

Rocket Diagrams

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Pinback A Boost-Glider

By Fred Williams, NAR 14198

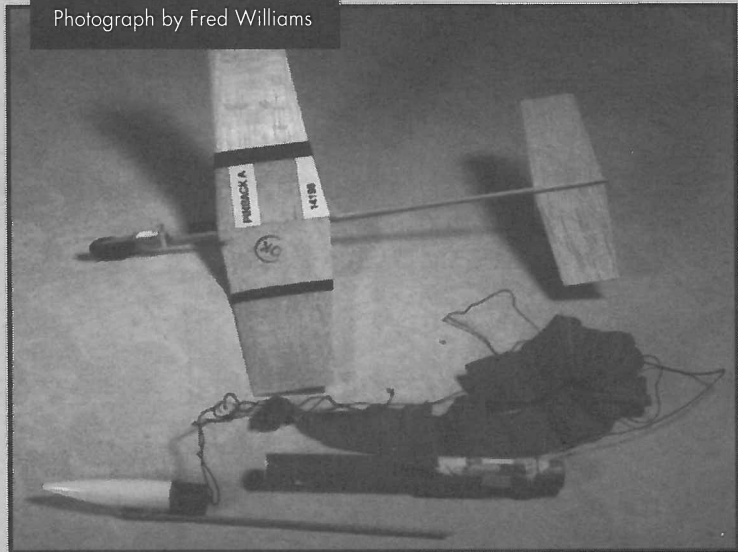
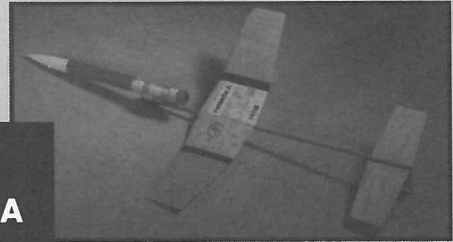
The Pinback A is a relatively simple $\frac{1}{2}$ A and A engine boost glider which incorporates the unique (and controversial) boost-glider pin-pod method of separation. Nearly all B/G pod designs are based on the method of hanging a glider on a hook and relying on the "reverse thrust" action of the ejection to free the pod. There are problems inherent in the standard design: The glider can be blown off by a stray gust while still on the pad. If the pod is too loose, it can separate early. If it is too tight, it won't separate at all. And even when it does separate on time, the ejection charge kicks the pod body one way and the nose the opposite way, with the result that the two parts that are connected by a shock line are right by the glider and stand a good chance of getting snagged ("Red Baron"). The pin-pod design has a more positive connection during boost, and when the pin is removed at ejection, the glider simply "falls" away from the pod thereby reducing the risk of a "Red Baron". The glider itself is based on Gregorek BBG (Basic Boost Glider) proportions.

Sleeve: Most of the construction of the Pinback A is standard B/G fare. The only exception is the sleeve. It is essentially rolling a very thin tube. Using a $\frac{1}{12}$ " diameter wooden dowel as a mandril, roll two wraps of wax paper then hold it in place with scotch tape. Wrap package sealing tape (the self-adhesive paper type, sometimes called mailing tape) to an outside diameter of $\frac{1}{8}$ ". Roughen the surface by sanding with a medium grit sandpaper. Remove the sleeve from the mandril and set aside for now (If you find the thought of rolling your own tube a burden, you can look for plastic or thin aluminum tubing in better hobby shops).

Glider: Cut and airfoil the wing halves, then glue them together on a flat surface. Sand and seal (or tissue) the surfaces. Now, cut the wings at the dihedral joint, sand

