



RoadRunner

Mobile Digital Video Recording System

Installation Guide - School Bus

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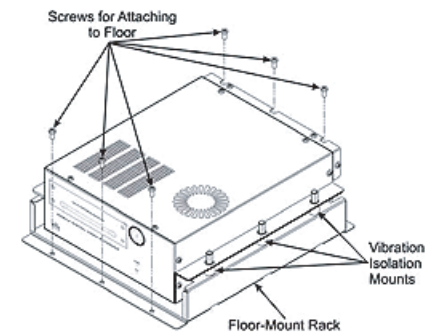
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The Roadrunner is a MilSpec-rated Digital Video Recorder for transit bus applications. It employs MPEG4 compression to record up to 4 cameras and 4 audio sources on a removable hard drive, and can be accessed directly on board using a laptop computer, with the optional controller and monitor; or the removable hard drive can be read directly on a desktop PC with the optional Hard Disk Player.

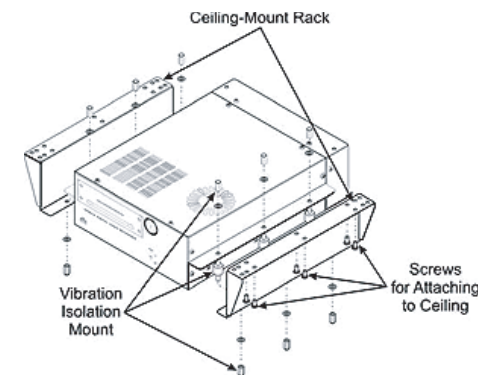
Installation follows these basic steps:

- Remove the DVR from its base and remove the cable guard from the rear of the DVR.
Note: be sure to pass the wiring through the cable guard if you wish to reinstall it when the wiring is complete.
- Mount the DVR base in its intended location (but DO NOT secure the DVR to its base until wiring is completed)
- Install the specified camera(s) in the front and rear of the bus
- Run the wiring through the bus, including the wiring for connecting the camera video, audio and power, and Main Power connections using the supplied harness.
- If door-activated Event recording is needed, see instructions on page 7 of this guide.
- Connect the wiring to the rear panel of the DVR.
- Connect power and turn on the DVR.



If a laptop computer is being used to communicate with and program the Roadrunner:







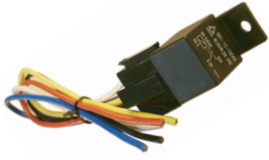

- Assign the laptop an IP address which is compatible with the DVR's IP address (see page 9).
- Install the IRAS software on the laptop
- Connect the Laptop to the DVR (see page 13).
- Refer to the direction in this guide for more data

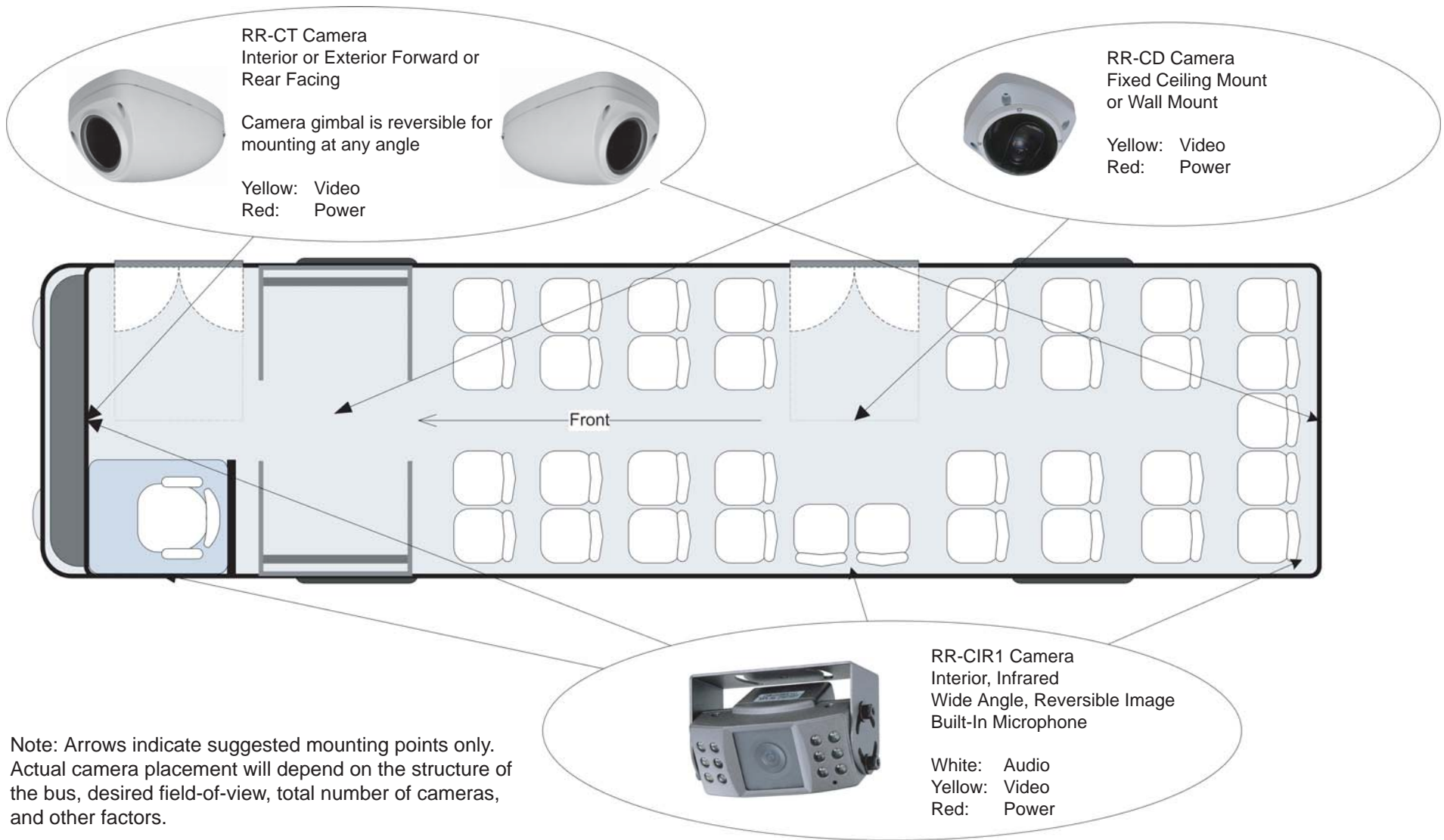


If the optional monitor and controller are being used to communicate with the Roadrunner:

