

# Jordan TOF Products, Inc.

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## NOTES ON EGUN GEOMETRY

Our Electron Gun was designed to operate as follows:

Electrons are emitted from the hot filament (FIL) and drawn toward the first slit (C) which is the electron collector. Some of these pass through the slit and are collimated by the second slit (F) which is the focus electrode. They then pass between the split lens and into the interaction region between Repeller and Extraction Grid plates.

The spring contacts of the two elements of the split lens actually make contact with the edges of the Repeller Plate and Extraction Grid Plate.

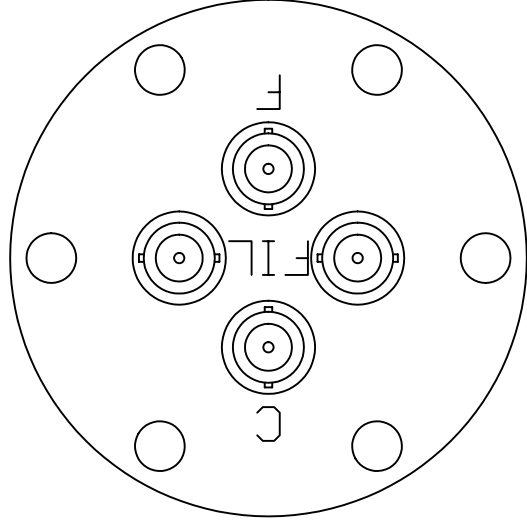
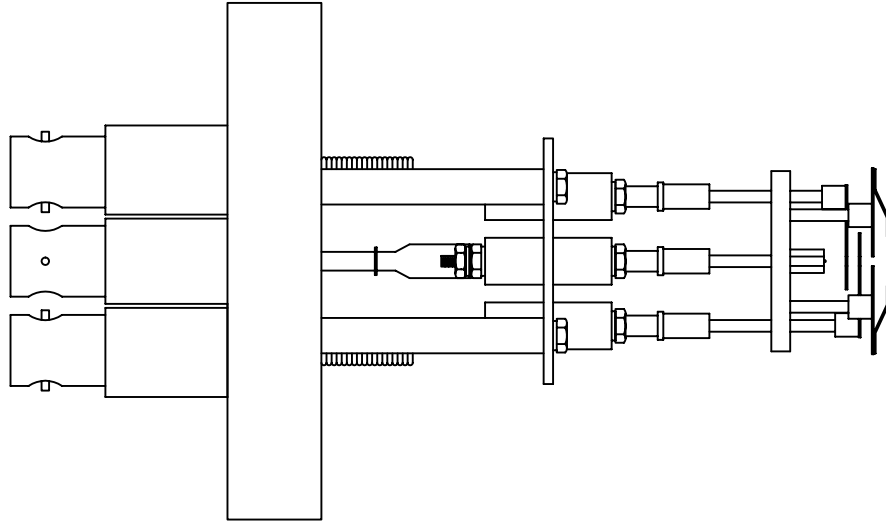
In this method of operation the repeller and extraction plates are at the same voltage until the ion extraction pulse causes them to become un-balanced. If the extraction pulse is negative on the extraction grid, the Ions will exit the interaction region, and at the same time the in-coming electrons will crash into the repeller plate.

If a positive extraction pulse is applied to the repeller plate, the ions will exit the interaction region and the in-coming electrons will turn around before entering the interaction region.