Get a boost
with PINBACK A
BOOST-GLIDER

Photograph by Fred Williams



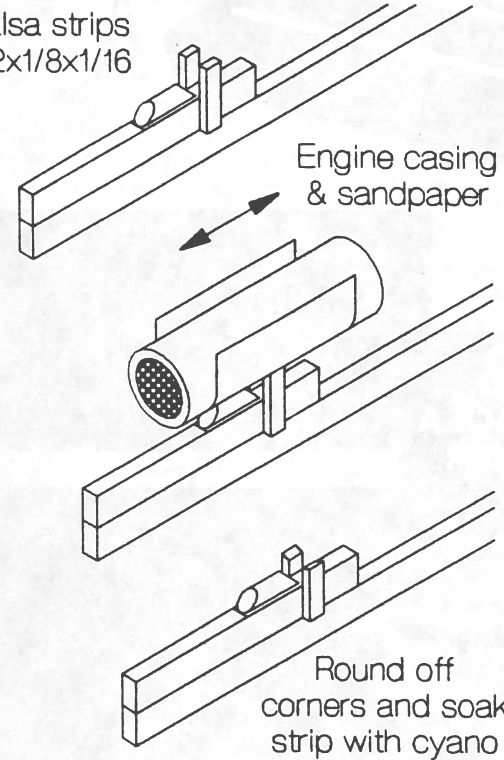
the root for the dihedral and glue the wing tips back in place. Cut the two tail halves and the rudder, finish the surfaces, glue the tail halves together on a flat surface, then glue the rudder to the tail. Shape the boom with medium grit sandpaper and carefully sand in the tail incidence. Glue a two inch length of spruce or basswood at the front of the boom. Cut a $\frac{1}{2}$ " length of sleeve and glue in place using a dowel to align the sleeve straight. Make an extra heavy fillet at the sleeve/boom joint. Bevel the ends of the sleeve. Attach two $\frac{1}{2}$ " x $\frac{1}{8}$ " x $\frac{1}{16}$ " balsa strips to either side of the boom as shown in the Roll Stop Detail on the plan. Wrap a sheet of sandpaper around an expended casing and trim the roll stops to "cradle" a BT-5 tube. Glue the wing and tail assemblies to the boom.

Pod: Cut a 2" length of sleeve tubing and attach it to the BT-5 body tube. Cut out a section of the sleeve to fit the glider sleeve (see drawing). Glue the launch lug in place. Glue a $\frac{1}{4}$ " length of tube coupler (or expended engine casing if you are as cheap as I am) to the base of the nose cone and sand the shoulder/coupler

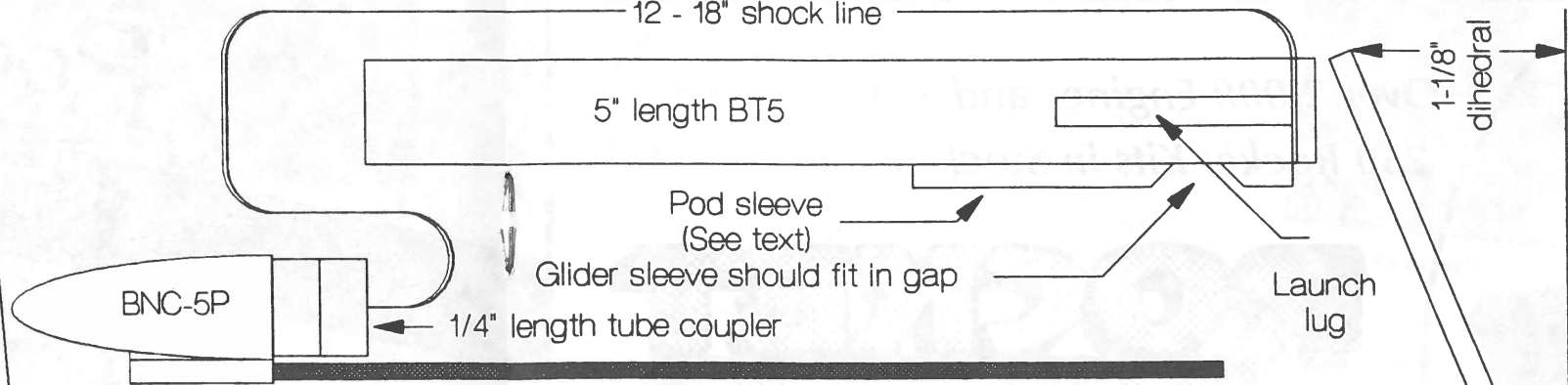
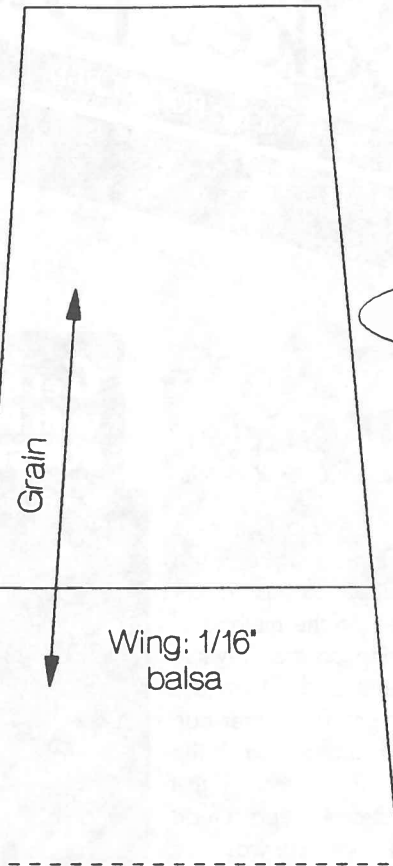
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Balsa strips
1/2x1/8x1/16

