

FLYING FOOL

35

By Bob Aberle

RC MICRO WORLD
CONSTRUCTION ARTICLE

John Stockbridge's "FLYING FOOL-35"

An all balsa sport rubber model from 1947
Modified for RC and electric power

Wing Area - 35 square inches
Weight - 1.1 ounces

BACKGROUND

The inspiration for this particular design came from a very close to home source. Namely the September 2104 issue of RC MICRO WORLD.

In that issue and as a tribute to FLYING MODELS magazine, which recently stopped publication, Roland reprinted a construction article, which turned out to be the very first published in the then new FLYING MODELS magazine.

The exact issue was June 1947. The design was called the "FLYING FOOL" and its designer was John Stockbridge. The plane was rubber powered and was made up totally from balsa sheet stock.

Since this was originally a very small model, I chose to enlarge the original design to an 18 inch wing span and 35 square inches of wing area.

THE CURRENT FLYING FOOL

The result, slightly larger than the original FLYING FOOL, ended up as a totally "cute" aircraft. Here are two photos of the resulting model which not only "looks right", but flies right as well.



To give you an idea as to the relative size, the photo that follows shows me holding the little plane prior to an indoor flight.



The next photo shows the FLYING FOOL at the right in comparison with the E-Flite UMX SPACEWALKER, that will be reviewed in the next issue of RCMW. In the middle is the operating transmitter, the Spektrum DX-7.



The same all balsa sheet construction was employed here, just like the original from 67 years ago. The plane is so simple it can be constructed in less than a day of work. The materials cost practically nothing.

CONSTRUCTION NOTES

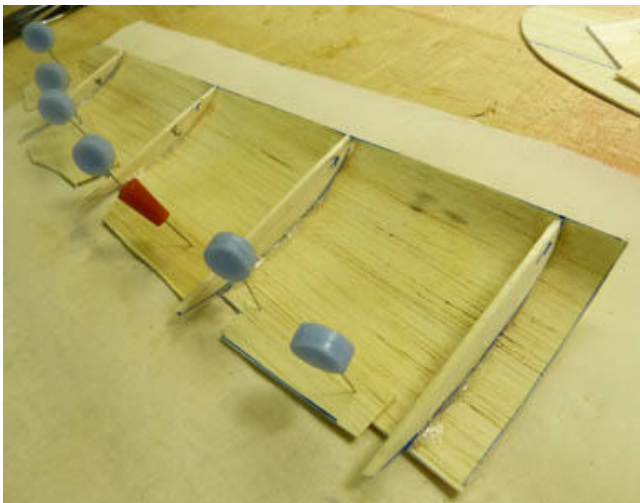
To start this the next photo shows all the parts prior to assembly. Except for the top and bottom fuselage sheeting, everything is 1/16 inch balsa sheet.



Initially I made my wing panels from 1/32 inch sheet balsa. It proved too thin and too soft, yielding a warped wing that was of little use. I substituted 1/16 inch medium balsa which only added a couple of grams to the total weight.

Note that the airfoil is not a Jedelski section. It has a continuous flowing airfoil that employs four ribs on each of the two wing panels. The placement of the two innermost ribs are set to fit the top of the fuselage perfectly.

As you can see in the following photos, the wing is constructed upside down with the trailing edge pinned to the building board. The ribs are installed next. Then the wing panels are lifted up to obtain the final airfoil shape.



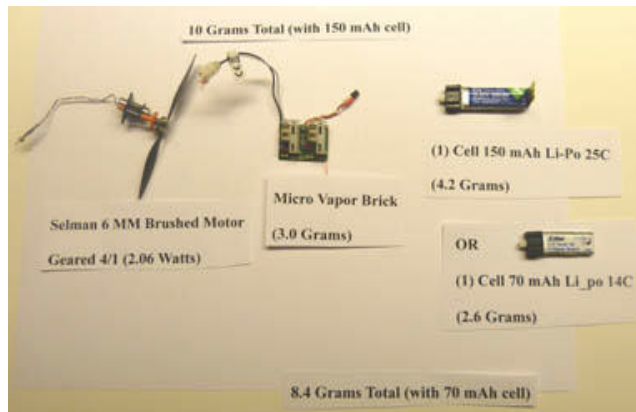
The wing panels are then joined with 1 1/4 inch dihedral under each tip. No dihedral braces are employed.



