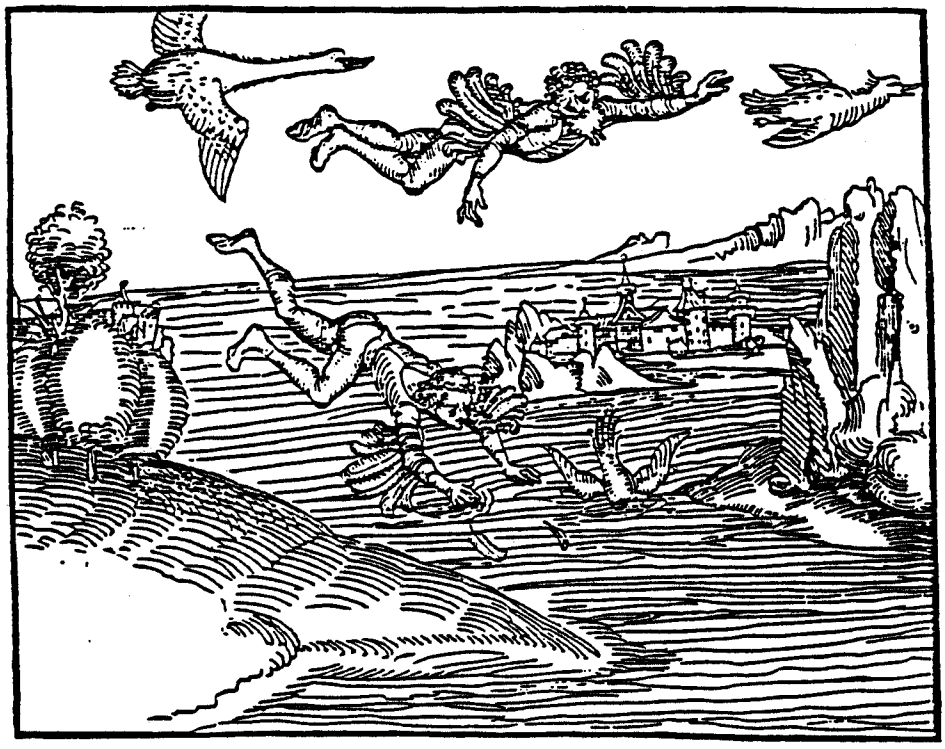
Klaus Strienz

A New Experiment

Hermann Holzhauser`s Flying Feather Aeroplanes



Klaus Strienz

Hermann Holzhauser`s Flying Feather Aeroplanes

Spectators from the USA and the whole world, attending the 1993 NATIONAL CONGRESS ON AVIATION & SPACE EDUCATION in Orlando, Florida and at the INTERNATIONAL EDUCATOR SPACE CAMP in Huntsville, Alabama, showed great enthusiasm about demonstrations with Holzhauser`s feather model aeroplanes.

A great many participants expressed the wish for building instructions.

Up until now, only one technical book has been published in German, written by Hermann Holzhauser (1), the inventor of stunt flight objects. This building instruction resulted from a project „Aviation and Space" which was carried out at a few German schools with support from Hermann Holzhauser.

As was found at the various demonstrations in schools, great interest was shown in Holzhauser`s feather planes by the computer generation youth. From the teacher`s point of view, construction and demonstration directly touches upon the following subjects:

Biology - Technology (bionics) - Art - Physics

Very often, obtaining the feathers proves to be difficult. Pigeon fanciers in Germany and the USA (2) are very helpful here. Getting in touch with the nearest zoo can be useful too. You don't only have to experiment with pigeon feathers!

With a little patience, you and your pupils will have a lot of fun building and flying the feather model aeroplanes.

Ikarus and Daedalus would be amazed!

Contact addresses:

(1) Hermann Holzhauser, Hardtstr. 81, 90766 Fuerth, Germany. The invention goes back to the year 1936. The title of the technical book is „Federleicht - Modelle aus Vogelfedern", Neckar-Verlag, Klosterring 1, 78050 Villingen-Schwenningen, Germany, ISBN 3-7883-0630-0, Price: 28.- US-$ (included transportation to the USA)

