GLIDECAM INDUSTRIES, INC.®

# GLIDECAM® X-45™

# MANUAL

## Set-up and Operations Guide

**Glidecam Industries, Inc. 23 Joseph Street, Kingston, MA 02364**
Customer Service Line 1-781-585-7900

Manufactured in the U.S.A.

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# #I INTRODUCTION

Congratulations on your purchase of a Glidecam X-45 System.

The Glidecam X-45 System is a lightweight, aluminum, camcorder stabilizing system designed to allow you to walk, run, go up and down stairs and travel over rugged terrain without any camera instability or shake. When used correctly the Glidecam X-45 System can move with such fluidity and grace as to be virtually indistinguishable from shots made by professional dollies, cranes and stabilizers. The Glidecam X-45 System is the most versatile and dynamic of all the consumer camcorder stabilizers on the market. It can shoot straight up and down, or even sideways and still produce stable images.

Fluid tilts and pans, crane-like booms, dolly-type maneuvers, and the ability to shoot smooth shots from moving vehicles are all easily accomplished with the Glidecam X-45 System. The offset gimbaled handle-grip and enclosed bearing assembly allows your hand to move freely in several directions, while the horizontal yoke allows your hand and arm to move up and down, alleviating the bouncing, pogo-type action often associated with our competitors' systems. The upper camera platform moves back and forth, and side to side to quickly allow the balancing of your camera in relationship to the counterweights. By varying the length of the central post, the Glidecam X-45 System can support any camcorder weighing from 25-45 pounds.

While the Glidecam X-45 System is in essence a very simple device, its simplicity doesn't lend ease in answering that often asked question, "how does it work?" To answer this question completely would require delving into Newtonian Physics. We would have to explain - center of gravity displacement, inertia, friction and angular motion reduction etc. However, a quick answer reveals the Glidecam X-45 System works by isolating your hand and arm's motions from your camera, while your camera is balanced in a relatively motionless state.

The Glidecam X-45 System requires practice and understanding to achieve professional looking results. We highly recommend that the user read this manual thoroughly before setting up and operating the Glidecam X-45 System. Doing so will save you time, and will minimize the risk of damage to your camcorder or the Glidecam X-45 System. It is important to perform and follow the Set-up and Operation's procedures in the proper sequence to avoid both frustration and a possible accident.

If you have any need for technical assistance, you can call our **Technical Support Line at 1-781-585-7900**, Monday through Friday between the hours of 9:00 am and 5:00 pm, Eastern Time.

We're sure you will find many years of enjoyment with your Glidecam X-45 System once you have it up and running.

# #2 GLIDECAM X-45 ARM

The GLIDECAM X-45's Dyna-Elastic™ Dual-Articulating Support Arm incorporates precision radial bearings and needle roller bearings within its machined T6 aluminum structure. The placement and implementation of these bearings produce minimal friction and allow the Dyna-Elastic™ Support Arm to pivot and boom very smoothly, and with virtually no noise.

Four Titanium Extension Springs are employed within the Support Arm's hard coat anodized Exo-Skeletal Shells. Utilizing Class Three Levers, the energy of the Extension Springs acts upon internal Fulcrum Points, and provides the Support Arm with its lifting power. The spring tension is field adjustable and allows for varying camera weights.

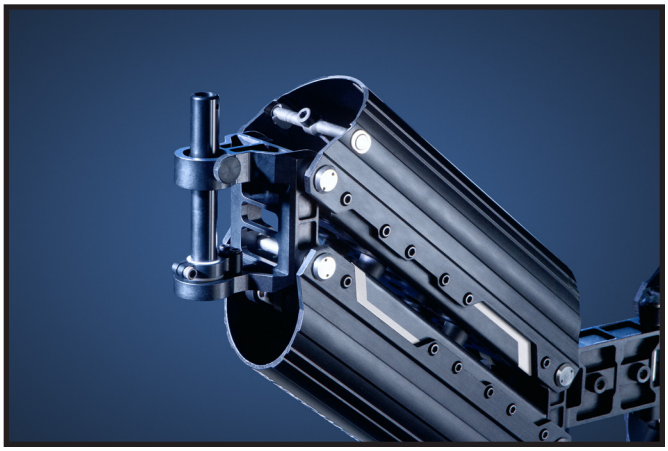
Our proprietary spring Inter-X-Change™ system makes the installation and removal of the springs quick and easy. The Support Arm can be setup and used in either a Two-Spring Mode, or a Four-Spring Mode.

A key design feature of the Support Arm is that it incorporates our Light-Force™ technology. This literally means that only a "light" force or effort is required by the operator to hold the arm at any given position, or to boom the arm up and down. It is this Light-Force™ feature that provides the operator with the optimum amount of camera buoyancy or float.

The Glidecam X-45 Arm is designed to isolate your unwanted body movements from the camera. The X-45 Arm will support the weight of your camera stabilizer (sled), camera, monitor, battery and any additional accessories and wiring. The Glidecam X-45 arm is designed to carry cameras from 20-45 lbs. The total load must not exceed 70 lbs. The camera weights may vary slightly as this assumes a total sled, monitor and battery weight of 25 lbs.

**IMPORTANT: READ THIS BEFORE CONTINUING. PRIOR TO EACH USE OF YOUR GLIDECAM X-45 ARM BE SURE TO CHECK THAT ALL INTERNAL, AND EXTERNAL BOLTS & SET SCREWS ARE SECURE TO ENSURE PROPER AND SAFE OPERATION OF YOUR GLIDECAM X-45 ARM.**

## ARM POSTS



When you first set up your Glidecam X-45 Arm, if not already installed, use either the 5" or 10" arm post in at the front top of the arm. You can stop the rotation of your arm post by tightening the small allen head bolt on the topside of the front arm hinge, if needed.

## ADJUSTING THE ARM SPRINGS

**IMPORTANT: When you make these adjustments, make sure you have removed the camera stabilizer from the end of the arm so that you reduce stress to the internal threads of each spring connector.**

The springs have been factory set to 1 on the 0-5 adjustment scale located at the top and bottom of each arm segment. On the scale, “0” would be for the lightest load and the “5” on the scale would be for the heaviest load. When adjusting the arm for the lightest load you should not adjust much beyond the “0” on the scale as you could disconnect the spring adjuster bolt. You will need to turn these socket head adjustment screws with an allen wrench to adjust the lift capacity of the arm. Turning the socket head bolt clockwise will increase the lift and turning the socket head bolt counter clockwise will decrease the lifting power of the arm.

When you pick up your camera stabilizer with your Glidecam X-45 Arm, you will want the arm to remain horizontal with the full load. You may prefer after some use that the arm remains slightly up or down from horizontal. We recommend that the arm remain horizontal, or slightly just below horizontal. If the arm is going down too far below horizontal, then you will need to increase the spring strength by turning the adjuster bolt (socket head bolt) clockwise. If the arm is going up and above horizontal, then you will need to turn the adjuster bolt (socket head bolt) counter clockwise to bring the arm lower to horizontal.

**IMPORTANT: When you make these adjustments, make sure you have removed the camera stabilizer from the end of the arm so that you reduce stress to the internal threads of each spring connector. When you look into the slot at each spring adjustment scale, check to see where the spring end guide is located.**

The first arm section, which is the section nearest the vest, holds the weight of the second arm in addition to the sled. Due to this fact the scale settings on the top and bottom of this arm section may be set to a higher setting than the second arm section. For example if the setting on the second arm section is at “3.75” on the top and bottom then the first arm section will probably be set at 4” on the top and bottom. Remember to make sure that the top and bottom scale markings of the section being adjusted match each other. Each spring has a silver adjustment guide that you can clearly see through the slot. When properly adjusted the two arm segments should move up and down together.

## CHANGE TO LEFT HAND OPERATION

If you choose to change the Glidecam X-45 Arm from the factory set right hand operation to left hand operation, you will need to follow the instructions in your operator vest manual and then you will need to remove the 2 screws that attach the 2-pin block to the pre-arm and then rotate the 2-pin block 180 degrees, then reinstall the screws from the opposite side. Now you can push the 2-pin block into the vest block on the bridge plate and you are set up for left handed operation.

