

Gen-Eye Junior™

Operating Instructions

Pipe Inspection/Location System



Your Gen-Eye Junior Video Pipe Inspection/Location System is designed to give you years of trouble-free, profitable service. However, no machine is better than its operator. We therefore suggest you read these directions through carefully before using your machine on a job. This will enable you to operate the Gen-Eye Junior more efficiently and more profitably. Failure to follow these instructions may cause personal injury to operator or damage to equipment.

General
PIPE CLEANERS

SAVE THESE INSTRUCTIONS

GENERAL SAFETY INFORMATION

WARNING

Read and understand all instructions. Failure to follow all instructions listed below may result in electric shock, fire, and/or serious personal injury. Call General's customer service department at 412-771-6300 if you have any questions.

SAVE THESE INSTRUCTIONS.

Work Area Safety

- Keep your work area clean and well lit. Cluttered benches and dark areas invite accidents.
- Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Power tools create sparks which may ignite the dust or fumes.
- Keep bystanders, children, and visitors away while operating a power tool. Distractions can cause you to lose control.

Electrical Safety

- Tool must be plugged into a 110-volt outlet or 12-volt internal battery. Outlet must be properly installed and grounded in accordance with all codes and ordinances. Check with UL approved tester or qualified electrician if you are in doubt as to whether the outlet is properly grounded. If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from user.
- Avoid body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerators. There is an increased risk of electrical shock if your body is grounded.
- Avoid exposure to rain or wet conditions. Keep tool out of direct contact with water. Water entering electric devices increases risk of electric shock.
- Use proper extension cords. Insufficient conductor size will cause excessive voltage drop and loss of power.
- Keep all electric connections dry and off the ground. Do not touch plugs or tools with wet hands. Reduces the risk of electrical shock.

Battery Precautions

- Use only the size and type battery specified. Using incorrect battery can damage tool.
- Recharge battery with charging unit specified. Using an improper charger can overheat and rupture battery.
- Properly dispose of battery. Do not dispose of in a fire. Exposure to high temperatures can cause battery to explode.

Personal Safety

- Stay alert, watch what you are doing, and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medications. A moment of inattention while operating power tools may result in serious personal injury.
- Avoid traffic. Pay close attention to moving vehicles when using on or near roadways. Wear visible clothing or reflector vests. Such precautions may prevent serious injury.
- Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts. Loose clothes, jewelry, or long hair can be caught in moving parts.
- Use safety equipment. Always wear eye protection, dust mask, non-skid safety shoes, hardhat, or hearing protection must be used for appropriate conditions.
- Rubber gloves should always be worn for health and safety reasons. Sewer lines are unsanitary and may contain harmful bacteria.
- Do not overreach. Keep proper footing and balance at all times. Proper footing and balance enables better control of the tool in unexpected situations.
- Use proper accessories. Do not place this product on any unstable cart or surface. The product may fall causing serious injury to a child or adult and serious damage to the product.
- Heed Warnings. All warnings on the product and in the Operator's Manual should be adhered to.

Tool Use and Care

- Do not use tool if switch does not turn it ON or OFF. Any tool that cannot be controlled with the switch is dangerous and must be repaired.
- Store idle tools out of reach of children and untrained persons. Tools are dangerous in the hands of untrained users.
- Maintain tools with care. Properly maintained tools are less likely to cause injury.
- Use only accessories that are recommended by manufacturer for your model. Accessories that may be suitable for one tool may be hazardous when used on another tool.
- Inspect tool and extension cords periodically and replace if damaged. Damaged cords increase the risk of electric shock.
- Disconnect plug from the power source before making any adjustments, changing accessories, or storing the tool. Such preventive safety measures reduce risk of starting tool accidentally.
- Keep handles dry and clean; free from oil and grease. Allows for better control of the tool.
- Protect against lightning. For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power surges.
- Protect against excessive heat. The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

Service

- Tool service must be performed only by qualified repair personnel. Service or maintenance performed by unqualified repair personnel could result in injury.
- When servicing a tool, use only identical replacement parts. Follow instructions in the Maintenance Section of this manual. Use of unauthorized parts or failure to follow maintenance instructions may create a risk of electrical shock or injury.
- Follow instructions for changing accessories. Accidents are caused by poorly maintained tools.
- Provide proper cleaning. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use damp cloth for cleaning.
- Conduct a safety check. Upon completion of any service or repair to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