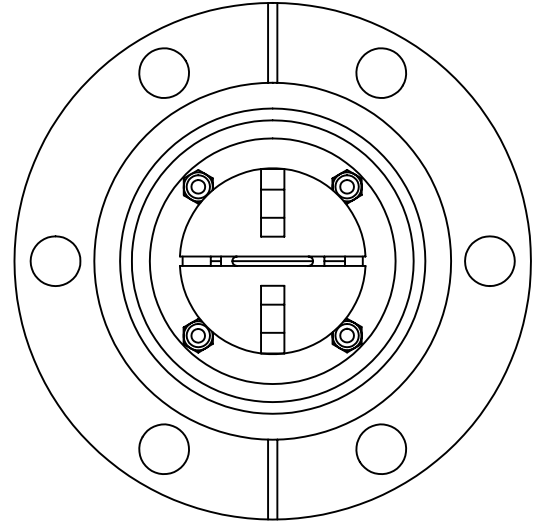
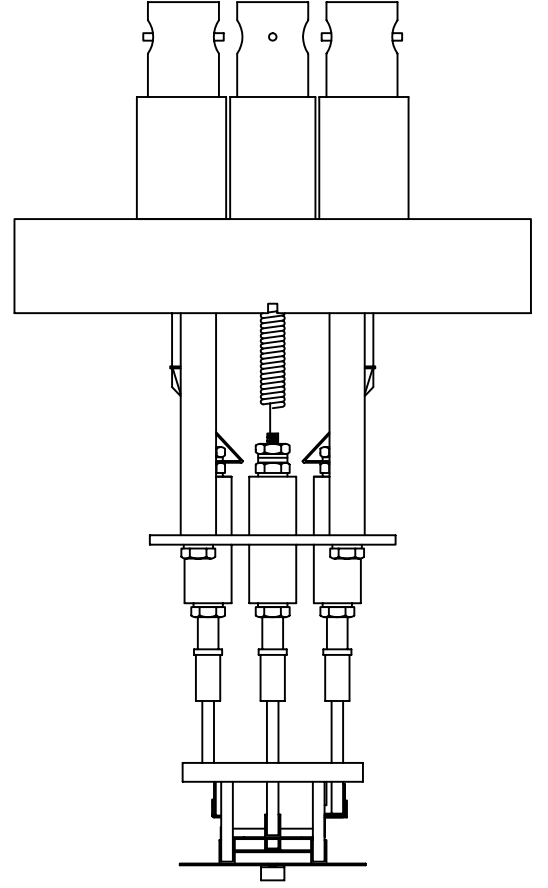
To facilitate this mode of operation, the edges of the Repeller and extraction plates are bent toward each other to allow the EGUN to move as close as possible (1/2") to the center of the interaction region. At this position the average width of the electron beam is about 1/8", and increases after it passes the center of the interaction region.

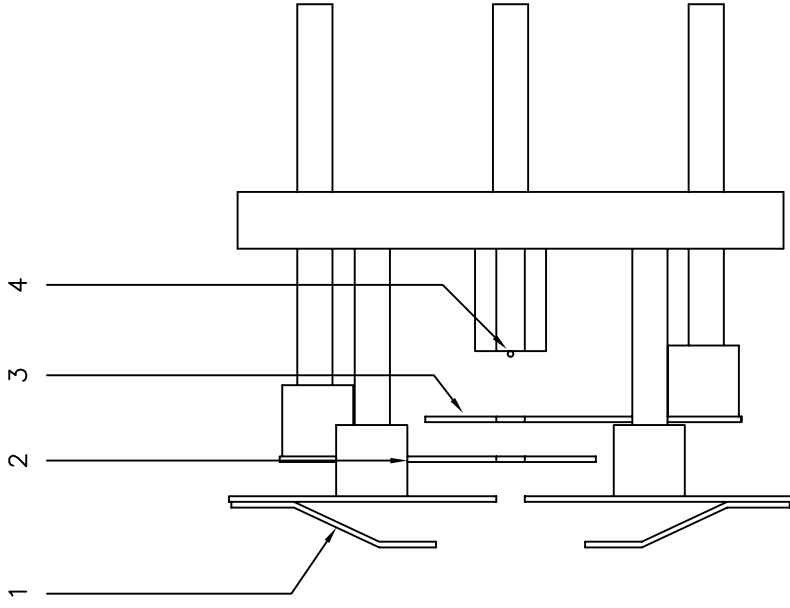
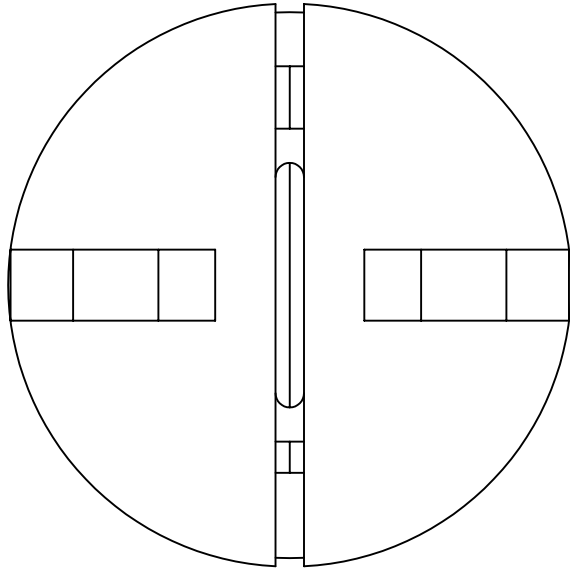
If the EGUN is moved back from contact with the source plates, the electron beam will become diffused, and stray fields will cause time dependent charging and discharging of nearby surfaces.

