



# ARF Construction

- Strength and Durability
- Alignment
- Trim Features
- Control System Upgrades
- Airframe Enhancements
- Engine Mounting Options

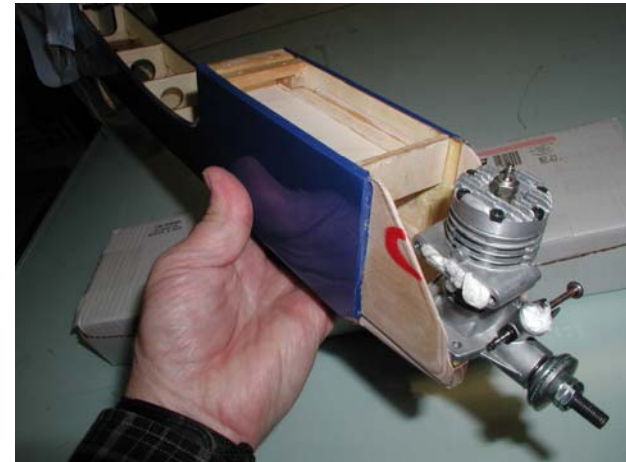


This information was developed by Doug Benedetti and Michael Ostella for the promotion, growth and participation, in control line flying. Proceeds for the benefit of the Garden State Circle Burners Inc.



# Strength and Durability

- Nose Reinforcement Parts
- Cross Grain Between Mounts
- Tank Floor
- Fuse Side Gussets
- Glass and Paint Nose
- Landing Gear Wire
- Dural Landing Gear
- Strip and Re-Finish Entire Airplane



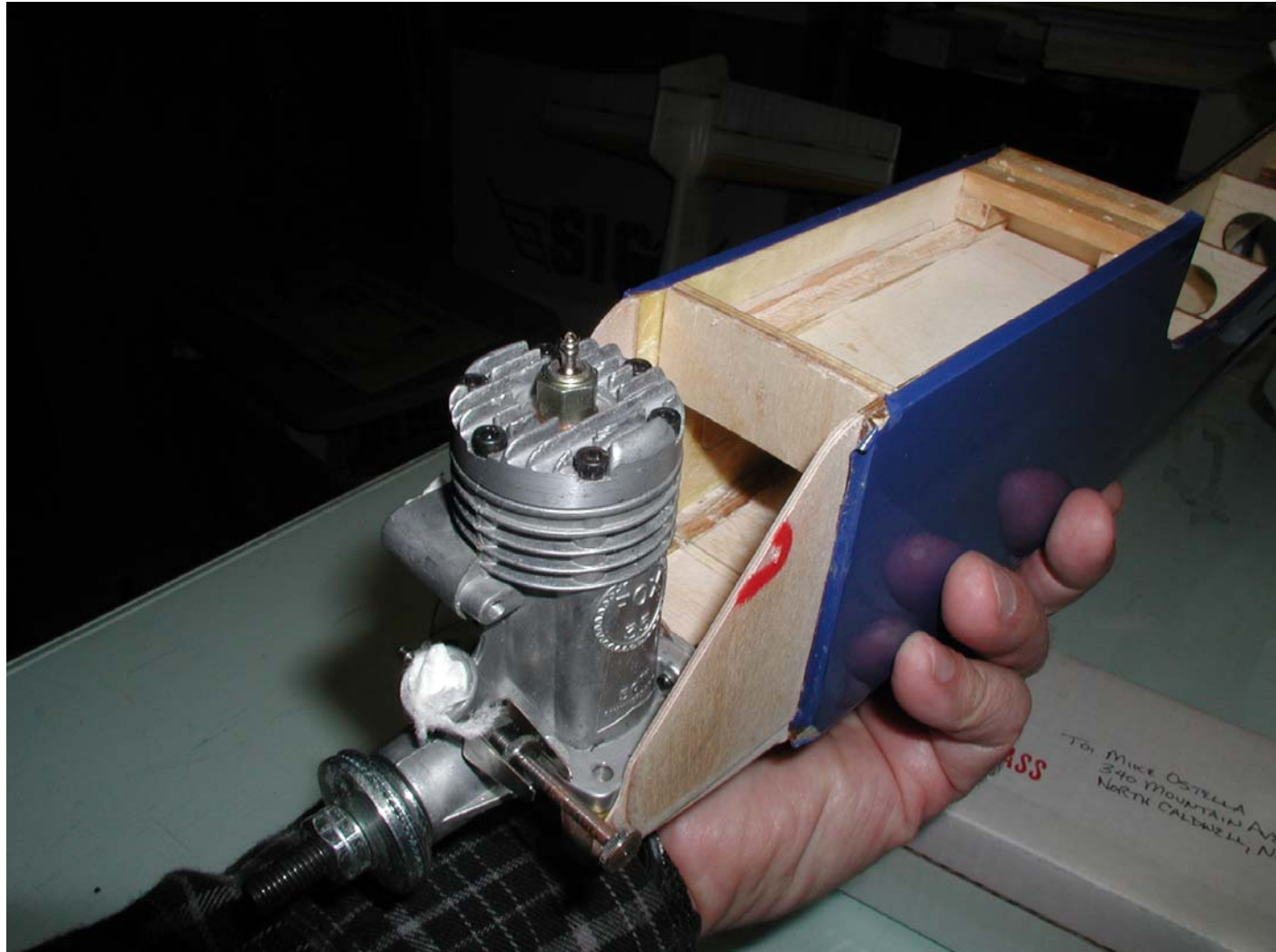
Arf Nobler is easy to strip. Brodak Planes are available in ARC configuration  
Patterns are available for ARF Nobler  
Nose Parts.

