

# A WEIGHING CONE DESIGN FOR USE ON ELECTRONIC BALANCES

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The use of paper or plastic cones and bags to weigh birds with spring balances is almost universally practised. Recent advances in electronic balance design, reduced production costs, market competition and increased levels of disposable income have brought battery powered electronic balances within the reach of some banders.

A variety of methods have been used to constrain birds being weighed on an electronic balance, usually entailing a variation in the function of the cone used with spring balances.

The following sketches illustrate a quick, cheap and easy method for making free-standing cones that place the weight of a bird directly over the weighing pan of an electronic balance.

## DESIGN

The template size shown (Fig. 1) is suitable for birds with body mass up to about 20 g. A slightly larger cone will adequately contain birds with body mass up to 35–40 g. Photocopy enlargements of the template shown will allow an infinite number of cone sizes to be made. Once a suitable size has been decided on, use the illustration to cut a template from heavy card and use this to trace the profile on to cartridge paper. This design, in three different sizes, has been used to weigh most species likely to be caught in 32 mm mesh mist nets, ranging from Weebill *Smicornis brevirostris* to Australian Ringneck *Barnardius zonarius*. The limitation is in the combined weight of the bird and the cone compared with the capacity of the balance. The balance used in an earlier project was a Sartorius with a capacity of 300 g. The current balance used is a Bamrico with a capacity of 200 g. Both models are battery powered.

## METHOD

1. Cut a disc of 60 mm diameter from a piece of 0.7 mm card. Use the compass to divide the circumference of this disc into three equal parts. Draw lines from the centre of the disc to each of the three marks on the circumference (Fig. 2). The disc will become the base of the cone and the lines drawn on the disc will be useful guides at final assembly.
2. Using the template as a guide, cut three blank cone sides of the desired size from cartridge paper.
3. Using a blunt, pointed implement and a straight-edge, score each paper blank along the heavily dashed lines. This will make it easy to fold the cones sides uniformly, but do not score too deeply or the cone will fall apart.
4. Hold each blank against the square edge of a board or a table or kitchen sink, with the flap 'A' centred on the board edge. Rub the top half of the blank between thumb and forefinger to produce a light crease in the cone surface. Pivoting from the end of 'A', crease the blank three or four times on each side of the centre line only to the scored line marks (Fig. 3). This will allow the top of the cone to form a circle when assembled.
5. Fold the sides along the scored lines as per Figure 4.
6. Brush a light, even coat of PVA glue on the inside of the 'wing' of one cone section (Fig. 5). Do not apply glue to the folded bits marked 'A' and 'B'.
7. Carefully fit a second cone section to the glued section of the first (Fig. 6). Align the two sections carefully and then press the glued area flat on to the table to ensure proper adhesion.
8. Repeat steps 6 and 7 to assemble the third side and so complete the cone body (Fig. 7).

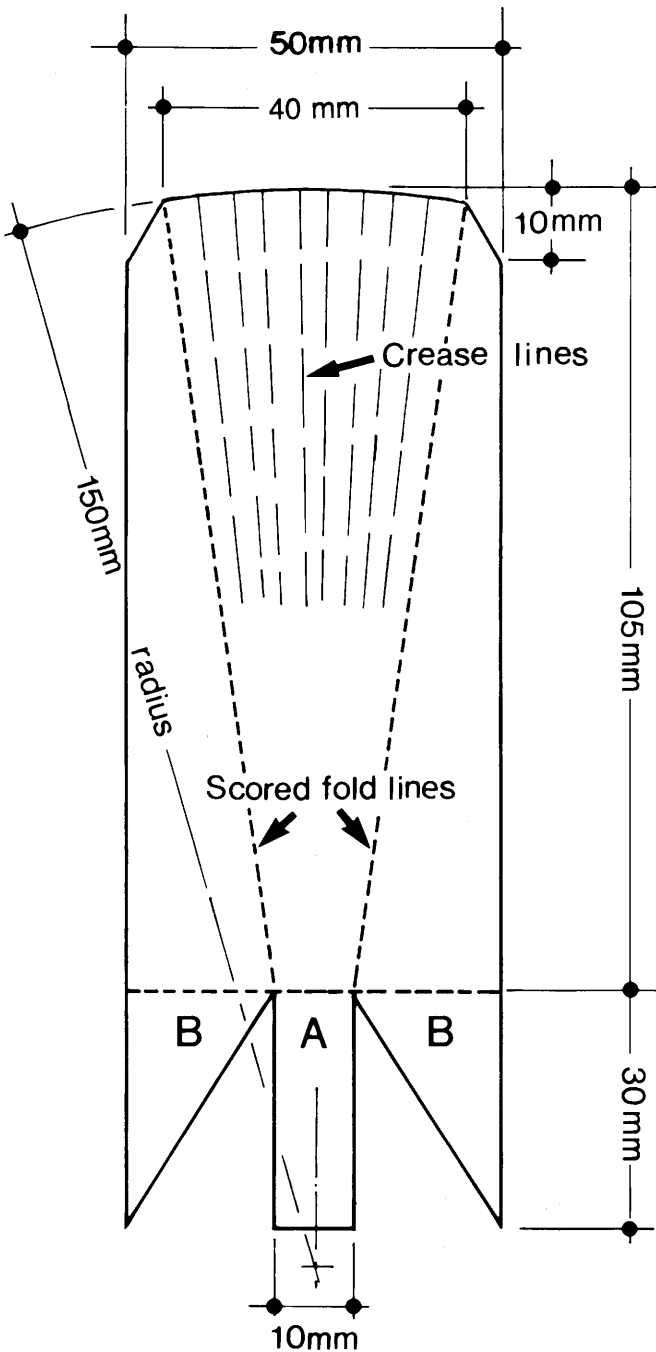


Figure 1. Template.

