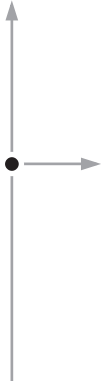


CameraMan

3-CCD ANALOG ROBOTIC CAMERA SYSTEM

Installation and Operation Manual



L1207101 Rev B
1998

the most watched worldwide

Contacting Grass Valley

Region	Voice	Fax	Address	Web Site
North America	(800) 547-8949 Support: 530-478-4148	Sales: (530) 478-3347 Support: (530) 478-3181	Grass Valley P.O. Box 599000 Nevada City, CA 95959-7900 USA	www.thomsongrassvalley.com
Pacific Operations	+852-2585-6688 Support: 852-2585-6579	+852-2802-2996		
U.K., Asia, Middle East	+44 1753 218 777	+44 1753 218 757		
France	+33 1 45 29 73 00			
Germany, Europe	+49 6150 104 782	+49 6150 104 223		

Copyright © Grass Valley. All rights reserved.

Grass Valley Web Site

The www.thomsongrassvalley.com web site offers the following:

Online User Documentation — Current versions of product catalogs, brochures, data sheets, ordering guides, planning guides, manuals, and release notes in .pdf format can be downloaded.

FAQ Database — Solutions to problems and troubleshooting efforts can be found by searching our Frequently Asked Questions (FAQ) database.

Software Downloads — Software updates, drivers, and patches can be downloaded.

Table Of Contents

I. Meet Your CameraMan	
? Congratulations on your Purchase	1
? 3-CCD Product Description	2-3
? 3-CCD Camera System Components	4
? CameraMan Ports and Jacks	5
? CameraMan Configuration Switches	6
II. Connect Your CameraMan	
? Mounting Your CameraMan	7
? Connecting to the Camera System	
Connecting the Camera Control Cables	8
Connecting the Video Output (on connector box)	8
Connecting the Video, RGB/Sync, and Genlock (if needed)	9
Connecting to the RS-232 Port	9
? Connecting Camera Control Devices	10
? Cable Restraint and System Power	
Restraining the Cable Connections	11
Connecting the Power Supply	11
III. Configure Your CameraMan	
? Switch Configuration	12
IV. Use Your CameraMan	
? System Startup	13
V. Appendices	
? A: Troubleshooting	14
? B: Multiple Camera Applications	15
? C: Camera Specifications	16
? D: Pin-out Diagrams	17
? E: Field-of -View Specifications	18
? F: Typical System Diagram	19
? G: On-Screen Camera Menus	20
? H: The 18x Lens Shroud	21

Congratulations On Your Purchase

Your new CameraMan 3-CCD General Pan/Tilt Camera is unmatched in quality, flexibility and expandability, providing you with one of the best video-communications cameras in the industry.

This manual will introduce you to your new CameraMan, explain how to install, connect and configure it, and how to use it in single, and multi-camera network applications. In addition, you will find handy diagrams and charts in the appendices, providing you with technical specifications.

You will see two icons throughout the manual:



This icon alerts you to *important instructions* in the operation and maintenance of your CameraMan System.



This icon alerts you to *tips or noteworthy suggestions* in the operation or maintenance of your CameraMan System

Your 3-CCD General Pan/Tilt Camera System should include these components:

- One 3-CCD CameraMan Camera (with 13x or 18x lens)
- One CameraMan Connector Box (unless purchased with Presenter or Deluxe Camera Systems)
- One CameraMan Power Supply.
- One RS-485 Connector "T"
- One 3' CameraMan Communication Cable
- One 25' CameraMan Keypad Cable
- One 3-CCD Installation and Operations Manual

3-CCD Product Description

Your new 3-CCD General Pan/Tilt Camera System is designed to be used in a variety of applications. You may have purchased this camera with one of the below packages. Below you'll find information on upgrade paths, and recommended accessories.

Product Description

The 3-CCD CameraMan's pan/tilt functions, zoom perspective, focus and IMAGE settings can be controlled via the Remote Control Keypad, CameraMan SHOT Director, or Tracking Keypad. In addition to the camera-control these optional accessories provide, they also provide multi-camera control and store up to 125 presets per camera.

Student Camera Upgrade Package

Used in distance learning applications. This system gives each student the power to be instantly identified by the camera with the touch of a press to talk microphone.

Includes Programmable Response Module for distributed preset control and a 3-CCD Camera Control Keypad.

Presenter Camera Upgrade Package

Used in distance learning, telemedicine and videoconferencing applications. The system gives presenters and instructors the ability to provide dynamic presentations while the camera automatically follows their every move. Includes a Tracking Ring Package, 3-CCD RF Tracking Keypad, and Main Docking Station.

Personal Locator Upgrade Package

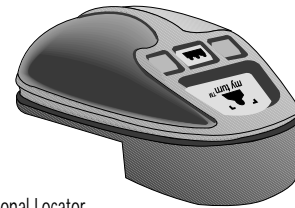
For videoconferencing applications. This system gives each videoconferencing participant the power to be instantly identified by the camera with the touch of a MY TURN button on individually controlled keypads. Includes three 3-CCD RF Personal Locator Keypads and one RF Chairperson Locator Keypad for distributed preset control.

Deluxe Upgrade Package

Combines the distributed preset control of the Personal Locator System and the autoTRACK presentation capabilities of the Presenter Camera System. Includes three 3-CCD RF Personal Locator Keypads, one RF Chairperson Locator Keypad, Tracking Ring Package, 3-CCD RF Tracking Keypad, and Main Docking Station.



Tracking Ring Package
for Presenter and
Deluxe Systems



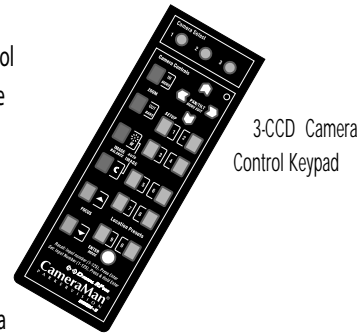
Personal Locator
Keypad for Personal
Locator and Deluxe
Systems

3-CCD Product Description

Recommended Accessories

Camera Control Keypad

Whether used in wireless RF, or hard-wired mode, this keypad gives you the ability to control the pan, tilt, zoom, focus, IMAGE, and location presets for up to three separate cameras. The keypad comes standard with the Student Camera System, and the Tracking Keypad comes standard with the Presenter and Deluxe Camera Systems



3-CCD Camera Control Keypad

CameraMan Shot Director

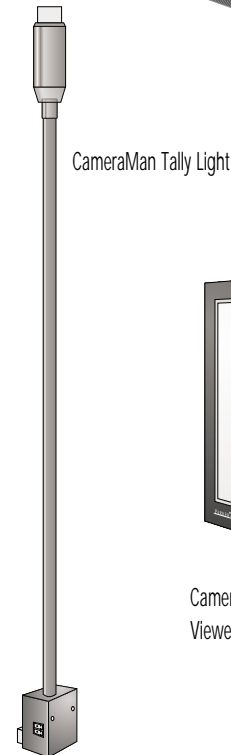
Some applications require precise and flexible camera control. The CameraMan Shot Director is a joystick controller designed to give you the ultimate in single, and multi-camera control by giving you the ability to adjust to the pan, tilt, zoom, focus, iris, CCU functions and location presets on up to 16 different cameras from one location. And its built-in CCU functionality allows you to adjust each camera's on-screen image. The CameraMan Shot Director is available in standard, and autoTRACK-equipped models.



CameraMan Shot Director

CameraMan Tally Light

For visual indication of which camera is selected in a multi-camera application, the CameraMan Tally Light provides a high intensity indication from an easy-to-install interface on the rear of the camera. A bright red indicator is mounted to the top of a flexible pedestal, allowing precise adjustment and positioning of the light for the best possible studio-wide observation. Control of the Tally light can be accomplished through the Shot Director, Control Center, SCRIPT Viewer and CameraMan STUDIO, as well as via an external closure connected to a side-mounted Phoenix connector. All current 3-CCD cameras are Tally-light compatible, and previous models are factory upgradeable.



CameraMan Tally Light

CameraMan SCRIPT Viewer Display

Adding a full-feature teleprompting display that moves with the camera is now available with addition of the powerful CameraMan SCRIPT Viewer system. The 12" active matrix, full color displays are available separately and are easily mounted to the camera. Contact your reseller for more information on the complete Script Viewer system.



