Laser Level

Contents

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The RT-7690-2 self-leveling, remote-controlled, simultaneous level and plumb rotational laser system is a Class IIIA laser product. Observe the following precautions when using the RT-7690-2 laser system:

- Always operate the unit according to the procedures in this user guide.
- Avoid direct eye exposure to the laser beam.
- Do not point the laser beam at your face, or another person's face.
- Turn off power to the base unit before moving it, to avoid accidental laser exposure and to protect and lock the pendulum.
- Do not disassemble or attempt to service the unit (with the exception of calibration, as described in the Calibration section).

Repairs or service are to be performed only by an authorized service center.

Warning Labels

The following labels are attached to every RT-7690-2 unit. They should not be removed or defaced.

This label is located on the front of the unit. It identifies the RT-7690-2 laser system as a device that emits laser radiation and requires appropriate user safety precautions.

This label is shown next to every laser aperture on the product. It indicates laser radiation is emitted from the level and plumb apertures.

This label indicates that the RT-7690-2 laser system is certified and approved for sale in Europe.

This label indicates that the RT-7690-2 laser system is certified and approved for sale in Australia.

FCC Statement

This product has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by performing one or more of the following:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT: Changes or modifications to this product not authorized by Toolz could void the FCC Certification and negate your right to operate the product.

Overview

The RT-7690-2 is a self-leveling, remote-controlled, simultaneous level and plumb rotational laser system. Its level and plumb laser beams can be independently controlled from the base unit or RF remote control.
A remote control with built-in laser detector allows for laser beam detection under lighting conditions where beam visibility is poor.

This guide describes the features and operation of the RT-7690-2 laser system. Important warranty and safety information is also included.

Features

The RT-7690-2 laser system includes the following:

Base Unit

- Level and plumb laser beams, with independent and simultaneous operation
- Level and plumb self-leveling range - ±6°
- Accuracy
  - Level - ±1/8 in. (3 mm) at 100 ft. (30m)
  - Plumb - ±1/4 in. (6.4 mm) at 100 ft. (30m)
- Level and plumb Spin mode
  - Variable rotation speeds - slow, medium and fast
  - Plumb alignment - ±2.0°
- Level and plumb Line Dither/Scan mode, for higher beam visibility
  - Six line lengths
  - 360° level and plumb positioning
- End-user calibration
- Pendulum lock mechanism for protection during transport and storage
- Out-of-level indicator
- Automatic power standby, with override
- Low battery indicator
- Built-in tripod mount - 5/8" x 11, for standard surveyor's tripods, such as the RoboToolz RT-A1150 tripod

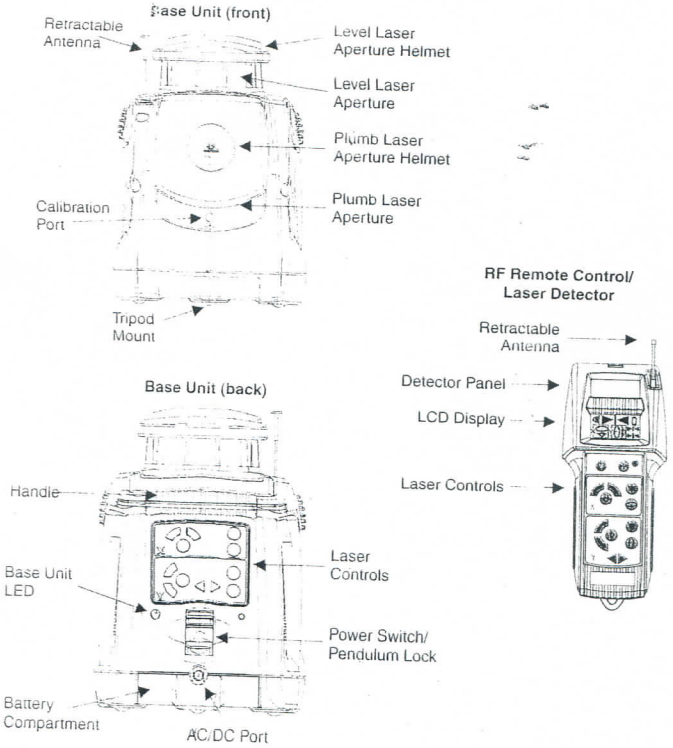
RF Remote Control/Laser Detector

- RF remote control range - 300 ft. (91m)
- Laser beam functions, controllable from the base unit or RF remote control
- Last command sent confirmation
- Laser beam locator, with fine/coarse resolution selection
- Low battery indicator

