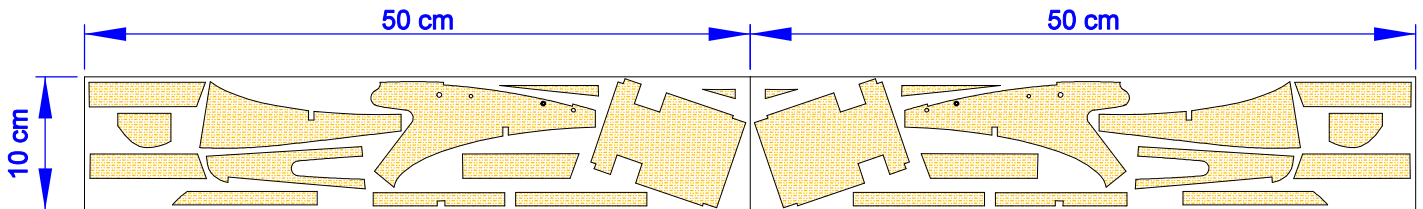
sowie Holz gemäß Auflistung auf Seite 2



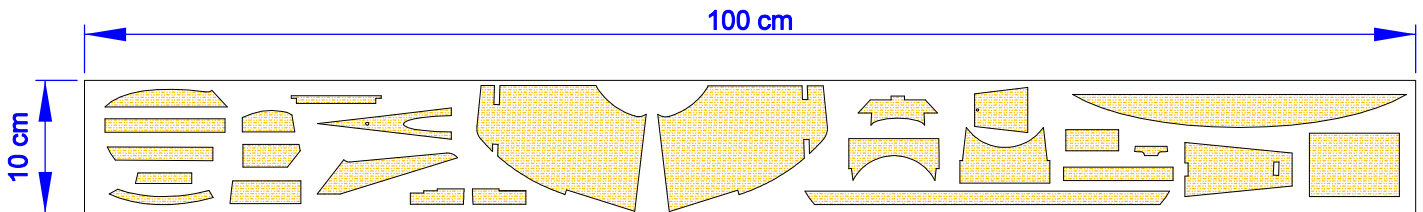
Holzbedarf bei platzsparender Teile-Anordnung:



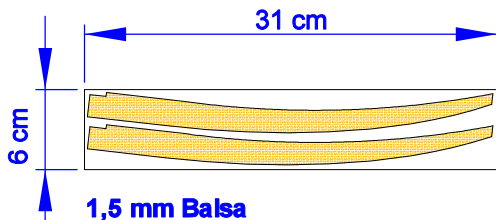
1 Brettchen 2 mm Balsa (mittelhart / ca. 20 g pro Brettchen)  
Tipp: die Bauteile sind zur Hälfte spiegelbildlich angeordnet.



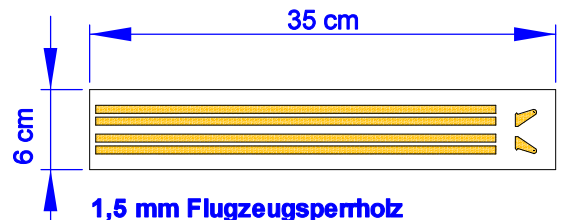
1 Brettchen 2 mm Balsa (mittelhart / ca. 20 g pro Brettchen)  
Tipp: die Bauteile sind zur Hälfte spiegelbildlich angeordnet.



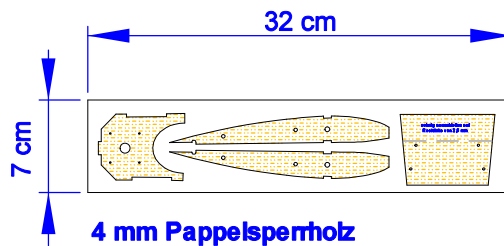
1 Brettchen 2 mm Balsa (mittelhart / ca. 20 g pro Brettchen)



1,5 mm Balsa  
(hart / ca. 40 g pro 1-m-Brettchen)



1,5 mm Flugzeugsperrholz



4 mm Pappelsperholz



□ 4x4 mm Balsaholzleisten, ca. 3 m

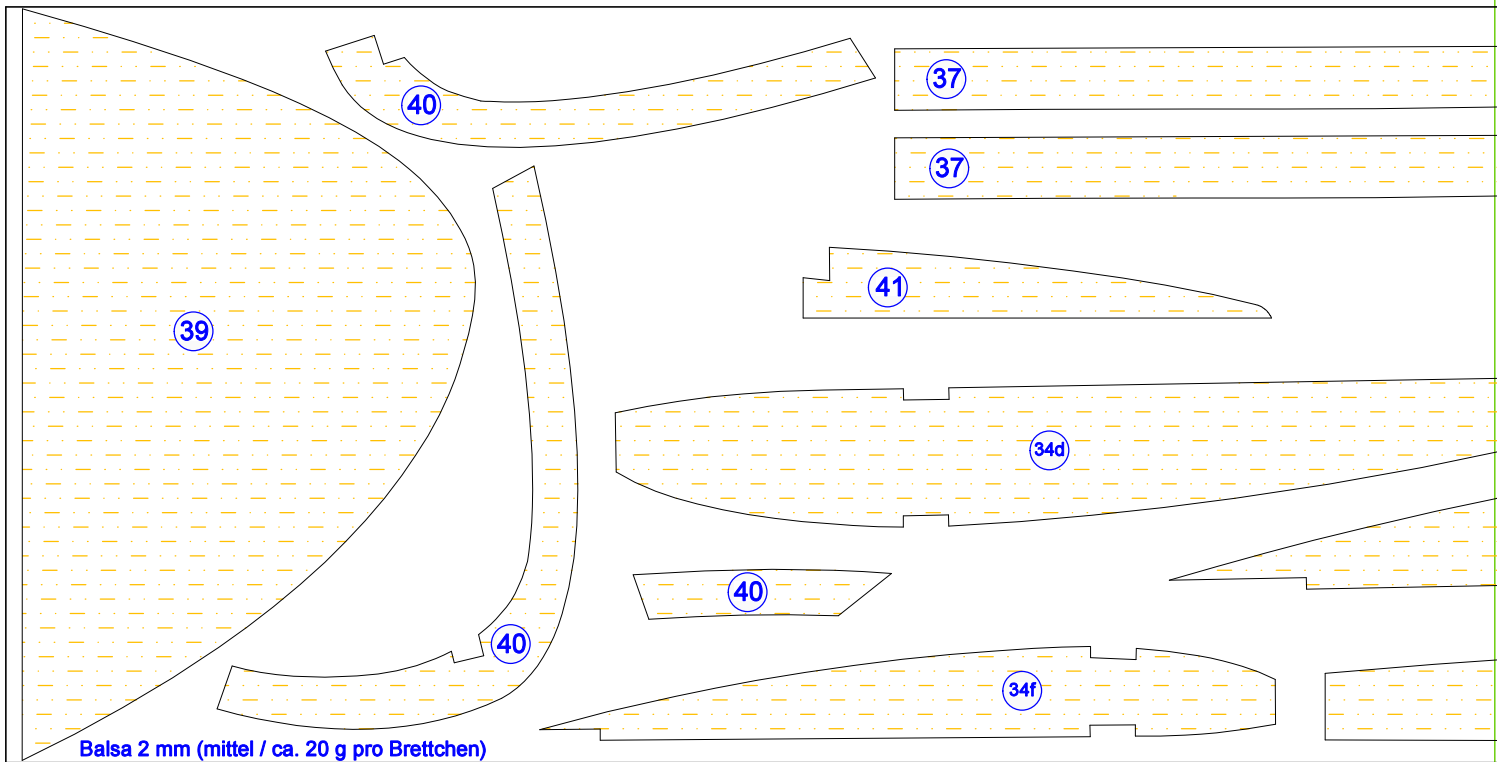


2x4 mm Balsaholzleiste, ca. 1 m



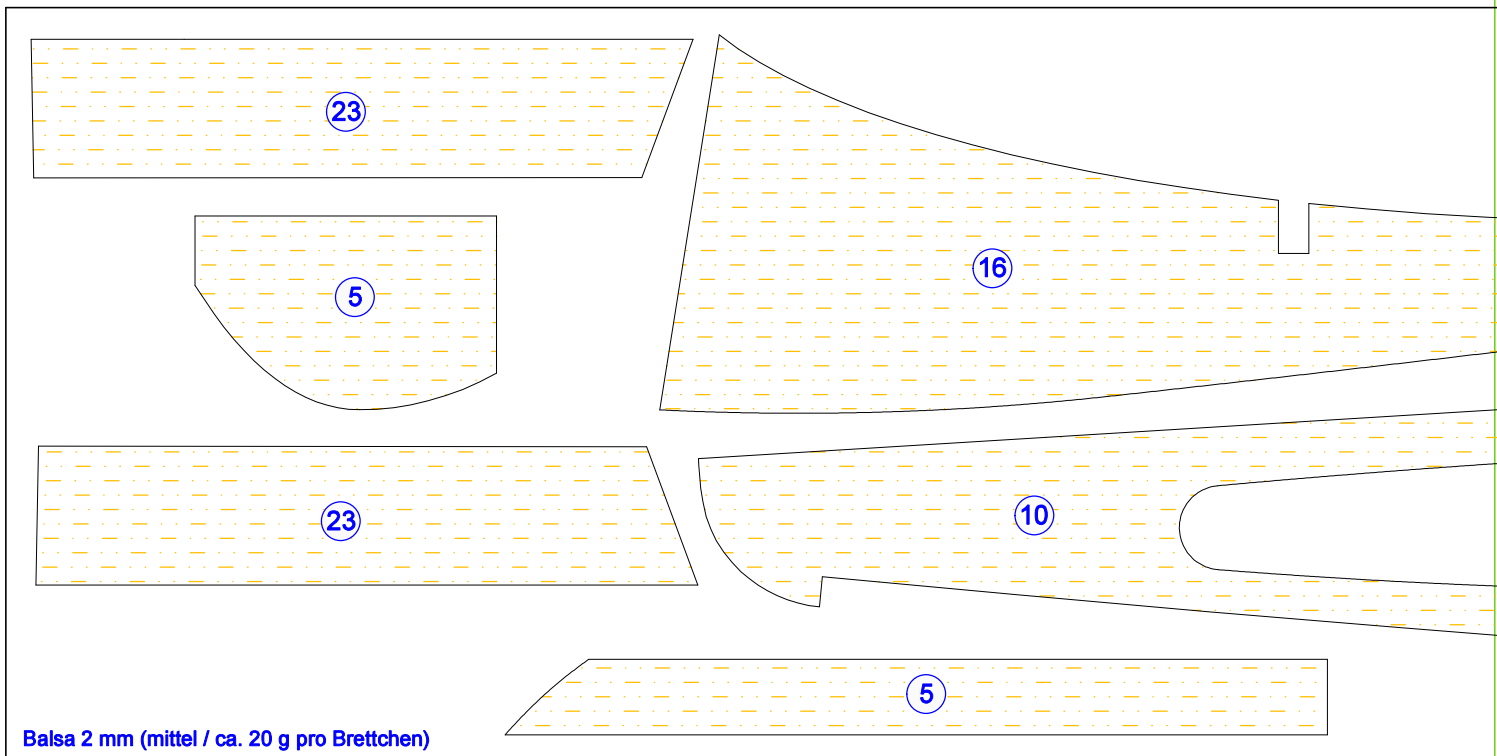
∅ 3 mm Holzrundstab, ca. 1 m

Kleben Sie die nächsten 5 Seiten (3-7) exakt an den grünen Linien zusammen. Schneiden Sie dann die 1m langen Streifen aus und heften Sie sie mit etwas Sprühkleber aufs Holz. Die Einzelteile werden dann mit einer frischen Klinge oder einer Bandsäge möglichst präzise ausgeschnitten. Lassen Sie das Papier zwecks Identifikation des jeweiligen Teils bis zum späteren Einbau auf dem Holz.

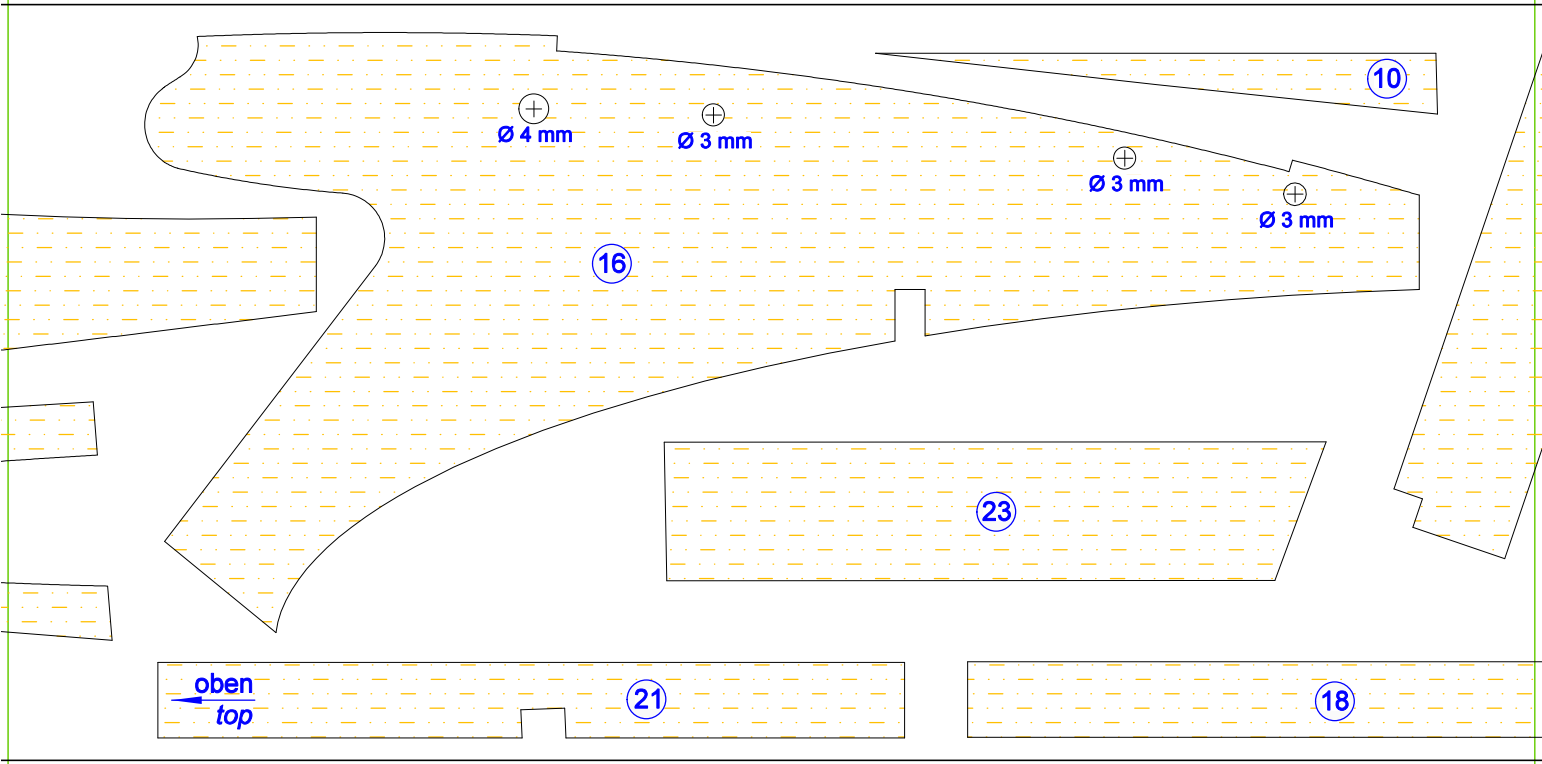
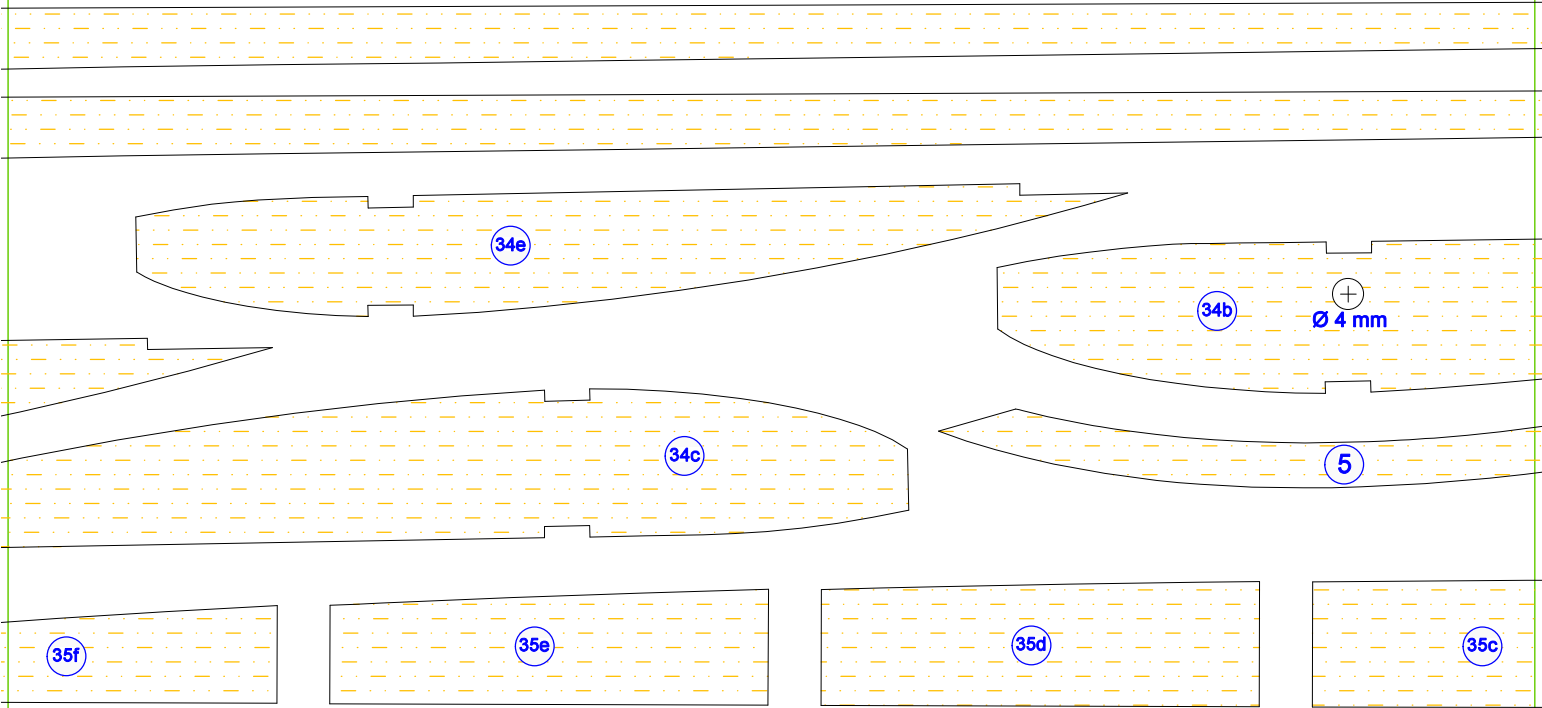


Jedes Bauteil besitzt eine Nummer, die dem dazugehörigen Baustufenfoto entspricht. Am Besten sortieren Sie die Teile nach dem Aussägen zu ihrer passenden Bauplanseite.

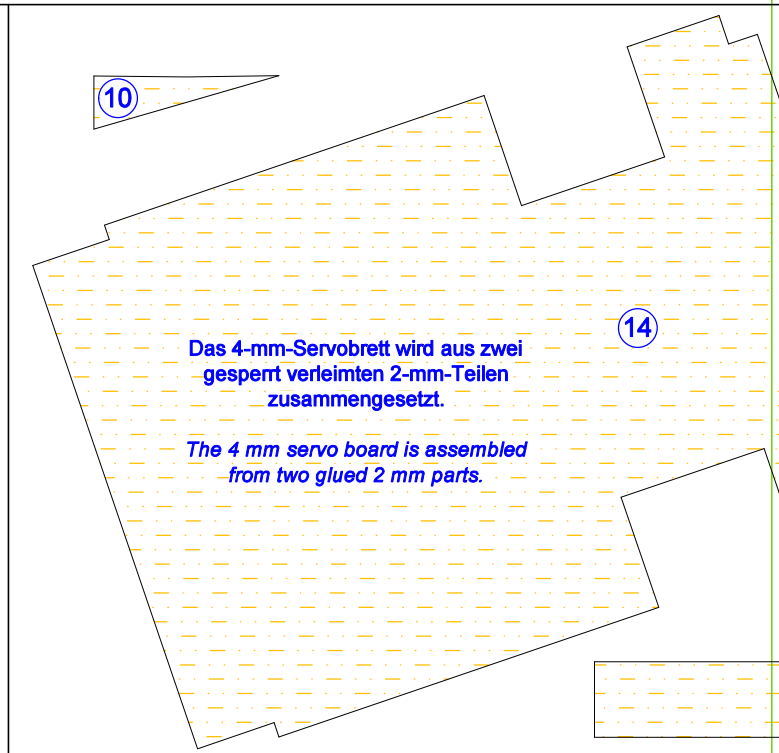
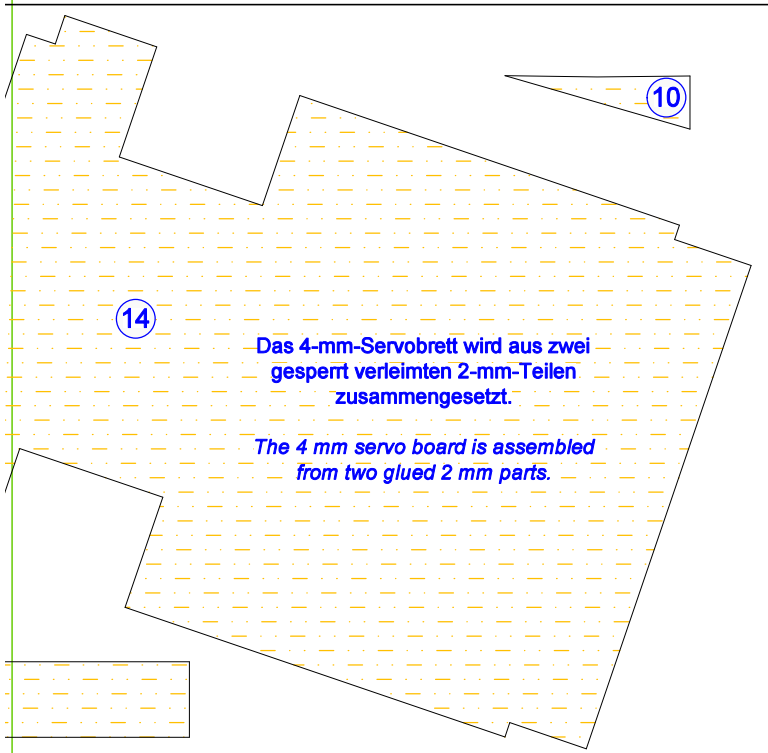
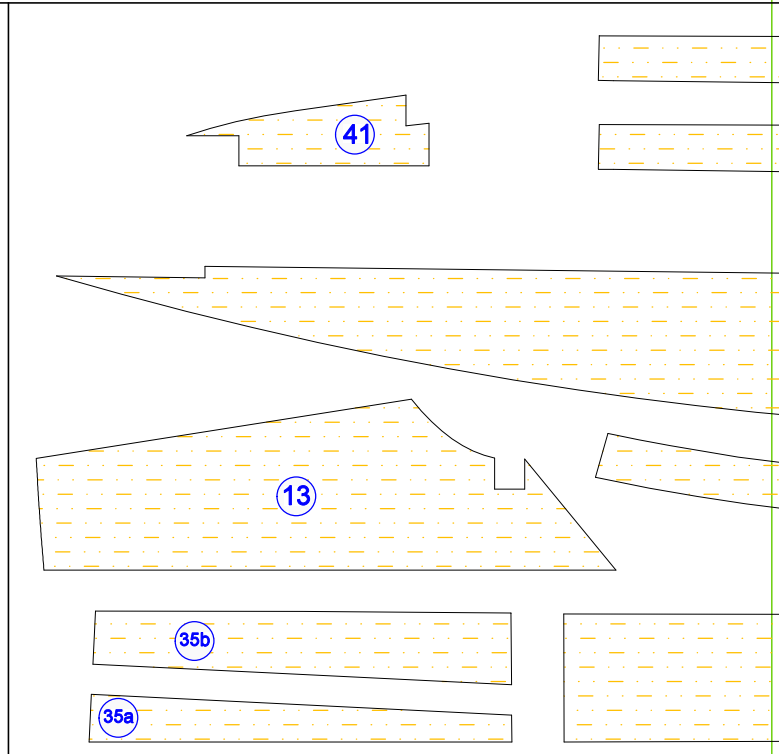
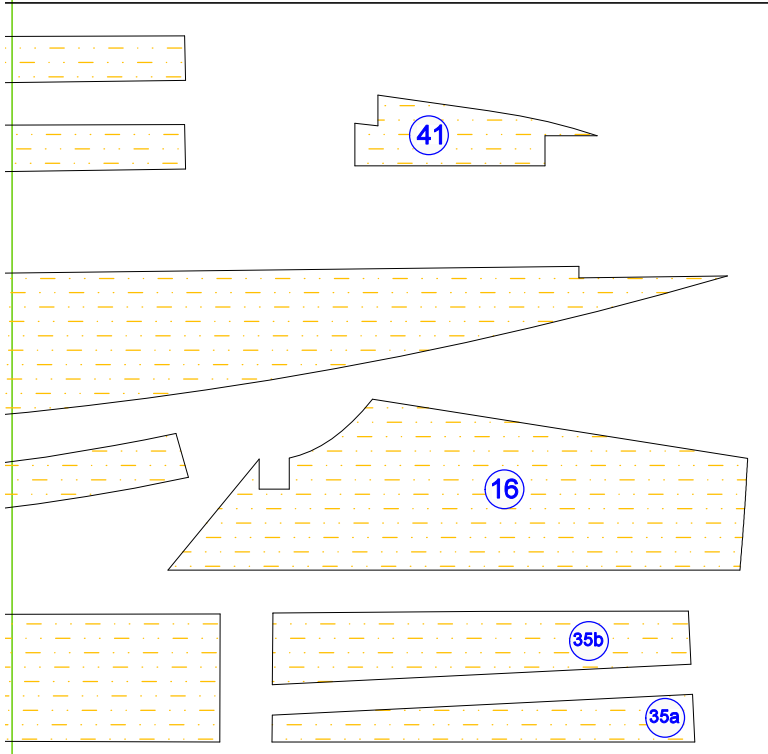
*Each part has a number that corresponds to its construction stage picture. It is best to sort the parts after sawing them out to their matching page of the plan.*