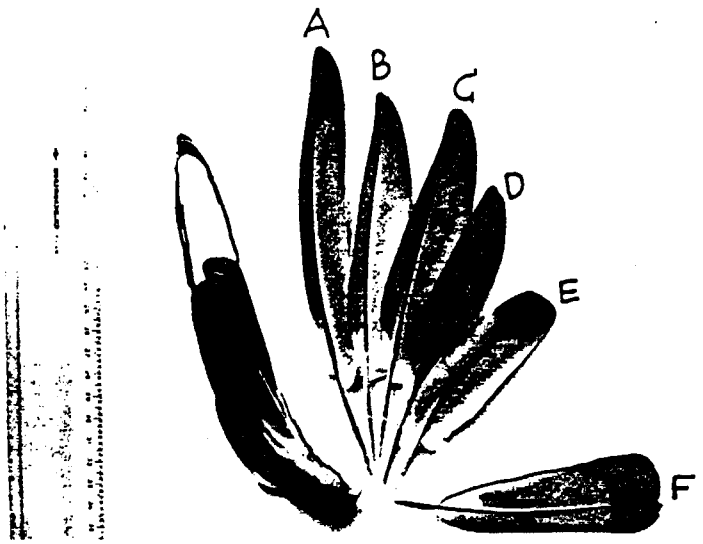
Address of the author of this construction guide: Klaus Strienz, Peter-Vischer-Str. 30, 91315 Hoechstadt, Germany, FAX: +49-9193-4996 (school)

(2) In the USA: I.F. of American Homing Pigeon Fanciers Inc., Secretary Treasurer: Mrs Marie Rotondo, 107 Jeffersen Street, Belmont Hills, Pa 19004. Phone: 215-664-0266. President: Matthew Reilly, Phone: 215-637-7766.

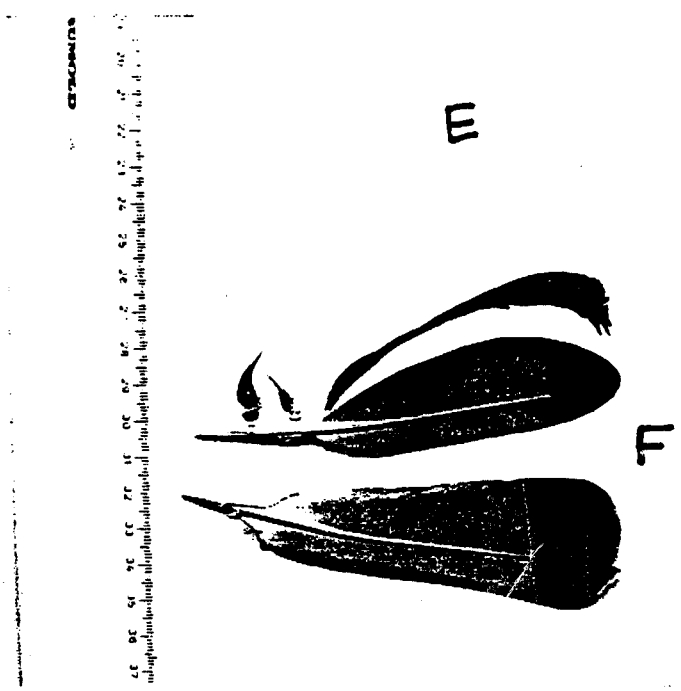
The American Racing Pigeon Union, Secretary Treasurer: Russ Burns, P.O. Box 2713, South Hamilton, Ma. 01982, Phone:508-927-3631. President: Charles E. Weaver, Phone: 808-395-2566

Pigeons shed their feathers after the 2 nd brooding in summer (moulting season).

Building Instructions for a Flying Wing



The photo shows four pinion feathers, one body feather and a tail feather from the pigeon (A-F). It is easiest to obtain pigeon feathers from pigeon fanciers. Your nearest one will be listed in the association register, at the municipal government or at the national central addresses of the pigeon fanciers' associations mentioned in the foreword.

