

TENNESSEE BUREAU OF INVESTIGATION

Forensic Services Division



Latent Print Standard Operating Procedures

1.1 Alternate Light Source (ALS)

1.1.1 Scope

An Alternate Light Source (ALS) is an illumination source that can be used to visualize latent prints with applied chemical dyes or to evaluate items or lifts with fluorescent powder. An ALS may also detect latent fingerprints left in naturally fluorescing substances, such as semen. An ALS produces high-energy wavelengths between 350 and 650 nm. An ALS might also be capable of using Infrared (IR) wavelengths approximately between 700 and 850nm to detect other substances such as blood.

1.1.2 Evidence

An ALS may be used on any non-porous or semi-porous evidence in which a dye stain has been applied and any porous evidence in which 1, 2-Indanedione has been applied. The ALS may also be used to visualize latent lifts that have been developed with fluorescent powder. Items with latent prints composed of substances such as blood, perspiration, chemicals or other organic substances may fluoresce within 350 to 650 nm. Blood and prints in blood can also be visualized with infrared light.

1.1.3 Safety Precautions

Protective goggles consistent with the wavelength range and protective clothing (i.e. latex gloves, long sleeves, long pants, etc.) shall be worn to protect both the eyes and the skin.

1.1.4 Instruments/Equipment

SPEX Crimescope (ALS)
Polilight PL500SC (ALS) with UV-Vis and Infrared (IR) light guides
Yellow, orange, and red goggles
Yellow, orange, red, blue, and IR filters for camera
Fluorescent ruler
Camera
Full Spectrum Imaging System (FSIS)
FSIS flashlights

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1.1.5 Procedure

Use the following procedure when using the SPEX Crimescope.

1. Turn the power rocker switch on. This switch will turn on the fan, which will come to full operating speed within a few seconds.
2. Turn on the lamp switch.
3. Choose the appropriate wavelength and goggles. View evidence and photograph with the same filter and wavelength. Refer to 2.5.2 and 2.5.5 of the Forensic Imaging Standard Operating Procedures Manual for further instruction.
4. When completed, turn off the lamp switch. Wait for the unit to cool down. Feel the exhaust from the back of the unit to determine if the unit is cool. Once the unit is cool, turn the power rocker switch off. The unit should be allowed to run for longer periods of time, rather than repeatedly turning the unit on and off for short periods of time.

Use the following procedure when using the Polilight PL500.

1. Turn on the Polilight using the switch on the back of the unit. A red LED illuminates on the front panel below the standby button.
2. Press the standby button located above the red LED. (The power supply fans start. The LED changes to green and the Polilight runs through a 30 second self-test sequence. When the self-test is completed, the lamp cooling fans start and the front display panel shows the light has defaulted to the 450nm waveband at P7 power.)
3. Consult the User's Manual if the remote control will be used.
4. Choose the appropriate wavelength and goggles. View evidence and photograph with the same filter and wavelength. Refer to 2.5.2 and 2.5.5 of the Forensic Imaging Standard Operating Procedures Manual for further instruction.
5. When completed, press and hold the standby button located above the green LED, for approximately one second to switch off the Polilight and put it in standby mode / lamp cooldown.

Note: The fans continue to operate to cool down the lamp. After approximately three minutes, the lamp will switch off, however the power supply will continue to run.

6. Press and hold the standby button located above the green LED to bring the polilight out of standby mode and switch it on.

If the lamp is not restarted within 60 minutes, the Polilight will switch into

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low power mode. While in this mode, the front panel display and *all* fans switch off.

Use the following procedure when using the FSIS and ALS flashlights:

1. Turn on the computer, mouse, and keyboard.
2. Login to the computer – press control, command, command. Use your desktop login information (your DH# and password)
3. Start the FSIS program.
4. Place the appropriate filter in the filter tray, and slide this filter under the camera.
5. Choose the *Fast Scan* option in the Camera Control panel.
6. Turn on the appropriate rechargeable flashlight. There are three wavelengths available – 455 nm (blue), 525 nm (green), and 625 nm (red). The IR flashlight (850nm) may be used to search for blood on dark colored objects.
7. Illuminate the item of evidence with the flashlight, and view the image on the screen. Adjustments to the F-stop, exposure, gain, and gamma may be necessary to obtain the best image. Consult the user manual for further information on these settings.
8. If a latent print needs to be photographed, locate the print in *Fast Scan* mode and focus the camera. Switch to *Full Resolution* in the Camera Control panel. Make lighting adjustments as necessary to optimize photograph quality. Use either the foot pedal or *Save* button in the Camera Control panel to capture the image. Refer to 2.5.2 and 2.5.5 of the Forensic Imaging Standard Operating Procedures Manual for further instruction.
9. Integration: For difficult (uneven, curved, etc.) surfaces, integration may be utilized to capture the best image of a latent print. Integration combines many images of the print, viewed at different light angles, into one consolidated image. Integration can be performed in both *Fast Scan* and *Full Resolution* modes, with the latter being utilized for comparison photography. To begin the integration process, ensure the print is in focus, and set the F-stop to 16. Press the *Start Integration* button, and slowly move the flashlight to illuminate the surface. Once a satisfactory image has been obtained, press the *Pause Integration* button, and save the image. You may also restart the integration process at this time to re-capture the image.
10. When finished, turn off the flashlight and close the FSIS program.



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1.1.6 Interpretation of Results

Latent prints of comparable value shall be marked and photographed using the appropriate filter with a ruler included in the photograph. Refer to 2.5.2 and 2.5.5 of the Forensic Imaging Standard Operating Procedures Manual for further instruction.

1.1.7 Equipment Maintenance Log

A log will be maintained on each piece of equipment in the Latent Print Unit. This log will include the following information, when applicable:

- Equipment Item
- State ID Number
- Model Type
- Serial Number
- Model Number
- Year Purchased
- Operating Status
- Purchase Price

Service or maintenance performed on a piece of equipment by an external vendor will be documented in the equipment maintenance log.

1.1.8 Operating Manuals

Operating manuals and warranty information provided by the manufacturer should be maintained near its respective equipment within the Latent Print Unit.

1.1.9 References

Spex Forensics. April 2004. CrimeScope Cs-16-500 Operation Manual v. 1.0.

Arrowhead Forensics. July 2017. LatentMaster 16MP Workstation with 16MP Full Spectrum Imaging System (FSIS) User's Manual. FSIS Version 1.6.5, LatentMaster Version 2.6.6.

ROFIN POLILIGHT PL500SC Universal Forensic Light Source User's Manual. Version 1.