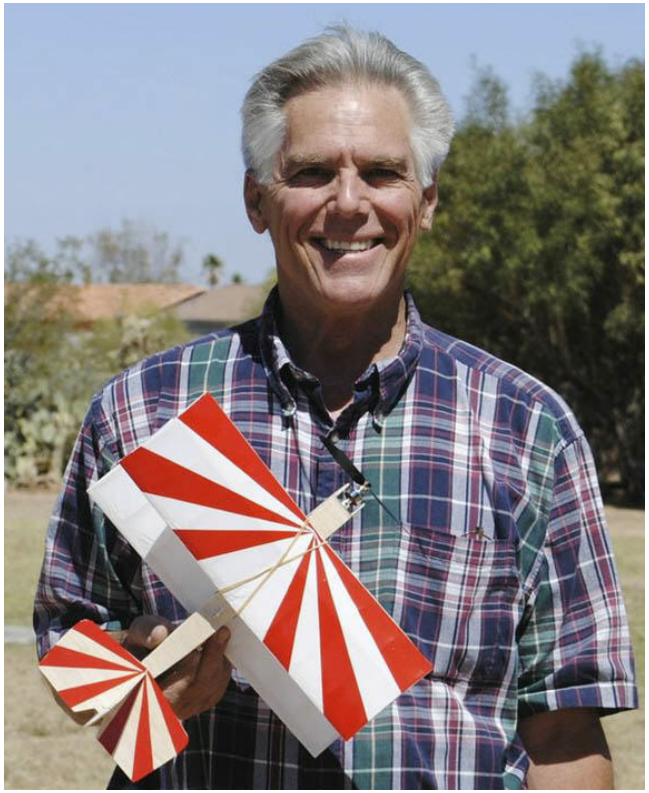
PEANUT CANNON

by

Tom Binkley



Ken Willard was a talented and prolific model designer. His ever present grin, his monthly column and many of his model designs are well known to the readers of this magazine.

Perhaps less well known is Bill Cannon, who was an electrical engineer, manufacturer, technical writer and publisher. In 1955 he started C&S Electronics which grew to become Cannon Electrics, and finally Cannon Radio Control Systems, an American manufacturer of digital proportional radio control components. For some years in the 1970's and 1980's Cannon was known worldwide for the smallest, lightest, sophisticated Radio Control systems
ever manufactured.

In 1974 the brag was made that their 4 channel flight pack weighed only 10.4 ounces, and by 1981 they advertised a 3 channel flight pack under 3 ½ ounces.

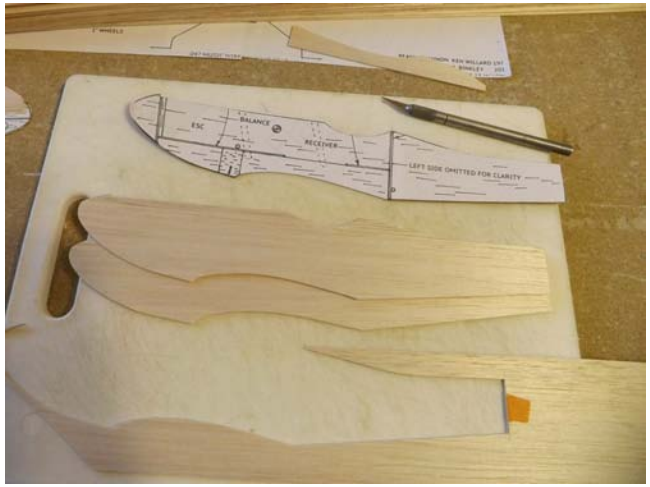
In June 1976 Ken Willard published plans for the CANNONSHOT, a 16" span biplane that was designed around Bill Cannon's latest, light weight innovation, a 2 channel "brick", a combination receiver and 2 servos.

There is no indication of the model weight on the original plans, but we, today, would probably consider it to be heavy. And compared to currently available R/C components, the word "brick" really takes on graphic meaning.

