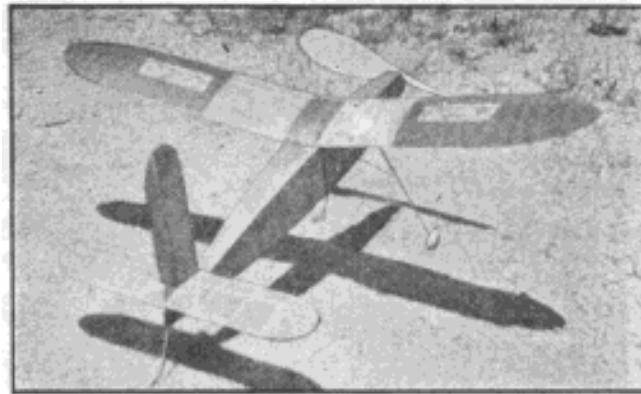


# Building a World Record Fuselage Model

**How You Can Build and Fly the Model With Which the  
Author Established a World's Record of 41 Minutes and 19  
Seconds**

By WILLIAM YING



The finished model ready to fly portrays excellent 'dying proportions and grace

In the year of 1935, my ambition was to construct a model plane which would perform well enough so that I could enter the Eastern States Model Meet at Hadley Field, N.J.

After having gone through my pile of magazines and books, I took out some MODEL AIRPLANE NEWS containing many helpful articles. From these books, I obtained much useful information which I used to design this class D fuselage model.

The model has 198 square inches of wing area and meets all N.A.A. requirements and also the Wakefield International contest. The model was completed in the early part of April, 1935, and a few trials were made on the same day. The best time was 13:16 seconds and it flew out of sight but it was retrieved later in the afternoon.

On April 27, 1935, I entered the class D model in the Lyndhurst High School Meet at Teterborough Airport, N. J. Three trial flights were made and the third one got away with a flight of 13:36 seconds. A chase was given and later in the afternoon, the

model was retrieved again several miles away from the field. But, while getting the model off for an official flight, the motor stick snapped, thus ending any further flights.

On May 25, 1935, I was ready again with the same model to enter the Eastern States Model Airplane Meet held in Hadley Field, N.J. The model was prepared with an extra strong motor stick.

At the field, no test flights were made, for I knew it would take the air because it was so proven twice. The model was set up and checked by the judges then placed in the car until it was ready to make flights.

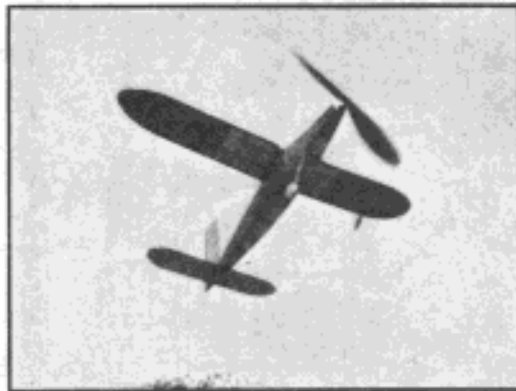
Later in the morning about 11:30 A.M., the class D model was taken from the car for an official flight. It was glided and satisfactory results were obtained. Mr. Le Roy Boshen, my timer, was on hand and we were all ready for the flight. My assistant, Ted Hoffmann, helped me wind up the motor. 650 turns were given. The model was then placed on the gas model ramp for the take-off.

My hands were off the model, and up she climbed, higher and higher to the waiting sky as it spiraled with the torque. In about 5 minutes, the model was well up in the heaven and we decided to start after it in an automobile. We did until we were held back by the railroad tracks about two miles away from the airplane field and this stopped us from going further.

Mr. Boshen kept the model in sight with his field glasses.

The model finally disappeared into the blue sky and the stop watch recorded 41 minutes and 19 seconds. This broke Vernon Boehle's 8-1/2 minutes record and a new one was set.

Before we go on with the construction of this model, I want to express my sincere gratitude to Mr. Boshen, Mr. Rouse, Ted Hoffmann and many others for their kind co-operative work.



The record model in actual flight at the Eastern States Contest

## **CONSTRUCTION**

### **Fuselage**

Enlarge the plans to full size and tack them to a soft working board similar to the drawing board. Place 1/8 square longerons along the outline of the fuselage side. Use pins wherever is necessary to hold the shape. Cut the vertical members in proper lengths and cement them on. The other half of the fuselage is made in the same manner.

