

WORKING DIAPHRAGMS - AN ORIGAMI APPROACH

Nigel C. Phillips

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Working Diaphragms

- Working diaphragms in plastic for passenger cars and cab diesel locomotives can be expensive and difficult to assemble.
- HO passenger cars and cab diesel locomotives are often much further away from the adjacent cars and locomotives than the prototype because of tight track radii and over-scale coupler length.
- The method described here is quick, inexpensive, and only uses paper, card stock, and some glue.

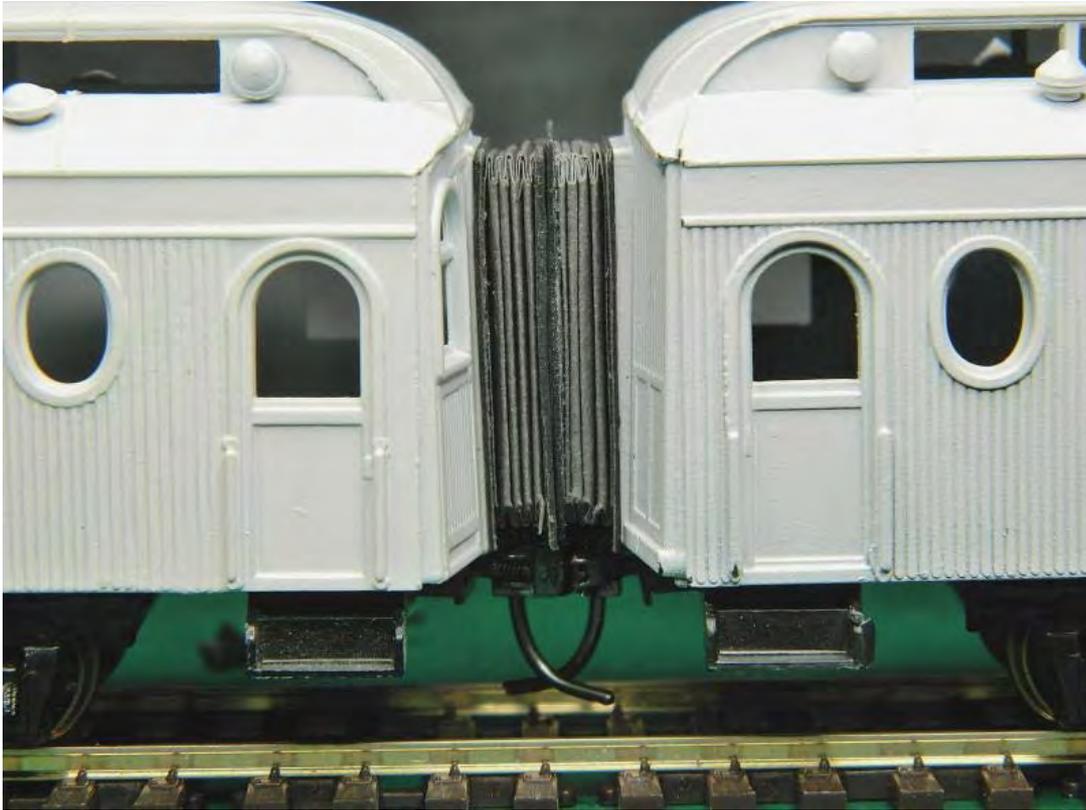
Working Diaphragms

- The method is based on that described by the Elgin, Scotland, model railway club. I developed a number of modifications that make it a workable design.
- The diaphragms are made from folded paper, and have pleated sides and tops, unlike many methods using paper that leave the tops open.
- Software to design the diaphragm and a printer (to print the cut lines) is useful, but not necessary.
- Please acknowledge the original (Elgin) method and the modifications (me) if you ever use the method and have it published or posted online.

Working Diaphragms

- Materials list.
 - Grey printer paper. I use Artoz S-Line 5 Bogan graphite, check your local art supply store for similar. Printing black lines on black paper is a no-no.
 - Black card stock. The Michaels range works well.
 - Design software. I use Corel Draw, the drawing tools in Microsoft Word or PowerPoint are fine.
 - Inkjet or laser printer. Or a 2H pencil and ruler.
 - Adhesive suitable for card and paper (craft glue or one of those aerosol adhesives) and plastic compatible CAA.
 - Gloss black acrylic paint. Michaels has this in the craft section.