Specific Safety Information

- Be sure that the unit is plugged into a properly grounded receptacle. If in doubt, check receptacle before plugging in machine. Check the power cord to see that there are no cuts or frays, and that the grounding prong on the plug is still in place.
- If the power cord supplied with the machine is not long enough, be sure to use heavy-duty extension cord no more than 50 feet long and in good condition. Using lighter cords can result in severe power loss.
- Neutralize or remove corrosive drain cleaners from drain before starting. Exposure to these chemicals can cause injury to the operator and damage the equipment.
- Do not operate machine if operator or machine is standing in water. Will increase the risk of electrical shock.

Set-Up

1. Position Gen-Eye Junior on a stable surface. Note the unit may be operated in a vertical or horizontal position.
2. Choose a power source. You may connect the Gen-Eye Junior to a 110V AC outlet or use the optional internal 12V battery.
3. Loosen knob and open the monitor cover.
4. Lift Sun Visor and position the monitor to a suitable viewing angle.
5. Switch Power ON by pushing the green button on the monitor.
6. Release the reel brake (See "Reel Brake" section).



Table 1. Push Rod Selection Guide

Push Rod	Pipe Sizes	Lengths Available
Gen-Eye Micro-Rod	1-1/2" to 4" (38 to 100mm)	100 ft (30m)
Gen-Eye Mini-Rod	2" to 6" (50 to 150mm)	200 ft. (60m)

Table 2. Camera Selection Guide

Camera Type	Catalog No.	Pipe Sizes
Black & White Mini-Camera	G3-2010	2" to 6" (50 to 150mm)
Color Mini-Camera	G3-2015	2" to 6" (50 to 150mm)

Note: The Micro-cameras for 1-1/2" to 4" (38 to 100mm) lines are not available separately.

Reel and Camera Features

Reel Brake

The Gen-Eye Junior has a brake to keep the reel from turning while the unit is being transported. To set the brake, turn the thumb wheel to the RIGHT (clockwise) until the brake pad stops the reel from turning. To release the brake, turn the thumb wheel to the LEFT (counter-clockwise) until the brake pad has been completely retracted.



Skids

The trap skid lifts the camera off the bottom of the pipe for a clearer view of the line and helps the camera around tight bends. Whenever possible use the trap skid to protect the camera housing from excess wear. The trap skid is a standard accessory with a complete unit with mini-camera. It is optional when purchasing the complete unit with micro-camera.



Components



Mini Color Camera



Micro Color Camera



Locator

Command Module Features

Battery Pack (Optional)

The optional battery pack enables remote operation for up to three hours, depending upon camera LED levels, transmitter activation, and ambient temperatures. It fits snugly in the compartment at the base of the unit below the monitor. To install the battery, remove the two screws in the front, and one on the bottom of the compartment. Then slide the compartment open. Connect the battery to the leads—red wire to the red (positive) terminal and black wire to the black (negative) terminal. Then slide the compartment closed and replace the three screws.

Caution: Be careful not to pinch the battery wires when closing the battery compartment.

Initial charging time for a completely drained battery is approximately 7 hours. However, the unit can be used on AC while the battery is charging. Subsequent recharging times will vary depending on the battery level at the time of recharging. Indicator lights on the power panel will indicate when the battery is fully charged.

Picture Inverter

No need to stand on your head when the camera turns upside down. Just press the INVERT button and the picture will be right side up again.

Press Invert button to flip picture.

Press again to return picture to normal.

Note: Graphics will not appear on screen while in Invert mode.

Dimmer

Press UP or DOWN arrows to adjust brightness of camera lights (LED's) for the best picture. It lets you adjust the light level of the camera LED's to match the size and reflectivity of the pipe you are working in. Bar graph on screen will indicate light levels.

Note: Lights will always be off when first turning on system.