CameraMan SCRIPT Viewer Display

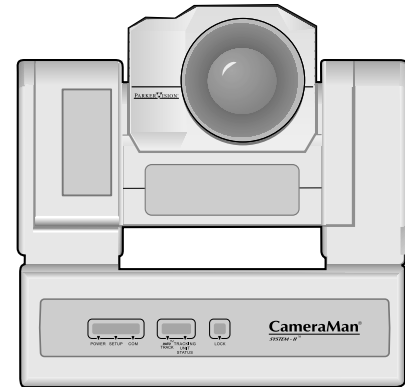
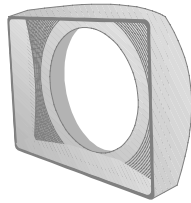
3-CCD Camera System Components

On page one of this manual, you'll find a list of the components that came with your 3-CCD General Pan/Tilt Camera System. Below, you'll find a short description of each.

3-CCD CameraMan camera

The camera and its integrated intelligent pan/tilt system is the primary component, and the basis for all of the CameraMan camera systems.

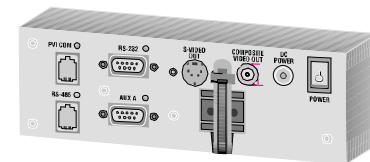
The 18x version of the 3-CCD camera includes a rectangular lens shroud. See Appendix H: page 24 for instructions on how to install the shroud.



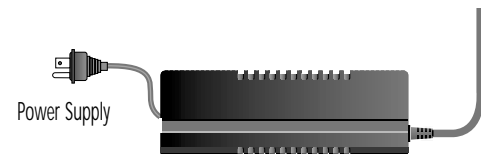
CameraMan Connector Box

The connector box should be attached to the back of the camera. This box is the point of connection for all RS-232, RS-485 and video signals. The only time you would need to remove this box is if you are upgrading this camera to a Presenter Camera System.

Note: If you purchased a Presenter or Deluxe Camera System, you will not need a connector box



Connector Box

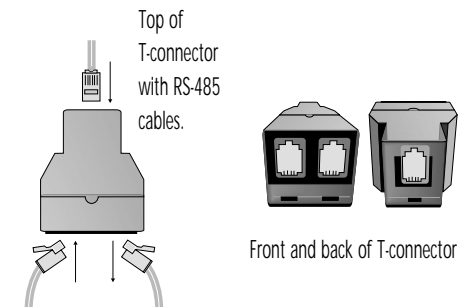


CameraMan Power Supply

The included power supply enables use with 50/60 Hz, 100-240V Power sources.

Connection Accessories

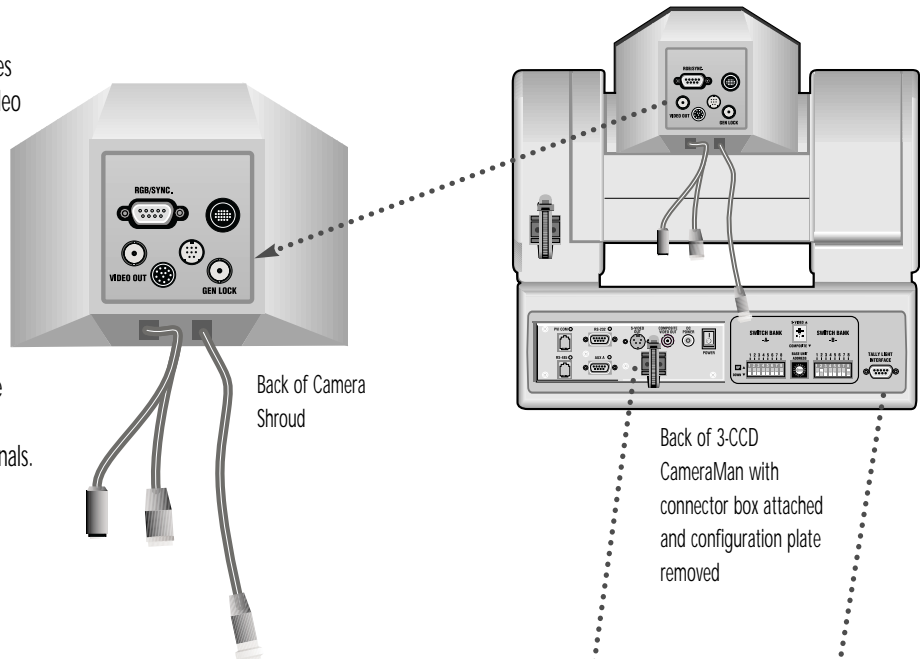
- RS-485 Connector "T"
- 3' CameraMan Communication Cable
- 25' CameraMan Keypad Cable



CameraMan Ports and Jacks

The back of your new CameraMan has a variety of ports and jacks used to connect your camera to other video, audio, and camera control components in your system.

- ▼ **RGB/Sync. Port**– DB-9 connection that provides RGB/Sync, component, Y/C, and composite video signal output.
- ▼ **Video Out Jack**– Aux BNC connection for composite video output.
- ▼ **Gen Lock Jack**– BNC connection used to synchronize the camera to an outside sync source.
- ▼ **Camera Control Cables and Jacks**– The three cables connect to the 12, 8 and 20-pin jacks to control the camera's lens, power and video signals.



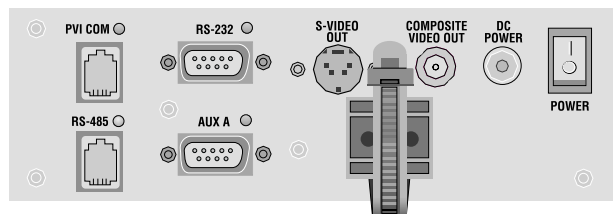
? **PVI COM Jack**– Used by certain devices as a communication interface to the camera system. (For example, a hard-wired key would attach here). This is a standard 6-conduc RJ-11 jack.

? **RS-485 Jack**-- Used for RS-485 communications between the camera system and other devices. This jack can be used to network multiple cameras or to connect appropriate, approved peripherals using a Grass Valley T-connector. This is a standard 4-position modular handset jack.

? **Auxiliary Communication Port**– Provides communications to select Grass Valley peripherals and provides capability for future expansion.

? **RS-232 Port**–Provides RS-232 communications to external devices such as PC's or other vendor control systems. This connector is a standard DB-9 (female) connector.

? **S-Video Jack**-- Provides direct S-VIDEO video output. Connector is a standard mini DIN jack. S-Video cable is not provided.



? **Cable Restrainer**– Helps keep cables from becoming disconnected, or hindering the pan and tilt capabilities of the camera.

? **Composite Video Jack**– Provides direct composite video output. Connector is a standard BNC-type jack. Video cable is not provided.

? **DC Power Jack**– Power input for the CameraMan Camera. Plug only the provided power supply into this jack. No other types of power supplies should be used.

? **Power**– Used to power on/off the CameraMan Camera.

? **Tally Light Port**-Provides output and external control for CameraMan Tally Light.

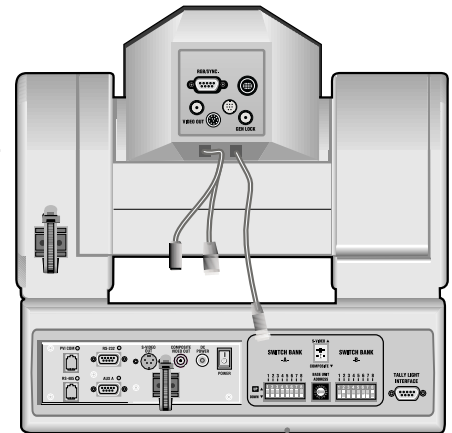
CameraMan Configuration Switches

Behind the configuration plate on the lower left side of the back of your CameraMan is the configuration panel. These DIP and rotary switches allow you to link the camera's settings to other components in your system.

! **Note:** After changing any switch's settings, turn the camera off, then back on to activate the change.

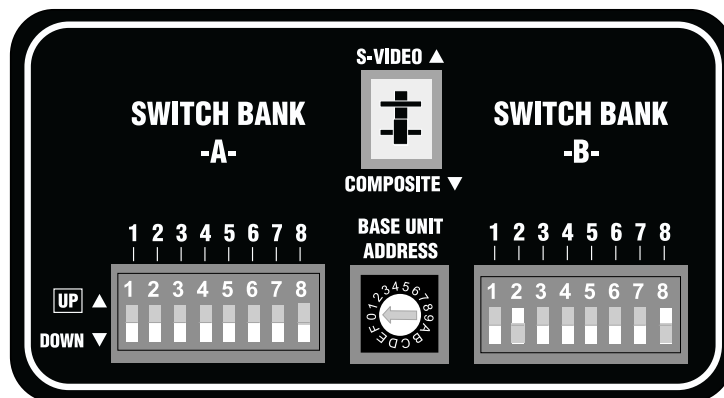
Switch Bank A

- ▼ **Switch 2 (Sub-Carrier Coarse Adjustment Switch)**—Used to change the sub-carrier phase from 0° to 180°.
- ▼ **Switch 7 (Baud Rate Switch)**— Used to change the camera's Baud Rate.
- ▼ **Switch 8 (Memory Lock Select Switch)**—Can be used to prevent programmed settings from being accidentally overridden.
- ▼ **Switches 1, 3, 4, 5 and 6**— Reserved for future use.



