



## Simple soft sails for small rigs

As an alternative to cutting panels and forming seams in drawing film, very adequate small sails can be made using soft sail material just folded over to form double sided sails. These are ideal for the smallest models like Footys up to BOTTLE boats with a sail area of 600 square inches. They can even be used for light weather jibs for 'A' boats with additional film reinforcing the leech.

### Soft materials

Such soft materials include any sort of thin plastic bag materials such as dry cleaner's bags, bin bags, shopping bags, freezer bags etc. The massive choice of colours allows a bit of visual fun! As this thin soft material is flexible and stretchy, it is possible to create fullness within the sail very simply without the need for panels or great DIY skills. The thin material immediately forms a slight curve where folded over and held with a bit of tension. It allows a very good 'automatic' shape to form in the luff of jibs and mainsails from just a flat sheet. However to achieve this it does need to be set up carefully as described below.



### Cutting the sails

After selecting the material, fold it over with the fold to form the front edge of the sail. Place on a laminate or similar cutting surface and tape it down with only just enough tension to get rid of the major wrinkles. Either mark the plan of the sail on the material or place a pattern of the sail shape onto it with the straight luff on the fold line. This pattern can be made from cardboard or thin ply so that the material can be sealed with a hot soldering iron along the back edge. With such soft material the leech shape needs to be a series of straight lines between corners and/or battens. Cut the foot and head shapes with a sharp knife, but don't seal the two surfaces together.



### Finishing the mainsail

Add reinforcement tape (e.g. electrical insulation tape) to the corners as shown in the photographs with the number of layers dependant on the forces generated from the boat. Two layers is sufficient for Footy sails. Fit eyelets to the bottom corners, making sure that the tack eyelet allows the mast to fit within the sleeve in front of it. An important part of the design is a wide head shape at right angles to the mast. Stick the tape along the top of the leech and fold it over the head and down the other side. Repeat on the other side of the sail. Battens need only be fitted to one side. Any flexible thin plastic can be fixed with double sided tape reinforced by tape to the sail at the front end and around the aft end of sail.





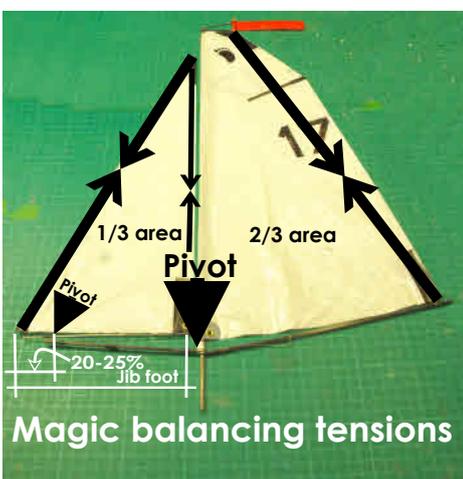
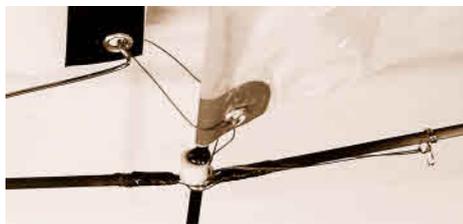
### Finishing the jib

Repeat sticking on corner reinforcements and fit the eyelet for the clew, but don't add the eyelets to the tack or head until the luff line is fitted to take the rig forestay tension. Use a light (6 – 20 kg) Dyneema line and make a loop at the bottom to go inside the two sail surfaces and round the tack eyelet before you close that up. Thread the line up the luff using a bodkin or thin wire loop and pull close to the luff before fitting the head eyelet. Temporarily tape the tack down, remove wrinkles in the luff and apply a bit of tension in the luff line. Tie a single overhand, figure of eight or other stopper knot in the luff line about 10mm above the head. Apply more tension to the line and tape that down. Make a loop passing through the head eyelet and with a cigarette lighter create a blob at one end. Pass this round the luff line above the stopper knot and tie a half hitch back on the loop. Carefully pull tight so that the blob and the stopper knot are together. Repeat with the other end of the loop and adjust the length of the loop such that it is only just slack when the luff line is taut. Cut about 5mm from the knot and burn the end back close to the knot. This will keep the fullness in the luff of the sail when the luff line/forestay is under tension.



### Setting up the sail on the rig

The photos show a simple swing rig for a Footy where the mast is fixed and the yard rotates around it. The 3mm yard spars are simply joined with 2mm bent wire and held against the upward pressure of the sails by a small PTFE block bonded to the mast. The camber in the mainsail is fully adjustable at both top and the bottom in the normal model yachting tradition with a loose foot fixed to a boom or yard spar at the clew. There is no spar as such at the top, but a large 1.25mm diameter wire headstick rotating about the mast allows the head of the sail to be fixed at the aft corner and located along the headstick to create or remove camber at the top of the sail. The fullness here allows the mast to bend within the sleeve without creating major creases as the wind increases. The photos show connection to the headstick by the tape reinforcement mentioned above, which can be adjusted by slitting the tape or shortening the slit with more tape to get a beautiful shape of any degree of fullness all the way up the sail.



### Adjusting the Swing Rig tensions

This design of Swing Rig has a magic balance of forces which only requires the adjustment of the bowsie on the jib luff line to suit different wind strengths. The design concept automatically keeps perfect tension balance between the main and jib leeches. The design principles of this rig are shown in the diagram and can be applied to a rig of any size.