



Set-up Guide

**A LETTER FROM
STEADICAM INVENTOR,
GARRETT BROWN**

Dear Friends,

You are about to have a two-part experience. Even the manual is in two parts. First you must go through the Setup of your particular camera on the Steadicam. Think of this stage as a brief game of weights and balances--It may fall short of delightful, but in no event will it be worse than assembling a barbecue grill!

Immediately thereafter you will progress to the delightful part—Operating! With the tape and the manual, you can learn everything that my friends and I have learned about shooting with the JR as of June 1990. Steadicam is a compelling and evolving art, and if you get hooked as easily as we did, you may want to keep the operating section with your camera so you can look up the odd nuance.

Meanwhile, good luck and have fun.

Garrett Brown

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1. INTRODUCTION

READ THIS FIRST

Congratulations on your purchase of the Steadicam JR.

The Steadicam JR is a camera stabilization system for lightweight camcorders based on the professional Steadicam widely used in professional film and television production. Camcorder video quality is now excellent, but unstable shooting still looks amateurish. When you master the JR, you will be able to move your camera smoothly, with a high level of artistic and creative freedom. With the JR your moves can be virtually indistinguishable from those made by dollies, cranes and the big Steadicam.

The Steadicam JR is one of those inventions that requires some know-how and practice from the user. Please read the rest of this introduction and then carefully follow the recommended procedure for setup and operation. You'll save time in the long run by not rushing into it, and minimize the risk of damaging the unit.

HOW TO USE THE JR MANUAL AND VIDEOTAPE

The JR manual and videotape are designed to be used together. They are divided into corresponding sections. Watching the video for each section will show you the basic principles and operations of the JR and give you a feel for how to perform them. Then the manual takes you step by step through the same operations on your JR and camcorder. We recommend that you proceed as follows:

- Read this introduction all the way through and prepare for setup as described. From this point on, each step requiring a specific action on your part contains space for a check mark and should be checked off as performed.
- Then watch section 1 of the videotape. Watch it all the way through, and don't attempt to follow along with your JR. We've found that it's almost impossible to work with the JR and watch TV at the same time!
- At the end of video section 1, stop the tape and turn to section 1 of the manual. Perform each step as requested, and check them off as you go. If you determine that a step does not apply to you, check it off as well.
- It is important to perform the steps in the proper sequence, to avoid both frustration and the risk of damage to the JR. Do not unfold the unit or attempt to mount your camera except as directed.

THE JR COOKBOOK

In addition to this manual, you have received the *JR Cookbook*. It contains pre-setting instructions for most commonly available lightweight camcorders. You will be referring to the specifications for your camcorder as you proceed through setup. Before we begin, locate your camcorder in the Cookbook and check the box next to it. Keep the Cookbook open to the appropriate page for reference.

If your camera is not in the Cookbook, we recommend the following:

- ① If you know that your camera generically resembles one that is listed, try using the specifications for that camera.
- ② If specifications for your camera are not available, read on; follow the steps you can, and later (in Section 8 of the video and manual) we'll provide instructions for balancing from scratch.



check off box as you complete each step

REQUIREMENTS FOR SETUP

Set aside a couple of hours for your first session with the JR. Set up a comfortable work chair and table in front of your TV and near a bright light, and put the following items within easy reach:

- The JR packing case. Don't unpack yet.*
- Your camcorder, with a fully charged lightweight or heavy-weight battery as specified in the Cookbook.*
- Large flat head and small phillips screwdrivers.*
- A pencil.*
- A white grease pencil or china marker (optional).*
- Cereal bowl (optional).*
- The VCR remote control. It can help to perform this setup as a team effort. One person reads the manual, checks off each item and plays the sections of videotape as appropriate; the other performs the setup of the JR.*

YOU WILL PERFORM THESE BASIC OPERATIONS

- Unpacking and identifying each part.
- Learning to safely unfold the JR into "flying mode" and to re-fold it into "travel mode". Don't attempt to unfold the JR until you reach this section.
- Presetting JR balance for your camera.
- Preparing and mounting your camera.
- Trimming (fine-tuning) JR balance.

Once the camera is properly mounted and balanced on the JR, we recommend that you leave it there permanently. The JR can be folded for travelling, put into shoulder mode for conventional hand-held shooting, or mounted on a tripod. JR setup takes a little time, but if you do it right you'll only have to do it once. If you do remove your camera it will automatically remount in the correct balanced position with just a single screw.

Now, you're ready to start. View the first section of the tape, including Section 1, "Introduction," and Section 2, "A Tour of the JR". Then continue with the next section of this manual.



2. A TOUR OF THE JR

Before you take your Steadicam out of the box...

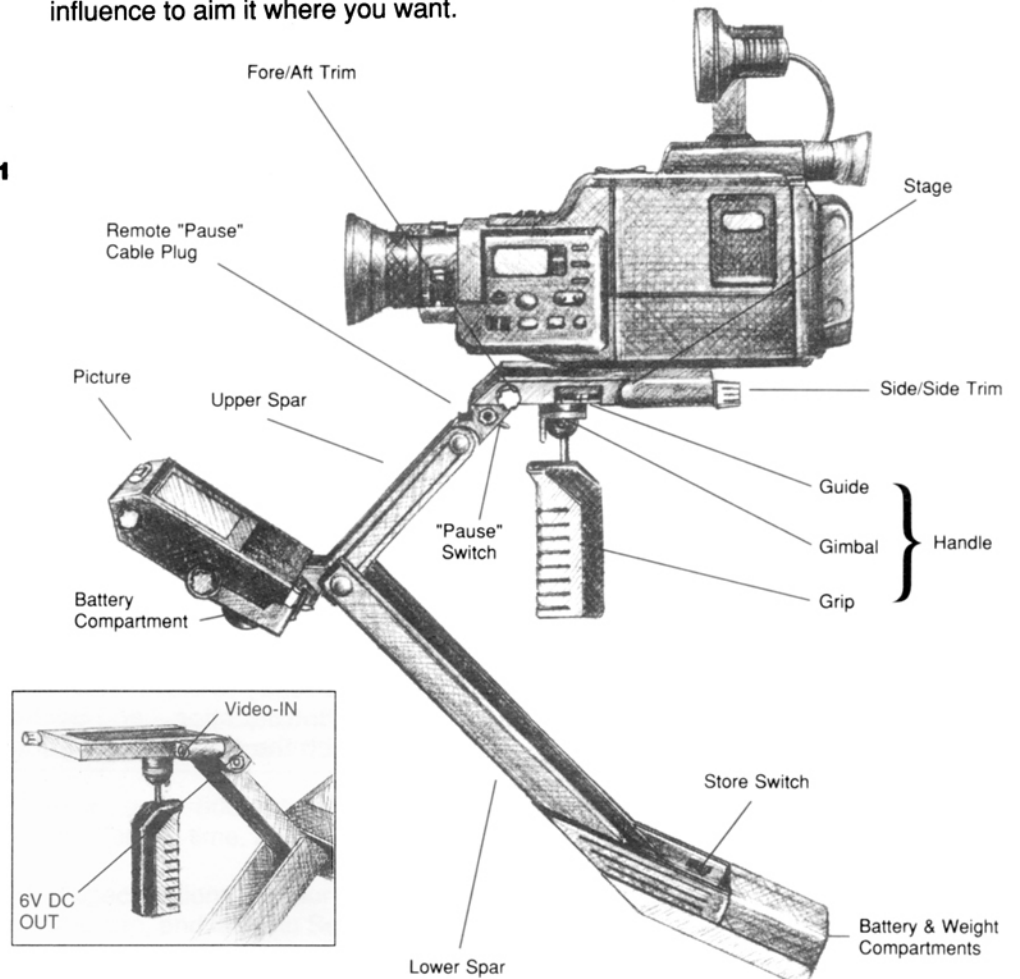
We'll begin by describing the purpose of the system and identifying the major components. Then we'll cover the procedure for safely unpacking and unfolding the unit. So leave it in the box for now!