- Connect the monitor and controller as part of the installation (see page 5).
- Enter the menu by pressing the MENU button
- Enter the default password: 4321
- Refer to the operations manual for further instructions

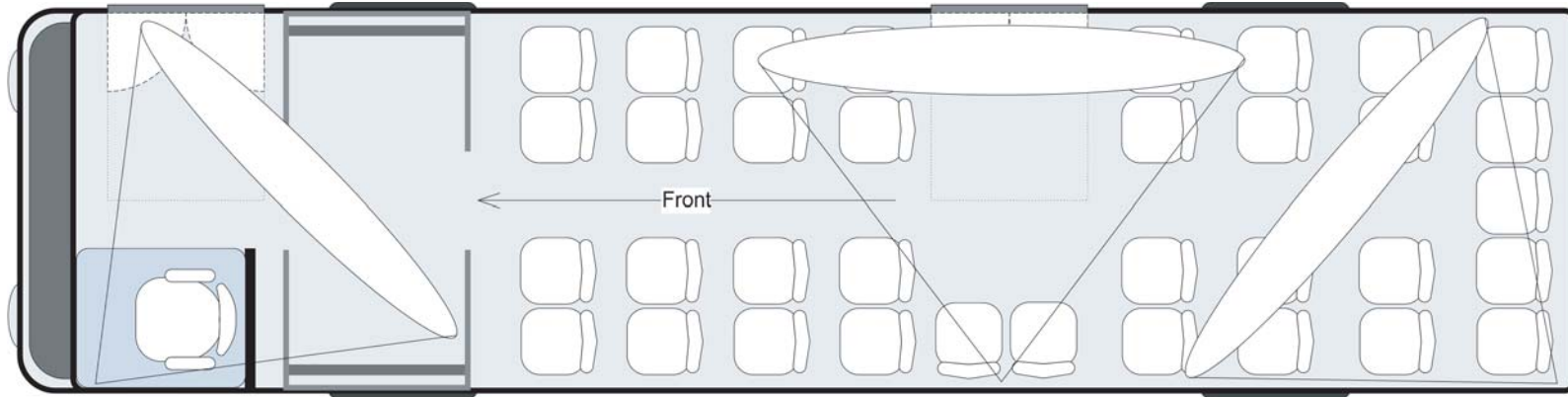
Note: These photos are for identification only. Some Items below are optional and may not be included with every order. Other options may also be available. Individual specifications and color codes subject to change without notice.

<p>RR-CT: Teardrop Vandal Resistant Indoor/Outdoor Color Camera</p> 	<p>Main Power harness: reduces 6 wires to 3; connects to Ground, Battery and Ignition</p> 	<p>Push Button Recording Trigger</p> 
<p>RR-CD: Dome Vandal Resistant Indoor/Outdoor Color Camera</p> 	<p>Coax with BNC connectors at both ends. Used for both video and audio sources.</p> 	<p>Crossover network cable for laptop installations (color may vary)</p> 
<p>RR-CIR1: IR Illumination Camera with Audio Recording</p> 	<p>Relay and pigtail: used to connect 12 VDC sources such as door switches to the alarm inputs on the RoadRunner</p> 	<p>RR-HDP: (Sold Separately) Hard Drive Player for connection to USB compatible computer (also included: USB cable, power supply, power cable)</p> 

