

# **Black Hawk**

## **Professional Heavy-duty Dual-dynamic Stabilizer Manual**



Please read the instruction manual thoroughly before operating your Black Hawk stabilizer for the first time to avoid injuring yourself or damaging the unit.

The robust construction of the Black Hawk makes it an excellent long-term investment, but its precision design also means that you must exercise care in the storage, transport, and operation of the unit to ensure optimal long-term performance.

You should also review the instructional DVD before attempting to shoot usable footage with the Black Hawk. The Black Hawk consists of the vest, dual-dynamic arm, and sled:



The System also includes a 7" 16:9 monitor, 11" Dovetail plate, padded rolling case, DVD, Tool Kit, BNC video cable, Lemo power cable, handle extension, & balancing plate. **NO BATTERY OR CHARGER INCLUDED.**

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**Subsystems**  
**The Vest**

The purpose of the vest is to comfortably distribute the weight of the camera and stabilizing system on your body. To achieve optimal results, you should adjust the vest so that it fits snugly.

Adjust the vertical fit by adjusting the straps, pulling the chrome release pin and sliding the chest plate up or down until you find the right position.

-The arm bridge has been replaced by the MX Trim adjuster – see instructions for the MX-TA.

- Adjust the tightness of the vest around your waist using the Velcro strap, drawing it around evenly on both sides of the lower vest pad.

-Adjust the tightness around your torso by positioning the Velcro straps across the back of the vest and securing the buckles to the chest plate. Make the vest as tight as possible to maximize operational quality and comfort. Once you've adjusted the vest, remove it for easy re-suiting by unclipping the buckles and strap on one side only.



<b>Complete System Weight</b>	23 lbs
<b>Arm Weight</b>	10.5 lbs
<b>Vest Weight</b>	6.2 lbs
<b>Sled Weight</b>	6.3 lbs (w/ monitor)
<b>Vertical Range of Arm</b>	38"
<b>Camera Weight Range</b>	10-25 lbs (w/ free optional weight plate, 15-25 lbs w/o)
<b>LCD Monitor</b>	7" 16:9 NTSC (16:9/4:3 switchable); PAL version available on request
<b>Components List</b>	Sled, 11" Dovetail, Monitor, Arm, Vest, Extension Grip, Balancing Plate, Tool kit, Low Mode Cage, DVD, Manual
<b>Arm / Sled Dimensions</b>	39.5" x 3.5" x 2.75" / 29.5" x 12.5" x 4.5"
<b>Case Dimensions</b>	H 33" W 20.5" D 17"
<b>Packed Weight</b>	Approx. 46 lbs
<b>Black Hawk w/ V-lock</b>	Add 1" sled length, Extra attachable counterweight (2lbs, non-integral)

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Attach your batteries to the lower sled. You may wish to power the camera from the batteries on the lower sled to reduce the overall weight of the system. In this case, you can utilize the supplied lemo cable to connect the power jack on the stage to the camera, but the camera power connector is not supplied, so you must attach the appropriate power connector with CORRECT POLARITY before proceeding. To prepare the camera for attachment to the sled you should first find the center of gravity (CG) of the camera. The CG is the point at which the camera will balance best, and it can be determined by using a rounded object such as a pencil. Set the camera lengthwise on top of the pencil so that it is balanced to find the lateral center (side-to-side), and then set it on top of the pencil in a perpendicular orientation to find the longitudinal center (front-to-back). The spot where the lateral and longitudinal centers intersect is the CG – you may want to mark the CG with a grease pencil or non-permanent marker.

Once the CG is determined, you must mount the camera to the dovetail (mounting plate) using a hole that will put the CG closest to the center of the mounting platform. Look at the bottom of the dovetail - on one side you will see a metal rack of teeth and on the other side a pair of sloped end stops. When you attach the dovetail to the camera, you want the rack to be on the same side as the viewfinder (or lcd display) so that it will line up with the brass gear in the dovetail channel of the stage.

#### **Page 9** **OPERATION**

For instructions on operation, watch the DVD. Generally speaking, you have to keep in mind that the stabilizer will not work like a magic wand and instantly transform your shots into brilliant footage. Operator skill is critical, and it takes many hours of practice to master this device, but the reward for all the practice will be substantial. Here are a few simple quick-start guidelines:

- Hold the system by the gimbal handle to control the orientation and elevation of the sled.
- With the other hand, lightly grasp the center post of the sled just below the gimbal, holding it close to the gimbal for optimal control.
- Delicately grasp the center post with your fingertips, like a flute – do not grab it like a handlebar.
- Practice good posture and hold the sled close to your body.
- Fine-tuning of the balance adjustments may be necessary a few times during operation.
- The way you walk will affect the quality of stabilization, so you need to develop a light-footed rhythmic pattern.
- Practice for at least 20 hours before attempting to acquire usable footage.

The DVD contains detailed, clear instructions and tips on operation, and if you have any general questions, visit the website – [www.varizoom.com](http://www.varizoom.com). If you've watched the video and practiced and still have technical questions, call 310-545-0466

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### **Low Mode Assembly**

The Low Mode (optional) consists of the camera cage and a few screws. Start by attaching the dovetail plate (upside-down) to the top of the camera cage using the supplied screws (the top of the cage has threaded holes).



Then turn the sled upside-down and slide the dovetail plate into the stage. Mount the camera inside the cage using the supplied screw.