Camcorders are unstable because the human beings holding them are always in motion. Small rising, falling and side-to-side movements don't really show unless there's some object close in the foreground, but tilting the camera up, down or side-to-side by a similar amount will noticeably affect the framing.

- Activate your camcorder, go fairly wide-angle and frame a scene across the room. Keeping the camera level, try raising and lowering it about an inch by slightly bending and unbending your knees, then moving it side-to-side the same amount by slightly shifting your weight from one foot to the other. Note that the effect on the framing is slight.*
- Now tilt the camera half an inch or so to the left... to the right... up... down. Note the dramatic effect on framing of these tipping motions.*

Hand-holding a camera, particularly a little camera, results in angular motions (little tilts and corrections) which are quite disturbing because the human eye doesn't see the world with the shakes. The Steadicam embodies an elaborate scheme to disconnect you from your camera, retaining only enough angular influence to aim it where you want.

Diagram 1





Locate the following parts on Diagram 1

- Gimbal and Grip.** *The shape of the JR is designed to stabilize the system by placing its center-of-gravity below the camera—in fact, just below the center of the Gimbal. The Gimbal won't permit any angular force to pass through it, so it doesn't matter if your hand shakes while holding the Grip, which is below the Gimbal and thus isolated from the camera.*
- Just above the Gimbal is the **Guide**, the small surface you use to aim the JR. Since your "gripping hand" does all the work in supporting the JR, your "guiding" hand can retain the extremely light touch necessary to aim the camera without transmitting the shakes.*
- The camera will be mounted to the **Stage**. The **trim controls** on the Stage make it possible to tune the balance of the system so that it is poised level on the Gimbal, but is ever-so-slightly bottom heavy.*
- The **Monitor** allows you to see what you're shooting without your eye at the viewfinder, which would transmit additional motion to the camera, and restrict your freedom to move it around with your arms.*
- Finally, the **Upper Spar** and **Lower Spar** distribute the mass of the system and place the Monitor in a comfortable viewing position.*

The combination of these elements works surprisingly well, and we hope you enjoy the JR as much as we do. Once you are good at it, you can make your way through almost any shooting situation without much fanfare, and end up with wonderful shots.



UNPACKING AND IDENTIFYING PARTS

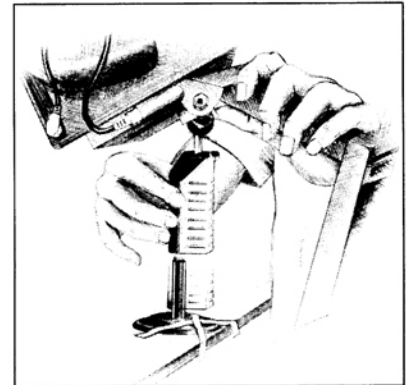
Remove the parts one at a time from the box, and make a check in the space provided as you identify each part. Any part that is packed in an envelope should be kept in that envelope after you identify it until it's called for. Do not throw away any packing material until all parts are accounted for. If anything is missing, please contact Tiffen for a replacement.

To order additional replacement parts see the enclosed parts list.

Standard Parts

Steadicam JR, including Monitor (with normal stop block installed).

The Steady Stand may be used to support the camera during balancing, to avoid tiring your arms. The procedure described in this manual does not make use of it. If you use the Steady Stand, place it at the edge of a level table and secure the base of the Stand with gaffer's tape or other heavy-duty tape. Do not use without firmly securing to the table. Allow room under the table for the Lower Spar to swing without obstruction. When the JR is in flying mode, the hole in the bottom of the Grip will fit onto the Steady Stand.



The Steady Stand is designed to aid in balancing the JR

- VHS video: "The Art of Steadicam JR"—Version 2.0.*
- Counter weights: 2 large, 2 small, 1 extra small.*
- Spare 'Obie' light bulb. (optional)*
- Mounting screws for mounting camcorder to JR (1 long, 1 short).*
- Locating pin set. Four different sizes, numbered 1-4 on the plastic "tree". Leave them on the tree for now.*
- Spare 'light' and 'heavy' stop blocks with screws (for use with various weight cameras).*
- Velcro strip. This is to provide optional cushioning and support as required by some cameras.*
- Rubber stabilizing wedge for further stiffening the camera mounting surface as required.*
- Spare Spar hinge cover.*

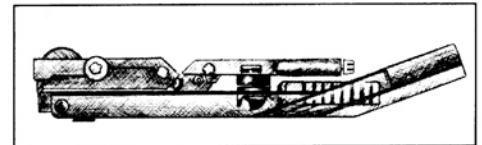


Special Parts

- RCA to RCA video cable for most 8mm camcorders.
- If you have a VHS-C camcorder, you should order our part number 8J020 VHS-C kit, including:
 - Stepper adapter for certain JVC and other side-mounted camcorder batteries. If mounting you camera to the JR interferes with the opening of the battery latch, use the stepper adapter.
 - Remote pause-control cable for most JVC, Panasonic, and other "make-break" type camcorders.
 - 8-pin A/V cable for most VHS-C camcorders.
 Contact your dealer if you have a VHS camcorder and want to order the kit.
- Certain camcorders do not use the supplied video cables. Contact your dealer or camcorder manufacturer.