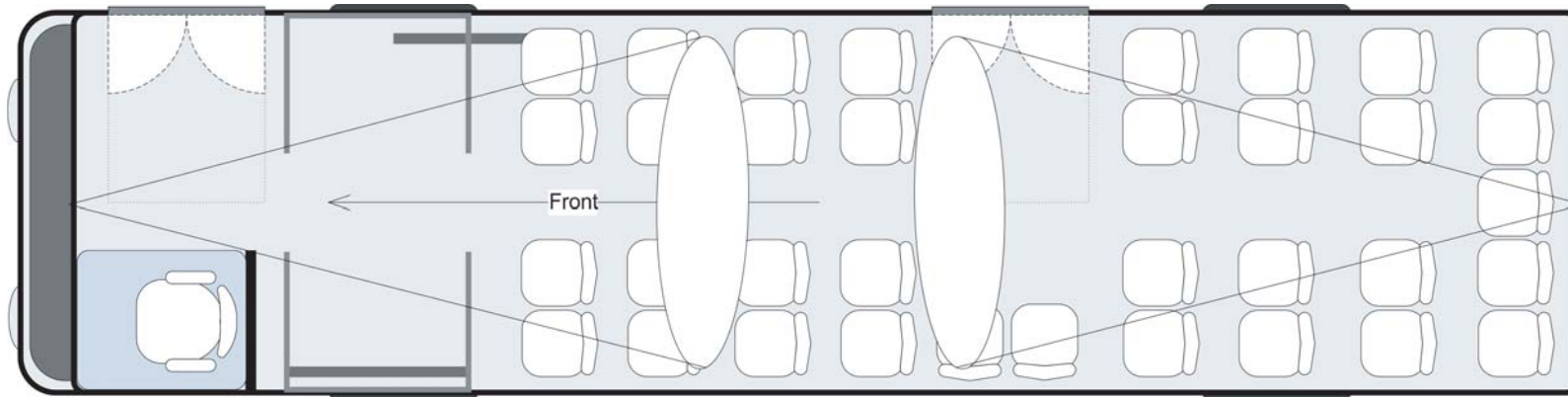


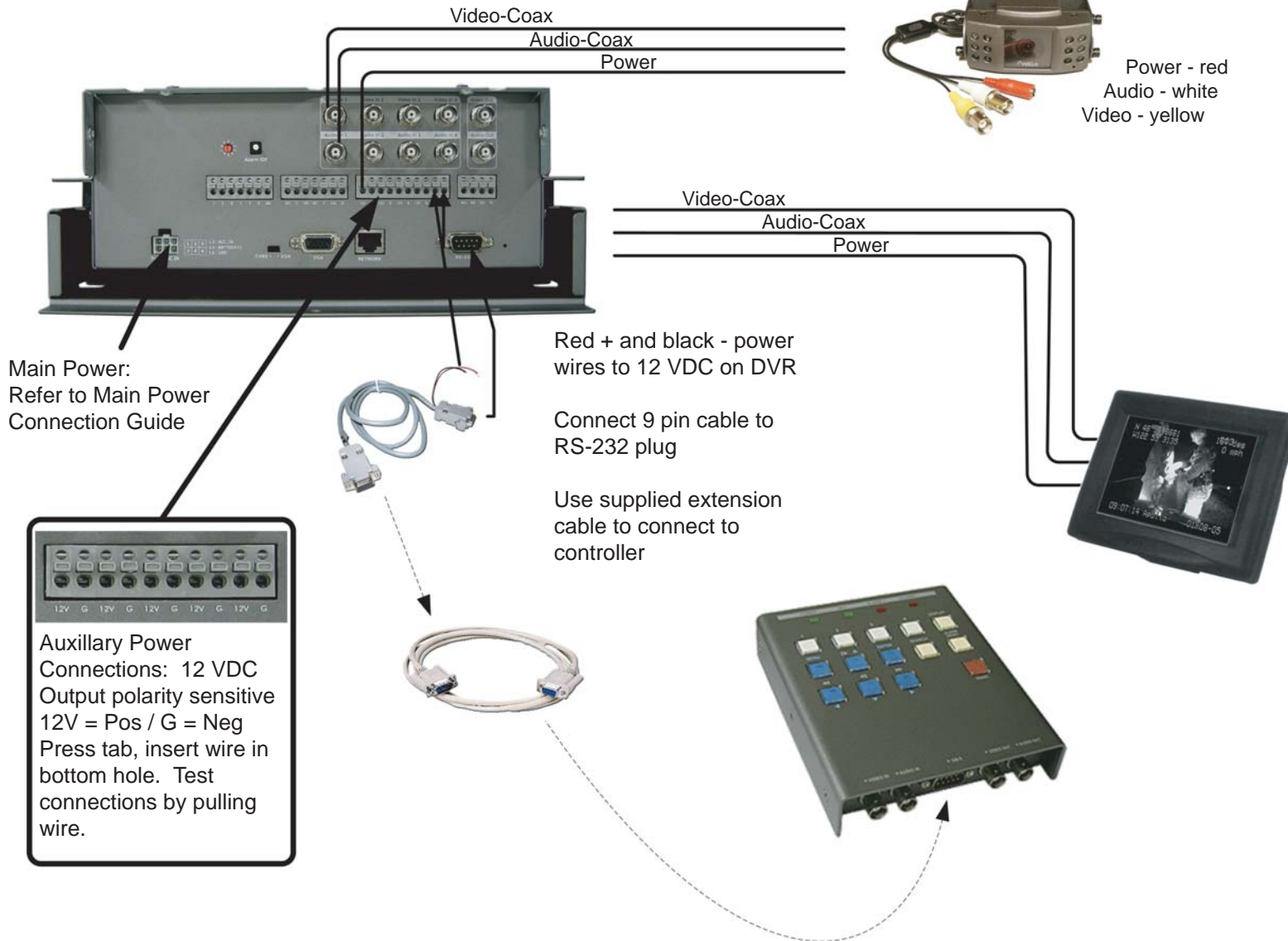
Note: Arrows indicate suggested mounting points only. Actual camera placement will depend on the structure of the bus, desired field-of-view, total number of cameras, and other factors.

