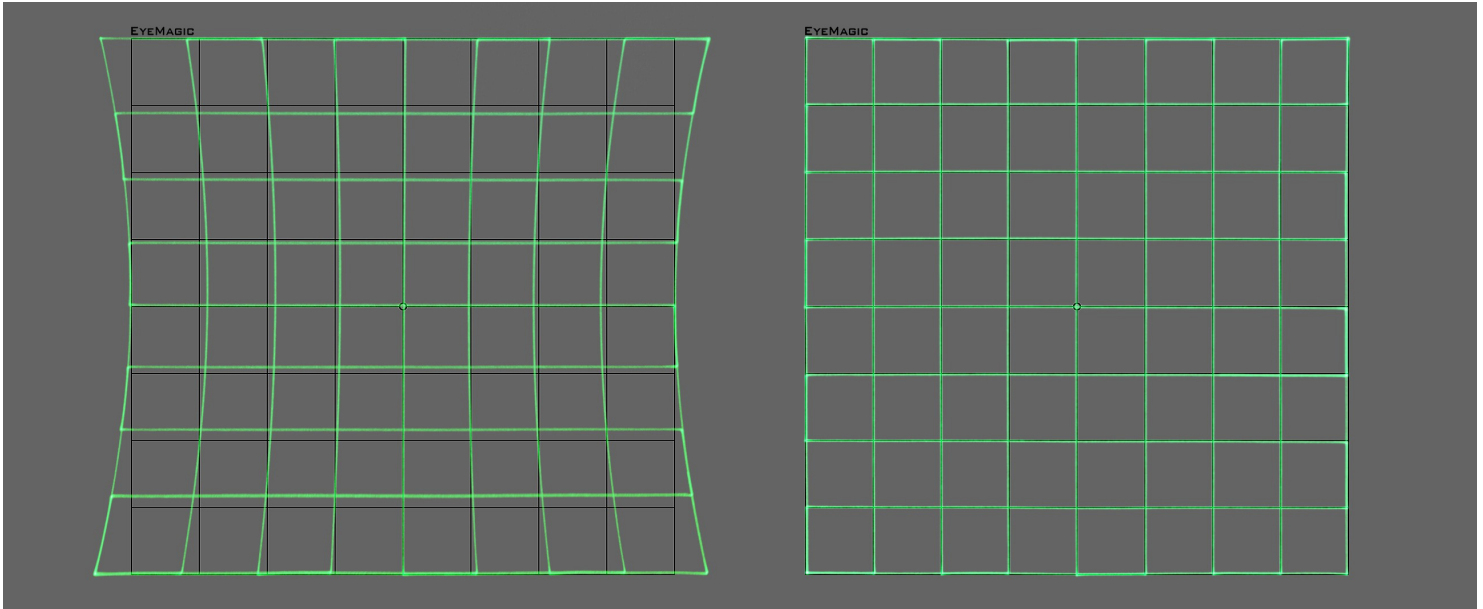# EYEMAGIC
LASER SCANNING TECH

Pincushion and f-theta distortion correction

Pictured above is a projection on a printed target screen. Left image is without any corrections, right image is with both pincushion and f-theta correction enabled.
The projection angle is 54 degrees, which equals to 1/1 projection width to projection distance.

F-theta distortion occurs because a rotating mirror projects an image on a flat surface. The rotating mirror requires a curved surface (with surface radius = distance) to project a linear image. Having a flat surface, a non-linearity (f-theta) is introduced, which can be seen at the size of the grid squares. As we move towards the edges, their size expands.

Pincushion is another non-linearity (distortion) which is caused by the physical arrangement of the X and Y galvanometers. This distortion is only on the X axis, causing the image to look like a "pillow". In small angles the effect is minimal, but as the field increases, the pincushion makes the image at the corners severely skewed.

Our DigiAmp digital servo has built in mathematical corrections for both types of distortions. The correction is performed in realtime, with full digital accuracy (no approximations). All our scanners are mounted on a fixed jig and calibrated on a 2x2m screen, acheiving correction equal or better than 99.5% at 54 degrees scan field.

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