Long intrigued by the design, I built a reduced size CANNONSHOT some time back. Presented here is a lighter, revised, Peanut size version, the PEANUT CANNON.

Power is from the popular 18-11 2000kv, 10g outrunner motor spinning a GWS 5043 prop. The Peanut Cannon requires a slim 300 mAh, 7.4V LiPo battery and a small, light ESC. For guidance I chose the Orange R415 2g receiver and two Ultra Micro servos.

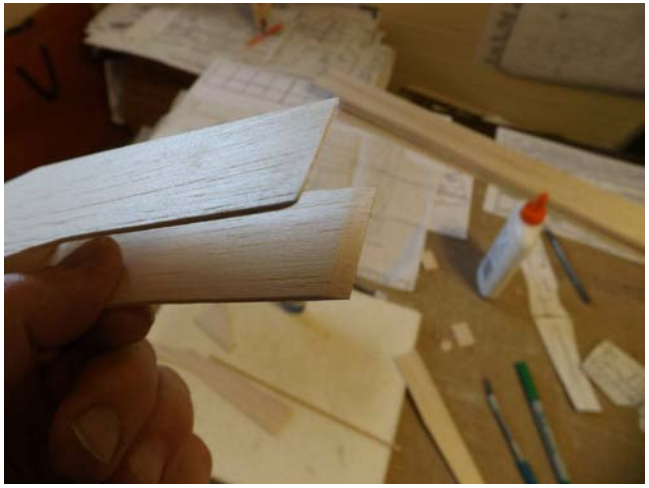
Building the Peanut Cannon is really easy. Start by cutting the fuselage sides, doublers, bulkhead, battery tray, fin, rudder, stab and elevator out of 1/16" balsa, and the landing gear reinforcements and firewall out of 1/16" ply.



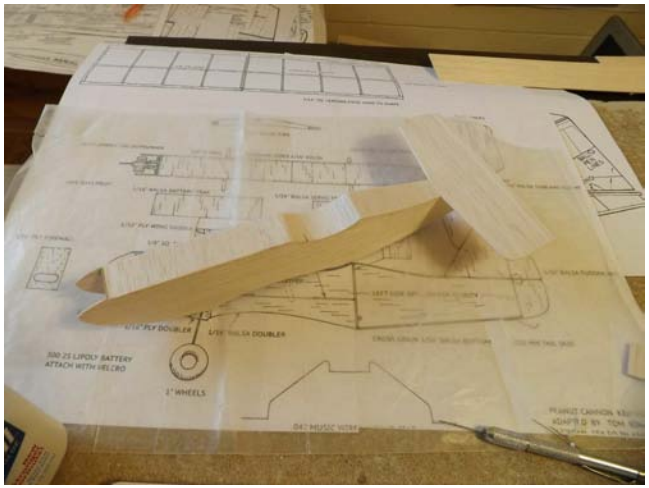
Carefully position and glue the doublers and 1/8" square balsa firewall braces to the right and left fuselage sides. Trial fit the bulkhead in its place and the battery tray on top of the side doublers. When aligned, glue in place. Trial fit, then glue the firewall.

Install cross grain 1/16" balsa fuselage top sheeting from the firewall back to the bulkhead. Sand the inside surface of the fuselage tails to a

slight taper, so that when clamped and glued together the fuselage width, where the rudder attaches will be 1/16”.