Center Control Switches

- ▼ **Video Select Switch**—Used to select the Video Output Format. This can be configured as either Standard Composite or S-Video.
- ▼ **Base Unit Address**—Used to configure the address of the Camera.



Back of 3-CCD CameraMan

Switch Bank B

- ▼ **Switch 1 (Protocol Select Switch)** – Used to select the type of Protocol being used for RS-232 and RS-485 communications. This can be configured as either Basic or High Reliability.
- ▼ **Switch 2 (Camera Data Local/Remote Select)** – Used to determine whether the camera will receive data from a local source or a remote source, such as a joystick.
- ▼ **Switch 4 (RF Commands Switch)** – Used to enable or disable the RF Receiver in the CameraMan camera.
- ▼ **Switch 5 (Preset Save)** - Used to determine how the preset settings will be saved.
- ▼ **Switch 8 (Interlink Switch)** – Used to disable commands from being sent on the RS-485 bus to other CameraMan devices.
- ▼ **Switches 3, 6 and 7**— Reserved for future use.

Mounting Your CameraMan

You can mount your CameraMan Camera on any flat, non-slick, non-metal surface with a minimum supporting area of 8"x8" by following these easy steps.

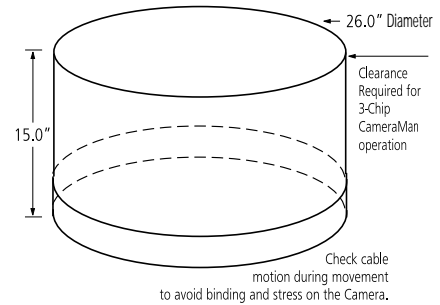
Step 1: Check your selected camera-location to ensure that you have enough camera and cable clearance space (right) for the CameraMan to pan and tilt without obstruction.



Note: Do not mount the camera upside down, or with more than a 10° angle from horizontal.



Tip: See Appendix E: FIELD OF VIEW SPECIFICATIONS on page 18, to assist in placing the CameraMan to achieve optimum optical views.

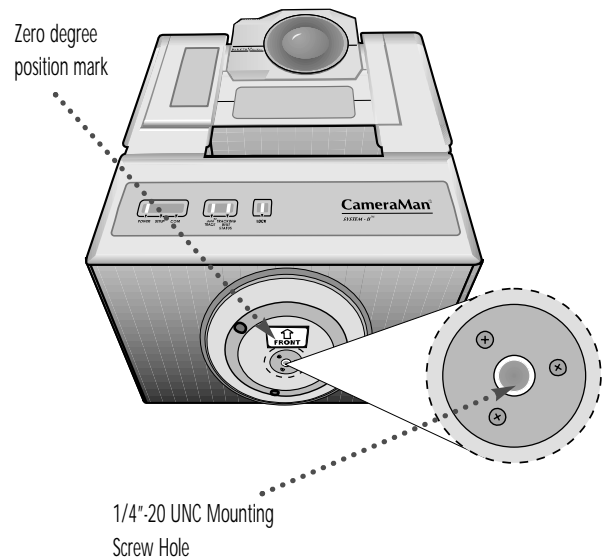


Step 2: Locate the zero-degree position mark labeled FRONT on the bottom of the base unit. This mark helps ensure that the base unit is calibrated correctly. Point this indicator mark in the direction that best reflects the center of travel in which the camera will be used (usually the center of the room).

Step 3: To ensure that your camera-mounting is not prone to vibrations, securely fasten the camera to a rigid flat surface using a 1/4"-20 UNC cap screw that does not extend into the base platform by more than 0.4". (The screw hole is provided in the base platform for this purpose. The cap screw is not provided.) This screw should be hand-tightened. If necessary, use a non-hardening threadlock to prevent the screw from loosening.



Note: Be sure to take environmental conditions into consideration when operating the camera. Always operate the camera indoors, and follow the temperature and humidity specifications outlined in Appendix C: CAMERA SPECIFICATIONS on page 16.



Connecting To The Camera System

On page five, you learned where the CameraMan's video and network connection ports and jacks are located. Now, you can begin connecting the camera to your system..



Tip: After connecting each cable to the camera, let it hang loosely behind the camera. Then follow the instructions in the "Restraining the Cable Connections" section before attaching the other ends of the cable to other equipment. This will relieve undue stress on the cables, allowing the camera to move freely.

Connecting The Camera Control Cables

On the back of the camera, you'll notice three cables. These control the camera's lens, power and video signals. *These must be attached for the camera to operate properly.*

- Connect the 8-pin male connector (#1) to the middle female jack.
- Connect the 12-pin female connector (#2) to the left male jack.
- Connect the 20-pin female connector (#3) to the right male jack.

Connecting The Video Output (on connector box)

The 3-CCD General Pan/Tilt Camera System supports NTSC and PAL versions (dependent on your camera-type) of both Composite and S-Video formats, although only one can be used at a time.

For Composite format, connect to the BNC jack on the back of the camera, labeled COMPOSITE VIDEO OUT, using a standard coaxial cable with a BNC connector (not provided).



Note: Verify that the Video Select switch is set to COMPOSITE on the back of the General Pan/Tilt camera. (See Page 12)



Note: Only connect one signal output (composite or S-Video) at a time.

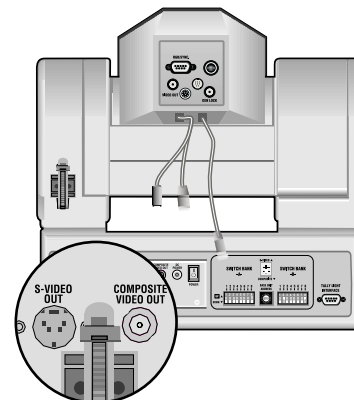
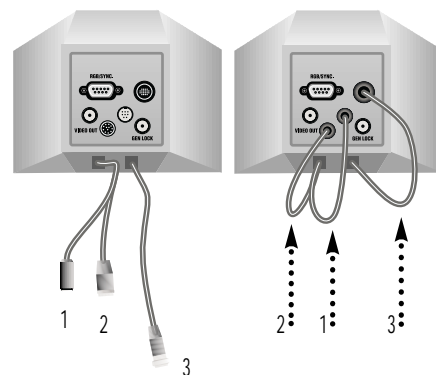
For S-Video format, connect to the S-VIDEO jack on the back of the camera, labeled S-VIDEO, using a standard S-video cable (not provided).



Note: Verify that the Video Select switch is set to S-VIDEO on the back of the General Pan/Tilt camera. (See Page 12)



Tip: For video output specifications, see Appendix C: CAMERA SPECIFICATIONS on page 16.



S-Video and Composite
Video Out Jacks

Connecting To The Camera System

Connecting The Video, RGB/Sync and Genlock Output (if needed)

RGB / SYNC: If your system requires RGB or component video output, use a DB9 to BNC breakout cable to connect the DB-9 port labeled RGB / SYNC to an appropriate video input on your network. The DB-9 pin assignments are:

Pin 1	Signal	Pin 2	Ground (VBS)
Pin 3	RED (R-Y) output	Pin 4	GREEN output
Pin 5	BLUE (B-Y) output	Pin 6	VBS (Y) output
Pin 7	SYNC output	Pin 8	Ground (SYNC)
Pin 9	NC (C output)		

VIDEO OUT: For aux composite video output, connect the BNC-type connector labeled "VIDEO OUT" to an alternate video input in your network using a standard BNC cable.

GEN LOCK: Connect the BNC-type connector labeled "GEN LOCK" to your network's Video Timing Source (Sync Generator) using a standard BNC cable.

! **Note:** A Camera Control Keypad, Tracking System Keypad, or CameraMan Shot Director are necessary to adjust the H. (horizontal) and SC (sub-carrier) phases, as well as configure the RGB/Sync Connection.