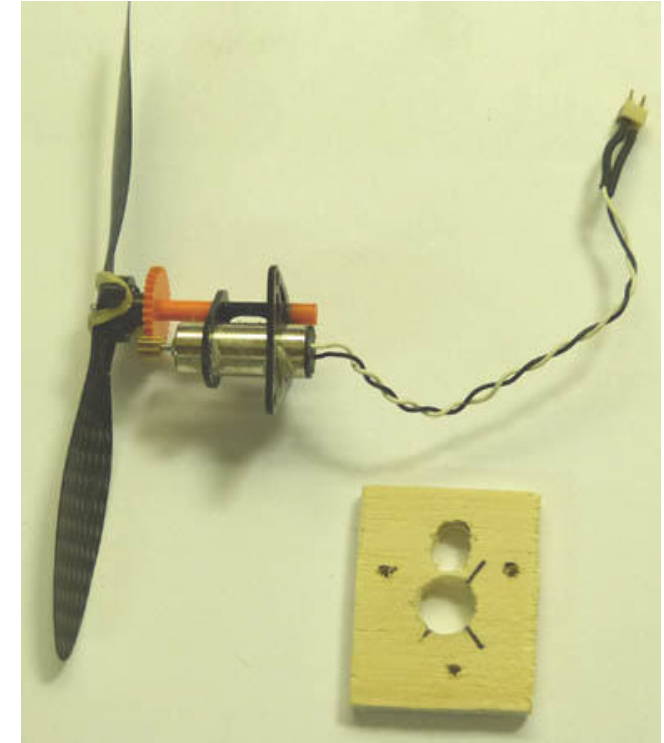
The bottom of the finished wing prior to attaching to the fuselage.

RC & POWER SYSTEMS

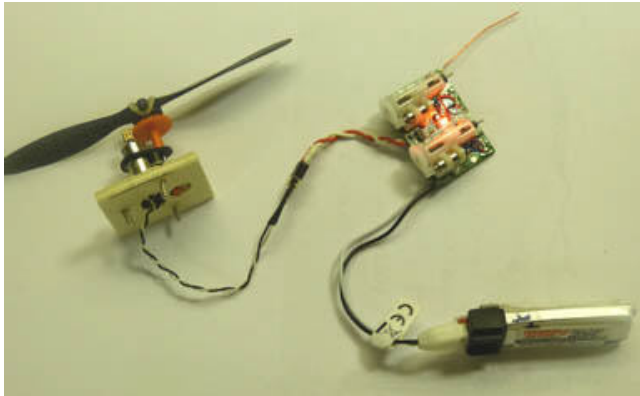
In the next photo you will see the entire power and RC system, which weighs 10 grams with a single 150 mAh Li-Poly battery cell.



I chose the 6 MM geared motor offered by Bob Selman of BSD Micro RC. The motor is a ParkZone CUB J3 brushed 6 MM variety with Bob's 4/1 gear drive. As noted you could save weight by going to a lower capacity 70 mAh Li-Poly battery cell.

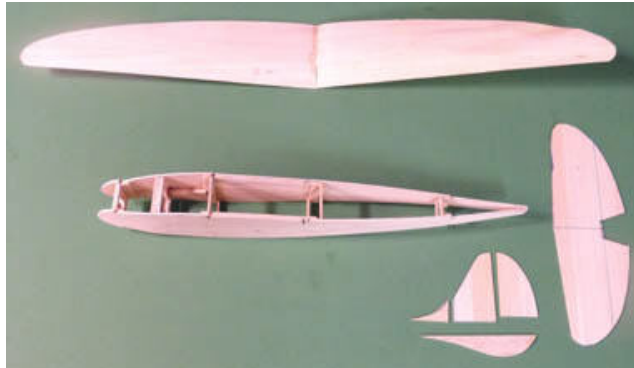
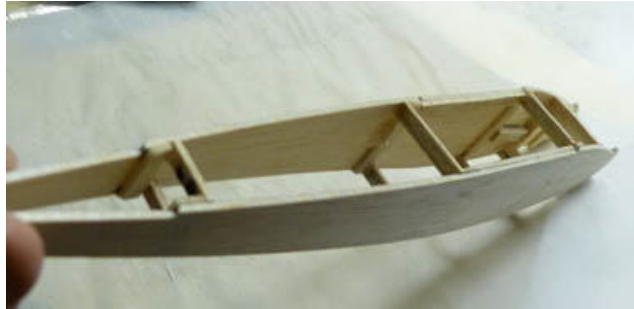


This is the 6 MM brushed motor with the Bob Selman 4/1 gear train. Note the cut outs on the 1/8 ply firewall. One hole clears the motor, and next the protruding gear box shaft along with the two wire motor cable that mates up to the connector exiting from the Mini-Vapor brick.

