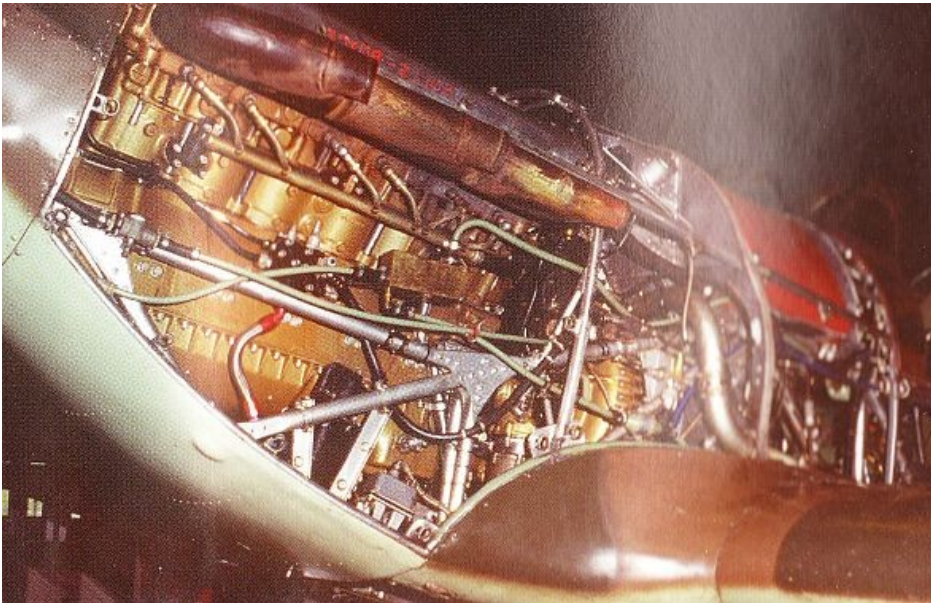


Building a Vailly Aviation Hawker Hurricane...Instalment 7



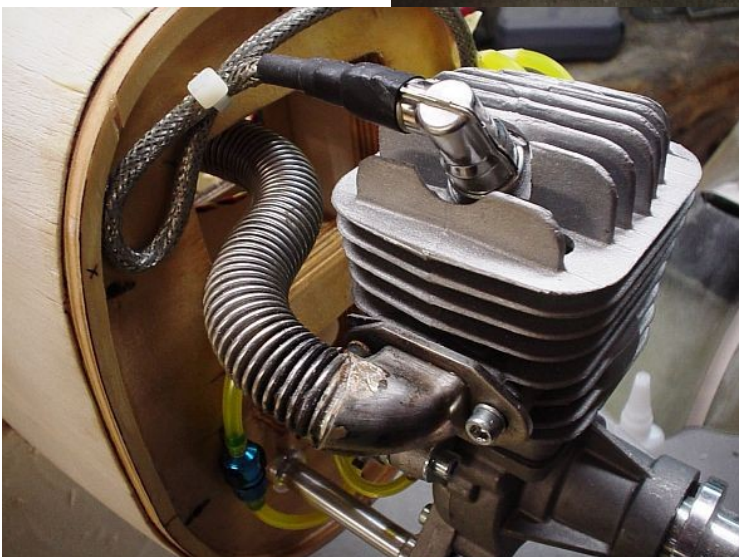
Exhaust System:

Nothing looks worse to me than a nice scale plane with a bloody great muffer hanging out of it and so I wanted to hide the whole exhaust setup within the cowl or the cowl and the fuselage.

The Vokes filter under the chin of the cowl made it hard to exit the

exhaust under the cowl without seeing holes and pipes so I was forced to make a system that would exhaust through the fuselage and exit from the underwing radiator fairing.

Custom exhaust systems are always a bit of a chore but I've hit on a product that makes up a quiet system relatively



easily. The product is a corrugated flexible stainless steel tube. It is available with 5/8", 3/4" and 1" inside diameters and is available from:

Convolute Technologies

**Unit 2 / 163 Prospect Highway,
Seven Hills, NSW 2147**

p: (02) 9838 9599 f: (02) 9838 9611

<http://>

www.convolute.com.au

One of the nice things about this stuff is that it does away with the need for an expansion box, the corrugations seem to allow the gas to expand and cool and so cut down the noise.

I bought about 5 metres of 5/8" ID and the same of 1" ID, from memory it costs about \$10 per metre cash sale at factory door, ring first to make appointment..

I needed an angled flange to suit the DL50 exhaust and I sourced this from:

DL ENGINES AUSTRALIA.COM

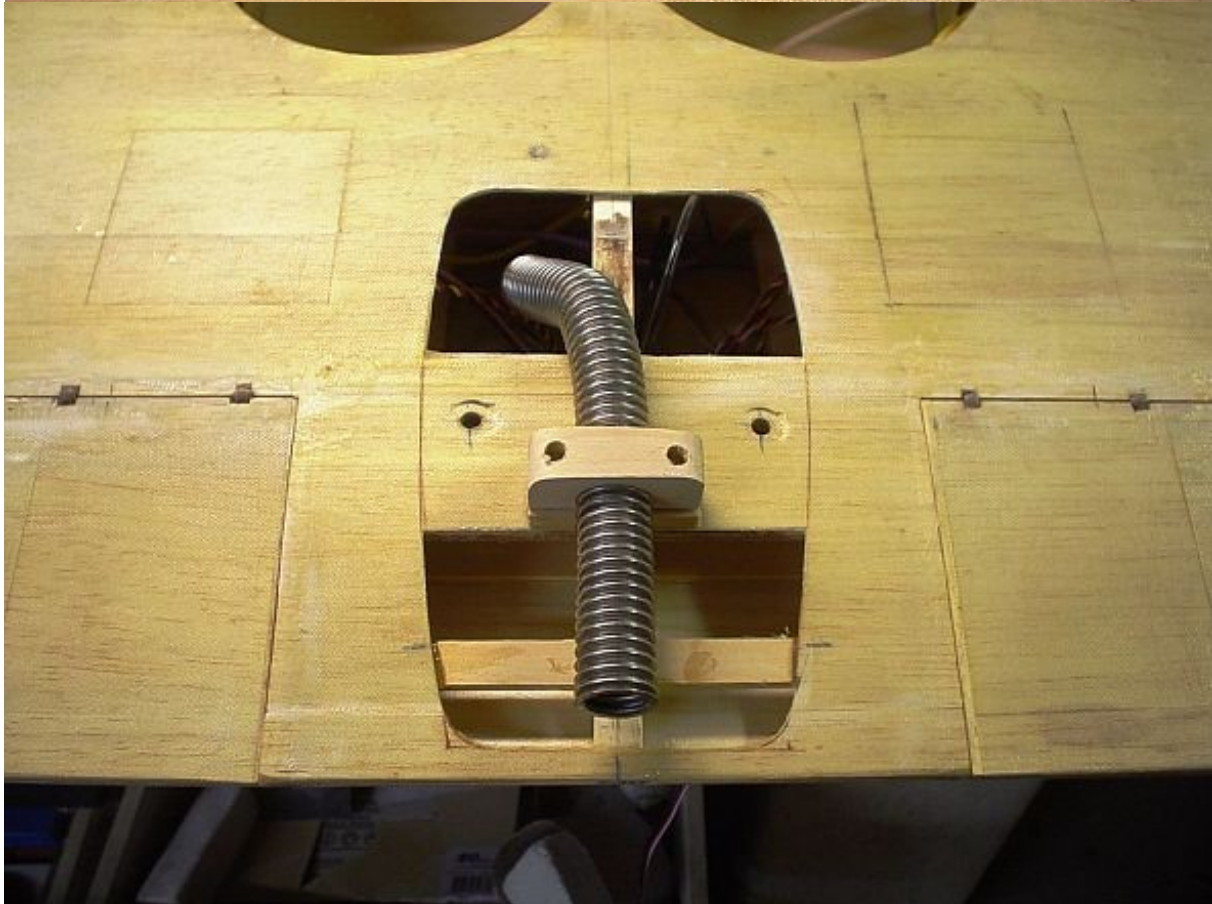
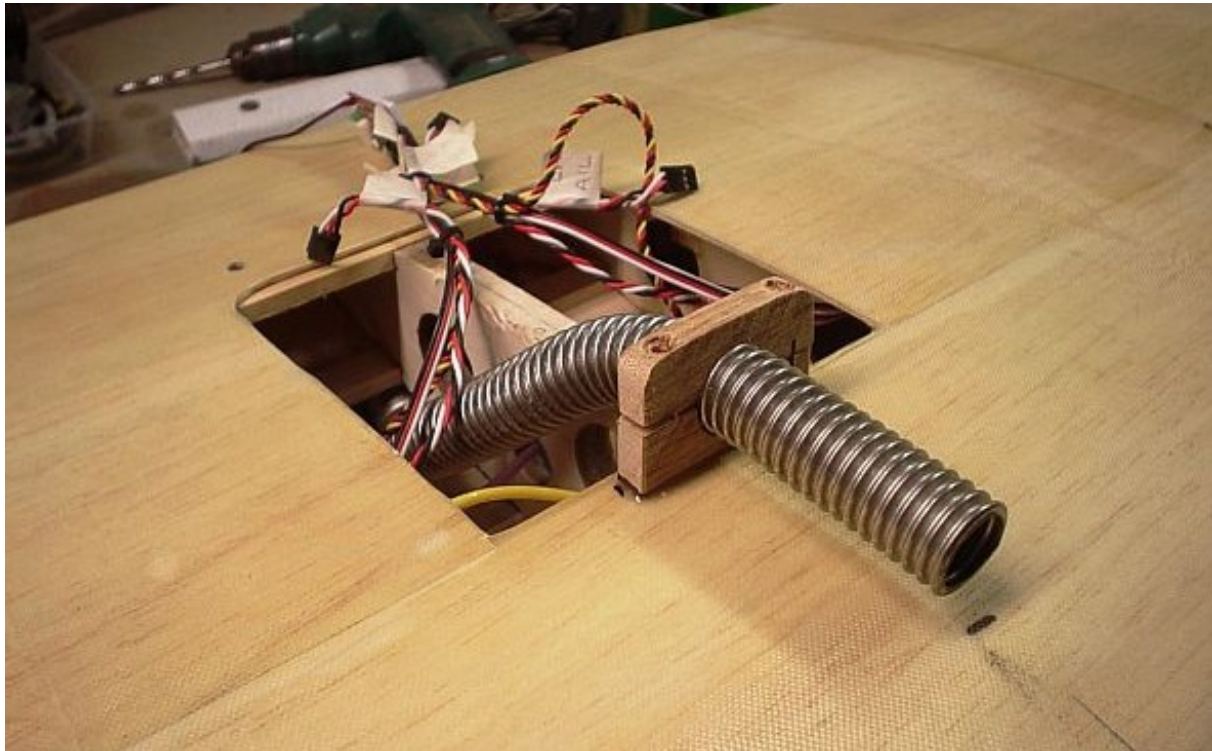


I had to cut the existing pipe off the flange and silver solder my flexi pipe in its place.

Because the wing is removable I had to have a join in the pipe, this was done by silver soldering a 5/8" OD brass tube up the inside of the front pipe, the pipe fitted in the wing slides over the joiner when the wing is joined with the fuselage.



The exhaust pipe mounted in the wing is clamped on the top of the wing and then led through the wing to another clamp under. Later on the radiator fairing will be glued over the underside and an exhaust pipe cover will be fitted to the top of the wing.





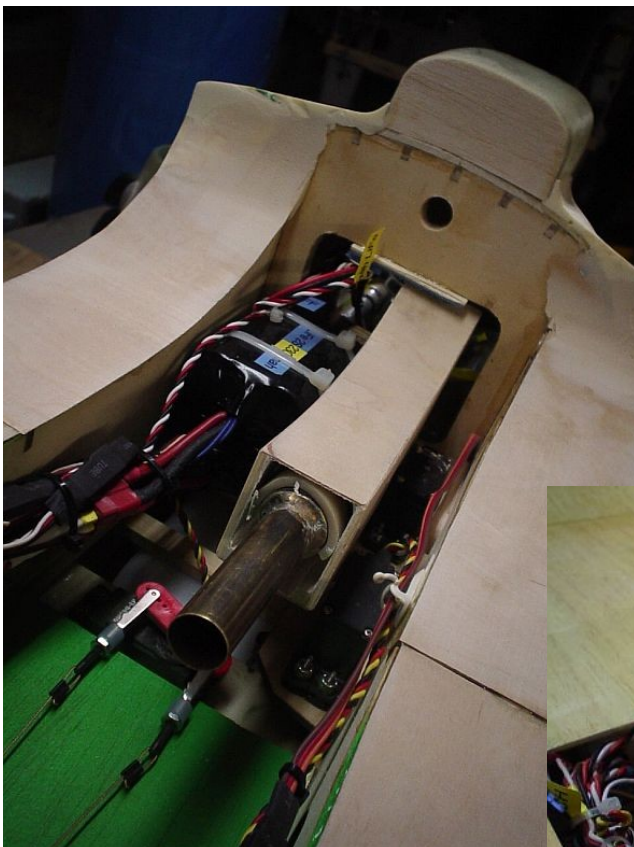
To protect the servo wiring from coming in contact with the hot exhaust pipe I have made a couple of plywood shrouds, one to fit over the pipe after it exits the firewall and one to be glued to the topside of the wing over the pipe clamped there.

I have coated the inner faces of the shrouds with **BVM Heat Shield**, its a sort of white ceramic paint that reflects heat, it comes in 8oz cans and is available from

www.bvmjets.com for \$US16 plus p&p.

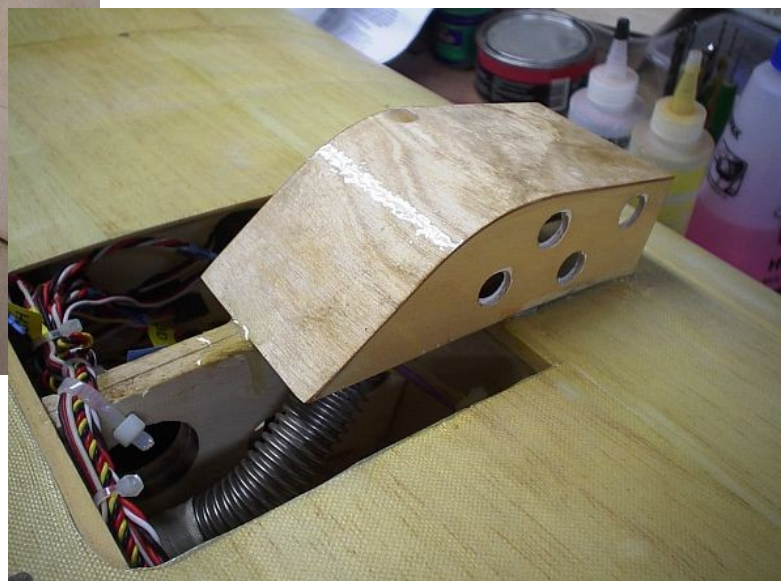
I have a couple of concerns with the whole setup which will only be allayed when I have done a few engine runs and flights. My first unknown is how hot will the pipe get and how far back from the engine will the heat be excessive. The corrugations in

the pipe seem to be able to radiate heat readily and the pipe will be in the shroud with airflow created by the radiator door being open so I'm hoping that the pipe won't be excessively hot past the firewall..we will see...



Second concern is metal to metal contact causing interference. I don't know much about this but all the pundits have been saying for years "avoid metal to metal contact". The joining pipe I have used is made from brass so I'm hoping that a ferrous

metal contacting a non-ferrous metal will not generate any interference, once again, we shall see.....



Tank Plumbing: I have used the chin type **DUBRO** 24 oz tank with a gas conversion plug and **TYGON** tubing. I use the three tube system, inlet, outlet and overflow, and filter the fuel through a firewall mounted filter from **DL Engines**. Some people don't like inline filters but I have fitted an external filter regardless as I don't want to have to pull the motor off its mounts to get to the carburetor to clean its internal filter if it gets crap in it. I will vent the overflow tube through a fitting in the bottom of the cowl. The in-fill tube will be hidden in one of the exhaust stacks.

Wing Detail: The wings require a lot of detailing at this stage and later to look any good. Navigation lights, landing lights, radiator fairing and canopies have to be done first before the wing can be primed for final detailing.

Nav and Landing lights: The nav and landing lights require custom made transparent covers and I made mine by heating PETG sheet and pulling the shape over the wing itself. I bought a 2400 x 1200mm sheet of 0.5mm and the same size sheet of 1mm from:

Mulford Plastics Australia Offices

Sydney

Address: Unit 21-22 Slough Business Park

Holker Street

Silverwater

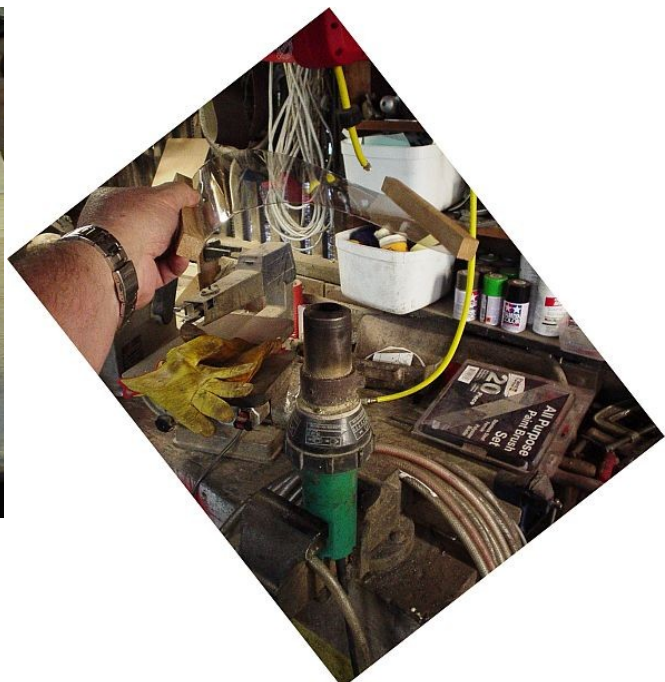
NSW 2128, Australia

Phone: +61 2 9911 8100

Fax: +61 2 9911 8112 (Sales Office)

I think I paid about \$30 a sheet.

The process of making these lenses is simple; prepare the wing by priming and sanding the areas smooth where the lenses will be fitted, cut four pieces of sheet

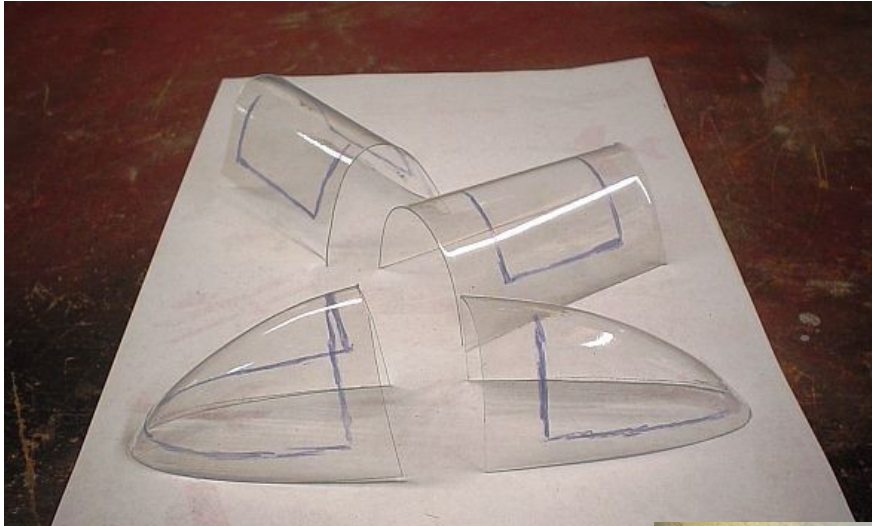


PETG and staple to two pieces of wood, heat the piece of sheet over a hot air gun.



When the PETG is hot enough to be very flexible stretch it over wing leading edge for landing lights lenses and then the wing tip for the navigation light lenses.





Cut the lenses to size and set aside. The internal details of the lights consist of a coloured bulb and reflectors.



I have used painted



LED's for my lights, port, starboard and tail. The landing lights are the lenses from two small torches. To fit the lights I drilled holes



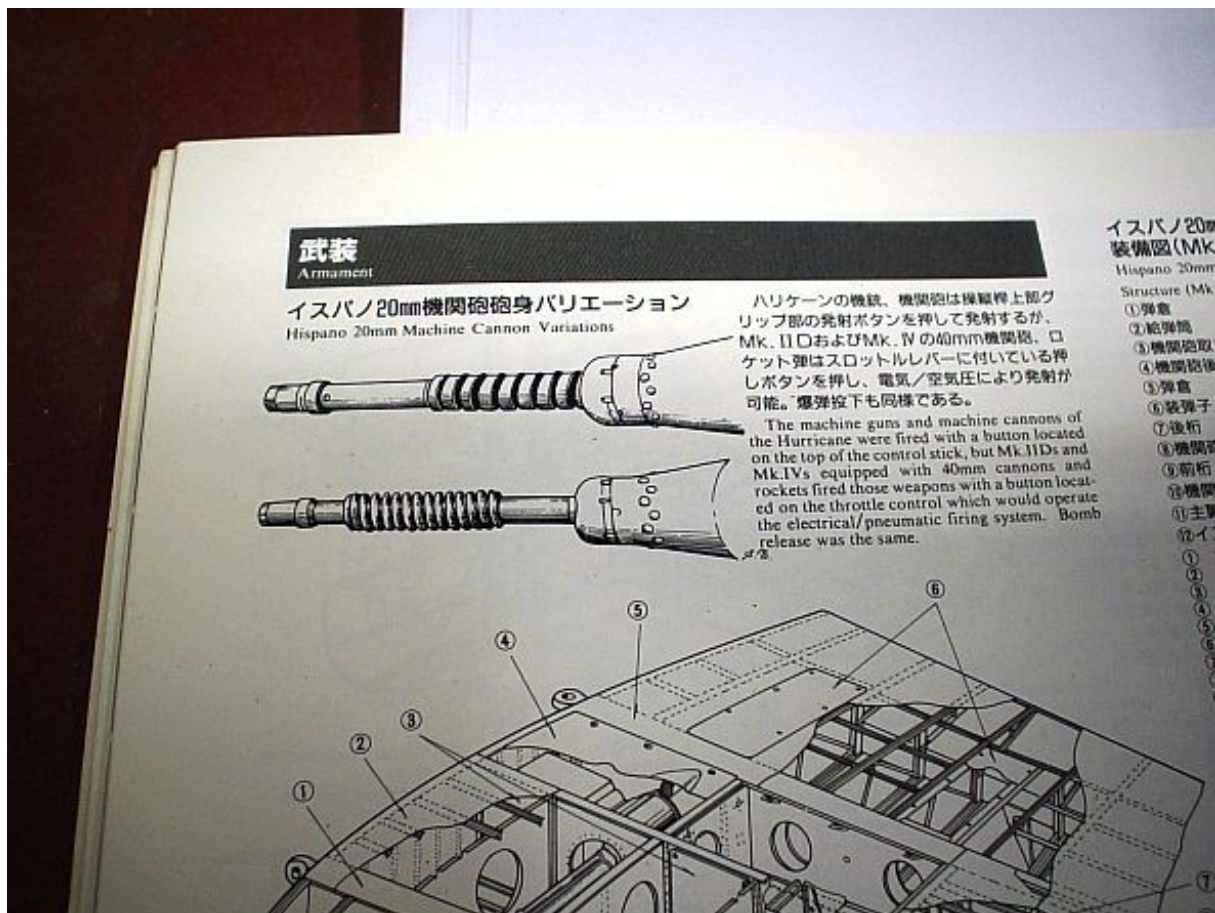
in the leading edge to suit and glued them in place with epoxy.



The picture above shows aluminium duct tape in the tip light cut out to look like reflectors.

Finally I have trimmed and glued the lenses in place with canopy glue and masked them prior to primer. Later on after painting the wing I will add small screws to the edge of the lens as per the full size.

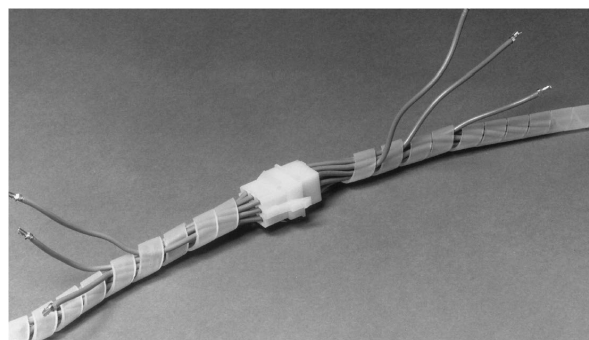
Canons: The canons on the IIb and IIc Hurricanes were the large 20mm bore Hispano type. There were two versions and an accurate replication of one of them is necessary for the thing to look right when completed.



I am going to make the version with the recoil spring in the middle of the barrel. I am going to use plastic tubing to make the barrels and the cuffs and wrap the barrel with spirap to represent the spring. The precision plastic tubing is made by:



Their website is www.evergreenscalemodels.com you see racks of all sections in most hobby shops. **Castle Hills Hobbies** has a good range. **Spirap** is a spiral cable wrapping material and is available from Electrical Goods Retailers.





The barrel is 5/16" OD. The cuffs are 3/8" OD and the muzzle is 1/4" OD.

The completed canon was epoxied to a turned wooden base with an 8-32 threaded rod screwed and epoxied in the base for screwing to the wing.

The full set took me a couple of hours to make and they can now be painted with primer and then finished with matt black.

Because the canons stick out so far from the LE of the wing it is imperative that they are mounted



parallel to the axis of the aircraft. This caused a bit of head scratching until I came up with counter boring the LE to give me a flat surface to work off and then hammering 8-32 T-nuts into the centre of the flat surface. I tacked the T-nuts with cyano and screwed 4 x 100mm 8-32 cap screws into them. I then aligned all the screws until they all lined up with the fuselage axis. I added another drop or two of cyano to the T-nuts to secure.



Next I epoxied a disc of dowel over the T-nut and held it in place with a well greased short 8-32 cap screw into the T-nut.

I built up the void with my usual mixture of bog



and removed the cap screws when all was set, then out with the sanding pads to smooth to shape.



Until at the end of the day they looked like this.

The good part of this method is that I can un-screw the can-
ons for transport to and from the field



Radiator Fairing: I was able to use the plastic kit to give me the shape of the panels used to secure the radiator fairing which I transferred to the underside of the wing. I then glued the fairing to the wing using [Hysol](#). I have fitted a piece of piano hinge to the radiator flap to give me access to the ON-OFF switches and the wing mounting bolts.

The flap has a support fitted so it is fixed at the angle bottom right for flight.

I would have liked to have fitted the pneumatics valve inside the fairing but as it was getting a bit crowded it ended up on the outside.



The next instalment should be wiring and covering.
Cheers
Stan