Tape these 5 pages (3-7) together exactly along the green lines. Then cut out the 1m long strips and attach them to the wood with a little spray glue. The individual parts are then cut out as precisely as possible with a fresh blade or a band saw. Leave the paper on the wood for the purpose of identifying the respective part until later installation.







⊕  
Ø 4 mm

34b

34e

5

34c

35c

35d

35e

35f

10

⊕  
Ø 3 mm

⊕  
Ø 3 mm

⊕  
Ø 3 mm

⊕  
Ø 4 mm

13

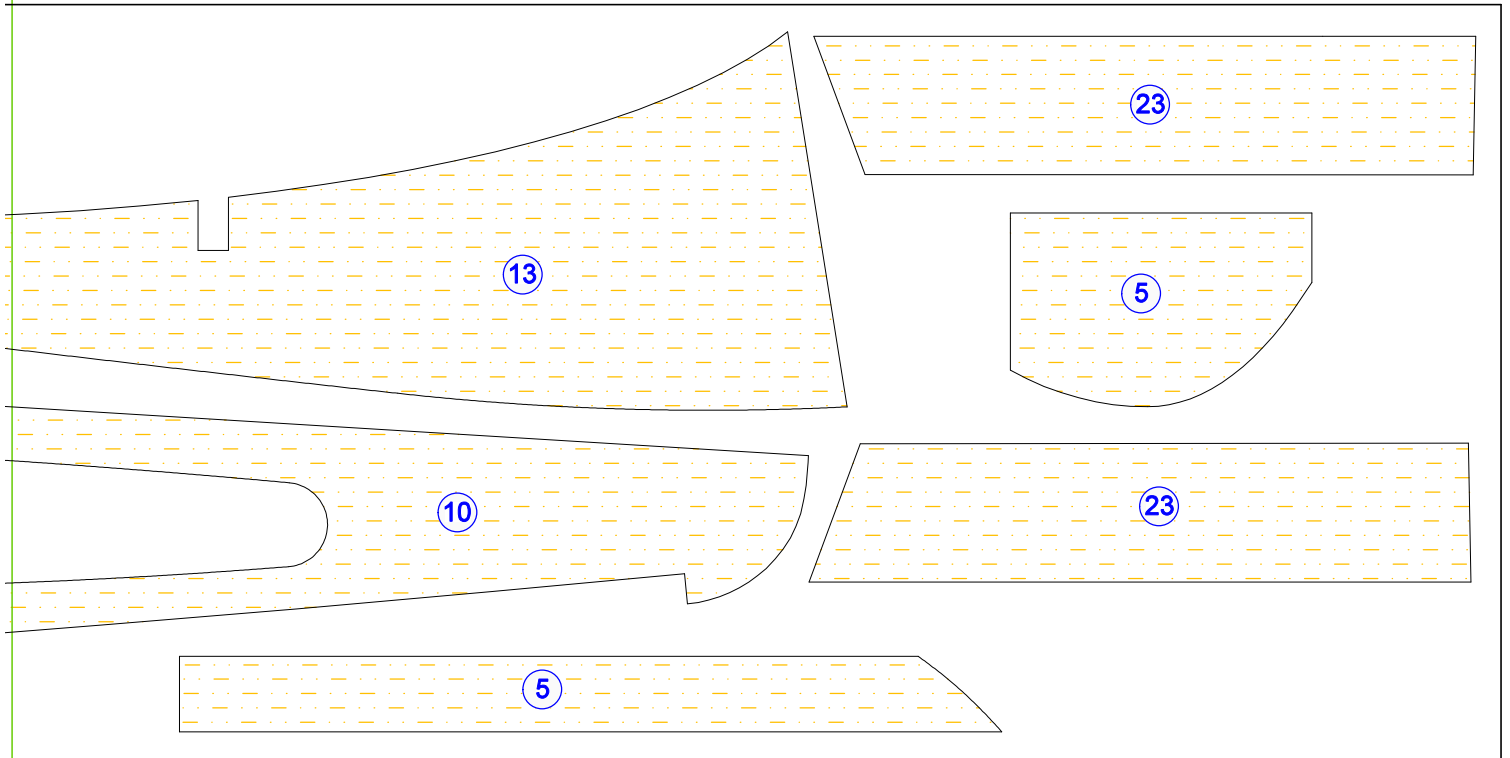
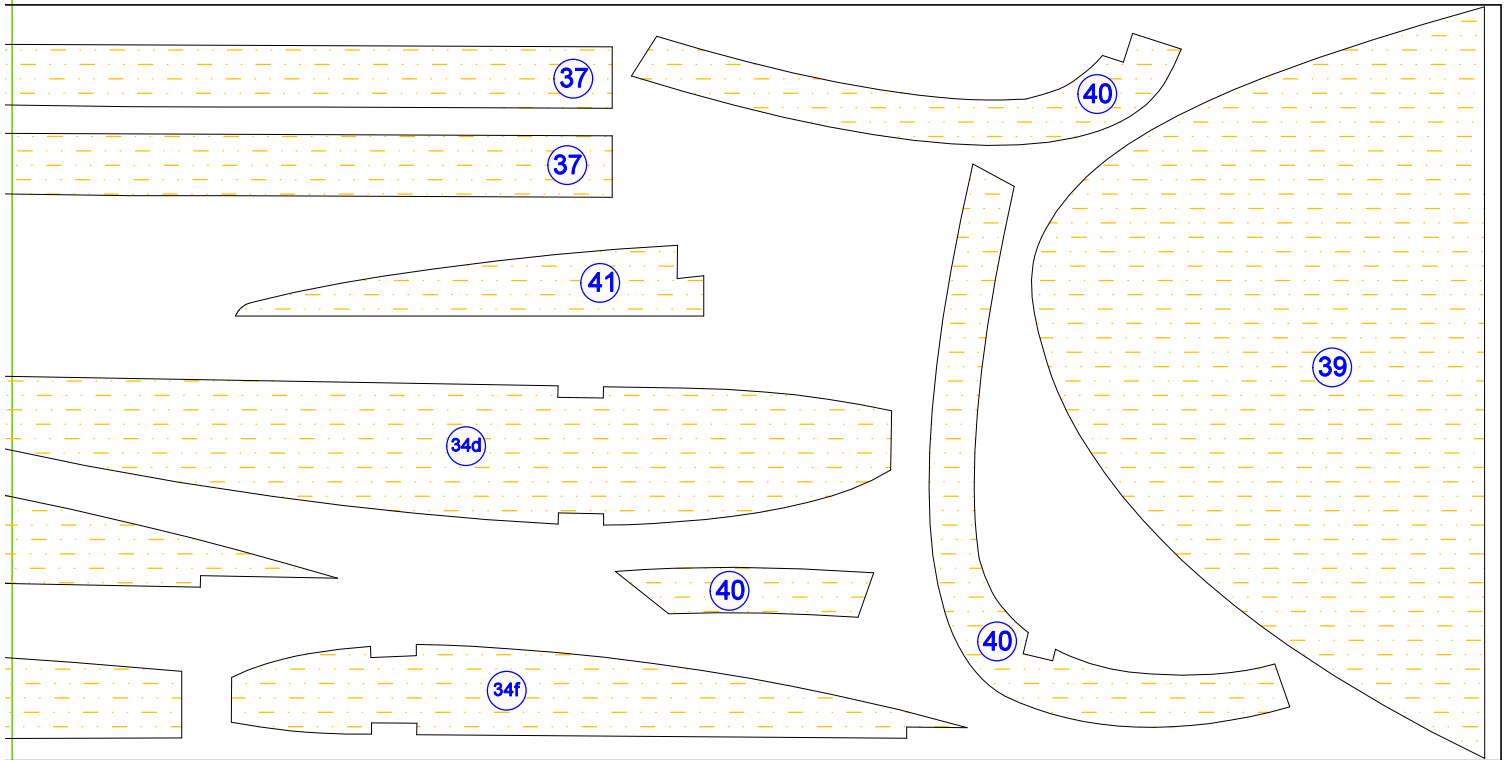
23

18

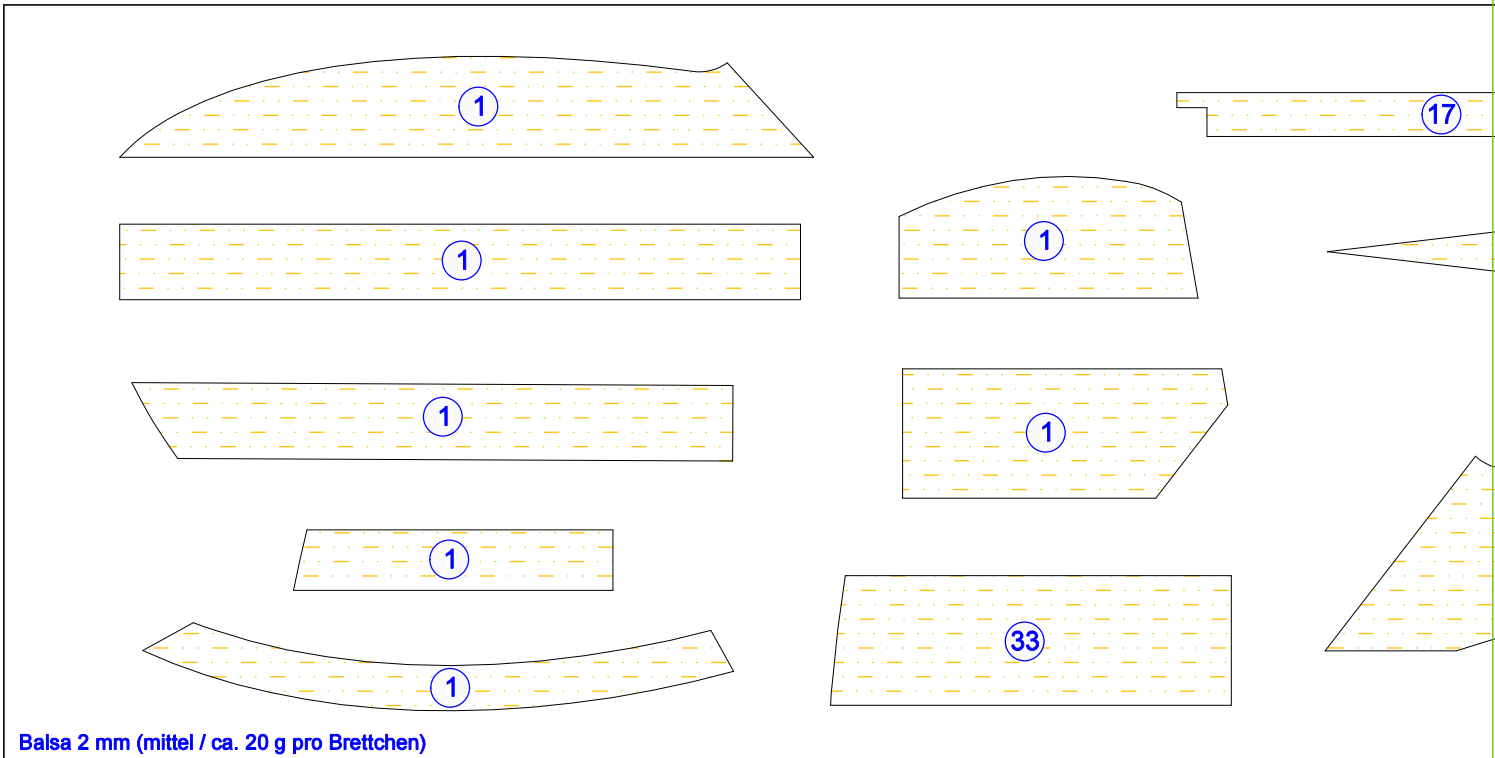
21

oben  
top →



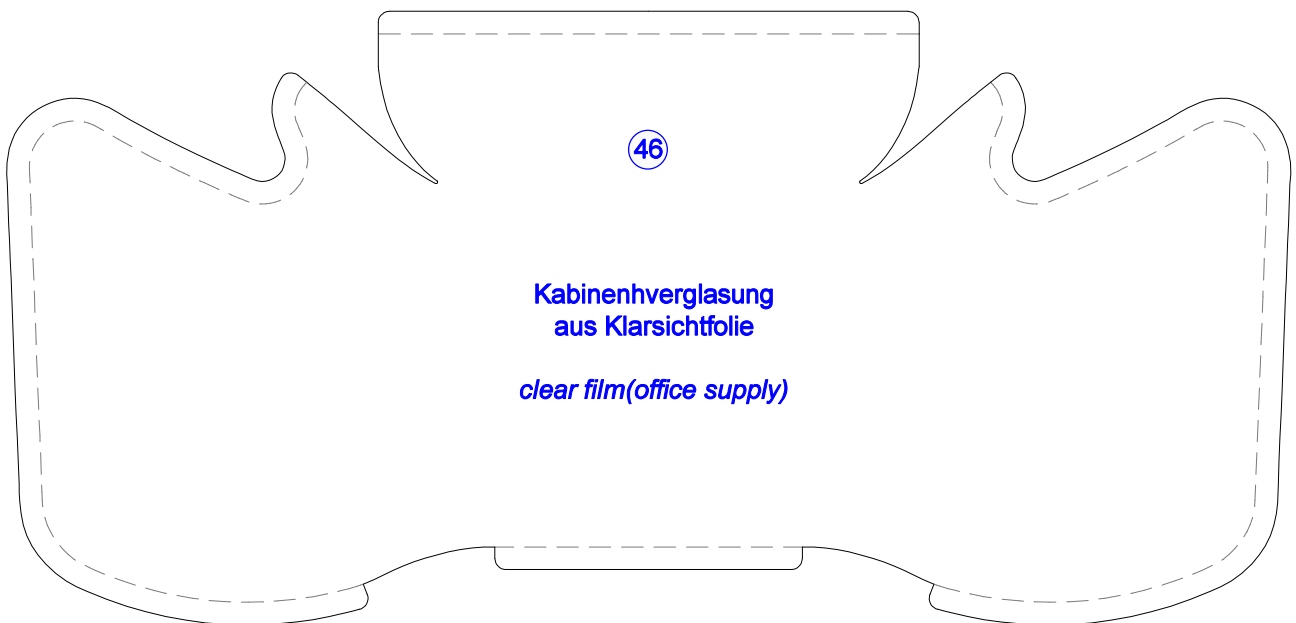


Kleben Sie die nächsten 5 Seiten (8-12) exakt an den grünen Linien zusammen. Schneiden Sie dann die drei Streifen aus und heften Sie sie mit etwas Sprühkleber aufs Holz. Die Einzelteile werden dann mit einer frischen Klinge oder einer Bandsäge möglichst präzise ausgeschnitten. Lassen Sie das Papier zwecks Identifikation des jeweiligen Teils bis zum späteren Einbau auf dem Holz.

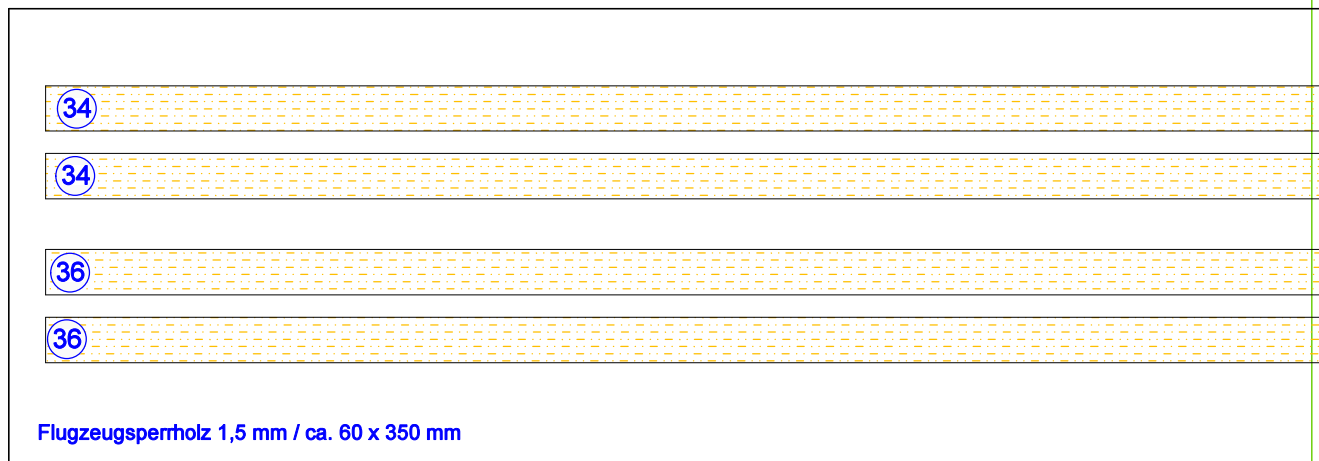
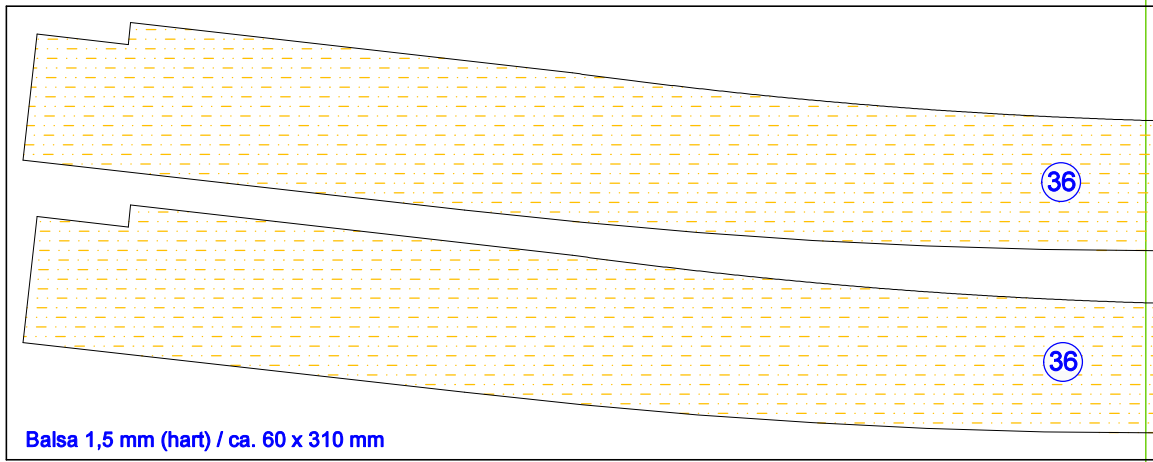
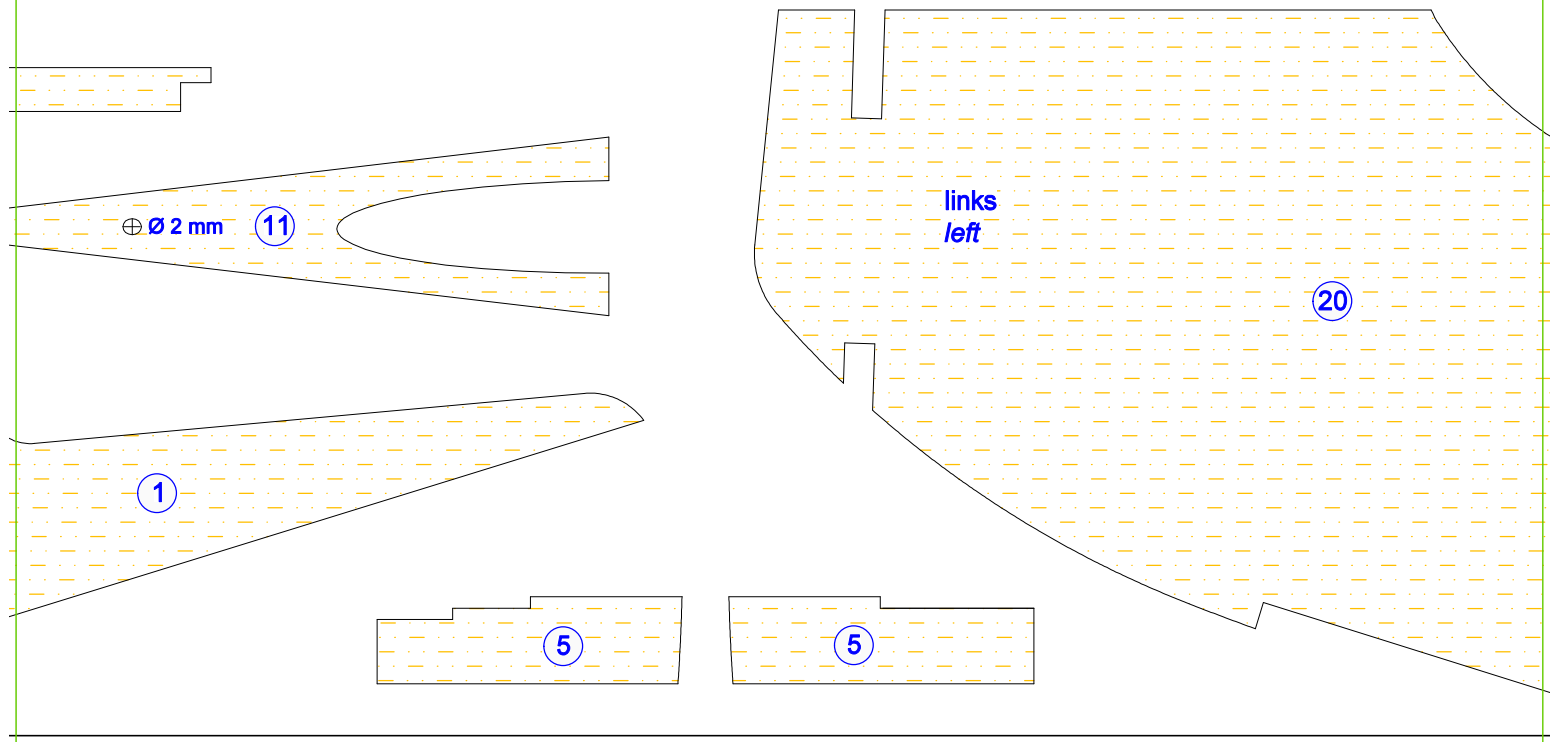


Jedes Bauteil besitzt eine Nummer, die dem dazugehörigen Baustufenfoto entspricht. Am Besten sortieren Sie die Teile nach dem Aussägen zu ihrer passenden Bauplanseite.