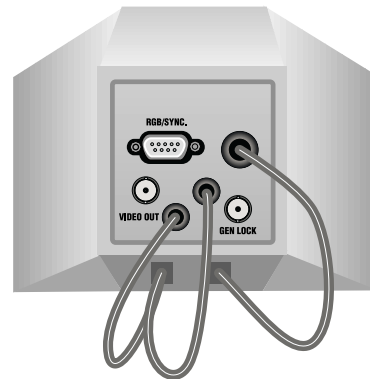
Connecting To The RS-232 Port

The General Pan/Tilt Camera System provides for RS-232 communications using the DB-9 jack on the back of the camera, labeled RS-232. This RS-232 port can be used to control the CameraMan Camera from external devices such as a PC or other vendor control system (i.e.: AMX, Crestron). Connect to this port using a standard computer cable with a DB-9 connector. When used with a CameraMan SHOT Director, this port operates at 19,200 Baud, No Parity and software hand-shaking using a High Reliability protocol. Otherwise, the port operates at 9600 Baud, No Parity, and software hand-shaking using a High Reliability or Basic protocols.

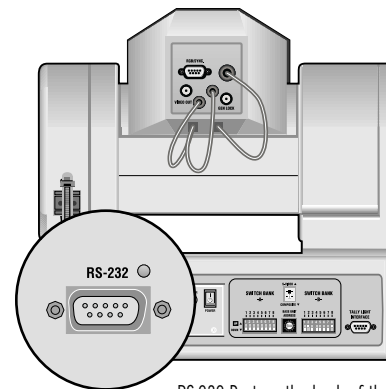
! **Note:** Verify which protocol is being used by checking the PROTOCOL switch on the Camera (see page 12).

💡 **Tip:** The COM light above the RS-232 port is used to indicate communication activity.

💡 **Tip:** For the DB-9 pinout port information, see the Appendix D: PIN-OUT DIAGRAMS on page 17 .



Back of 3-CCD Camera Shroud



RS-232 Port on the back of the 3-CCD CameraMan

Connecting Camera Control Devices

There are several ways to control your CameraMan's movement. The information below explains how to connect and configure the optional Camera Control Keypad, or the CameraMan Shot Director .

Connecting Optional Camera Control Devices

! Note: Do not use the Camera Control Keypad and the CameraMan SHOT Director at the same time

Camera Control Keypad (or Tracking System Keypad)

The optional Camera Control Keypad controls the camera's movement via wireless RF technology (up to 60 feet), or hard-wired connection (up to 250 feet). If you choose to use a Camera Control Keypad in the hard-wired mode, follow these directions for installation.

1. Using the 25' CameraMan Keypad Cable included with your camera, connect one end of the cable to the RJ-11 type jack located in the battery compartment of the CameraMan.
2. Connect the other end of the cable to the RJ-11 type jack on the back of the CameraMan labeled PVI COM.

💡 Tip: When the system is powered on, the light on the keypad should illuminate momentarily, indicating the keypad is ready for operation. The light located above the PVI COM port is used to indicate communication activity.

! Note: Using cable other than the supplied cable for the PVI COM port may cause damage.

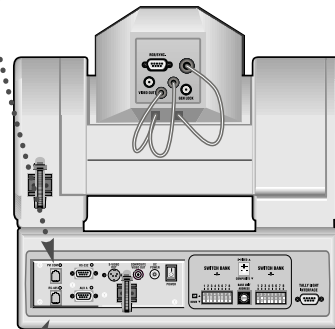
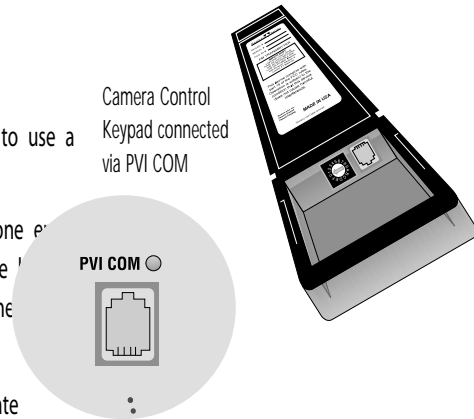
CameraMan Shot Director

The optional Shot Director multi-camera controller can be connected in hard-wired mode only. Follow these directions to connect the Shot Director to your CameraMan.

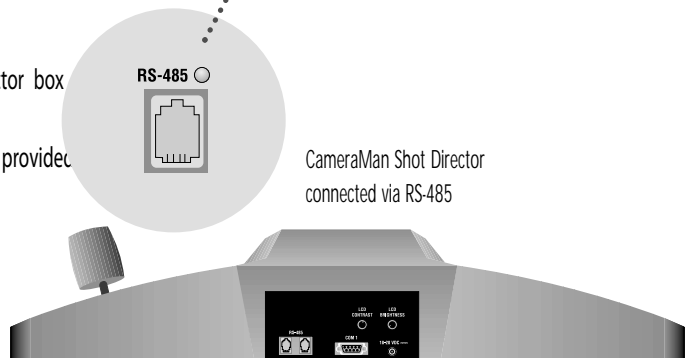
1. Using a standard RS-485 cable, connect one end of the cable to one of the RS-485 jacks (either one) on the back of the Shot Director.
2. Connect the other end of the cable to:
 - The jack labeled RS-485 on the back of the CameraMan connector box for single camera applications, or
 - The T-Connector for multiple-camera applications. Then use the provided CameraMan Communication Cable to connect the T-connector to the camera's RS-485 jack.

! Note: If you are using a Camera Control Keypad or Shot Director, you should have its operations manual. If you do not, contact your local reseller or Grass Valley.

Camera Control Keypad connected via PVI COM



CameraMan Shot Director connected via RS-485



Cable Restraint and System Power

You'll notice that if left alone, the now connected cables may impede on the camera's movement. To combat this, your 3-CCD camera comes equipped with two cable restrainers on the left back, and on the connector box. Follow the instructions below to properly restrain the cables and power-up the camera.

Restraining The Cable Connections

For upper (ie GEN LOCK) cable connections (if used)

1. Locate the cable restraint on the back left side of the camera.
2. Insert cable(s) through the cable restraint from left to right.

! **Note:** Allow 16" of cable between the restraint and the connection port to provide enough slack for the camera's tilting movement.

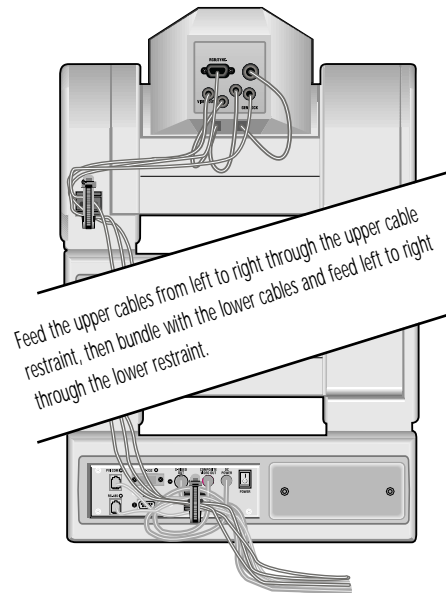
3. Tighten the restraint by pulling on the strap's "free" end to prevent any cable from becoming dislodged. (the cable restraint is reusable and adjustable)
4. Group the cables with all the other cables connected to the connector box and follow the instructions below to feed them through the lower cable restraint.

For lower cable connections

1. Insert all cables (upper and lower) through the cable restraint from left to right. This will result in the cables being located approximately in the center of the camera, instead of near the edge.
2. Tighten the restraint by pulling on the strap's "free" end to prevent any cable from becoming dislodged.

! **Note:** To relieve undue stress on the camera and the cable connections, it is important to fasten all cables using the cable restrainer on the back of the camera.

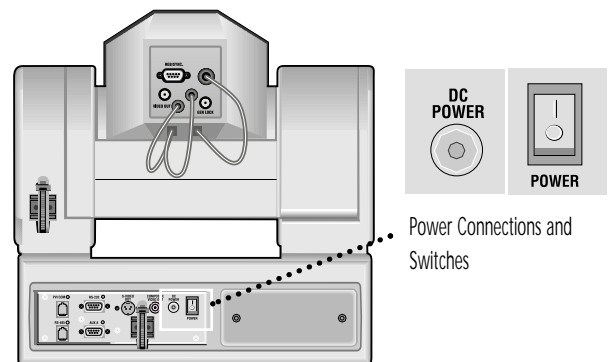
! **Note:** Be sure to leave enough slack in the cables for the camera to pan left and right free of any constraints.



