

# A NEED FOR SPEED!

If you indeed have a need for speed, then try on a pair of these 1/2 A and .15 sized speed machines from the grand master of F2D proto speed, Jerry Rocha.

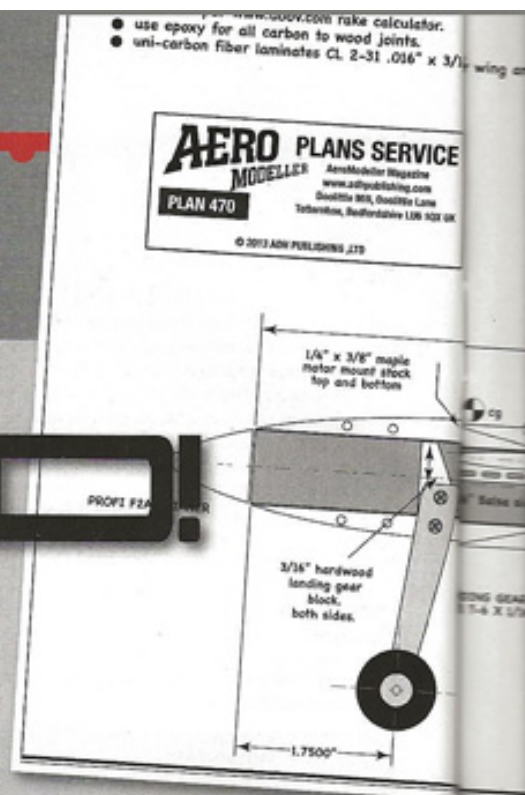
Text and Photos by Steve Higginson

First and foremost, the plan in this article is for the 1/2 A version of The Accelerator. An ultra-sleek and uber-light speed demon that holds the current AMA 1/2 A speed record at 108.78 mph. Also pictured here is The Accelerator's big sister, which is an exact 150% enlargement, made for .15 sized engines. The .15-sized version is no slouch either, as her fastest official speed is currently 110.83 mph.

Jerry's models are absolute works of art and wonders of streamlining ingenuity and simplicity. His level of craftsmanship is

among the best I have seen and it is most evident that he loves the entire process of engineering, designing, building and flying in the name of speed.

The F2D Proto Speed Event is a relatively new phenomenon. Since 2008 the new F2D Proto Speed Event has been gaining... Well, speed and popularity here in the US. Jerry was an early adopter when the F2D Proto Speed Event was born from the mind and efforts of Ken Burdick. We are all aware, here in the US, as well as in the UK, it is very difficult to get a new event going. So, before we get into the details of Jerry's machines, we



wish to acknowledge the people who helped Ken make the event successful, both in rules and participation from the get go. The people that helped Ken the most in doing so are:

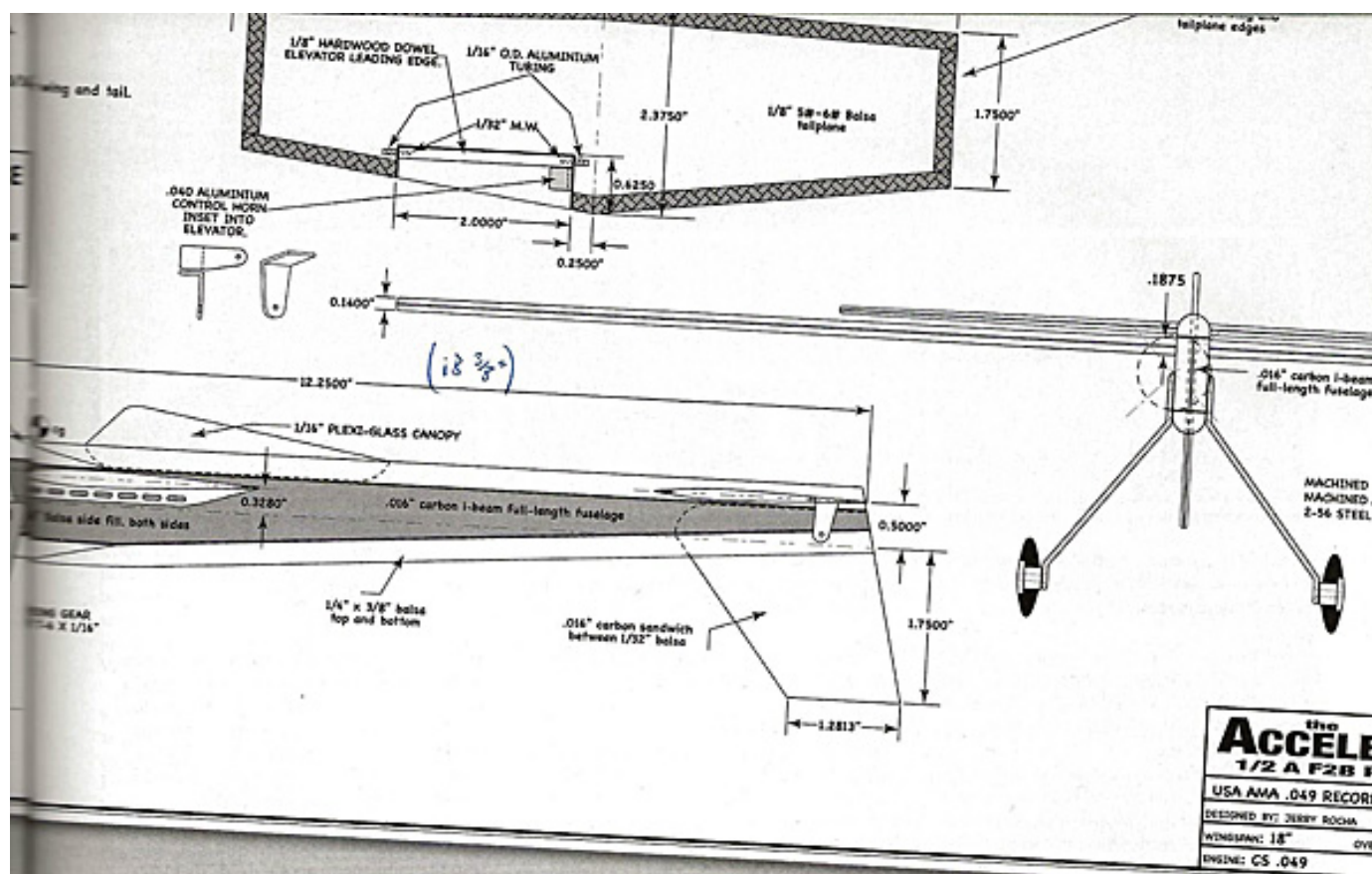
John Thompson, Editor of Flying Lines.  
<http://flyinglines.org/index.html>

Mike Hazel, Associate Editor of Flying Lines Competition team: "The Broadway Bod"

*"The methods that Jerry uses for the construction of The Accelerator are relatively precise and border on the 'high-Tech' end of model building. However, are not in the realm of unobtainable."*







Busters"; Ken Burdick, Jeffrey Rein, Buzz Wilson and Don McKay.

The methods that Jerry uses for the construction of 'The Accelerator' are relatively precise and border on the "high-tech" end of model building. However, are not in the realm of unobtainable. His processes are works of simplicity and for models of these

types, where strength and light weight are key to success in the C/L speed game, his uses of composites and epoxy finishes are well within the means of experienced builders.

#### Wing

The wing is a single piece of 5 to 6 pound balsa (to keep the weight down) with a pair of

.016 x 3/16" uni-carbon fibre laminate spars set into the centre of the wing and a surround of the same carbon material set into the edge all the way around. Jerry fabricated a slitting saw that is chucked into a drill press or mill to cut his slots to accept the carbon laminate (see slitting saw sidebar). At this point, space for the hardwood bellcrank mount is made.

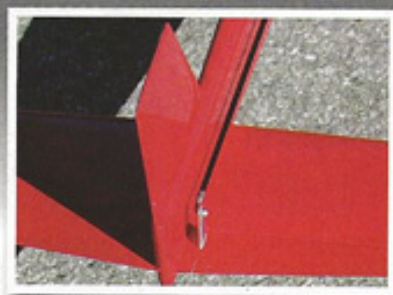


*As you can see, the .15 size is exactly 150% that of the 1/2-A version.*

Plan for the The Accelerator Plan No. 470 is available through the ADH website at: [www.acromodeller.com](http://www.acromodeller.com) for £9.95 plus p&sp: £2.50 (UK); £4.00 (Europe); £6.00 (Overseas)



## C/L Speed



Detail of the elevator, control horn and push rod shows no detail is too small to overlook when it comes to streamlining.



Jerry uses every possible opportunity to cheat the wind and utilised as much slipstreaming as was afforded to him to hide the tank in the .15 version.



This beautiful bellcrank assembly by Darrel Albert is used on both ships.