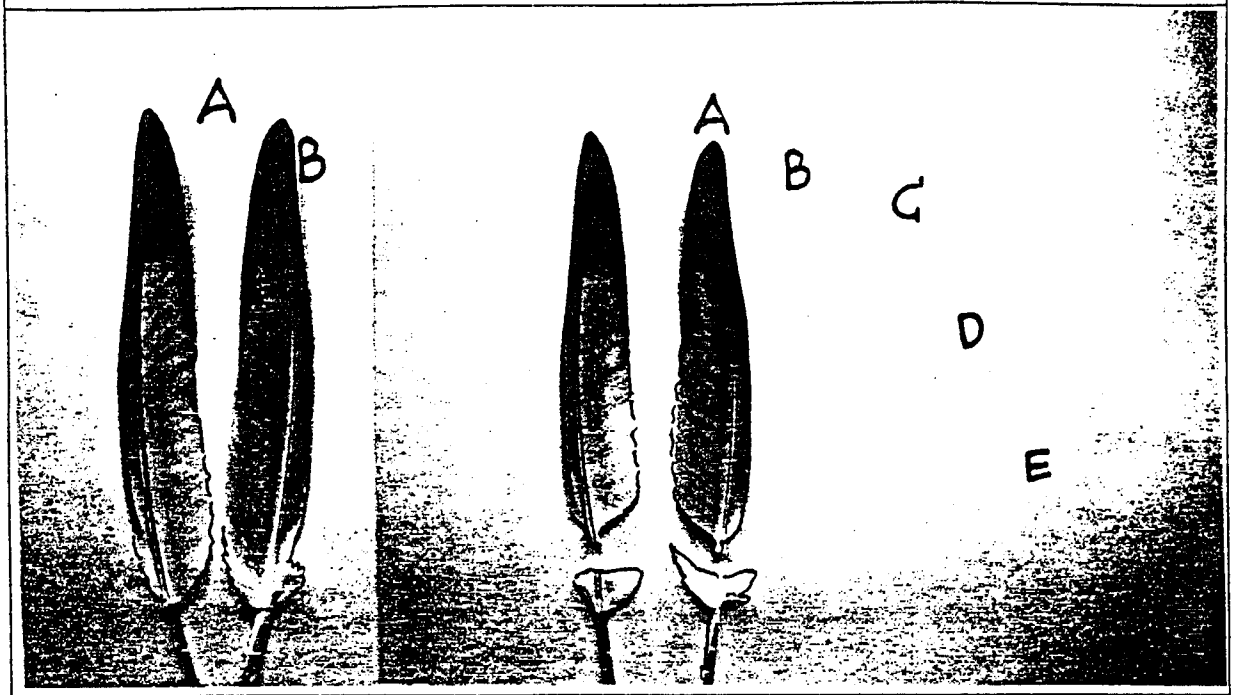


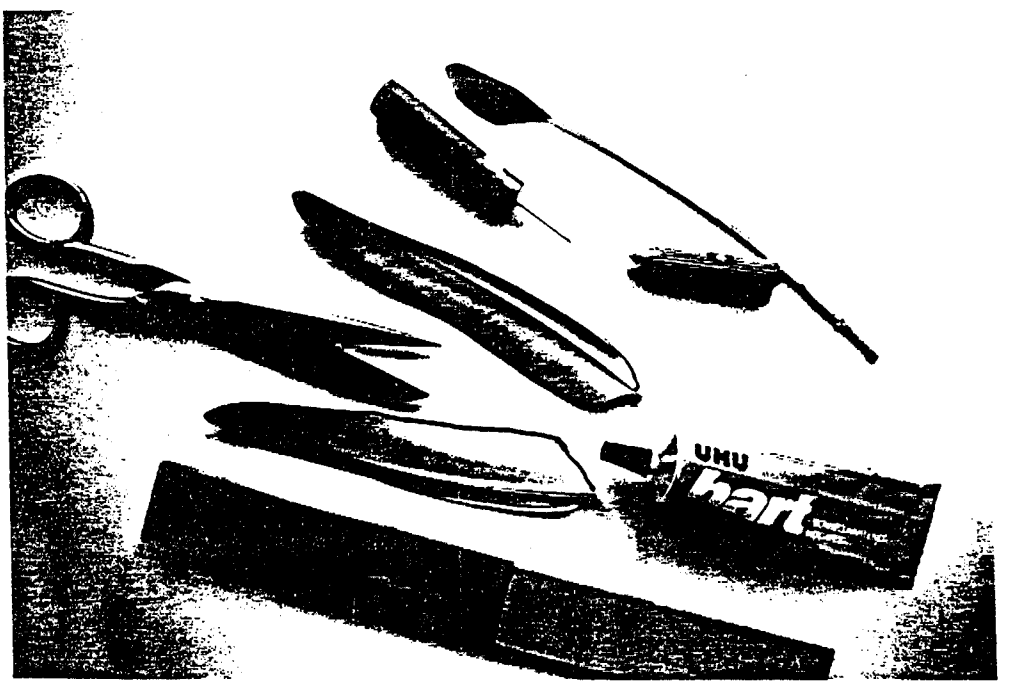
Two tail feathers. One (E) has been cut to shape with sharp scissors.