Connecting The Power Supply

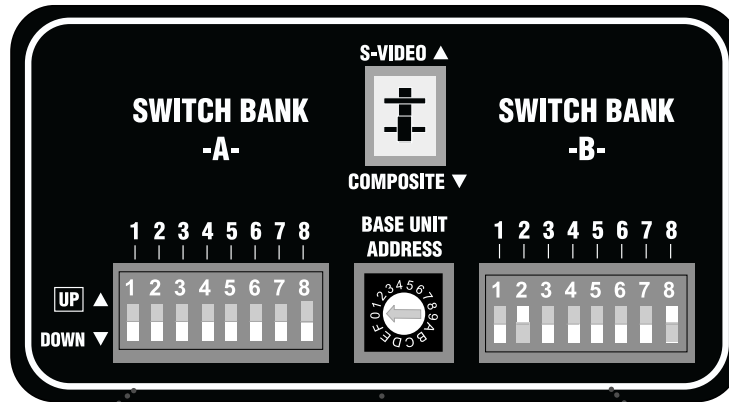
You can mount the Power Supply with any orientation, or on top of a table or roll-about unit by using the following steps.

1. Verify that the POWER switch, on the back of the camera, is turned OFF.
2. Plug the 5.5mm female connector from the power supply cord into the DC POWER jack in the back of the camera.
3. Connect the other end of the power supply into a 120 VAC source.



Switch Configuration

Now that you have connected your CameraMan to your power supply and control devices, you need to configure the camera to work in your specific application. To begin, remove the configuration plate on the back right side of the camera by removing the two screws holding it in place. Behind it, you'll see all the configuration switches. From left to right, they are:



Switch Bank A

Dip Switch 2 (SC-Coarse)
This switch is used to configure the SC-PHASE (coarse) to either 0° (DOWN) or 180° (UP). (factory default: DOWN)

Dip Switch 7 (Baud Rate)
This switch is used to configure the camera's Baud Rate for the RS-232 and RS-485 ports. Switch UP for 19,200 and DOWN for 9600. (factory default: UP)

Dip Switch 8 (Memory)
For the majority of applications, this switch should be set to UNLOCK (UP). When DOWN, all programmed features are locked and cannot be overridden. (factory default: UP)

Central Control Switches

Video Select (Composite/S-Video)
Set the video source switch to the *down* position to select the COMPOSITE VIDEO OUT option, or *up* to select the S-VIDEO OUT option. (Factory Default: COMPOSITE)

! You must choose either the Composite, or S-Video format. They cannot be used simultaneously.

Base Unit Address
Use the 16-position rotary switch labeled BASE UNIT ADDRESS to set the unique identification number for this CameraMan. If using the optional Keypad, Shot Director, or another control system, refer to the documentation provided with those accessories for proper configuration.

! For setting up a camera network, see page 15, Appendix B: MULTIPLE CAMERA APPLICATIONS.

! All switches not discussed on this page should remain in the down or OFF position.

Switch Bank B

Dip Switch 1 (Protocol)
Select the communication protocol which will be used by the RS-232 and RS-485 ports on the camera. The High Reliability protocol includes some advanced error checking that is not performed in the Basic protocol. (factory default: DOWN)

Dip Switch 2 (Camera Data Local/Remote Select)
When this switch is DOWN, the camera will receive data from a local source. When it is UP, the camera will receive data from a remote source, such as a joystick. (factory default: DOWN)

Dip Switch 4 (RF Command)
When this switch is DOWN, the camera responds to commands sent from an RF Keypad. When it is UP, the RF receiver in the camera is disabled and the camera cannot receive commands directly from a wireless keypad. (factory default: DOWN)

! When using multiple cameras networked on the RS-485 bus, only one camera should have its RF receiver enabled. Set switch 4 on the other cameras to UP.

Dip Switch 5 (Preset Save)
Use this switch to determine how the preset settings will be saved. DOWN saves your Manual Gain, Iris, and Focus settings. UP saves only the Auto settings for presets and autoTRACK Views. (factory default: DOWN)

Dip Switch 8 (Interlink)
Use this feature in multi-camera applications. When it is DOWN, all commands will be passed onto the RS-485 communication bus to the appropriate camera. For a single-camera application, the setting of this switch does not matter. (factory default: DOWN)

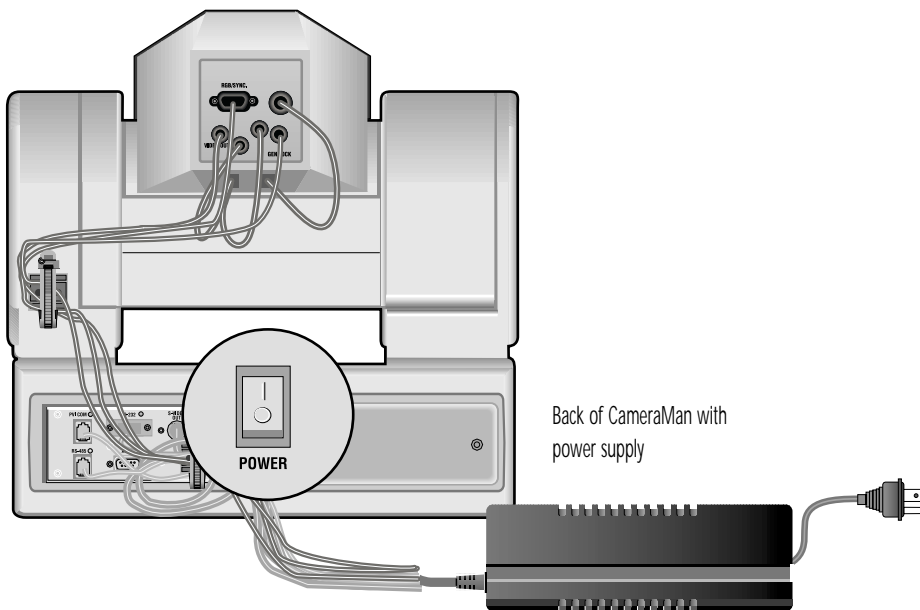
Once all necessary connections and configurations are made, you are ready to turn on the system.

Powering On

1. Just switch the Power button on the back of the CameraMan Camera to the ON position. The Camera should automatically enter its position calibration mode and then stop at the zero degree point.
2. Verify that the camera is now facing in the direction the "FRONT" label was pointing during mounting (see page 7).
3. If you are using the optional Camera Control Keypad or Shot Director, make sure its base unit address is the same as on the camera. If they are, verify that the camera's PAN and TILT functions are working properly.



Tip: If the camera does not move, refer to the TROUBLESHOOTING section of your Camera Control Keypad, or Shot Director manual.



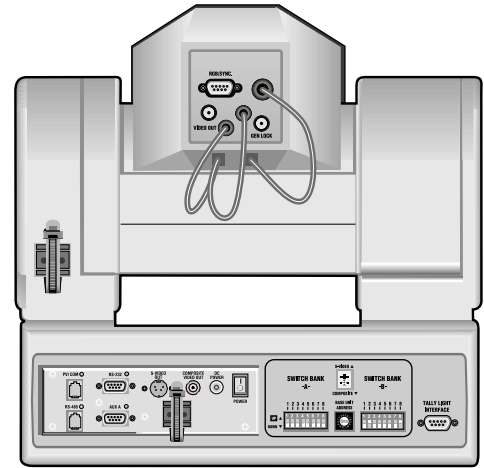
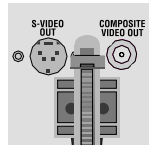
Appendix A: Troubleshooting

Should you have any problems with your CameraMan General Pan/Tilt Camera System, please refer to the following guide. If you still have questions or problems after troubleshooting, please contact your authorized reseller or contact Grass Valley.

Problem: *The Camera's Video is not working properly.*

Solution:

1. Verify that the VIDEO SELECT switch on the back of the Camera is set properly. (see page 12)
2. Verify that the appropriate video connection is being used on the back of the camera, either S-VIDEO or COMPOSITE VIDEO OUT. (see page 8)
3. Verify that the video output of the camera is connected to the appropriate video input on the switcher or CODEC.

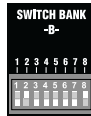


Back of 3-CCD CameraMan

Problem: *No communications through the RS-232 port.*

Solution:

1. Verify that the cable being used is wired correctly. (see page 17)
2. Verify that the PROTOCOL SELECT switch on the back of the Camera is set properly. (see page 12)
3. Verify that the BASE UNIT ADDRESS switch is set properly.
4. Does the COM light above the RS-232 port on the back of the camera blink when you send a command through this port? If no, change the cable and retry.