Once all access slots for the carbon and the space for the bellcrank block are made, glue all carbon and the wood block into place using 3M Scotch-Weld DP-460 (off-white) Epoxy and let cure.

Once the wing has cured sufficiently, taper the wing equal amounts on both sides from root (.1875") to tip (.1400"). Carefully sand the airfoil cross-section into the wing. When you hit carbon on the leading and trailing edges, you are on centre. Finish off the wing assembly by covering with .58 glass cloth and epoxy.

The line guide is made of 1/16" plywood with seven 1/16" slots .175" long. Set the guide into the wing by cutting down to the carbon edges with a hack saw blade (keep

parallel to the fuselage centre line). For the line rake, use ([www.doov.com](http://www.doov.com)).

### Rudder and tailplane

The rudder is made up as a laminate of .016 carbon sheet between two layers of 1/32" balsa sheet. Use 3M Scotch-Weld DP-460 (off-white) Epoxy and let cure under the constant pressure of a flat weight. Trim rudder to final shape and sand to a slight airfoil.

The tailplane is built exactly like the wing only using 1/8" sheet balsa. The elevator slot can be cut after the epoxy has set. The elevator is made from 1/8" sheet balsa. The elevator hinge is made from a piece of 1/8" diameter hardwood dowel. Drill each end of

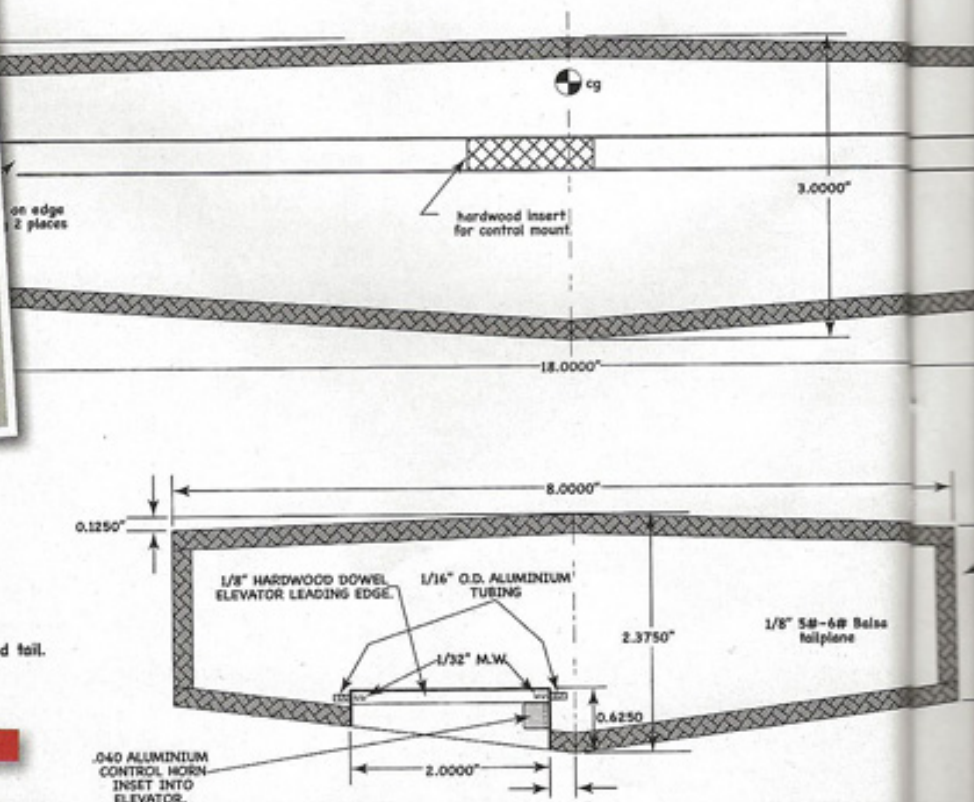
the dowel to accept a 1/32" x 1/4" piano wire shaft and epoxy the wire into place. Sand a concave slot into the LE of the elevator to accept the dowel hinge and epoxy into the leading edge. The elevator will be covered with .58 glass cloth to wrap around the LE and over both sides of the elevator.