# #3 GLIDECAM X-45 VEST

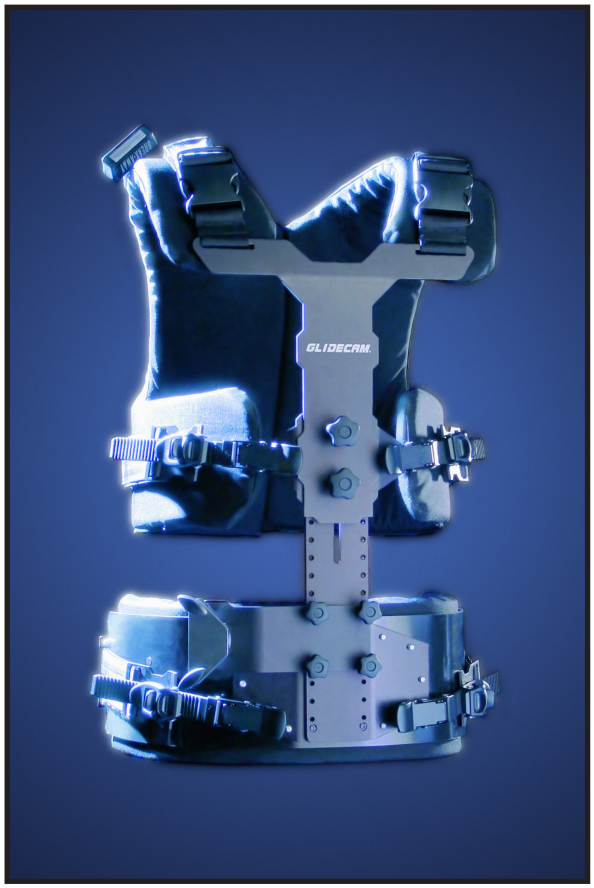
The Glidecam X-45 Support Vest is lightweight and comfortable, and can be adjusted to fit a wide range of operators. High endurance, dual density, EVA foam padding and integral T6 aluminum alloy create a vest that can hold and evenly distribute the weight of the system across the operator's shoulders, back, and hips. For safety, quick release, high impact buckles allow the vest to be removed quickly. The Vest's outer shell is made of 1000 denier cordura fabric, and 7-panel seat belt strapping, noted as being the best in the industry.

The Glidecam X-45 Vest incorporates a unique and proprietary Arm-to-Vest Connector that allows the Support Arm to be attached and removed from the Vest without affecting the operator's trim settings. The Glidecam X-45 Support Vest incorporates a unique and proprietary Arm-to-Vest Connector that allows the angle of the Support Arm to be adjusted relative to the Support Vest. This Trimming Mechanism allows you to neutralize the weight of the Support Arm relative to your body's center of gravity. When set correctly the effort required while shooting is greatly reduced. Another unique and proprietary feature of the Arm-to-Vest Connector is that it allows the Support Arm to be attached and removed from the Vest without affecting the operator's selected trim settings.

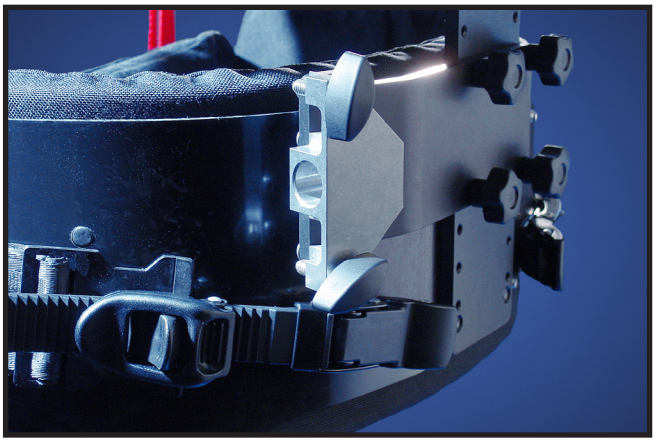
## GLIDECAM X-45 VEST ADJUSTMENTS AND SAFETY

When the Glidecam X-45 Vest is properly worn the vertical center plate must be vertical on the operator and the straps must be tight enough so that the vest does not twist or move forward when the camera and sled are lifted. Check to see that all pads and straps are set up as they appear to the left.

To put on the vest we suggest you disconnect the top left buckles above and below the shoulder and the left or right belt buckle. Put your right arm through the armhole between the top and underarm straps. Put the vest on around your back and attach the buckles. Now attach the belt buckle the same way around your hips. You can tighten the vest if needed by moving the belts with Velcro through the clips.



Once the vest is on you should adjust all the straps so that the vertical plate is centered. Push down on the vest to place on your hips. Tighten all straps so that the vest fits tightly with enough room for you to breathe freely. The vest waist pad should be low enough so that it wraps around your hips but not so low that your legs shift the vest when you walk up stairs. The vest should be tight but not uncomfortable.



To change the horizontal bar (bridge plate) attached to the vertical plate from right to left or left to right unscrew the four screws, flip around and attach again using the four screws.

The two knobs on the front of the bridge plate are to adjust the arm in front of your body. When you tighten the top you must also loosen the bottom screw to get the sled to come towards you and when you tighten the bottom you must loosen the top at the same time to get the sled to move away from you. The two knobs on the top and bottom of the bridge plate are to adjust the arm left to right in front of your body. Once you have the desired position make sure that all bolts are tight. The adjustment gets the sled to the position you most often use without having to apply much pressure to keep it there.

# #4 GLIDECAM X-45 SLED

The Glidecam X-45™ sled holds any video or 12 volt film camera weighing up to 45 pounds. The X-45 Sled incorporates sophisticated engineering and precision machining to make it lightweight and strong. Three dedicated video BNC connections are located on the base and head assembly. The Glidecam X-45 central post power/video cable can handle composite video, component video and HD-SDI video. Two 2-pin Lemo connectors are also located on the base and head assembly. The two on the base are for accessories. The head has one for camera power and the other for camera accessories.

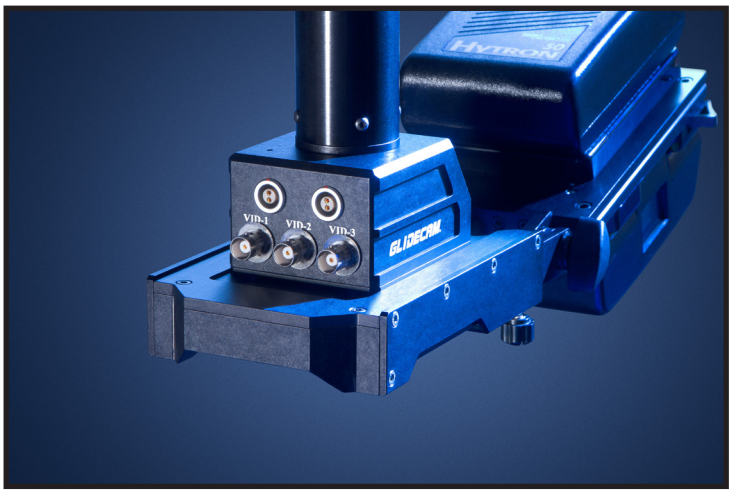
The precision, x-y adjustable Head assembly incorporates a drop in style dovetail camera plate for quick front to back balance. Very, fine tuning, ergonomic knobs control front to back and side to side balance adjustments.

The Sled's "no-tools" precision Gimbal is made to top of the line quality. The Gimbal incorporates 4 bearings inside the handle to yoke connection (the tilt axis). There are 2 bearings on each side of the yoke, providing 4 bearings for the roll axis. A very tight knurling has been machined onto the Gimbal Tube to improve handling. An easy to replace soft foam covers the handle grip.

The Glidecam X-45 Sled has a strong and rigid 1.75" central post, and a "no-tools" Telescoping Post. This allows you to easily adjust the sled length and position of the LCD and batteries. The Glidecam X-45 base platform can be set up with two-three Anton Bauer or V-Mount style batteries.


**IMPORTANT: PLEASE NOTE THAT THE GLIDECAM X-45 SLED USES ONLY 2-PIN LEMO CONNECTORS FOR POWER AND BNC CONNECTORS FOR VIDEO.**

The junction box distributes power from the batteries on the base of the X-45, and routes the video signal to/or from the base. The 12 Volt Camera power output is the 2-pin connector closest to the sled and the accessories 12-volt power output is the 2-pin connector furthest from the central post. This junction box can be positioned closer to, or further away from the central post by removing the 2 screws and placing in the desired location. This photo shows the junction box in the furthest position.