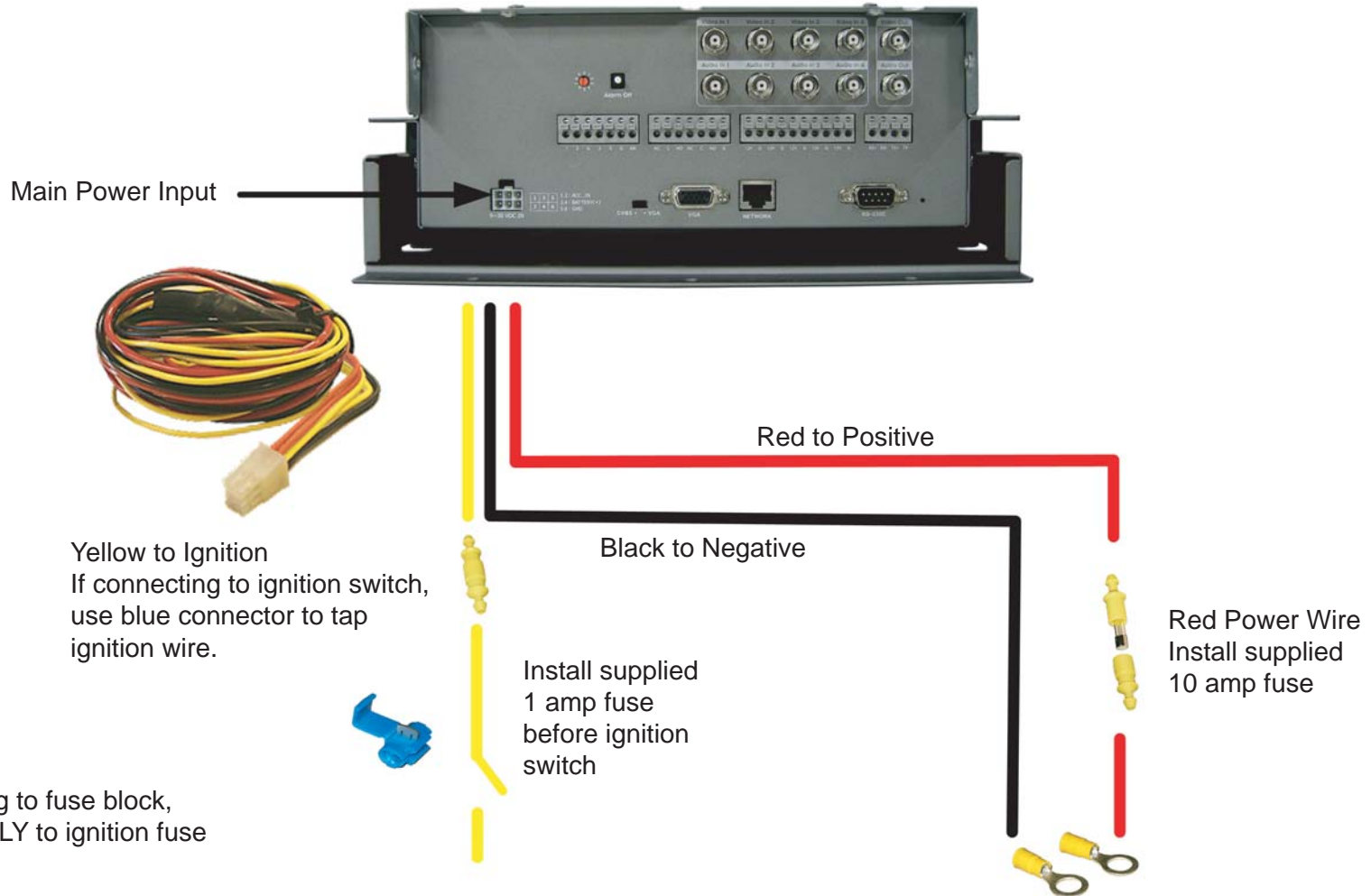
Example of camera placement with wide-angle lens.



Example of camera placement with a longer field of view.

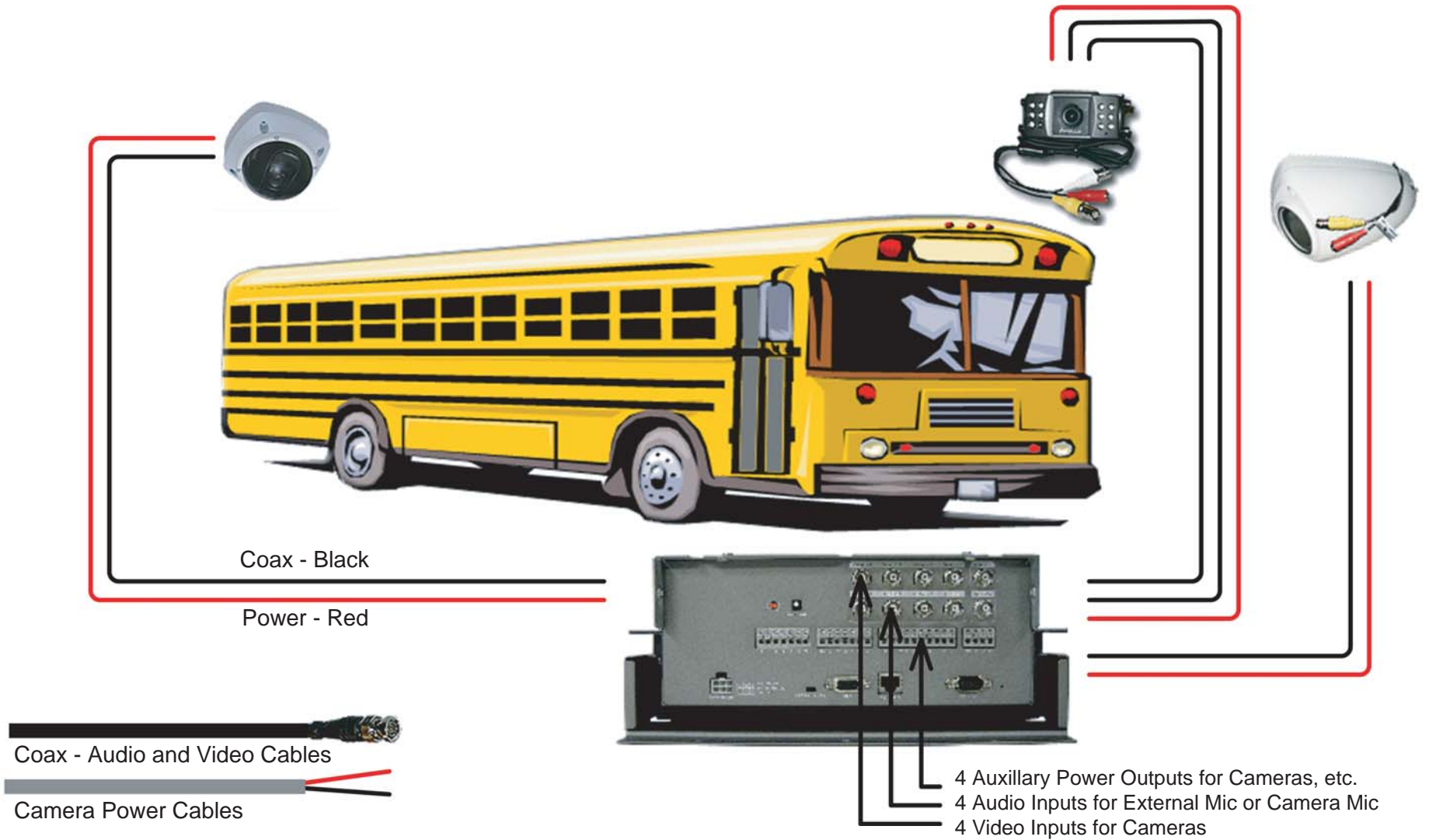






If available, use 24 VDC bus power (filtered on-board power not necessary)

Note: This diagram represents a typical installation; camera models and locations may vary.



