

## 8. Geometry Files – Creating 2D and 3D GEM files

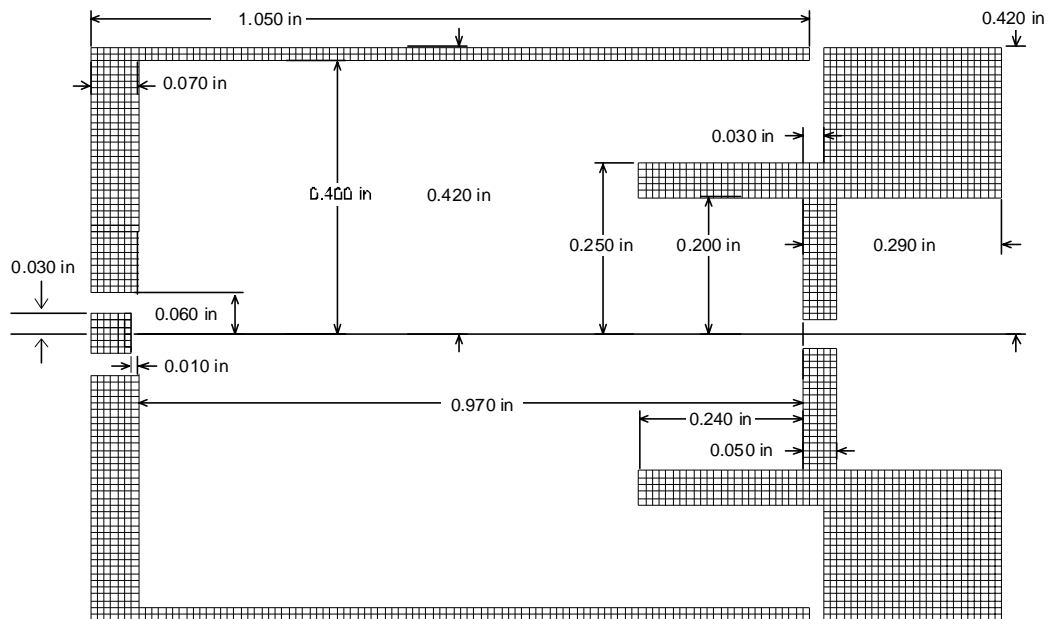
**Files:** C:\Advanced SIMION Class\08. Creating Geometry File\Lab

Creating geometry files for an electron gun using 2D and 3D definitions

Create a gem file for the electron gun shown in Figure 8.1

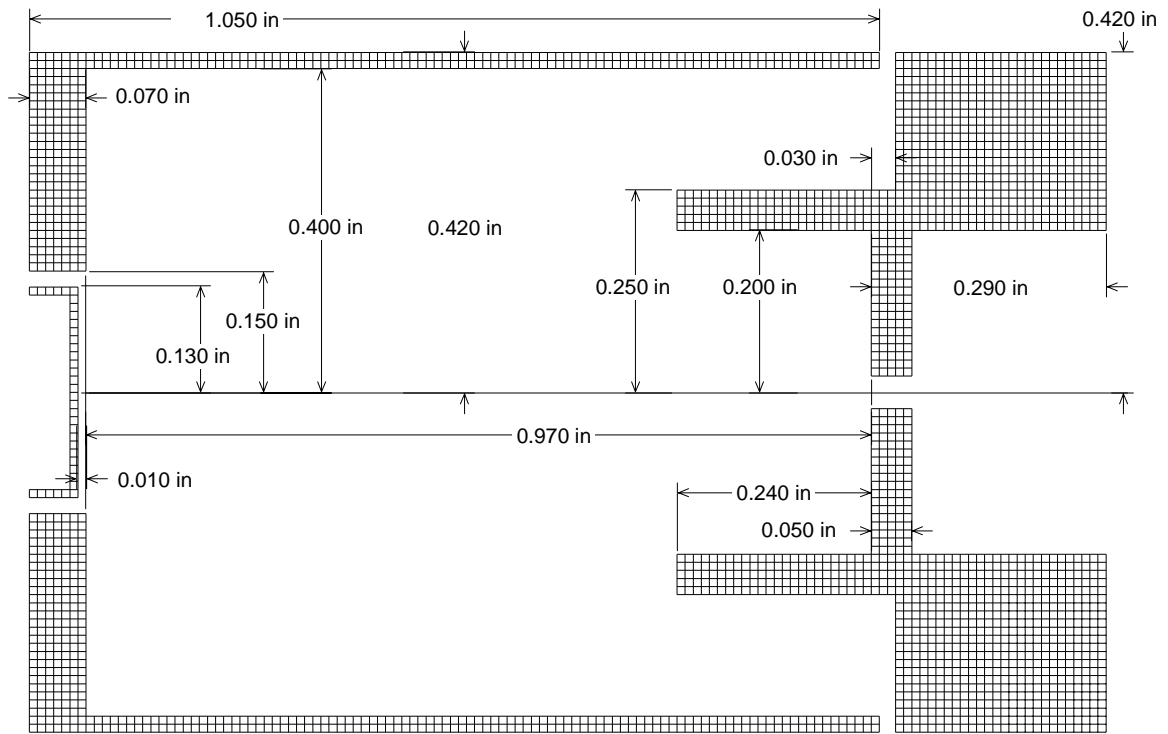
No After Installation Files Need to be Created

1. Referring to Figure 8.1, create a gem file that will produce the 2D electron gun. Use real units (inches) in your geometry file and a locate command to scale the system to fit into an array of 140 x 45 x 45 grid units. If you get stuck, refer to the file egun2d.gem. Fly the ions in the file egun2d.fly with the gun set to produce electrons with 70 eV of energy. Tune the lens to focus the beam within the final aperture.

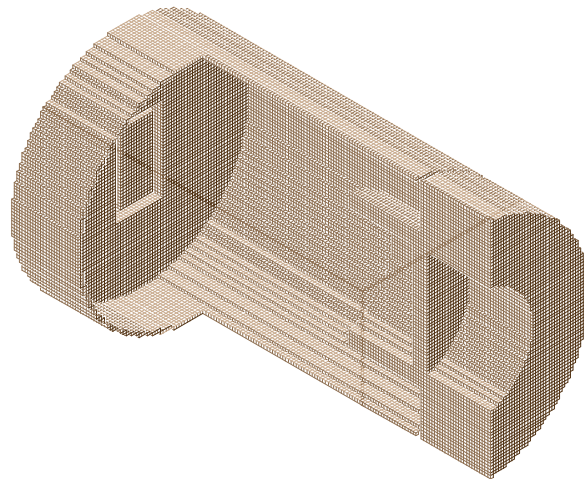


**Figure 8.1** 2D cylindrically symmetric electron gun.

2. Referring to Figure 8.2 and 8.3, create a gem file that will produce the 3D electron gun. Use real units (inches) in your geometry file and a locate command to scale the system to fit into an array of 140 x 45 x 45 grid units. Fly the ions in the file egun3d1.fly with the gun set to produce electrons with 70 eV of energy. If you get stuck, or to see several different approaches to solving this, refer to the files egun3d1.gem and egun3d2.gem.



**Figure 8.2** 3D electron gun, symmetric about the X axis. Filament is 0.012" wide (Z in this view).



**Figure 8.3** Isometric view of 3D electron gun design. Filament is 0.012" wide.

**For the Speedy**

3. Add a set of X-Y deflectors to the exit of the electron gun, check your design for beam distortion, how can this be minimized?