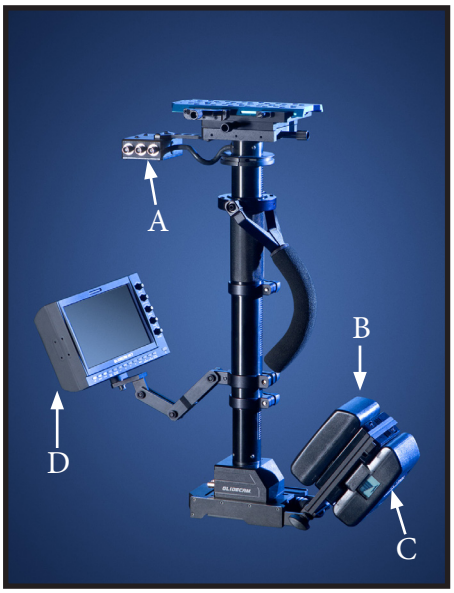

**Glidecam X-45 Sled lower distribution box. There are 2) 12-Volt power outputs, to power support accessories. There are 3) Video I/O (inputs and outputs) that are used to send video signal(s) from, or to the X-45 head unit.**

NOTE: You will need a common Film Industry “C” STAND (also known as a Century Stand, or Grip Stand), or a Film Industry LIGHT STAND so that later during the BALANCING procedures and operation of the Glidecam X-45 SLED you will have something to attach and park your X-45 SLED onto. The “C” STAND or LIGHT STAND needs to terminate with a standard 5/8” diameter STUD on its uppermost riser. The STAND must also be of Film Industry quality in the sense that it must be rugged and made of steel etc. Do not attempt to use a light weight aluminum light stand, like the ones that are often sold at local amateur photography stores.

**Glidecam X-45 docking bracket atop a C-Stand.**
**Please note the incorporated arm hook, and locking safety pin.**

****NOTE – Sandbags should always be used to securely weight down the C-Stand in position and the load of the Glidecam X-45 sled should always be positioned over one of the legs of the C-Stand.**

****NOTE: Whenever you attach ANYTHING to the BASE PLATFORM, be it a BATTERY, or MONITOR etc. make sure that it is attached so that it can not shift or move in place when the X-45 SLED is in operation. If something that is attached to the X-45 SLED shifts during operation, it could throw the system out of balance, possibly causing unstable results.**




**Glidecam X-45 with the monitor and battery pack attached:**

**A – Power/Video distribution box**
**B – Accessory Power Battery Position**
**C – Camera Power Battery Position**
**D – Optional Position for Battery Pack to power monitor **useful for dynamic balance***

When it comes to choosing a BASE PLATFORM configuration, one should take into account the general principle that: The lighter the load on the top section of the Camera Mounting Assembly (the Sled), the less counterweight required to counterbalance the Sled. In other words, if you reduce the weight of the CAMERA PACKAGE attached to the top of the Sled, you'll need less COUNTERWEIGHT at the bottom of the Sled, (i.e. monitor and battery) thereby making the whole System lighter and more comfortable to use.

You can reduce the weight of your CAMERA PACKAGE in several ways. First, the Camera you choose to use with your X-45 SLED should be as light as possible. For instance, if you can choose between shooting with a Camera that weighs 26 pounds, and a Camera that weighs 18 pounds, then definitely shoot your footage with the 18 pound camera, given of course that the lighter Camera will be able to fulfill your projects needs.

If you are unable to choose which Camera to shoot with, then you should a least try to lighten the overall weight of your CAMERA PACKAGE. You can reduce the CAMERA'S weight by selecting a lightweight PRIME LENS (preferably a wide angle lens) instead of a longer and heavier TELEPHOTO or ZOOM LENS. Still another way to lighten the CAMERA PACKAGE is to remove any part of the camera's VIEW FINDER SYSTEM that you will not be needing. Most Betacam Cameras have completely detachable VIEWFINDERS

Also it should be NOTED that moving the MONITOR AND BATTERIES closer to the CENTRAL SUPPORT POST reduces the CAMERAS PANNING INERTIA, or in other words, moving the monitor and battery closer to the POST, will allow you to PAN your CAMERA quicker. Moving the monitor and battery away from the POST, increases PANNING INERTIA, thereby smoothing out, or causing the PANNING motion to be slower.

To achieve accurate balance of the X-45 BASE PLATFORM, the positionable MONITOR BRACKET can be moved in and out, or tilted up and down. The TAIL UNIT of the BASE PLATFORM can also be moved in and out, or tilted up and down. This will allow you to precisely balance and align the center of gravity on the BASE PLATFORM of the X-45 before attaching your camera.

# #4.1 GLIDECAM X-45 SLED: MOUNTING YOUR VIDEO OR MOVIE CAMERA

**NOTE: If your camera comes with, or if you have, a quick release BALANCE PLATE for your camera, then attach the BALANCE PLATE to the X-45 SLED's CAMERA PLATE first, and then simply attach your camera to the BALANCE PLATE.**

To mount your video camera, camcorder to the CAMERA MOUNTING PLATE start by finding your cameras approximate center of gravity. To do this you will need a round pen, pencil or 1/4" dowel etc and some white camera tape. Assuming you're using a pencil, place the pencil on top of a flat work table. Next, place your camera base onto the pencil so that the pencil length runs perpendicular to the camera length. Now, with your hands supporting your camera, slide the camera base forward or backwards over the pencil until the camera can be balanced on the pencil. When you find the approximate point of balance of your camera use a bit of camera tape to mark this spot on the left side of your camera. Now place the pencil on the work table so it is parallel with the camera length, and then slide the camera side to side on the pencil until you find the approximate point of balance and then mark this spot on the back of your camera. These two tape marks now give you a fairly close indication as to the center of gravity of your camera.

Now that you have located the approximate center of gravity of your camera, mount your camera to the CAMERA MOUNTING PLATE by first placing your CAMERA upside down on your lap. Then align the center of the CAMERA MOUNTING PLATE with the point on your camera base where the two white camera tape marks would intersect if you where to draw imaginary lines through them. Next move the CAMERA PLATE so one of its center 1/4" or 3/8" SLOTS is aligned with the center of gravity of your CAMERA. Now take note of the slot in the CAMERA PLATE that is nearest to the MOUNTING HOLE on the base of your CAMERA, for this will be the slot you will use to bolt the CAMERA and PLATES together.

Later during the balancing procedure, you might have to move the mounting hole on your camera to a different SLOT on the CAMERA MOUNTING PLATE to obtain better balance. This is one of the reasons there is more than one SLOT in the CAMERA MOUNTING PLATE. The other reason for different SLOTS is to allow all sorts of different cameras to fit on top of the Glidecam X-45 SLED.

Now you will have to pick out one of the CAMERA MOUNTING BOLTS provided so you can bolt your camera to the CAMERA MOUNTING PLATE.

Next insert the correct CAMERA MOUNTING BOLT(s) into the SLOT(s) you have chosen on the CAMERA MOUNTING PLATE, and then screw the CAMERA MOUNTING BOLT into the base of your camera until the camera and CAMERA MOUNTING PLATE are bolted firmly together. ( NOTE: do not over tighten, for in doing so you could pop out the metal threaded insert that is in the mounting hole of your camcorder.)

Next place your assembled Glidecam X-45 SLED on the docking side of the docking bracket. Now carefully slide, or drop-in the combined CAMERA MOUNTING PLATE and CAMERA into the MID PLATE of the X-45Head.
NOTE: If your camcorder comes with, or if you have a quick release BALANCE PLATE for your camcorder, then attach the BALANCE PLATE to the X-45 SLED's CAMERA PLATE first, and then simply attach your camera to the BALANCE PLATE.

Given you have followed the previous instructions correctly, you should now have your camera securely attached to the top of the Glidecam X-45 SLED.

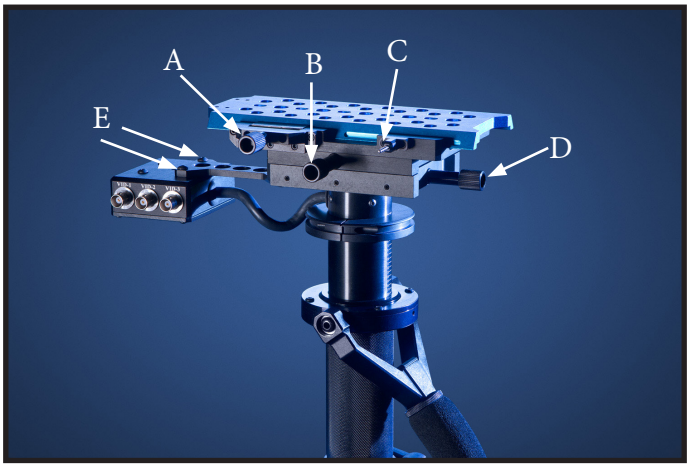
# #4.2 GLIDECAM X-45 SLED: BALANCING THE HORIZONTAL AXIS

**NOTE: You will need a common Film Industry "C" STAND (also known as a Century Stand, or Grip Stand), or a Film Industry LIGHT STAND so that during the BALANCING procedures and operation of the Glidecam X-45 SLED you will have something to attach and park your X-45 SLED onto. The "C" STAND or LIGHT STAND should terminate with a standard 5/8" diameter STUD on its uppermost riser.**
**(A "C" STAND is not included with your X-45 SLED PACKAGE.)**

Now that your Glidecam X-45 SLED is assembled properly, and your CAMERA is securely attached to the top of the SLED, and your MONITORS and BATTERIES are securely attached to the base of the SLED. You can now test the SLED's HORIZONTAL BALANCE. The objective in obtaining correct HORIZONTAL BALANCE for the SLED is to allow the CAMERA to remain level during operation, given you are not applying either a PAN, TILT or ROLL type of hand pressure to the SLED. In other words, if the SLED is horizontally BALANCED correctly, then the CAMERA will remain level, and the CENTER POST will remain VERTICAL unless you intentionally position the SLED otherwise, and if the SLED is horizontally BALANCED correctly it will always return to a level and vertical position after you release any PAN, TILT or ROLL hand pressure on the SLED.