In the Nobler, F-1 is partially removed to allow tank to slide in from the front. An x-acto number 15 keyhole saw blade works great here. Use a Brodak BH-490 tank. You will have to bend the uniflow, and overflow vents down so that they will not interfere with the engine.

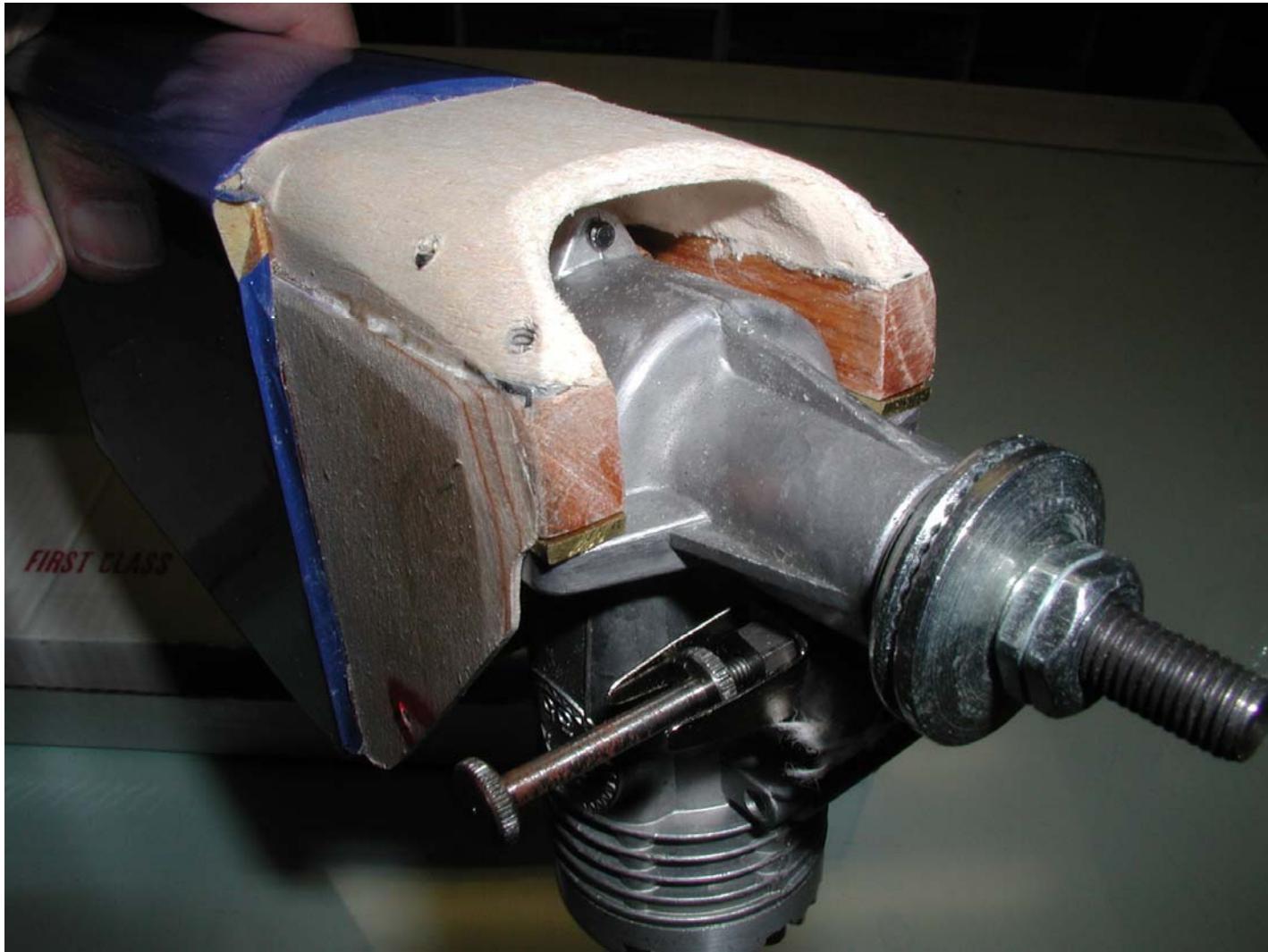
Wire landing gear supplied is soft. Bend up new gear struts from 1/8 wire or use a Aluminum dural Landing Gear.