It may be necessary or preferable to use switches, doors or other triggers to initiate recording.
READ THE FOLLOWING PRIOR TO INSTALLATION



Any 12 VDC or higher output **MUST** use the supplied relay or damage to the DVR can result.

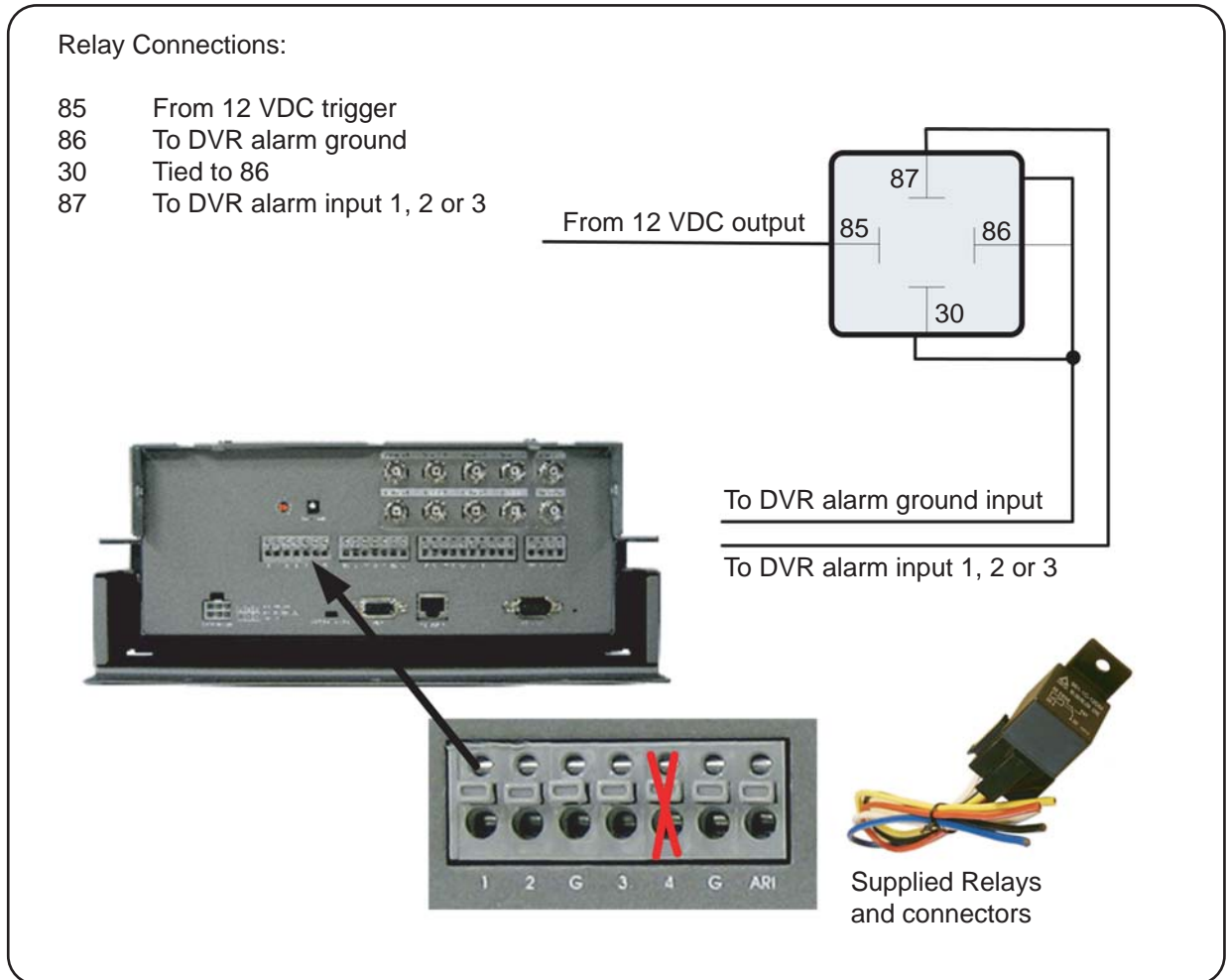
Devices which go to Ground when activated do not require the relay and may be connected directly to the DVR alarm inputs.

Many devices besides door switches or indicators may be used as recording and event log triggers.

Up to three external devices can be used as Recording and Event log triggers.

Some software set-up is required; see RoadRunner manual for more information.

Alarm input 4 is reserved for the optional Panic Button.



Note: Roadrunner RAS Software is compatible with Windows 98, 2000 and XP. It is NOT compatible with Mac OS, Windows 95 or NT.

The Roadrunner DVR is generally preconfigured according to customer-supplied specifications before delivery. However, should on-site programming be required, it is accomplished primarily with a laptop computer and the supplied IRAS Software. This enables the user to create custom configurations, multiple configurations for one DVR, or even to copy configurations into many DVR's, which can be a huge time savings when installing DVR's into many vehicles.

Configuring a laptop to communicate with the Roadrunner DVR is not difficult and simply refers to assigning the laptop an IP address that is compatible with the default IP address of the DVR. It is similar to having two telephones... if they had the same phone number they would not be able to call each other. In the same way, the laptop and the DVR must have different IP addresses.

