Company Description
A local Delaware small business that produces diamond parts. Product applications include electron microscopy and sectioning, fiber optics cleaving, semiconductor wafer scribing, heat spreading for high powered electronics, and windows for spectroscopy and lasers.

Scope
The project will generate a prototype fixture to replace the current one. The fixture must hold a diamond slab against the lap wheel while preventing lap wheel wear. The project will also take into consideration redesigning the production line to accommodate the new fixture.

Current Set-up
The current fixture was purchased from DuPont and has been use for over twenty years. It provides multiple degrees of freedom which allows it to grind diamond slabs in various orientations and at various angles. A linear motor is attached to it to move he diamond across the lap wheel to prevent lap wheel wear.

The final design is automated making use of a force sensor and linear encoder and can apply an indicated amount of force to the diamond and detect diamond thickness as per the following Control Chart.

Implementation
The final system will be an improved version of the PoC will be implemented by Delaware Diamond Knives and will have six fixtures per table.

Key Wants
• Minimize Defects
• Ease of Use
• Repeatability
• Maximum Productivity

Key Metrics
• Thickness Measurements
• User Attention Time
• Degrees of Freedom