Inverter



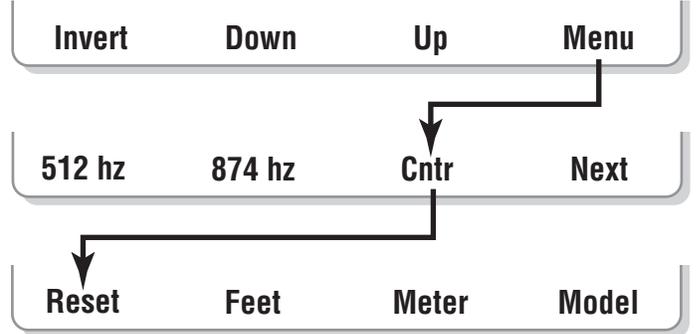
Down Up

Distance Counter

The On-Screen Distance Counter lets you keep track of the amount of push rod you've fed into the line. It helps you zero in on the area to start locating the camera.

To Reset The Counter To Zero

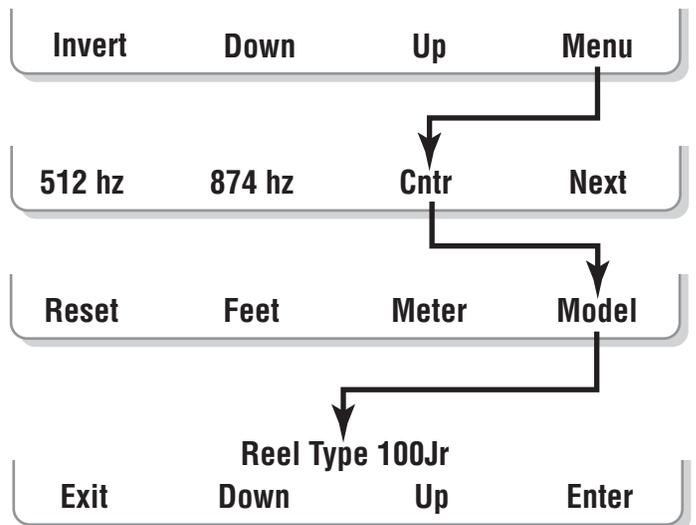
1. Press MENU
2. Press CNTR (Counter)
3. Press RESET. The counter will reset to zero.



Reel Configuration

To measure more accurately, the Gen-Eye Junior must know the length of the push rod you are using (100 ft. or 200 ft.)

1. Press MENU
2. Press CNTR (Counter)
3. Press MODEL.
4. Use UP or DOWN arrows to set to reel type you are using. (i.e. "Mini Reel 200 ft".)
5. Press ENTER when the right selection appears.

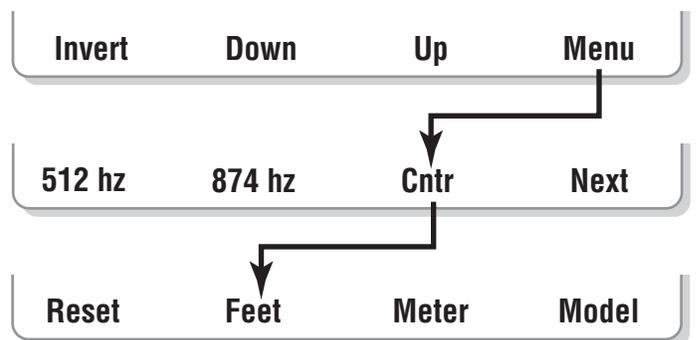


Use UP or DOWN arrows to set reel type.
Press Enter to store.

To Select Unit of Measure (Feet or Meters)

To measure more accurately, the Gen-Eye Junior must know the length of the push rod you are using (100 ft. or 200 ft.)

1. Press MENU
2. Press CNTR (Counter)
3. Press MODEL.
4. Use UP or DOWN arrows to set to reel type you are using. (i.e. "Mini Reel 200 ft".)
5. Press ENTER when the right selection appears.