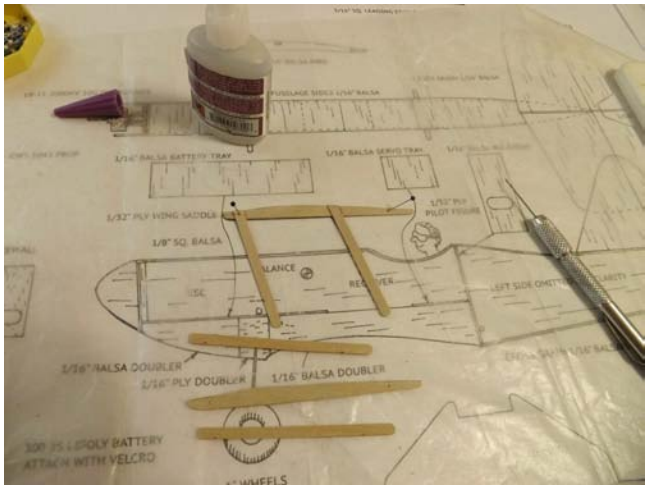


Align carefully and glue the rear of the fuselage sides together. Sand a bevel on mating edges of stab and elevator and rudder and not only the fin, but also the fuselage back edge. Glue the stab in place.

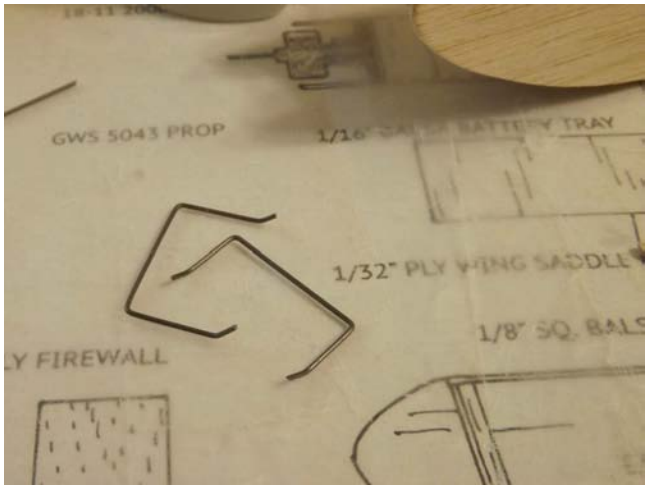


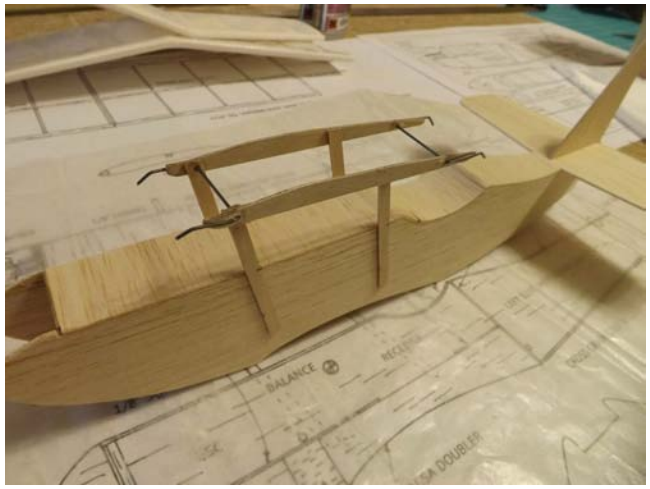
Plank the remainder of the fuselage top. Carefully fit and glue the fin in its place so the rudder mates with the fin and fuselage rear for a straight hinge line.

Leave the fuselage bottom open for now. Finish sand the fuselage, rudder and elevator, (except the uncovered fuselage bottom), and apply three light coats of clear spray lacquer or other sealer. Attach rudder and elevator with tape hinges.



