

TECHNICAL SOURCE GUIDE

PLOTTING ARCS, CIRCLES, AND ELLIPSES WITH "ACES"

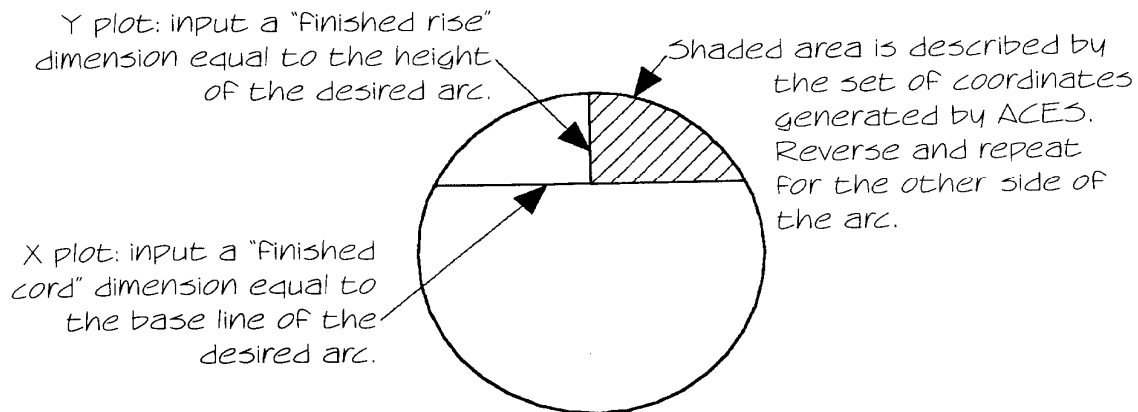
By Dan Culhane, Technical Director, Children's Theater Company, MN

We all know, there is more than one way to layout large arcs, circles and ellipses. Loren Schreiber described several of his favorite methods in his TSG article, "Creating the Ellipse" (TSG numbers Technical Source Guide #21 and 22, Sept. and Oct. 1995) In this article, Dan Culhane gives us another set of ways, using a computer spreadsheet template for Microsoft Excel he calls "ACES" (Arcs, Circles and Ellipses Spreadsheet).

ACES is a software tool for accurately determining an X, Y layout grid for large arcs and ellipses. The user simply inputs the length of the cord and its rise in the case of arcs, of the length of the major axis and half of the height of the minor axis in the case of an ellipse. The spreadsheet will then generate a series of X and Y measurements for accurately laying out the arc or ellipse from the centerline (Y-axis) outward along the baseline (X-axis). The user can specify the incremental distance for each point along the X axis.

The spreadsheet also allows the user to specify a reveal or facing thickness. In the case of the reveal this would refer to a flat with an arc or elliptical hole in it. The spreadsheet adds the reveal thickness to the arc or ellipse in order to create a larger hole which will have the correct finished dimension when the reveal is attached. In the case of an arc/elliptical shaped platform the facing thickness is subtracted from the finished dimensions giving a slightly smaller layout that will grow to the finished dimensions when the facing is attached to the front.

ARC LAYOUT



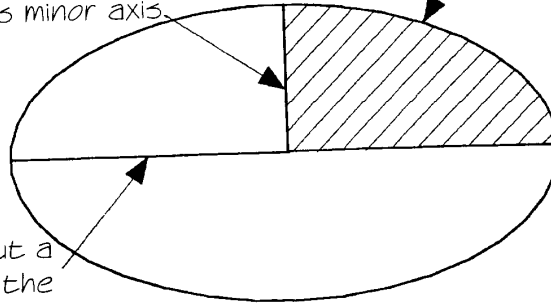
Note: the "arc layout" will plot circles by making the finished cord equal to the circle's diameter, and the finished rise equal to its radius.

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ELLIPSE LAYOUT

Y plot: input a dimension equal to half the length of the ellipse's minor axis.

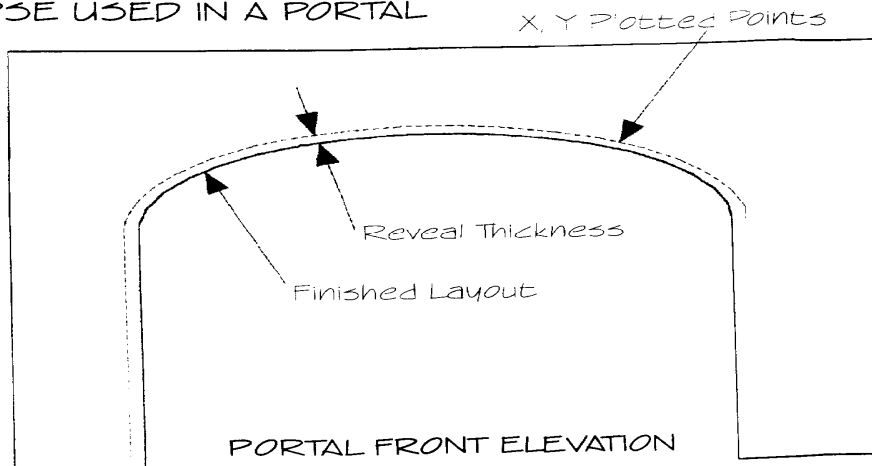
X plot: input a dimension equal to the ellipse's major axis.



Shaded area is described by the set of coordinates generated by ACES. Reverse and repeat for the other quadrants of the ellipse.

Examples:

AN ELLIPSE USED IN A PORTAL

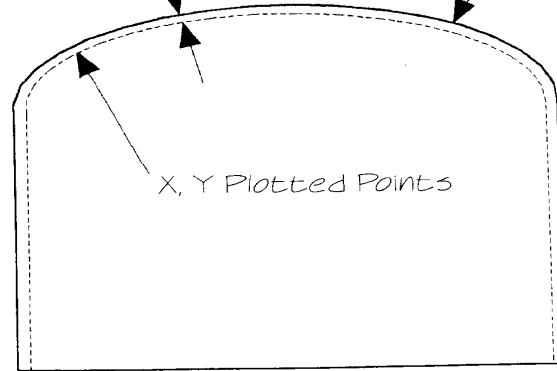


Note: Give ACES a "reveal thickness," and the spreadsheet adjusts the X,Y plot outward so that the finished layout is correct when the reveal is in place.

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AN ELLIPSE USED IN A PLATFORM WITH A CURVED EDGE

Facing Thickness Finished Layout

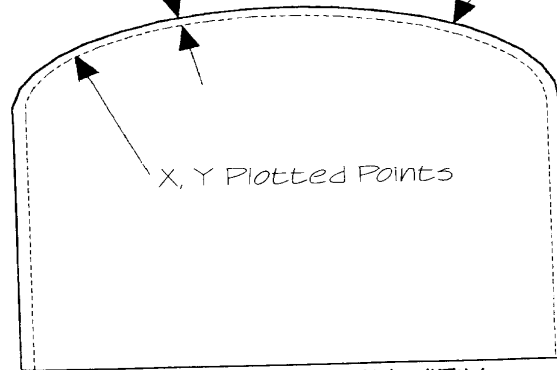


PLATFORM PLAN VIEW

Note: Give ACES a "facing thickness," and the spreadsheet adjusts the X,Y plot inward so that the finished layout is correct when the facing is in place.

AN ELLIPSE USED IN A PLATFORM WITH A CURVED TOP

Decking Thickness Finished Layout



PLATFORM SECTION VIEW

Note; Give ACES a "decking thickness," and the spreadsheet can plot the X,Y points for the plywood frame needed to support the platform, leaving a allowance for the thickness of the decking

Contact author to download software

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