Pattern for ARF Smoothie F-4 for extended tank compartment

F-1 is cut away to allow tank to slide in from the front. Ply gussets and tank floor make the nose more solid for better engine performance ■



Block across mounts makes nose more solid.



Make an alignment tool from a large flexible poster board to align fuse and wing. Try both sides,, if they are both off in the same direction, split the difference. The peg that locates wing in fuse may be off. Check it. Every plane that we checked that was built without taking this step was out of alignment.

Place one edge of the tool against the fuse side between F-1 and F-2. That is the only flat spot on the fuselage to guide off of. Use incidence meter to align the thrust lines of the stab, wing and Engine. It's always better to do this before the flaps and elevators are permanently attached. Use a builders triangle to get the rudder vertical 90 degrees. See next slide.



# Alignment

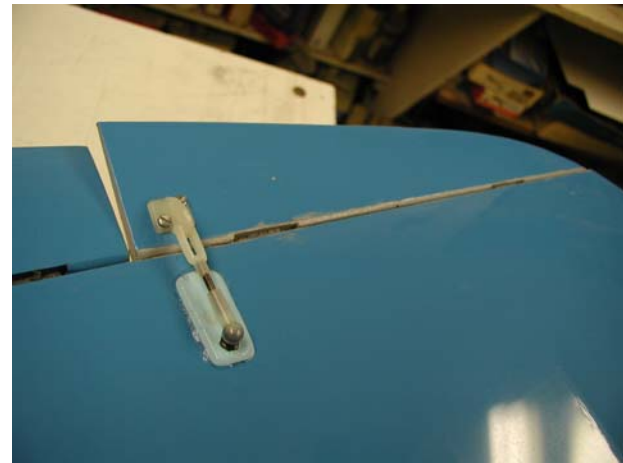
- Fuse Center Line 90 Degrees to Wing Trailing Edge
- Incidence of Engine, Wing, and Stabilizer
- Wing and Stabilizer Trailing edge Parallel
- Rudder 90 degrees to Stabilizer





# Trim Features

- Removable Tank
- Tip Weight Box
- Adjustable Lead outs
- Adjustable Rudder
- Adjustable Trim Tab
- A Du Bro ball link makes the trim tab and rudder adjustment easy