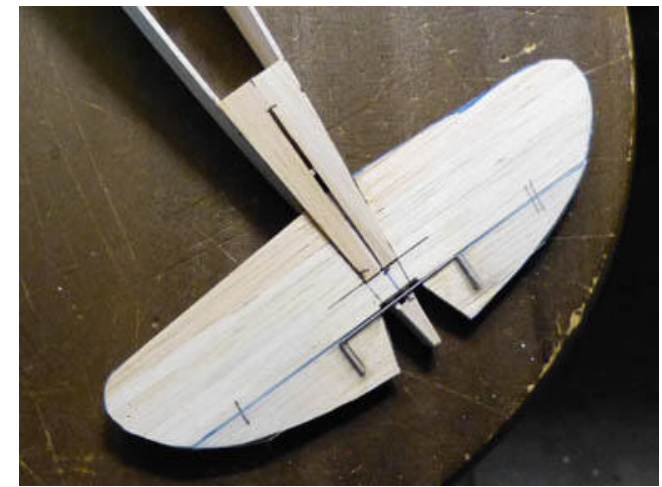
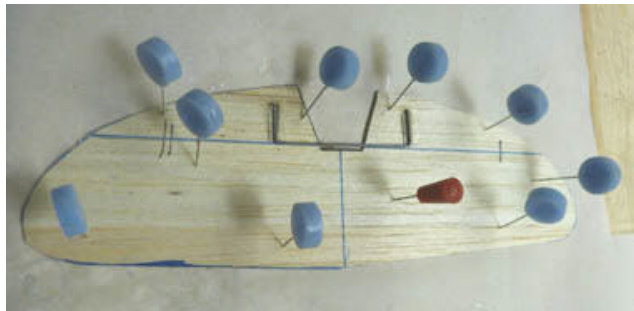


Here is the complete motor/RC system ready for installation.

The fuselage sides are cut from 1/16 inch balsa sheet. Stiffeners and cross pieces are used instead of actual formers, but I did use a couple of temporary formers to hold the shape during assembly.



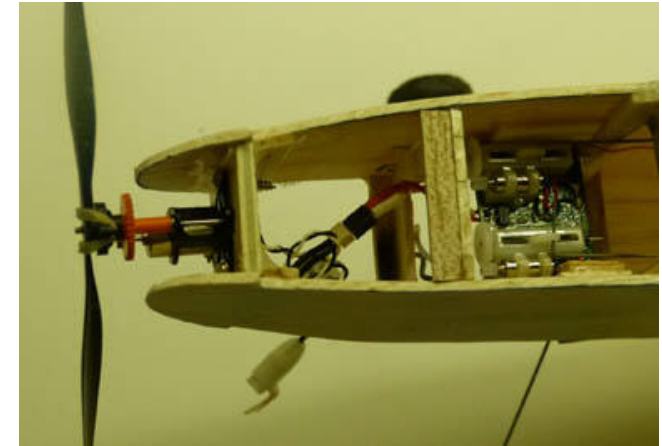
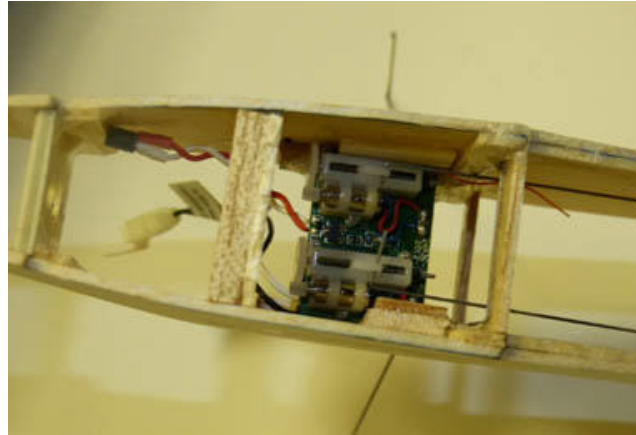
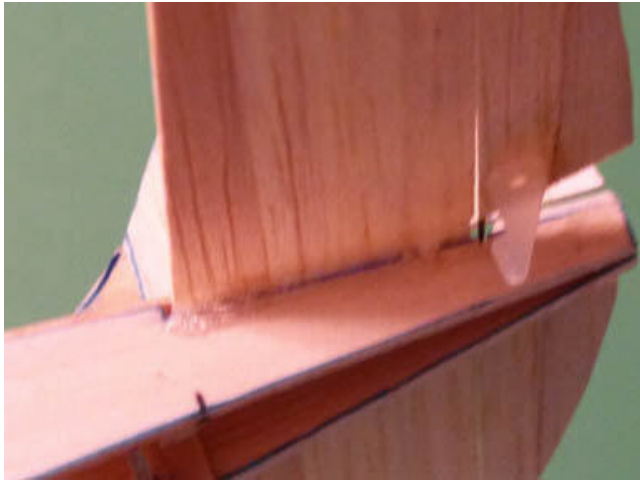
Getting ready for final assembly. The tail pieces are made from 1/16 inch medium sheet balsa. The elevators are two pieces and must be joined with .032 inch diameter wire.