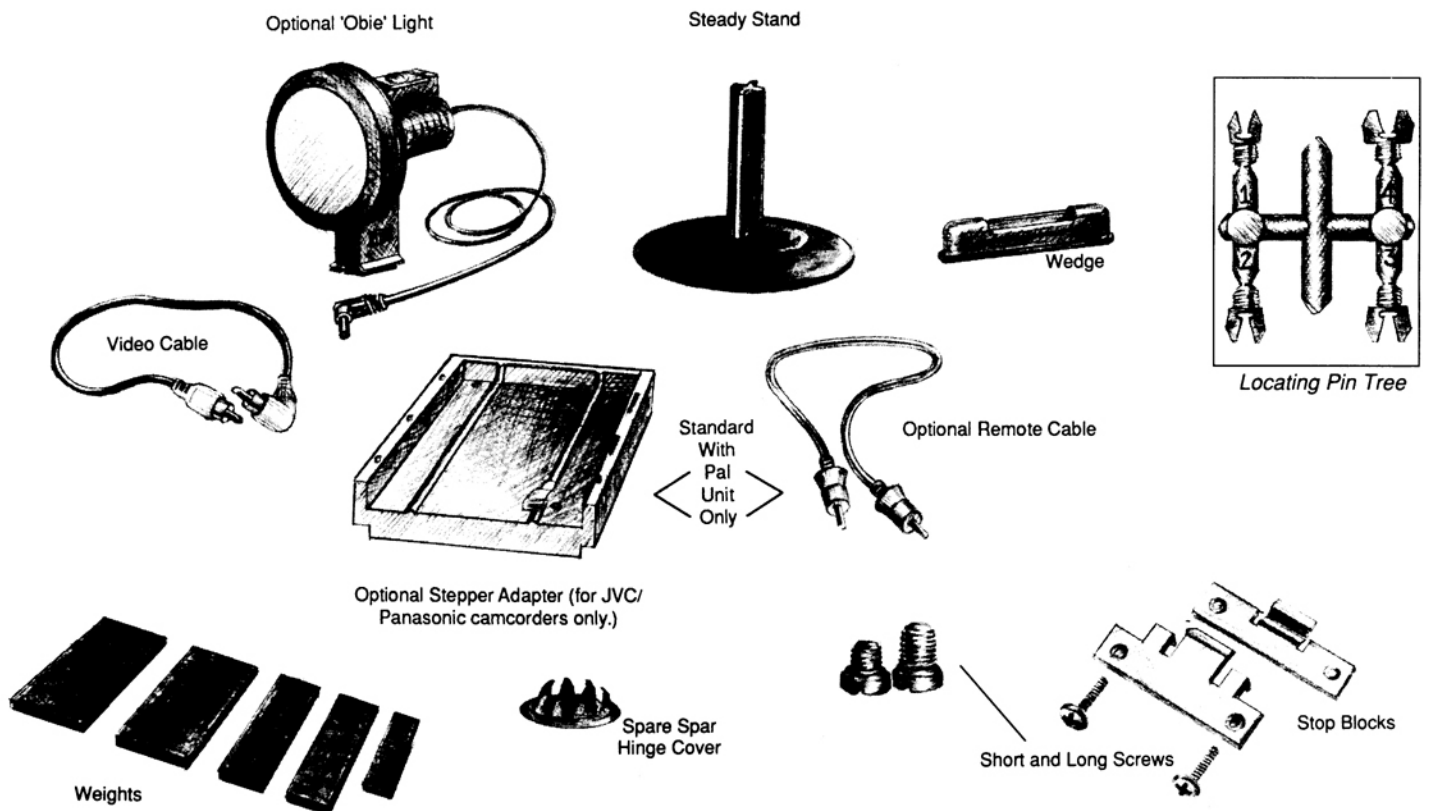
Note: Sony and Canon owners will be offered an accessory "L-protocol smart-cable" at an additional charge, to provide the correct data-stream for control of pause.

When all parts have been located and identified, watch Section 3 of the tape, "Unfolding the JR". Then continue with the manual.



Steadicam JR including Monitor

Diagram 2: Standard and Special Parts



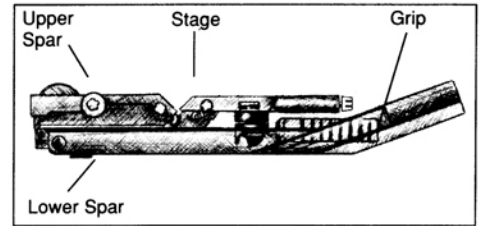


3. UNFOLDING THE JR

The Steadicam is shipped to you in its compact folded or *travel mode*. It is important to unfold and fold the unit in the proper sequence, to avoid accidental damage. Begin by unfolding the unit into flying mode as follows:

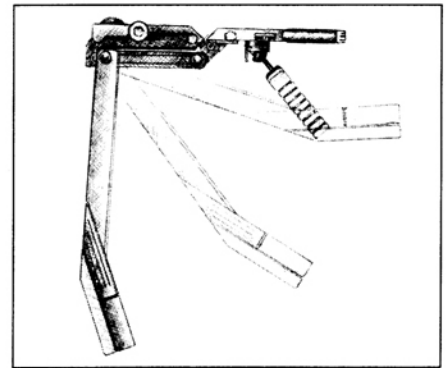
**Achieving
Flying Mode**

- Position the JR as shown, with the Monitor on your left. The Monitor end of the unit will be referred to as the front or forward end of the JR. Note the position of the Grip in the folded unit, laying flat between the upper and lower Spars.*



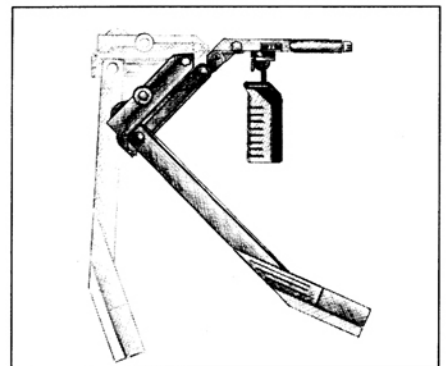
Diag. 3 Travel Mode

- Grasp the Stage in one hand. With the other swing down the lower Spar until it clicks into the fully opened position. The upper Spar will now form an angle of approximately 90° from the lower Spar.*



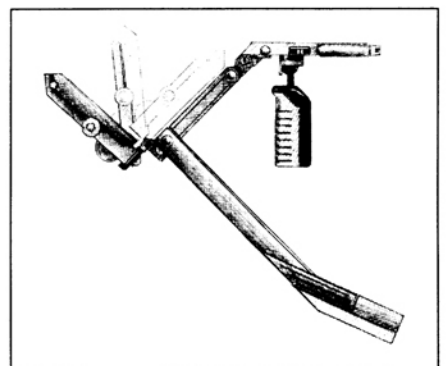
Diag. 4

- Grasp the stage in one hand and the upper Spar in the other and fold down until they click into position at about a 45° angle.*



Diag. 5

- Fully fold out the Monitor bracket to a 90° angle from upper Spar. The Monitor itself will now swivel forward and backward on the bracket. **DO NOT ATTEMPT TO SWIVEL THE MONITOR FROM SIDE-TO-SIDE.***



Diag. 6

The Steadicam is now in flying mode. When a camera is properly mounted on the Stage you will be able to hold the unit by the Grip (grey side forward) and the camera will "float" above it.



PRACTICE CLOSING THE JR

Shoulder Mode



Fold in the Monitor bracket.



*Fold up the lower Spar until it touches the Stage. **Be careful that the Grip slides back to lay flat within the lower Spar.** This is called "shoulder mode". Notice the "whale's tail" which swings out from below the battery compartment to help the JR rest on your shoulder. Fold the whale's tail back in before proceeding.*

Travel Mode



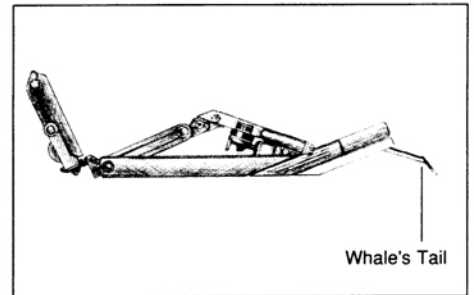
Carefully squeeze down the Stage so that the unit lies flat.

Now the unit is back in "travel mode".

Rest Mode



Another variation, referred to as "rest mode", is to face the Grip straight down as you fold up the upper Spar. Now you can set the unit upright on a table but maintain easy access to all moving parts. You may find this position useful during Set-up.