9. Using the marks on the disc as guides, set each of the 'fins' on a line and hold the flaps marked 'A' and 'B' in place with paper clips or springback clips. Space the flaps equally on the disc, centralize the cone and make sure that all the flaps are in the right place.
10. Free one of the flaps marked 'A' and glue it to the disc, leaving the 'B' flaps unglued for the time being. When securely fixed, glue a second 'A' flap and then the third. When they are securely fixed, glue down the 'B' flaps in turn. Trim off any bits of paper projecting beyond the edge of the disc. Trim the top if necessary.

The finished product is best stored and transported in a tubular container such as those used for packaging the more expensive brands of Scotch whisky.

Most electronic balances have a tare function. This enables the balance to display a zero weight when the cone is on the pan. Nevertheless it is useful to know the weight of the cone to reduce the possibility of errors. Weigh the individual cones and record the weight prominently on each one. When a cone is lifted from the pan the balance will display the cone weight as a negative number which should match the known weight of the cone.

When placing a bird into a cone, ensure that the carpal joint does not catch on the rim. Once in the cone the birds can be pushed gently downwards to prevent excessive movement. After weighing, invert the cone to release the bird on to the palm of the hand to allow it to orientate itself for flight.

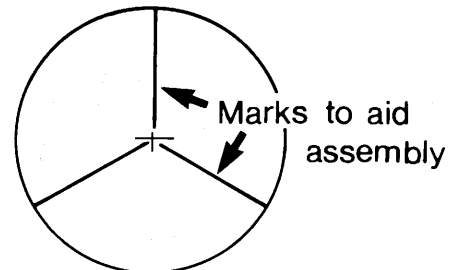


Figure 2. Disc for base.

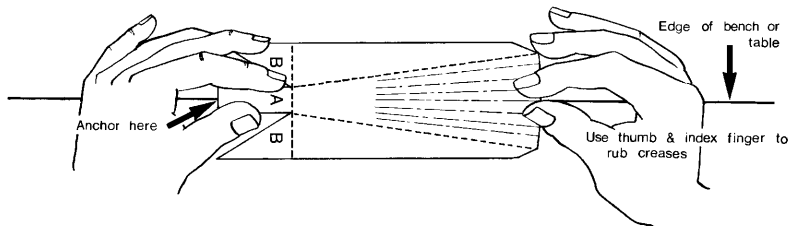


Figure 3. Creasing action.

These wings left flat, not creased

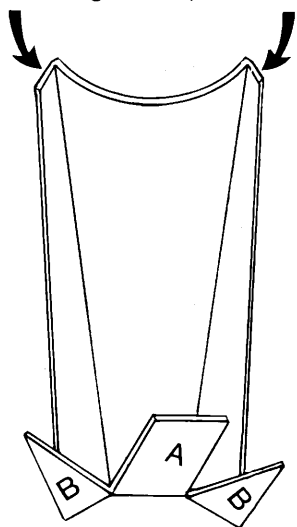


Figure 4. Folding.

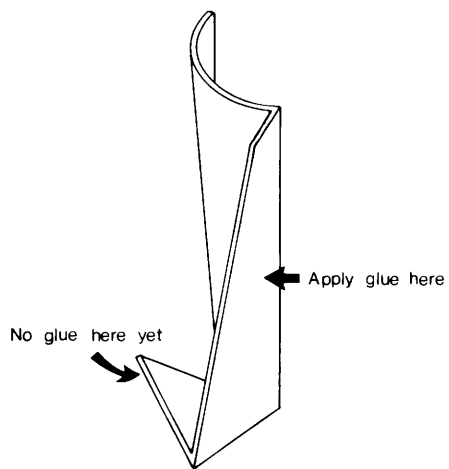


Figure 5. Gluing first cone section.

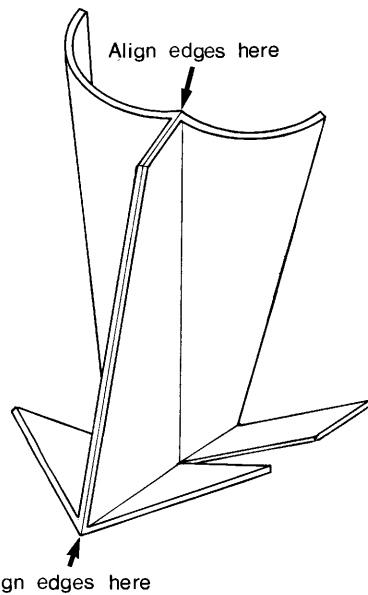


Figure 6. Fitting second cone section.

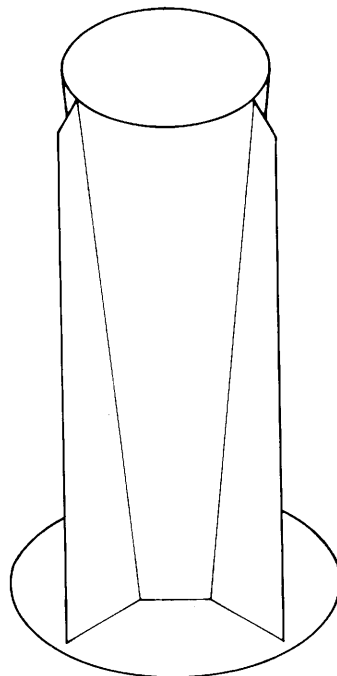


Figure 7. Assembled cone.