The best way of adjusting the SLED's HORIZONTAL BALANCE is to move the CENTER of GRAVITY of the CAMERA. This can be accomplished by either repositioning the CAMERA on the CAMERA PLATE, or by adjusting the position of the CAMERA MOUNTING PLATFORM with the CAMERA on it via the front to back and side to side adjustment knobs. Another way to adjust the SLED's HORIZONTAL BALANCE is to move the front to back, or side to side position of the MONITOR, or BATTERY on the SLED's BASE PLATFORM.

The Glidecam X-45 SLED can be BALANCED by one person, but if you have an assistant, then by all means have them assist you in this operation.




**Glidecam X-45 Head**
**A – Locking Knob for the Camera Plate**
**B – Side to Side Adjustment Knob**
**C – Camera Plate Locking Pin**
**D – Fore and Aft Adjustment Knob**
**E – Screws for Moving Video/Power Box**

Before you can check and then correctly adjust the HORIZONTAL BALANCE of the SLED you will need to first attach the DYNAMIC BALANCE AND DOCKING BRACKET to the top 5/8" diameter stud on your "C" STAND or LIGHT STAND.

On the DYNAMIC BALANCE AND DOCKING BRACKET the 5/8" diameter stud side of the BRACKET is used in the DYNAMIC BALANCE procedures (the horizontal and vertical balance procedures), and the "horse shoe" shaped receptacle side of the BRACKET is used for DOCKING or parking your X-45 SLED when it is not in use.

**NOTE: Whenever you use the DYNAMIC BALANCE AND DOCKING BRACKET make sure that the end of it that you are using is aligned over one of the legs on the STAND that it is attached onto. The reason for this is to ensure that the STAND does not fall over when the DYNAMIC BALANCE AND DOCKING BRACKET is in use with the full weight of the CAMERA and SLED on it.**

When setting up the STAND be sure to set the STAND up on a flat and level surface. You will also need to raise the top riser on the STAND up high enough so that when the SLED is on the BRACKET which is attached to the STAND that the BASE of the SLED does not touch the STANDS LEGS. The height of the STAND's upper riser should be high enough to raise the X-45 SLED so that when the SLED is in its upright vertical position, its BASE does not hit the STANDS LEGS even if the SLED is tilted all the way forwards or backwards. If however, you raise the STAND's upper riser, and consequently the X-45 SLED, too high off the ground you will cause the STAND to be to top heavy. That is, unstable enough to cause the STAND to fall over if bumped etc. Which brings us to the point of using SANDBAGS to weigh down the legs of the STAND to make everything more stable during all of the BALANCING procedures which follow. If you do not have SANDBAGS, or something similar, then be very careful not to knock everything over.

Given that you have followed the earlier procedures for setting up the BASE with MONITOR AND BATTERIES etc. and attaching your CAMERA to the SLED correctly, you should now find the SLED set up so that the CAMERA is aligned lengthwise with the BASE PLATFORM, and that the lens of the CAMERA is facing the FRONT end of the BASE.

Given you have the DYNAMIC BALANCE AND DOCKING BRACKET securely attached to your STAND, you can now securely place the SLED onto the DYNAMIC BALANCE AND DOCKING BRACKET. To do this, securely place the bottom end of the GIMBAL HANDLE (the curved tube portion of the GIMBAL ASSEMBLY) onto the 5/8" diameter stud that is facing up on one of the ends of the DYNAMIC BALANCE AND DOCKING BRACKET. Placing the SLED onto the DYNAMIC BALANCE end of the BRACKET will set the SLED up so you can now easily tell if the SLED is balanced correctly on its HORIZONTAL AXIS.

Before you place the SLED onto the DYNAMIC BALANCE AND DOCKING BRACKET to test for correct HORIZONTAL BALANCE, you should make sure the GIMBAL TUBE is securely in place on the SLED's CENTRAL SUPPORT POST. When you receive the SLED, the GIMBAL TUBE should already be securely attached at its highest position on the CENTER POST. If the GIMBAL TUBE is not on the POST as described above, then adjust it so that it is. Adjusting the height of the GIMBAL TUBE on the CENTRAL SUPPORT POST changes the VERTICAL BALANCE of the UNIT, but for now you should leave, or set the GIMBAL TUBE at its highest position on the CENTER POST. You will learn more about setting the VERTICAL BALANCE in the next section. Also, when you place the SLED onto the DYNAMIC BALANCE AND DOCKING BRACKET be sure to align the SLED so that the length of the CAMERA is perpendicular with the length of the DYNAMIC BALANCE AND DOCKING BRACKET.

**NOTE: Be extra careful when placing the SLED onto the DYNAMIC BALANCE AND DOCKING BRACKET, for if the SLED is top heavy, the SLED might quickly turn upside down causing possible damage to the SLED and/or yourself. Because this is a potential hazard, you should hold tightly onto the SLED until you are sure that it is not going to move suddenly or flip over. Only then should you gently release the SLED so it hangs freely on the DYNAMIC BALANCE AND DOCKING BRACKET.**

Remember, the X-45 SLED is only designed for camera packages weighing from 10 to 45 pounds. If your SLED is found to be top heavy at this point then, either your camera is too heavy for the SLED, or the GIMBAL TUBE is not set at its highest position on the CENTER POST, or the EXTENSION POST is not in its fully extended position, or you do not have enough WEIGHT on the BASE PLATFORM. If you do not have enough WEIGHT on the BASE PLATFORM, then recheck the BASE to see if all the MONITOR AND BATTERIES are in place, or if you have not yet attached a BATTERY and MONITOR to the BASE, then do so now.

Often your CAMERA, or more appropriately your CAMERA PACKAGE, can actually weigh more than you think it does. Try weighing your camera package to see if it is over the 45 pound weight limit of the sled. Your CAMERA MANUAL may give you your camera's weight, but it might not be giving you the correct weight of your camera, given you include its on board battery, tape, accessories like additional lenses, balance plate, lights, microphones or matte boxes etc.

Also, when checking the HORIZONTAL BALANCE of the SLED make sure you let the SLED hang freely on the DYNAMIC BALANCE AND DOCKING BRACKET. In other words, don't touch it with your hands when judging it for correct balance. If the SLED is balanced correctly on its HORIZONTAL AXIS, then it will be level and upright, with the CENTER POST in a virtually perfect VERTICAL position.

If the SLED leans to the right, then you will have to position the camera over to the left a bit. If the SLED still leans to the right, then position the camera more to the left. If the SLED is leaning to the left, then move the camera to the right.

If you find that you cannot get the LEFT to RIGHT AXIS balanced with this method then try remounting your camera to a different SLOT in the CAMERA MOUNTING PLATE. Try a SLOT either to the left, or to the right of where your camera is currently mounted. This will move the camera weight to a different point on your CAMERA PLATE.

Now you can go about balancing the SLED's FRONT to BACK AXIS. If your SLED tilts to the front, then you will have to position the CAMERA PLATE back a bit. If the SLED still tilts to the front, then position the CAMERA PLATE more to the back. If the SLED is tilting to the back, then position the CAMERA PLATE to the front.

If you find that you cannot get the FRONT to BACK AXIS balanced with this method then try remounting your camera to a different SLOT on the CAMERA MOUNTING PLATE. Try a SLOT either to the front or to the back of where your camera is currently mounted. This will move the camera weight to a different point on your CAMERA PLATE. After adjusting the front to back balance as mentioned above you might have to go back and readjust the left to right balance again to obtain really fine balance of the whole system.

You can also reduce the speed in which a PANNING motion can take place with the SLED, by moving the monitor and battery further away horizontally from the CENTRAL SUPPORT POST on the BASE PLATFORM. In other words, to increase PANNING (vertical camera axis rotation) INERTIA move the MONITOR AND BATTERIES outward, because this will have the effect of expanding the mass of the SLED horizontally. Moving the MONITOR AND BATTERIES closer to the CENTER POST will decrease the PANNING INERTIA.