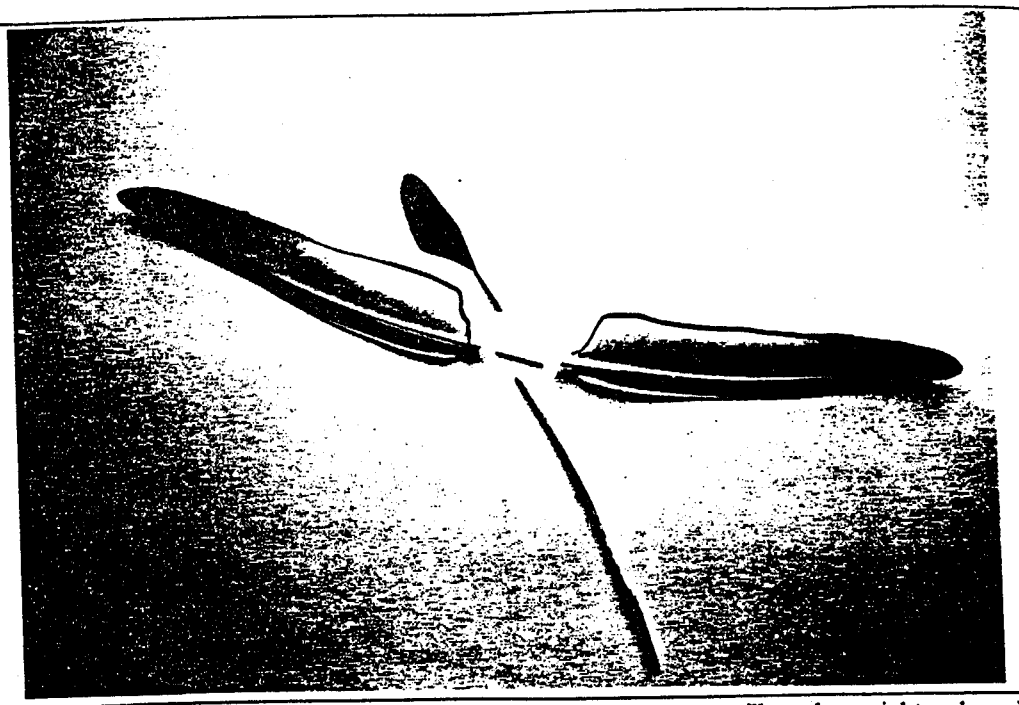
Building Instructions for a Flying Wing

Materials:

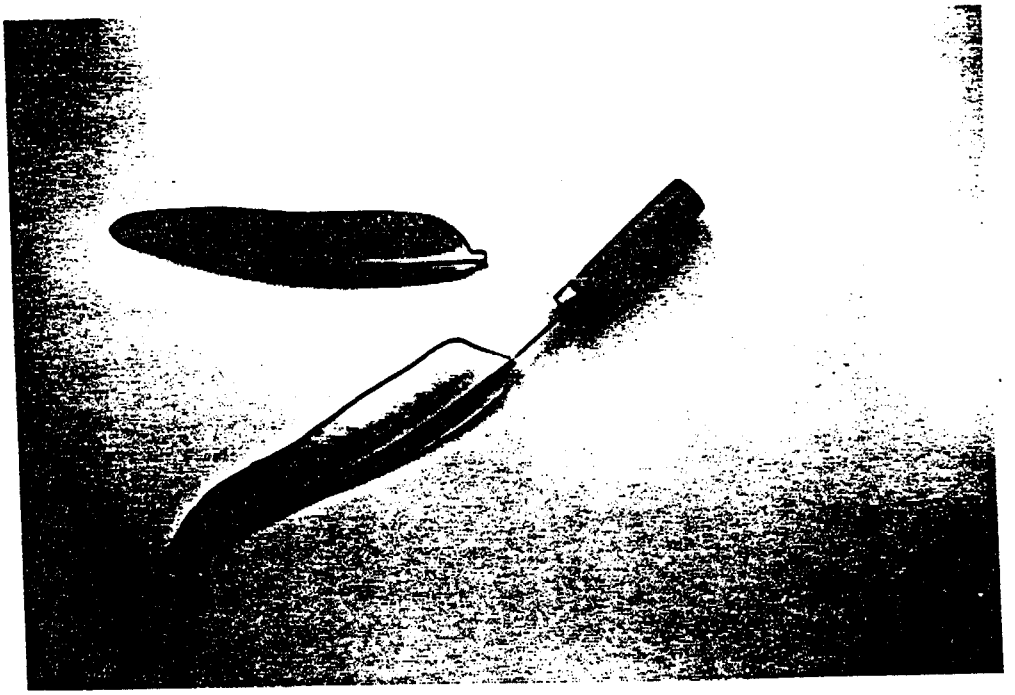
feathers, of which 2 are pinion feathers, 1 tube of cement glue, scissors, sandpaper, 1 fine drill bit.