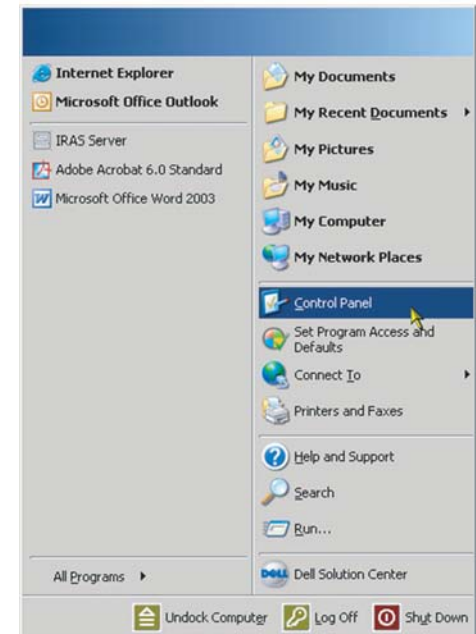
The Roadrunner DVR has a factory default IP address of 192.168.1.129, which makes it simple to connect to any MR4 you encounter in the field.

IP Address: (Internet Protocol) There are three parts to an IP address. Just like a phone number has a country code, area code and exchange, i.e.: 01-555-555-5555, an IP address has the address, the subnet mask and the gateway.

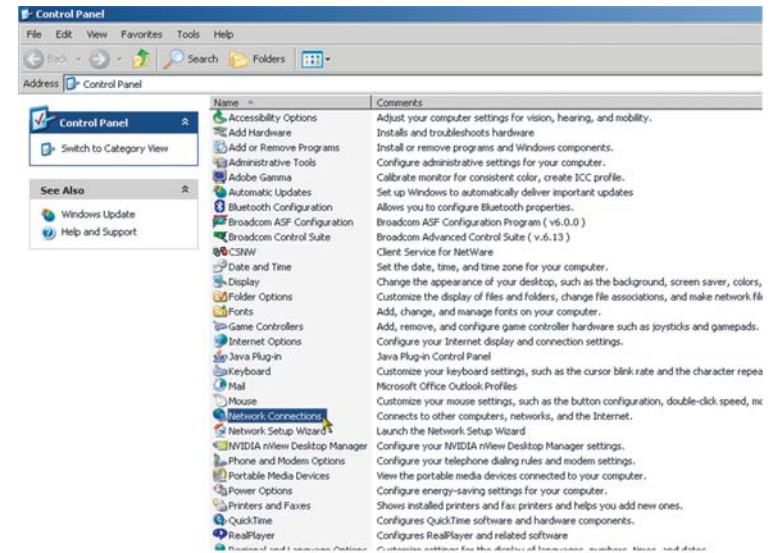
Generally it will only be necessary to set the laptop's IP address and possibly the subnet mask:

192.168.1.130: IP address
255.255.255.0: Subnet mask
192.168.1.254: Gateway, if needed

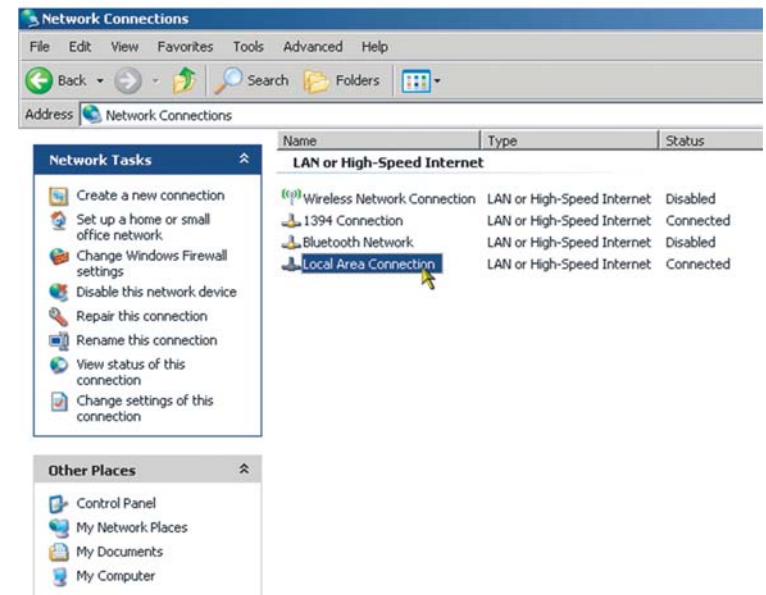
1. First, go to the Start Menu, then click on Control Panel.



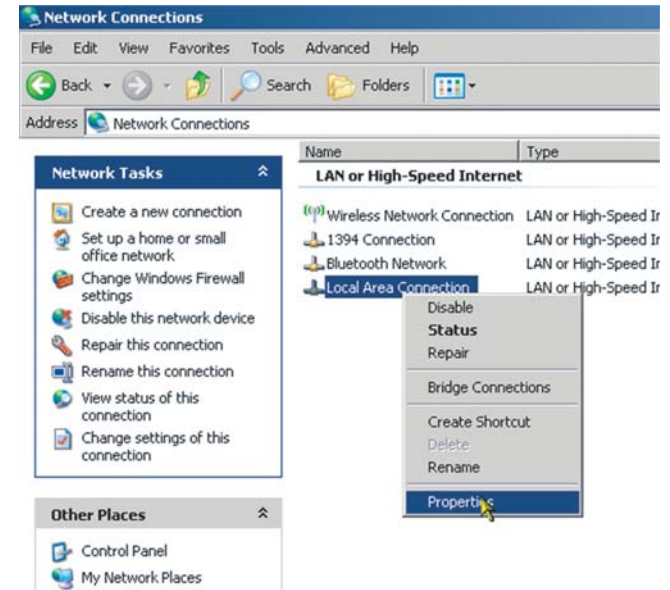
2. On the Control Panel, select **Network Connections**, and either press the ENTER key, or double-click with the mouse.