Diag. 7 Shoulder Mode



Unfold to flying mode again.

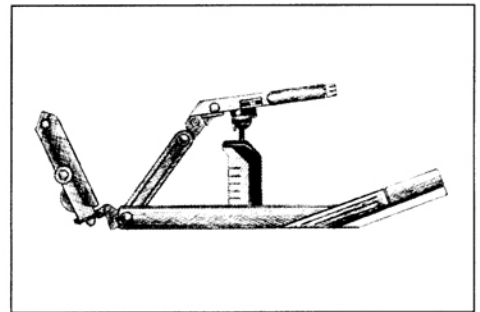
Compare the unit with Diagrams 1 and 8. Identify the following parts:



Gimbal. We identified the Gimbal in Section 1, but now examine its range of motion. The Gimbal contains delicate bearings, and must not be forced beyond its natural range of movement.



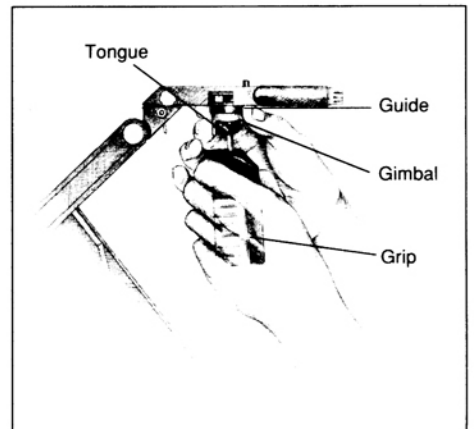
*Grip. The Grip supports and positions the JR. **The Grip should always be held with the grey side facing forward.** If it's held backward movement of the Gimbal will be impeded, and under some circumstances the Gimbal could be damaged. Try moving the Grip and Gimbal in both positions to get a feel for this.*



Diag. 7a Rest Mode



Guide. This is the grey ring above the Gimbal. The Guide provides a minimal surface so the thumb and fingers can aim the camera. The "tongue" at the front of the Guide provides extra surface area to assist in tilting the camera. Do not rotate or adjust the Guide yet.



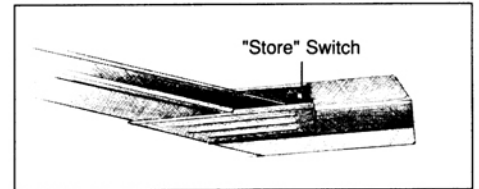
Diag. 8 Handle



- Fore-aft trim knob, on the side of the Stage.*
- Side-to-side trim knob, on the back of the Stage.*
- Pause switch and pause cable input, below the fore-aft trim.*
- Picture brightness adjustment knob, on the left side of the Monitor.*
- Upper battery compartment.*
- Lower battery and weight compartment.*
- Store switch. This switch should be placed in the OFF position whenever you stop working with the unit, even for a few hours, to avoid battery drain.*

Turn the unit around, with the Monitor on your right, and identify the following:

- Video-in connector. This is the input for the video signal from your camera.*
- 6 Volt DC out connector. This is the power output for the "Obie" light or other accessories.*
- Turn the unit upside down, and locate the stop block at the juncture of the lower and upper Spars. It's labelled "normal" and fastened down by two screws.*



Diag. 9 "Store" switch in OFF position

Now you are ready to begin balancing the unit for your camera. Watch Section 4 of the tape, "Presetting Z Axis (Vertical) Balance". Then continue with the manual.



4. PRESETTING Z AXIS (VERTICAL) BALANCE

When your camera is mounted onto the JR, the combined unit (camera plus JR) should balance perfectly on top of the Gimbal. But before performing this balancing act we need to make the combined unit bottom-heavy, or in other words, place the combined center of gravity of the camera plus JR below the Gimbal. Let's take a moment to understand this.

- Try balancing a cereal bowl on the tip of your finger. It's very difficult to do, because the center-of-gravity of the bowl is above your finger.*
- Turn the bowl upside down. Now it's much easier to find the balance point, and once you find it you can swing your finger from side-to-side and it won't fall off. That's because you've made the bowl bottom heavy and put its center-of-gravity below your fingertip.*

Slight bottom-heaviness is the key to Steadicam stabilization. That's what the weighted lower Spar is all about: to provide enough weight well below the Gimbal to compensate for the greater weight of your camera just above the Gimbal. You want the unit to be somewhat bottom-heavy before attempting side-to-side or front-to-back balance, or the camera will tend to flop over and hang upside-down.

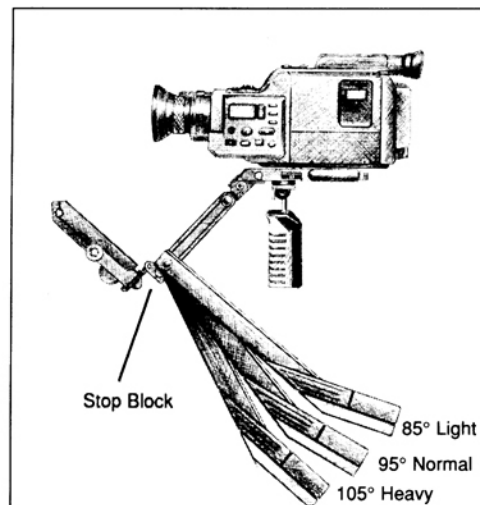
ACHIEVING BOTTOM-HEAVINESS

One: Stop Block

Because the JR accepts cameras weighing from 2 to 4 pounds, we have provided three ways of achieving appropriate bottom heaviness.

The coarsest adjustment is obtained by changing the stop block. Using the stop block marked "heavy" will cause the lower Spar to swing down 10°, thereby lowering the center-of-gravity to accommodate heavier cameras. Using the stop block marked "light" will raise the lower Spar by 10°, thereby raising the center-of-gravity to accommodate lighter cameras.

- Find the stop block recommendation for your camera in the Cookbook, and enter in this space _____.*
- Turn the JR upside-down, and note the position and function of the stop block. Flex the Spars, and observe how the tab on the stop block fits into the slot in the upper Spar. The size of the stop block determines the angle of the Spars in the open position.*
- If the light or heavy stop block is specified in the Cookbook, remove the two screws and change the stop block. Install with the recessed screw holes facing up and the tab facing forward. It is possible to put a stop block in backward, so pay attention!*



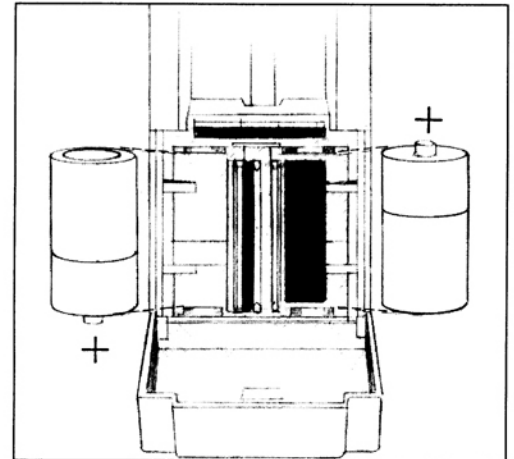
Diag. 10 Choosing the right Stop Block



Two: Adding Weights

A finer adjustment of the bottom-heaviness is obtained by adding weight to the lower Spar, which lowers the center-of-gravity in a more controlled manner.