COM light on
RS-232
Connection

Appendix B: Multi-Camera Applications

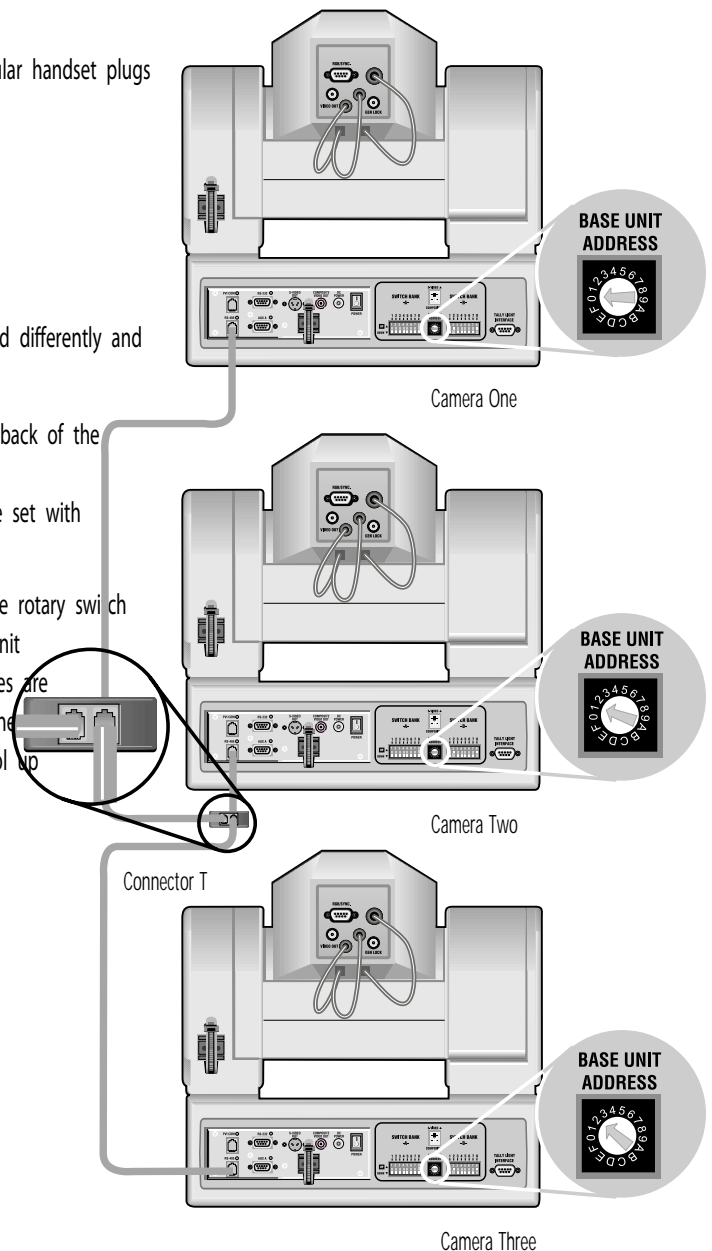
If your application requires that you have more than one CameraMan, you will need to set them up in a "daisy-chain" network configuration by following these steps:

1. Connect the cameras together by plugging the supplied T-connector into the RS-485 port on the back of the camera.
2. Connect each camera using a 4-conductor cable, with 4-position modular handset plugs wired "straight-through":

Pin 1.....Pin 1
Pin 2.....Pin 2
Pin 3.....Pin 3
Pin 4.....Pin 4

 Note: Do NOT use a standard phone cable, as these are wired differently and may cause damage.

3. Using the BASE UNIT ADDRESS rotary switch, which is located on the back of the Camera, configure each camera with a unique Base Unit Address. (i.e.: Camera One would be set with address 0, Camera Two would be set with address 1, and so on)
4. In order to control each camera with your Camera Control Keypad, the rotary switch inside the keypad battery compartment must match the lowest Base Unit Address in your system. For example, if the Base Unit Address switches are set according to the illustration to the right, the rotary switch inside the keypad should be set to zero. The Camera Control Keypad can control up to three cameras.



Appendix C: Camera Specifications

This device complies with part 15 of the FCC rules. Operation is subject to the condition that this device does not cause harmful interference. FCC identifier: JFECM003-AA

3-CCD General Pan/Tilt Camera

Image Sensor:	1/2"IT (Interline Transfer Power HAD) CCD (x3)	Mechanical Drives:	WhisperDRIVE Plus™ Rated For 5000 Hrs. Of Continuous Motion
CCD Integration Mode: . . .	.Frame/Field Selectable	Tilt:	± 25° (Speed: 1°/Sec to 50°/Sec)
Picture Elements:	NTSC: 768 (H) x 494 (V) PAL: 752 (H) x 582 (V)	Pan:	359° (Speed: 1°/Sec to 45°/Sec)
CPT-2013-A3N(A3P)		Location Presets:	125
Lens (13x):	13x Zoom; f = 7.5 to 97.5 mm	Location Preset Data	Pan, Tilt, Zoom, Focus, Iris, Pedestal, R/B Gain, R/B Paint
Angle of View(13x Lens)	46.2° x 35.6° @ 7.5 mm 3.8° x 2.8° @ 97.5 mm	Location Preset Accuracy:	±.125°
Minimum Rel. Aperture:	1:1.4 @ 7.5-80.3 mm 1:1.7 @ 97.5 mm	Video Out	NTSC or PAL
CPT-2018-A3N(A3P)		Connector Type	Composite– 75 Ohm BNC (x2) Y/C– 4-pin miniDIN Y,U,V/RGB– 9-pin D (F) Genlock– 75 Ohm
Lens (18x):	18x Zoom; f = 6.7 to 121 mm	RS-232 Port:	DB-9(F) Connector
Angle of View (18x Lens)	51.1° x 39.6° @ 6.7 mm 3.03° x 2.27° @ 121 mm	RS-485 Port:	Bus Up To 16 Cameras (4 pos. RJ handset port)
Minimum Rel. Aperture:	1:1.4 @ 6.7-91 mm 1:1.85 @ 121 mm	Power:	100-240VAC Power Supply 100 W Maximum Consumption
Hor. Resolution:	750 TV Lines	Genlock:	VBS lock (F range: 3.58Mhz+50Hz)
Min. Illumination: . . . . .	.5 lux F1.4	Phase Control:	H/SC Phase Control
Sensitivity:	NTSC: F9.5 at 2000 lux PAL: F8.5 at 2000 lux	Knee:	Switchable
S/N Ratio:	NTSC: 60 dB PAL: 58 dB	Scanning System:	NTSC: 2:1 Interlaced, 525 Lines PAL: 2:1 interlaced, 625 lines
Gamma Control: . . . . .	.ON/OFF Switchable	Temperature	32° to 100°F (0°-37.78° C)
Gain Control:	AGC/0 to 18 dB Selectable	Humidity: . . . . .	.0 to 95% Non-condensing
CCD Iris Control: . . . . .	.ON/OFF Selectable	Dimensions:	US: 9.25"L x 12.75"W x 10.75"H INT: 23.5cmL x 32.38cmW x 27.31cmH
White Balance: . . . . .	.Auto/Manual (R/B Gain), ATW Selectable		
Linear Matrix: . . . . .	.ON/OFF Switchable		
Electronic Shutter			
Speed (sec):	NTSC: Adjustable in the range of 1/10,000 to about 8.5 second. PAL: Adjustable in the range of 1/10,000 to about 10 second.		
Iris Control: . . . . .	.Auto or Manual		

CameraMan Clearance

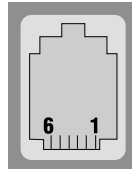
The minimum dimension for the CameraMan is a circular diameter of 26". This accounts for both camera and cable clearance. Check cable movement to avoid binding and stress on the camera.



Tip: See clearance diagram on page 7.

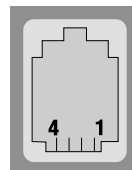
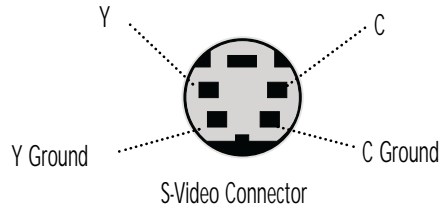
Appendix D: Pin-Out Diagrams

You'll find the following pinout connections on the back of your connector box on the back of your CameraMan. These diagrams are for your reference.



