

4.3 Making Transmission Holograms

4.3.1 Recording Transmission Holograms

The illustration of optical path for recording a transmission hologram is shown in Figure 4.

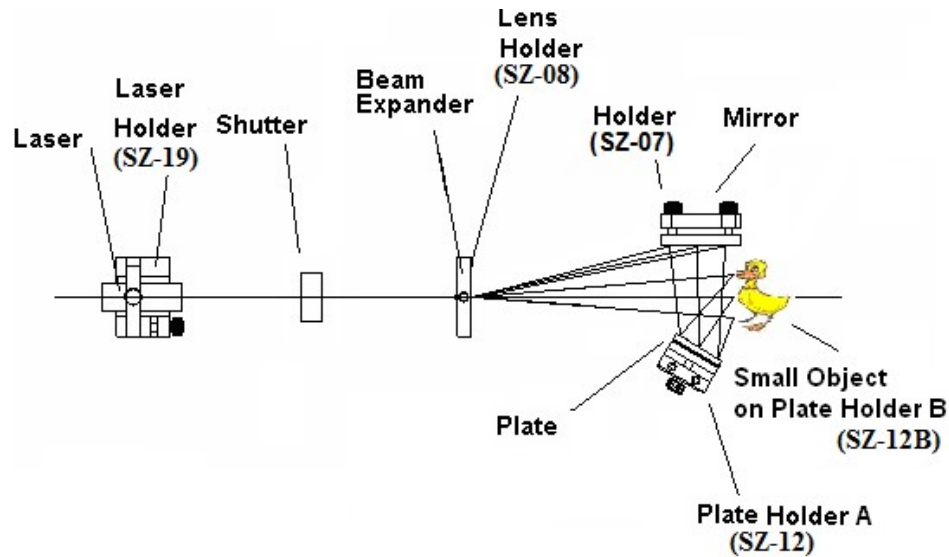


Figure 4 Configuration of transmission hologram recording

- 1) Prepare the required parts per Figure 4. Plasticine is suggested for securing the object on plate holder B (SZ-12B).
- 2) Place a piece of cardboard the same size as photopolymer plate in plate holder A first. Turn on the laser and align the laser beam to hit the centre of both shutter and object.

Warning: Direct eye exposure to the laser light should be avoided and wearing appropriate laser goggles is required.

- 3) Adjust the beam expander until the expanded beam covers both the object and the flat mirror.
- 4) Adjust flat mirror and plate holder until the angle between object beam and reference beam is about 30° as seen in Figure 5. Adjust the locations of plate, mirror and object so that the optical path distance is approximately the same from the beam expander (to achieve best coherence). Also, when remaining the previous conditions, let the plate as close as possible to the object to achieve better reflected object beam energy on the plate.

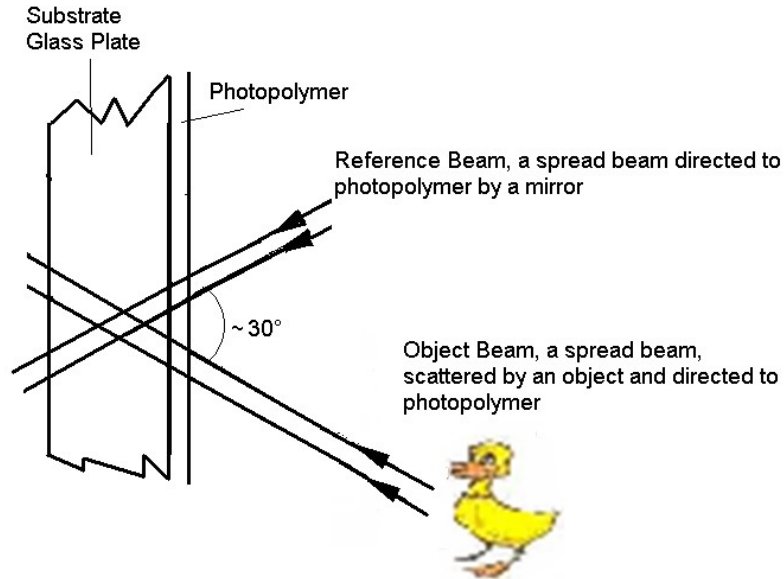


Figure 5 Schematic of transmission hologram recording

- 5) Place the shutter to block the laser beam. Replace the cardboard with a holographic plate. The emulsion side should face the object.
- 6) Set appropriate exposure time which is about 2-3 minutes (for a highly reflective object such as a coin), subject to the laser power, reflective characteristics and the size of object.
- 7) Expose the plate by opening the timer-controlled shutter.

4.3.2 Development and Seal

For details of developing and sandwiching the exposed photopolymer plate, please refer to **4.2.2 Development** and **4.2.3 Sealing the Plate**