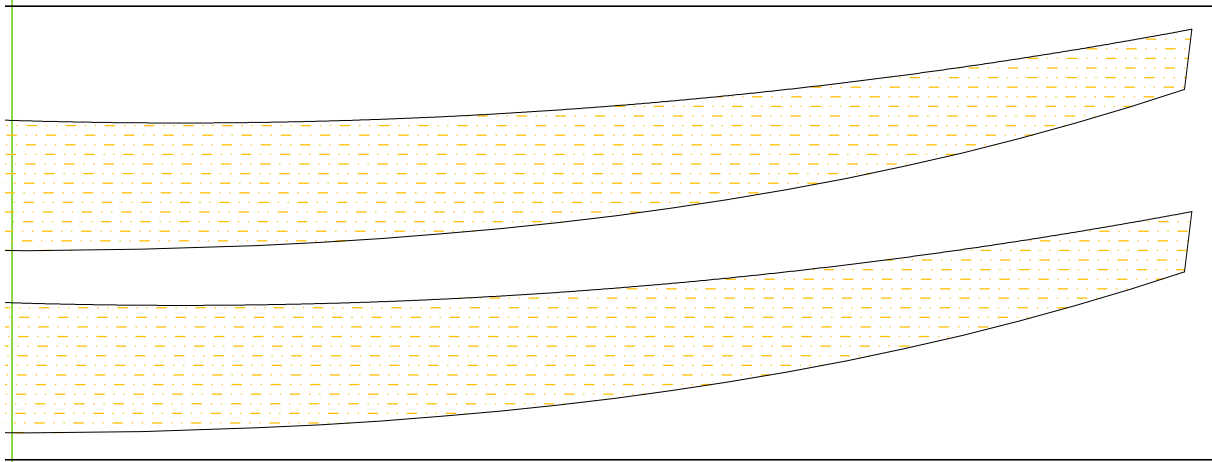
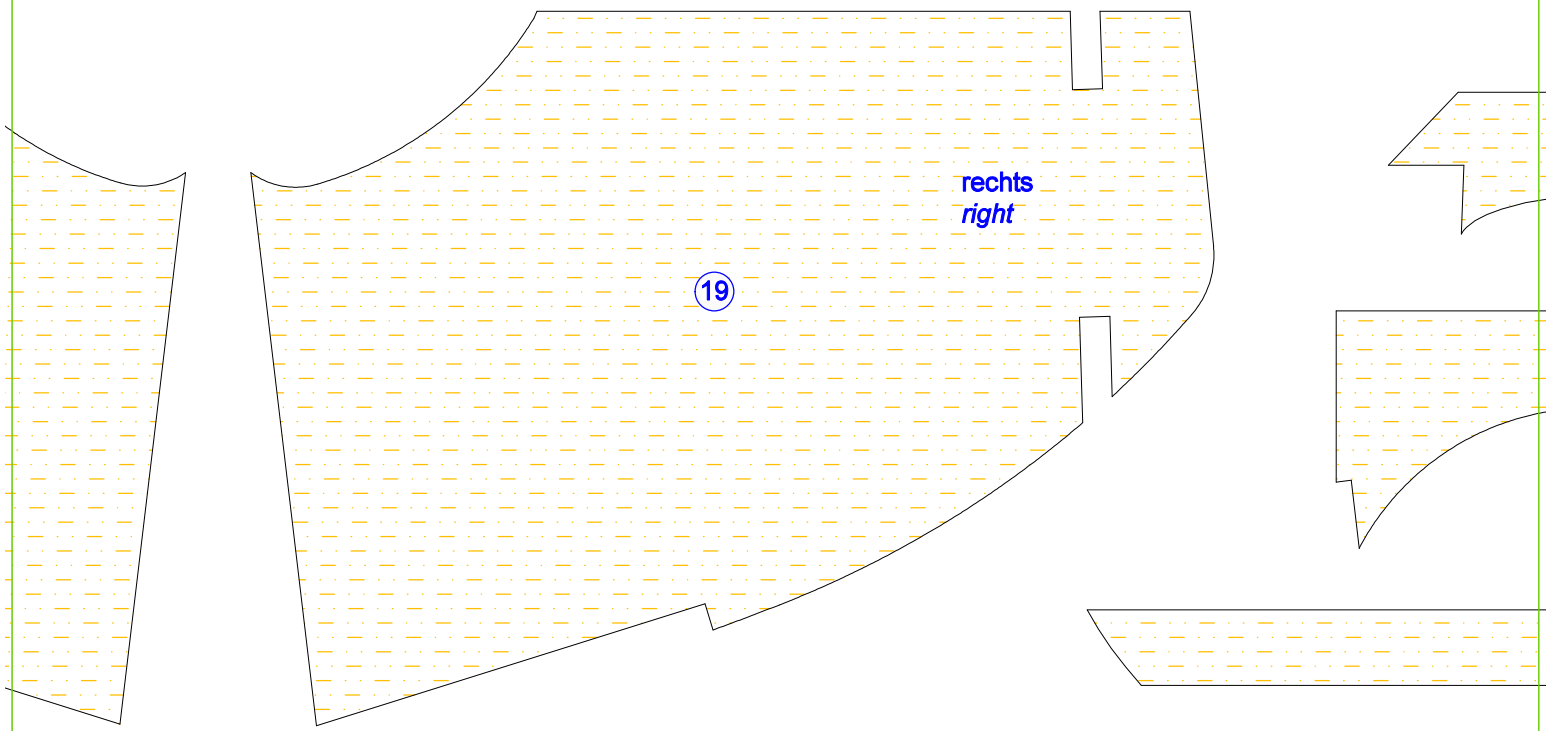
*Each part has a number that corresponds to its construction stage picture. It is best to sort the parts after sawing them out to their matching page of the plan.*



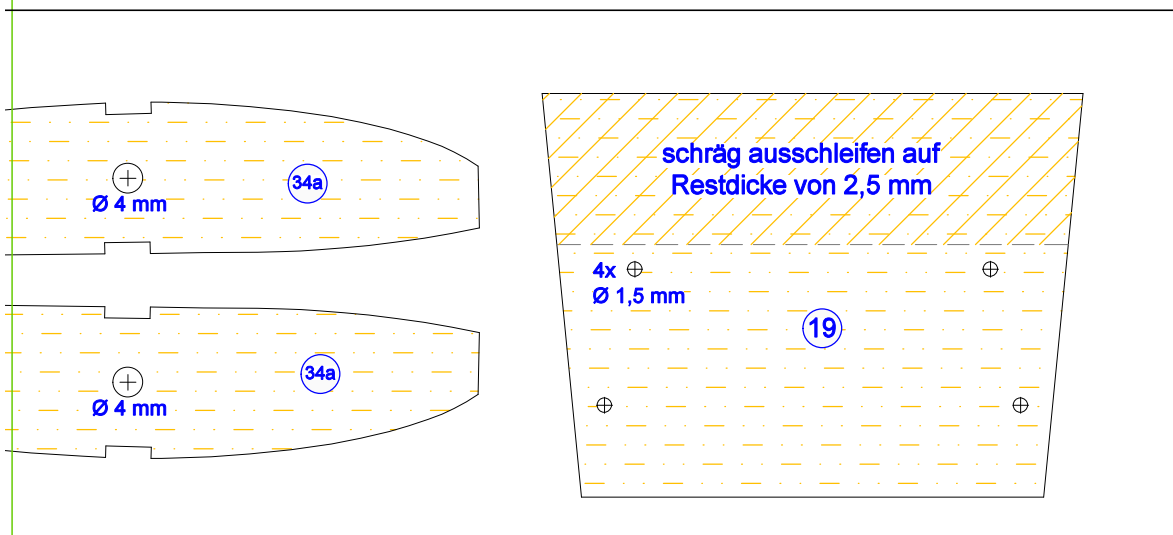
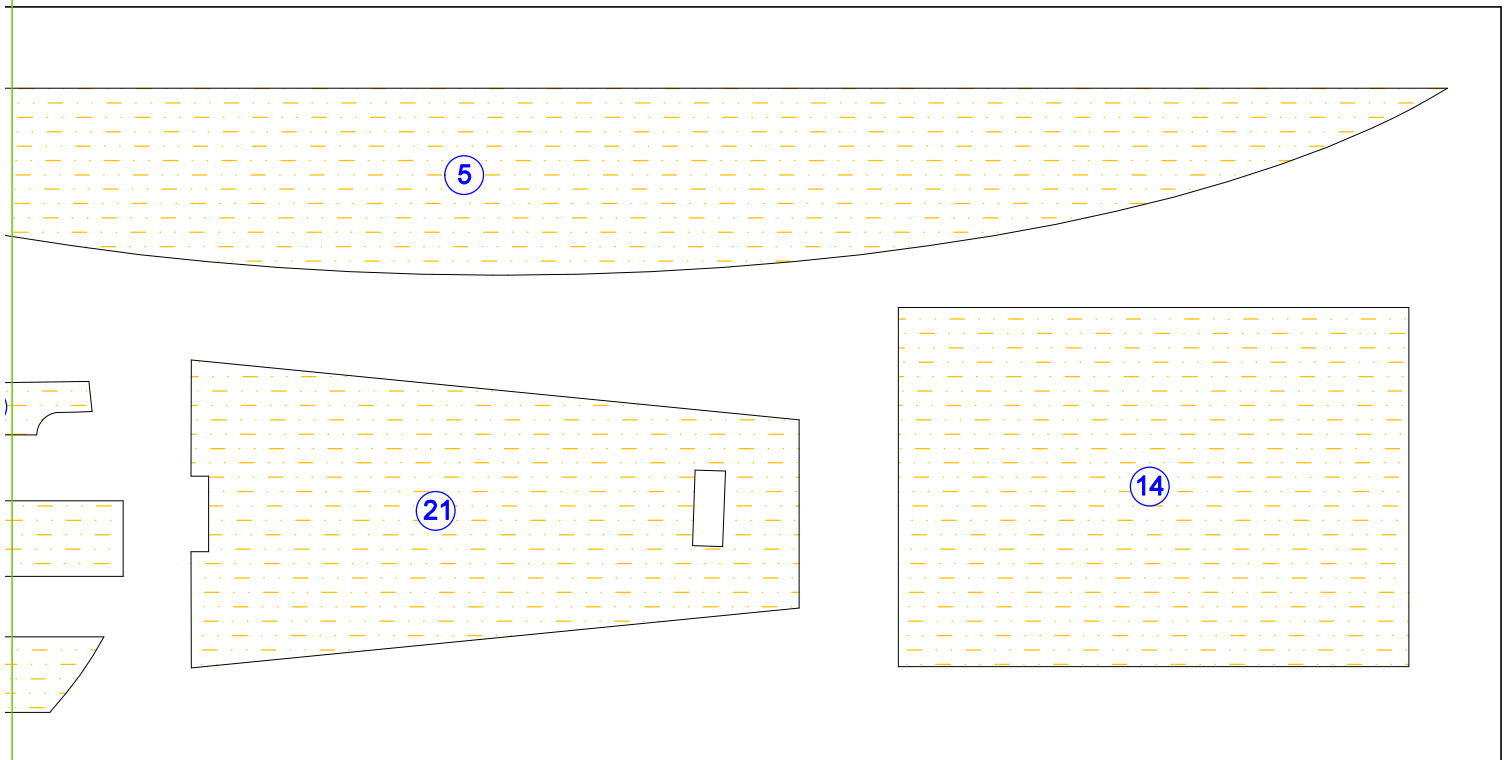
Tape these 5 pages (8-12) together exactly along the green lines. Then cut out the 1m long strips and attach them to the wood with a little spray glue. The individual parts are then cut out as precisely as possible with a fresh blade or a band saw. Leave the paper on the wood for the purpose of identifying the respective part until later installation.





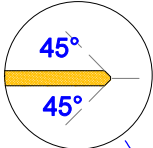
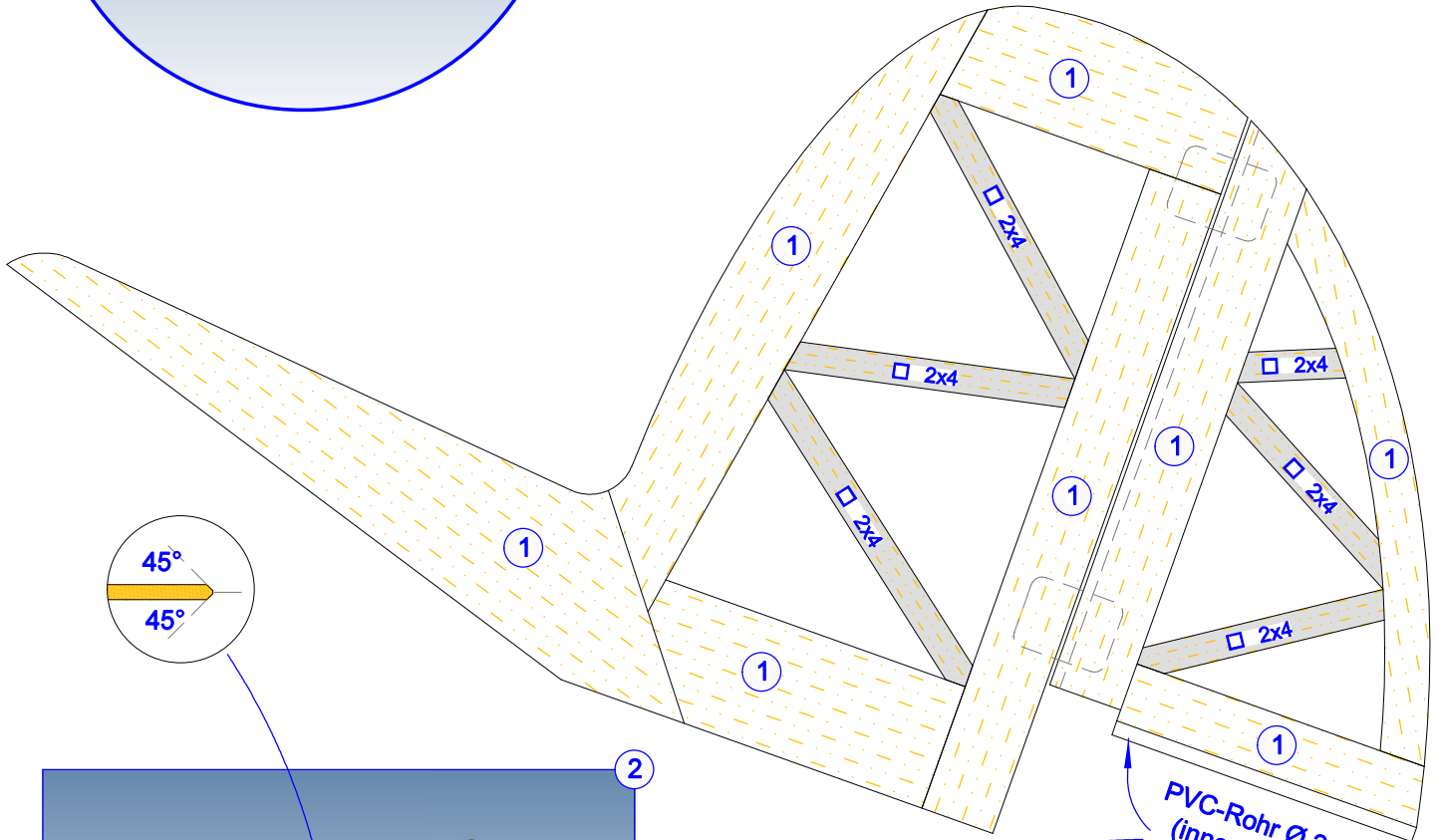
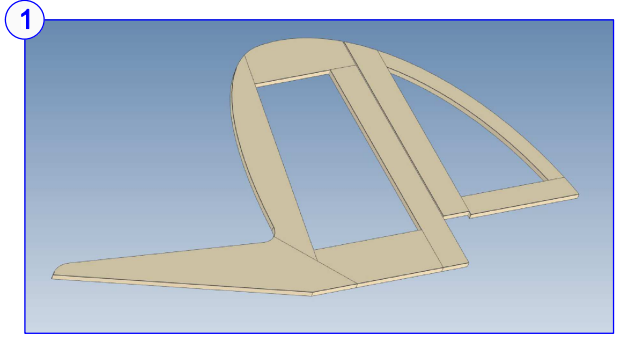
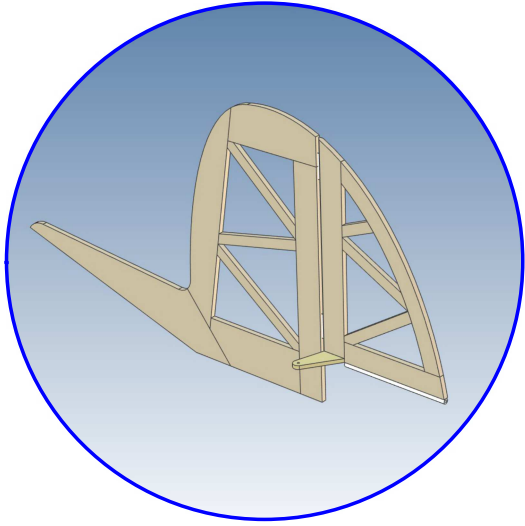




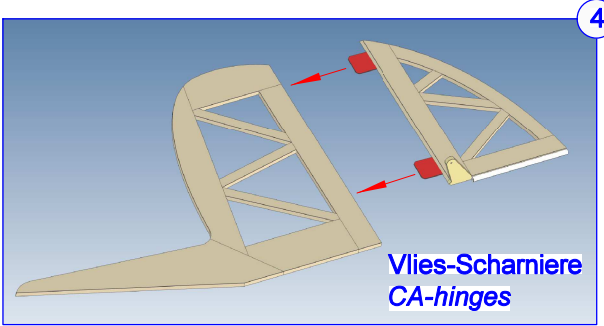
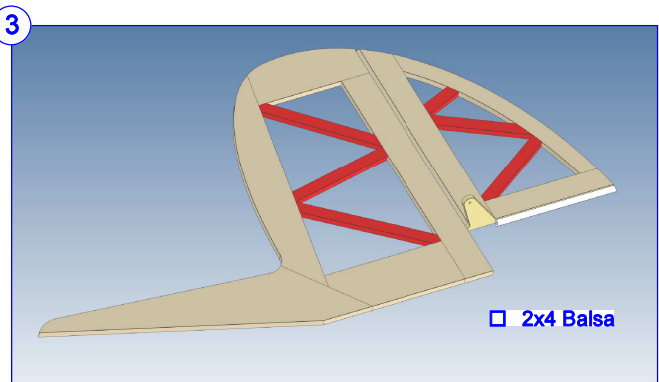
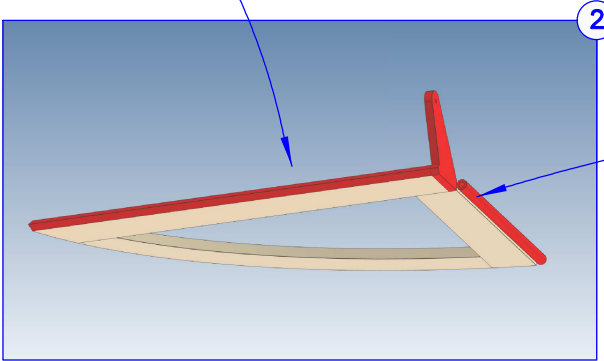


Setzen Sie die vier Bohrungen in Bauteil (19) erst **nach** dem Biegen des Fahrwerksdrahtes (S. 30/31), damit Sie sie genau in die Eckpunkte des Drahtes bohren können.