After the tailplane has been covered in .58 glass cloth and the epoxy has set, cut slots into the tailplane to accept 1/16" diameter aluminium tubing as elevator hinge bearings. This is where craftsmanship is king as you make the final fitting of the elevator as smooth and close tolerance as you can. Cut a slot in the edge of the elevator for the .040 aluminium control horn and epoxy in place. Install the elevator by epoxying one



Jerry Rotha displays his .15 size Proto Speed model and has every right to be proud. These are flat beautiful!

lane covered with .58 glass cloth.  
er [www.doov.com](http://www.doov.com) rake calculator.  
for all carbon to wood joints.  
fiber laminates CL 2-31 .016" x 3/16" for wing and tail.





aluminium tube first and letting it set. Slide the corresponding elevator hinge pin into the first tube followed by sliding the second tube on the remaining pin and setting the tube into the second slot in the tailplane with epoxy.

### Fuselage

The overall thickness of the fuselage is 3/8" and has a .016 carbon fibre I-beam running through the centre. At the nose on top and bottom of the I-beam are 1/4" x 3/8" maple motor bearers as per the plan. Aft of the motor bearers top and bottom is made of 1/4" x 3/8" balsa stock as per the plan. All carbon to balsa joints are epoxied with 3M Scotch-Weld DP-460.

To facilitate the landing gear mount, a 3/16" thick piece of hardwood is set as per the plan on both sides and the space between the top and bottom I-beam caps is filled with 3/16" thick balsa stock. Make sure the rudder is laminated into the centre of the fuselage before all is epoxied in place. After the fuselage is glued up and has set (BEFORE SHAPING) the wing and tailplane slots need to be cut out. The best method is to use either a mill table or a router table for the initial cut through to keep it perpendicular to the fuselage sides and then hand fit always making sure all is square.

Once the wing and tailplane are fit, the fuselage can be shaped and the motor bearers can be drilled for the engine of choice. The fuselage will have to be clearanced in the nose for your engine as well. After you are satisfied with the fits and shape of the fuselage, cover with .58 glass cloth and epoxy. NOTE: THE ENTIRE AEROPLANE IS COVERED IN .58 GLASS CLOTH. SEE AEROSPACE COMPOSITE PRODUCTS DATA SHEET AT: [www.aeromodeler.com](http://www.aeromodeler.com)

### Landing gear

The landing gear material is 6061 T6 aluminium 1/6" thick and cut to the size and bent to the shape as per the plans.

### Assembly

The aeroplane is symmetrical and there is no tip weight. The rudder/fin on the bottom does a good job of keeping the plane out on takeoff. No offset in the rudder/fin or engine is necessary. Epoxy wing and tailplane into fuselage assembly making sure all is square. A 1/16" wide slot is made in the center-top of the fuselage to fit the Plexiglas canopy (do not glue in until all sanding and paint prep is completed).

When the airframe structure is set and dry, let the sanding begin to make sure the airframe is as smooth

## How to Use the Slitting Saw

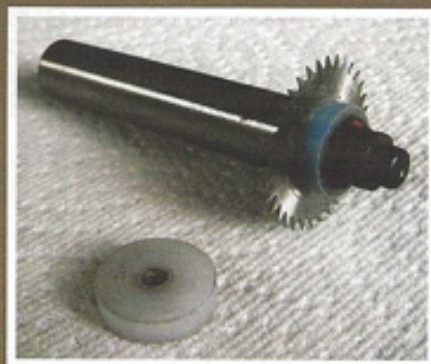
By Jerry Rocha

The saw I use is 1" diameter x .015 thick and I use either a 3/16" or a 1/4" nylon rub-wheel to adjust for the depth of cut. You can use either a drill press or a mill to cut the slot in the edge of your balsa wing and tailplane.

