Lens Types

Ultra Short Throw Lenses

Usually a throw less than .4:1 is considered an UST.

Classic UST lenses are mirrored, shoot from the back of the projector, and have complex offsets that are calculated with exponential formulas. Mirrored lenses on projectors with interchangeable lenses are often called “hammerheads” because they look like hammerhead sharks. There also isn’t a rounded lens diaphragm; instead there is a small rectangle. I would *never* use a hammerhead UST in a multi-surface projection mapping scenario – the distortion and focus falloff is aggressive.

Projection-Lens-UST.png

Later, a newer UST lens was developed that shoots at a 90° angle, this is called a “snorkel” because it peaks below the projector chassis in certain configurations. It has a normal lens diaphragm. This lens is superior because it can shoot with 0 offset and the math is a lot less difficult. Also, the distortion is a lot better and *can* be used for mapping fairly reliably. Epson has a version of this lens that is fixed at 180°, whereas Panasonic and Barco’s version shoot at 90° and can rotate in 90° increments when you adjust the lens collar. **Snorkel lenses** are kind of in their own category because they sometimes have zoom, they often have a good shift range, and their throw ratio is sometimes categorized as Short Throw *and* Ultra Short Throw

Projection-Lens-Snorkel.png

Traditional / Normal Optics Lenses

- **S**hort **T**hrow Lenses - usually a throw less than 1.5:1 is considered ST. Optoma has a projector line of .5:1 non-interchangeable lenses. These are fantastic little workhorses, with a fixed offset.
- Medium Throw Lenses - usually less than 4:1
- Long Throw Lenses - usually greater than 4:1

Projection-Lens-Normal.png

Why is this projector at the top of the image field? Learn about offset here.

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