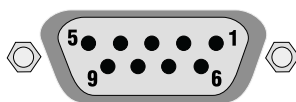
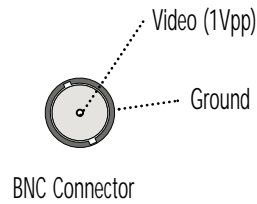
PVI COM
RJ-11

Pin	Signal
1	12v
2	12v
3	Ground
4	Signal A
5	Signal B
6	Ground



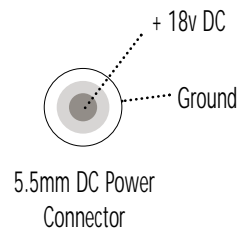
RS-485
Four position
Modular Handset

Pin	Signal
1	Ground
2	Signal A
3	Signal B
4	Ground



RS-232
9-pin Female D-9 Sub

Pin	Signal
2	Transmit
3	Receive
5	Ground
1,4,6-9	Not Used

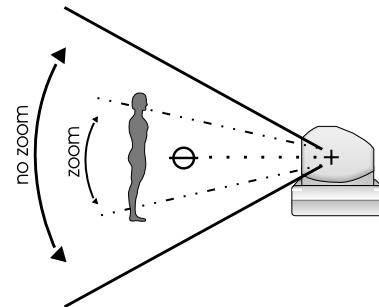
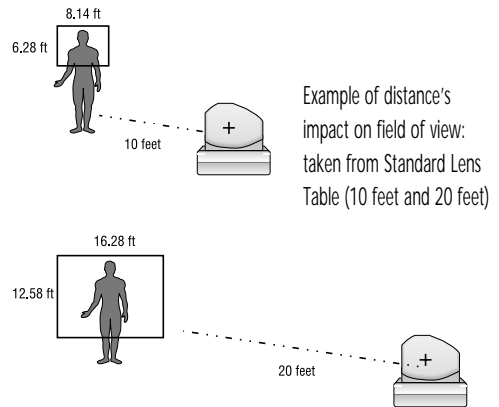


Appendix E: Field-Of-View Specifications

The reference charts below represent the size of your field of view and angle of view from various distances and with different lenses.

13x Lens:

Dist. from Lens (feet)	No Zoom		Full Zoom	
	Hor. (ft)	Vert. (ft)	Hor. (ft)	Vert. (ft)
10	8.53	6.42	0.66	0.49
15	12.80	9.63	1.00	0.73
20	17.06	12.84	1.33	0.98
25	21.33	16.05	1.66	1.22
30	25.59	19.26	1.99	1.47
35	29.86	22.47	2.32	1.71
40	34.12	25.69	2.65	1.96
45	38.39	28.90	2.99	2.20
50	42.65	32.11	3.32	2.44
55	46.92	35.32	3.65	2.69
60	51.18	38.53	3.98	2.93
65	55.45	41.74	4.31	3.18
70	59.72	44.95	4.64	3.42
Angle of view	46.20°	35.60°	3.80°	2.80°

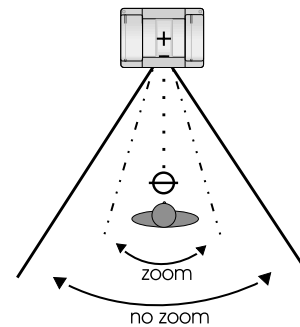


Above- Vertical angle of view:
Below- Horizontal angle of view:

no zoom= wide angle (more scenery, less specific detail)
zoom= narrow angle (less scenery, more specific detail)

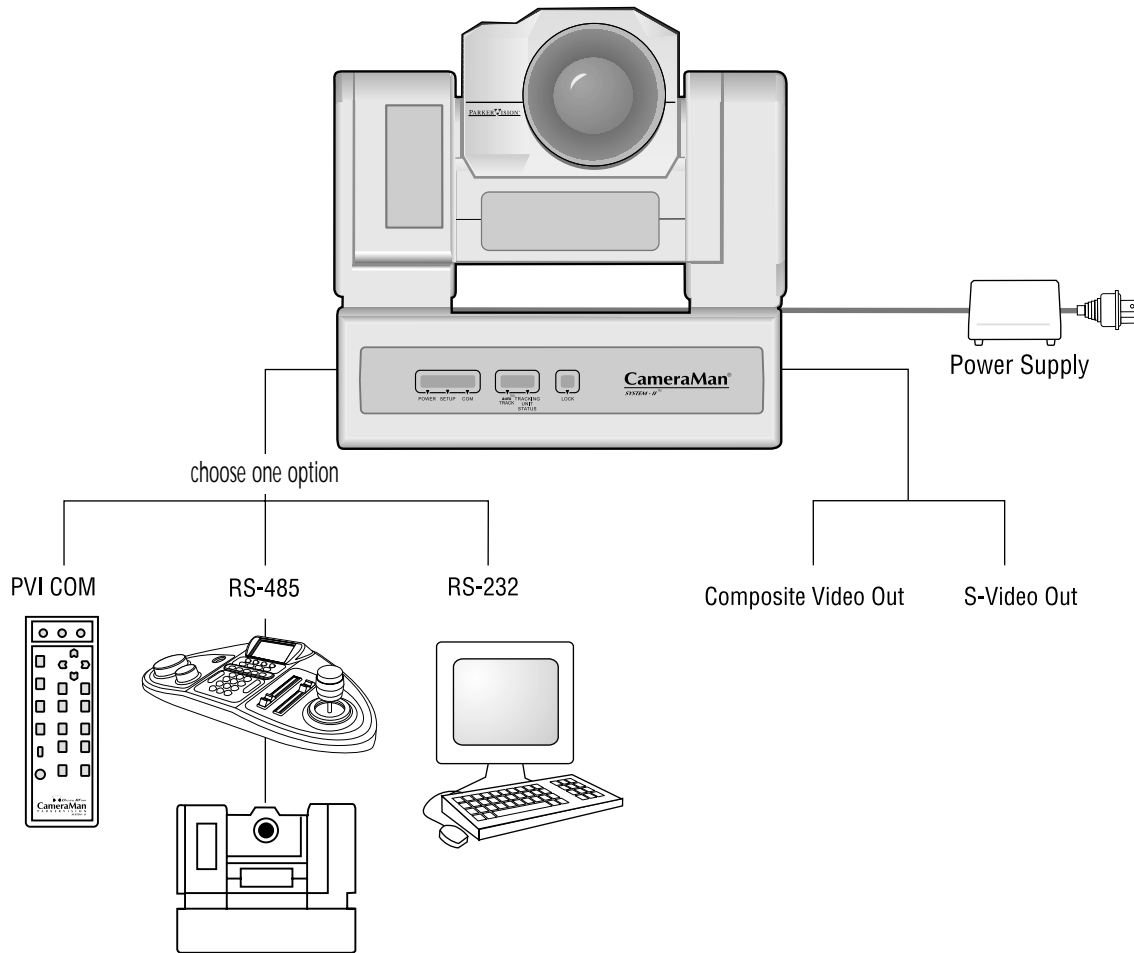
18x Lens:

Dist. from Lens (feet)	No Zoom		Full Zoom	
	Hor. (ft)	Vert. (ft)	Hor. (ft)	Vert. (ft)
10	9.56	7.16	0.53	0.40
15	14.34	10.74	0.79	0.59
20	19.12	14.32	1.06	0.79
25	23.90	17.90	1.32	0.99
30	28.68	21.48	1.59	1.19
35	33.46	25.06	1.85	1.39
40	38.54	28.64	2.12	1.58
45	43.02	32.22	2.38	1.78
50	47.80	35.81	2.64	1.98
55	52.59	39.39	2.91	2.18
60	57.37	42.97	3.17	2.38
65	62.15	46.55	3.44	2.58
70	66.93	50.13	3.70	2.77
Angle of view	51.1°	39.4°	3.03°	2.27°



Appendix F: Typical System Diagrams

Below is a typical setup for your CameraMan camera. The items in the diagram are not to scale.



Appendix G: On-Screen Camera Menus

Your 3-CCD Camera allows you to adjust the camera settings via on-screen menus by using your Camera Control Keypad, or CameraMan SHOT Director. These adjustments should be performed by qualified technical personnel only. The first menu is the Exposure Setup Menu. *If your system includes a SHOT Director, always use the SHOT Director's LCD menus to make these adjustments.*

Exposure Setup Menu

>1. Exposure Setup	:A
Gain	AGC
Shutter	off
AE Window	medium
Field/Frame	field

GAIN (video gain)

[AGC, STEP, ISO] *Initial Setting: step, 0 dB, ISO, 400*

AGC: Automatic control of video gain. The gain of the video signal is automatically controlled depending on the brightness of the subject.

STEP: Used to set the gain to a desired level from 0 to 18dB in units of 1 dB.