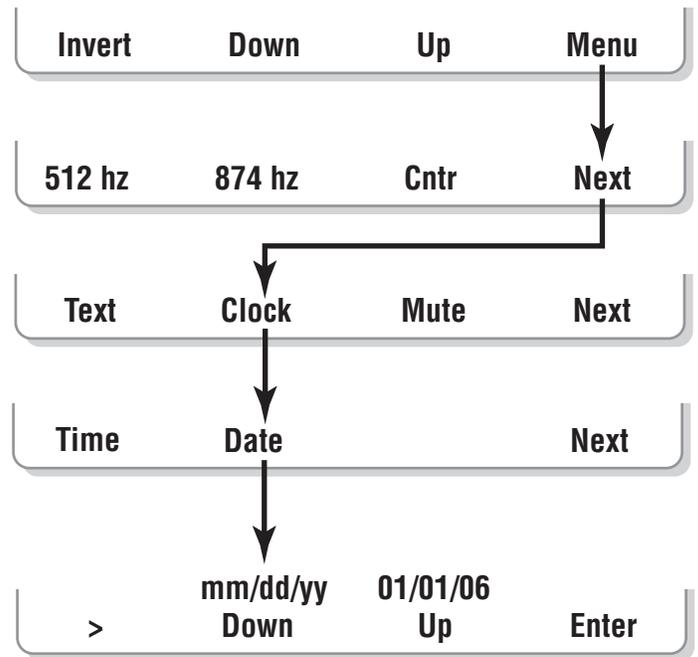


Date and Time Stamp

Allows you to document the date and time of each job for your records to turn each video into a legal document.

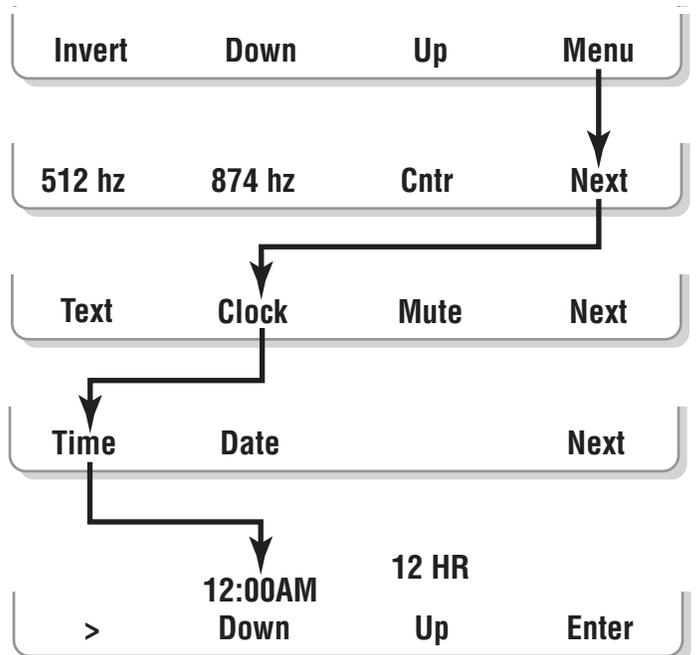
To Set Date

1. Press MENU.
2. Press NEXT.
3. Press CLOCK.
4. Press DATE.
5. Press RIGHT arrow to move the cursor to the next position and press the UP and DOWN arrows to scroll through the numbers.
6. When complete, press ENTER to save changes.



To Set The Time

1. Press MENU.
2. Press NEXT.
3. Press CLOCK.
4. Press TIME.
5. Press RIGHT arrow to move the cursor to the next position and press the UP and DOWN arrows to scroll through the numbers.
6. Select 12 HOUR or 24 HOUR Mode.



Internal Text Writer

The Internal Text Writer gives you two lines of 24 characters each to add your company name and phone number to every video you make so your customers will remember who did the job.

Editing Titles

1. Press MENU
2. Press NEXT
3. Press TEXT
4. Locate letter by pressing LEFT or RIGHT arrow buttons and press ENTER.
5. To save text on screen, hold ENTER for 3 seconds on your final character selection.
6. To clear text, move cursor to the blank space in the character selection and hold ENTER until the text has been deleted.

To Remove All Graphics from Screen

1. Press MENU.
2. Press NEXT
3. Press NEXT again.
4. Press CLEAR.
5. Graphics will return to screen by repeating procedure.

Microphone

An external microphone (not included) may be used to add a commentary to a video recording. Plug the microphone into the mini phone jack to the right of the screen. The microphone will be ON when you plug it in. To turn the microphone OFF press MENU, then NEXT, then the MUTE button. MUTE will flash on the screen when the microphone jack is deactivated. Repeat these steps to reactivate the microphone jack.