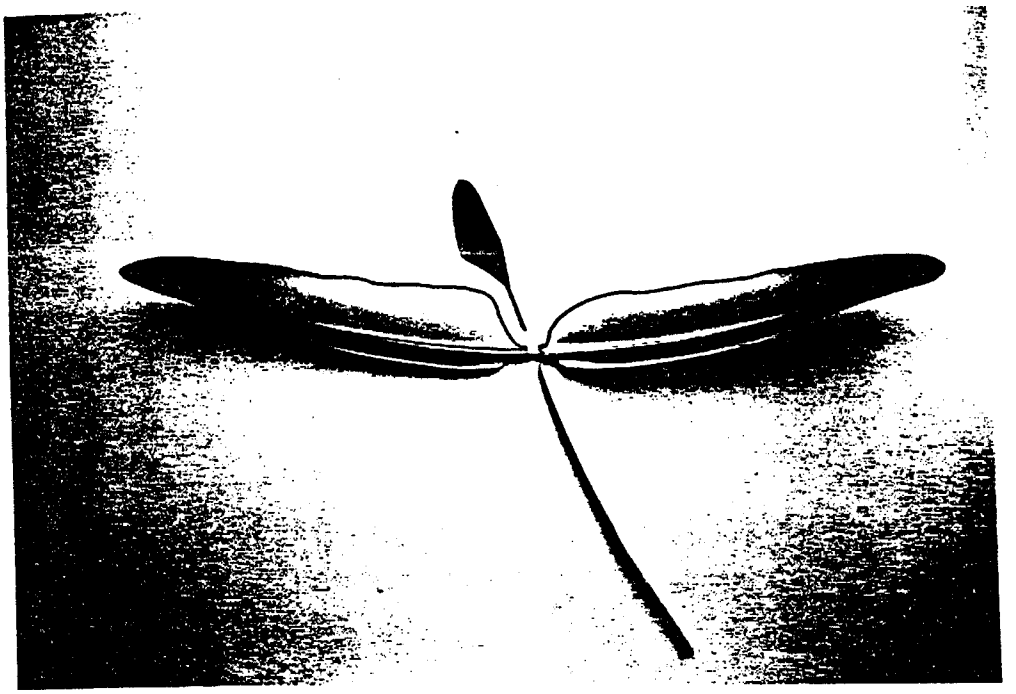




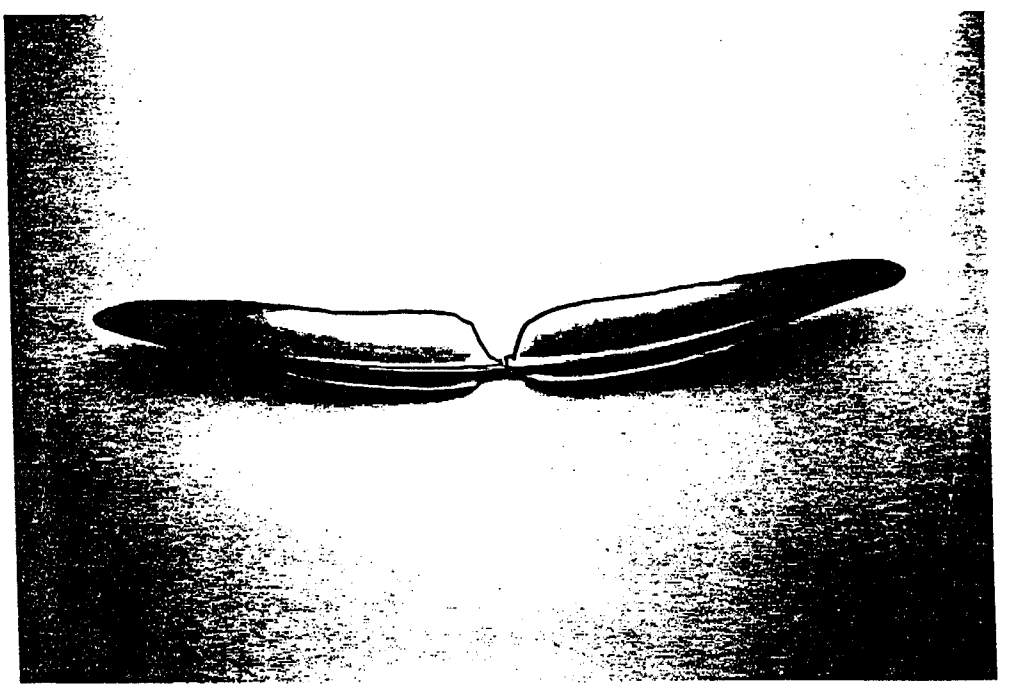
Using scissors, shorten the quill on the pinion feathers to equal lengths. You will need one right and one left pinion feather. Important for stability and dynamics: the quill is to be found fairly near to the front edge of the feathers in the direction of flight. The side which seems to produce more air resistance points upwards in the illustration and at the moment of take-off.



