



Forensics Source
13386 International Parkway
Jacksonville, Florida 32218
Tel. 800-347-1200
Fax: 800-366-1669
www.forensicssource.com

Evi-Paq[®] Trajectory Kits

TECHNICAL NOTES

Background

Evi-Paq Trajectory systems were designed to provide the crime scene investigator with the most accurate reconstruction information available. Each component of the kit is manufactured to deliver straight line information, allowing for reasonably accurate data to assist in the reconstruction of the shooting incident.

Safety

When working with lasers, it is highly recommended that all personnel don protective eyewear to prevent accidental ocular exposure to the laser beams. In addition, all extraneous personnel should be restricted from the reconstruction area to prevent accidental exposure to the laser beams. Please read and understand the safety concerns in the documentation provided with each laser.

Components

The following components are available in a kit or can be purchased separately.

- **Laser Trajectory Pointer** – used to reconstruct the flightpath of the projectile. The laser is constructed so that the beam is co-aligned with the barrel to provide a straight line of sight when the beam is activated. Each laser is factory tuned to ensure its accuracy. The laser can be used alone or in conjunction with the Protrusion Rods.
To use the laser independently it must be mounted on a tripod. It can be mounted on the Tripod Mount (see below) or on the Dual Laser Holder (see below). To activate the laser used in this manner, a connector must be screwed into the base of the laser. Once the connector is fully inserted the beam will turn on (take care not to point it at the eyes when activating).
If it is used with Protrusion Rods it is screwed onto the end of the rod, allowing the rod to act as the activator. Secure the rod tightly into the laser. This will keep the laser in a straight line to the length of the Trajectory Rod.

- **4-pc Protrusion Rod Set** – Protrusion Rods are used to penetrate projectile holes in objects to assist with the determination of flight path of the projectile. Each rod has a male and female threaded end to allow for longer rods, if necessary. Each threaded end has a seat to lock the rod in place and prevent wobble in the overall length of joined rods. It is not recommended that more than three rods be used in a line without proper support. The mechanical sway in the joined rods and provide inaccurate reconstruction data.
The rods are supported through the projectile holes with Spacer Cones (see below). The rods are held in place with the assistance of O-rings that snug the rods in place with the cones.
Once the rods are secured in the projectile hole, the reconstruction data can be gleaned with the use of string or a laser.
- **Spacer Cone Kit** – these plastic cones are designed to be placed on the Protrusion Rods to allow for centering in the holes. There are two styles of cones, short and long. It is recommended that the long cone be placed in the entrance hole in the object and the short cone placed in the exit hole. The cones are then snugged into the holes and stabilized with the O-rings to keep the rod in place in the hole.
- **Aluminum Tripod Mount** - the tripod-mount has a universal threaded hole in the center and threaded holes on each of the four edges. The center hole is used to fasten the tripod-mount to a camera tripod. Once the tripod-mount is in place the rods or the laser can be attached to any of the four edges by using one of the connectors.
- **Dual Laser Holder** - the Dual Trajectory Laser Holder is used to hold two trajectory lasers in opposing directions with a high level of accuracy for gunshot trajectory reconstruction. The mount can also hold a single laser and an EVI-PAQ Angle Finder. The Dual Trajectory Laser Holder easily mounts on a standard tripod.
- **Angle Finder** - the Angle Finder is used to determine the angle of the rods or tripod-mount. Once the rods or the tripod-mount is in place the angle finder can be placed on one of them and angle reread by looking at the dial on the angle finder.
- **Trajectory String Kit** – used in conjunction with the Protrusion Rods and Eye Connector the Trajectory String provides a physical, demonstrative means of visualizing the flight path of a projectile. String is available in standard or elastic.
- **Eye Connector** – used to attach Trajectory String to the end of Protrusion Rods. Each connector has a threaded end for attachment to the rods and an eye to tie the string.
- **Tapered End piece** – the Tapered End is used to allow Protrusion Rods to easily glide through projectile holes that may have sharp edges or damaged materials between the entrance and exit holes. The Tapered End will protect the threads of the Protrusion Rods.
- **Multi-Colored Forensic Rods** – although not part of the Trajectory Kit, these rods can be used to simple reconstructions. The rods can be used with the Spacer

Cones to project the rods through projectile holes in objects. Two or more rods can be attached together with the provided connectors.

- Photographic Fog – Photo Fog is used to visualize laser beams when reconstructing flight paths. With the laser beams activated and in a darkened area, the fog is sprayed along the path of the laser to allow visual confirmation of flight path or the camera to record the path.

Application

There are many written articles about the use of trajectory reconstruction equipment. This will be a quick summary of the major points necessary for reconstruction.

- Document the crime scene before any reconstruction efforts take place. All photography should include before and after of each projectile strike in question.
- A detailed diagram of each strike location should be produced for the case notes.
- Each strike should include a numerical indicator, direction and location.
- Each strike should be measured, and those measurements recorded in the case notes.
- Determine the equipment needed for reconstruction.
- Determine how the reconstruction should take place (logical progression through the scene) and how it will be visualized (string or laser)
- Insert rods and spacer cones in projectile holes, snugging each rod in place so the rod is centered in each hole.
- Document each rod placement (photographs, sketch and measurements, including angle of strike)
- If string projection is chosen, attach an Eye Connector to the end of the Protrusion Rod and tie off one end of the string. Pull the string taught without deflecting the Protrusion Rod from the center of the hole. Attach the string to a fixed object at the other end of the string. Use Adhesive Clip or Adhesive Wax to secure in place.
- Continue with this process until all projectile holes are reconstructed.
- Photograph each string as well as the grouping of strings, if applicable.
- If laser projection is chosen, attach the laser to the end of the Protrusion Rod. When using a laser only one rod should be used due to the weight of the laser. If more than one rod is used the weight of the laser will deflect the rod from the center of the hole.
- Darken the room, if applicable, and turn on the laser. The beam can be visualized using the Photographic Fog.
- Continue the process until all holes are reconstructed.

Before attempting to reconstruct a shooting incident scene each crime scene examiner should take a specialized training class in the use and understanding of bullet path reconstruction.

Ordering Information

TRK-1 (1008064)..... Standard Trajectory Kit
LTRK-1 (1007376)..... BP-1 Red Laser Trajectory Kit
LTRK-2 (1007377)..... BP-2 Green Laser Trajectory Kit
BP-1 (1006493)..... BP-1 Red Laser
BP-2 (1006496)..... BP-2 Green Laser
DLSR-1 (1006572)..... Dual Laser Holder
PR-S06 (1007800)..... Yellow Protrusion Rods, 4 pack
PR-S06S (1007801)..... Pink Protrusion Rods, 4 pack

PF-1 (1007724)..... Photo Fog Spray
AF-1 (1006373)..... Angle Finder
PR-TM1 (1007806)..... Tripod Mount
PR-OCE (1349369)..... Eye Connector
PR-SK1 (1007804)..... Spacer Cones, 4 pack