This shows the stab mounted to the fuselage using 5 minute epoxy cement.

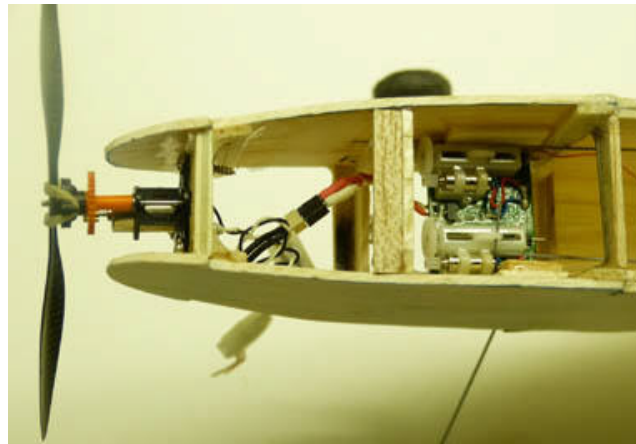
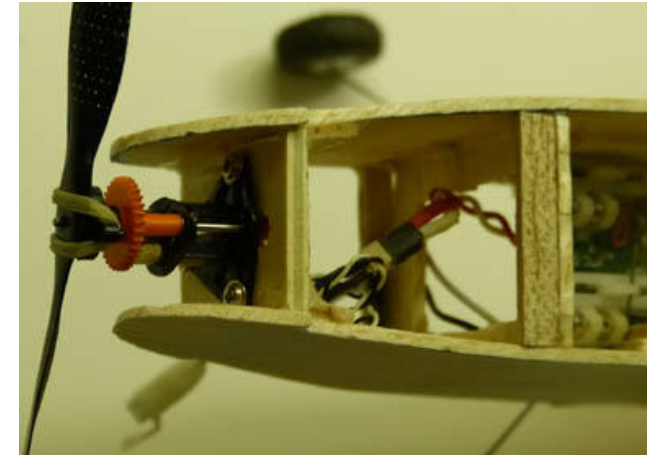
The rudder and elevators are connected to the control rods using DuBro micro control horns. Control rods were made from .020 inch diameter wire. A right angle bend is used at the servo output arms. At the tail, a second piece of .020 wire is added with a "Z" bend. That end goes into the control horn. After zeroing out the control surface, a dab of cement holds the two wires together.





Starting to take final shape.

The next series of photos shows the installation of the motor and the RC brick. Note that the brick is mounted forward of the wing leading edge. A top access hatch can be employed to allow access to the brick. I didn't bother doing that and never had a problem. The single battery cell is attached to the fuselage bottom, just behind the motor. I used Velcro tape to attach the battery.



Check out the controls and the motor, then affix the wing permanently to the fuselage using 5-minute epoxy cement. I added some color using a Krylon Spray called "Short Cuts". In this case it was "Glow Orange". Then I applied an over spray coat of Krylon Crystal Clear Acrylic coating No. 1303. This is especially helpful when applying the hinge tape on the control surfaces. It helps the tape adhere to the raw balsa sheet surfaces.



FINAL CG COMMENTS

The final CG position ended up at 5/8 inch back from the wing leading edge. You don't want it any further back than that. Control throw was rudder 1/4 inch either side of the neutral position and elevator 3/16 inch either side.

I did add in 30% expo rate on the rudder and elevator channels. It was not really essential, but it did make flying a little easier.