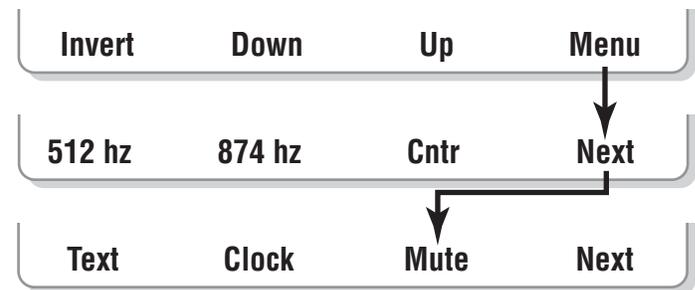
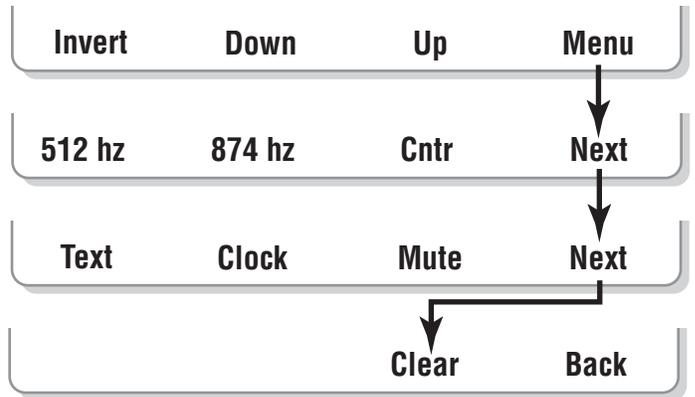
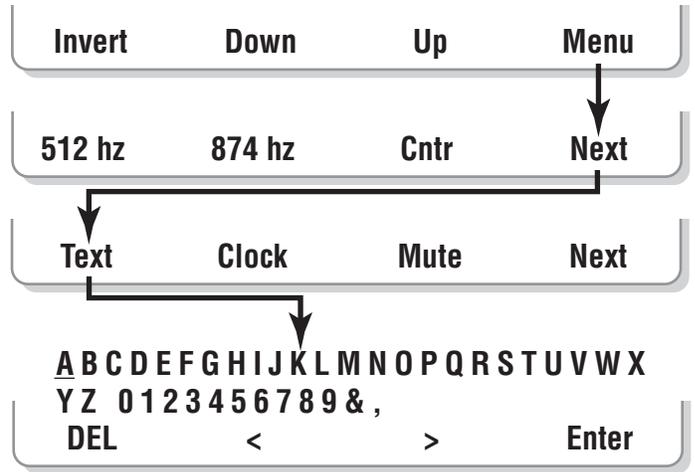
Note: To prevent feedback when using an external monitor, reduce the volume or mute the speaker.

Video and Audio Out

The Gen-Eye Junior can be attached to an external recording device (VCR, DVD-R, etc.) using the jacks located to the right of the screen. Connect the Audio Out (white jack) to the Audio In of the external recording device. Connect the Video Out (yellow jack) to the Video In of the external recording device.

Note: Be sure to set switch on the back of the monitor to CAMERA ON (or VIDEO OUT) to view Junior camera.

To playback external video, set switch to VIDEO IN or (CAMERA OFF).



Microphone
Audio Out
Video Out

To Remove Reel

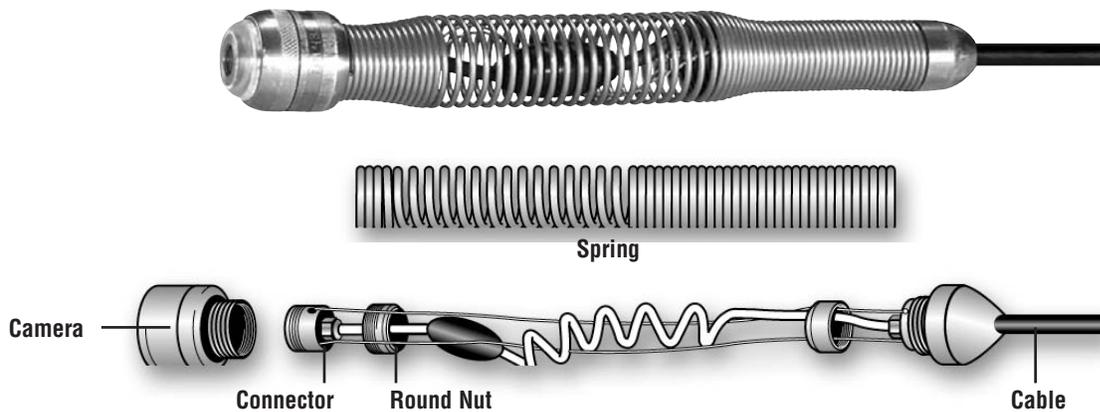
1. Unscrew the three (3) Philips head screws from the round back cover of the reel, then remove the cover.
2. Disconnect the connector from the center of the hub by rotating locking ring one quarter turn counterclockwise. Pull the connector straight out.
3. Unscrew the five (5) machine screws from the reel hub, then remove the reel.
4. Lay the reel flat on work surface.