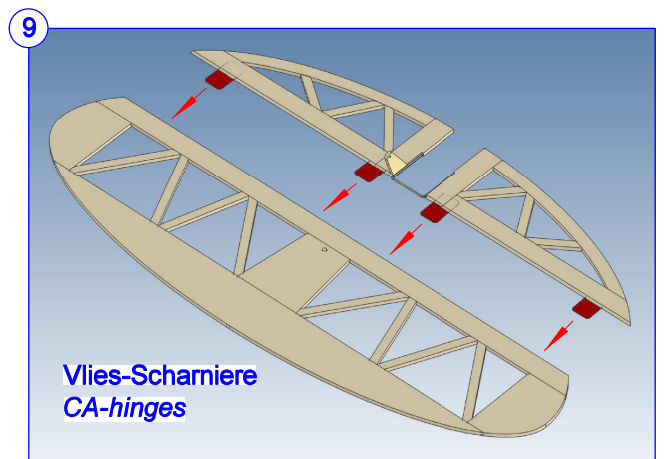
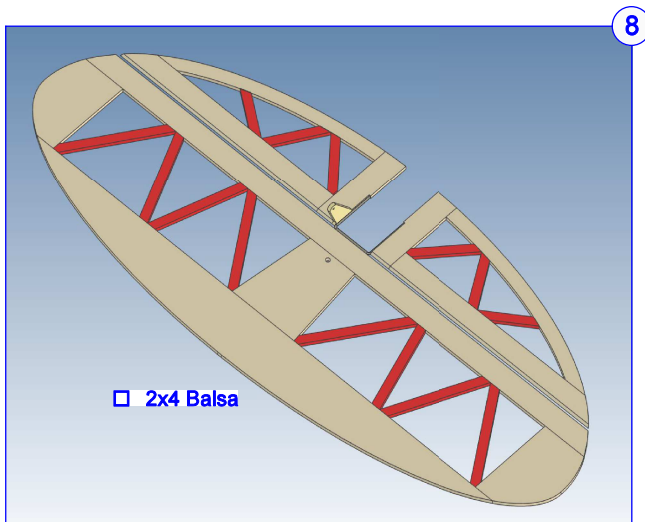
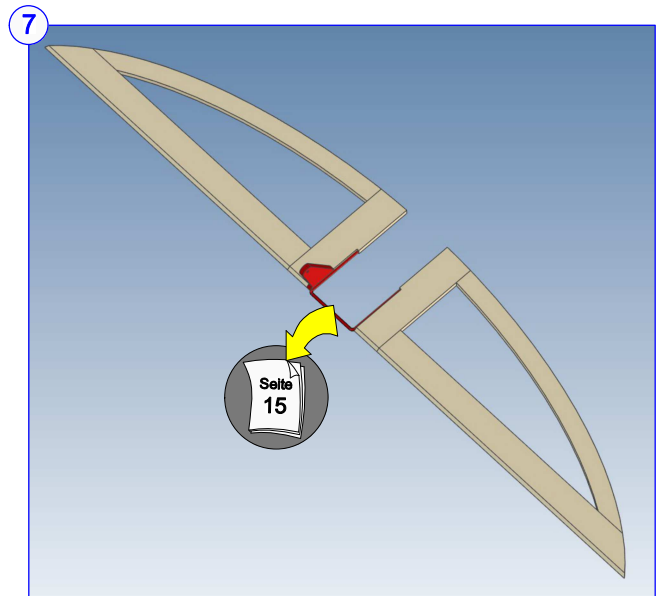
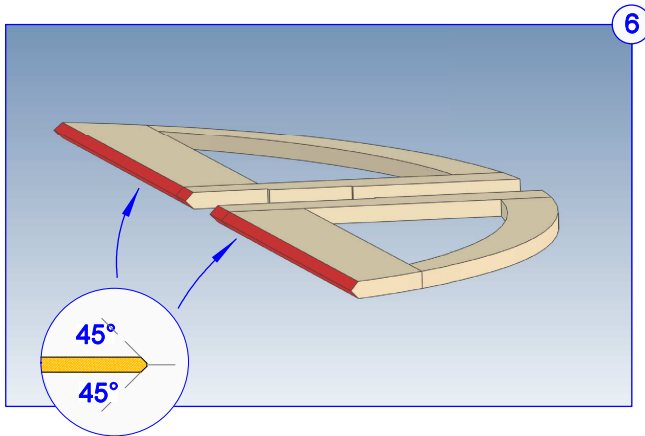
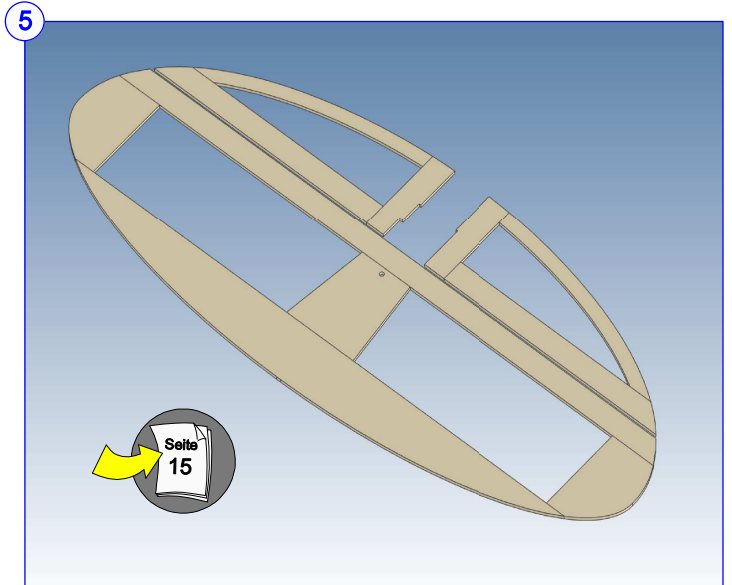
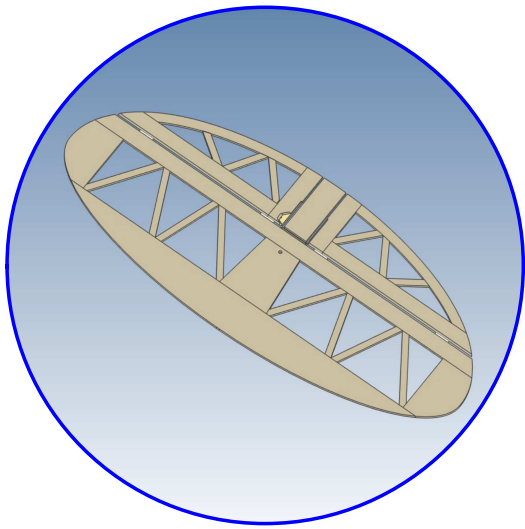
*Place the four holes in part (19) **after** you have bent the gear wire (page 30-31) so that you can drill them exactly into the corner points of the wire.*



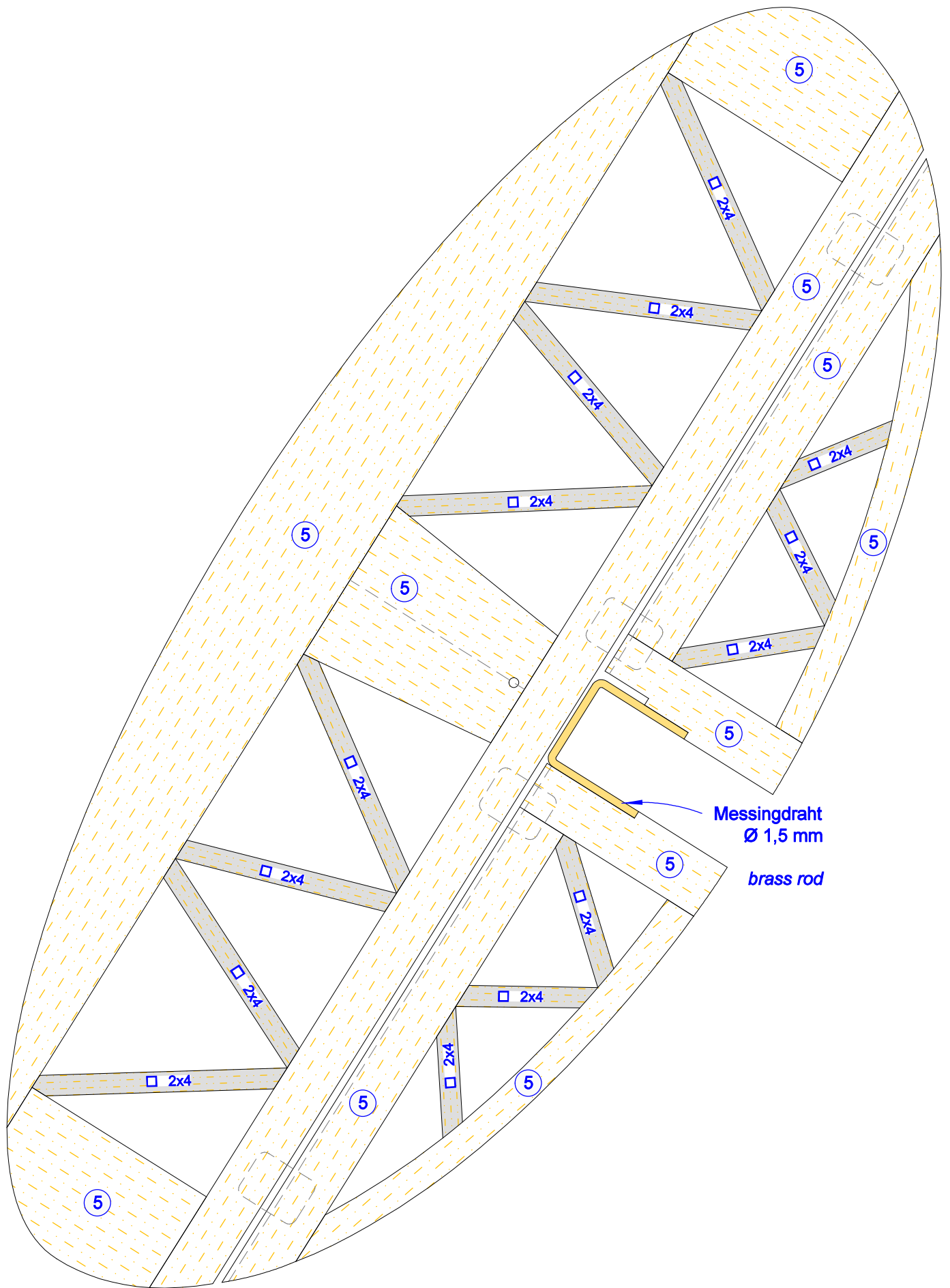
PVC-Rohr Ø 2 mm  
(innen-Ø 1 mm)  
PVC-tube



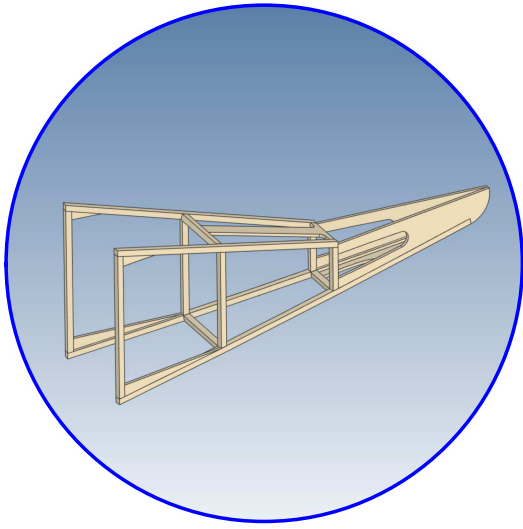
Vlies-Scharniere  
CA-hinges



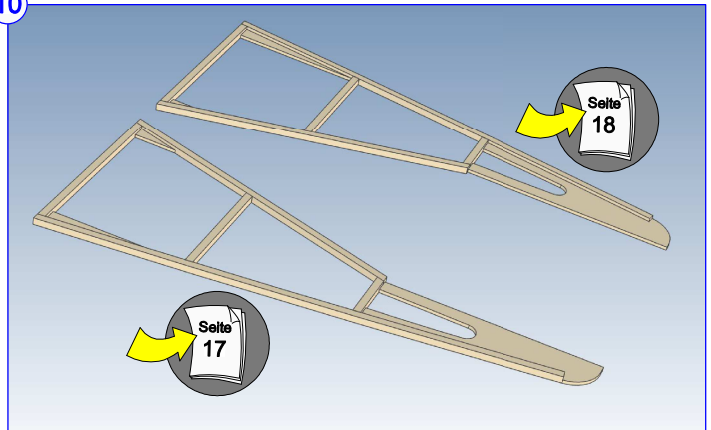




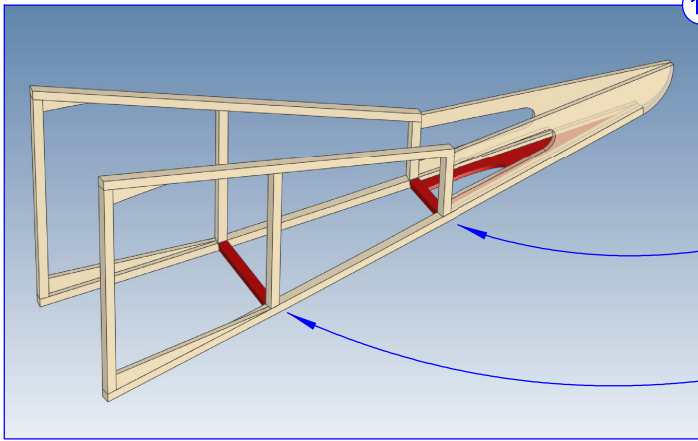
Messingdraht  
 Ø 1,5 mm  
 brass rod



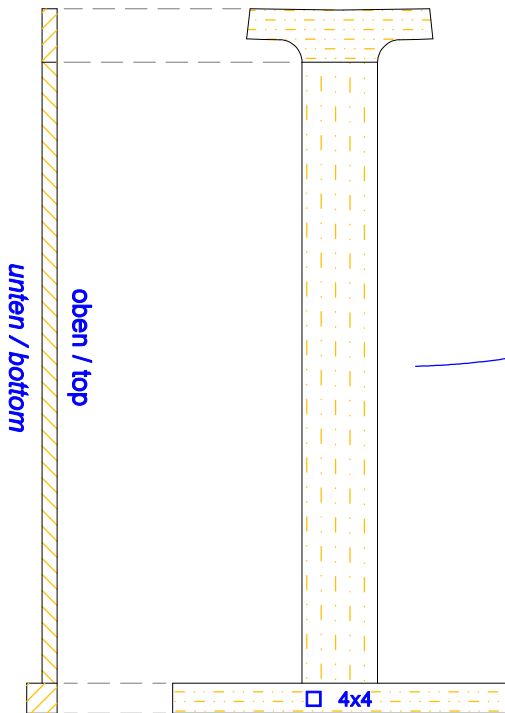
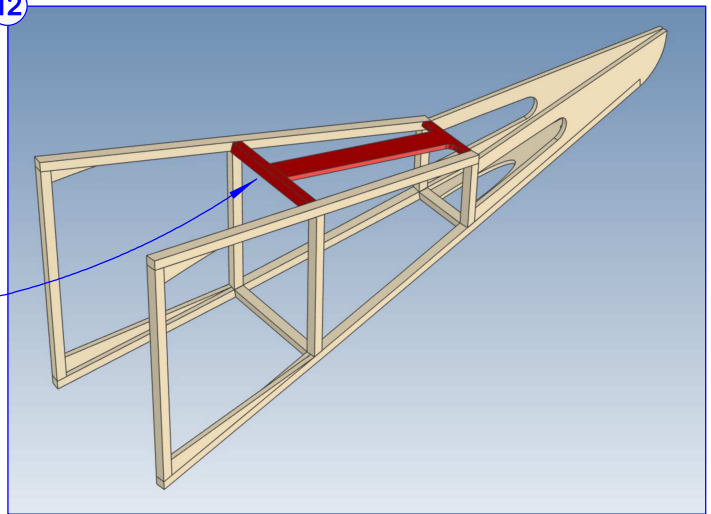
10

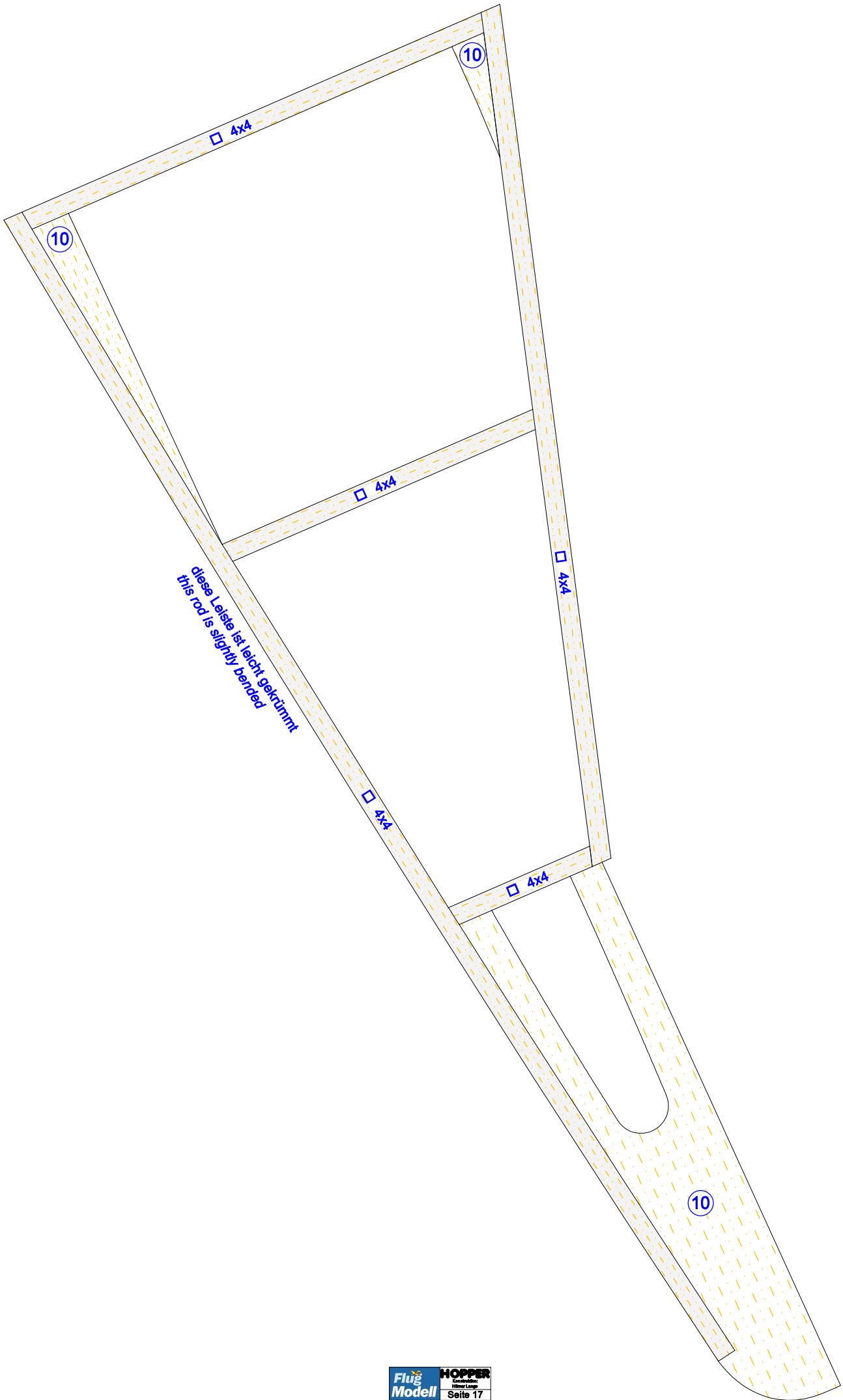


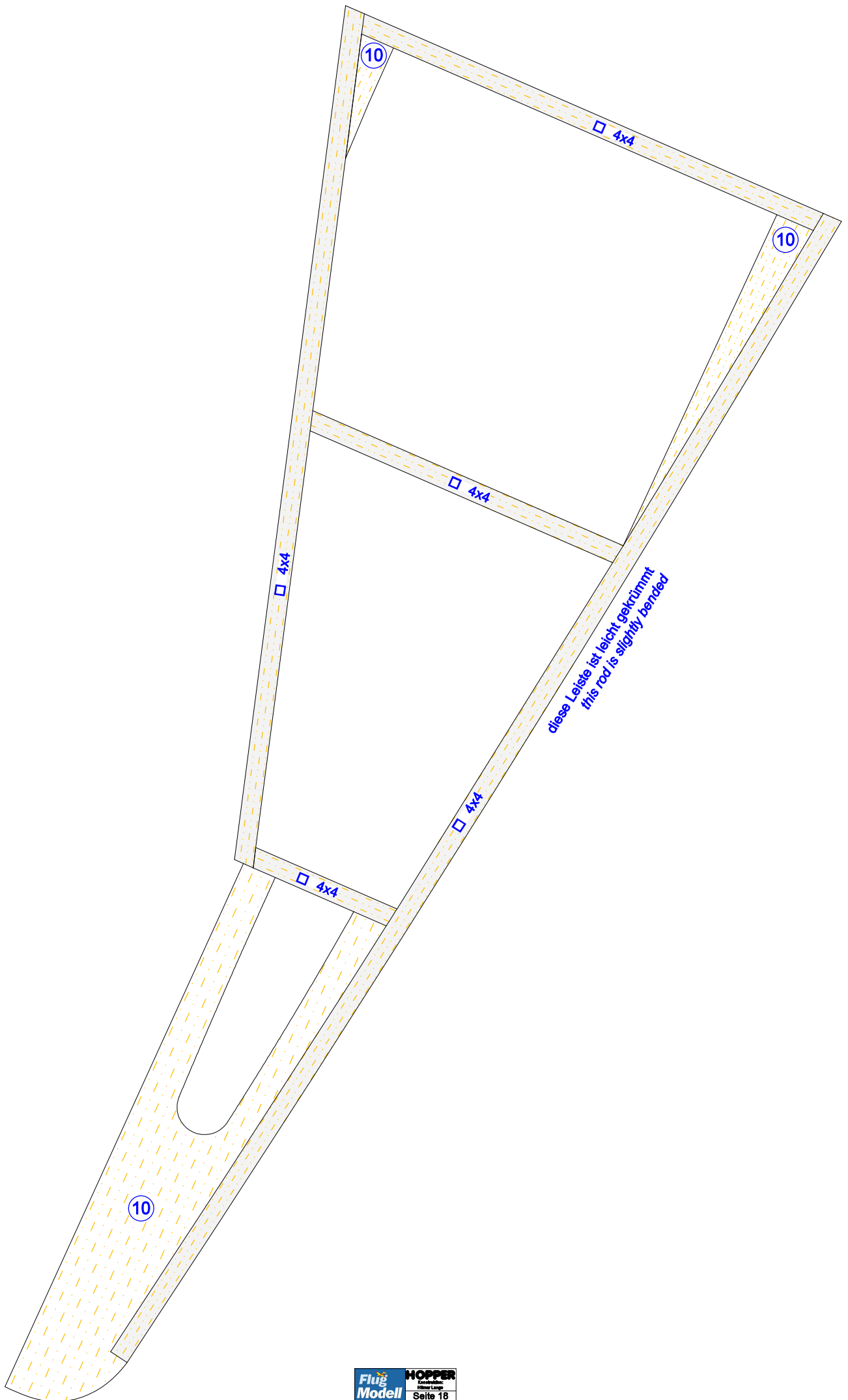
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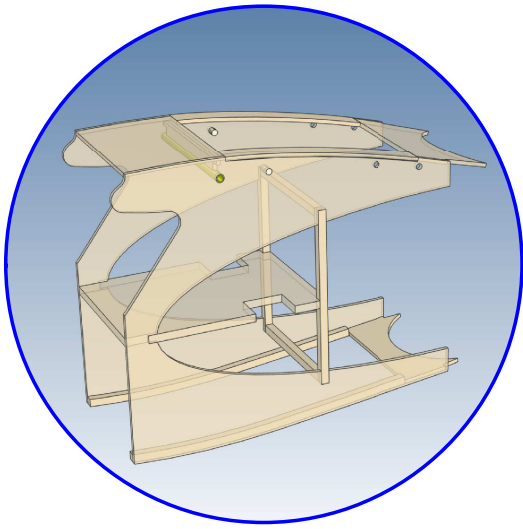