Accessories

- Rod bracket (for RF remote control/laser detector)
- Laser target
- Laser enhancement glasses

The following diagrams illustrate the main components of the RT-7690-2 laser system base unit and RF remote control/laser detector.



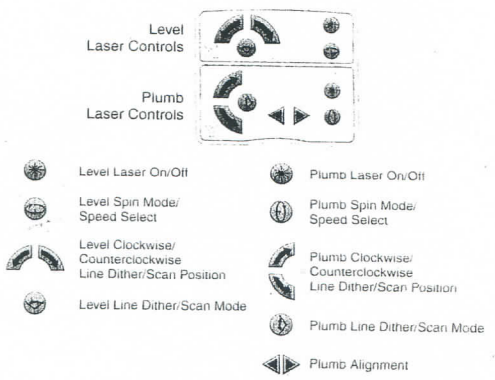
Operation

This section describes the RT-7690-2 base unit and its operating modes, and explains how to use the laser detector.

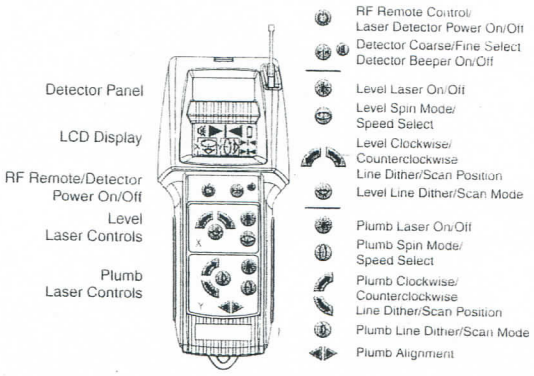
Controls

Laser control functions are available from the base unit and RF remote control/laser detector. Refer to the following diagrams for the operating control locations.

RT-7690-2 Base Unit Controls



RT-7690-2 RF Remote Control/Laser Detector Controls



✍ ***Note:*** *The LCD display icons are described in the Laser Detector section.*

Turning on the Laser System

To turn on the laser system:

1. Place the RT-7690-2 base unit on a flat surface, or set it on a standard surveyor's tripod, using the built-in 5/8" x 11 tripod mount on the bottom of the unit.
2. Turn on the unit with the base unit power switch. This switch also unlocks the pendulum inside the unit so it can move freely, allowing the unit to self-level. The base unit LED should flash green for approximately five seconds, then turn to a steady green, indicating that the unit is on and properly functioning.

✍ ***Notes:***

1. *Main power can be turned on only from the base unit.*

none of the control buttons on the base unit or RF remote control work until the LED on the base unit has stopped flashing and turned to a steady green.

3. *Turn on the level or plumb laser from the base unit or RF remote control.*

❖ ***Caution:*** *ALWAYS turn off both lasers and the main power switch before transporting or storing the base unit.*

Using the Lasers

The RT-7690-2 base unit's level and plumb lasers operate independently. The level laser, plumb laser, or both lasers can be turned on simultaneously.

- Level laser - Use the level Spin or Line Dither/Scan laser for indoor and out door level applications, such as leveling cabinetry, setting concrete forms, or leveling electrical outlets.
- Plumb laser - Use the plumb Spin or Line Dither/Scan laser for indoor and outdoor plumb and alignment applications, such as plumbing framing or aligning conduit.
- Level and plumb lasers - Use both lasers simultaneously to generate a crosshair for level and plumb alignment applications, such as aligning cabinetry or tiling.

