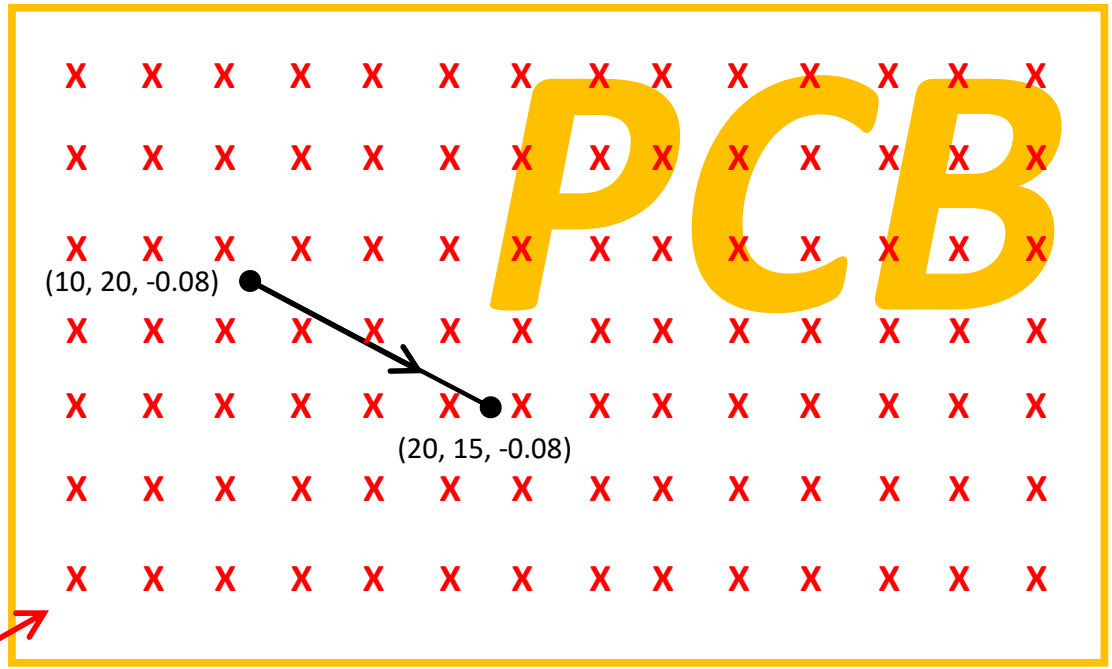
td0g's PCB Gcode Toolkit

Bilinear Levelling Algorithm

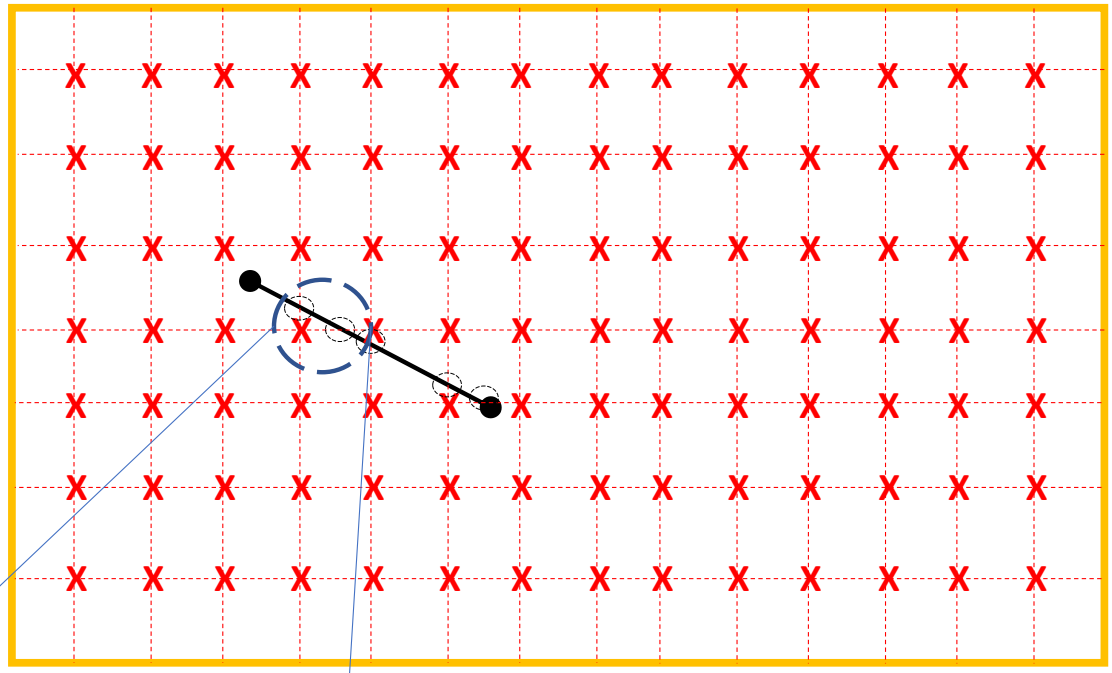


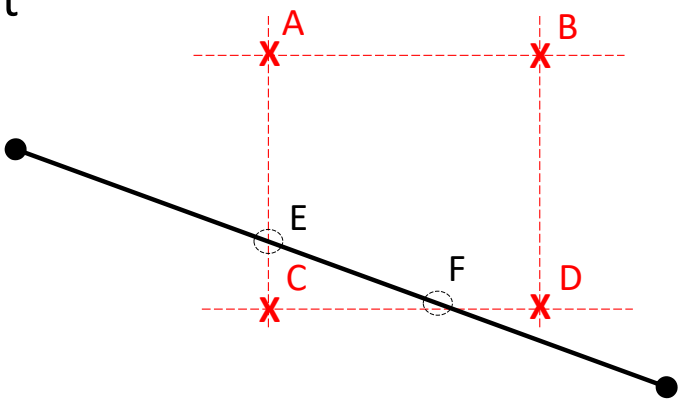
Probe grid

Overhead View

Example Move:
G1 X20 Y15

1. Create intermediate points along line where probe grid is crossed
2. Interpolate the Z-probe height at those intermediate points
3. Divide line into multiple segments, beginning and ending at the intermediate points
4. Add the interpolated Z-probe height