- Primary weighting of the JR is accomplished with C-cell batteries in the Monitor housing and in the lower Spar. Remove the lid from the Monitor battery compartment. Note the battery polarity stamped on the bottom of the compartment, and install 2 of the alkaline C-cells as indicated.
- Find the supplementary weight recommendation for your camera in the Cookbook, and enter the totals here:



Diag. 11 Adding the weights

___ large; ___ small; ___ extra small

- Open the lower Spar battery compartment. Note the indication of polarity on the bottom of the compartment; then install batteries and weights. You have several possible places to put the weights:
 - Small weights can go under each battery.
 - Large weights can be placed in the two slots between the batteries.
 - When the two large weights are in these slots, one small weight can be placed between them.
 - The extra-small weight can be placed crosswise in front of the two batteries.

Three: Raising and Lowering the Gimbal

The finest adjustment of bottom heaviness is obtained by rotating the threaded Guide below the Stage to raise or lower the Gimbal. This is called the Z (vertical) axis adjustment, X being fore-and-aft and Y being side-to-side. THIS RING IS PRESET—DON'T ADJUST IT UNTIL DIRECTED!

- Consult the Cookbook and enter the approximate number of Z turns counterclockwise here : _____.
- With the unit open in "flying mode", turn it upside-down and stand it on the Stage.
- Examine the Guide ring under the Gimbal. At the front of the ring is a black rectangular latch button that keeps the ring from rotating. If this ring is depressed with a fingernail or the back of a pencil (it's purposely stiff) the Guide ring can be rotated one full turn before snapping back into its lock—but read the next several paragraphs, including the warning, before you try it!

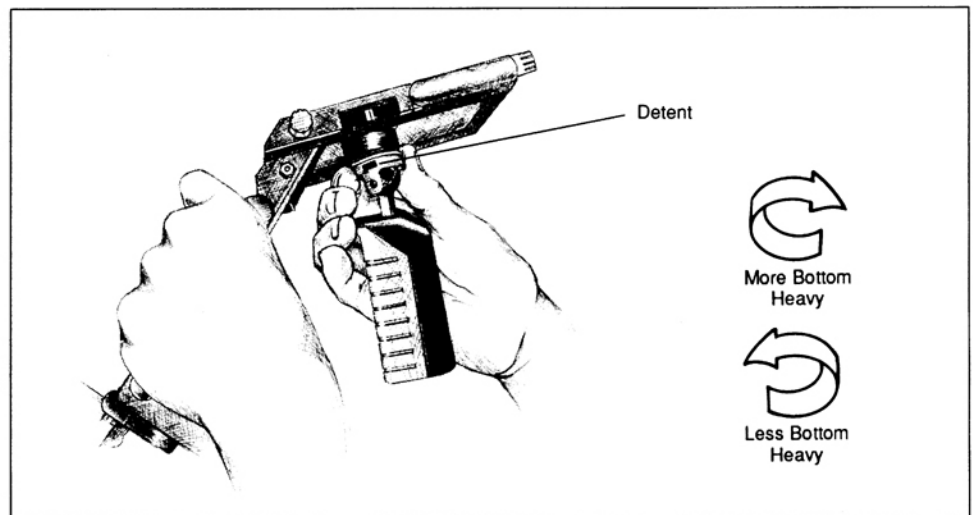


Rotating the Guide ring clockwise (screwing it IN) raises the Gimbal closer to the Stage. Rotating counterclockwise unscrews the ring and lowers the Gimbal away from the Stage. The unit was shipped from the factory with the Guide unscrewed (counterclockwise) three full turns.

WARNING: THE GUIDE CAN BE DIFFICULT TO ROTATE IF SCREWED ALL THE WAY IN, AND TIGHTENING THE GUIDE ALL THE WAY MAKES THE LATCH DIFFICULT TO RELEASE.

THE GIMBAL CONTAINS DELICATE BEARINGS—EXCESSIVE FORCE WILL CAUSE THE GIMBAL RING TO BREAK. DO NOT USE THE GRIP AS A LEVER FOR TURNING THE GUIDE. THIS WILL BREAK THE GIMBAL. ALSO DO NOT USE THE TONGUE AS A LEVER FOR TURNING THE GUIDE.

- Now depress the latch and gently rotate the Guide three turns clockwise, pressing in the latch each time it comes to the front of the unit. It should rotate easily. You may be able to rotate it part of a third turn, but **DO NOT ATTEMPT** to force or tighten it.*
- After determining that the Guide is screwed in all the way clockwise, back it off to the first detent position (latch forward). Then rotate it counterclockwise the number of turns specified in the Cookbook.*
- Always leave the Guide ring with the latch and tongue in the forward position, locked into place. If the Guide ring is left with the tongue at the rear, the handle will strike it and may snap off the tongue when the unit is folded into travel mode.*
- You have now preset the rough balance of the Z (vertical) axis. After the camera is mounted, this balance will be further adjusted.*



Diag. 12 Z Adjust

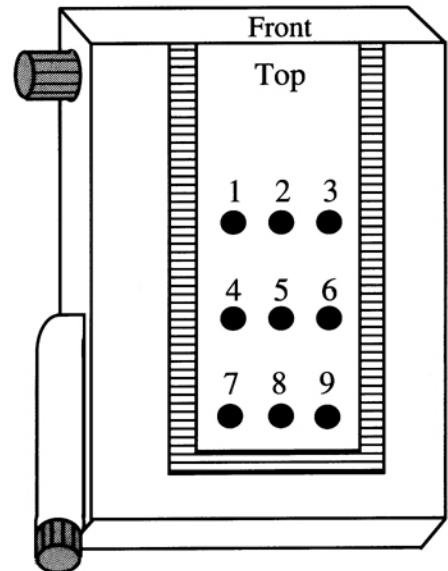
Watch Section 5 of the video, "Presetting the X-Y (Horizontal) Axis". Then continue with the manual.



5. PRESETTING THE X-Y (HORIZONTAL) BALANCE

Because the center-of-gravity of each type of camera is different, the positioning of each camera on the Stage will be different. Gross positioning above the Gimbal is accomplished by the proper choice of mounting hole. Fine positioning is accomplished with the fore-aft and side-to-side trim knobs.

- Consult the Cookbook to find the hole recommended for your camera. Note the hole # in this space _____.
- Examine the top of the JR Stage. There are nine mounting holes. Directly in front of each is a smaller hole for a locating pin. Consult diagram 13 to locate the appropriate hole, and mark it with a grease pencil or other marker. Be sure the mounting plate is facing the same way as the drawing.
- There are four threaded locating pins, numbered 1-4 on the "tree". Four is the largest. Find the locating pin size recommended for your camera in the Cookbook, and enter the number in this space _____.
- Twist and break off the appropriate pin from the tree. If any burr remains on the end of the threads, smooth it off with an emery board.
- Use a large screwdriver or coin to mount the locating pin directly in front of the mounting hole you plan to use.



Diag. 13 Top of Stage

Preset: Fore-Aft and Side-to-Side Knobs

Before mounting up the camera, let's take a closer look at the operation of the fore-aft and side-to-side trim knobs, and roughly preset them.

