



If your only reference for a structure is a photo shot at an angle, getting usable dimensions for scratchbuilding from it can be tricky. Wim Harthoorn explains how to do it with a simple diagram. Wim Harthoorn photo

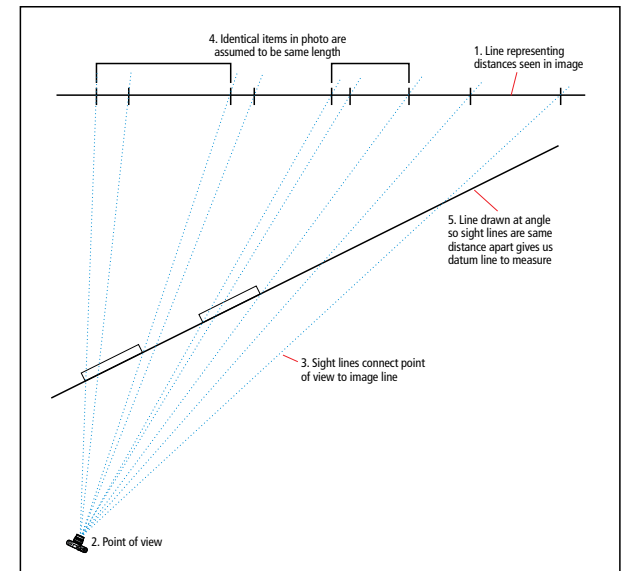


Illustration by Kellie Jaeger

The other problem is that the relative position of objects at different distances from the camera changes with the angle they are viewed. It would be possible to adjust for that by placing different planes on separate layers in the digital photograph and moving the layers in relation to each other, but that's a lot of work just to make a drawing.

horizontal line represents not the subject, but its image on the backplane of the camera – the film or digital sensor. Now we want to draw a line that represents the angle our subject makes with the line of the camera backplane. On this line, the measurements for the width of each shop unit will be the same. Once we have that positioned, we have a datum line for our drawing.

Removing perspective

We start with our photograph. What we want are two or more features that are likely the same width. In the photo of a line of shops, we can assume that each shop unit is the same width. So we draw a horizontal line at the level of the upper floor and measure the distances along that line between the dividing pillars. We transfer those measurements to a horizontal line on a drawing.

The next step is to mark a point to represent where the photographer was standing. The position of this point doesn't have to be all that accurate, as long as the orientation of the viewpoint to the subject is correct. If the photographer stood to the left of the subject, then our point should be to the left. From that point, we draw sighting lines to the marker points on the horizontal line.

How this works is that our point represents the camera lens and our

From datum to data

What we don't have, though, are any dimensions, unless we can get them from another source. No matter; we can repeat the exercise using the shop front of the fish and chip shop, where we can assume the three windows are the same size. If we estimate a 3-foot-wide shop doorway, we can calculate a likely width for each shop unit. And once we have a dimensioned framework for our drawing, we can fill in more details, using photos taken from different angles as well, if we have them.

Our aim here is to produce an outline drawing from which we can build a model in plastic or wood. Micrometer accuracy is not necessary, but this technique will be accurate to a millimeter or so – representing 3½" in HO scale – and that's plenty good enough for the purpose in mind. [MR](#)

UNDOING PERSPECTIVE in reference images

Geometry yields more accurate dimensions for making structure plans from photos

By Wim Harthoorn

BOB FOLZ, IN HIS ARTICLE "Scratchbuilding without plans" (*Model Railroader*, November 2012), suggested that while estimating vertical dimensions from photographs was relatively easy, estimating horizontal dimensions wasn't unless you have photo-editing software with which to manipulate digital images. Although I have that

software, I wouldn't use it for that purpose, as there's a neat pencil-and-paper technique that delivers better results.

At the outset, I'd say that there's no substitute for taking a tape measure to the building being modeled and supplementing that with dozens of detail photographs, or for sourcing the original plans from an archive. But that isn't

always possible. In my case, the prototype I wanted to model is some 6,000 miles from my home. In other cases, the gap is one of time, as steam- and transition-era modelers may find that the structure in question has been demolished and the only surviving record is a photograph. It is then that the technique I will describe proves its worth.

The limits of flat images

Our starting point is the best photograph we can find of our subject. The problem with a photograph is that it is a two dimensional representation of a three dimensional object. Nothing new in that; humanity has been representing 3D objects on a two-dimensional plane since the time of the Great Masters. But in doing so, we lose information. And no matter how clever our photo-manipulating software is, it can't put back lost information. The camera that can look around corners or see behind foreground objects has yet to be invented. The same is true for the camera that produces images that are pinpoint-sharp over the entire field of view. These limitations mean that the results of using software to stretch an image to undo perspective distortion are generally disappointing.