Now, using a sharp object (eg. the point of a small drill) carefully make a 1 cm deep hole up into the quill.



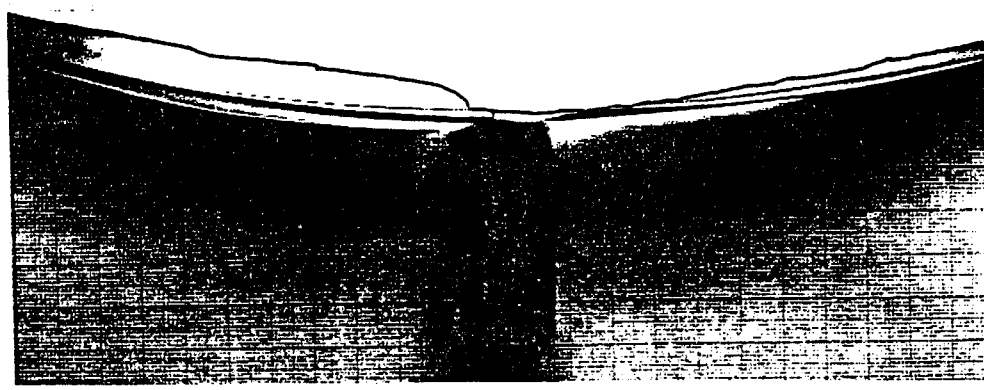
Push both quills onto an approximately 1 cm length of quill which originates from the third feather. The diameter of the connecting piece has to be slightly smaller than that of the pinion feather quills.



Both pinion feathers are pushed onto the connecting piece. First test flights precede gluing.

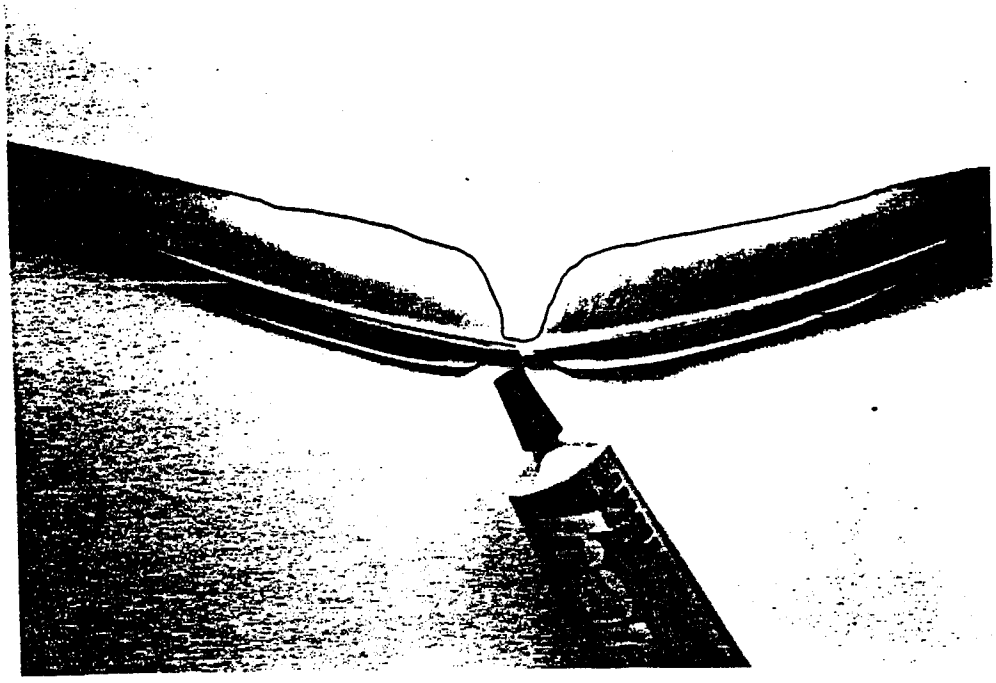
To start, take the flying wing between thumb and forefinger and align in the direction of flight. Make sure that the sides of the feathers which show most of the quill point upwards.

On the first test flights, the flying wing will probably veer in a right- or left-hand curve or even crash. The causes are easily determined and rectified.