12

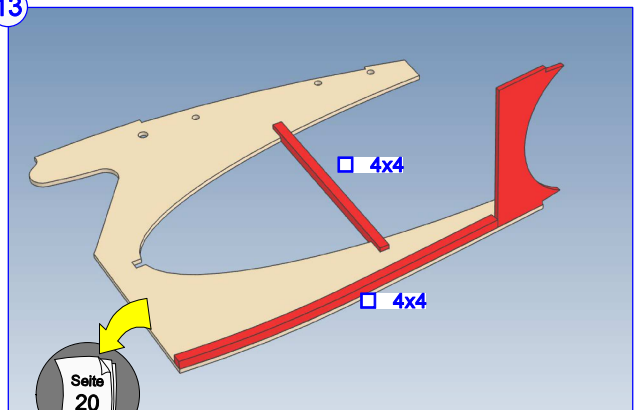




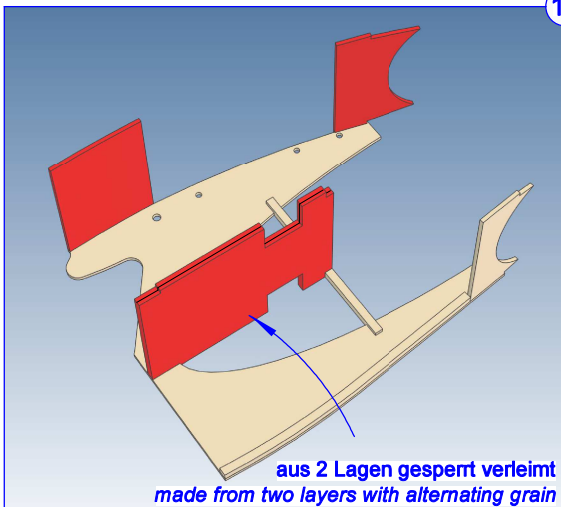




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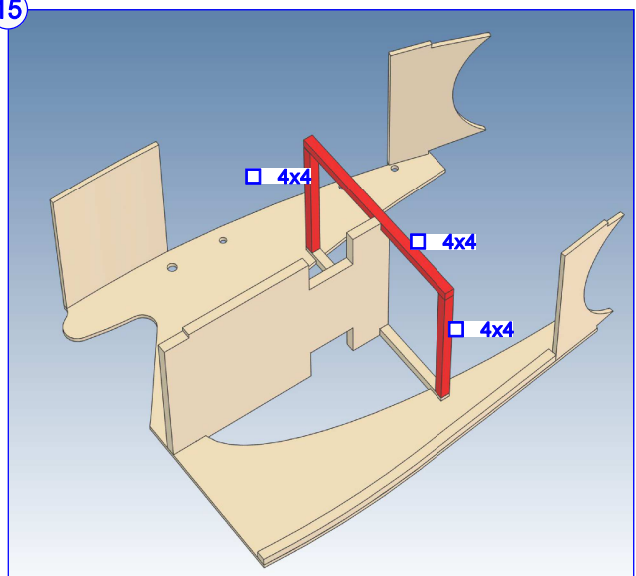


14

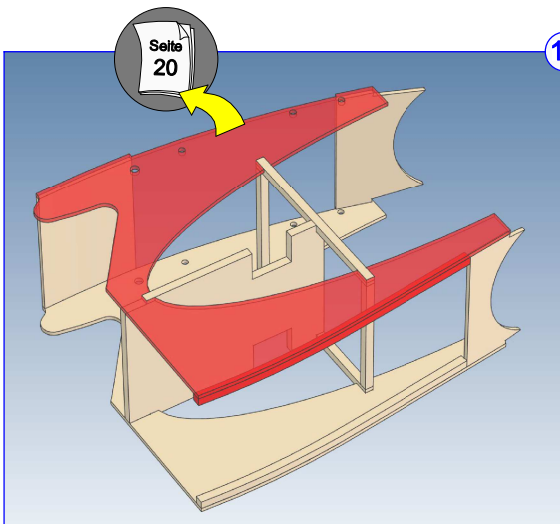


aus 2 Lagen gesperrt verleimt  
made from two layers with alternating grain

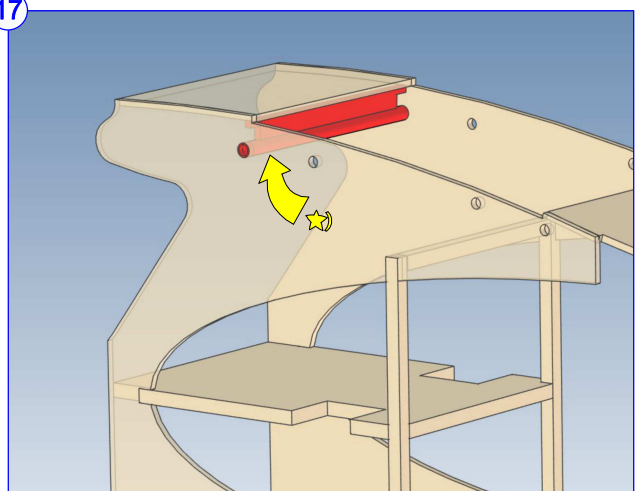
15



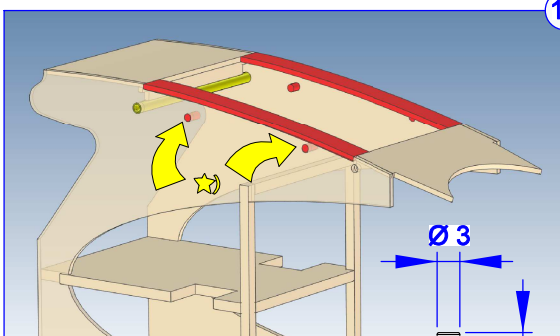
16



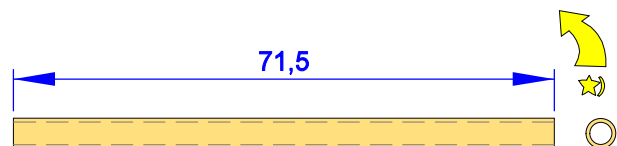
17



18

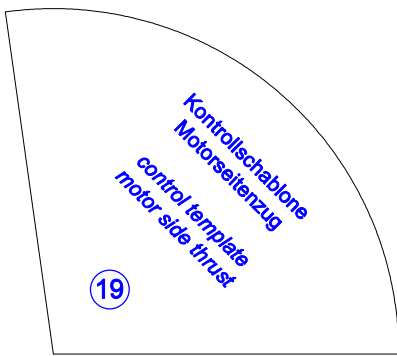
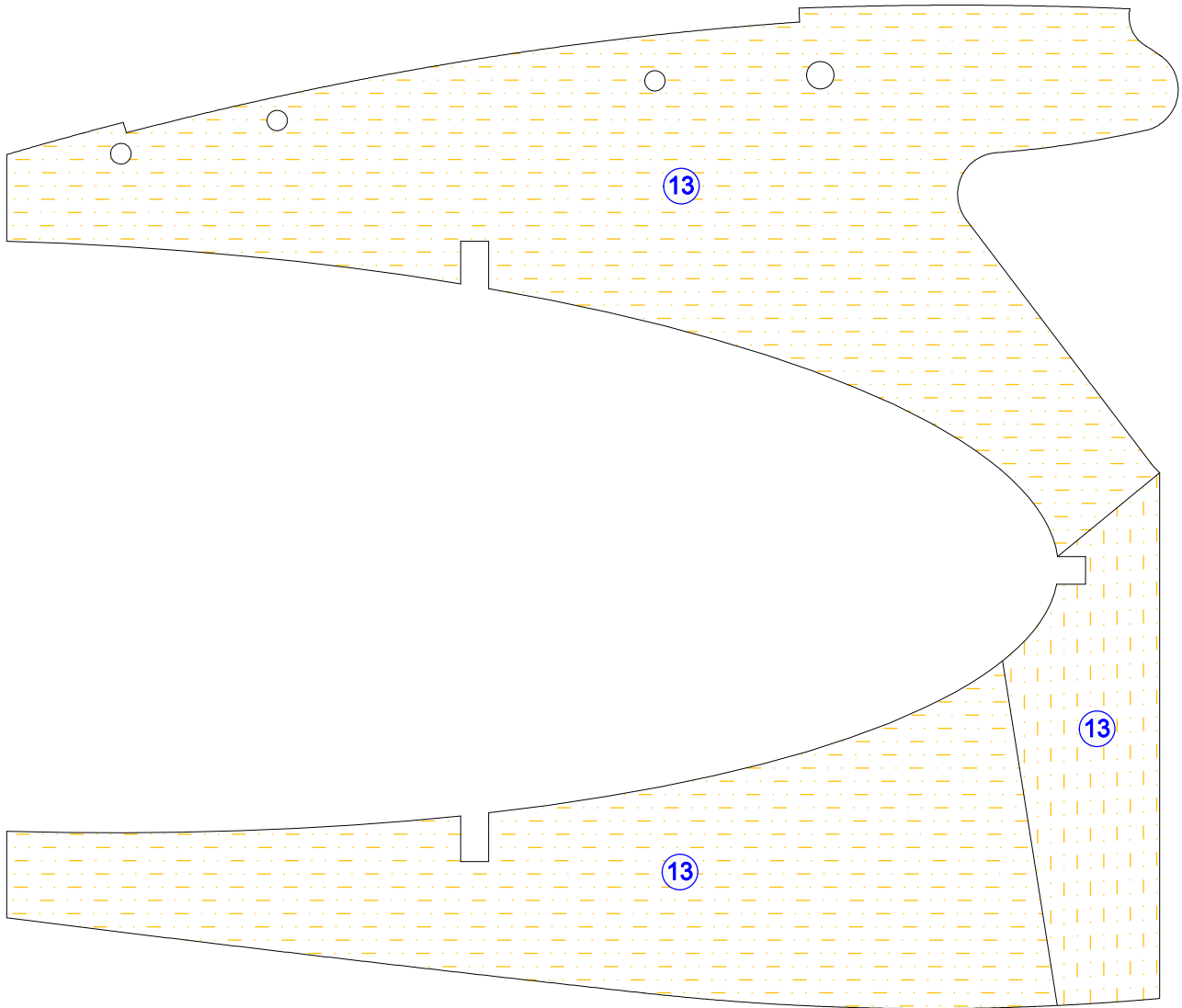
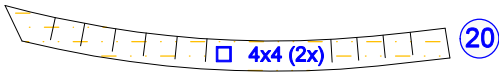
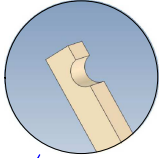


4x Neodym-Magnet

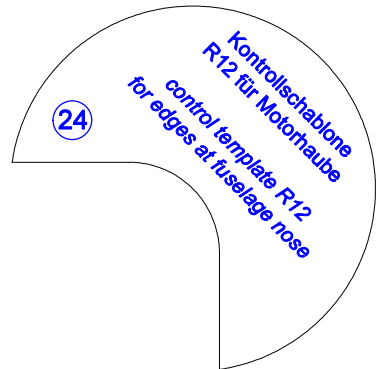


Messingrohr Ø 4 mm (innen-Ø 3,1 mm)  
brass tube

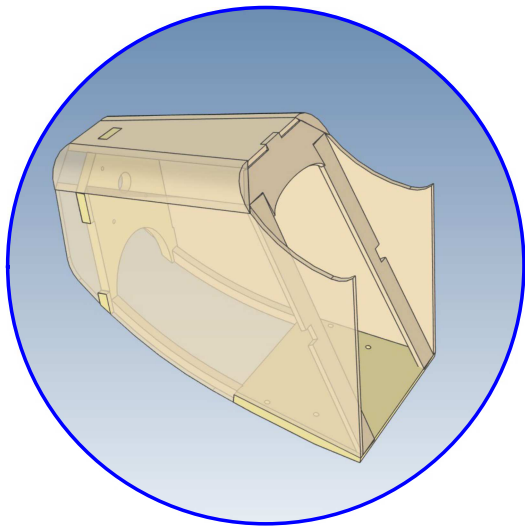




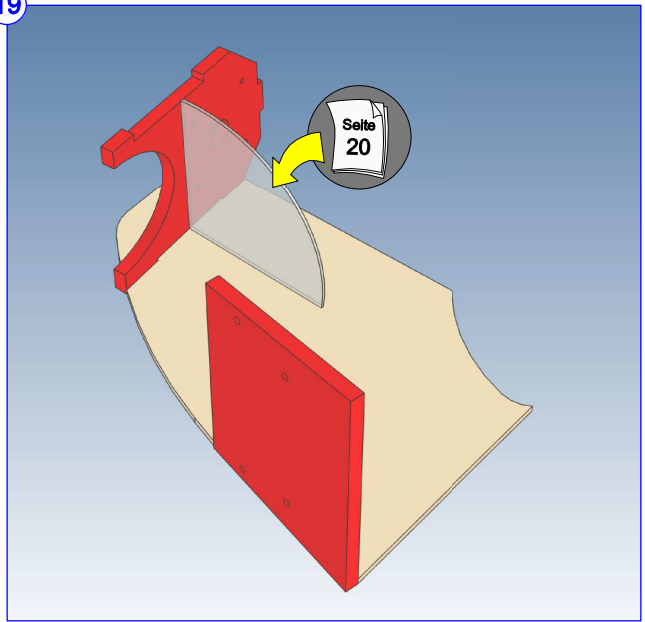
Kontrollschablone  
Motorseitenzug  
control template  
motor side thrust



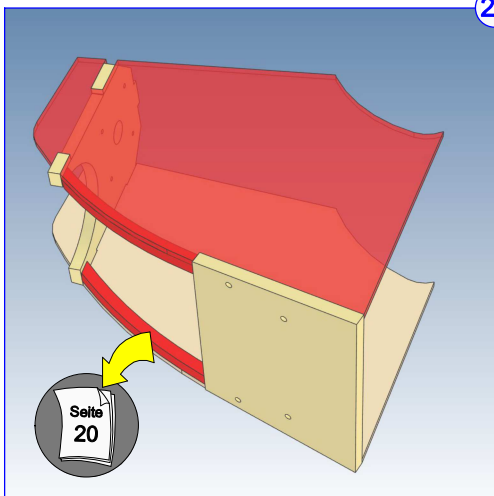
Kontrollschablone  
R12 für Motorhaube  
control template  
for edges at fuselage nose



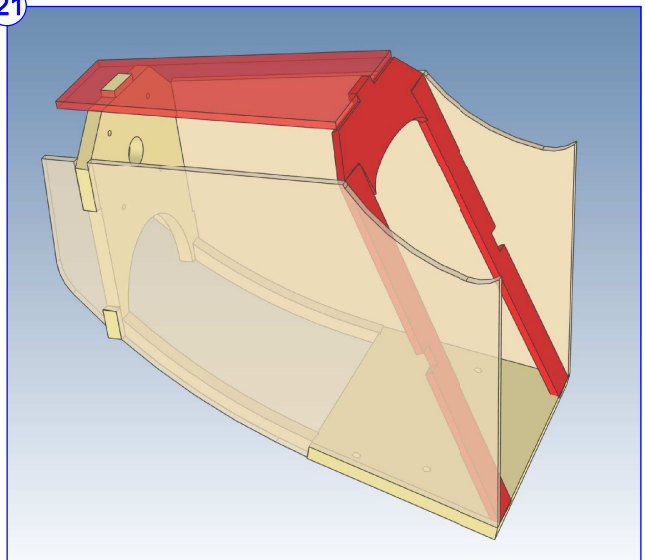
19



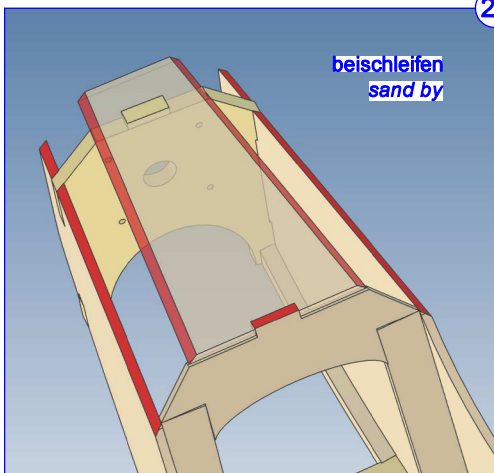
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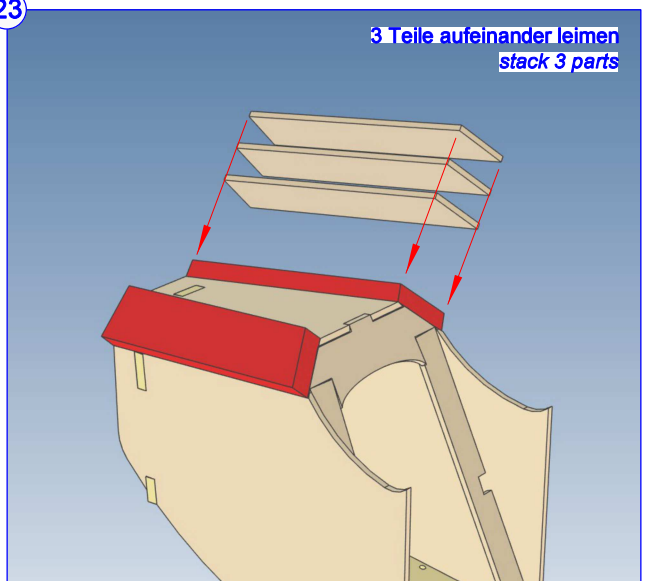
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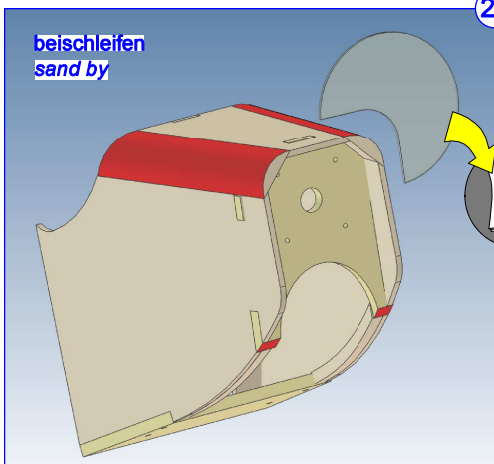
22

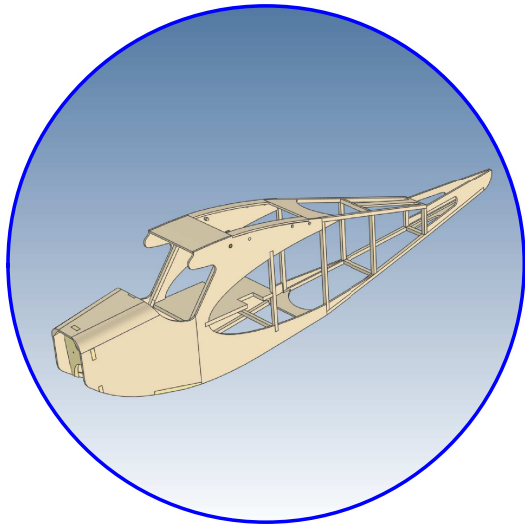


23

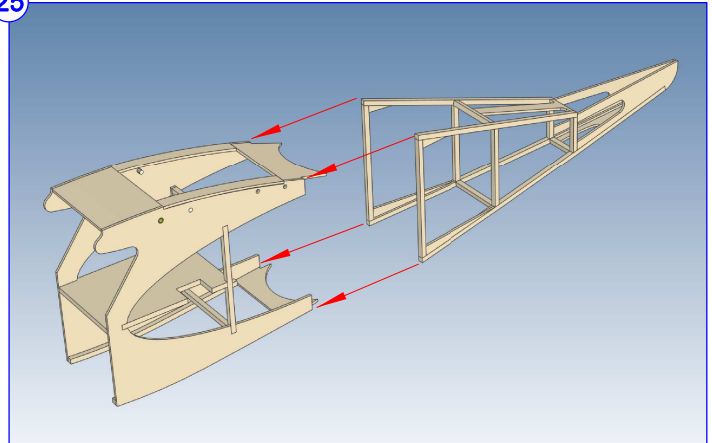


24

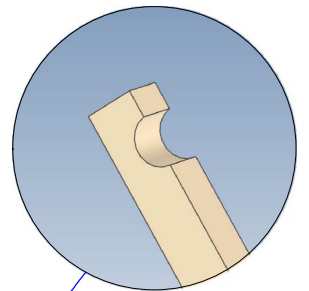
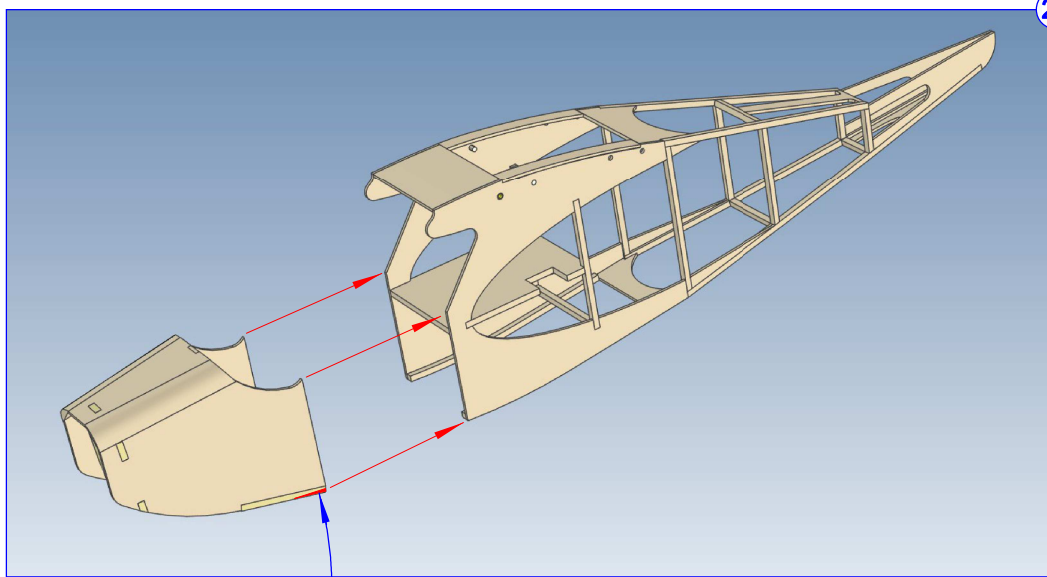