You can use your eyes to judge for correct HORIZONTAL BALANCE, or you can use a BUBBLE LEVEL (carpenter level etc.) to ensure that the SLED has correct HORIZONTAL BALANCE. When using a BUBBLE LEVEL or other similar device to judge the SLED's HORIZONTAL BALANCE, you should realize that large and heavy CARPENTER LEVELS will effect the BALANCE of the SLED. The effect it has on the SLED'S BALANCE will vary dependent on where the LEVEL is placed. For best results you should use only a small LEVEL and affix it to the BASE PLATFORM so that its weight is, as it were, permanently added to the SLED, or you can use a LEVEL only temporarily on the SLED given that it is not very heavy and that you place it as close to the center of the BASE as possible. You can also use the LEVEL on the CAMERA if you find this works better for you. In the end, how level the footage viewed through the viewfinder or MONITOR looks is obviously the most important result of all these BALANCE tests and procedures.

**NOTE: Later after you adjust the SLED's VERTICAL BALANCE you will have to go back and readjust the HORIZONTAL BALANCE again in order to obtain really fine balance of the whole system. This is not always necessary, but you should check the HORIZONTAL BALANCE again to make sure it is correct. NOTE: The HORIZONTAL BALANCE of the SLED becomes less sensitive, as the SLED becomes increasingly bottom heavy. And conversely, the HORIZONTAL BALANCE becomes very sensitive, as the SLED progresses towards correct VERTICAL BALANCE.**

# #4.3 GLIDECAM X-45 SLED: BALANCING THE VERTICAL AXIS

Now that your SLED is HORIZONTALLY BALANCED, it's VERTICAL AXIS can now be tested and properly BALANCED. The objective in obtaining correct VERTICAL BALANCE for the SLED is to allow the CAMERA and SLED to remain level during operation, given you are not applying either a PAN, TILT or ROLL type of hand pressure to the SLED, and most importantly that the SLED's CENTER POST remain vertical even if you are walking, running, or turning while the X-45 SLED is in operation. In other words, if the SLED is vertically BALANCED correctly, then the CAMERA will remain level, and the CENTER POST will remain VERTICAL unless you intentionally position the SLED otherwise. If the SLED is not vertically BALANCED properly, then it will swing about or pendulum when you walk, run or turn.

Again, if the VERTICAL BALANCE is set correctly you will be able to move about quickly, as well as start or stop moving suddenly, and still have the CENTRAL SUPPORT POST remain VERTICAL. The best way to adjust the SLED's VERTICAL BALANCE is to change the VERTICAL position of the GIMBAL TUBE on the CENTRAL SUPPORT POST. Other ways to adjust the SLED's VERTICAL BALANCE are to either add, or subtract WEIGHT from the BASE PLATFORM, or to either extend, or contract the SLED's EXTENSION POST. All of these methods has the effect of altering the position of the SLED's CENTER of GRAVITY along its VERTICAL AXIS.

**NOTE: The basic procedures for holding and operating the X-45 SLED during the VERTICAL BALANCE procedures are basically the same as those in the HORIZONTAL BALANCE section, so please be sure you have read that section carefully before going any further.**

To correctly set the SLED'S VERTICAL BALANCE you will have to make sure that the SLED is setup on the STAND as described earlier, and that the SLED's HORIZONTAL BALANCE is correct, or close to correct. Also, before you can properly set the SLED's VERTICAL BALANCE, you must first adjust the position of the GIMBAL TUBE so the SLED hangs in "NEUTRAL BALANCE". NEUTRAL BALANCE is when the SLED's CENTER of GRAVITY is positioned at the center of the main BEARING on the GIMBAL TUBE. If the SLED is setup so it is in NEUTRAL BALANCE it will no longer be BOTTOM HEAVY or TOP HEAVY. Instead it will be evenly BALANCED so that if you position the SLED so the Center Post is horizontal it will basically stay in this position. Again if the SLED was BOTTOM HEAVY and you TILTED it horizontally, it would swing back to a VERTICAL position.

Now TILT the CENTRAL SUPPORT POST forward 90 degrees so that it is in a HORIZONTAL position. The CAMERA LENS should be pointing down at the ground if you have done this correctly. Now very, VERY carefully loosen the LOCKING COLLAR at the bottom of the GIMBAL TUBE, while at the same time tightly and SECURELY holding onto the center of the CENTRAL SUPPORT POST with one of your hands so that the CENTRAL POST doesn't fall through or change its basic position within the GIMBAL TUBE when the CLAMP is loosened. Also, be sure that the GIMBAL TUBE CLAMP or LOCKING COLLAR is fully unlocked before you move the position of the GIMBAL TUBE on the CENTER POST. Remember the SLED is very heavy, so be extra careful when following this procedure.

At this point you will need to carefully and gently shift the CENTRAL SUPPORT POST within the GIMBAL TUBE until the SLED hangs in NEUTRAL BALANCE. You will know when you have set the SLED in NEUTRAL BALANCE, because the CENTER POST will be HORIZONTAL, that is parallel with the floor given the floor is level, and the SLED will seem to suddenly float in a HORIZONTAL position. You might have to slide the CENTER POST back and forth within the GIMBAL TUBE a bit to find the exact center of gravity. Once this is done, tighten the LOCKING COLLAR on the GIMBAL TUBE so the GIMBAL TUBE is very securely fastened to the CENTER POST again.

Now that the SLED is NEUTRALLY BALANCED, write down, mark with white camera tape, or take note of the position that the top, or bottom of the GIMBAL TUBE is in by using the GUIDE SCALE MARKINGS that are laser etched onto the upper portion of the CENTER POST. It has been found that a favorable condition for normal operation of the SLED can be obtained by raising the GIMBAL TUBE position 1/2" above this noted position and then tightly locking it thereon. This position should provide the SLED with the correct amount of BOTTOM HEAVINESS for proper operation. Each line on the GUIDE SCALE MARKINGS is about 1/8" apart, so you will need to raise the GIMBAL TUBE on the CENTRAL SUPPORT POST by four lines. The lines are numbered to make this easier.

**NOTE: Always make sure that the GIMBAL TUBE is very tightly secured in place before using the system. You may want to switch out the kip handle on the gimbal tube for a socket head if needed.**

It should be noted however, that this position on the CENTRAL POST might not be ideal for your SLED, given the possibility of various camera weights and or shooting preferences. NOTE: You should therefore always retest the SLED'S VERTICAL BALANCE by testing the SLED as described later in this section.

It should be also be noted that the SLED will always require a little bit of BOTTOM HEAVINESS to operate properly, because the SLED will always need to stay, or return to a VERTICAL position. Think of the SLED like a children's "seesaw" that is designed to operate VERTICALLY instead of HORIZONTALLY.

Now that you know the position which allows the SLED to hang in NEUTRAL BALANCE, and the position which will create the appropriate amount of bottom heaviness for the SLED, you can now unlock the GIMBAL TUBE CLAMP and set the GIMBAL TUBE in the correct position on the CENTER POST. This procedure can be done while the SLED is on the DYNAMIC BALANCE AND DOCKING BRACKET.

However if you do not have an assistant helping you, or do not feel comfortable adjusting the GIMBAL position while the SLED is on the BRACKET you can take the SLED off the DYNAMIC BALANCE and DOCKING BRACKET and place it on the ground in an upright position. **Be careful of the power/video wire under the bottom of the BASE PLATFORM, and that the SLED remains upright and does not fall over if you decide to place it on the ground, as this can cause serious damage or injury **

THE SLED ARC TEST: Another way of checking your SLED to see if its vertical balance is correct is to perform a sled arc test. To do this first make sure that your SLED is correctly connected to the DYNAMIC BALANCE end of the DYNAMIC BALANCE AND DOCKING BRACKET. To do the SLED ARC TEST simply grab hold of the back battery end of the SLED's BASE PLATFORM and pull the BASE up and back until the SLED'S CENTRAL SUPPORT POST is now horizontal. Now carefully let go of the BASE PLATFORM and count how many seconds it takes for the SLED to then swing back to VERTICAL. If the SLED is vertically balanced properly then it should take about THREE SECONDS for this to happen. Count your seconds with the words "one thousand one, one thousand two" etc for accuracy. Adjust the GIMBAL POSITION until it takes only three seconds for the sled's center post to swing in an arc from horizontal to first passing vertical. NOTE: Be careful when doing the ARC TEST for you do not want your camera or sled to bang into the "C" STAND.

If all is proper the SLED should now be balanced correctly on its VERTICAL AXIS.

# #4.4 GLIDECAM X-45 SLED: USING THE EXTENSION POST

The Glidecam X-45 SLED comes with an EXTENSION POST that allows you to expand or contract the overall length of the SLED's CENTRAL SUPPORT POST. Changing the length of the CENTRAL SUPPORT POST effectively changes the CENTER OF GRAVITY of the SLED. When the EXTENSION POST is in an extended position it expands the mass of the SLED. When the EXTENSION POST is in a contracted position it contracts the mass of the SLED. If your SLED is still TOP HEAVY even with the GIMBAL positioned high on the CENTER POST, then extending the EXTENSION POST could work towards bringing the correct amount of bottom heaviness to the SLED. If your SLED is still too BOTTOM HEAVY even though the GIMBAL is positioned lower than you would like on the CENTER POST, then contracting the EXTENSION POST could work towards bringing the correct amount of bottom heaviness to the SLED.

