The Card Model

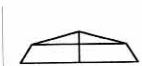
The nose of "Little Boy" is a compound curve, that is, a curve which moves in more than one direction. For example, bend a piece of paper. That is a simple curve. Now crumple that same piece of paper into a ball. That's a compound curve. Anyone who has ever built a paper model of an airplane fuselage knows how difficult it is for paper to elegantly reproduce a compound curve. In fact, most designers *hint* at compound curves by creating a series of truncated cones. There are several notable exceptions, however. Dr. Emil Zarkov from Bulgaria has designed a sphere that brilliantly recreates a compound curve. The development looks like an apple skin that has been carefully peeled in one, long, painstaking slice. Other modelers suggest pressing moistened paper into a spoon or a similar hollow mold to achieve a true compound. G. H. Deason, the late British designer, was an avid proponent of this method. I, however, am content to hint.

As mentioned before, by using tracing paper I drew over the illustration (Figure 1) to translate the nose into two cones: one right circular cone, one right truncated cone. Both call for radial-line developments. To continue, the main body of the bomb is a right cylinder - a parallel-line development. The lower end of the weapon tapers from a cylinder to a truncated cone, and the fin unit is another right cylinder. (We'll save the fins themselves for last.)

How Many Pieces Does it Take?

Aesthetic question: how many truncated cones does it take to resemble a compound curve? There is no one answer, although "more than one" is almost always true. Much depends on the final scale. For example, a large 1:16 or 1:32 model would require a subtler transition, calling for more pieces, while a smaller model could easily become too "fussy" by breaking up the visual flow through too many transitions. Trial, error and experience are the best teachers for this.

Back to the model. Let's begin with the nose. Pictured below is the complete nosecone.



We will remove the lower portion and focus on the extreme tip. CB is the radius of base and measures 9 mm. AB is the slant height and measures 9.25 mm.

Using the formula:

$$\frac{\text{Radius of Base}}{\text{Slant Height}} \times 360°$$

- or -

$$\frac{CB}{AB} \times 360°$$

- or -

$$\frac{9}{9.25} \times 360°$$

- which equals -

$$\frac{3240°}{9.5}$$

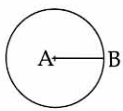
- or -

$$350.2°$$

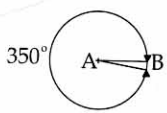
- rounded down it becomes, -

$$350°$$

On paper, describe a circle with the radius AB.



Set off the angle of 350° with a protractor.



This development is complete.