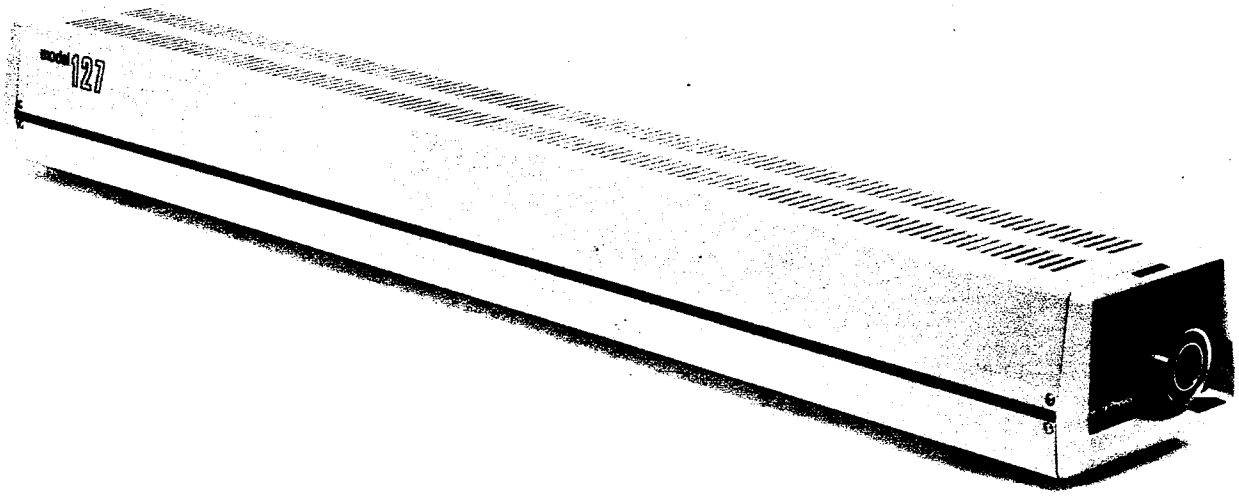
Model 127
25 or 35 mW Helium-Neon Laser



A Powerful Helium-Neon Laser for Scientific Applications

A rugged He-Ne laser that is:
- Stable
- Long Lived
- Versatile
- Easy to Use
- Dependable
- Powerful

Its 25 or 35 mW TEM_{00} polarized output is ideal for:
- Holography
- Particle Analysis
- Laser Doppler Anemometry
- Spectroscopy
- Inspection Systems
- Entertainment Applications

Model 127 delivers either 25 or 35 mW of 632.8 nm light over a lifetime that typically exceeds 20,000 hours. This laser features high output power in a compact package designed to comply with United States safety regulations and promote ease of operation. The laser head and the power supply are integrated into a single compact unit, and an accessory bezel is provided to mount optical accessories in the beam path.

Representing 25 years of design expertise at Spectra-Physics — the world's largest and most experienced laser manufacturer — the Model 127 is the ideal solution for many applications including spectroscopy and holography. It delivers high power you can depend on, even in difficult environments.

S-P* Model 127

This laser is the heart of the SAIC HOLOGRAPHIC STEREOGRAM PRINTER. It was purchased in 1987 and has not had to have any maintenance in all that time. (Knock on wood!)

It belongs to the Spectra-Physics 120 family of lasers, (120, 5mW; 124, 15mW; 125, 50mW; 127, 35 mW) which are third generation He-Ne technology. At the time it was purchased it was the largest He-Ne laser Spectra-Physics currently made.*****

Stable Operation and Long Life From a Compact Package

Resonator Designed for Maximum Stability
An improved external mirror configuration, mounted on rugged adjustable plates, enhances stability over a broad temperature range. This resonator has been designed to minimize the effect of temperature changes on output power.

Hard Seals Promote Long Tube Lifetime
Hard-sealed plasma tube windows make the plasma tube impervious to contamination and provide virtually unlimited shelf life. A specially enlarged cathode and gas reservoir greatly increase operating lifetime, which typically exceeds 20,000 hours.