ISO: Sets the video gain to the desired level in the ISO sensitivity display (frame mode). The gain level can be set to 400, 800, or 1600. In the field mode, the value is twice the displayed value.



Note: CameraMan will automatically adjust gain when using the IMAGE control from the keypad. The adjustments above should only be made when special conditions exist.

SHUTTER (electronic shutter)

Initial Setting: off

The electronic shutter allows you to obtain blur-free pictures of a fast moving subject.

OFF: Turns off the electronic shutter.

LONG EXP: Sets the shutter speed in units of 1 frame.

- Range: Field mode: 1-255 FRM (frames)
Frame mode: 2-256 FRM (frames)
- Sync/W.EN: This function lets you change the output from the RGB/SYNC connector on the rear panel. It is only enabled when the unit is in the "long exp" mode.

- Booster: When camera is in "long exp" mode, this function lets you set the focus or color for subjects in poor lighting conditions by allowing 4 frames accumulation and gain adjustment. In such situations, set "booster" to on, set the focus and color, and then turn it off. You can then shoot in long exposure mode.
- W.EN: Outputs a WEN (timing) pulse. Use this function to synchronize a connected frame memory.

STEP: Allows setting the shutter to one of the following eight speeds: FL, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, and 1/10000 sec.

C.SCAN: Sets the shutter speed in units of 1 H (horizontal scanning time: 63.56µs). The shutter speed can be set to anywhere between 1/525 - 260/525 H. This setting can be used to reduce noise when shooting a computer screen.

CCD-IRIS: • ON: When an excessive amount of light passes through the lens, this function increases the shutter speed automatically. This has the same effect as reducing the lens iris by six stops.

- OFF: Use this setting when shooting in normal lighting conditions or when the following conditions exist:
 - The picture flickers: This may occur with certain lighting conditions. In such cases, set CCD IRIS to OFF and shutter speed to FL.
 - The CameraMan is used under fluorescent lighting. This may slow variations in color to the picture. If the degree of color variation is unacceptable, set CCD IRIS to OFF.

AE WINDOW [LARGE, MEDIUM, SPOT]

Initial Setting: large

The AE (auto exposure) window comes in three different sizes and is used together with the AGC and CCD-IRIS.

FIELD/FRAME [FIELD, FRAME]

Initial Setting: field

FIELD: For shooting fast moving objects. The CCD accumulates and outputs the charges, field by field, to give pictures showing a minimum blur even when the subject is fast moving.

FRAME: For producing pictures with the highest possible vertical resolution. The CCD accumulates and outputs the charges frame by frame.

Appendix G: On-Screen Camera Menus

The second on-screen menu is the Color Setup.

Color Setup Menu

>2.	Color Setup	:A
	C. Temp	3200K
	WHT. Bal	auto
	R Paint	off
	G Paint	off
	Linear Matrix	on
	Shading	off

C. TEMP (color temperature)

Initial Setting: 3200K

- 3200K: for indoor shooting.
- 5600K: for outdoor shooting.

WHT. BAL (white balance)

[AUTO, MANU, ATW]

Initial Setting: auto

AUTO: Set to autoWHITE value stored with the Auto White Balance button.

MANU: Manual adjustment of the white balance.

- R gain (red gain): -99 to 99
- B gain (blue gain): -99 to 99

ATW: Activates the auto-tracing white balance. This mode is used when light sources are changing, as the white balance is automatically adjusted as the color temperature changes.

PAINT: This is used to fine adjust the white balance in the ATW or Auto White mode.

- R PAINT (red paint): -7 to 7
- B PAINT (blue paint): -7 to 7

LINEAR MATRIX [ON, OFF]

Initial Setting: on

Processes images with a color matrix to produce natural colors.

- ON: Matrix processing is activated
- OFF: Matrix processing is de-activated

SHADING [OFF, 1 TO 99]

Initial Setting: off

In most situations, this should be set to OFF. It is used to compensate for uneven color shading throughout the screen.

Appendix G: On-Screen Camera Menus

The third on-screen menu is the General Setup menu

General Setup Menu

>3.	General Setup	:A
	M. Pedestal	00
	Detail	00
	H. Phase	00
	SC Phase	00
	fine	00
	Gamma	on
	Knee	1
	G Sync	on

M. PEDESTAL [-99 TO 99] *Initial Setting: 00*


- Normally set this to "00".
- When the black parts of the picture are too dark, you can brighten them by adjusting the master pedestal or black level. Use of a waveform monitor is recommended.

DETAIL [-99 TO 99] *Initial Setting: 00*

This is used to adjust the sharpness of the outlines of objects in the picture. A higher value makes the picture look sharper with more detail on the image outlines, and a lower value makes the picture look softer with less detail.

H. PHASE [-99 TO 99] *Initial Setting: 00*

When an external reference sync signal is connected to the GEN LOCK connector on the back of the camera, the camera operates at the frequency of that reference signal. The H. PHASE function can be used to perfectly synchronize the horizontal phase of the camera with the horizontal phase of the reference signal.

 **Note:** If there is not an external sync signal connected, no value is displayed.

SC PHASE [0, 180] and (SC)fine: [-99 to 99] *Initial Setting: 00*

When gen-locking the camera, use the SC PHASE and (SC)fine functions to adjust the subcarrier phase. First use the SC PHASE for coarse adjustment and then (SC) fine for fine adjustments. The subcarrier phase switch on the back of the camera (Switch Bank A-DIP Switch 2) must match the SC PHASE coarse adjustment.



Note: If there is not an external sync signal connected, no value is displayed.

GAMMA [ON, OFF] *Initial Setting: on*

- ON: For normal use of the camera. The camera compensates the reproduction characteristics of the monitor CRT to produce natural tone images.
- OFF: The video signal is output linearly from the CCD without gamma compensation.

KNEE [1, 2] *Initial Setting: 1*

- 1- Use this setting for normal shooting conditions.
- 2- Use this setting when shooting a dark object and a highly illuminated object at the same time.

G SYNC [ON, OFF] *Initial Setting: on*

- ON: Adds sync to the G signal output from the RGB/SYNC connector of the camera.
- OFF: The sync is separate from the G signal output at the RGB/SYNC connector of the camera.

Appendix G: On-Screen Camera Menus

The fourth on-screen menu is the System Setup menu

System Startup Menu

>4.	System Setup	:A
	Mem. Bank	A
	Mem. Protect	off
	Data Send	B->A
	D-Sub out	VBS
		Component
	Baud Rate	9600
	Flash	master
	Printer Trig.	off

MEM. BANK [A, B]

Initial Setting: A

Two different sets of settings can be stored in the camera, and then switched between depending on the shooting conditions. These are stored in memory bank "A" and memory bank "B". The selected memory bank is shown in the upper right hand corner of the menu.

MEM. PROTECT [ON, OFF]

Initial Setting: off

Each memory bank can be protected by setting the MEM. PROTECT to ON. When the bank is protected, the memory bank indicator will be flashing.



Note: The following items can be changed even if the memory bank is protected: GAIN, SHUTTER, C. TEMP, WHT. BALANCE, MEM. BANK, MEM. PROTECT, DATA SEND

DATA SEND [A -> B, B -> A]

Initial Setting: A->B

The camera settings can be copied from one memory bank to the other.

D-SUB OUT [VBS/YC, RGB/COMP]

Initial Setting: VBS/RGB

VBS: Changes the output of the RGB/SYNC connector on the camera to VBS output.

YC: Changes the output of the RGB/SYNC connector on the camera to Y/C (S-video) output.

RGB: Changes the output of the RGB/SYNC connector on the camera to RGB output.

COMP: Changes the output of the RGB/SYNC connector on the camera to Component Video output.

BAUD RATE [9600, 4800, 2400, 1200]

Initial Setting: 9600

Changes the baud rate of the REMOTE connector on the camera.



Note: This setting should always be set to 9600. Changing this setting may impact the camera's communication links.

FLASH [OFF, MASTER, SLAVE]

Initial Setting: off

This should always be set to OFF.

PRINTER [ON, OFF]

Initial Setting: off

This should always be set to OFF.

Appendix H: The 18x Lens Shroud

The 18x version of the 3-CCD CameraMan camera comes equipped with a rectangular lens shroud. The shroud helps to keep out glares from light sources located on the sides of the camera.

Installing the Shroud

1. Locate the red dots on the top and bottom of the shroud, and on the lens itself.
2. Align the red dot on the shroud with the dot on the lens, then slide the shroud over the lens.
3. Tighten the shroud in place using the bolt attached to the shroud.