✍ *Notes:*

1. *Slight variation of beam brightness at distances less than 3 ft. (91 cm) may be seen. At distances greater than 3 ft. (91 cm), there are no interruptions in the beam.*
2. *See the Applications section for application diagrams.*

Operating Modes - Spin and Line/Dither Scan

The RT-7690-2 base unit has two basic operating modes:

- Spin mode - The laser beam disperses throughout the level or plumb plane. Spin mode is used under conditions where laser beam visibility is poor or non existent (for example, outdoors in daylight). Spin mode produces a less visible laser beam, which can be detected indoors or outdoors with the RF remote control's built-in laser detector.

- Line Dither/Scan mode - The laser beam moves rapidly back and forth (dithers), producing a shorter, brighter beam than in Spin mode. With the brighter laser beam, the laser detector is not required. The dither line length can easily be set to level and plumb application requirements. Line Dither/Scan mode is normally used for indoor applications.

✍ ***Note:*** *The RT-7690-2 base unit can be controlled by the laser controls on the base unit and RF remote control. The RF remote control allows for non-directional, unobstructed operation of the base unit, from up to 300 ft. (91m) anywhere on the job site.*

Spin Mode

When the laser is first turned on, it is in Spin mode at the slowest speed. Continue pressing the level or plumb Spin button to cycle through the medium and fast speeds, then back to slow speed. Decrease speed to improve laser beam visibility, especially for indoor applications.

Plumb alignment is available for the plumb laser in Spin mode, with a range of ±2.0° around the center of rotation. The default position is the midpoint of the 4° adjustment range. The base unit emits a constant beep if the adjustment limit is reached.

✍ ***Note:*** *To enter Spin mode from Line Dither/Scan mode, press the level or plumb Spin button on the keypad.*

Line Dither/Scan Mode

When the laser is first turned on, it is in Spin mode. To enter Line Dither/Scan mode, press the level or plumb Line Dither/Scan button on the keypad. A short, bright line appears. Continue pressing the Line Dither/Scan button to cycle through the six different line lengths, then back from the longest line to the shortest.

✍ ***Note:*** *The laser beam is less visible at longer line lengths. It may be necessary to use the laser detector to accurately locate the beam.*

Plumb alignment is available for the plumb laser in Line Dither/Scan mode, with a range of ±2.0° around the center of rotation. The default position is the midpoint of the 4° adjustment range. The base unit emits a constant beep if the adjustment limit is reached.

The level and plumb Position buttons are used to move the line dither through a 360° range in the level or plumb plane. Pressing and holding the button increases the speed of travel.

Out of Level

Out-of-level indicators alert you if the base unit is not on a level surface or if it is out of self-leveling range. When the unit is out of level, the following occurs:

- The base unit LED flashes red once per second.
- The laser beam stops rotating (if in Spin mode) or dithering (if in Line Dither/Scan mode) and flashes a laser dot in sync with the base unit LED.
- The base unit beeper sounds in sync with the laser beam and base unit LED.

✍ ***Note:*** *If the laser beam is not turned on, an out-of-level condition is indicated by flashes and beeps emitted from the base unit.*

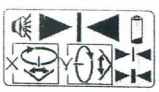
Reposition the unit to ensure that it is within the self-leveling range of ±6°. Once the unit is within self-leveling range, the LED turns green and the laser beam stops flashing. The RT-7690-2 base unit resumes the mode of the last signal received.

✍ ***Note:*** *The out-of-level indicator overrides all other indicators. If the laser system is in Low Battery or Power Standby mode and the laser system becomes out of level, the out-of-level indicator overrides the Low Battery or Power Standby mode indicator.*

Laser Detector

The laser detector allows accurate laser beam detection outdoors, or under other conditions when the laser beam is difficult to see. The following diagram illustrates the laser detector LCD display icons.

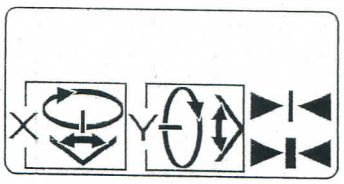
Detector LCD Display



	Beeper On/Off		Level Spin Mode/ Speed Select
	Detector Laser Beam Locator		Level Line Dither/Scan Mode
	Low Battery Indicator		Plumb Spin Mode/ Speed Select
	Fine Resolution		Plumb Line Dither/Scan Mode
	Coarse Resolution		

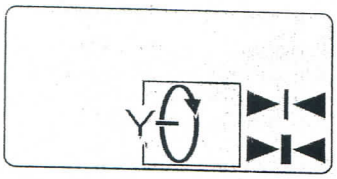
To use the laser detector:

1. Activate the RF remote control/laser detector with its keypad Power On/Off button . The unit emits a single beep, and icons in the lower portion of the LCD display appear, showing all available options. This confirms that the unit is activated, but the lasers and laser detector have not been turned on. It is now safe to turn on the lasers and the laser detector.

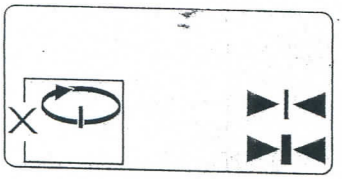


RF remote control/laser detector activated

um on the level and/or plumb laser and make desired selections from the key pad. (See the Operating Modes section.) As soon as one or both of the lasers are turned on, the displayed icons confirm the selected laser(s) (level, plumb, or both) and mode (Spin or Line Dither/Scan). The level and plumb lasers start up in Spin mode, at the slowest speed.



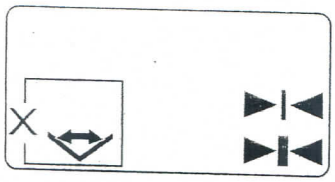
Plumb laser, Spin mode, Detector off



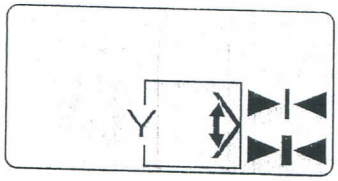
Level laser, Spin mode, Detector off

✍ ***Note:*** The LCD display shows the laser modes for commands transmitted to the base unit from the RF remote control. Commands made from the base unit controls are not shown on the RF remote control/ laser detector LCD display.

Press the Line Dither/Scan button again to change to Line Dither/Scan mode.

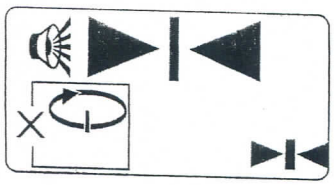


Level laser, Line Dither/Scan mode, Detector off

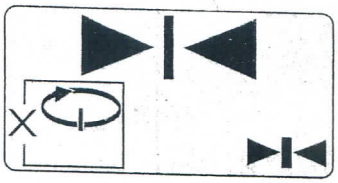


Plumb laser, Line Dither/Scan mode, Detector off

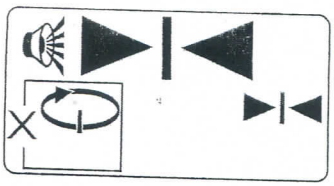
3. To turn on the laser detector, press the Coarse/Fine Select button . On startup, the laser detector resolution is coarse, with the beeper on indicated by the icons on LCD display. Continue pressing the Coarse/Fine Select button to cycle through the following options:



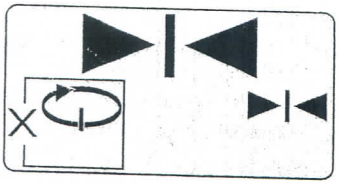
Beeper on, Laser detector on, Coarse resolution, Level laser, Spin mode



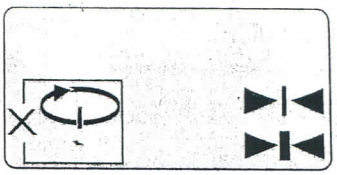
Beeper off, Laser detector on, Coarse resolution, Level laser, Spin mode



Beeper on, Laser detector on, Fine resolution, Level laser, Spin mode



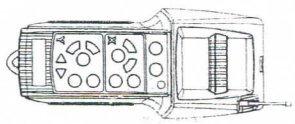
Beeper off, Laser detector on, Fine resolution, Level laser, Spin mode