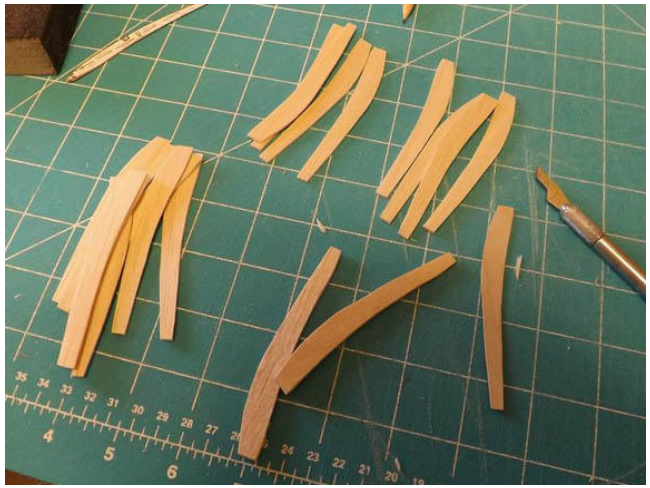
Cabane struts can be made from coffee stir sticks, as per Ken Willard's original plans, or from 1/32” ply. Wing saddles are also 1/32” ply. Make a left and a right strut assembly. Drill a 1/32” hole in the overlap of the front cabane strut and the wing saddle for the hold down wire. Drill matching holes in rear of wing saddle. Bend .032 music wire as shown.

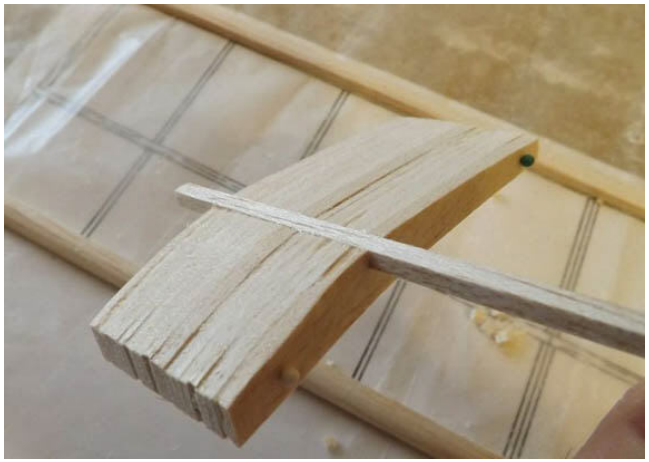


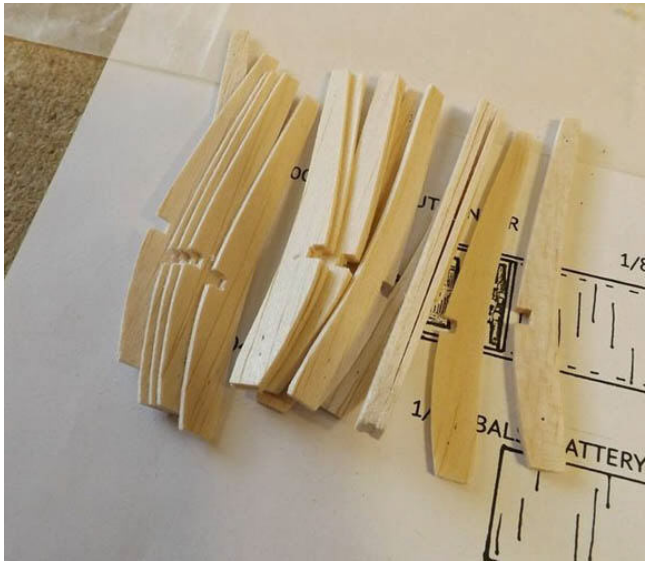


Thread both wires through holes in both wing saddles, then position and glue strut assemblies to fuselage sides, locating carefully to insure that the wing will be level and at the incidence angle indicated on the plans. Glue hold down wires to wing saddles with thick CA.

