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## Assembly instructions for Composite-ARF 'New Rookie' Fuel Tanks

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*The kevlar tank is factory-joined and includes all hardware shown.*



*The fibreglass tank kit and hardware as supplied*

## 'New Rookie' Fuel Tanks

Thank you very much for purchasing the composite fuel tanks for our 'new Rookie'. If you have any questions, please don't hesitate to contact your Rep, or C-ARF directly. Below are the contact details:

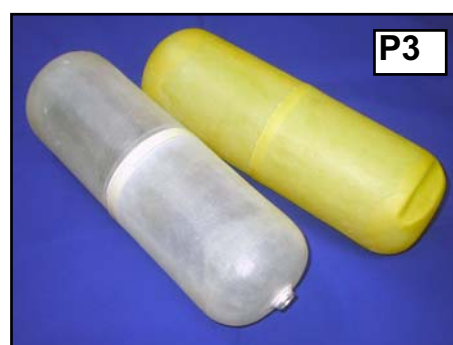
**Email:** [feedback@composite-arf.com](mailto:feedback@composite-arf.com)  
**or** [techsupport@composite-arf.com](mailto:techsupport@composite-arf.com)

**Telephone:** Phone your C-ARF Rep!!! He will be there for you.

**Website:** <http://www.composite-arf.com>

## Composite Fuel tanks

Available now is a choice of 2 moulded composite fuel tanks, one in kevlar and the other in fibreglass, to fit the 'New Rookie'. Actually, by slightly enlarging the diameter of the holes in the 2 main bulkheads these can also be retro-fitted to original Rookies and Harpoons. Both tanks have an internal baffle to prevent fuel surge and C of G changes during high-G manoeuvres. With the much larger cockpit size of the 'New Rookie' it is easy to fit the fuel tank from the front thru' the cockpit opening, or from the engine bay, allowing simple installation and maintenance.



The full kevlar moulded tank has a capacity of just over 3 litres and is joined at the factory, ready to install, with the baffle and aluminium sleeve for the stopper hardware also fitted. Included are the kerosene stopper, aluminium cap, brass tubing, fuel barbs and felt clunk (photo P1).

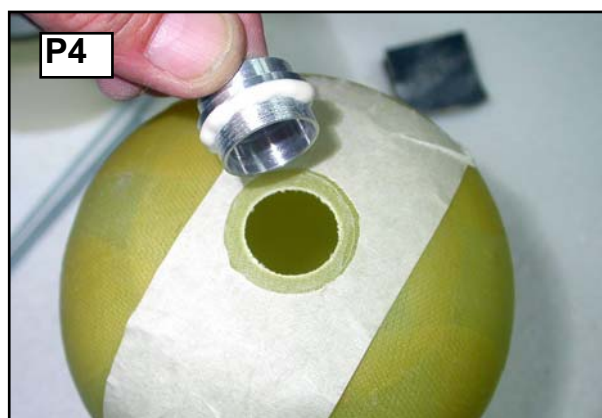
The fibreglass tank comes in 'kit' form, ready for you to join. By cutting the length of the front half before joining, capacities of between 1.6 and 3.2 litres can be achieved - to suit your choice of engine and required flight times. Included are the baffle plate, kerosene stopper, aluminium cap and sleeve, brass tubing, fuel barbs and felt clunk (photo P2). If the tank is not cut the maximum tank length is 350mm (14"), and the diameter of both tanks is 118mm (4.6").

The photos below show the kevlar tank to illustrate the assembly, because there is more contrast in the pictures. The back part of the tank has a moulded-in lip on it for joining to the front part of the tank, and also a moulded groove in the back that can be located over the wing tube in the plane to prevent it moving backwards, or rotating.

Below is a simple and painless method of joining your tanks, guaranteeing a leak-free fuel cell that will last for many years.

### Step 1:

The front part of the tank already has a pre-drilled hole for the stopper sleeve. Lightly sand the outside surface of the aluminium stopper sleeve where it will be glued into the tank. Clean with Acetone for a good bond. The inside of the sleeve has a small 'step' in it, and the end with larger diameter *must be downwards* (inside the



tank). This allows the inner end of the stopper to expand and grip the inside of the sleeve properly. Check that this sleeve is the correct way around before gluing in position! (photo P4)

Cover the outside of the tank around the hole with tape, and cut a neat circle in the tape of about 30mm (1 1/8") diameter. Carefully sand the tank surface within the hole in the tape, and clean with Acetone. Sand a band about 6mm wide (1/4") around the hole on the inside surface of the tank also, and clean.

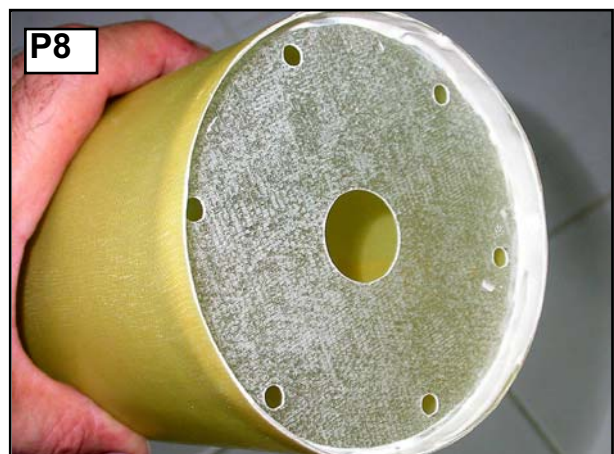
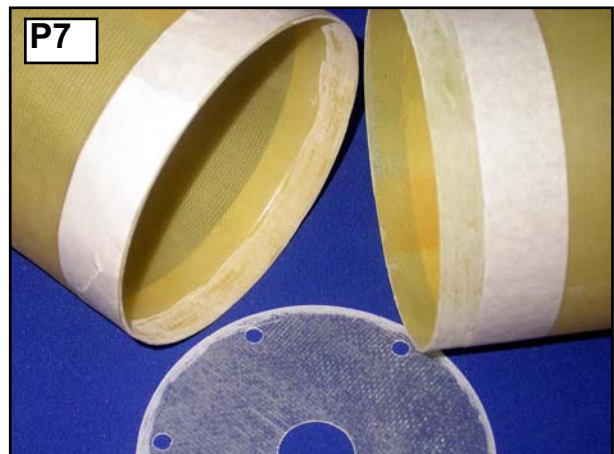
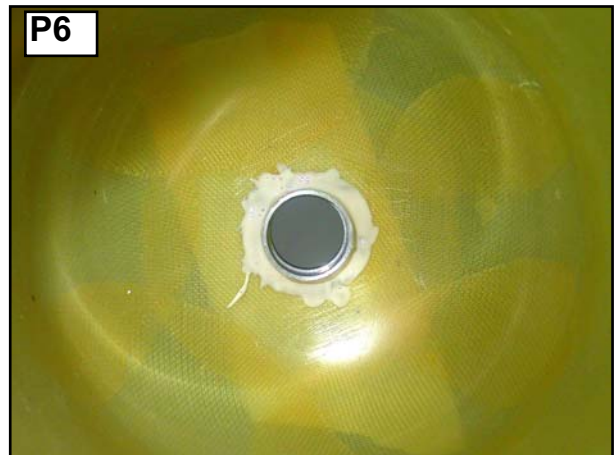
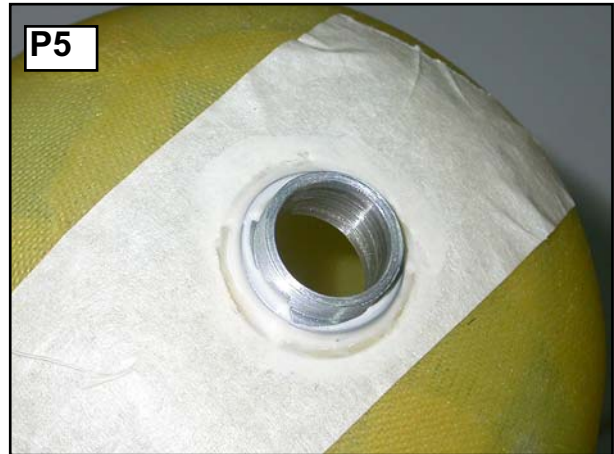
**Glue:** We highly recommend that you use a filled thixotropic epoxy (eg: Hysol 9462/Aeropoxy) for assembly of the fuel tanks, but you can also use normal 24hr laminating resin mixed with some thixotropic filler, which works fine. Do NOT assemble with 5 min. or 30 minute epoxy!

Apply a thick bead of epoxy to the underside of the flange on the aluminium sleeve and insert into the hole (P5). Apply another thin bead of epoxy to the sleeve where it projects inside the tank (P6). Smooth both glue joints to make them look 'pretty'. Set aside to cure.

### Step 2:

Determine the capacity of fuel required and cut the front part of the tank to the required length with a cutting disc, and sand to a nice straight edge. If left uncut you will have just over 3 litres capacity. The front part is a tight fit inside the lip of the back part. Sand a small chamfer on the edge to aid assembly. Insert the front into the back part and mask the outside of the tank about 2mm in front and behind the joint with tape. This prevents excess glue getting on the outer surface of the tank when joining, and makes the 'clean-up' easy.

Carefully sand all around the inside surface of the raised lip on the back part of the tank. Do *not* sand into the fibreglass cloth, just scuff up the resin on the surface. A fine Dremel sanding drum is good for this if used *gently*. Do the same on the outside surface of the front part, about 2 - 3mm more length than will be inserted into the back part, up to the edge of the masking tape. Clean mating surfaces. (photo P7)





**Step 3:**

Lightly sand a band about 4 - 5mm wide around the edges on both sides of the milled fibreglass baffle plate (P7). Clean with acetone. Insert the baffle into the lip in the back part and secure with a couple of drops of thin CA. The baffle plate should sit flat at the back of the lip. NB: If you are joining the tanks at the minimum length for a small capacity (less than 230mm / 9" long) you do not need to fit the baffle plate.

Apply a bead of epoxy to the inside of the lip and around the joint between the baffle and sides of the tank. Use a spatula to spread it around, making sure that *all* the surface of the lip is covered thinly. Apply a very small bead to the outside of the front part, and spread it with a spatula as above. The joint is very small and only a little glue is needed here.

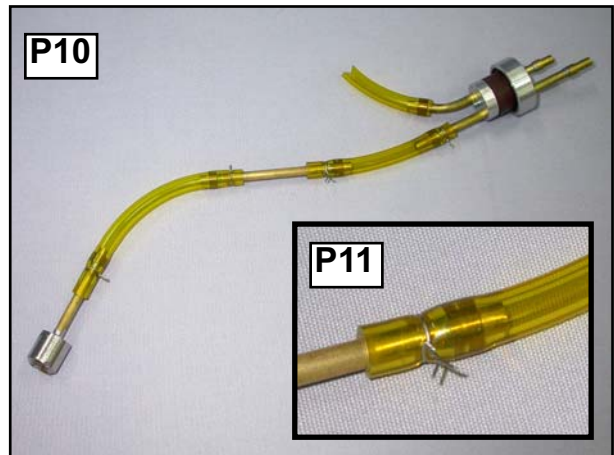
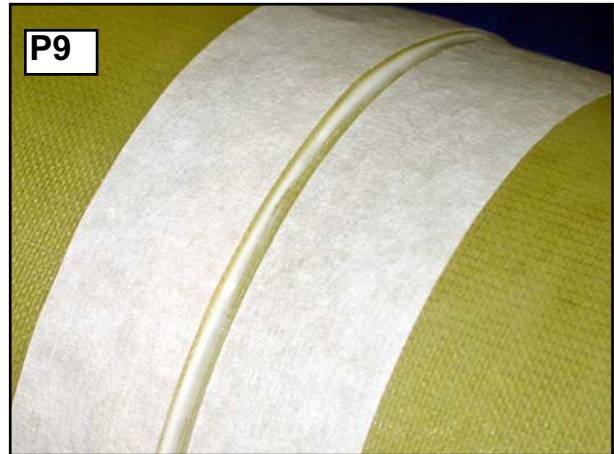
Insert the front part of the tank into the back part and rotate it at least 1 full turn to make sure all surfaces are covered with glue. Wipe off excess glue that squeezes out of the joint. Smooth the glue joint with a small fillet as shown (photo P9). Remove masking tape. Check that the tank is straight, and tape in position while glue cures.

**Step 4:**

Assemble the brass tubes, kerosene stopper and aluminium tank cap as shown in photo P10, using a kerosene-proof fuel tube inside the tank to join the parts together (Tygon or equivalent).

To prevent any chance of fuel or air leaks, we highly recommend that you solder the supplied short brass sleeves over both ends of all the 4mm O.D. brass tubes as shown (photos P12 and 13). Clean both parts first with 'Scotchbrite' or fine sandpaper for good joints. Fit safety wire ties, or commercially available fuel clamps, on all connections (photo P11).

Because the tank has a baffle in the middle you need to make the tube inside the tank to the clunk weight from 2 pieces of fuel tube, with a length of brass tube in the middle where it passes through the baffle. If you don't do this the edges of the hole in the fibreglass baffle will cut thru' the flexible tubing in just 1 or 2 flights.... (photo P10)



You can either use a heavy clunk in the tank, or the felt clunk provided in the hardware. If you are fitting an in-line 'Hopper' tank with a felt clunk in it, or UAV or equivalent, between the main tank and fuel pump we recommend that you remove the felt from the felt clunk in the main tank - because the extra drag of this could cause high fuel pump voltages, or in extreme cases insufficient fuel flow to your turbine.

When the tank is completed wash it out carefully to make sure you remove any small particles that could get into the fuel pump or turbine fuel system.

**Installation:**

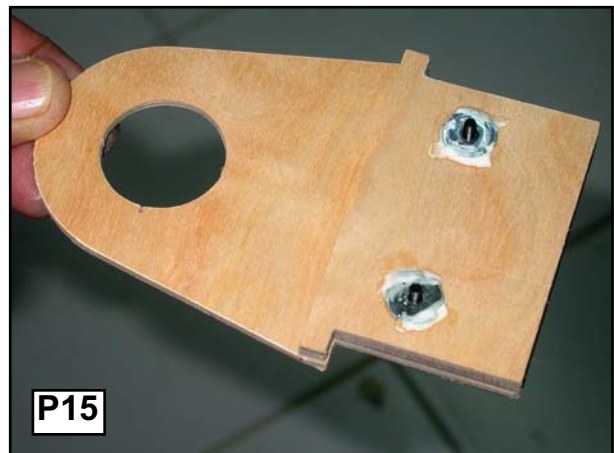
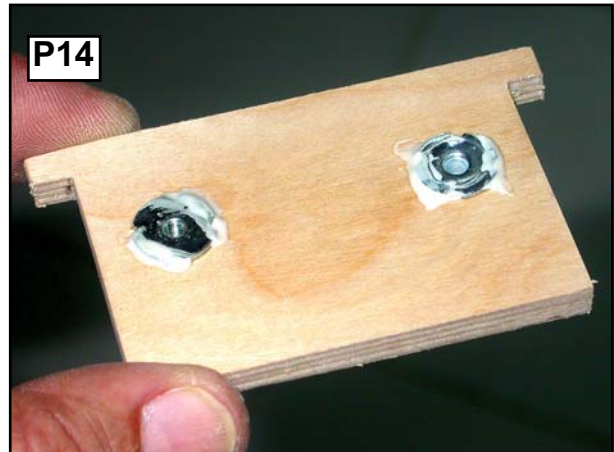
Install the tank in your 'New Rookie', pushed backwards so that the moulded groove on the lower back end locates over the wing-tube, to stop it rotating. If you have a long turbine, or the electric starter prevents you pushing the tank right back so that the groove locates over the wing-tube, you can glue a plywood strip across the bottom of the circular cutout in the rear main bulkhead to locate the groove on instead.

We now include 3 milled plywood parts in the fuel tank sets to make up the front retaining mount to secure the tank in place. Glue the two 'T' shaped parts together as shown in photo P14 with slow CA, lining up the milled holes for the bolts and M3 T-nuts carefully. Glue the T-nuts to the back face of the ply with a little epoxy.

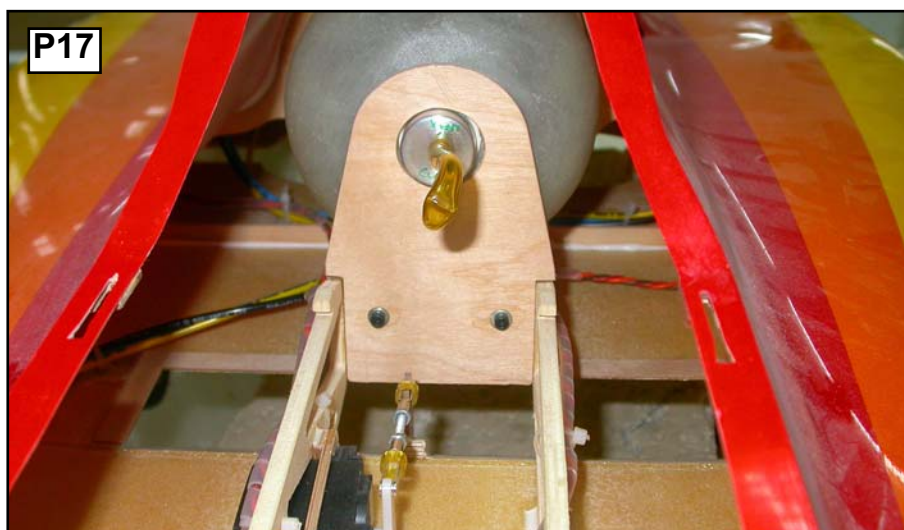
Bolt the larger plywood fixing plate to the 'T' shaped plates (P15), install the tank in the final position, and fit the complete mount assembly over the front of the tank, pushing it backwards firmly. You might need to sand a shallow semi-circular cut-out in the top of the 'T' plates - depending on the length, and therefore the position, of the front of your tank (see photo P16).

Carefully mark the exact position of the plywood mount on the lattice rails, and then remove the tank and mount. Glue *only* the 'T' shaped plate to the lattice rails with a little CA, about 2mm further backwards than you marked - so that when finally installed the plywood mount presses back firmly on the tank.

Check the position, using the tank, and when correct secure the 'T' plates properly to the lattice rails using 30 minute epoxy. Re-install your tank and bolt the plywood mount to the 'T' plates with the M3 x 16mm bolts provided. The photos here should make the assembly clear (P17).







## Appendix:

### Packing List - 'New Rookie' Fuel tanks

#### Fibreglass tank (kit)

<i>Quantity</i>	<i>Description</i>
1	Front part fibreglass tank (with 22mm Ø hole)
1	Back part fibreglass tank
1	Baffle plate (milled fibreglass sheet)
1	Kerosene Stopper (Dubro #400)
1	M3 x 25mm Allen Bolt (zinc plated)
1	Cap (aluminium)
1	Disc (aluminium)
1	Sleeve (aluminium)
3	Brass tubes (4mm O.D x 90mm long)
6	Brass tube barbs (I.D. 4mm x 5mm long)
1	Felt Clunk (Webra #1121)
3	Milled plywood parts (tank mount)
2	M3 x 16mm bolts
2	T-nut M3
1	Assembly Instructions

#### Kevlar tank (factory-joined)

<i>Quantity</i>	<i>Description</i>
1	Kevlar tank 3.2 litres (joined, with baffle and aluminium sleeve glued in)
1	Kerosene stopper (Dubro #400)
1	M3 x 25mm Allen Bolt (zinc plated)
1	Cap (aluminium)
1	Disc (aluminium)
3	Brass tubes (4mm O.D x 90mm long)
6	Brass tube barbs (I.D. 4mm x 5mm long)
1	Felt Clunk (Webra #1121)
3	Milled plywood parts (tank mount)
2	M3 x 16mm bolts
2	T-nut M3
1	Assembly Instructions