Working Diaphragms



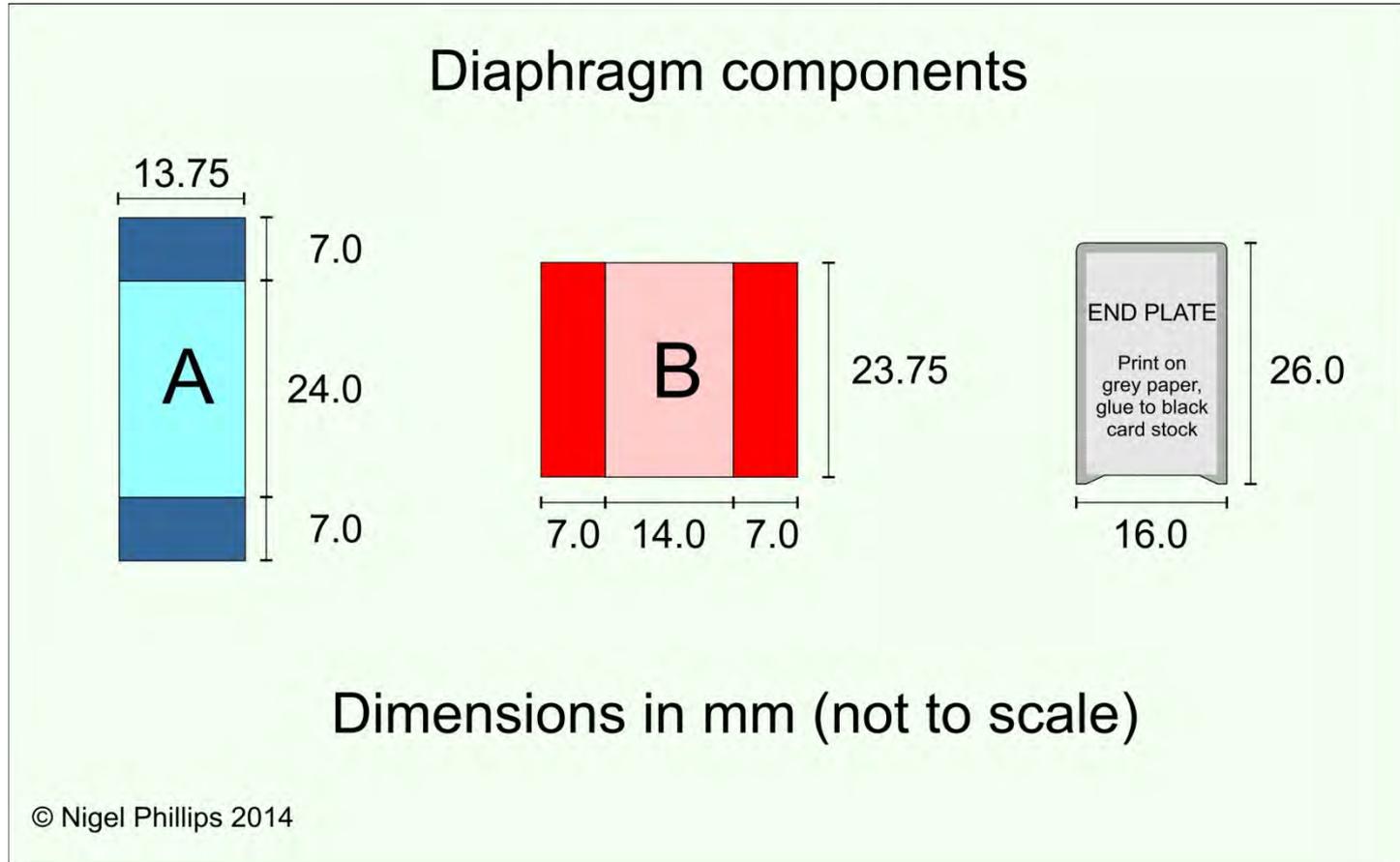
So, what do they look like?
How about a pair of Pullman Palace cars with 4-pleat diaphragms?