Failure Check List

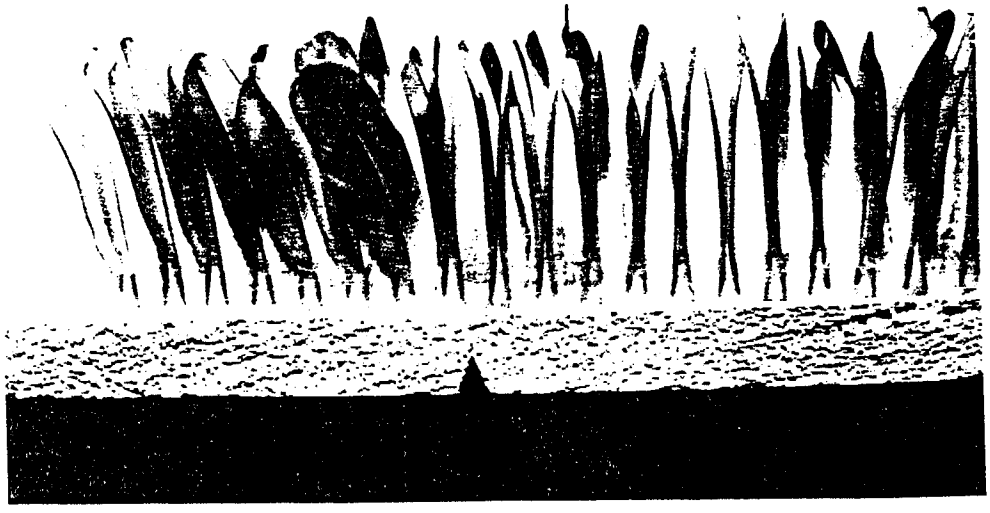
Failure description	Cause	Remedy
After starting, the model flies against one's own knee, it tilts over onto the front of the wing.	It was thrown upside down.	Turn the model so that the other wingside points upwards. You have to be able to of well identify the quill.The arodynamically wellrounded side must show downwards!
The model flies only a very short distance, it almost crashes.	The flying feather wasn't thrown, nevertheless, it is noseheavy.	The feather must be bent backwards at the middle.
The model veers to the right/left.	The feathers are twisted against each other (see photo above).	Twist a feather at the middle on the connecting piece until a straight flight is achieved.
	The feathers are of unequl size.	Lay the left and right feathers on top of one another. They must be the same size. Correct with scissors.
After hand-start, the model wants to fly upwards, ascend, but then tilts downwards.	The flying feather is too heavy at the rear, tailheavy.	The feathers must be bent foreward at the connecting piece.



All testflights should be carried-out in a large room or gym. Close windows to avoid possible draughts. Air-conditioning units should be switched off because they also cause air currents which may influence the flight path.

When the Flying Wing flies satisfactorily, glue the flight feathers to the connecting piece. For a better bind, first roughen the places to be glued with sandpaper.

Successful flying!