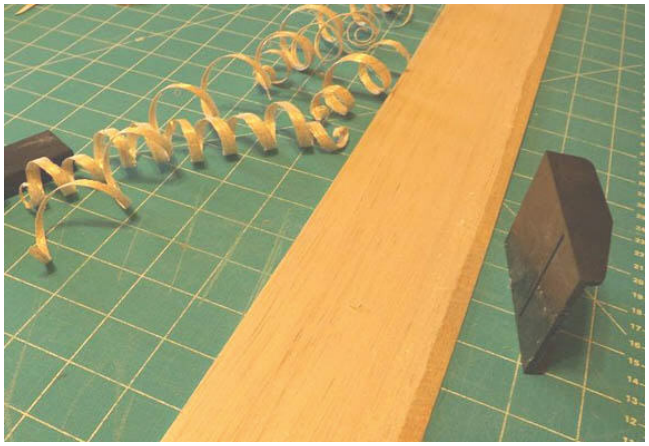
Make a rib template from 1/32” ply. Cut 16 ribs from 1/16” balsa and 4 (tip) ribs from 1/8” balsa. Stack sand the ribs to final shape and notch for the spar.



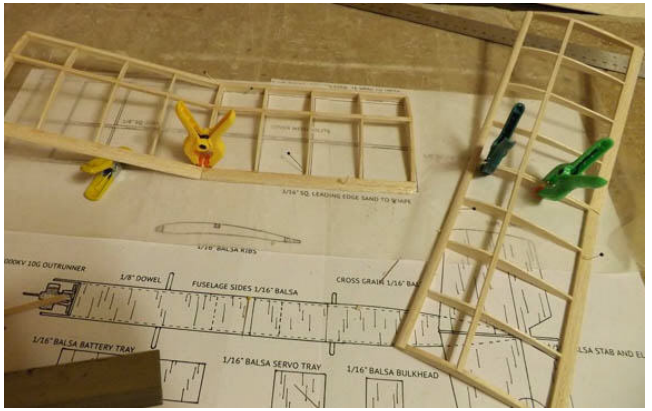




To make the leading edge, plane one edge of a sheet of 3/16” balsa to shape, then cut it to width. Do the same for the trailing edge. Plane a taper on the edge of a 1/8” balsa sheet, then cut it to 3/8” width.

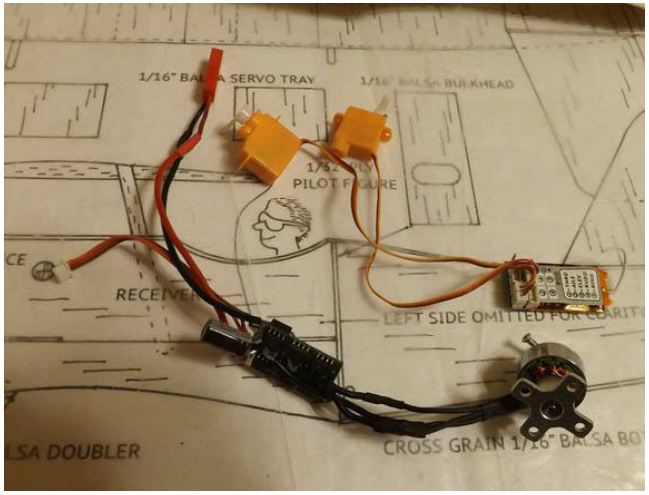


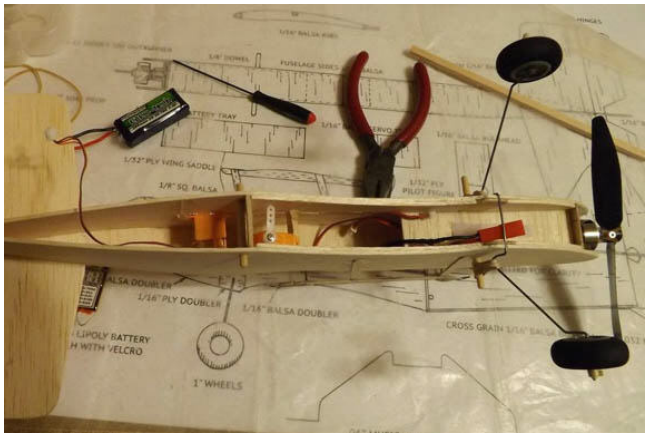
Assemble the wing panels in pairs with the center ribs canted at the dihedral angle. Sand the mating edges and clamp and glue with 1 7/8” dihedral under one wing tip.