**Please note the alignment reference hole. Use this to view the alignment line on the lower post to ensure proper alignment between the X-45 head and base unit. This can also be done by visually aligning the head and base.**

The monitor bracket clamp can be adjusted to fit on either the top or lower post by using, or removing the custom shim that is provided.

**WARNING**
****NOTE – THE TELESCOPING CLAMP MUST BE SECURELY FASTENED AT ALL TIMES. AVOIDING TO DO SO WILL RESULT IN THE BASE SEPARATING FROM THE UPPER CENTRAL POST AND CAUSING POTENTIAL DAMAGE TO THE INTERNAL X-45 WIRING, YOUR CAMERA, MONITOR, AND/OR OTHER EQUIPMENT****

It should be understood that expanding the mass of the SLED by extending the EXTENSION POST allows you to reduce the amount of COUNTERWEIGHT required to correctly set the VERTICAL BALANCE on your SLED, thereby making the whole SLED lighter, or allowing you to use less weight to counterbalance a heavy camera. Therefore, you MIGHT need to extend the EXTENSION POST to its fully expanded position if you have a very heavy CAMERA, such as any CAMERA above the weight of 20 pounds. You might also want to extend the EXTENSION POST given you find it more comfortable to operate your SLED with less overall weight on it. This could come about because you wish to lighten the load for prolonged use of the SLED.

# #4.5 GLIDECAM X-45 SLED: BALANCING THE VERTICAL AXIS WHEN IN MOTION

In order to test the VERTICAL BALANCE of the SLED while you are in motion you will need to read the section called “HANDLING YOUR GLIDECAM X-45 SLED” before going any further. The reason for this is that you need to be all suited up with the SUPPORT VEST,X-45ARM, and SLED on to test the VERTICAL AXIS while you are in motion. You should also read the “BALANCING THE VERTICAL AXIS” section before going any further.

To test the BALANCE of the SLED’s VERTICAL AXIS when in motion, hold the SLED with your left hand very lightly holding onto the CENTER POST just below the GIMBAL, and use your right hand to hold onto the curved GIMBAL HANDLE. Make sure that the CAMERA is aiming forward, then walk briskly forward. As you walk briskly forward, observe the BASE PLATFORM and CENTRAL SUPPORT POST. If the SLED swings or pendulums away from the upright VERTICAL position it was just in at the moment you moved forward, then the SLED is not balanced correctly. The SLED’s CENTER POST should remain vertical during this movement, if it is balanced properly.

Another way to test for correct VERTICAL BALANCE is to walk briskly forward with the SLED, and then stop suddenly. If the SLED swings or pendulums away from the upright VERTICAL position it was just in at the moment you stopped, then the SLED is not balanced correctly.

This type of “movement test” applies also to running, or turning around quickly with the SLED. Again, if the SLED is balanced properly, then any body movement like running or turning will not effect the basic upright and vertical position of the SLED.

**NOTE: As mentioned earlier, the quickest and easiest way to achieve correct VERTICAL BALANCE is to move the position of the GIMBAL TUBE either up, or down on the CENTRAL SUPPORT POST. Remember, you will need to move the GIMBAL TUBE down if the SLED is too BOTTOM HEAVY, or move the GIMBAL TUBE up if the SLED is too TOP HEAVY. However, if the SLED is too BOTTOM HEAVY, then you might want to first try contracting the EXTENSION POST to reduce BOTTOM HEAVINESS, before you attempt to lower the GIMBAL TUBE on the CENTER POST.**

**NOTE: Always make sure that the GIMBAL TUBE is very tightly secured in place before using the system. You may want to switch out the kip handle on the gimbal tube for a socket head if needed.**

After you have readjusted the position of the GIMBAL on the CENTER POST, or either extended, or contracted the EXTENSION POST, or added or subtracted WEIGHT from the SLED’s BASE as mentioned in the previous procedures, you should RETRY the “in motion” VERTICAL BALANCE tests as mentioned above until the SLED is properly BALANCED. This procedure might have to be repeated to find the right position for the GIMBAL TUBE etc.. The numbered GUIDE SCALE MARKINGS on the upper portion of the CENTRAL SUPPORT POST are designed to allow you to incrementally adjust the position of the GIMBAL TUBE, and to allow you to take note and reset the GIMBAL TUBE to any given position in the future.

Also, after adjusting the VERTICAL BALANCE you might have to go back and readjust the HORIZONTAL BALANCE again in order to obtain really fine balance of the whole system. This is not always necessary, but you should check the HORIZONTAL BALANCE again to make sure it is correct. NOTE: The HORIZONTAL BALANCE of the SLED becomes less sensitive, as the SLED becomes increasingly bottom heavy. And conversely, the HORIZONTAL BALANCE becomes very sensitive, as the SLED progresses towards correct VERTICAL BALANCE.

**NOTE: After you have BALANCED both the SLED's HORIZONTAL and VERTICAL AXIS, you should then park or dock the SLED onto the DOCKING end of the DYNAMIC BALANCE AND DOCKING BRACKET. To do this make sure that you set the DOCKING end of the BRACKET so that it is aligned over one of the STAND's legs. You can now slide the DOCKING RING, which should be attached to the central post above the gimbal, into position locking the sled into the Docking Bracket.**

If all is proper the SLED should now be docked in such a way that later after you have put the SUPPORT VEST and SUPPORT ARM on you will be able to connect the end of the SUPPORT ARM to the GIMBAL HANDLE without having to bend over to pick the SLED up. In other words, you should adjust the height of the STAND so that the DYNAMIC BALANCE AND DOCKING BRACKET is just a little below shoulder height, or whichever height ends up working best for you.

# #4.6 GLIDECAM X-45 SLED: HANDLING YOUR GLIDECAM X-45 SLED

**NOTE: Please make sure that you read the following sections over before you actually put the VEST, SUPPORT ARM, and SLED onto your body. Even though the sections are written from the point of view that you are actually following the procedures as you read them, this is not really the case. So read the sections first, and then use the system.**

Before you can operate and handle the GLIDECAM X-45 SLED you must learn the correct sequence of putting the X-45 SLED system onto your body. This sequence is rather simple and obvious, but it is nonetheless important. Whenever you use the GLIDECAM X-45 SLED you should always put the SUPPORT VEST on first, then attach the SUPPORT ARM onto the VEST, and then connect the SLED to the end of the SUPPORT ARM. More information on this follows.

Also, it is often best to set up, or make adjustments to the SLED, VEST, or SUPPORT ARM when you are not wearing the SUPPORT VEST, for the VEST can restrict you body's movements.

HEALTH WARNING: Operating and handling your GLIDECAM X-45 SLED requires that you are in good health. If you are not in good health do not use the GLIDECAM X-45.

# #4.7 GLIDECAM X-45 SLED: CONNECTING THE SLED TO THE SUPPORT ARM

Now given that the X-45 SLED is properly setup and BALANCED and parked on the DOCKING end of the DYNAMIC BALANCE AND DOCKING BRACKET, and given that you have the SUPPORT VEST on properly with the SUPPORT ARM connected to it, you can now attach the SLED onto the SUPPORT ARM.

When you connect the SLED to the SUPPORT ARM you are actually connecting the bottom of the curved GIMBAL HANDLE to the ARM POST. Since the SLED is DOCKED on the BRACKET that is attached to the top of your GRIP STAND etc. it should now be very easy to just walk up to the docked SLED, and simply slide the top of the ARM POST into the bottom receiving socket that is on the bottom of the GIMBAL HANDLE. Make sure that the ARM POST goes all the way into the GIMBAL HANDLE's receiving socket before you undock the SLED from the DOCKING end of the BRACKET. You might have to adjust the height of the DOCKING BRACKET so it is at a height which makes it easy for you to connect the ARM to the GIMBAL HANDLE. The best height is a height that allows you to not have to crouch or bend over to get the ARM and GIMBAL HANDLE connected. Try setting the BRACKET just below the height of your shoulder. This height works quiet well for most people.