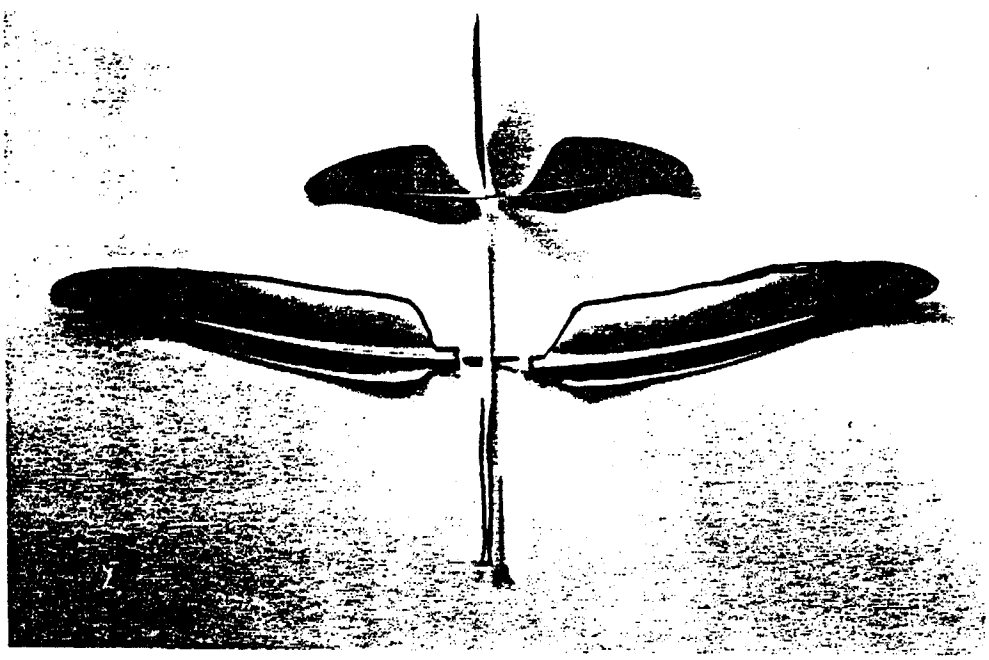


A „Normal“ Model Glider

Materials: 5 pinion feathers, 1 dressmaker`s pin, cement glue

The wings and stabilizer for the model glider are made out of 4 pinion feathers. The quills are to be shortened as shown in the illustration. To connect the left- and righthand side feathers, use a thin quill which is stuck into 2 small holes on the fuselage. They hold the 2 large (wing) and 2 small (stabilizer) feathers together. The 5 th feather is used for the fuselage. Use a sharpe knife to trim the feathers from the quill, leaving just a jot at the tip. Leave just enough at the thin tip of the feather to equal half the size of the stabilizer. Straighten the natural curve of the quill by gently pressing it in with a thumbnail about every 5 mm. You can lengthen the fuselage by adding (pushing in) a thick piece of quill at the front. Use a dressmakers's pin or small nail for the trim. The centre of gravity is at the quill of the wing feathers. Correct positioning of the centre of gravity is responsible for a long glide and it can be altered by simply changing the position of the pin or nail.

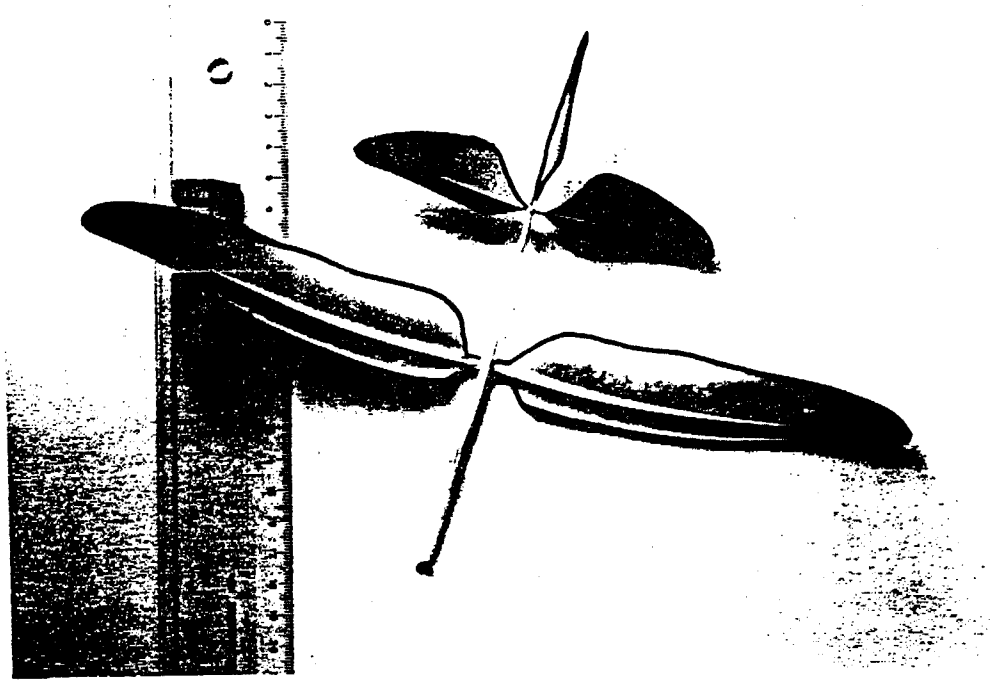
After balancing the model (trimming) the flight behaviour can be optimised by altering the angle of the wings tabilizer. (decalage) or the stabilizer.



Failure Checklist

(Refer also to the failure information for the „Flying Wing“)

Failure description	Cause	Remedy
The model makes only a short glide.	The centre of gravity is not at the correct place.	Reduce the weight at the tip of the fuselage. Push the pin further into the quill.
The model accomplishes only	The angle (decalage) between the main wings and the fuselage is not optimal.	Increase the angle between the fuselage and the stabilizer feathers by raising them a litte at the rear end.



A berth made with blocks and lines to support the wings during gluing is very helpful and enables an exact construction. It also saves a lot of disappointment

Once you gain some experienc, artistic use of feathers with different colouring is very attractice.

Succesful flying!

The Author.