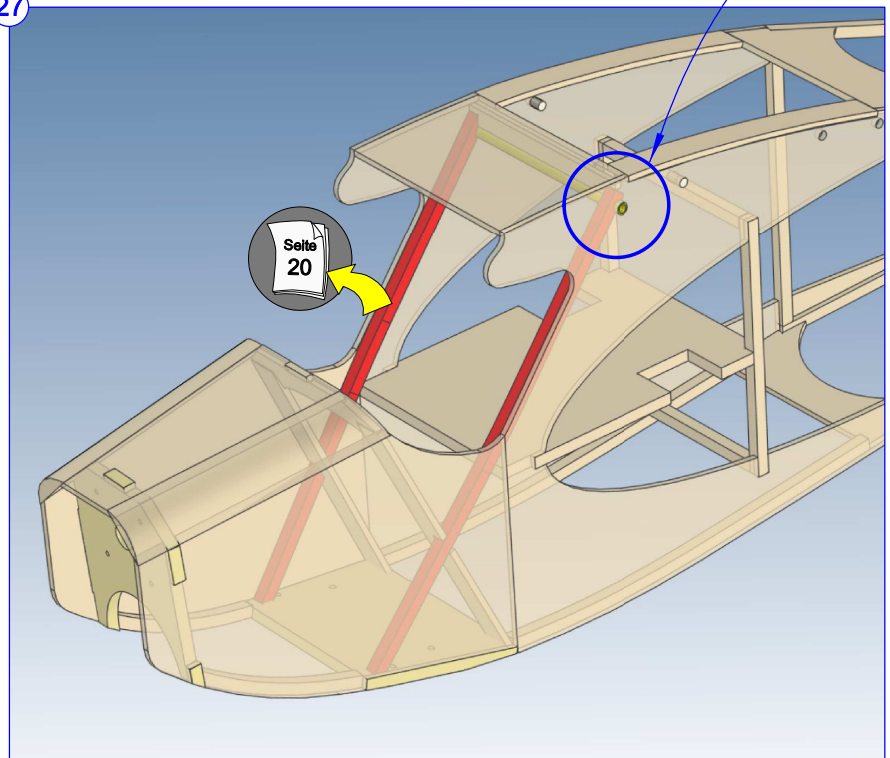
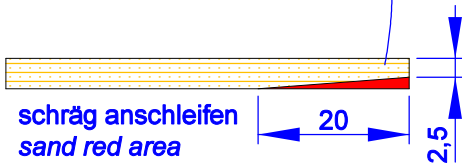
25

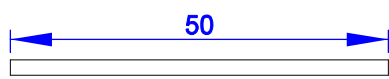
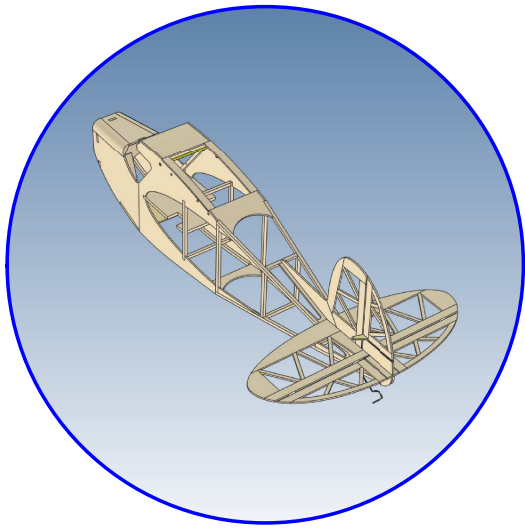


26

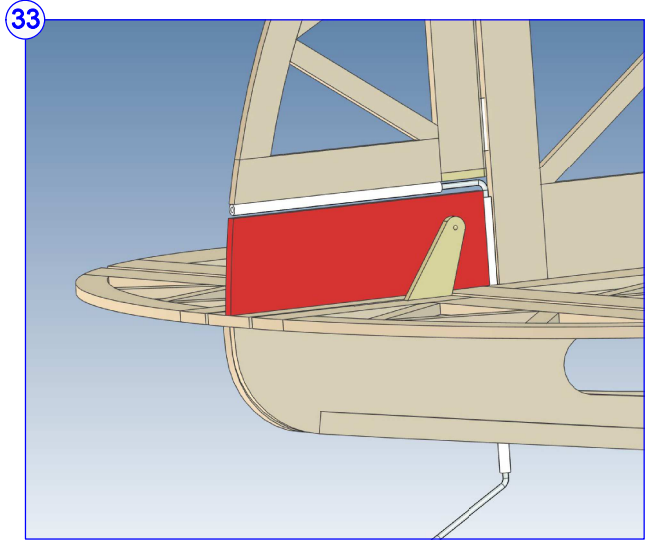
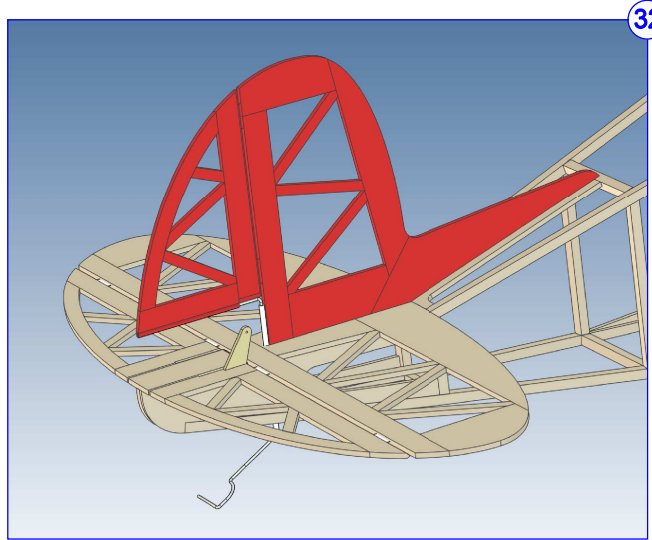
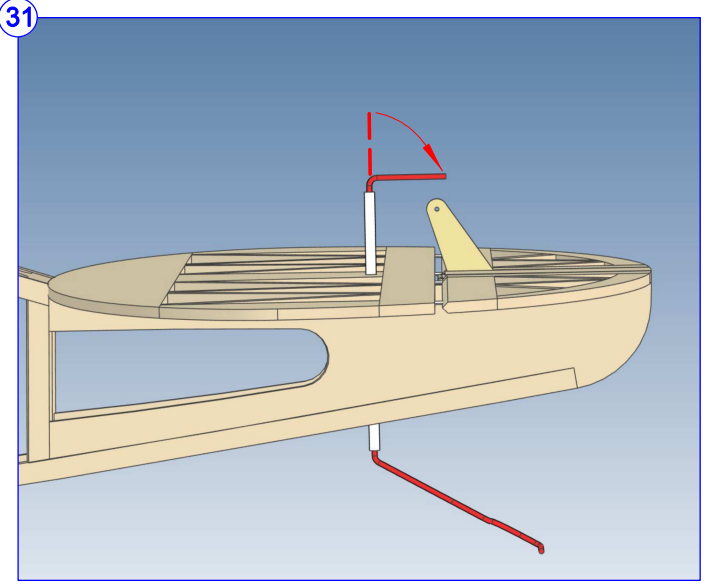
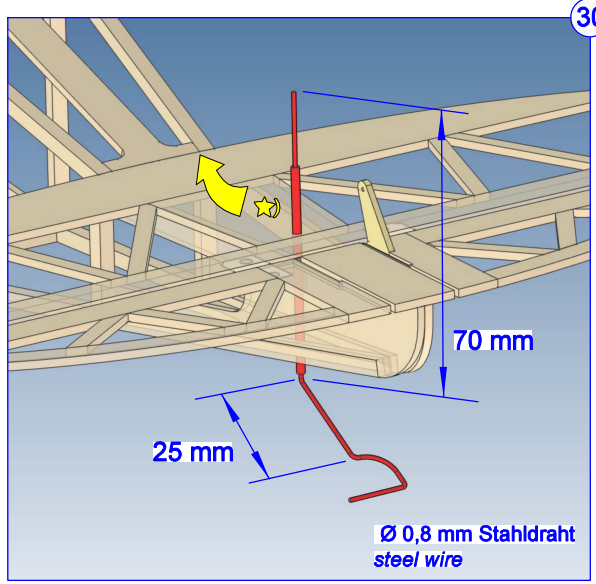
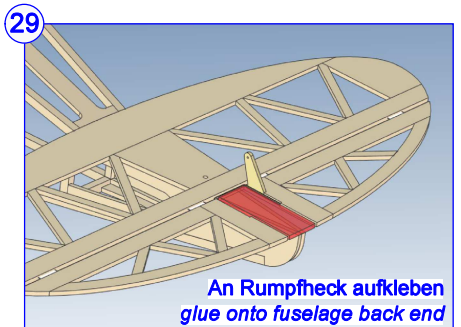
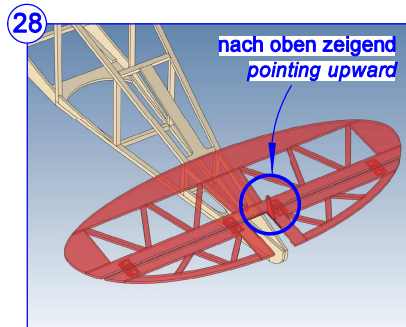


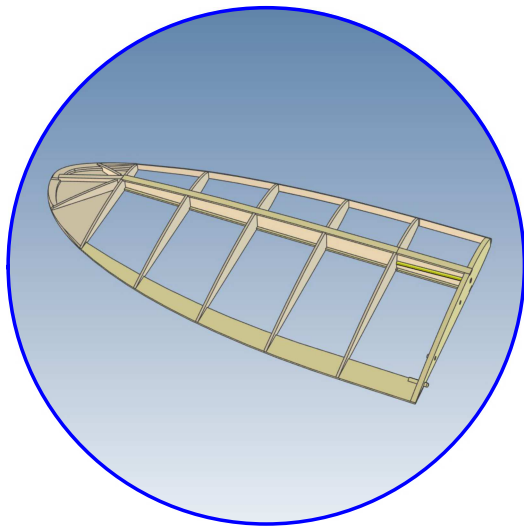
27



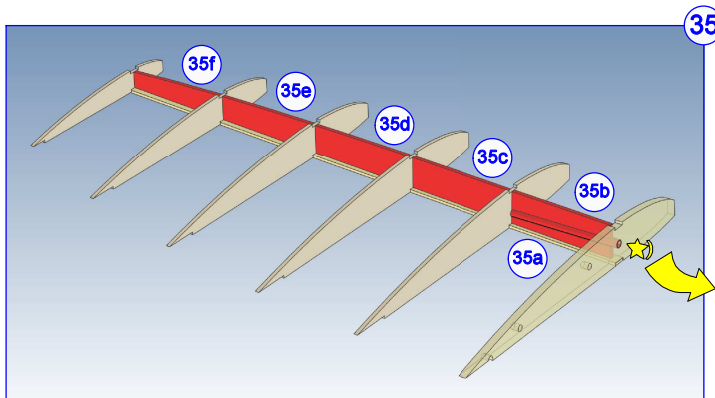
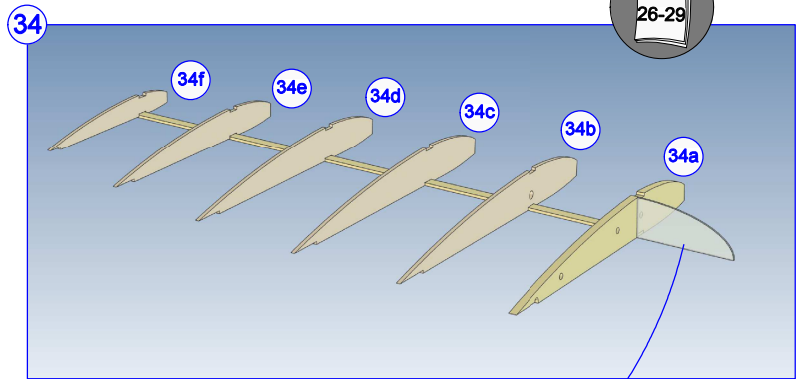


ABS-Rohr Ø 2 mm  
ABS-tube

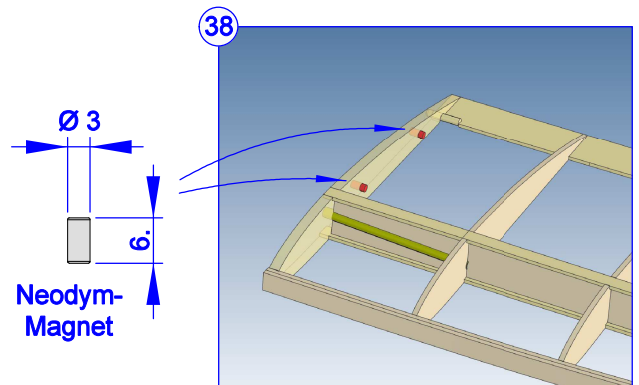
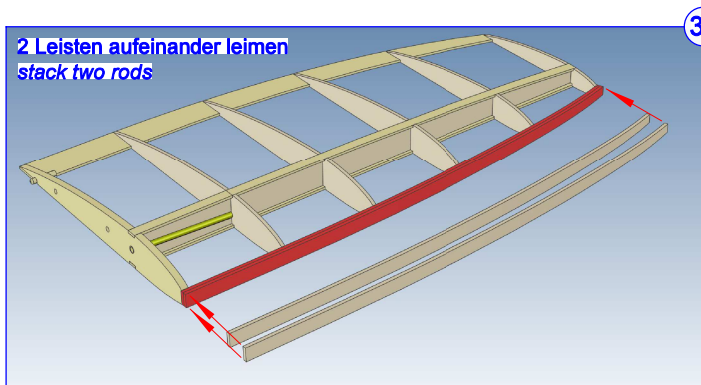
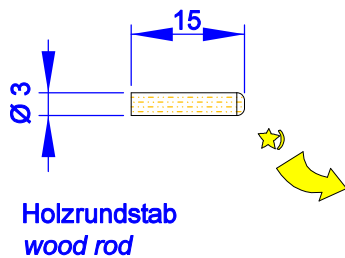
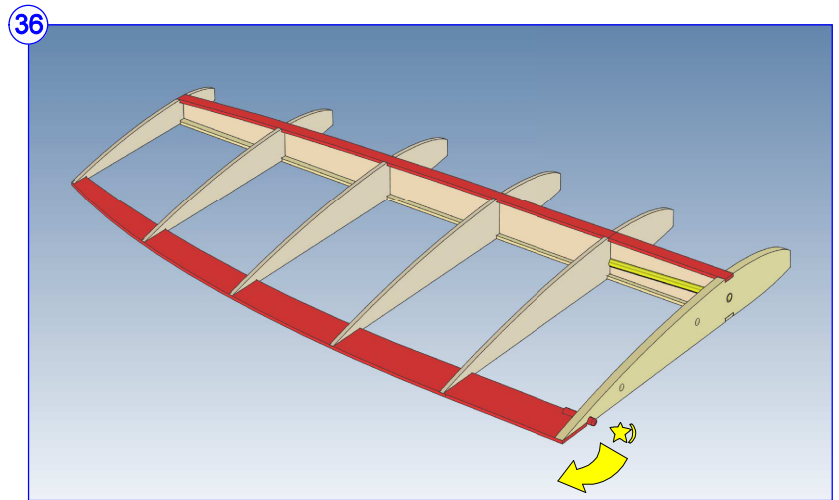
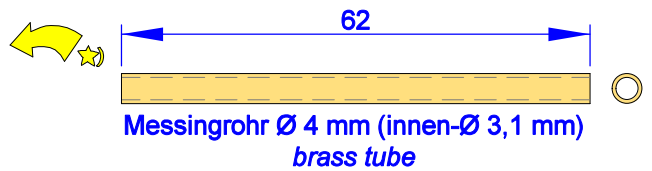




Selten  
26-29



Kontrollschablone 3°  
für Wurzelrippe  
angle template for root rib

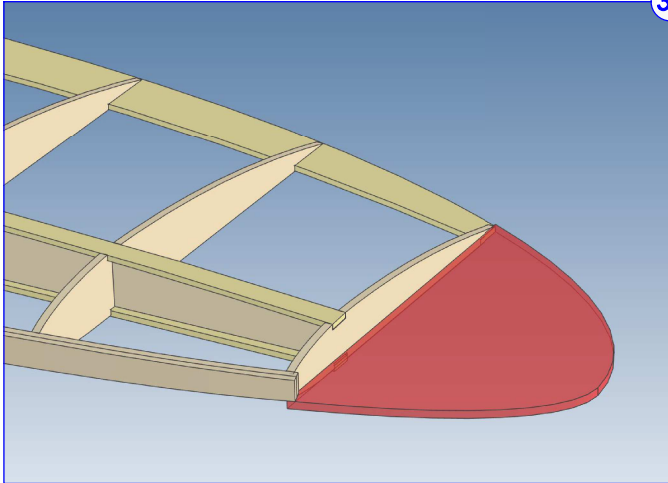


Polarität passend zum Rumpf  
beachten!

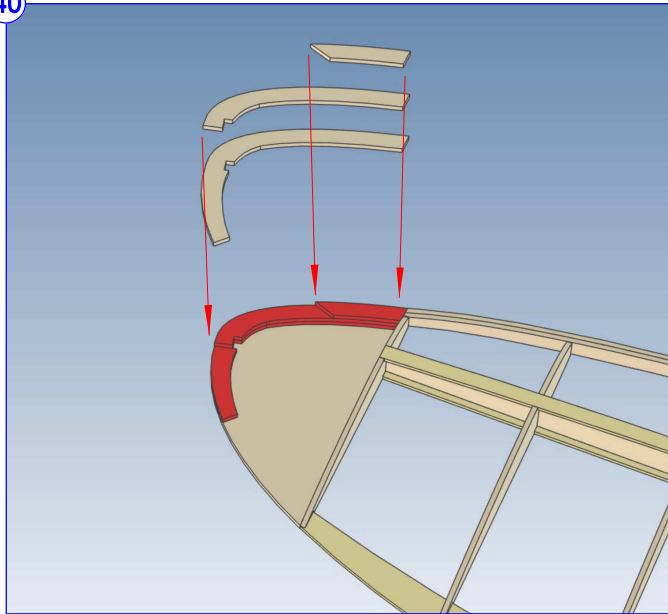
polarity must match the fuselage  
magnets!