5. To free the spring and camera from the case, remove one screw in each of the three straps in the case. Loosen the other screw from each and rotate each strap out of the way.
6. Remove camera and spring assembly from its channel in the case. Place the camera in the center of the reel.
7. Reverse steps 1 through 6 to replace the reel.

Note: During reel replacement, in Step 2, be sure to align the polarity key before pushing the connector straight in. Rotate lock ring one quarter turn clockwise to complete the connection.

Changing the Mini Camera

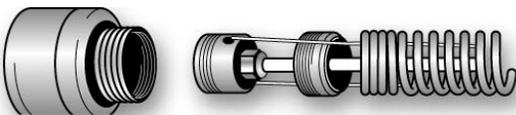
Note: Micro-Cameras are not removable. See "To Remove Reel".



1. Ensure that the camera and spring are clean and dry.



2. Place the C wrench at the end of the spring so that the camera can be removed. Holding the C wrench so that it tends to loosen the spring, turn the camera in the opposite direction to unscrew it.



3. When the camera has been released from the spring, remove the round nut at the rear of the camera. This nut holds the two lanyards in place and secures the connector at the rear of the camera.

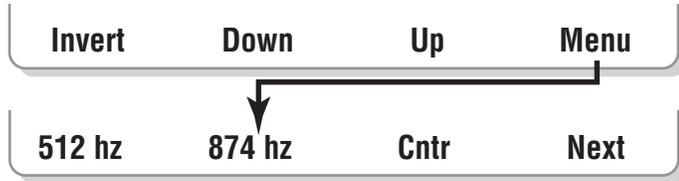
4. Release the lanyards and pull the connector at the rear of the camera to remove it.

Caution: The camera is not waterproof when the rear connector has been removed.

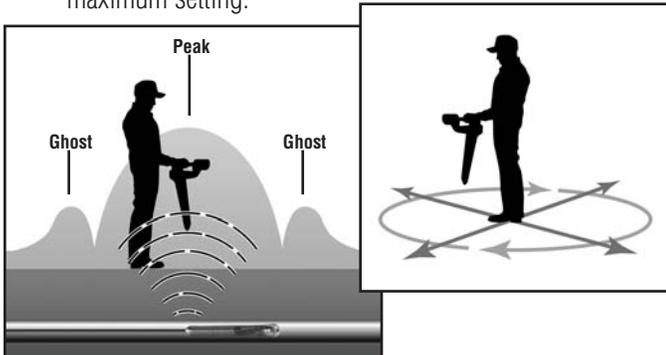
5. Fit the replacement camera to the connector.
6. Ensure the lanyards are straight and locate them in the connector slots. Screw the knurled round nut into the camera until hand tight.
7. Align the camera and the spring, keeping the lanyards straight. Before screwing the camera onto the spring turn the camera counter-clockwise approximately 2-1/2 turns. This twists the lanyards so that they end up straight when the camera has been fully screwed onto the spring (clockwise). Screw the camera onto the spring until hand tight. The C wrench is not required.

Camera Location

1. Turn the power switch ON. To select a transmitter frequency, press MENU, then press the 512 or 874 buttons. The LCD screen will flash the frequency selected to show the unit is transmitting.



2. Press the ON/OFF button on the G3 Locator to turn the unit on, then check that the battery indicator shows at least one bar. Replace batteries as needed.
3. Make sure the Locator is set for the same frequency as the transmitter by pressing the Frequency button (FREQ) until the desired frequency appears on the display.
4. Press Antenna Select (ANT SEL) so that the indicator arrow points to TWIN PEAK.
5. Press the UP arrow so that the gain bar is at the maximum setting.

