LASER ALIGNMENT GUIDELINES

In the research setting, over 60% of all laser accidents occur during the alignment process, therefore alignment procedures are very important and should be strictly adhered to.

The following is a guide for developing specific alignment procedures for a Class 3B or Class 4 laser system.

- Only those personnel who have been trained in laser safety should align the laser. It is best to perform alignments with another trained person (to respond to a laser safety emergency) and exclude all unnecessary personnel during the period of alignment.
- Review all procedures before attempting the alignment. Make sure that all of the warning signs, lights, and locks are operating.
- Post the "Laser Alignment in Progress" notice sign outside the laser lab before beginning any alignment procedure.
- Check that laser curtain is securely closed with no gaps.
- Housekeeping is paramount. The work area and optical table should be free of objects or surfaces that could reflect the light. Remove any watches or jewelry, including objects in shirt pockets, and tape over rings so that they will not serve as reflectors. Make sure that any reflective surfaces in the area are blocked or covered.
- Wear protective eye wear at all times during the alignment. Make sure that it is appropriate to the wavelength of the laser.
- Use low-power visible lasers for determining the optical path. If this is not possible, try to use another laser (e.g. a low-power HeNe) or even a stabilized laser pointer.
- Make sure that beam paths are at a safe height (not at eye level when seated or standing).
- When aligning invisible beams (UV or IR) use phosphor cards or image converter viewers so that the beam can be located.
- Never allow the beam to propagate beyond the point to which you have aligned and always be aware of the full beam path.
- Always block the beam upstream when inserting/removing anything into/from the beam path, such as alignment irises.
- Pulsed lasers are aligned with single pulses if possible.
- If the laser is Q-switched, turn off the Q-switch and use low power, or CW.
- Enclose the beam as much as possible.
- Use beam blocks to block high-power beams at their source (except when the beam is actual needed for alignment).
- Use beam blocks behind optics (mirrors) if there is a possibility beams might miss the mirrors during alignment.
- Check for stray reflections before continuing the next part of the alignment process.
- Make sure all beams and reflections are terminated before high-power operations begin.