Integrated Packaging Makes Model 127 Easy to Use
The plasma tube and power supply are integrated into a single compact unit. There are no cables to connect, except the power cord. An emission indicator clearly signals laser operation, and a built-in shutter makes control of the output easy.

Model 127 is designed for worldwide use. A voltage selection switch on the rear panel enables either 90-130 V ac or 180-260 V ac operation.

Model 127 is designed for simple mounting on optical tables. It has five 10-32 UNC-2B mounting holes along its base. It also comes with removable rubber feet for free-standing operation. Refer to the outline drawing for locations of mounting holes and feet.

Accessory Bezel Provides Additional Versatility
Model 127 is ideal if the application requires beam focusing, expansion, or other special handling. It comes equipped with a 1-32 threaded mounting bezel for optical accessories including Spectra-Physics spatial filters and telescopes. A separate catalog describes these accessories.

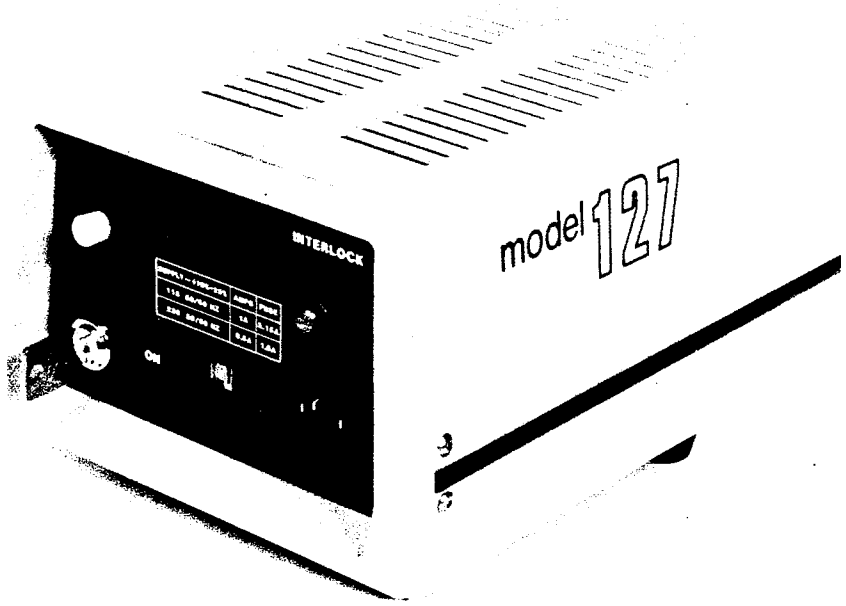


Figure 1: Model 127 is a single package whose controls are always within easy reach.

Figure 1: The **On-Off Switch** on SAIC's laser is flakey. Sometimes the laser will remain **ON** even if the switch says **OFF**. The **White Power On Bulb** has been removed for light-proofing.