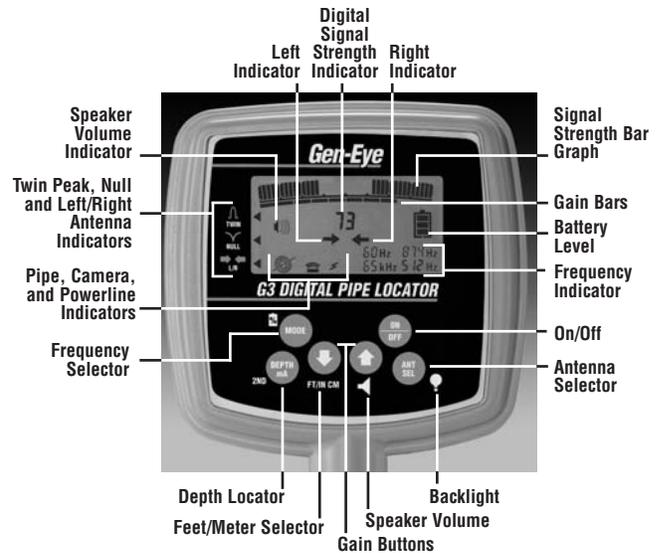


6. Hold the Locator blade vertical and in line with the camera head (handle of the Locator at 90 degrees to the camera head). If you are not sure of the direction of the pipe, hold the locator above the drain opening and rotate it until you obtain the maximum signal.

Note: The camera must be stationary to be precisely pinpointed.

7. Move the Locator forwards and backwards and side to side along the path of the pipe until you obtain a peak response on the display.
8. If the display indicates a maximum signal of 100, reduce the gain by pressing the DOWN arrow to keep the display at approximately 50% - 70%.
9. Repeat step 7 and 8 as you narrow your search area.

Locator



10. A small ghost signal may appear before and behind the peak reading. Lower the gain button until you receive only one signal.
11. When you can only receive the signal in a small one foot square area, you've located the camera. Mark the spot.

Tip: It's much easier to locate the camera when it's closer to the drain opening than when it's 100 feet away. Push the camera five or ten feet into the line, then do your first location. Mark the spot and push the camera ahead another five or ten feet, then repeat. When you're done, you'll have the whole line traced and marked.

Depth Measurement

1. Recheck the camera location using the steps outlined above.
2. Rest the tip of Locator on the ground, and hold the locator vertically above the pinpointed position of the camera head.
3. Press the DEPTH button. The LCD screen will indicate the depth of the camera.
4. You can select the unit of measurement (inches, feet/inches, centimeters, meters) by pressing the DEPTH button and the DOWN arrow at the same time.

Note: An indication of four dashes on the display can be caused by too much or too little signal strength. Adjust the gain and recheck the depth measurement.

See complete G3 Locator instruction manual for more information

Table 4. Trouble Shooting Guide

Problem	Probable Cause	Solution
Push rod kinks.	Operator forcing the push rod.	Do not force the push rod.
	Push rod used in wrong size drain line.	A push rod that is too large or too small in diameter for a line is more likely to kink. Consult Table 1 – Reel Selection Guide.
Unit will not turn on.	Blown Fuse	Check fuse on panel.
	12-volt battery needs to be recharged.	Unit may be plugged into 110v receptacle while battery is recharging.
No Picture on screen	Video In/Video Out switch in wrong position.	Place switch, located on back of monitor, in Video Out position.
No graphics on screen.	Picture inverted.	Press Invert button.
	Graphics turned off.	See, “To remove all graphics from screen” section.
Hum or squeal in audio.	Feedback while recording.	Turn down volume on external monitor.
Difficulty locating camera.	Transmitter and locator not set to the same frequency.	Make sure locator is set to the same frequency as the transmitter.
	Low batteries in locator	Check battery level and change batteries as necessary.
	Attempting to locate beyond optimum range.	Plastic and clay pipe can be located to a depth of 20 ft.; cast iron pipe can be located to a depth of 10 ft. Tip: Pull the camera back to within 10 ft. to 15 ft. of drain opening and reattempt to locate camera.

General / **General Wire Spring Co.**
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