**NOTE: When you undock the SLED from the BRACKET you will suddenly feel all the weight of the X-45 SLED system on you. Be extra CAREFUL at this point. Having all this added weight on you can take quite a bit of getting used to. Again, be very careful of your back. At this point you should not wander too far from the sled DOCKING area, for you might suddenly feel the need to take the SLED off, and if you are not near the DOCKING BRACKET you will have to place the SLED onto a table or the floor, and in doing so you could injure your back. It will soon become obvious to you that the use of the DOCKING STATION is mainly to make it easier on your back.**

At this point you should have the SLED attached to the end of the SUPPORT ARM. Make sure that you never let go of the ARM in such a way that it swings completely out in front of your body. If the ARM is allowed to be fully extended in front of you, you will feel the full load of the system on your back, which will needlessly fatigue you. If the ARM does get away from you and swing all the way out in front of you, then instantly grab hold of the rigid UPPER ARM and pull it towards your body, and then grab hold of the spring operated FOREARM and also bring it back into your control. Again, don't let the ARM swing out of control in front of your body, doing so could cause serious injury.

# #4.8 GLIDECAM X-45 SLED: OPERATING THE GLIDECAM X-45 SLED

Given that you now have the Glidecam VEST, ARM and SLED correctly setup and on your body, you can now begin to learn how to shoot smooth shots with the system.

The X-45 SLED can be used equally well by either left handed, or right handed operators. When you operate the Glidecam X-45 SLED you will need to use your RIGHT HAND to hold onto the curved GIMBAL HANDLE, and your LEFT HAND to hold onto the area just below the GIMBAL TUBE on the CENTRAL SUPPORT POST. For reference we shall call the HAND that holds onto the curved GIMBAL HANDLE the HOLDING HAND, and we shall call the HAND that holds onto the CENTRAL SUPPORT POST just below the GIMBAL TUBE the GUIDING HAND.

When your RIGHT HAND is on the GIMBAL HANDLE it is being used to control the position of the SUPPORT ARM in front of your body. It is your right HOLDING HAND that moves the SUPPORT ARM up or down, in and out, or side to side.

When your LEFT HAND is on the CENTER POST it is being used to control the orientation of the CAMERA by controlling the position of the SLED. It is your left GUIDING HAND that moves the SLED in a way which causes the CAMERA to TILT, PAN, or ROLL.

Your left GUIDING HAND should lightly hold or touch the CENTER POST just below the CENTRAL BEARING on the GIMBAL TUBE. The reason for this is to have your GUIDING HAND positioned as close to the CENTER of GRAVITY of the SLED as possible. If you were to GUIDE the SLED with your LEFT HAND say 6” below the GIMBAL TUBE then it would be very difficult to not cause the SLED to inadvertently TILT, PAN or ROLL.

**NOTE: Make sure that your GUIDING HAND and/or wrist do not touch the GIMBAL’s MAIN BEARING ASSEMBLY and/or YOKE during shooting, for doing so can cause unstable shooting.**

And again, always make sure that your GUIDING HAND holds lightly onto the CENTER POST and that you do not grab the CENTER POST in a way that would cause the SLED to not float freely. In other words do not try to hold up any of the SLED’s weight by holding tightly onto the CENTER POST. Obviously it is all right to apply enough pressure to the CENTER POST to cause the SLED to TILT, PAN or ROLL.

When shooting you will be using your GUIDING HAND to gently or rapidly guide the CAMERA in the direction you wish to shoot. It is the GUIDING HAND that controls the PANNING, TILTING and ROLLING of the SLED. You can guide or hold the SLED so as to shoot upside-down (given you balance the SLED for this), sideways, low near the ground, overhead or angled as in a Dutch shot.

You should also realize that the quality and smoothness of your TILTS, PANS and ROLLS will depend on how well you learn to control the CENTER POST and SUPPORT ARM. Again, since the SLED is in essence floating freely, slight twitches of the GUIDING HAND can cause twitches in your shots. With heavier cameras this is not so much of a problem, and it is not a problem with lighter cameras after you get used to shooting with the SLED.

The GLIDECAM X-45 SLED is designed to work best only when the CAMERA OPERATOR is using their HOLDING HAND and their GUIDING HAND to hold and control the ARM and SLED. If you try to operate the SUPPORT ARM with just your HOLDING HAND, the camera may drift or pan away from its original position. Also, without the GUIDING HAND in place, you will be unable to control the direction of the camera. It is possible however, to use just your GUIDING HAND while it is guiding the CENTER POST to control both the SLED and ARM at the same time, but this is not recommended.

As a reference in learning the best positions to use your SLED, you should think of your waist like a clock, with your navel being at 12 o'clock, your center back at 6 o'clock, your left hip at 9 o'clock, and your right hip at 3 o'clock.

For most shooting situations you will want to place the CENTER POST of the SLED on your left side at, or between the 9 and 11 o'clock positions. If you need to move through a narrow hallway, or doorway, then you might need to move the SLED in front of you to the 11 or 12 o'clock position. You can change the position of the SLED during shooting by simply using your right HOLDING HAND to move the end of the ARM and consequently the SLED to the position you desire.

A typical shot might start with the SLED in the 10 o'clock position, with the SLED close to your body, then as you travel through a doorway you would move the SLED to the 11 or 12 o'clock position, with the SLED away from your stomach, and when you clear the door frame you might return the SLED to the 10 o'clock position, with the SLED close to your body. During a typical shot you might also boom the FOREARM up and/or down depending on the framing requirements of the shot.

When the SLED is in front of you, you will need to keep it far enough away from your body so you don't end up bumping your legs into it. When the SLED is by the left side of your body you should try to keep it as close to your body as possible without either the SLED, or the ARM touching you. The reason to keep the SLED as close to your body as possible during most shooting is to reduce the amount of fatigue on your body and back. When the SLED is near to your own body's center of gravity it becomes a lot easier to shoot for longer periods of time. Also, when you move the SLED away from your body you might find it easier on your back if you lean backwards a bit. This can be especially true with heavier cameras.

It is possible to shoot smooth shots with your X-45 SLED with the ARM and SLED in a wide variety of positions, but the above mentioned positions are generally best for most shooting situations. After you get accustomed to using the X-45 SLED you will inevitably find SLED positions that work best for you.

NOTE: Always keep the SLED as VERTICAL as possible during shooting, except for when you intentionally want the SLED to be TILTED, PANNED, or ROLLED.

NOTE: The main concern when shooting with the X-45 SLED is to be aware of your shooting frame's HORIZONTAL ALIGNMENT. One of the main things which can make a shot look unstable is when the CAMERA appears to be tipping over to either its left, or right side. This tipping motion is also called ROLL. ROLL is very different from a PAN, or a TILT, because when a CAMERA is PANNED and TILTED its frame's HORIZONTAL ALIGNMENT is not effected.

So therefore, with the exception of an intentional SLED ROLL, virtually all of your shots should be executed in a way that is completely free of SLED ROLL. SLED ROLL is very much like CAMERA ROLL, except that with SLED ROLL the center of rotation is within the GIMBAL. CAMERA ROLL is when a CAMERA rotates around the axis that runs through the center of the lens' length.

Also, when shooting with the X-45 SLED you do not always have to have the CAMERA facing in the same direction that your body is facing. Sometimes it is a lot easier, and a lot more comfortable to have the SLED angled so that the side of the BASE PLATFORM and CAMERA are either diagonal, or parallel with the front of your torso. This type of SLED alignment allows you to have the SLED even closer to your body, thereby reducing fatigue. You will of course need to walk or move at an angle if you wish to use this type of SLED alignment, while the SLED and CAMERA are moving in a forward direction from their point of view. You can even turn the SLED around, and shoot with the CAMERA looking over your shoulder even though you are walking forwards, or if you wish you can walk forwards and shoot sideways etc. You will probably have to rotate or adjust the orientation of either the CAMERA, or the MONITOR for over the shoulder shots etc. Whenever you reposition the direction of the CAMERA on the CAMERA MOUNTING PLATE, or whenever you alter the position of any item on the SLED such as the MONITOR or WEIGHTS, then you will most likely need to readjust the SLED's HORIZONTAL BALANCE and possibly even the SLED's VERTICAL BALANCE.

**NOTE: Also important is the position or angle of the GIMBAL HANDLE in relation to the end of the SUPPORT ARM's FOREARM. As a reference in learning the best angles to use your GIMBAL HANDLE, you should think of the GIMBAL HANDLE as a hand on a clock, with the 12 o'clock position being the location of the SLED's CENTER POST given that the GIMBAL HANDLE was pointing straight out in front of the FOREARM. If the GIMBAL HANDLE was in the 6 o'clock position then it would be pointing at the SUPPORT ARM's ELBOW HINGE.**

For most shooting situations you will want to angle the GIMBAL HANDLE so the SLED's CENTER POST is at, or between the 12 and 3 o'clock positions. It is these positions which will allow you to hold the ARM close to your body and still have the SLED positioned comfortably. When moving through a narrow doorway it is often best to set the GIMBAL HANDLE at the 3 o'clock position.

It is possible to shoot smooth shots with your X-45 SLED with the GIMBAL HANDLE at a wide variety of angles, but the above mentioned positions are generally best for most shooting situations. After you get accustomed to using the Glidecam X-45 SLED you will inevitably find GIMBAL HANDLE positions that work best for you.