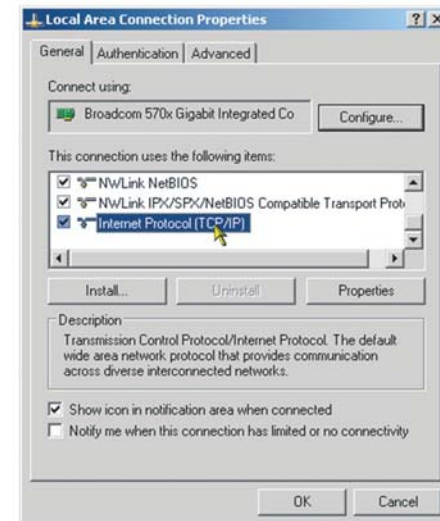
3. On the Network Connections screen, select **Local Area Connection**, then click the right hand button on the mouse and select **Properties**.



4. This opens the **Local Area Connections Properties** dialogue box, now click on **Properties**



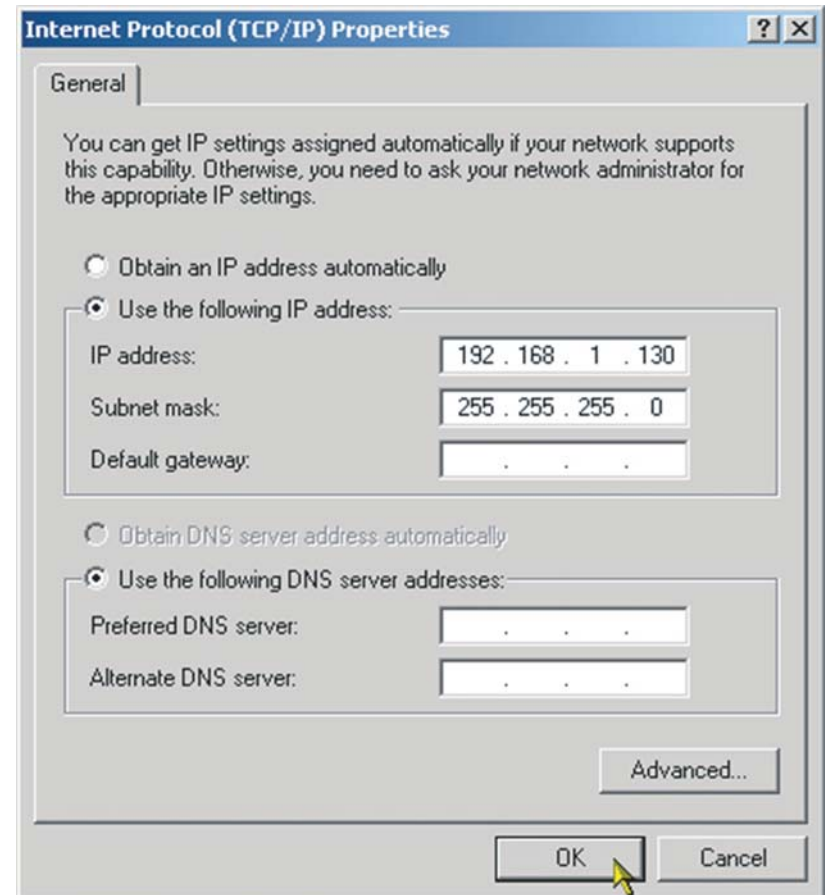
5. In the properties window, scroll down in the white area to find **Internet Protocol (TCP/IP)**, then double click on it.



6. Select **“Use the following IP Address”**
For the IP Address, enter **192.168.1.130**
If necessary, for the subnet mask enter **255.255.255.0**

7. Click the OK button to close this window. It may be necessary to restart the laptop for this change to take effect. (restart not necessary with Windows XP.)

8. Install IRAS Software on laptop following the directions in the supplied IRAS manual. Connect using the RoadRunner’s default IP Address of 192.168.1.129.



1. Connect the ethernet cable



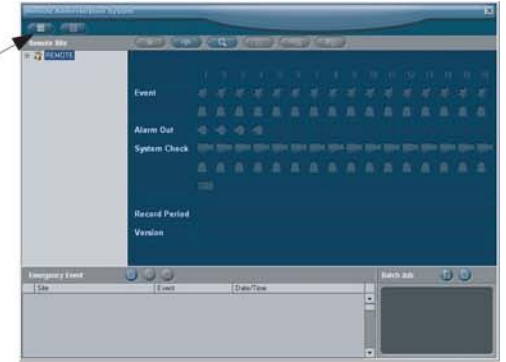
Color of the network, or ethernet, cable may vary, but it **must** be a **crossover** cable, and should be labeled as such.



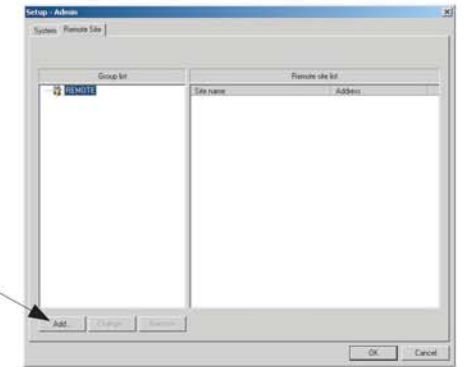
2. After installing the software on laptop or PC this Icon will appear on the desktop. Double click it to open the IRAS Admin Screen.



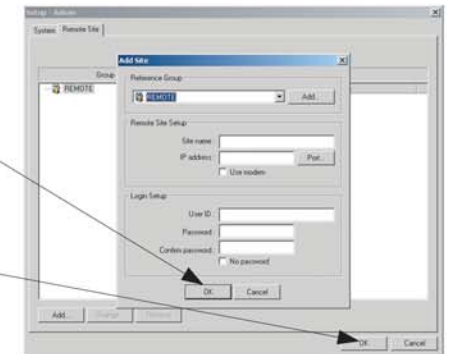
3. Click on the small button with the computer monitor on it at the top left of the screen.



4. Click on the Add button to open the Add Site screen.



5. Assign a site name (usually the vehicle number)
6. Enter the DVR's default IP Address: 192.168.1.129
7. Unit ID is not required.
8. Enter the default password: 12345678
9. Confirm the password.
10. Click the OK button to close the Add Site screen.
11. Click the next OK button to close the Setup-Admin screen.



