FUEL TANKS FOR STUNT

by Brian Eather

The requirements of a good stunt tank are:
1) Consistent feed to engine throughout all manoeuvres.
2) No excessive speeding up as the head of fuel decreases.
3) Similar engine runs on the ground and in the air.
4) A cut at the end of the run which gives some notice but without excessive burping which may result in an over-run.
5) The ability to stunt right up to the end of the run to overcome having to carry excess fuel.

Experimentation has resulted in the tank shown in Figure 7. This design has been used in a number of models, fulfilling the above 5 requirements.

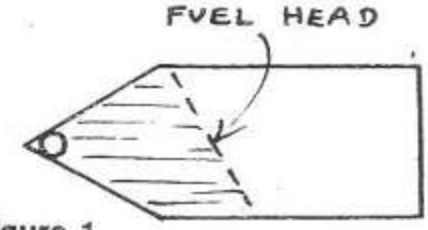


Figure 1

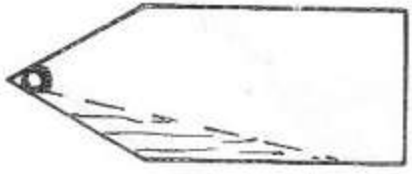
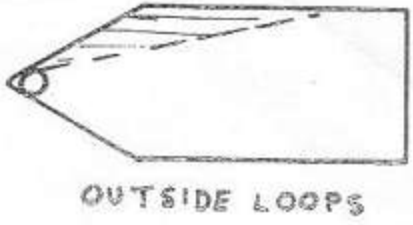
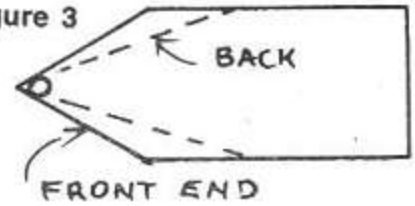


Figure 2



Materials: My tanks are constructed from 0.010 inch tin plate and 1/8 inch OD thick wall copper tube. I do not recommend the use of brass, as I have seen models destroyed from fatigued brass used in tank construction. *Very interesting. Would anyone care to comment?*

Figure 3



Fuel Feed: Experiments have indicated that the fuel feed should be terminated in the outboard rear corner of the tank and should be angled at 45°. I have tried the feed in many locations along the outboard of the tank and have found the above location to be the best. The feed should be soldered at this point to prevent any movement or vibration.

Wedge Angle: The circular flight path of the model causes the head of fuel to move across the tank as in Figure 1. The motion of the model in manoeuvres causes the fuel head to flatten as in Figure 2. This flattening of the fuel head may cause the fuel feed to come out of the fuel during manoeuvres as the quantity of fuel decreases towards the end of the flight. This is the cause of some flights being terminated prematurely during the Clover. To prevent the engine from cutting during the final manoeuvres, a small wedge angle is required. My tank has an 80° wedge at the front squeezed down to 50° at the back (see Figure 3).

Plan Shape: Another cause of premature engine cutting and burping for a long period at the end of the run is incorrect plan shape. As all models fly at an angle of yaw (nose out of the circle), a tank with the outboard side parallel to the centre line of the model will result in the fuel feed coming out of the fuel before the tank is empty as in Figure 4. By sighting along the leading edge of the model while flying, I have been able to estimate the angle of yaw (of my model) to be 6°. I construct my tanks with a 6° angle on the outboard side as in Figure 5.

Uni-Flow Vent: To prevent engine speed-up as the fuel head decreases, I use a Uni-Flow set up. This works on a similar principle to a bird water feeder, by maintaining a constant fuel pressure to the engine. This vent is located as shown in Figure 7. Note that for the system to work, the overflow must be blocked off during flight.

Figure 4

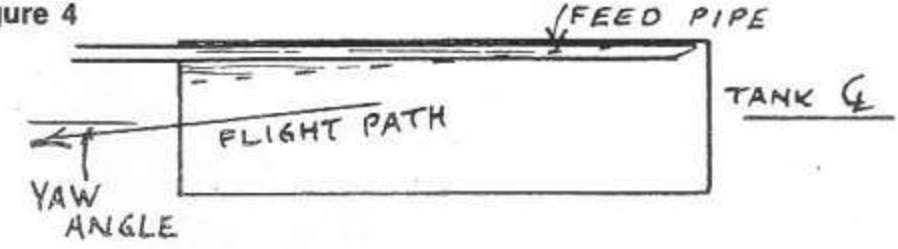


Figure 5