Laser detector power off, Level laser, Spin mode, Level laser, Spin mode

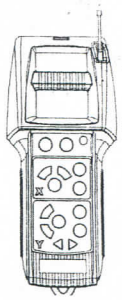
4. Locate the laser beam, using the red sensor panel on the RF remote control/laser detector. As the laser beam is approached, a single arrow points in the direction of the beam. The base unit emits sounds to aid in locating the laser beam:
   - Rapid beep - Indicates that the laser detector is pointed overly high or far to the left or right.
   - Continuous tone - Indicates that the laser detector is pointed directly toward the laser beam.
   - Slow beep - Indicates that the laser detector is pointed overly low, or off center in the opposite direction.

5. Center the beam by moving the laser detector in the direction of the arrow. When the beam is aligned with the center of the detector panel, both arrows on the LCD display are lit and the beep is continuous, indicating that it is properly centred.



Level laser detection

✍ ***Note:*** *Laser detector orientation depends on whether it is being used to locate the level or plumb laser beam.*



Plumb laser detection

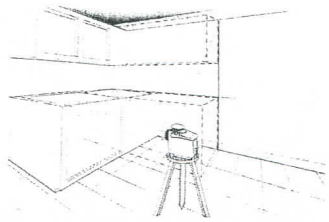
6. To turn off the RF remote control/laser detector, press its Power On/Off button . There is a double beep for confirmation, the LCD display becomes blank, and the lasers shut off.

Reflective Target

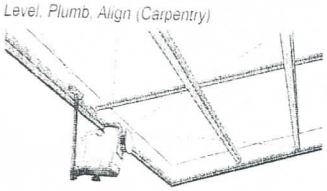
The red acrylic used in the targets enhances the laser beam, making the laser dot more visible.

Laser Enhancement Glasses

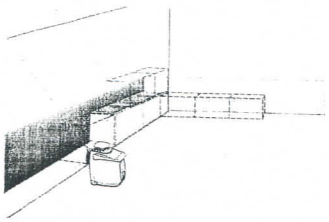
The red plastic used in the glasses enhances the laser beam, making the laser dot more visible. These glasses are particularly useful when using the RT-7690-2 laser system outdoors or in brightly lit environments.



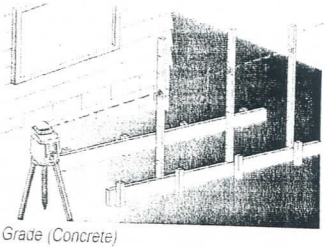
Level, Plumb, Align (Carpentry)



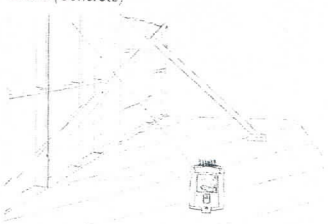
Level (Drop Ceiling)



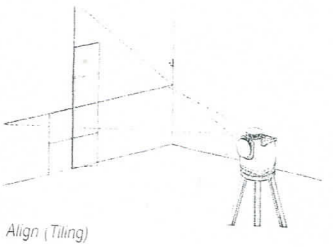
Plumb (Concrete)



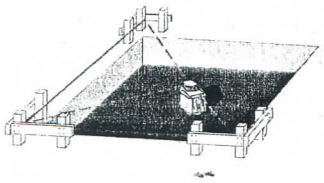
Grade (Concrete)



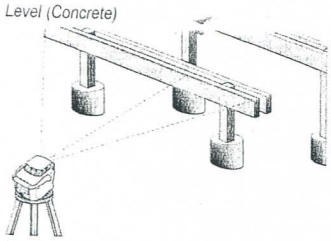
Align (Framing)



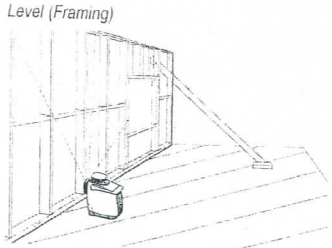
Align (Tiling)