- Face the unit with the back end toward you and place on table in rest position.
- Rotate the side-to-side trim knob located on the rear of the Stage and note how it moves the camera platform inside the Stage. Rotating this control clockwise moves the platform to the right, and when a camera is mounted, this shifts the camera weight to the right. Rotating counterclockwise moves the platform to the left and will shift the camera to the left. Think of it as a wheel; whichever way you roll the wheel, that's the way the camera will tip. The control is finely calibrated, so it takes a lot of turns to achieve a noticeable effect.



Note that on the front of the Stage there is a scale indicating the position of the camera platform within its range of travel. This will come in handy when the platform itself is covered by the camera.

- Consult the Cookbook to find the correct preset for side-to-side trim . Enter the correct preset here_____.
- Preset side-to-side trim to Left (counterclockwise), Right (clockwise) or center, as appropriate.
- Now turn the unit upside-down on a table with the fore-aft control facing you. Rotate the fore-aft control and observe how it moves the small Gimbal platform slotted inside the Stage. Note also the fore-aft position indicator on the side of the Stage, which indicates the position of the Gimbal platform within its range of travel.
- When you have a feel for how this mechanism works, turn the unit right side up and face it forward again. Note that rotating the control counterclockwise moves the Stage forward on top of the Gimbal. Again think of a wheel: rolling the trim knob forward will (when there is weight on the Stage) have the effect of tipping the camera forward. Rolling the trim knob back will tip the camera backward.
- Consult the Cookbook to find the correct preset for Fore/Aft trim. Enter the correct preset here_____.
- Preset fore/aft trim Clockwise, Counterclockwise, or Center, as appropriate.
- If you are mounting in one of the front row of holes (1, 2, or 3), you may have to temporarily move the Gimbal to the front of the Stage (by rotating the fore/aft trim knob fully clockwise) to provide access from below to the mounting hole on the Stage. After your camera is mounted you can retrim the fore and aft adjustment to the preset position specified in the Cookbook.

Now watch Section 6 of the video, "Mounting your Camera." Then continue with the manual.



6. MOUNTING YOUR CAMERA

The presence of accessories or cables, even the position of a dangling lens cap or strap, will affect the center-of-gravity. Eventually you will want to balance the unit with your preferred combination of accessories in place. But to get started, we'll take you through mounting up the camera in a fairly *stripped down* state. This is how your camera was mounted to come up with the specifications for the Cookbook.

TIP: A bit of velcro mounted on the side of your camera makes a handy lens cap holder

- Remove the shoulder strap.*
- Remove anything else that will dangle and swing, such as your lens cap if it cannot be clipped to the side strap or otherwise immobilized.*
- If you have a choice of light and heavy camcorder batteries, mount up the light battery, unless the Cookbook indicates otherwise.*
- If your camera has an accessory shoe, mount up the "Obie" light.*
- Ultimately you may want to use a wide angle adapter with the JR; but for now, leave it off.*
- If you are using any other special accessories or sound gear on the camcorder, remove them temporarily if possible.*
- Put a tape in the camera. Don't balance the JR without a tape installed!*
- Consult the Cookbook to determine whether your camera should be mounted with the short or long camera mounting screw. Locate the proper screw.*
- Turn your camera upside-down and hold it between your knees, with the lens away from you. Note the small "locating" hole in front of the threaded mounting hole.*
- Hold the JR upside-down, with the Monitor facing away from you.*
- Guide the locating pin on the inverted JR into the locating hole on the camera.*
- The appropriate mounting hole on the JR Stage should now be directly over the mounting hole of your camera. Insert the screw and tighten snugly with a large screwdriver. Do this gently; if you inadvertently use the large screw where the small screw is called for, you could pop the*



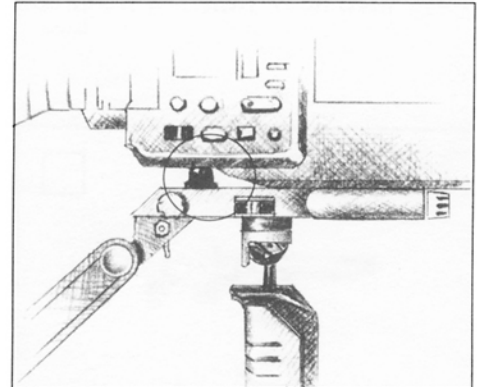
Diag. 14 Invert camera and JR for easy mounting visibility



metal mounting insert out of your camera. If the large screw tightens into the camera without fully clamping down the Stage, switch to the smaller screw.

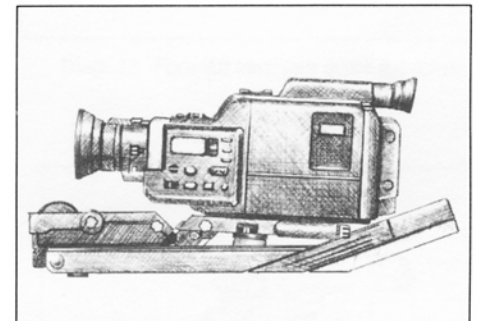
If you used mounting hole 1, 2 or 3, you may now set the fore/aft trim control as specified in the Cookbook.

If your camera does not make contact with the front of the camera platform, the rubber wedge can be stuffed under the front of the camera to further brace it against vibrations front-to-rear. Note: certain cameras have recessed back-light buttons etc. in this area—check that the wedge doesn't contact them.



Diag. 15 *The Wedge fits in front of your camera*

You may need to trim down the wedge to fit under the front of your camera, or add cardboard shims to create a tighter fit. If your camera sits flush on the Stage, a shim may still fit under the front to create a firmer fit. Be careful not to shim up the camera too high as it may cause excessive strain on the threaded insert.

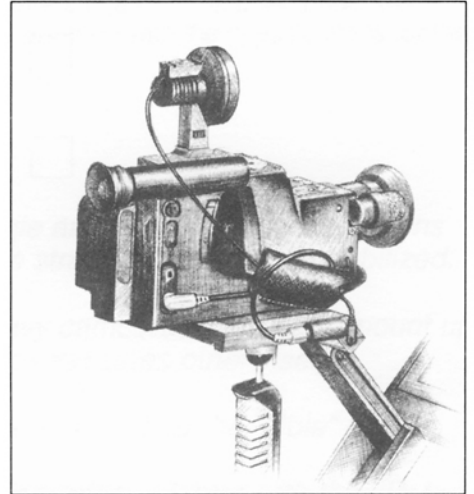


Diag 16. *Folded/Travel Mode*

When the camera is snugly mounted, carefully fold the unit into travel mode. As you do so, note whether the back of your camera makes contact with the battery compartment of the lower Spar. Some cameras, especially if they are mounted toward the rear (or if a large rear-mounted camcorder battery is used), will strike the lower Spar before the unit fully closes. This is not harmful, but it may scratch the JR battery cover, if this is the case:

- *Avoid closing the unit too forcefully.*
- *You may wish to add a piece of the provided velcro strip as a cushion at the point of contact on the lower Spar battery compartment.*

- Add the video cable from the video-out of your camcorder to the video-in of the JR.
- Plug the cable from the "Obie" light into the 6 volt DC out connector of the JR.
- If your camera has a remote pause connector, run the supplied remote pause cable to the pause connector of the JR.
- "Dress" the cables around the camera and through and around the hand-strap so they don't flop around. The Steadicam operates in such fine balance that even a loose cable could cause variations in the trim.