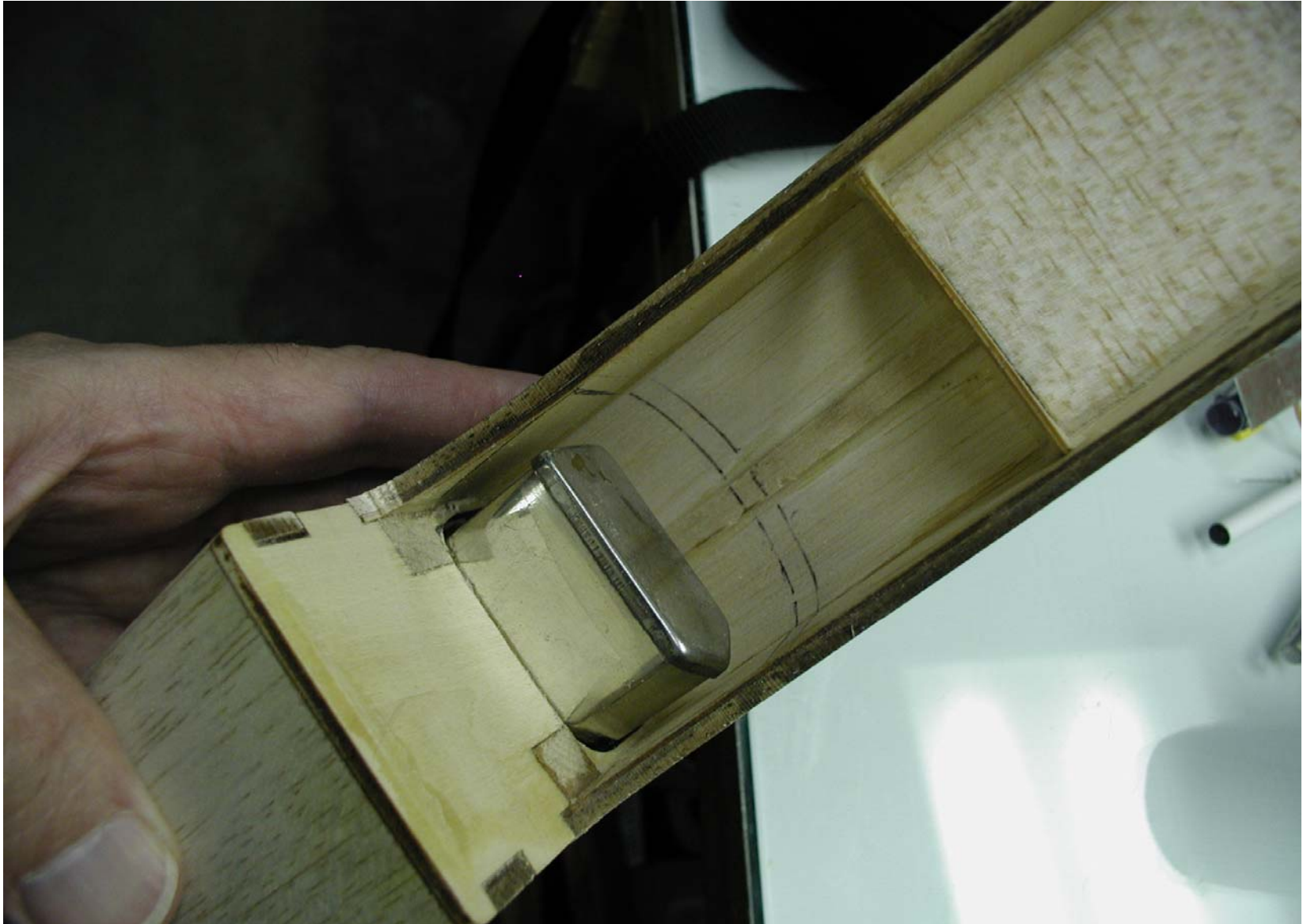
**Don't trust your tank to be made correctly. Use a torch and a screwdriver to pop the back off the tank.**



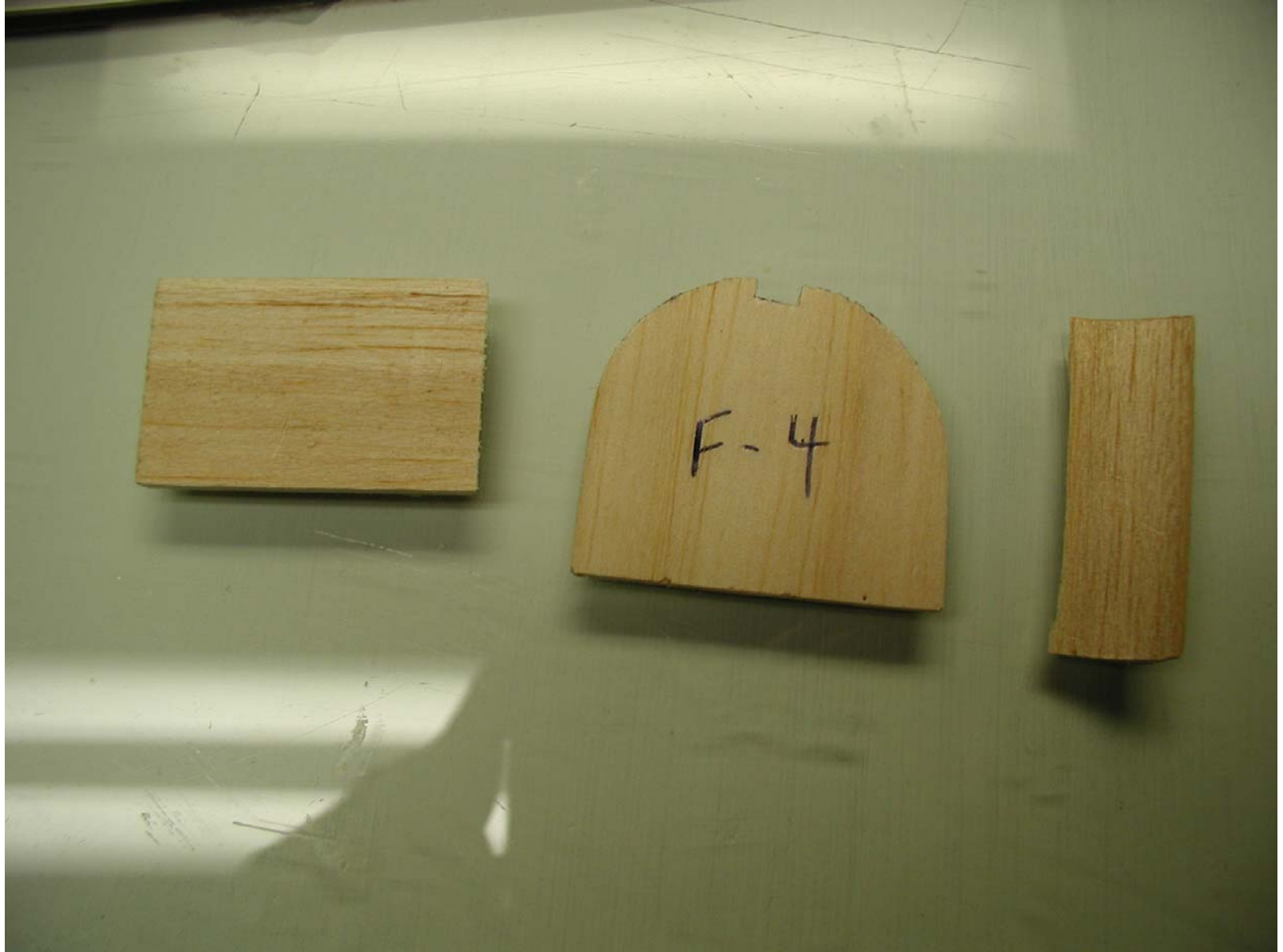
View of tank inside. Many tanks are made poorly. In this one, the uniflow vent and overflow vent need to be relocated.



Mark the fuse for a new F-4 to make a rear former for the tank compartment for the Smoothie.



Three pieces will be needed to make the tank compartment in the ARF Smoothie.



View with parts installed.



View with new parts installed. Opening will be closed in by the wing when it is installed, closing off the tank compartment from the rest of the fuselage.



# Removable tank





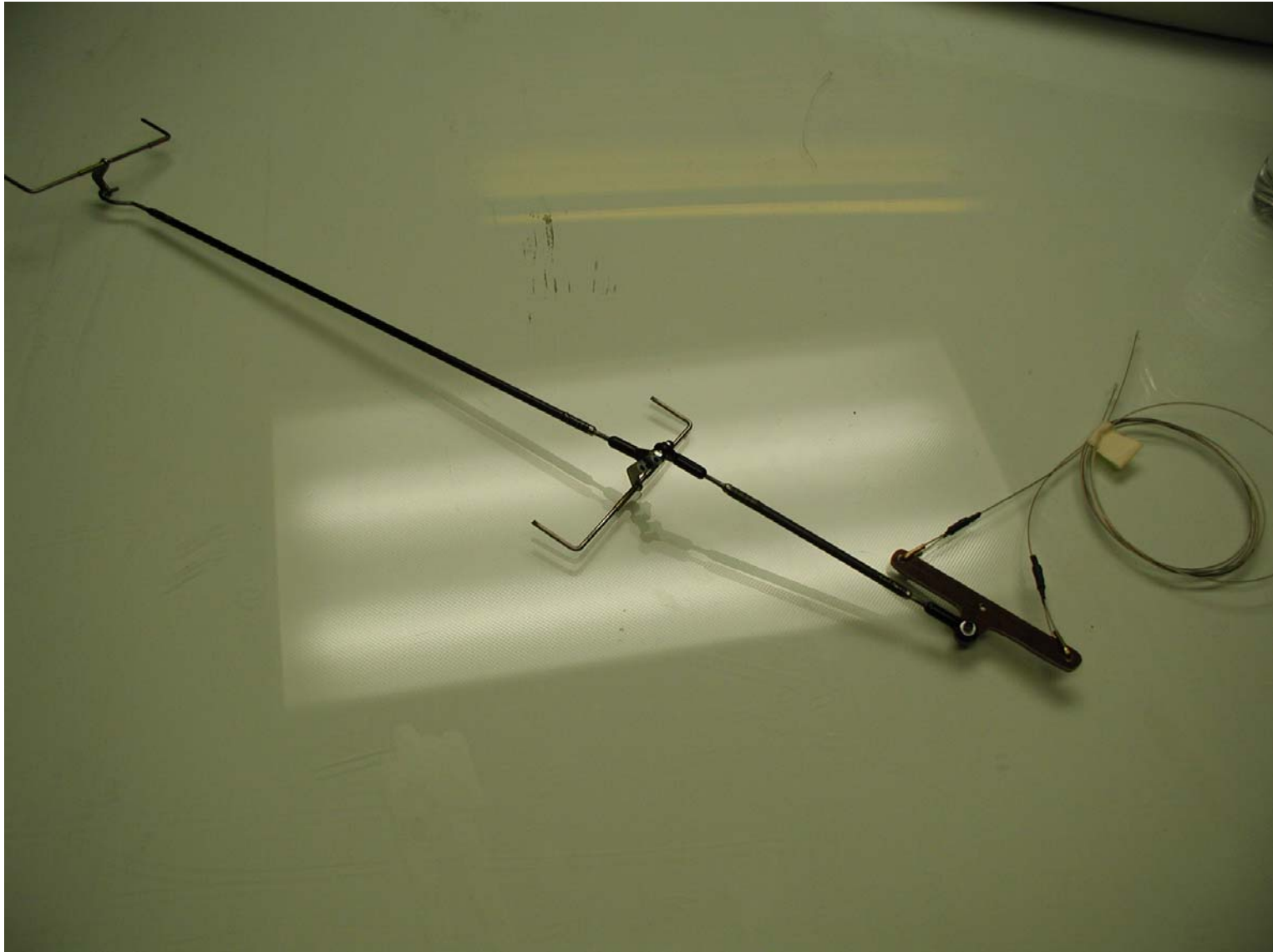
# Control System Upgrades

- Lead outs and Bell crank Replaced
- Adjustable Pushrod and control Horns (external)
- Du Bro Clevis
- Sleeve Wire Push rods with carbon fiber tube
- Bush and Anchor Horns
- Ball Links
- Nylon Barrel Hinges
- External Nylon Horns



Top Flite airplanes need upgrades. Brodak planes need less enhancement. Excellent control systems are available from Tom Morris. Custom installation (more work) may be required to accommodate these systems, but it may be worthwhile. Crimps and crimp tool from fishing tackle shop comes in handy here. Keeping a few Brodak Nylon Bell cranks of both 4" and 3" is always a good idea. Carbon fiber push rods and 4-40 threaded inserts from Tom Morris or Central Hobbies are recommended. The Black plastic DuBro Clevises with locking pin are preferred. I have seen the kit supplied clevises fail resulting in a crashed plane.

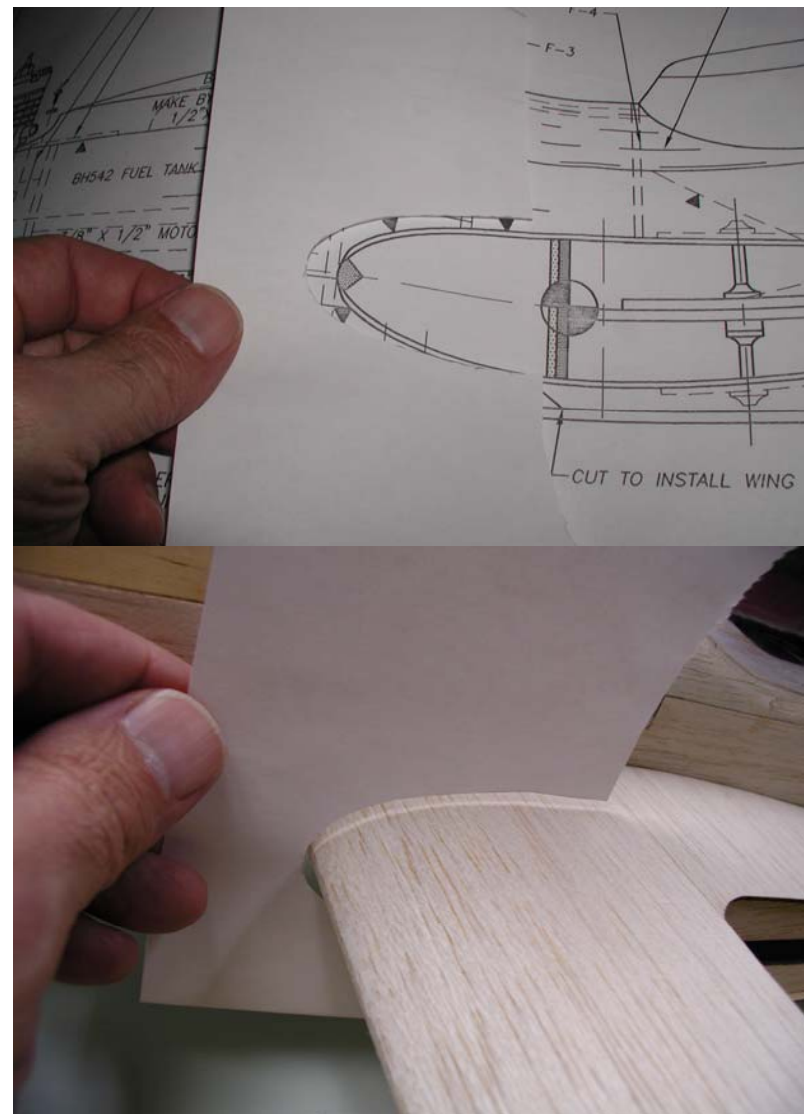
# Tom Morris control system





# Airframe Enhancements

- Leading Edge Shape
- Replace Plastic Cowl with Wood Cowl
- Add Wheel Pants
- Add Fillets



ARF Cardinal has a very sharp leading edge. Remove some of the covering and sand to shape then re cover. Make a pattern using the plans and check the airframe for accuracy. Sand to shape as construction of model will allow. It's an ARF, after all, and you can only go so far. A significant improvement can be made, however, if you take the time to do this procedure.

I prefer a different configuration for opening the access holes in the Nobler cowl. See photos.

Pattern for wheel pants is available.



# Engine Mounting Options

- Traditional Blind Nuts with Aluminum Pads
- Clamp Mounting with threaded inserts
- Clamp Mounting with Blind Nuts
- Tapped Aluminum Bar (3/16") with threaded inserts
- More info on next slide



You can drill and tap aluminum plates for engine desired. Fasten plates to mounts with blind nuts or threaded inserts. Plates can sometimes be drilled for two different motors providing more power options.

Windy's clamp mount with blind nuts is a very good way to go.

On the ARF Nobler, step one is to get the mounting beams flat, and parallel to one another by sanding using a glass table top with sandpaper stuck to the surface.

Brodak Clamp mounts and Windy's clamp mounts are very different. Be careful that your clamp mount won't interfere with your needle valve assembly. This is especially critical with small motors like the OS 25

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- The annual dues are only \$125.00 for an Open member. This is less than \$11.00 monthly! Imagine keeping a strong tradition like the CIRCLE BURNERS alive for only \$11.00 monthly! We really need members as we have lost several stalwarts in recent years and not only are their wit and character missed, but their dues as well!
- The Executive Committee has taken several steps to reduce expenses: we are currently meeting at Ron's Deli and have significantly reduced the cost of trophies for our contests while providing better, more meaningful plaques. Our annual expenses keep rising, however: field rent and maintenance and outhouse rental have all increased, and insurance and State fees have risen as well.
- Please do your best to help keep the GSCB alive and well! And, oh yes, come out and FLY!
- Thanks

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