When the 2 sides are completed, cut the cross members, having 2 of each, one on the top and one on the bottom. Cement the members on to the 2 sides of the fuselage at the widest point, and gradually work toward the rear end. Also use pins to hold members in place while cement is drying.

After the whole fuselage is finished, round off the longerons with sandpaper slightly before putting on the landing gear.

### **Landing Gear**

Take a piece of 1/16x1/4x9 bamboo and taper it from 3/16 to 1/8. Then streamline and sandpaper. The rear struts are made of 1/8 x3/32x8, they are also streamlined. Make 2 of each of the same dimensions.

A piece of .040 music wire is bent to shape for the central shock absorber. Then assemble with the rest of the bamboo struts. The 9" struts are inserted in the lower longerons at former No. 3 and the 8" at No. 4. Cement well and assemble the whole outfit with thread and cement.

The wire axles are bent from .034 music wire and bound with thread at the tapered end of the 9" struts and cemented. Put a 1-3/4" pr. of wheels on the axles and bend up the wire to prevent from falling off.

### **Motor Stick**

Select a soft piece of balsa size 3/16x3/8x25 and shape it as indicated on the plans. Cover the 4 sides with hard 1/32 sheet balsa and dope them. Use 10 rough sandpaper if possible to finish the stick and then cement the rear hook on.

The nose block or plug is made from a hard piece of 3/4x1x2-1/8 balsa. Take a sharp knife and cut it to shape. Sandpaper it smooth and drill a hole large enough to fit the bushing and at the same time having the thrust-line pointing to 1/8.

With the point of a sharp knife, cut a little groove in the nose plug to fit the motor stick snugly. Before cementing the stick on, place it in the fuselage just far enough to stick out from the front in order to receive the plug. By doing this, you will prevent the nose plug from being poorly fitted. When they are on, and cemented, remove them and retouch where necessary.

### **Wing**

17A and 2B ribs are cut from 1/20 sheet balsa. Then pin down the 1/4x3/8 leading and the 1/8x3/8 trailing edges. Cement the ribs in their proper places and add the required spars. The top spar is 1/8x1/4 and the bottom one is 1/16x1/4. 1/16 square bamboo wing tips are formed with an electric iron or still better an electric soldering iron and then they are cemented at each end of the wing. The center section of the wing is made in the same manner by pinning down the leading and trailing edges and cementing on the ribs.

When the left and right wings and also the center section are finished join them together carefully and accurately. The 4" dihedral of the wing is formed by using wood blocks or books. The wing tip is raised to form a 4" dihedral by putting blocks underneath the tips. Use plenty of cement on all the joints and check the 1-1/2" sweepback on the wing.

## **Empennage**

The tail and rudder are built in the same method as the wing. Ten ribs from 1/32 sheets are cut to shape and cemented on the trailing and leading edges of the tail. Double ribs are used in the middle of the stabilizer and bamboo rods are cemented on to receive the rudder. Bamboo tips curved from 1/16 square are cemented on before adding the center spar.

The rudder is of streamline type. Five 1/16x1/8 ribs are cut to size and cemented on. It is streamlined after the whole rudder is finished, that is when all the ribs are cemented in their proper places. Remove the rudder from drawing then streamline the ribs by using a razor blade. Cut down the rectangular ribs to form the streamline shape as shown in the drawings, and finish with fine sandpaper.

## **Propeller**

The propeller used on the record model was a 17-1/2 one, having a pitch of about 25". The block was 1-3/4x2-1/4x17-1/2. To make this prop. select a block of the medium hard grade of balsa and mark out the prop block as indicated in the plans. With a jig-saw or sharp knife cut out the outline and carve the prop so that the blades taper from 1/4" at the hub to 1/16 at the tip. Both blades should have 1/4 " camber, without fail. Be sure to take plenty of time and great caution, because a poorly made prop may reduce your flying time.

The free wheeling is made of .040 and .028 music wire. Cut a piece of 3/32 o.d. aluminum tubing that will extend about 3/16" out from the front end of the propeller and insert it in the center of the prop hub. Take great caution in doing this, because the prop is liable to split. Cement the tube well at each end and insert in each end a bushing.

The wire hinge-like arrangement is bent from .034 wire. Insert one about 3/4" from the center, on the leading edge of the prop and cement securely. The prop shaft is bent from .040 wire, with a hook at one end and a loop at the other end for the free wheeling. To assemble shaft on to the prop, pass the wire shaft through the nose plug, and 3 large washers. Put on the prop and bend the wire shaft, then with round nosed pliers, bend the loop for free wheeling. Finish the prop by sandpapering it and then cover it with any desired tissues.