Working Diaphragms

- Instructions

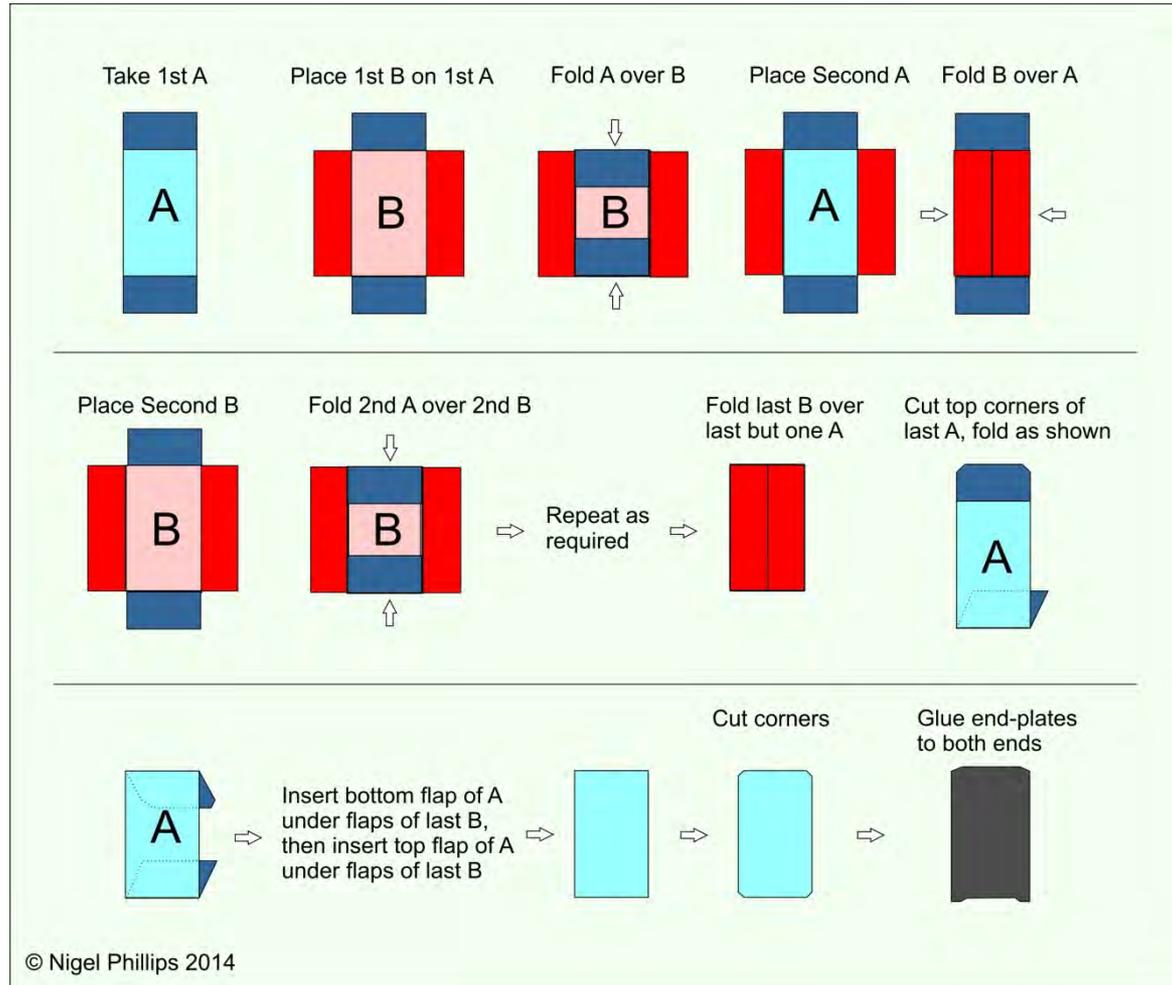
- Design and print or draw templates on grey paper (A and B diaphragm strips and the end plates). The example given is sized for Pullman Palace cars.
- Cut out. I use a utility knife and a sharp blade. Sharp scissors work as well.
- Score fold lines with back of utility knife blade (important).
- Fold using A and B strips (instructions follow), number of pleats to suit. Three to 4 generally works well. Clip corners at 45° (very important).
- Glue end plates to black card stock with craft glue, cut out, let dry completely
- Paint end plates with gloss black acrylic (one side), glue to ends of diaphragm (painted side out).
- Glue one end to the door frame of the car or diesel with plastic compatible CAA.
- Add detailing (roof, side levers, etc.), and weather using powders as required.
- Admire.

Working Diaphragms



The difference in dimensions between the width and height of the A and B strips is very important and is required to allow the A and B strips to be correctly folded over each other. The 0.25mm difference works with the paper I use (which is 0.1mm thick), adjust to suit your paper thickness. Size the end plates to the dimension of the passenger car or locomotive door frames.

Working Diaphragms



Working Diaphragms

- Conclusions
 - Model passenger cars often have highly visible gaps, and the presence of gangways, even as rudimentary as these, makes a big visual improvement.
 - Same goes for an A-B or A-B-B-A cab diesel locomotive consist.
 - They also take up any coupler slack, and give a much smoother ride (none of that hunting back and forth).
 - These gangways cost cents to make and only a few minutes work, commercial offerings can cost from \$4.00-\$7.50 per car.