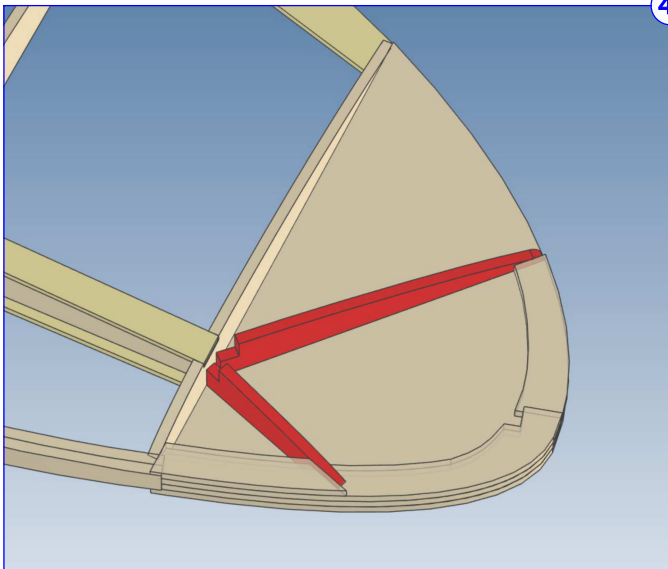
39



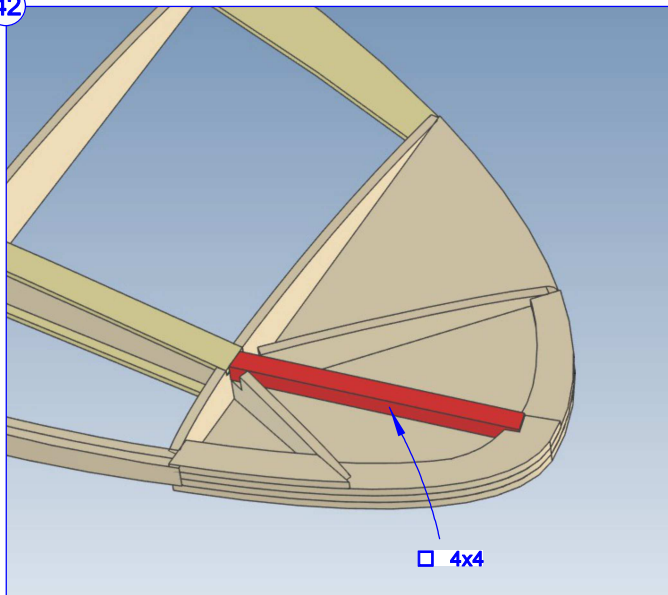
40



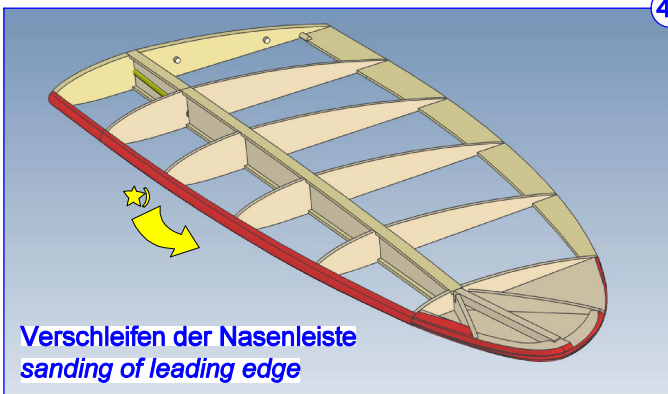
41



42



43



Verschleifen der Nasenleiste  
sanding of leading edge

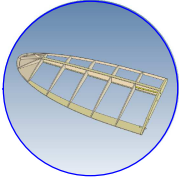


@ Rippe c



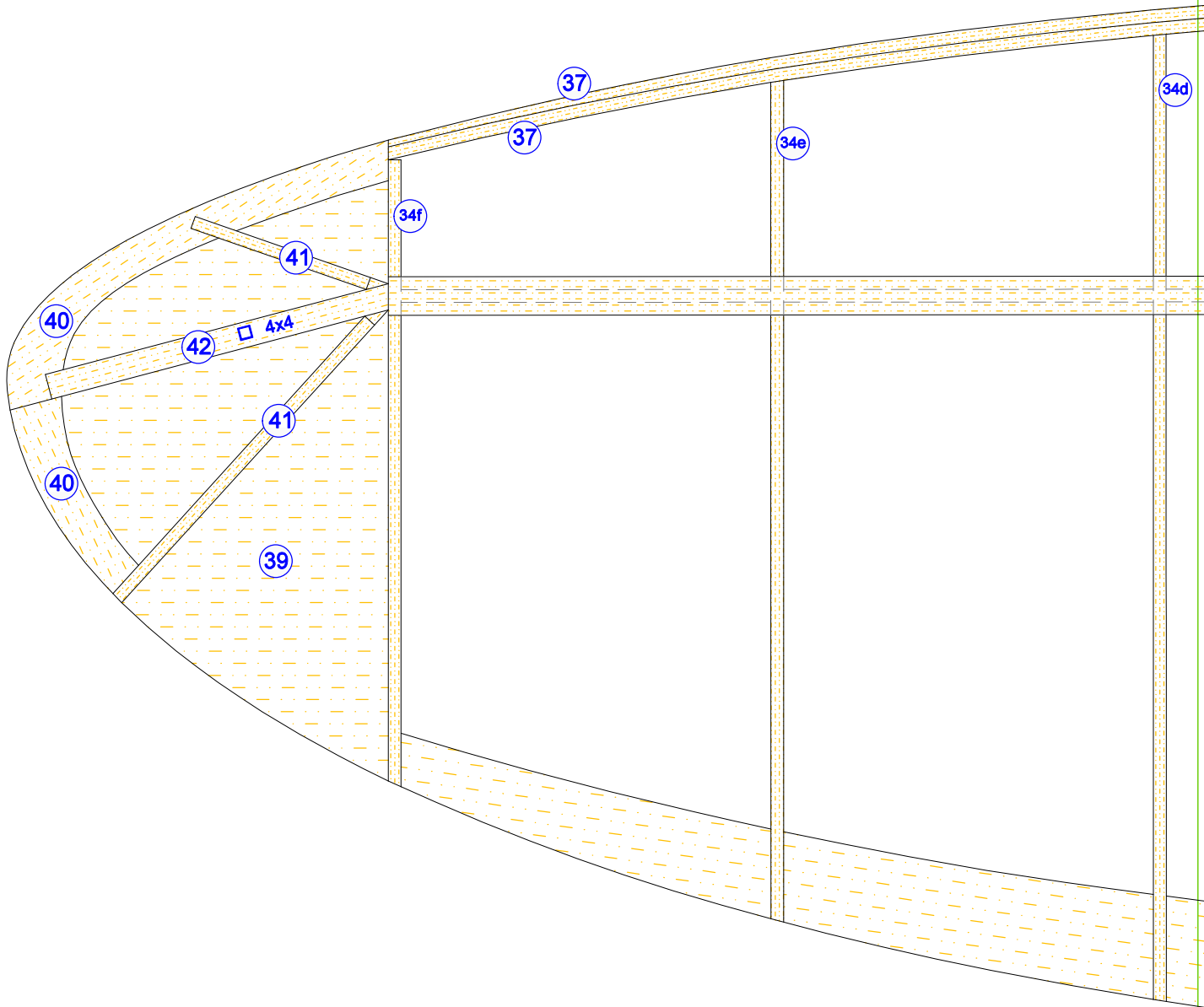
Nasenleisten-  
Kontrollschablone

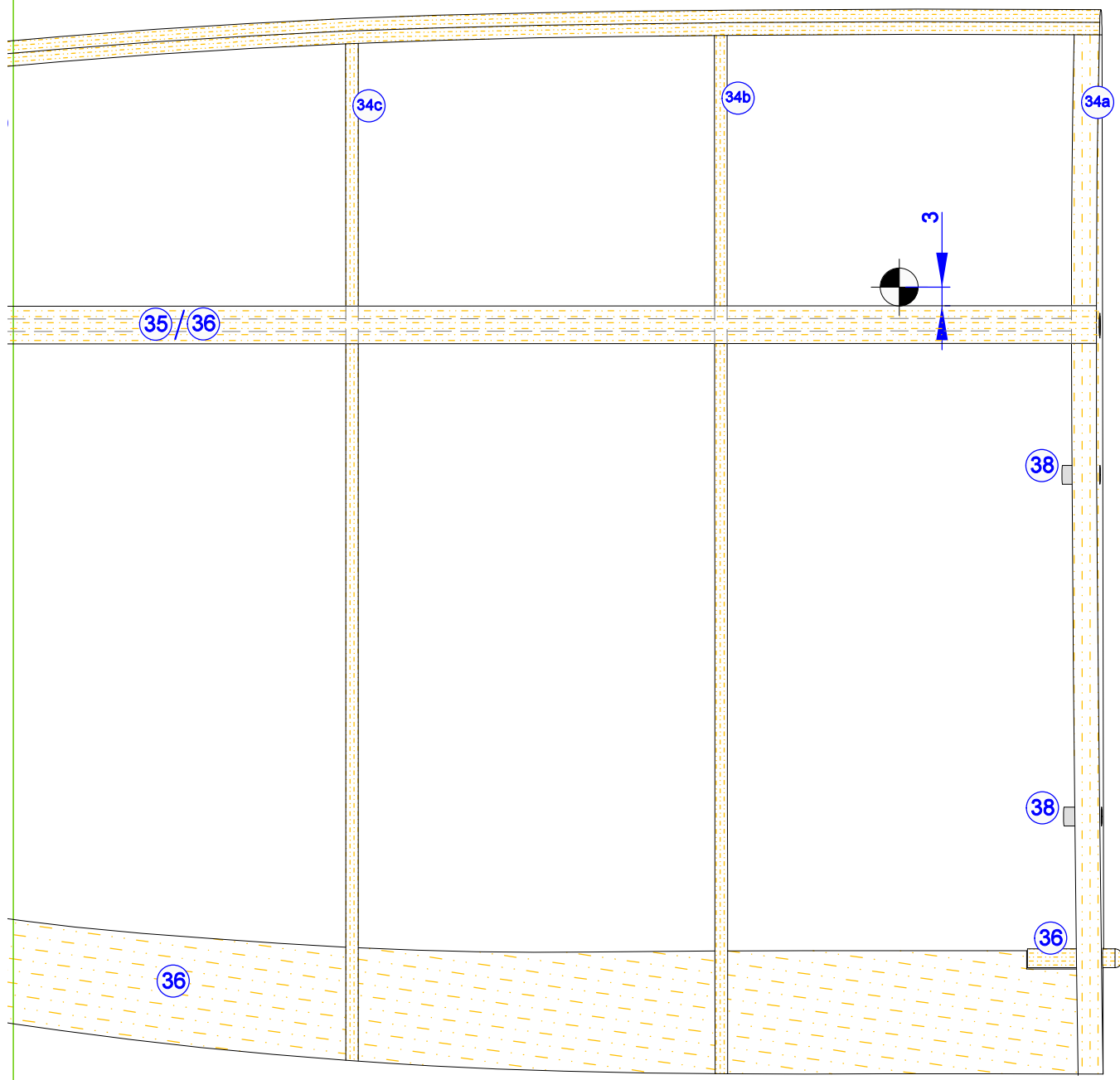
check leading  
edge contour  
with template

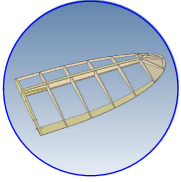


## Hilfsdarstellung für den Bau der linken Flügelhälfte

Control drawing for the left wing assembly

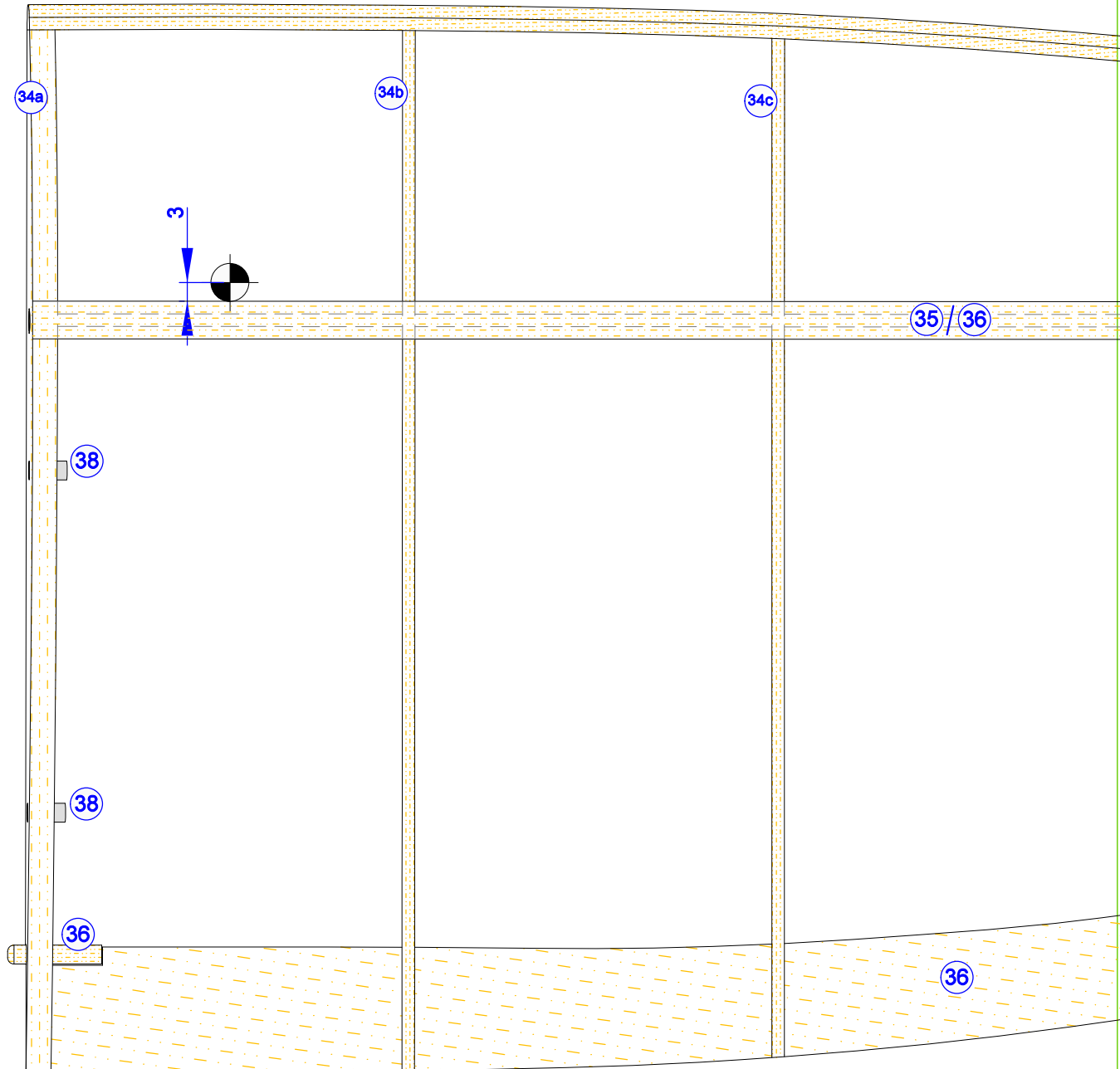


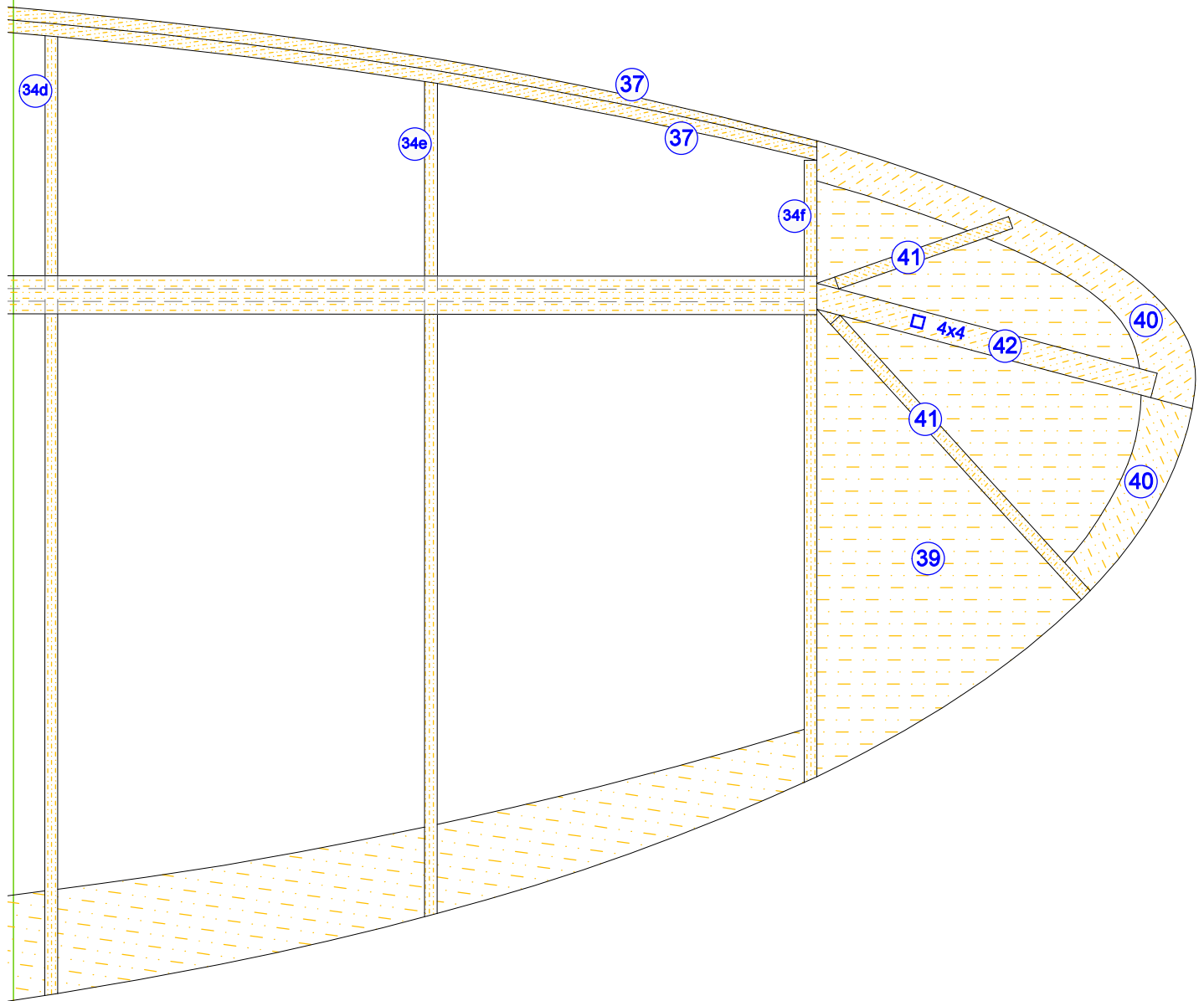


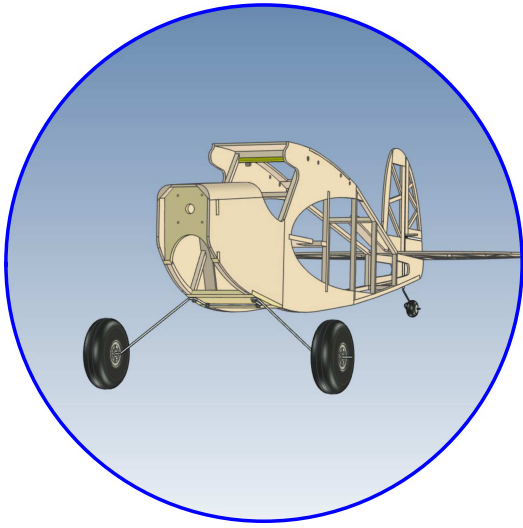


# Hilfsdarstellung für den Bau der rechten Flügelhälfte

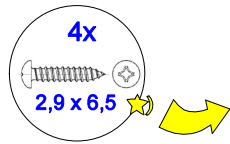
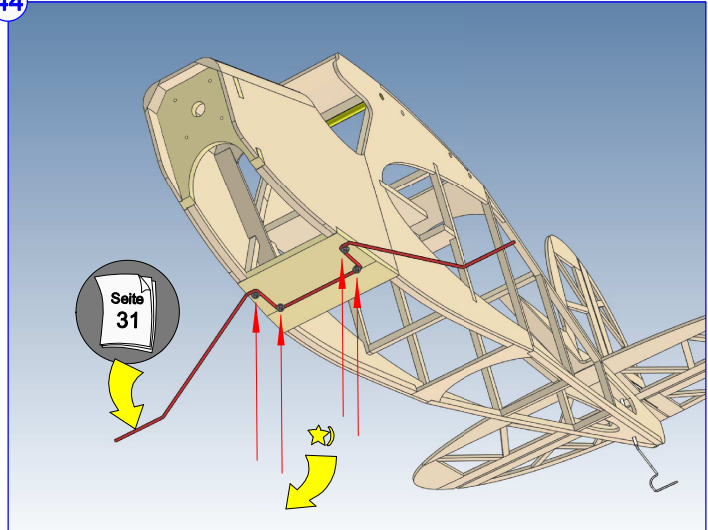
Control drawing for the right wing assembly







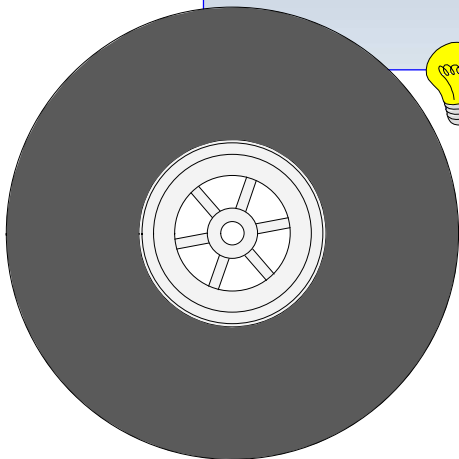
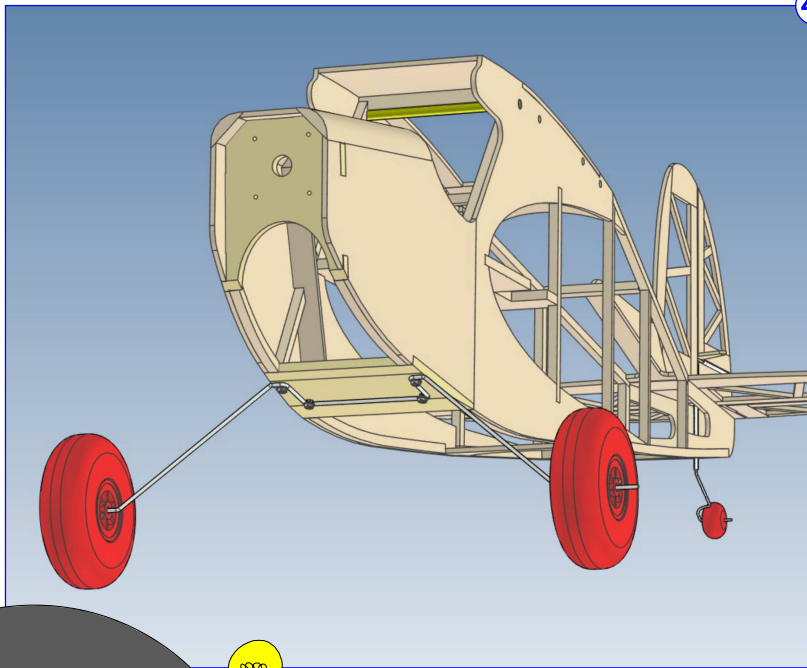
44



Drehen Sie die Schrauben gerade so weit fest, dass sich das Fahrwerk von Hand entnehmen und wieder einsetzen lässt.

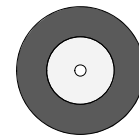
*Tighten the screws just enough to hold the gear wire in place. You can now take it off and put it back on without using tools.*

45



Achsdurchmesser mit mehreren Lagen Schrumpfschlauch aufdicken

*fit axle diameter with several layers of shrinking tube*

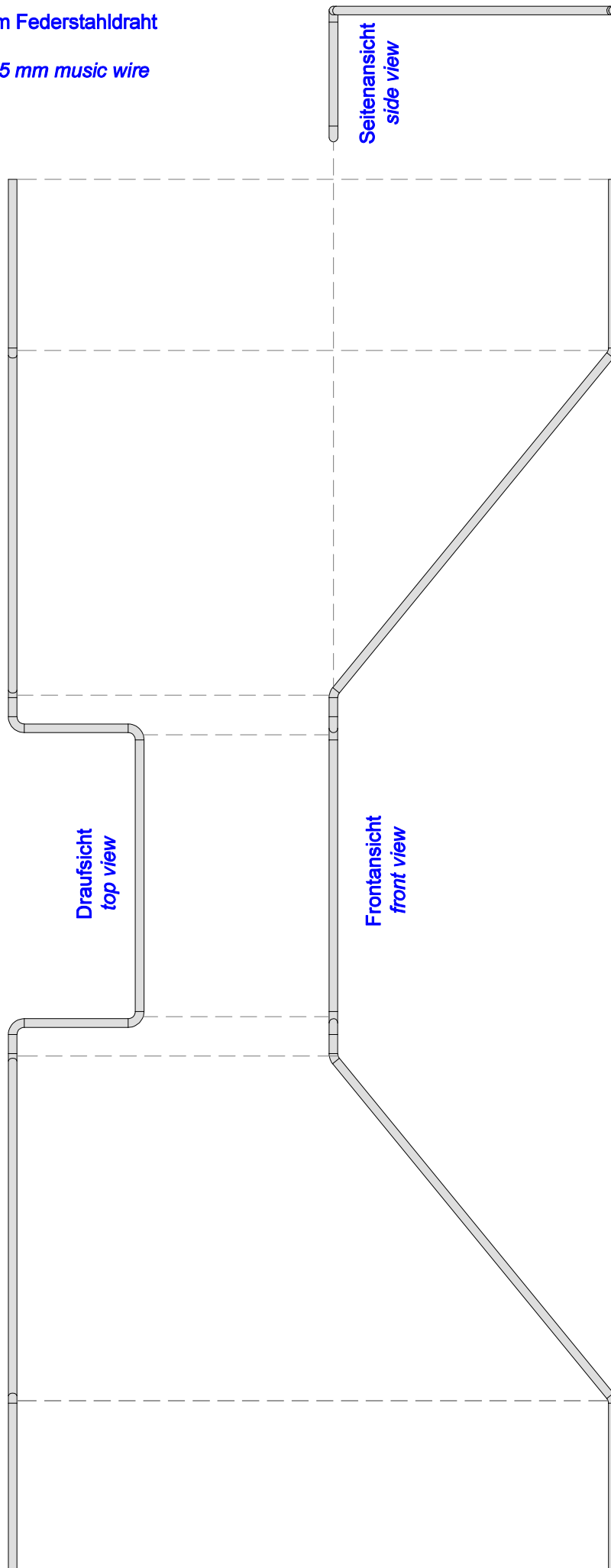


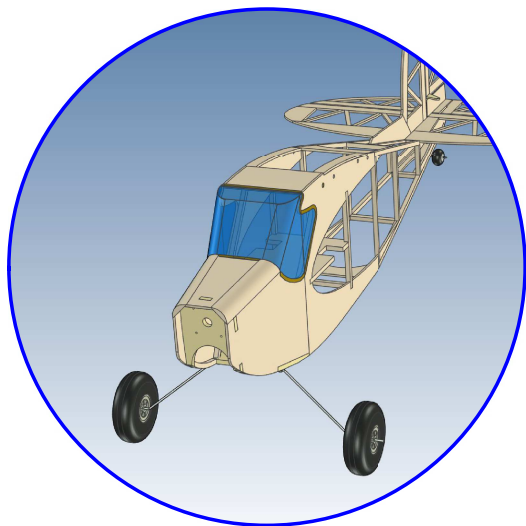
Leichtrad  
Ø 15 - 17 mm

2x Leichtrad 60/20 mm (14g)  
Aero-Naut Art.-Nr.: 735333

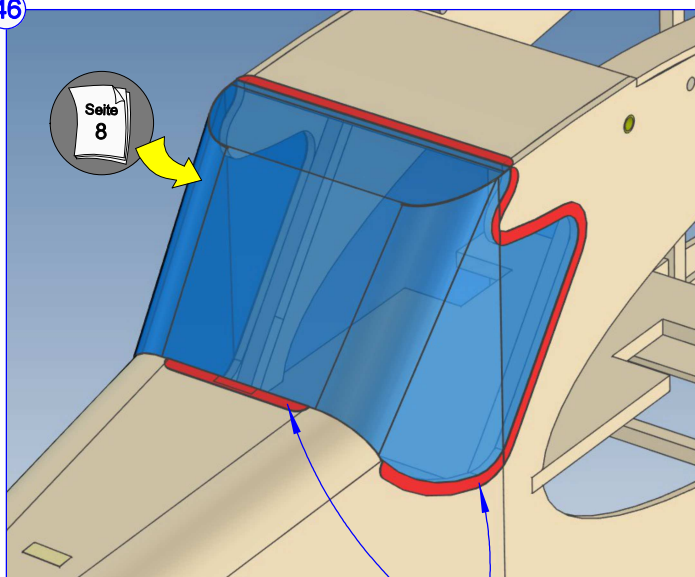
Hauptfahrwerk aus 1,5 mm Federstahldraht