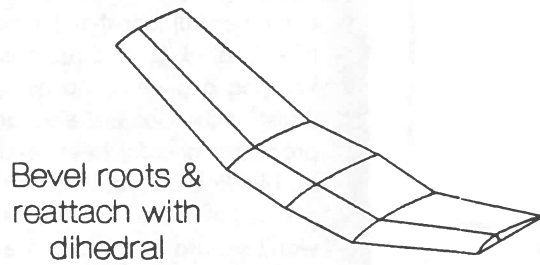


ROLL STOP DETAIL

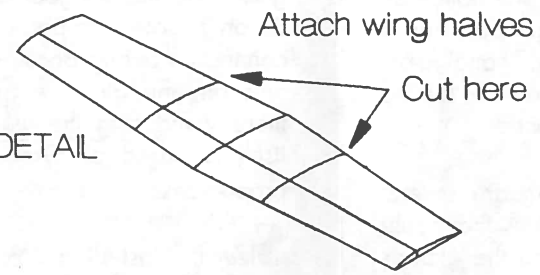
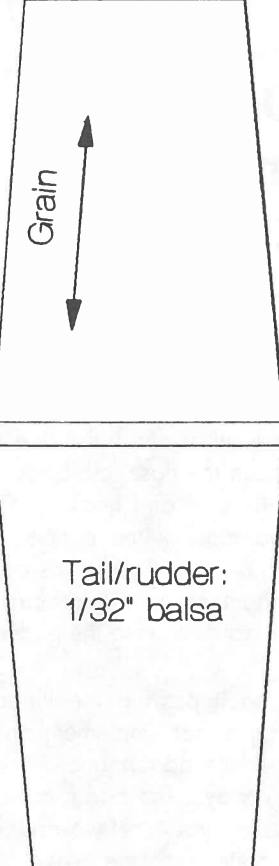


1/12" dia. dowel

Shim to sleeve dia.

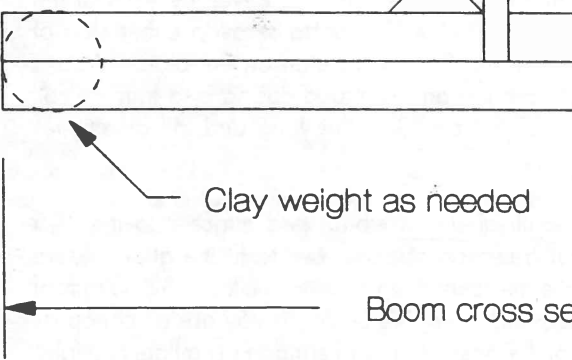
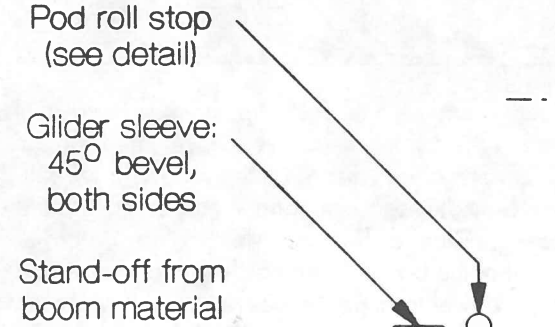


Glider boom: 1/4" x 1/8" spruce or basswood

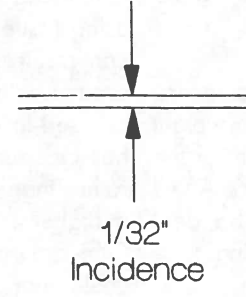


WING DETAIL

Note boom taper:

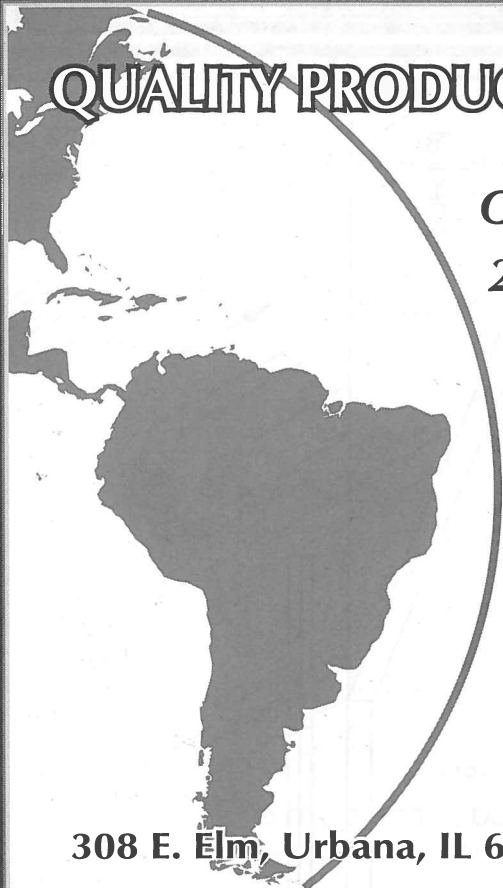


Boom cross section:



| | |
|----------|--------------------------|
| PLAN # | 03-1993 |
| PROJECT | Pinback A |
| DESIGNER | Fred Williams, NAR 14198 |
| SCALE | Scale 1:1 |

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to a loose fit. Roll a $\frac{3}{4}$ " strip of package sealing tape around the tip of a 6" length of $\frac{1}{12}$ " dowel to the same outside diameter as the sleeve material. (If you are unable to obtain the $\frac{1}{12}$ " dowel from a hobby shop, you can get some in the form of cotton tip cleaning sticks at Radio Shack). Insert the nose in the front end of the tube. Slide the dowel into the pod sleeve until the taped section is even with the nose, then glue the dowel to the nose. Be careful to avoid gluing the nose or dowel to the tube! Attach a 12" to 18" length of shock cord to the nose. Sand the dowel for a loose fit in the sleeve. Attach a streamer to the shock line at the base of the nose, tie a slip loop in the other end of the line and loop the line at the base of the pod tube. Tape the line in place for good measure.

Flying: Like any B/G, the Pinback A glider should first be trimmed. Before tossing the glider, add enough weight to the nose to balance the glider at the high point of the wing. Then proceed with the trimming. The Pinback A will fly well with a $\frac{1}{2}$ A3-2t or an A3-2t. A $\frac{1}{4}$ A would be ideal for small field tests. Wrap a $\frac{1}{8}$ " strip of masking tape around the nozzle end of the engine (as an engine block) and insert the engine in the pod. Wrap a single layer of tape around both the engine and the tube. Put in the wadding. Roll the streamer and insert it and the nose into

the nose until the pin is out of the sleeve gap, place the glider on the pod, then push the nose/pin back in place. Once you set the Pinback A on the pad and hook up the clips you will notice an immediate advantage of the pin-pod: since the pin-pod has a positive connection to the glider (as opposed to the "hanging-on-a-hook" arrangement of a standard pod) there will be no problems of the wind blowing the glider off the launcher.

Some ideas on improving the Pinback A: There are several techniques that you can implement on the Pinback A that could improve the model's performance. You can reduce the glider's weight in a few ways. The boom could be sanded thinner or be made of balsa. If you are worried about balsa strength, try laminating graphite onto the wood. Consider a built-up wing using tissue over a frame. Built-up wings are difficult to make but can result in a much lighter model. As for the pod, try playing around with the glider sleeve lengths. A thin music wire loop can be used to result in a quicker release. Andy Tomasch of HUVARS has independently designed a pin-pod that uses a string lanyard rather than a stick. This method can reduce weight and allow for a higher stand-off such as that used in the Flanigan Standard. One drawback to a lanyard is that the loose end of the string could snag the glider. But the concept is worth checking out. At any rate, give the Pinback A a try and see how you like the pin-pod. Just don't get into any metaphysical discussions with Bomb 20...▲