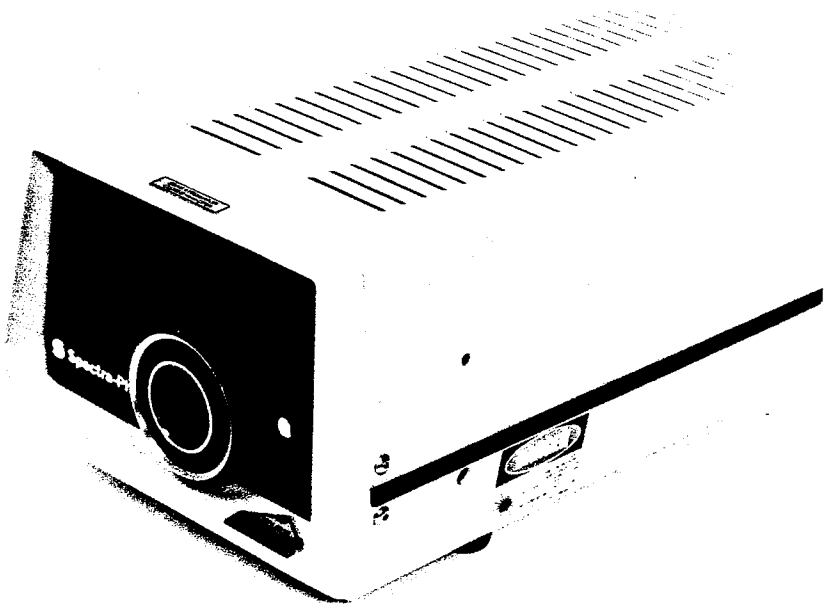


Figure 2: Check the built-in shutter on the accessory bezel if the tube lights, but no beam appears even if the **Printer's Shutter** is open. If it is open, then panic!

Specifications[1]

	127-25	127-35
Optical Characteristics		
Output Power	25 mW	35 mW
Wavelength	632.8 nm	
Transverse Mode	TEM_{00}	
Polarization Extinction Ratio	500:1	
Angle of Polarization	Horizontal ± 5°	
Beam Diameter @ $1/e^2$ Points	1.25 ± 0.10 mm	
Beam Divergence	0.66 ± 0.05 mrad	
Beam Waist Location	Outer surface of output mirror	
Dynamic Output Parameters		
Typical Warm-up Characteristics (% of Steady State Power)		
Power at Start-up	>75%	
Power 1 hr after Start-up	>95%	
Amplitude Noise, 10 Hz—2 MHz	<1% rms	
Amplitude Ripple, 45 Hz—1 kHz	<1% rms	
Beam Alignment Parameters		
Static Alignment (Refer to Outline Drawing)		
Beam Pointing Tolerance	±6 mrad	
Beam Position Tolerance	±2.3 mm	
Operating Stability[2]		
Beam Pointing	<0.2 mrad	
Beam Position	<0.05 mm	
Electrical Requirements		
Voltage	90-130/180-260 V ac	
Current	1/0.5 A	
Frequency	50-60 Hz	
Environment		
Operating		
Temperature	10—50° C (50—122° F)	
Relative Humidity	10—90% noncondensing	
Nonoperating		
Temperature	-20—60° C (-4—140° F)	
Relative Humidity	5—90% noncondensing	
Shipping Weight	17.6 kg/38.8 lb	

1. Specifications subject to change without notice.
2. After 1-hr warm-up at 25 ± 3° C

Ordering Information
Specify either Model 127-25 (25 mW) or Model 127-35 (35 mW) and identify voltage requirements.

Warranty
The Model 127 is protected by a one-year warranty. All mechanical, electronic, and optical parts and assemblies, including plasma tubes, are unconditionally warranted to be free of defects in workmanship and materials during a 12 month period that begins at the time of shipment. This warranty is in lieu of all other warranties expressed or implied, and does not cover incidental or consequential loss.