To wield the motor by hand, insert the loose piece of wire in the loop of the prop shaft.

## **Covering**

The original model was covered with two colors, red and yellow. The center of the wing (center section) was entirely red and from the center rib to the 5th one of each side with yellow, while the rest of the wing was red. The fuselage was entirely red. The tail yellow and the rudder red.

Use a mixture of 66-2/3% dope and 33-1/3% acetone to cover and dope the model; two coats of dope on the tail and rudder while 3 coats on the rest of the plane. When dopping the empennage, take great caution because it is liable to warp.

## **Flying**

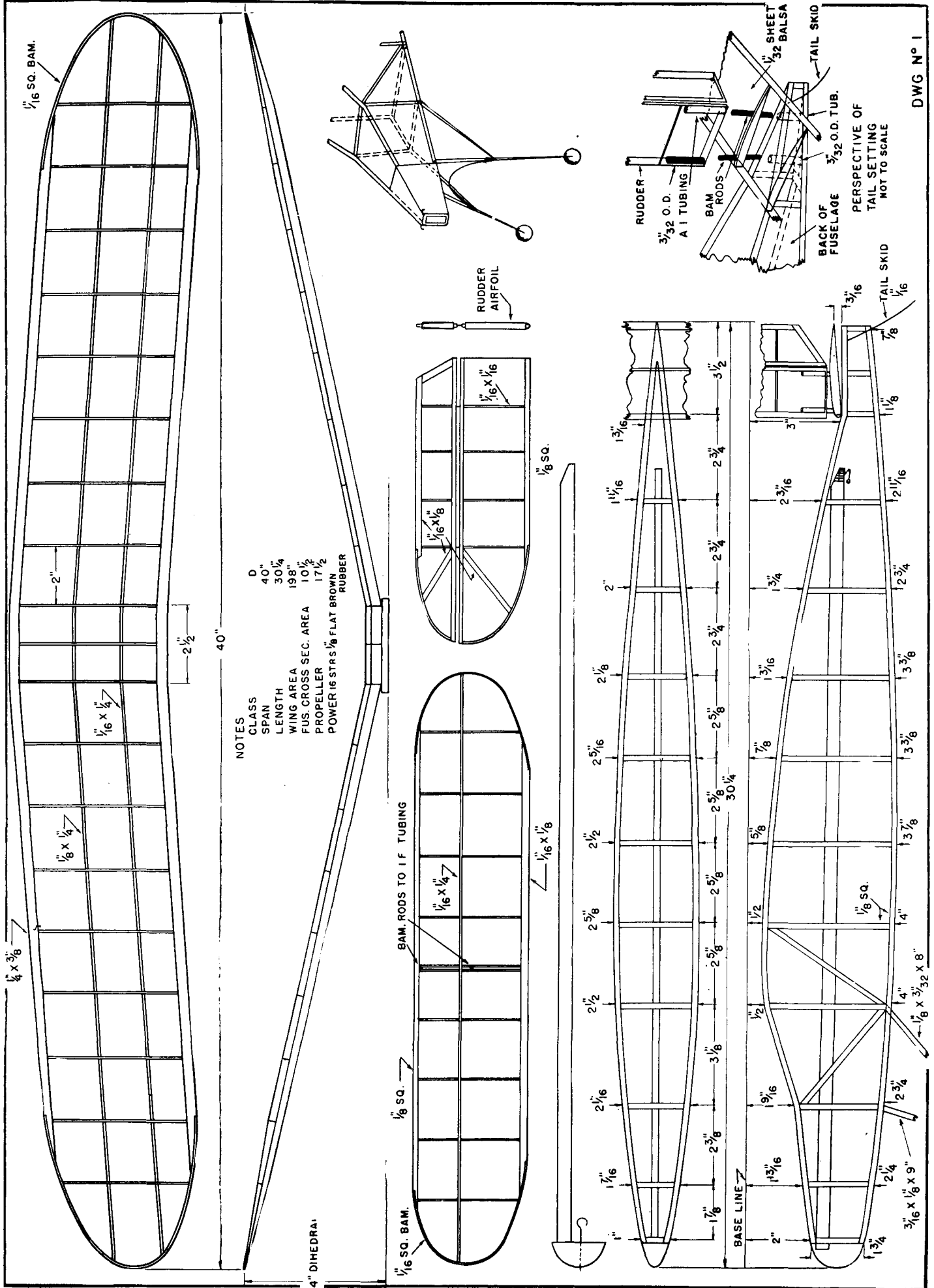
Assemble rudder onto the tail and then place the whole empennage onto the fuselage. Be sure to have them on tightly or they will fall off while in flight. The wing is fastened to the fuselage with a piece of flat rubber and the motor stick with 16 strands of 1/8 flat brown rubber is placed in the fuselage with 2 "U" wire clips holding them in at the nose plug. Check the 3/16" incidence on the wing and 3/16" at the tail. Incidence may be reduced by use of light wood on prop or any other parts.