The stage knobs and multiple cage holes allow for horizontal balance adjustment, and you can adjust the vertical balance using the same adjustments as in normal upright mode.

## Page 3 **The Sled**

The Sled holds the camera, monitor, and batteries, and it can be adjusted at various points to change its weight distribution, which in turn enables you to accommodate different cameras. The basic principle of sled adjustment is to make the section of the sled below the Gimbal effectively 'heavier' than the upper section and to center the camera's mass on the rotating axis. set up the sled using the balancing plate on a sand-bagged c-stand.



**The Stage** enables you to adjust the horizontal balance of the system and houses the video and power connectors.

**The Post and Gimbal** provide smooth pan and tilt action, a mounting socket for the spring arm, and a grip handle. This section also features one of several vertical balance adjustment points.



**The Lower Sled** holds the LCD monitor and batteries. To fix the monitor to the swivel mount, line up the flat edges of the screw with the slot so it will slide on, tighten the knob, and plug in the video and power cables.



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**Exercise caution when handling or adjusting the arm, as it is very hefty and possesses a possibly dangerous amount of potential recoil energy.** Mount the balanced sled to the arm. Now you need to Set the “float point”, which is the ideal point of arm spring tension. At the end of each arm section you will find a hex screw for adjusting the spring tension. Use the hex-socket driver to make the tension adjustments. Clockwise turning increases tension while counter-clockwise turning decreases tension.

You will want to play with the independent adjustments of each arm section until you get the right cumulative force. There should be some degree of balance between the two sections, but the lower arm section bears more weight, so the amount of adjustment may be different. Set the adjusters until both arm sections are near or above a horizontal level and the arm is compliant but not ‘mushy’.

The float point is not necessarily an exact setting, and you may find that what works for you is slightly different than another person’s preferred float point. The important thing is the end result: you have a sled that rises and falls with slight force and absorbs most of the shock imparted by walking. Now you should be able to turn on the monitor and begin practicing, assuming the batteries are charged. You may need to adjust the balance slightly after positioning the monitor and fine tuning may be necessary.

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Once it is securely fastened, slide the dovetail into the stage while making sure the rack on the dovetail lines up with the brass gear in the stage. You may need to push up on the dovetail lock to fully install the plate. Adjust the dovetail so that the camera stays fairly level. When properly installed, the locking release pin should prevent the plate from sliding out, but you should go ahead and secure your camera by tightening the **dovetail lock**.



Plug your video cable from the camera to the video output on the back of the stage. You are now ready to learn the balancing procedure. Now you can check the vertical balance of the sled. Make sure the dovetail is locked. Using your free hand, turn the sled 90 degrees so that it is horizontally oriented and let it drop back to the vertical position. **Keep** your free hand close to the center post of the sled in order to maintain control of the swinging action.

Ideal vertical balance is reflected by a “drop time” of 2-3 seconds, meaning it should take 2-3 seconds for the sled to swing down 90 degrees to the vertical plane (it will swing past that point, but count only until it reaches the vertical plane). If the system is top heavy (more than 3 sec), adjust the

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balance by repositioning the gimbal assembly upward, and if it is bottom heavy (less than 2 sec), move it downward.

When you loosen the gimbal clamp with your 5/32" hex key, you should support the weight of the sled by grasping the center post firmly beneath the gimbal and loosen the gimbal clamp slowly. **Exercise extreme caution!** The reason we urge you to grasp the center post below the gimbal is to prevent your hand from being crushed by the weight of the camera and the stage below it. You will be fine, however, as long as you proceed carefully and can support the sled and camera weight. A good alternative is to turn the sled to a horizontal position and then adjust the gimbal so you don't have to support the weight of the sled.

Now you can adjust the horizontal balance, which is accomplished by adjusting the longitudinal and lateral positions of the camera on the stage. Loosen the dovetail lock and adjust the knob at the front of the stage until the camera is level. If the sled leans to one side, you can adjust the stage laterally by using the second knob. Both knobs adjust in very fine increments, so you will find it is best to turn them slowly until you hit the "sweet spot" (where the camera stays totally level). Finish by tightening the dovetail lock.

Note that the rack on the 11" dovetail can be removed and repositioned if the need arises (i.e., your camera has very front- or back-heavy balance).

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You can further adjust the vertical balance by extending the lower sled downward, which will make the system more bottom-heavy. **ALWAYS** exercise caution when leaving the sled/camera assembly unattended – **ALWAYS** secure the c-stand with sandbags or counter weights to prevent the stand from tipping over. We recommend you lock the sled into the docking yoke (the U-shaped end of the balancing plate) while your hands are off the system. The docking yoke fits around the center post of the sled under the gimbal bearing and locks the system in place using a steel quick-release pin on a lanyard.

## ***Dual-Dynamic Arm***

The arm links the sled to the vest, provides vertical support, and allows the camera and sled to float. The Black Hawk arm is a reinforced, quadruple spring-loaded arm designed to handle cameras 10-25 pounds. For cameras well under 15 pounds, you will need the optional 5-pound weight plate (free on request). The arm comes with the sled-mounting post reversed for protection while in storage or transport, and we recommend reversing the post any time you store or transport the Black Hawk. For operation, simply unthread the post and screw it into the top so that it faces upward.

Mount the arm to the vest by inserting the lower post down into the socket on the arm bridge (the lower post is located on a short swivel-linkage at the base of the arm).