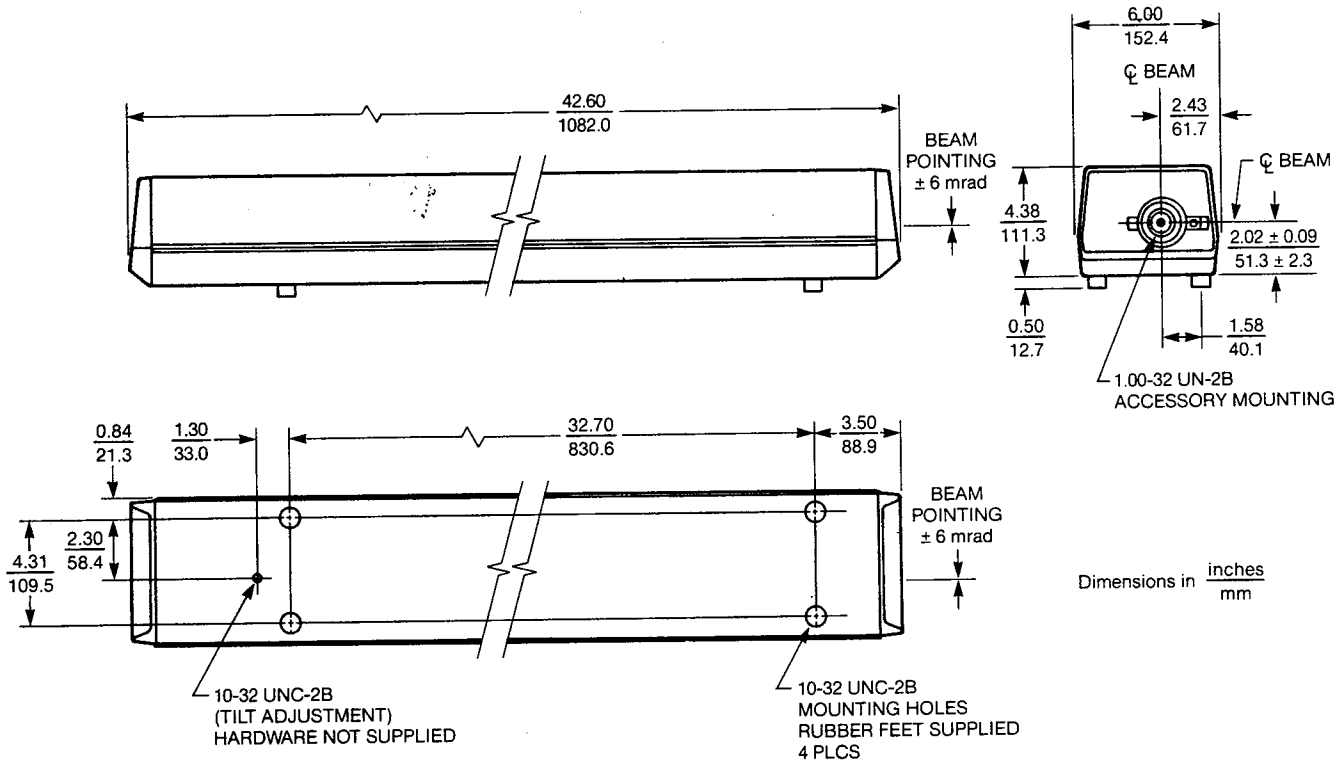
Laser Safety
Spectra-Physics has worked closely with government agencies to promote the safe use of lasers and has designed this product to comply with United States standards established by the Center for Devices and Radiological Health (CDRH).

The Model 127 incorporates features for user safety and convenience as specified for Class IIIb lasers by the CDRH. A CDRH warning logotype similar to that shown appears on each laser to indicate its CDRH classification and to certify that the output power of the laser will not exceed the power level printed on the logotype.

This is the only packaged He-Ne laser that is horizontally polarized. It really doesn't make any difference, since the optics on the HOLOGRAPHIC STEREOGRAM PRINTER right everything to vertical for the recording of holograms.

This laser has a large beam to begin with, and coupled with its high divergence, the undiverged beam when observed at the Printer's Plateholder is about the size of a dime.

The laser tube is terminated with Brewster Windows, which polarize the laser beams. The resonating cavity's mirrors are attached to aluminum plates which are adjustable to peak the output. Access to them is by removing the top of the laser housing. This laser is so stable that it has not been necessary to do this for the past few years.



The laser is permanently attached to **ThorLabs Stainless Steel Posts**. Don't mess with the laser!

There is a lot of "collateral radiation" coming out of the vent holes on the top of the **Laser**. An **insulated shroud** covers the laser to prevent fogging of the **holographic film** during handling.

FOOTNOTES

*. Spectra-Physics Lasers, 1330 Terra Bella Avenue, P.O. Box 7013, Mountain View, CA 94039-7013, 800-227-8054.

. First generation He-Ne's were Radio Frequency Excited, and didn't last very long. Second generation had filaments as the cathode, which evaporated junk on the Brewster windows; third generation lasers such as these have a big aluminum "cold cathode" in a side arm, which has long life but are harder to make than the current fourth generation tubes, which have the cathode coaxially mounted around the capillary tube wherein the lasing takes place. See the **Handout, M-G LHP 171.

***. The only bigger He-Ne's available in the world nowadays come from NEC Electronics of Japan, in 50 and 70 mW models.