To connect to the RoadRunner:

Click on the small + sign to drop down the Remote Site selection, then double click on the site name.

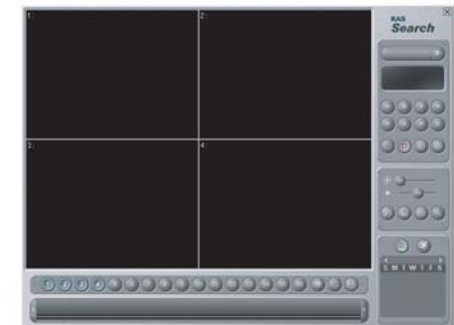
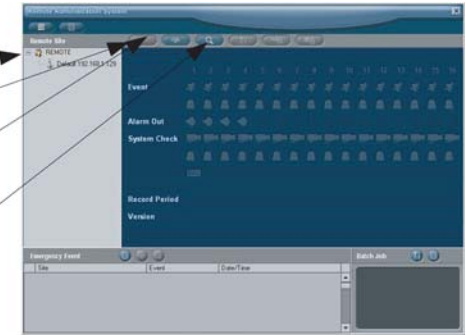
OR

Click the connection button at the top of the screen.

Click on the button with the eye icon, to open the **Watch** screen for live viewing.

Click the button with the magnifying glass icon to open the **Search** screen for playback of recorded video.

Refer to the supplied IRAS Software manual for further instructions.



Computer Terms

Bandwidth	The available capacity of a system or connection. Usually much less than the published rating.
Encryption	Processing and altering data so only the intended recipient can read or use it. The recipient of the encrypted data must have the proper decryption key and program to decipher the data back to its original form.
IP Address	Internet Protocol. A series of numbers that sets the address of a device on a network.
Network	Digital connection between two or more devices.
HDD	Hard Disk Drive. Can be in a computer or DVR
RS-232/RS-422	Computer communication standards used in video for the control of certain video equipment. Computer controlled VCRs, edit controllers, switchers and other studio equipment can commonly be found in professional video studios. Successfully linking two devices, at the very least requires that they use the same communication protocol.
Serial Port	A computer I/O (input/output) port through which the computer communicates with the external world. The standard serial port uses RS-232 or RS-422* protocols
Watermarking	A pattern of bits inserted into a digital image, audio or video file that identifies the file's copyright information (author, rights, etc.) Unlike printed watermarks, which are intended to be somewhat visible, digital watermarks are designed to be completely invisible, or in the case of audio clips, inaudible. Moreover, the actual bits representing the watermark must be scattered throughout the file in such a way that they cannot be identified and manipulated.

Video Terms

Artifacts	Visible distortion or blurriness due to compression in images
Compression	The process of electronically processing a video picture to make it use less storage or to allow more video to be sent down a transmission channel. Examples: JPEG Still images, usually used for photos. Good quality but large files, short recording times. MPEG Standardized motion-based compression, similar to that used on DVD's and Cable TV broadcasts. Apollo's chosen method of compression, giving high quality video and longest recording times. M-JPEG Non-standard method; series of still images with very large file sizes, very poor recording times.
ips	images per second. The rate cameras are sampled at for recording.
Resolution	1. The number of pixels (individual points of color) contained on a display monitor, expressed in terms of the number of pixels on the horizontal axis and the number on the vertical axis. Examples: 720 x 288 or 352 x 240 2. Rating of the fine detail of a TV picture, measured in scan lines. The more lines, the higher the resolution and the better the picture. A standard VHS format VCR produces 240 lines of horizontal resolution. 3. The process of removing picture data to decrease the size of a video image.

Camera Terms

AGC	Auto Gain Control. Circuitry in cameras that improves performance in low light conditions.
AWB	Auto White Balance. Circuitry in color cameras that compensates for different lighting conditions
BLC	Back Light Compensation. Ability of a camera to adjust for brightly lit backgrounds.
Digital Zoom	A method of zooming either by increasing the size of the pixels in the image or by interpolating between them.
Field Of View	Area covered by a camera
Optical Zoom	The use of lenses to change the focal length of a digital or analog camera. Image quality is superior to digital zoom.
White Balance	An electronic process used in camcorders* and video cameras* to calibrate the picture for accurate color display in different lighting conditions. (i.e., sunlight vs. indoor incandescent) White balancing should be performed prior to any recording, typically by pointing the camera at a white object for reference.

DVR Terms

BNC connector	A type of connector used on some VCRs, video and RF equipment providing twist-lock capability.
DVR	Digital Video Recorder
Event	Any input that creates an entry in a log and/or triggers recording to begin.
Input	Any signal received by a device. Audio, video, voltage and contact closure to ground are some examples of outputs.
Mil-spec	Rated for vibration according to established Military specifications
Monitor	Displays the video image, may also have speakers. Usually used when there is no laptop with the system
Output	Any signal created by a device. Audio, video, voltage and contact closure to ground are some examples of outputs.

Use this space to record your settings if changed from Defaults or Factory Presents.

Vehicle ID _____

IP Address _____ - _____ - _____ - _____

Passwords Admin _____

User _____

Cameras Cam 1 Title _____ Quality _____ Speed _____ Audio _____

Cam 2 Title _____ Quality _____ Speed _____ Audio _____

Cam 3 Title _____ Quality _____ Speed _____ Audio _____

Cam 4 Title _____ Quality _____ Speed _____ Audio _____

Alarms (Triggers) Input 1 Name _____

Input 2 Name _____

Input 3 Name _____

Input 4 RESERVED

Recording Timelapse Settings (non-event or alarm): Quality _____ Speed _____

Event Settings (triggered or alarm): Quality _____ Speed _____

Resolution Standard (up to 30 ips per camera) _____ High (up to 15 ips per camera) _____

HDD: On Full Overwrite _____ Stop _____

Other Notes: