

Physics 197 Lab 15: Hologram

Equipment:

Item	Part #	Qty per Team	# of Teams	Total Qty Needed	Storage Location	Qty Set Out	Qty Put Back
Hologram Kit Consists of:	Litiholo	1	6	6			
- Holographic plate holder							
- Spacer							
- Laser mount							
- Laser diode and special clip							
- Battery pack							
Double A Batteries		2	6	12			
Object such as toy car		x	6	6x			
Holographic film plate	Litiholo	4	6	24			

Layouts:



Figure 1, Experimental Set-up (Spacer missing)



Figure 2, Hologram of a gear

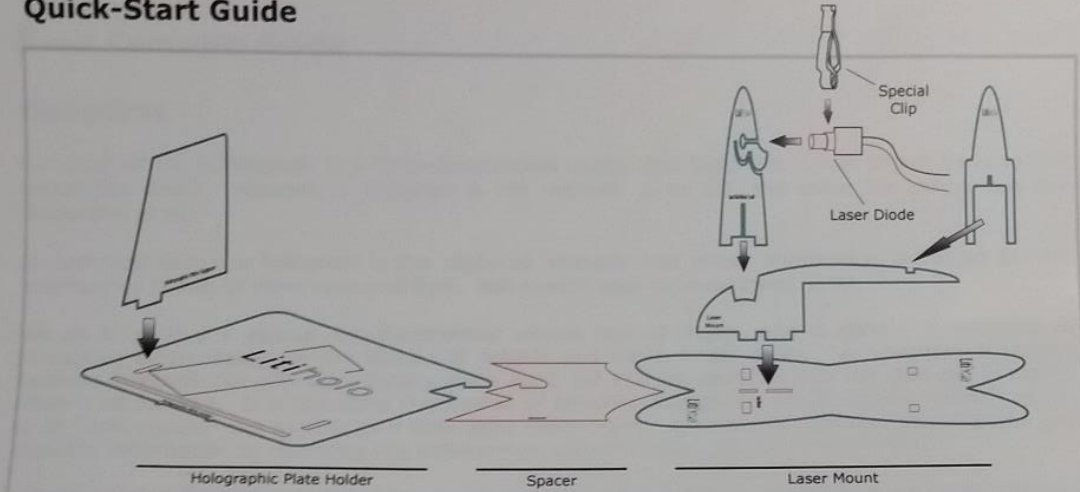
Summary

In this lab, students will make a hologram using self developing film. Students should bring in a small object to be the subject of their hologram. (The toy car in figure 1 is about 8 cm long and is about as large as the object should be). A red laser is aligned to illuminate the object and the location of the film (which is on a glass plate). With the room lights off, the film is removed from its light tight box and leaned in the location at the left end of figure 1. A black card is removed from in front of the laser to begin the exposure, which should last about 5 minutes. It is critical that nothing move and that vibration and noise are minimized during the exposure. After exposure, the hologram is viewed by removing the object and looking through the film (while still being illuminated by the laser). The only lab write-up required this week is to tape this cover page in the notebook. No prelab is necessary. A copy of the instructions for making the hologram is on the next page.

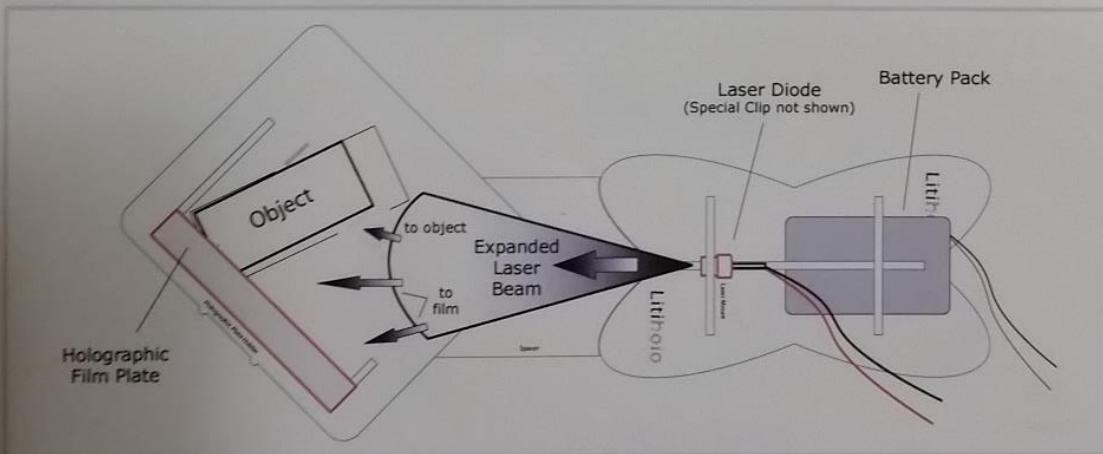
HOLOGRAM KIT

Litiholo

Quick-Start Guide



1. Assemble Holographic Plate Holder, Spacer, and Laser Mount (using "Small" Laser Diode Mount). Unscrew front barrel of Laser Diode, removing front barrel, lens, and spring. Place Laser Diode into Laser Diode Mount. Attach the Special Clip to the rear barrel of the Laser Diode.
2. Load Batteries into Battery Pack, and slide into rear of Laser Mount. Connect Laser Diode to Battery Pack with connectors, and turn on. Allow 5 minutes to warm-up before making hologram.
3. Place Uncoated Film Plate and Object as indicated below. Using the White Card, verify that expanded laser beam is hitting Film Plate and Object as indicated. Adjust as necessary.



4. Place the Black Card just after the Laser Mount so that it blocks the laser light (Black Card should be folded to stand on edge).
5. Turn off ALL LIGHTS except for the LED Darkroom Light. Remove an "Instant Hologram" Film Plate from the box and inner bag. Place it into the Holographic Plate Holder.
6. Wait about 3-5 minutes. TOTAL SILENCE IS IMPORTANT. DO NOT TOUCH TABLE.
7. Gently lift Black Card to expose hologram. Expose for approximately 5 minutes (or up to 10 minutes). TOTAL SILENCE IS IMPORTANT. DO NOT TOUCH TABLE.
8. Replace the Black Card momentarily. Remove your object. Then remove the Black Card again to view your hologram! Look through the Film Plate to see holographic object.

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