Hold model in hand anti glide model until a nice flat glide is obtained. If model stalls, reduce incidence at the tail and if it dives, increase it.

When a flat smooth glide is obtained, remove the 2 ""U"" clips and wind the motor up to 300 turns, and then let her take off. If model acts all right. then wind to full capacity and let her go.

Go to it !

*Scanned from December 1936  
Model Airplane News*



NOTES  
 CLASS D  
 SPAN 40"  
 LENGTH 30 1/4"  
 WING AREA 198"  
 FUS. CROSS SEC. AREA 10 1/2"  
 PROPELLER 17 1/2"  
 POWER 16 STRS 1/8" FLAT BROWN RUBBER

DWG No 1

PERSPECTIVE OF  
TAIL SETTING  
NOT TO SCALE

B.A.M. RODS TO IF TUBING

BASE LINE

1/16 sq. B.A.M.

1/16 x 1/4

1/8 x 1/4

1/4 x 3/8

2"

2 1/2"

40"

4" DIHEDRAL

1/16 sq. B.A.M.

1/8 sq.

1/16 x 1/4

1/16 x 1/8

1/8 sq.

RUDDER AIRFOIL

RUDDER

3/32 O.D. A.I. TUBING

B.A.M. RODS

1/32 SHEET BALSA

TAIL SKID

BACK OF FUSELAGE

3/32 O.D. TUB.

13/16

7/8

1 1/8

2 3/16

1 1/8

12 3/4

3 3/8

3 3/8

3 3/8

3 7/8

4"

1 3/4

2 3/4

2 3/4

3 1/8 x 1/8 x 9"

1 3/4

3 1/2

2 3/4

2 3/4

2 3/4

2 3/4

2 3/4

2 5/8

2 5/8

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2 5/8

2 1/2

1 7/16

1"

3"

3"

