

## **Topic 100**

### **Steadicam**

Steadicam is a brand of camera stabilizer mount for motion picture cameras that mechanically isolates it from the operator's movement. It allows for a smooth shot, even when moving quickly over an uneven surface. The Steadicam was invented by cameraman Garrett Brown and was introduced in 1975.

Before the camera stabilizing system, a director had two choices for moving (or "tracking") shots:

The camera could be mounted on a camera dolly, a wheeled mount that rolls on tracks or leveled boards. This is time consuming to set up, and depending on the location, impractical in many situations.

The camera operator could hold the camera in his hands. This allows greater speed and flexibility, but even the most skilled operator cannot entirely prevent shaking. Hand-held camera footage has traditionally been considered suitable mostly for documentaries, news, reportage work, live action, un-rehearsable footage, or to evoke an atmosphere of authentic immediacy or *cinéma vérité* during dramatic sequences.

The operator wears a harness—the Steadicam "vest"—which is attached to an iso-elastic arm. This is connected by a multi-axis and ultra-low friction gimbal to the Steadicam armature which has the camera mounted at one end and a counterbalance weight at the other. The counterbalance

usually includes the battery pack and a monitor. The monitor substitutes for the camera's viewfinder, since the range of motion of the camera relative to the operator makes the camera's own viewfinder unusable. In the film industry the armature and weight are traditionally called the "sled", as they resembled a sled in an early model of the Steadicam. The sled includes the top "stage" where the camera is attached, the "post" which in most models can be extended, with the monitor and batteries at the bottom to counterbalance the camera weight. This is how the Steadicam stays upright, by simply making the bottom slightly heavier than the top, pivoting at the gimbal. This leaves the center of gravity of the whole rig, however heavy it may be, exactly at the operator's fingertip, allowing deft and finite control of the whole system with the lightest of touches on the gimbal. The skill of the operator is to keep the desired framing and composition by feathering his or her touch on the gimbal, while the rig and operator is in motion, and, indeed, when still.

The combined weight of the counterbalance and camera means that the armature bears a relatively high inertial mass which is not easily moved by small body movements from the operator (much as it is difficult to quickly shake a bowling ball). The freely pivoting armature adds additional stabilization to the photographed image, and makes the weight of the camera-sled assembly acceptable by allowing the body harness to support it.

When the armature is correctly adjusted, the operator is able to remove their hands from the Steadicam entirely and have the camera stay in place. During operation, the operator usually rests his or her hand on the camera gimbal and applies force at that point to move the camera. To avoid shaking the camera when lens adjustments must be made during the shot, a wireless remote operated by the camera assistant is used to control focus and iris.

For low-angle shots, the camera/sled armature can be rotated vertically, putting the camera on the bottom and the sled on the top. This is referred to as "low mode" operation.

The newest generation is the Tango. The most modern body-supported camera-stabilization-system, its horizontal mechanism makes it possible to move the camera freely while staying horizontal. A Steadicam operator can change from low mode to high mode without any alteration. Dimensions are not limited to ups and downs, but also in depth and over or through obstacles.

The smallest, lightest Steadicam which can be used with a support arm and vest is the Steadicam Merlin. It is light enough to be hand held with cameras weighing up to about 5.5 pounds (2.5 kg), and may carry cameras up to about 7 pounds (3.2 kg) when used with the arm. The Merlin may be folded up and carried in comparatively small spaces such as medium-size camera bags. In its lightest configuration, the Merlin weighs just 12.5 ounces (0.35 kg). Photographers who shoot with HD/SLR cameras that combine still and motion photography most often work with the Merlin. Since the Merlin has no facility to carry a separate monitor, cameras suitable for it must have their own built-in monitors.

A smaller, lighter Steadicam was introduced in 2012, called the Smoothee™. Its tubular frame can support Apple iPhones (4 through 5S) along with GoPro cameras that have the attached viewfinder monitor. Its target retail price was originally "under \$200" and it may be purchased in consumer camera stores. Pre-weighted, balanced iPhone and GoPro adapters modularly allow interchange of cameras.

An even smaller, camera-specific Steadicam Curve™ is available for the GoPro cameras (2, 3 and 3+) which is made of a single, curved slash of aluminum. Its target retail price is just \$100, and it, too, is available in consumer camera outlets.