landing gear, bent from 1,5 mm music wire





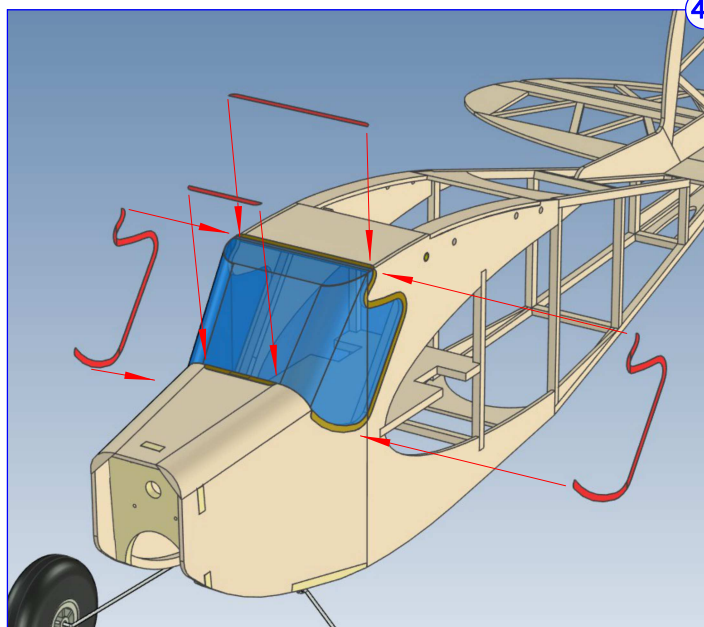
46



Verglasung am roten Bereich  
mit Kontaktkleber ankleben

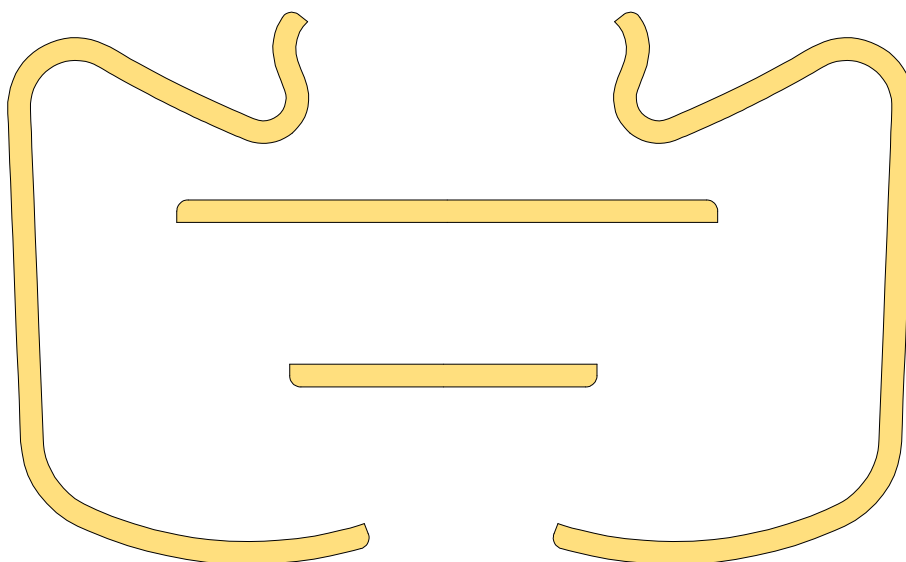
*install window with contact  
glue onto red area*

47

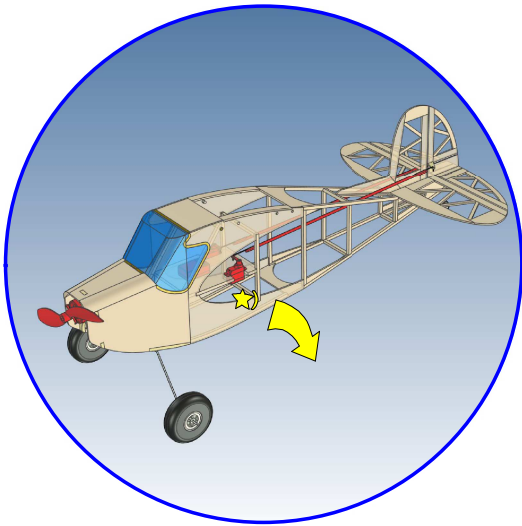


Kaschieren der Klebeflächen  
mit Bügel- oder Klebefolie

*Cover the visible glue areas  
with adhesive film*

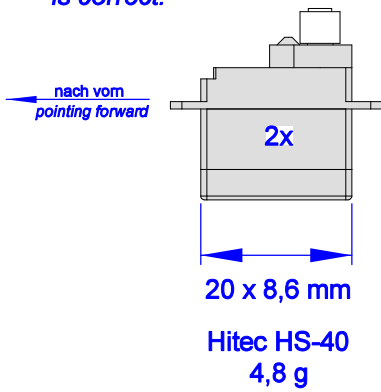






Einbauichtung der Servos beachten, damit die Gestängelänge stimmt

*note the installation direction of the servos so that the length of the rods is correct.*



Sekundenkleber und Schrumpfschlauch  
CA + shrink tube

nach oben gebogen  
bent upwards

Holzrundstab Ø 3 mm  
wood rod

CFK-Stab oder Rohr, Ø 3 mm,  
als Flügelverbinder  
connect wings to fuselage with  
CFK-rod or tube, Ø 3 mm

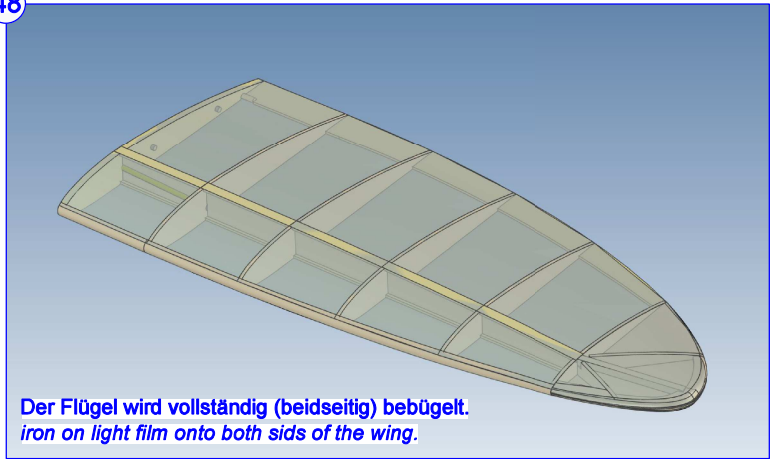


Ein Tropfen UHU por hindert die Gestänge daran, aus den Anlenkungen zu rutschen.

*A drop of contact glue prevents the rods from slipping out of the horns.*



48



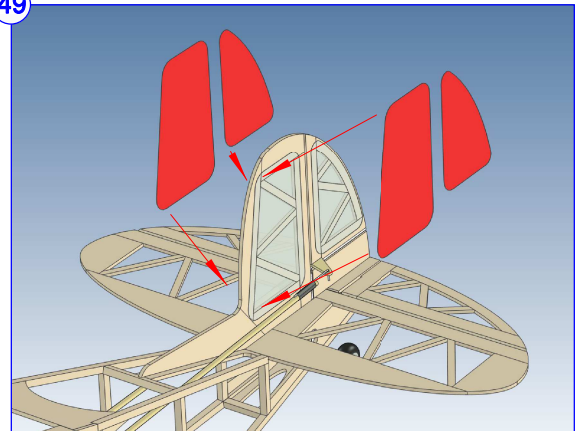
Der Flügel wird vollständig (beidseitig) bebügelt.  
iron on light film onto both sides of the wing.



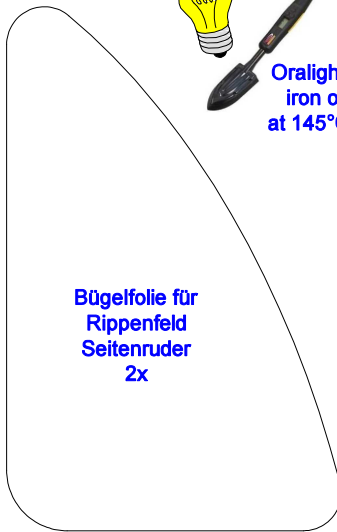
Oralight:  
iron on  
at 145°C

Der Rumpf wird nur an den gezeigten Stellen mit  
Bügel folie (ORALIGHT) bezogen.  
The fuselage is only ironed-on in the places shown.

49

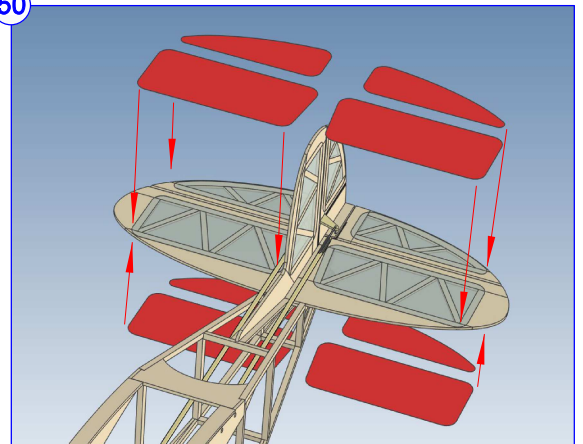


Bügel folie für  
Rippenfeld  
Seitenflosse  
2x

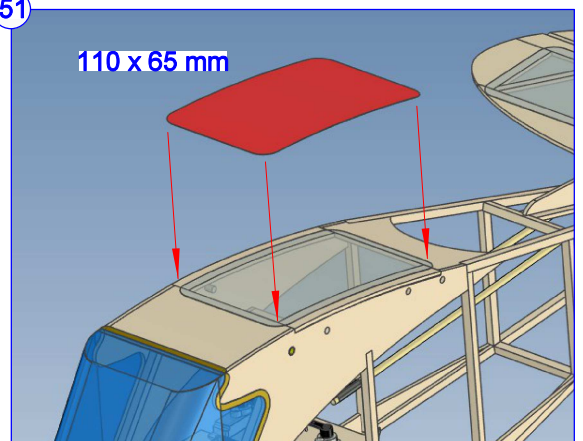


Bügel folie für  
Rippenfeld  
Seitenruder  
2x

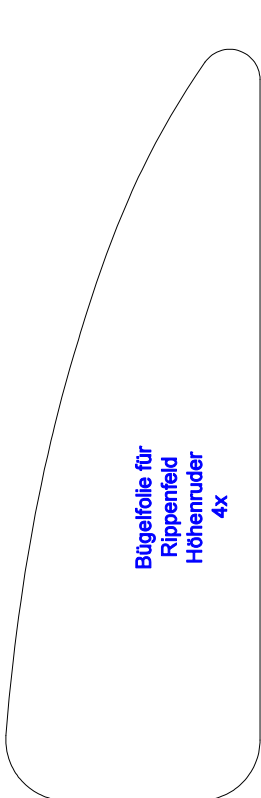
50



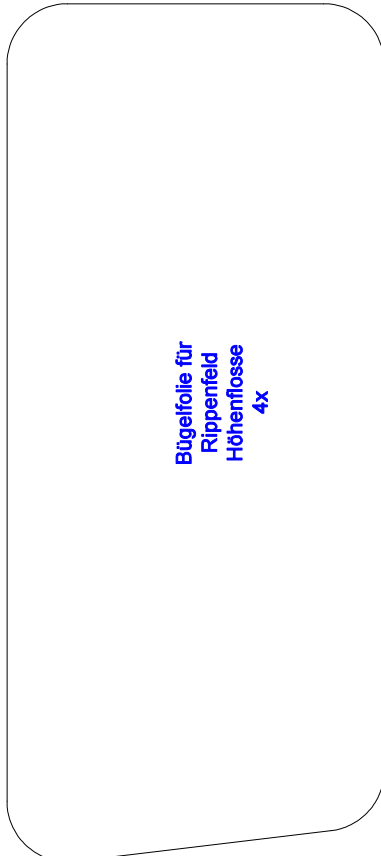
51



110 x 65 mm

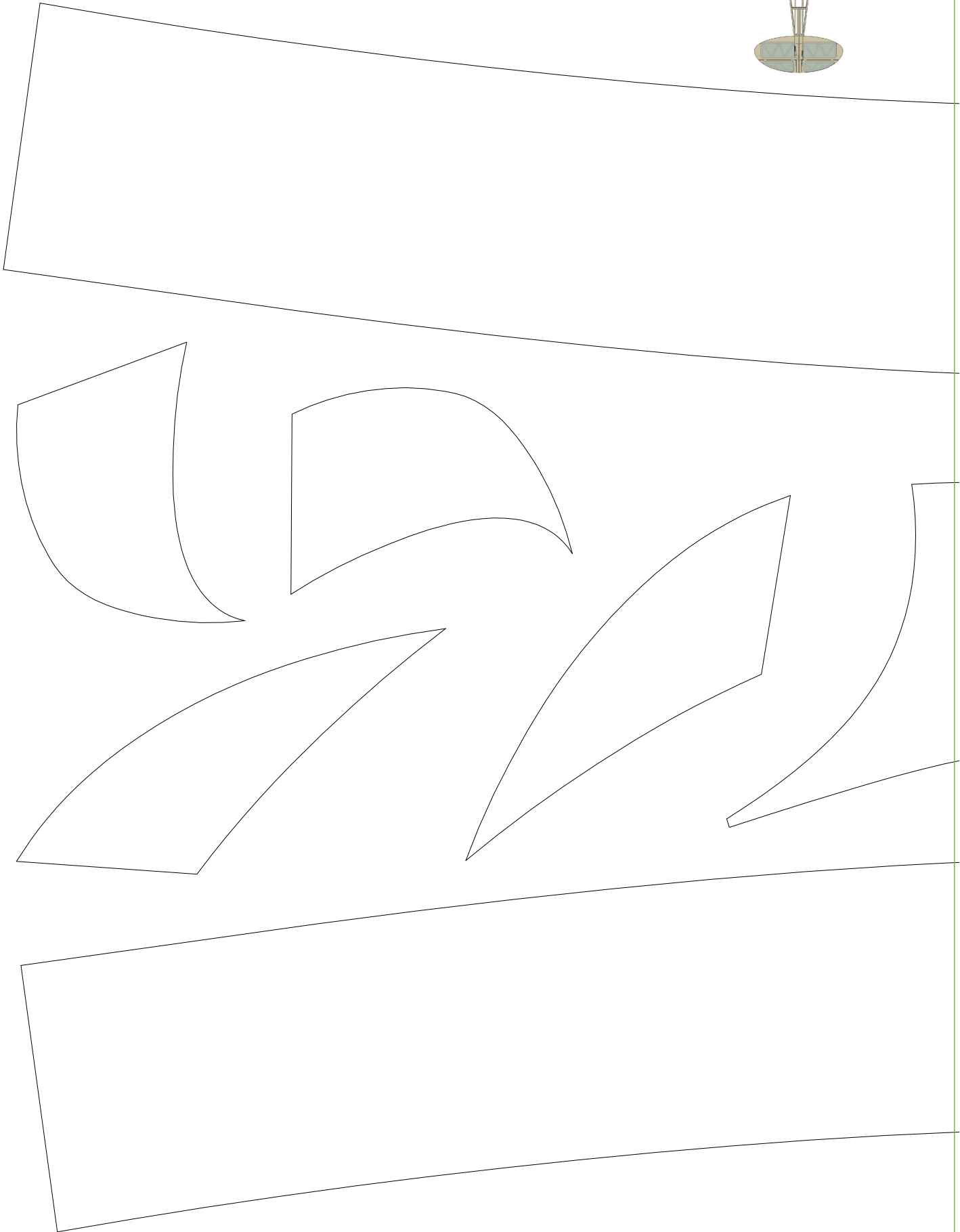
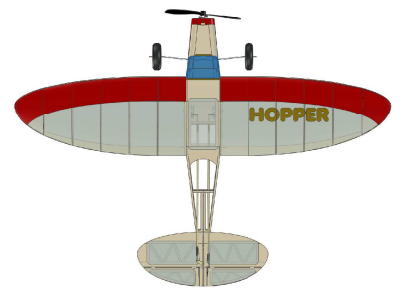
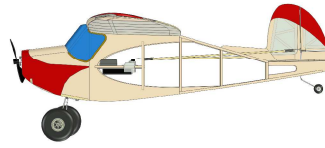


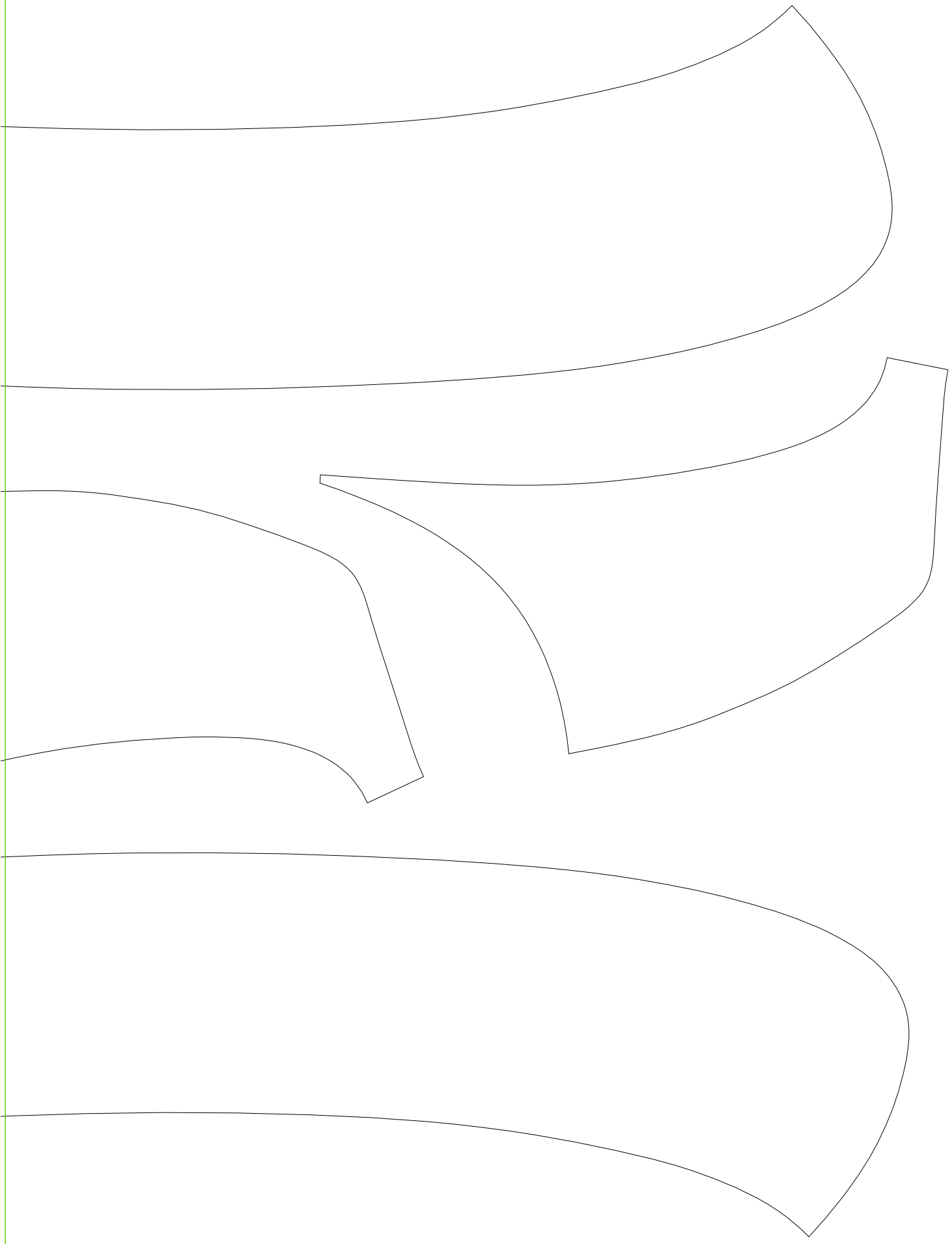
Bügel folie für  
Rippenfeld  
Höhenruder  
4x



Bügel folie für  
Rippenfeld  
Höhenflosse  
4x

**Designvorschlag:**  
Schneidkonturen der roten Dekor-Elemente  
*cutting contours of the red decals*





## Hinweise vor dem Einfliegen:

*Things to check  
before you fly:*



Justieren Sie den Schwerpunkt auf 3 mm vor der Holm-Vorderkante durch passende Positionierung des Akkus. Bei Verwendung der vorgeschlagenen Komponenten liegt der Akku auf dem Fahrwerksspannt, bei stärkerem (schwereren) Motor hängt er unter dem Servobrett.

*Balance the center of gravity 3 mm ahead of the front edge of the spar. Therefore the battery can be placed either on the landing gear plate or hanging under the servo-board, using velcro tape.*



Beruhigen Sie die Ausschläge mit 20 bis 30% EXPO. Das Modell fliegt am Schönsten, wenn man es weich steuert.

*Add 20 to 30% EXPO to the deflections.  
HOPPER flies best when steered smoothly.*

**Wichtiger Hinweis:**  
prüfen Sie sorgfältig, dass beide Flügelhälften auf dem ebenen Baubrett aufliegen ohne zu kipeln. Eventuelle Verzüge müssen sprichwörtlich ausgebügelt werden, sonst lässt sich das Modell nicht steuern!

*Important:  
check both wing halves thoroughly for being even and plane at their bottom surface. The slightest twist will cause problems in steering control!*