2 3/16

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3 3/8

5 3/8

1 1/2

1 1/2

9 1/16

1 3/16

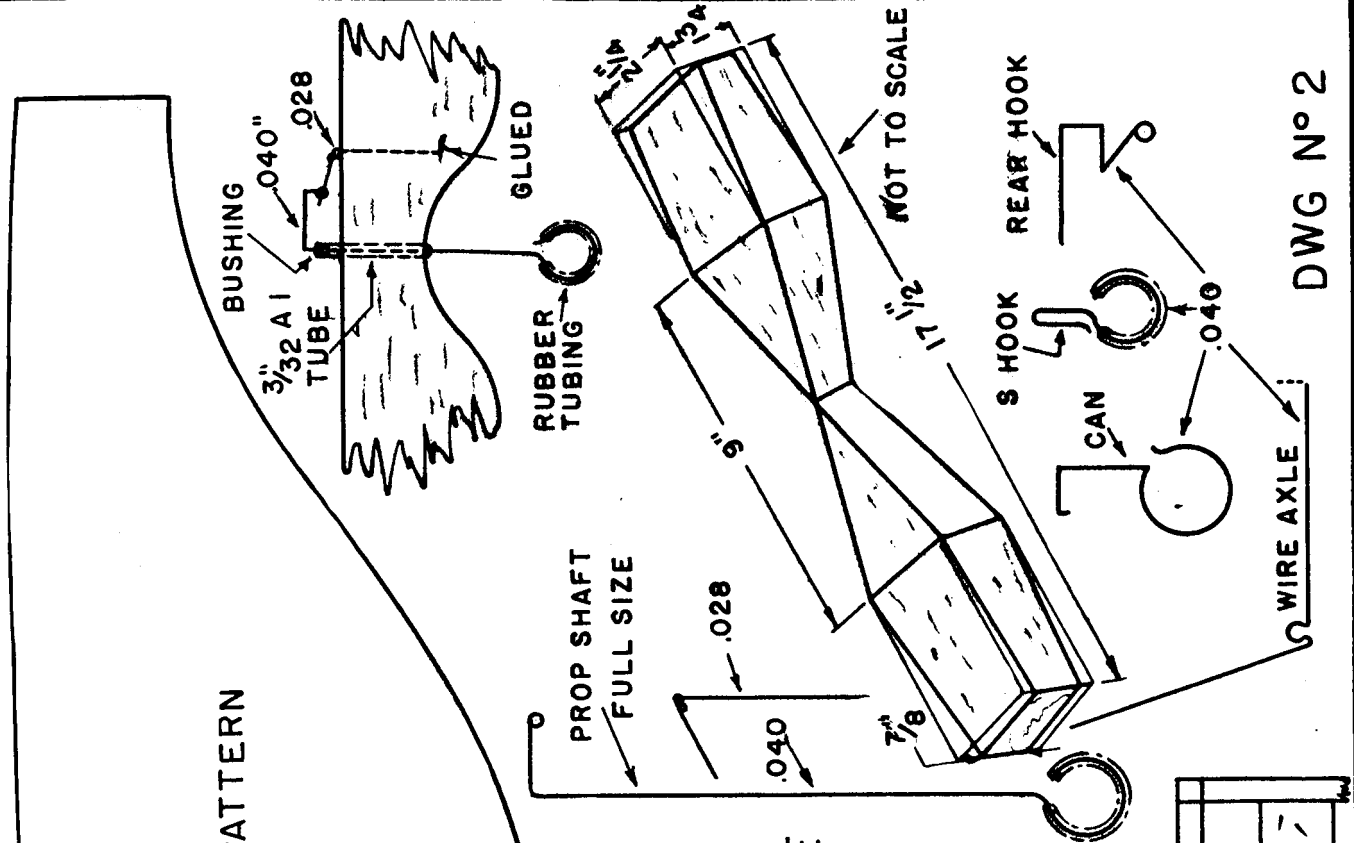
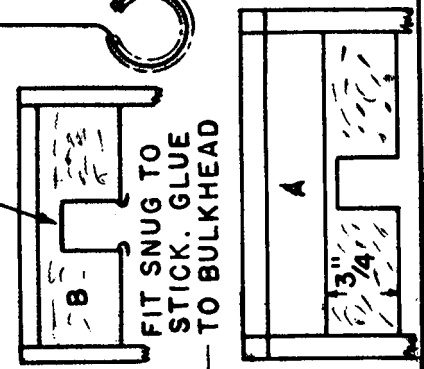
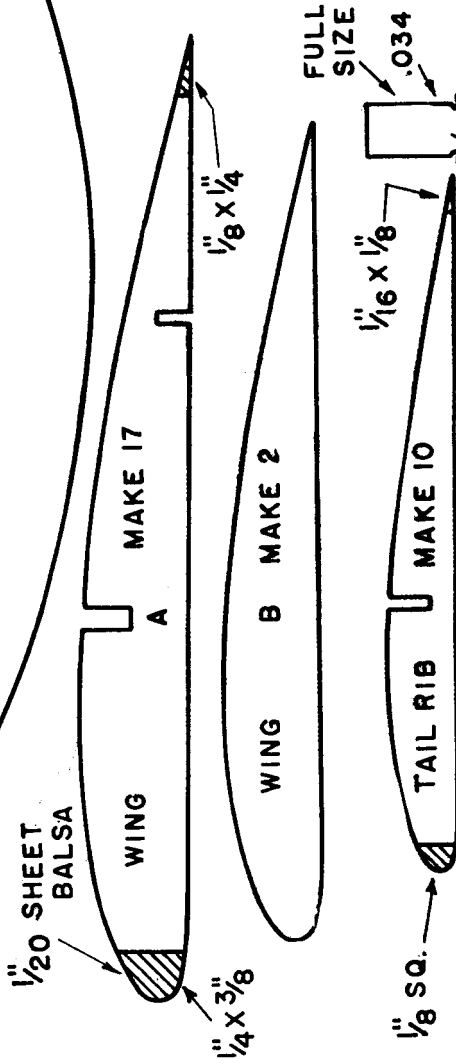
2"

1 3/4

1 1/8 x 3/32 x 8"

PROPELLER BLADE PATTERN

FULL SIZE



DWG N° 2