Operating the Glidecam X-45 SLED for extended periods of time can easily tire your arms and/or back etc. If fatigue sets in while shooting you should either place the SLED as close to your own body's center of gravity, so that the weight of the system is easier to carry, or you should park the SLED on the DOCKING BRACKET and then rest between takes. If you are not near the DOCKING BRACKET and feel the need to put the SLED down, then try to place the SLED onto a work table etc. If you have to place the SLED on the ground, then be sure to bend with your legs and not your back. And again, when placing the SLED on the ground be extra careful of your back. Remember that you can set the "KICK-STANDS" on the BASE of the SLED in their open position when the SLED is resting on level, or near to level ground.

**NOTE: EVERY TIME YOU USE THE GLIDECAM X-45 SLED ALWAYS LOOK THE SYSTEM OVER COMPLETELY BEFORE YOU ACTUALLY USE IT. THE REASON FOR THIS PRE-SHOOT INSPECTION IS TO ENSURE REASONABLE SAFETY FOR BOTH THE OPERATOR AND THE EQUIPMENT. WHEN INSPECTING THE SYSTEM LOOK TO SEE IF ALL THE SCREWS, AND PINS THAT HOLD THE SUPPORT ARM TOGETHER, AND THE VARIOUS CONNECTORS, FASTENERS AND STITCHING ARE ALL IN PROPER WORKING ORDER. ONLY WHEN YOU ARE SURE THAT THE SYSTEM IS WORKING CORRECTLY SHOULD YOU THEN USE THE X-45 SLED. AGAIN, THIS PRE-SHOOT INSPECTION SHOULD BE DONE EVERY TIME YOU USE THE X-45 SLED.**

When handling and operating your Glidecam X-45 SLED should always avoid violent moves. Violent movements could cause damage to the X-45 SLED or cause your camera to pull loose off the CAMERA PLATE. We recommend that you do not exceed 2 G's of acceleration when handling and operating your Glidecam X-45 SLED. Also, the Glidecam X-45 SLED is not intended for use under water, nor does it work under water. The X-45 SLED is not waterproof, so avoid direct exposure to rain or water spray. Also the BEARINGS are not sand and dirt proof, so avoid getting dirt or sand into them. The X-45 SLED is not arctic weather proof and if used in extreme cold the bearings could cease to operate. (See Bearing Maintenance)

# #4.9 GLIDECAM X-45 SLED: SHOOTING STYLES

For NORMAL SHOOTING, hold the GLIDECAM X-45 SLED with your GUIDING HAND at the point just below the CENTRAL BEARING on the GIMBAL TUBE as mentioned in previous sections. This placement of the GUIDING HAND will allow you to slowly or rapidly PAN or TILT your camera, while still producing smooth and shake free images. It is this position that will allow you to shoot smooth shots when walking or running with the SLED. NOTE: Make sure that your GUIDING HAND and/or wrist do not touch the GIMBAL's MAIN BEARING ASSEMBLY and/or YOKES during shooting, for doing so can cause unstable shooting.

For UNCONVENTIONAL SHOTS, like ones that require aiming the camera either straight up or down, sideways, or angled as in a Dutch type shot, you can try holding the SLED with your GUIDING HAND on a LOWER portion of the CENTRAL SUPPORT POST. With your hand in this position your GUIDING HAND will have a greater degree of control over the SLED while shooting at strange angles etc. It is this position that might allow you the smoothest shots when shooting very erratic shots, like shots simulating the point of view of someone who is drunk, or shots where you are trying to simulate the point of view of a bird flying through a house etc.

Also, the GUIDING HAND positions for shooting NORMAL or UNCONVENTIONAL shots can be interchanged in the middle of a shooting sequence.

# #5 OTHER CAMERA ATTACHMENT METHODS

**Quick release and installation** - To either remove or put your camera onto the CAMERA MOUNTING PLATE without removing the MOUNTING PLATE from the top of the unit, loosen the four BLACK THUMB SCREWS on the CAMERA MOUNTING PLATE and then slide the PLATE either forwards or backwards, so as to gain access to the underside of the CAMERA MOUNTING PLATE. (Not all of the MOUNTING HOLES are accessible this way, however all the MOUNTING HOLES can be accessed by removing one set of left and right BLACK THUMB SCREWS, and then sliding the CAMERA MOUNTING PLATE until all of the MOUNTING HOLES are accessible.) Also, the Manfrotto 394, 3273 or 577 Quick Release plates work well.

**Creating a gasket** - If when attaching your camera to the HEAD PLATE you find that the bottom of your camera isn't flat enough to allow for a good solid attachment, try making and adding a paper/cloth or rubber gasket to the HEAD PLATE. (Try using a piece of a rubber dish washing glove.) Simply cut the material to the size of the top of the HEAD PLATE and then create a hole in it to allow the CAMERA MOUNTING BOLT to fit through it and into the base of your Camcorder.

# #6 PROFESSIONAL USAGE

If you are using the Glidecam X-45 System to shoot professional looking shots, and you plan on incorporating them into a short movie or some sort of commercial project, we suggest that you plan the shot out in advance, perhaps rehearse the move a few times before shooting, and that you use an assistant to help you during complex shots. This will give you optimum results and will make your movies look more professional.

Good luck with your shooting.

# #7 MAINTENANCE

**Bearing Maintenance** - The main bearing on your Glidecam X-45 System is attached to the Central Support Post about two inches down from the top. It is metal and is partially enclosed by the Bearing Assembly. If after some period of time your bearing doesn't turn smoothly, you can oil it lightly. We recommend that you use very little oil. Very little, because this is all that is needed, plus anything more than a little will end up coming out of the bearing and onto the rest of your Glidecam X-45 System. Light oil may also be used (5-20 weight or 5-30 weight) if needed on the yoke and handle bearings.

# #8 SAFETY PRECAUTIONS

Absolutely do not allow a fully loaded arm to swing out and away from you, doing so will put a lot of stress and torque on the arm to vest connection components and potentially cause damage to you and camera gear.

Do not place your fingers inside the arm as they can get caught in the arm stop areas. Don't let an unloaded arm swing about as it may hit you or someone near you.

# #9 WARNINGS

You should make sure that you are very careful when using the Glidecam X-45 System at night or in low light conditions. Do not make the mistake of focusing so much on what you are shooting that you trip or fall over something, or wander into something dangerous like a swimming pool or automobile traffic, and be extra careful when shooting on stairs etc. These cautions pertain to daytime shooting as well.

**Storage** - If you are going to store your Glidecam X-45 System for a long period of time then please store the unit upright in a dry or low to normal humidity area whenever possible. If you are unable to find an environment like this, then we suggest you store the unit in an air tight plastic container or bag. Standing the unit upright helps to alleviate stress on the system.

**Cleaning** - Do not use solvents or harsh cleaners of any kind on your Glidecam X-45 System. If the unit becomes dirty, use only a cloth or sponge with water to gently rub the unit clean

# #10 WARRANTY

For 1 year from the date of shipment, we will repair or replace your Glidecam X-45 System, free of charge, in the event of a defect in materials or workmanship (the shipment date appears on your purchase receipt) which occurs during normal use in accordance with the Glidecam X-45 System's instruction manual. Shipping, packing, and insurance costs to and from the factory are your responsibility. This limited warranty extends only to the original purchaser, and you will need your purchase receipt. This warranty does not cover, by way of example, damage caused by products not supplied by us or damage resulting from mishandling in transit, accident, misuse, vandalism, neglect, modification, lack of reasonable care (or commercial use, including rentals to others) of the Glidecam X-45 System or service by anyone other than us. There are no express warranties except as listed above. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

WE ARE NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE UNIT OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE WARRANTY PERIOD.

To obtain service during (or after) the warranty period: Contact **Glidecam Industries' Customer Service** Department by calling **1-781-585-7900** or write to us at: **23 Joseph Street, Kingston, MA 02364** and explain the problem.

**DO NOT SEND THE UNIT TO US WITHOUT FIRST OBTAINING A RETURN AUTHORIZATION NUMBER.**

# GLIDECAM INDUSTRIES, INC.

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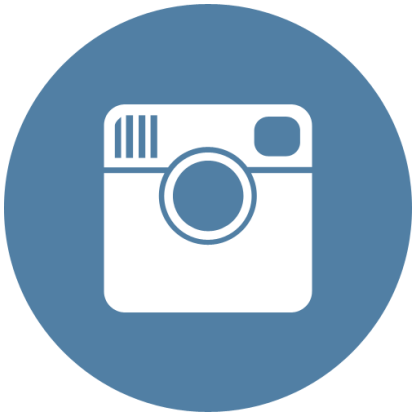

Instagram.com/Glidecam


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