Diag. 17 "Dress" the cables

Now watch Section 7 of the video, "Horizontal and Vertical Trim". Then continue with the manual.

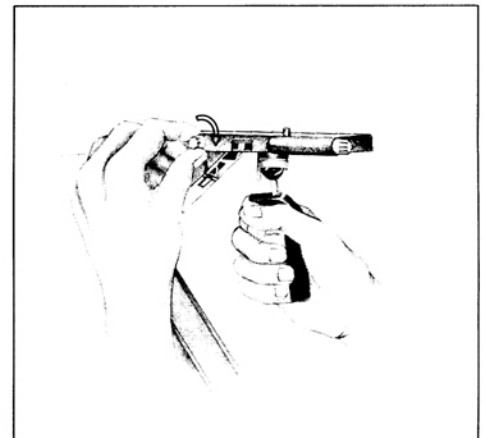


7. HORIZONTAL AND VERTICAL TRIM

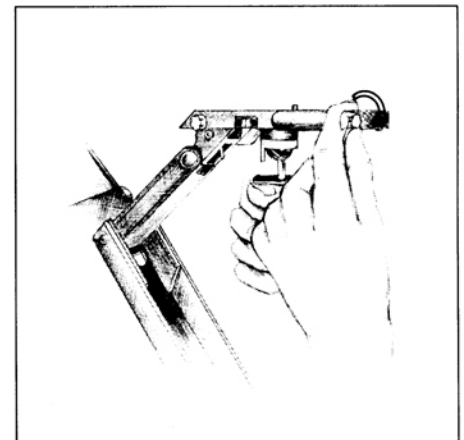
**ROUGH X-Y
(HORIZONTAL) TRIM**

- Make sure the upper and lower Spars are fully separated and locked, that the Stage is fully lowered and locked, and the Monitor bracket is fully folded out and locked. If any of these hinges are partially folded, balance will be radically affected.*
- Grasp the Grip with your right hand, and steady the camera with your left. Hold the unit in front of you and tentatively release the camera. Unless it happens to be in perfect balance, it will start to tilt over. Note the direction of tilt.*
- Steady the Guide with your right thumb and forefinger, or let your right hand slide up until the Stage rests on top of it, and perform a rough trim of the unit:*
- If the camera tilts forward, turn the fore-aft knob several quick turns clockwise to move the camera to the rear.*
- If the camera tilts back, turn the fore-aft knob several turns counterclockwise to move the camera toward the front.*
- If the camera tilts to the left, move the side-to-side knob several quick turns clockwise to shift the camera to the right.*
- If the camera tilts to the right, move the side-to-side knob several turns counterclockwise to shift the camera left.*

In practice you will be working with a combination of both knobs, periodically moving your grip hand down and releasing the camera to check balance. Don't go for perfect level yet; you just want to get the camera to float up there without falling over.

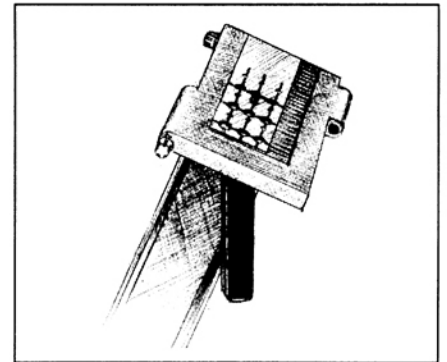


Diag. 18 Fore/Aft trim; use quick full turns



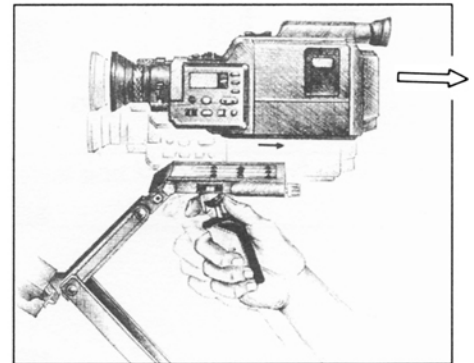
Diag. 19 Side-to-Side trim; use quick full turns

If a trim knob reaches the end of its travel without correcting the tilting of the camera, you will need to change to a different mounting hole on the Stage. Carefully remove the camera and select the adjacent hole "uphill" on the mounting plate from the camera's current off-level position. Move the locating pin, and remount the camera.



Diag. 20 *Levelling: select adjacent hole "uphill" on the mounting plate*

If the unit falls over in any direction you tilt it, then it may be top heavy, like the bowl we talked about earlier. Try adding a weight, or replacing a small weight with a large one and retrim for level. The idea is to be slightly bottom heavy, but no more than necessary. We'll take a closer look at how to arrive at that happy state in the next section.



Diag. 21 *Retrim for finger room: move camera one hole to rear*

If finger-room is tight between Guide and upper Spar, you may wish to try moving the camera one hole to the rear on the mounting plate and attempt a new fore-and-aft trim. This will get you some extra room. If retrim won't achieve approximate level, you must return to the original hole.

When the unit is in rough X-Y trim, the camera will float almost level above the Gimbal as you hold the unit by the Grip. Now it's time to check the vertical trim and make sure the unit is slightly, but not excessively, bottom heavy.



**Z AXIS (VERTICAL) TRIM
—ACHIEVING CORRECT
BOTTOM-HEAVINESS**

Grasp the lower Spar and hold it out to either side, until the camera is tipped over flat on its side (you'll have to tilt the Grip a little to allow this.) Imagine that the whole unit is a seesaw, balanced on the Gimbal. If the camera were in perfect Z axis balance, it would float like this when you let go. Now release the lower Spar.

- If it's top heavy, the camera will stay tilted over.
- If it's excessively bottom heavy, the Spar will fall too quickly.
- If it's slightly bottom heavy, as it should be, the lower Spar will slowly fall and the camera will right itself. The Spar should take just over a second to swing through the bottom of its travel like a slow pendulum. Stop its swinging by grasping the upper Spar

**If the Unit is Too
Top-Heavy:**

Raise the Gimbal by screwing in the Guide ring. Carefully pull the unit by the upper Spar, push in the small black latch and rotate the Guide ring clockwise.

If screwing the Guide nearly all the way in does not provide sufficient bottom heaviness (as tested by rolling the lower Spar sideways and letting it fall), try adding weights one at a time, starting with the lightest weights you have left.

Note: Because the battery compartment is to the rear of the center-of-gravity, adding a weight will have the effect of tipping the camera backward, while removing weights will tip the camera forward. After changing weights, you will always need to re-trim fore and aft. But DO NOT use the addition or subtraction of weight to the lower Spar as a way of adjusting fore and aft trim.

If adding all the weights does not make the unit sufficiently bottom heavy, change the stop block to lower the center-of-gravity. If you are on the light stop block, switch to normal; if you are on the normal stop block, switch to heavy. This will have the effect of lowering the Spar by 10°, and thereby lowering the center-of-gravity. Retrim fore and aft, as lowering the Spar will have tipped the camera forward. Note that changing the Stop block also makes the camera tilt up or down and you will need to readjust fore and aft trim.

If you are on the heavy stop block and still top heavy, you will need to add further weight to the lower Spar battery compartment.

If changing the stop block and lowering the Spar makes the unit too bottom heavy, take a weight out.