The following drawings show the relationship between the parts as described above.



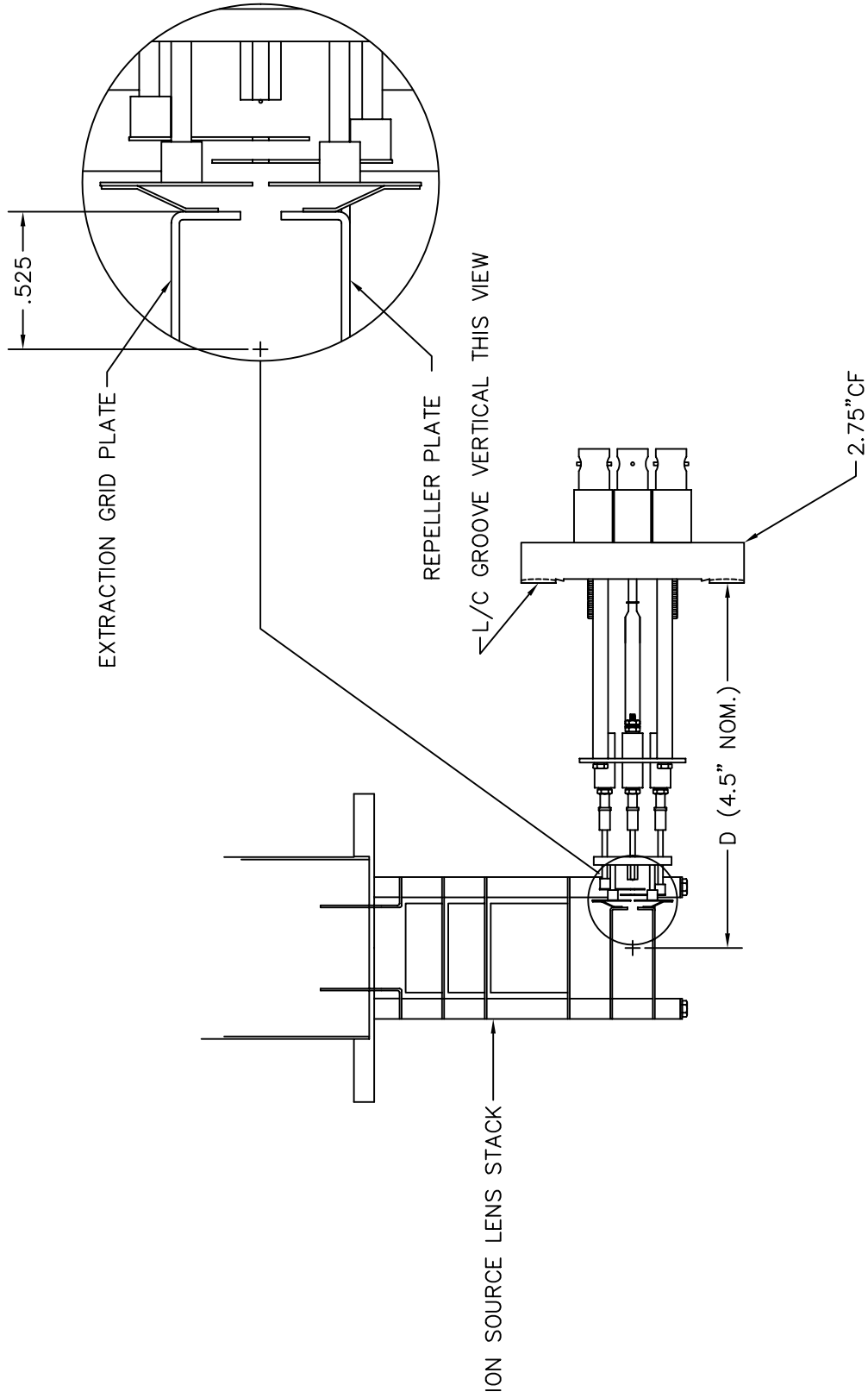
EGUN ASSEMBLY C-950  
EGUNASY  
JORDAN TOF PRODUCTS, INC.  
Grass Valley, CA