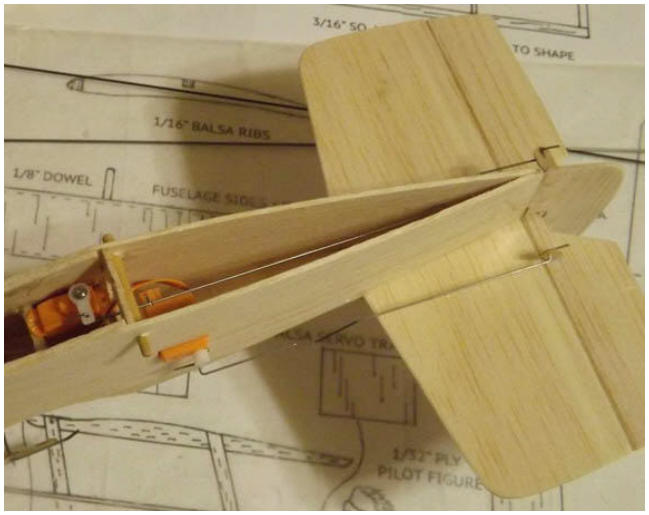
Finish sand the wings and cover with So-Lite. The red sunburst on the top of the wing was added to help maintain visual orientation in flight. The sunburst wedges are red SoLite carefully ironed on to the top of the wing and the stab/elevator.

Shape the landing gear from .032 music wire and install wheels. Saw a notch in ply landing gear doublers to accept the gear wire. Cut and install 1/8” dowels. Attach landing gear with two #16 rubber bands.





Shorten ESC to motor wires, and solder a small receiver connecter to the ESC if needed. Install the motor and prop and put the ESC in the fuselage space above the battery tray. Attach the battery with Velcro.



The fuselage is so narrow that mounting the servos through the fuselage sides, with external push rods is an option, or attach servos inside the fuselage and run push rods through the fuselage. I did one of each.

Hold wings in place with 2 # 16 rubber bands each. With components situated as pictured, the prototype balanced perfectly with the battery installed.

Glue a photo copy of the pilot to 1/16” balsa, cut out, and glue in place. Finally add the cross grain 1/16” balsa fuselage bottom, sand and spray with lacquer.

Set elevator travel to 3/16” each direction. Set Rudder for 1/4” each direction. Do the usual range check and make sure there are no warps. Peanut Cannon handles a breeze pretty well, but I recommend a calm day for your first flight.

My Peanut Cannon took off from the ground at about ¾ throttle with no drama, but things can happen pretty quickly, so you'll need to be alert. Peanut Cannon has a measure of stability, but it is very responsive. It's speed and small size require your full attention, especially at first.

Power is quite good. It will easily loop repeatedly from level flight. It will also snap roll very quickly and easily. Built light it makes a really fun, busy, cute Parkflyer. I would not hesitate to recommend it for indoor flying as well.

Our micro models may be more micro than those from the 1970's, but we are not the first to venture down this road. We owe a debt of gratitude to the innovators that came before us, like Bill Cannon and Ken Willard. Thanks Gentlemen.

Model Type	Electric Micro Biplane
Wingspan	13”
Wing Area	104 sq in
Length	13 1/2”
Weight	80g, 2.8 oz
Wing Loading	3.8 oz /sq ft
Motor	18-11 2000KV 10g
ESC	Micro 6A
Prop	GWS 5043
Battery	Turnigy Nano-tech 300mAh 35-70C 7.4V
Radio	DX6i, Orange R415
Servos	2 2.5g
Flight Time	10+ minutes
Power	2.7A 7.2V 19.6W

Tom demonstrates the PEANUT CANNON

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