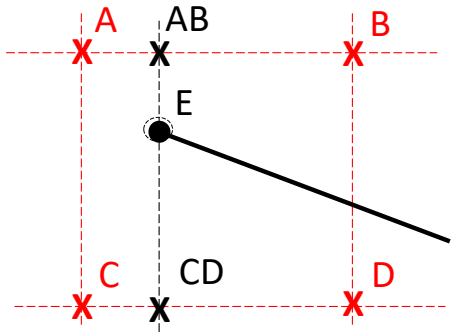


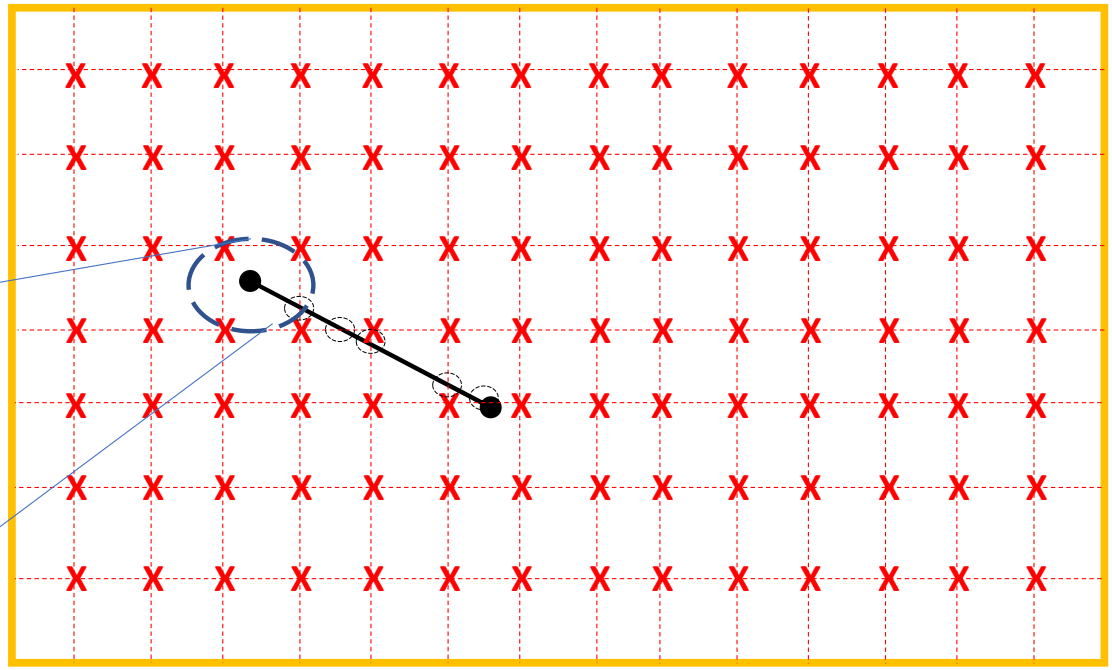
$$Ez = -0.08 + Cz + (Az - Cz) * (Ey - Cy) / (Ay - Cy)$$

$$Fz = -0.08 + Cz + (Dz - Cz) * (Fx - Cx) / (Dx - Cx)$$

Example Move:
G1 X20 Y15

5. Perform bilinear interpolation to find line begin and end probe height





*ABz = Az + (Bz – Az) * (Ex – Ax) / (Bx – Ax)*
*CDz = Cz + (Dz – Bz) * (Ex – Cx) / (Dx – Cx)*
*Ez = -0.08 + CDz + (ABz – CDz) * (Ey – Cy) / (Ay – Cy)*

6. Convert the line segments to gcode

Example Move:
G1 X20 Y15