Lower the Gimbal by unscrewing the Guide ring. Hold the unit carefully by the upper Spar and rotate the Guide ring counterclockwise.



If the Unit is Too Bottom-Heavy:

The total "Z" travel available is 12 turns from fully tight. When unscrewing the Guide, watch for the unthreaded band. If it appears, it is dangerous to further unscrew the Guide -- your camera may fall off!

- Actually, you won't need to unscrew that far. Four counterclockwise turns of the Z axis is the rough equivalent of removing one large weight from the battery compartment. If you have unscrewed a total of seven or eight turns from the fully screwed in position, remove a weight and try again. Note that ultra-light cameras don't need weights and may require up to 12 turns of 'Z'.*
- After removing each weight, you will need to re-trim fore-and-aft.*

When the unit is properly bottom heavy, as determined by the "1 second roll test", fine tune the fore and aft and side-to-side trim.

- When the camera is level, grasp the Grip with your strongest hand, remove your other hand from the unit and try moving your arm from side-to-side. The camera should remain level. If the lower Spar swings like a pendulum when you stop, you may be too bottom heavy. Use the Z axis adjustment to fine tune.*
- Put the thumb and forefinger of your other hand gently on the Guide ring above the Gimbal. Try using your fingers to tilt the camera up and down, and to swivel (pan) from side-to-side. A properly trimmed JR can be panned and tilted with almost no effort on the Guide. Under most circumstances, you will want to trim to keep the bubble level centered, indicating that your camera's framing is not tilted to one side. As you shoot, you will find that fine tuning of both trim controls becomes a familiar, ongoing process.*

If you have not been able to successfully balance your camera, or if it is not included in the JR Cookbook, watch Section 8 of the video, "Balancing From Scratch". Then continue with the Set-up Guide.

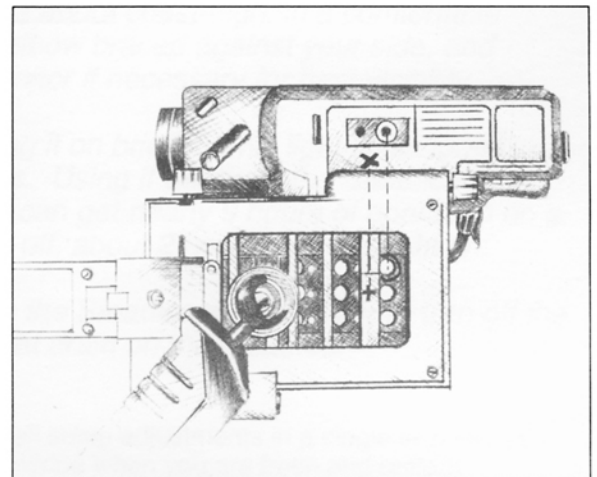
If you are now in satisfactory trim, you may wish to skip ahead to section 9, "Activating the Monitor." Then continue with section 9 of the Set-up Guide.



8. BALANCING FROM SCRATCH

If your camera or configuration is not included in the Cookbook, and does not generically resemble a camera in the Cookbook:

- Preset the Z axis as described in section 4 of the videotape and manual.*
- If you have a light camera weighing about 2 pounds, begin with the light stop block and no weights in the battery compartment.*
- If you have a medium weight camera of about 3 pounds, use the normal stop block (as shipped) and add 1 large and 1 small weight to the battery compartment.*
- If you have a heavier camera weighing about four pounds, begin with the heavy stop block and 2 large weights in the battery compartment.*
- Use 3 full turns counterclockwise as your Z axis preset.*
- Prepare the camera for mounting as described in Section 6. Remove shoulder strap, accessories, etc., insert a tape and install the "Obie" light.*
- Preset the X-Y axis as described in section 5. In order to choose the correct mounting hole, you must first determine the center-of-gravity.*
- Balance the camera on the tip of your thumb, or the eraser end of a pencil, holding it lightly with the other hand. When you find the balance point, mark it with a grease pencil.*
- Mark a spot on the JR Stage midway between hole 5 and hole 8. Turn the JR upside-down and notice the X mark in the center of the plastic strip which crosses the opening.*
- Invert the camera between your knees with the lens facing away from you. Holding the JR with the Monitor away, place the X mark on the Stage directly over the center-of-gravity point you marked on the camera.*



Diag. 22 Balancing from scratch—match the X marks.



-
- Note which hole on the Stage most nearly lines up with the threaded mounting hole on your camera. If you are between two holes, the one to the rear of this point on the Stage will be a good starting guess as the correct hole for your camera. Circle it with the grease pencil.*
 - Compare the locating pins with the locating pin hole in the base of your camera, and select the one that fits best.*
 - Mount this locating pin directly ahead of the mounting hole you have selected.*
 - Mount the camera as described in Section 6.*
 - When it comes to selecting the camera mounting screw, try the long screw first. DO NOT OVER TIGHTEN. If the mounting hole on your camera is too shallow, the screw will tighten into the camera without clamping it to the Stage.*
 - If this is the case, switch to the shorter mounting screw. Be careful not to over stress the camera mounting hole insert on your camera; it could pop out.*
 - Perform rough X-Y trim as described in section 7.*
 - Perform Z axis trim and fine X-Y trim as described in section 7.*

<p>When the unit is in satisfactory trim, proceed to section 9 of the videotape, "Activating the Monitor." Then continue with the Set-up Guide.</p>



9. ACTIVATING THE MONITOR

- Turn on the "store" switch located on the inside panel of the lower Spar. This will activate the Steadicam batteries, but will not turn on the Monitor. Whenever there's video coming from your camera the "power saver" circuit turns on the Monitor (and 'Obie' light, if it's switched on), so you can use the camera's on/off switch to control the entire Steadicam.
- Power up the camcorder. Rotate the green picture control knob on the left side of the Steadicam Monitor until the clearest picture appears as you look straight into the Monitor.
- If the Monitor only flickers briefly when activated, or if the Monitor picture becomes fuzzy or distorted, it's a sign that your batteries are low or dead.
- Double check that you just turned the store switch on and not off. If it's been on all this time, you may have run down your batteries.
- Check that the video cable is firmly plugged in at both ends.
- Check that all four Steadicam batteries are inserted in the correct direction, as indicated inside the battery compartments.
- Is the camcorder battery low? Most camcorders have a low battery indicator on their display panels. If the only low battery indicator is in your viewfinder, you may want to temporarily plug in the viewfinder to check the camcorder battery.
- Hold the unit with the camera about chest-high, in a comfortable shooting position with your elbow braced against your side, and adjust the rotation of the Monitor if necessary for best visibility.
- Test the 'Obie' light by turning it on briefly. This light is designed primarily for shooting indoors. Using it will drain the Steadicam batteries more quickly. You can get nearly 9 hours of operation on a set of batteries with the light off, about 2 hours with the light on.
- When you are through using the Steadicam, remember to turn off the store switch to avoid the slight drain on the batteries.

What to Do If No Picture Appears:

Congratulations, you've done the hard part. Now comes the fun.

However, if you have performed all setup adjustments in a single session, you may want to take a break and continue when you are fresh and rested!

When you are ready, watch Section 10 of the video: "Hand Positions". At this point, you can begin reading the Operations Manual.