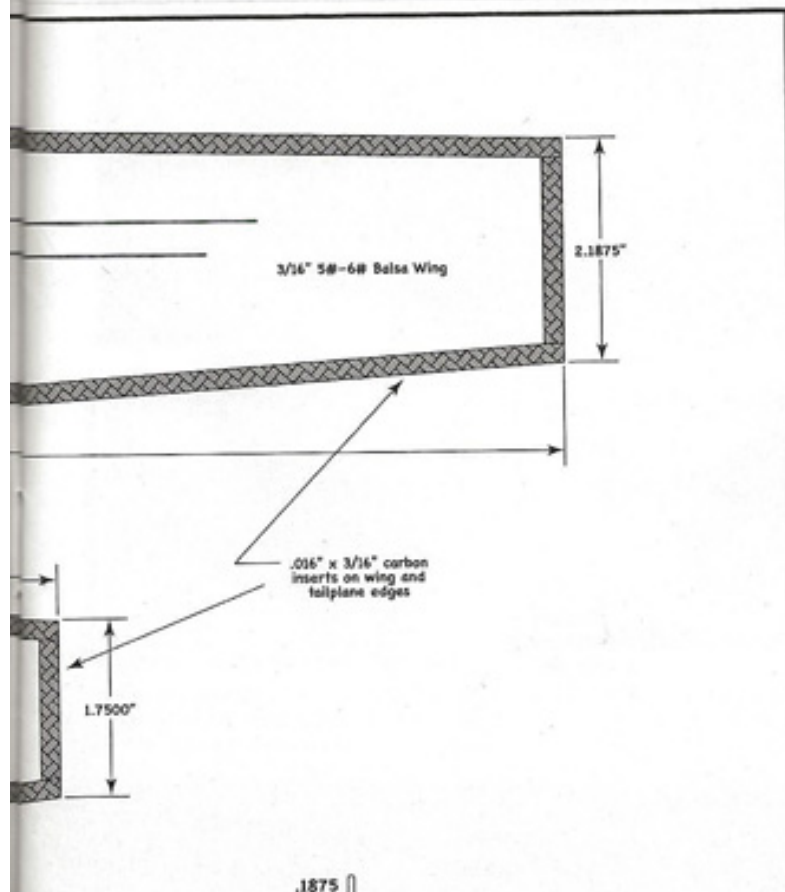
As a control, start with a scrap piece of the same thickness stock you will make your wing or tailplane with. Set the spindle of the drill press or mill as close to the centre of the thickness as possible and make a small cut. Flip the piece over and see if the cutting saw goes into the same slot. If not, adjust the spindle stop up or down until you get the cut on centre.

Now you are ready to cut your finish slots. At this point, do not turn the part over. Keep the same side up for all cuts on all edges. I like to push the cutter about 1/3 the way in on a first pass and then go deeper on successive passes until I touch the rub wheel. I then finish up with a complete pass at full depth for the full length of the part.

Once I am satisfied with the depth and quality of the cut, I use 3M Scotch-Weld Epoxy (DP-460 Off-White) to glue all carbon into wood slots.



Saw arbor with slitting saw and nylon rub wheels for cutting slots in the edge of wing and tailplane stock. Photo T/K Tuesday







*The subject of this article is almost lost behind the CS engine. Sleek and slippery, this little bird is right at home at 108 mph.*

as possible. Pre-assemble all mechanicals (bellcrank, elevator pushrod, landing gear and engine) to make sure all goes together as planned then disassemble to do your final paint preparation.

You can use your choice of finishes. Jerry's models are finished in Klass Kote epoxy finishes with no clear coat and he chooses to spray all his finishes for higher quality application and to minimise final sanding and polishing for that wet look.

The finished weight of Jerry's 1/8 A Accelerator is 12.5 oz. even though he was shooting for 12. As beautiful as these ships are and as fast as they are, I guess a half-ounce is not that much of a sacrifice. My hat is off to Jerry Rocha and thank you for sharing. ●

## SOURCES:

Composite Products  
Aerospace Composite Products  
<http://www.acp-composites.com>

Epoxy Paint Products  
Klass Kote Paint  
<http://www.klasskote.com>

Propellers  
Mike Hazel  
[zzcbpspeed@aol.com](mailto:zzcbpspeed@aol.com)

Steven Wilk  
[swilk117@yahoo.com](mailto:swilk117@yahoo.com)

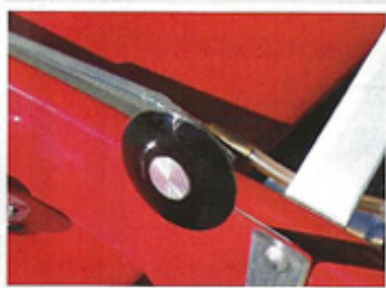
1/8 A Bellcrank with button attachments  
Racing Supplies from Darrel Albert  
[raceralbert1@aol.com](mailto:raceralbert1@aol.com)

Wheels with Button Hubs  
Glenn Lee  
819 W. Mandrake Drive  
Batavia, IL 60510  
PH# 603-879-2558

General C/L suppliers from Flyinglines.org  
<http://flyinglines.org/CLSsuppliers.html>



*The inset control horn is simple and as clean as one can make it. It would be a crime to screw on a ready-made adjustable unit here.*



*Delryn wheels with alloy button hubs make every effort to disguise and hide clunky hardware.*



*The Delryn used in these wheels is self-lubricating and ride around the alloy button axle held firm to the gear leg by a countersunk 2-56 steel screw.*