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# LIGO II IO/PSL Optical Table Layouts

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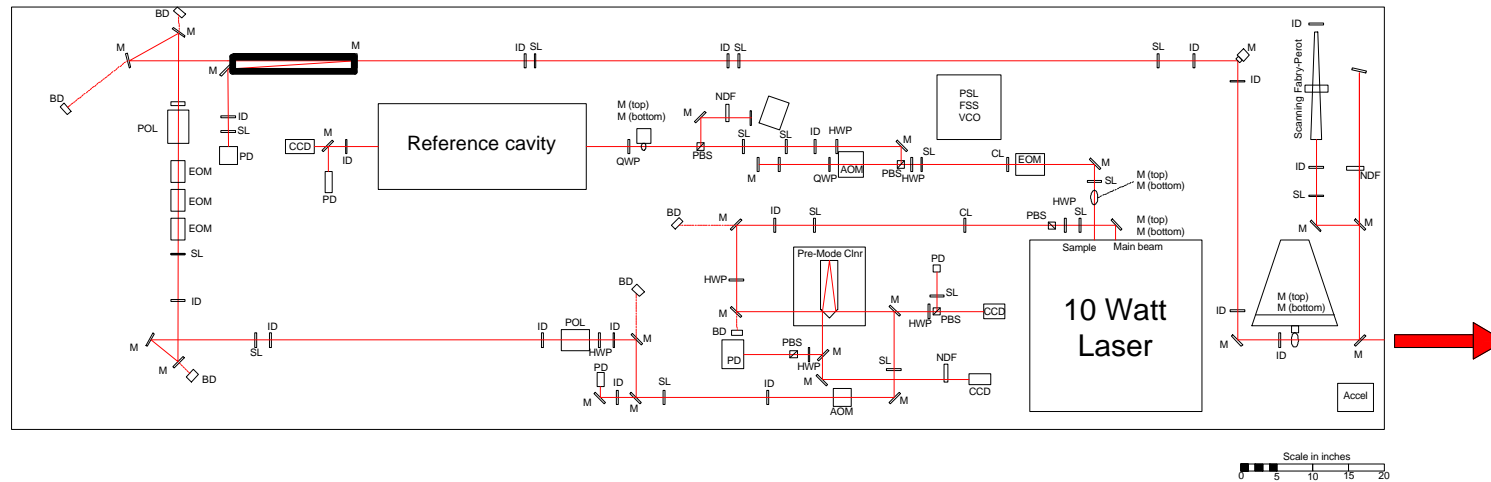
# Goals

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- Coordinate and optimize the integrated IO and PSL layouts before designs are “frozen”
- Reduce complexity of IO/PSL optical table layout
  - Minimize the number of mirror mounts
  - Make optical paths as short as possible
- Simplify the optical interface between the IO and PSL subsystems
  - Reduce the number of optical components required to satisfy interface requirements
  - Provide a stable interface that minimizes coupling of PSL beam changes to IO system



# LIGO I PSL Optical Layout





## Strategy ...

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- Position major optical components such that optical path is simplified and length is minimized
- Minimize number of mirror mounts
  - » Two adjustable mounts for alignment into optical cavities
    - Pre-modecleaner
    - Reference Cavity
  - » One or two adjustable mounts to align into IO optical train
  - » One adjustable mount to align into PSL frequency shifter AOM
  - » One adjustable mount for retroreflection through AOM
  - » Two PZT-controlled mounts for alignment into modecleaner
    - Both on the IO periscope to simplify layout
  - » Fixed mounts where only “folding space” is required
  - » Fixed mounts in all periscopes



## ... Strategy

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- » All EOMs on adjustable mounts
- » All lenses positioned then locked in place
- **IO/PSL Optical Interface**
  - » Midpoint between flat mirrors in pre-modecleaner
    - Provides a stable, fixed location for interface
    - Isolates changes in PSL beam changes from IO
    - Leaves all modematching downstream of the PMC in the scope of the IO system



# Possible Optimized Layout