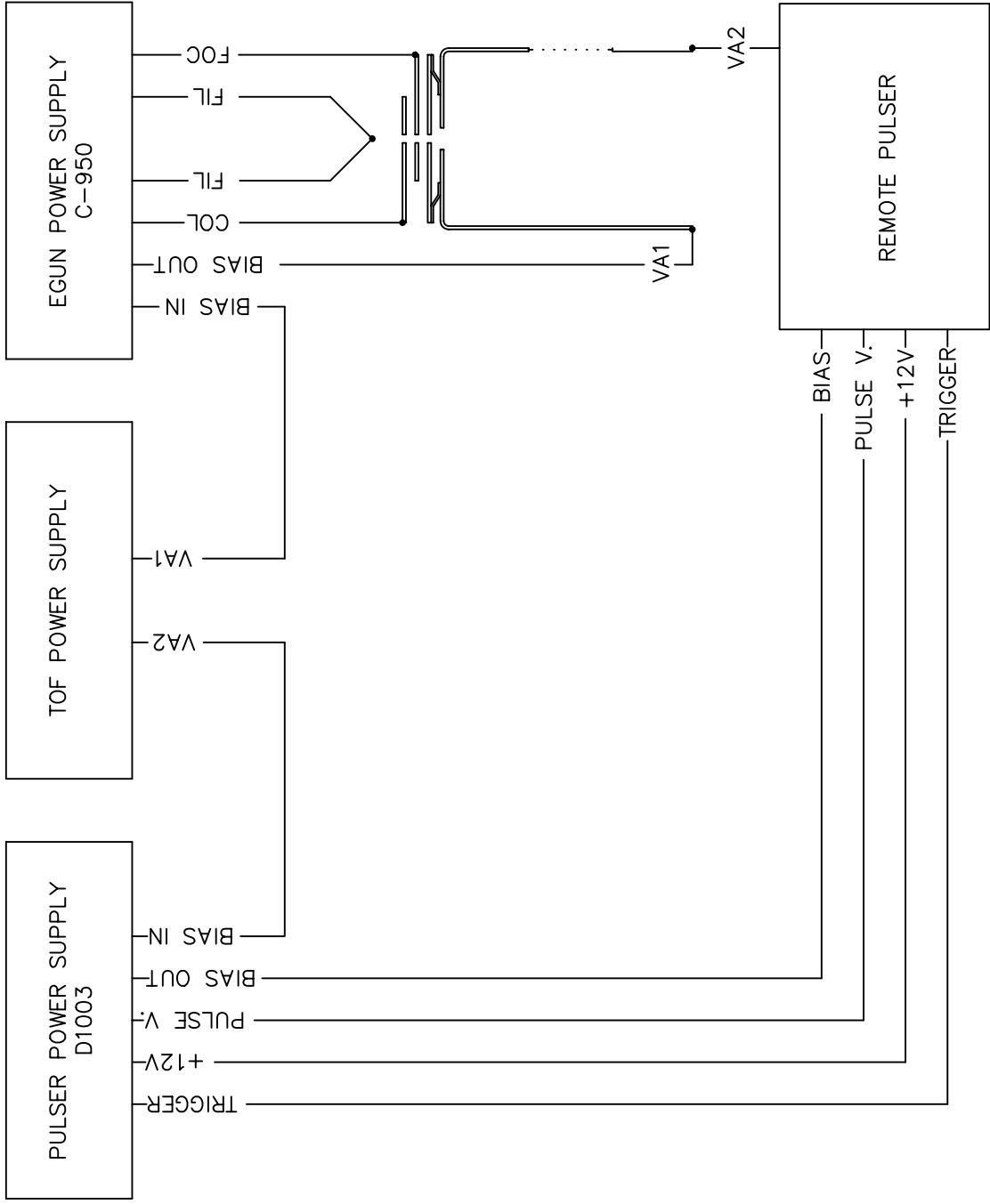
- 1 CONTACT SPRING
- 2 FOCUS SLIT
- 3 COLLECTOR SLIT
- 4 FILAMENT

EGUN FILAMENT ASSEMBLY  
JORDAN TOF PRODUCTS, INC.  
Grass Valley, CA  
B0957



INSERTION DEPTH "D" IS THE DISTANCE BETWEEN THE PARTING LINE OF THE EGUN FLANGE AND THE CENTERLINE OF THE ION SOURCE ASSEMBLY. IN CALCULATING THIS DISTANCE, ALLOWANCE FOR THE WIDTH OF THE SOURCE PLATES MUST BE CONSIDERED. THIS IS NORMALLY 0.5" (ALLOWANCE FOR BENT PLATES)

EGUN/ION SOURCE ILLUSTRATION  
 JORDAN TOF PRODUCTS, INC.  
 Grass Valley, CA  
 EGISILL



EGUN CABLING  
 JORDAN TOF PRODUCTS, INC.  
 Grass Valley, CA  
 B0915 REV 2

NO. REVISION  
 2 REDRAWN

DATE  
 12-24-03