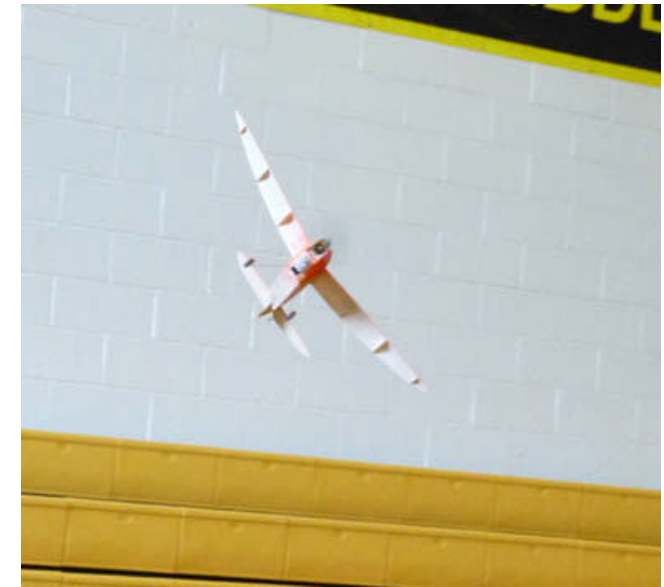
FLYING

Initial flying took place in my local Samoset Middle School Gymnasium in Ronkonkoma, NY. My SEFLI club rents this double size gym once a month from October till March each year.

The first flights were made with SEFLI President Tom Hunt on the controls and myself on the camera. Here are two flight shots.



Here are some underside shots showing the landing gear and the single cell battery attached to the underside of the fuselage.





I had some difficulties with my Panasonic Lumix FZ-150 camera and as a result got very few action shots.

Take offs from the gym floor went well. Outdoors you must consider strictly hand launching, unless you have a paved surface. The expo rate should help a little. It is possible to tip stall this plane because of the elliptical wing planform.

If that happens put the nose down (down elevator and throttle back a little). But still in all it is a pleasure to fly and costs practically nothing to construct.

SUMMARY

First of all the power system employed can easily handle a plane weight of up to 35 grams (a little over an ounce). As I have said so often, this power system can easily fly planes like the Dumas Products 17 inch span rubber scale models as well as those from Dare Designs and Stevens Aero-models.

Also keep in mind that Hobby King is now offering after market micro RC bricks (for both brush and brushless operation), geared brushed motors, micro brushless motors, separate micro

linear output servos and a variety of micro Li-Poly single cell batteries. Check out the prices!

I hope to pursue new designs using this equipment in the near future. Please write in with your suggestions.

Bob Aberle

baberle@optonline.net

SPECIFICATIONS

Model: "FLYING FOOL-35 "

Designed originally by John Stockbridge in 1947 as a sport rubber model

Updated and converted to RC and electric power by Bob Aberle 2015

Type: A micro Indoor/Outdoor Electric Powered RC sport design

Wingspan: 18 inches

Wing Area: 35 square inches

Length: 12 inches

Weight: 1.1 ounces (31 grams)

Wing Loading 4.5 oz/sq.ft.

RC GEAR USED:

Horizon/Spektrum DX-7 transmitter 2.4 GHz spread spectrum, Spektrum Mini-Vapor brick which includes two servos (rudder and elevator), plus a brushed motor ESC

POWER SYSTEM USED:

Bob Selman Micro RC - 6 mm brushed motor geared 4/1), 3.2 inch diameter prop and a single cell 150 mAh Li-Poly battery pack.

POWER SYSTEM PARAMETERS:

Prop: 3.2 inch diameter

Motor current: 640 mA (0.64amps)

Voltage: 3.22 volts (under load)

Power Input: 2.06 watts

Battery Loading: 4.3C

Power Loading: 30 watts/pound

Flight Time: 10 minutes

SOURCE REFERENCES:

Bob Selman Micro RC - 6 mm brushed motor with 4/1 gearing, suitable prop and a single 150 mAh Li-Poly battery cell.

www.bsdmicrorc.com

BP Hobbies (CA cement, 5 minute epoxy cement and CA accelerator)

www.bphobbies.com

DuBro --- (micro control horns, mini EZ connectors and electric flyer hinge tape)

www.dubro.com

Horizon Hobby (Spektrum DX7 transmitter and a Mini-Vapor brick.

www.horizonhobby.com

Krylon Products Group Inc.(Crystal Clear Acrylic Coating #1303 and Short Cuts Spray paint - (Glow Orange)

www.krylon.com