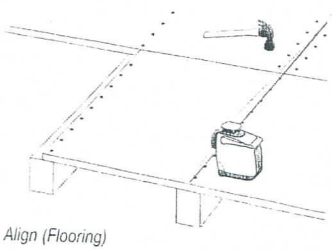
Level (Concrete)



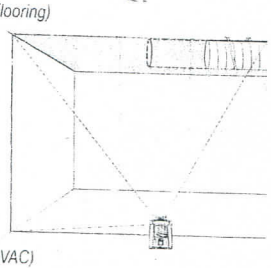
Level (Framing)



Plumb (Framing)



Align (Flooring)



Align (HVAC)

Power

Base Unit

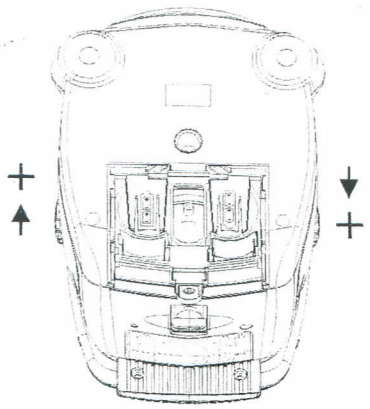
The base unit can be powered by four "D" cell batteries (alkaline or rechargeable) or by AC power through a power adapter. Batteries cannot be recharged in the unit.

Low Battery Indicator

Low battery power is indicated by the base unit LED flashing yellow when 25 percent of battery life remains (approximately five hours). The LED flashes, and continues to flash in a pattern of three seconds on/one second off, until the batteries are replaced or fail.

Battery Replacement

The base unit battery compartment is located at the back of the unit, below the power switch and AC/DC port. Open the compartment and replace the batteries, ensuring that the polarity is correct, as shown in the diagram.



❖ ***Caution:*** *Remove all batteries from the RT-7690-2 base unit and RF remote control/ laser detector whenever the units are stored for an extended period of time.*

Power Standby Mode

When commands are not received for 25 minutes, the RT-7690-2 base unit automatically enters Power Standby mode to save battery life. The base unit LED flashes green, once per second, to indicate Power Standby mode. The timer is reset each time a command is sent to the base unit from itself, from the RF remote control, or if the laser detector is still in use.

- To override Power Standby mode for the base unit, press and hold its Laser On/Off button for three seconds. The base unit emits a beep and two "chirps," confirming that automatic power standby is disabled. After automatic power standby is disabled, the base unit continues to operate for a maximum period of eight hours.
- To re-enable automatic power standby, press and hold the Laser On/Off button again for three seconds. The command is confirmed by another beep and one "chirp."

When the base unit enters Power Standby mode, it "remembers" the settings that were in effect, and returns to these settings when a command is issued and power returns. Current settings are **not** retained when power is turned off with the base unit main power switch.

Remote Control/Laser Detector

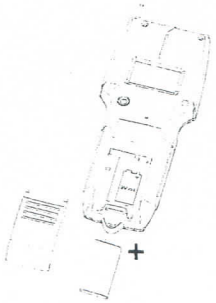
The RF remote control/laser detector is powered by a 9V battery (alkaline or non-alkaline).

Low Battery Indicator

When RF remote control/laser detector battery capacity falls below 25 percent, an icon on the laser detector LCD display indicates low battery power (approximately four hours remaining).

Battery Replacement

The RF remote control/laser detector battery compartment is located at the back of the unit. Open the compartment and replace the 9V battery, ensuring that the polarity is correct, as shown in the diagram.



❖ ***Caution:*** *Remove all batteries from the RT-7690-2 base unit and RF remote control/laser detector whenever the units are stored for an extended period of time.*

Power Standby Mode

The RF remote control/laser detector enters Power Standby mode if none of the RF remote control buttons are pressed or if the laser detector is not used for 20 minutes. The RF remote control/laser detector timer is reset each time a button is pressed to operate the RF remote control or use the laser detector.

- To override Power Standby mode for the RF remote control/laser detector, press and hold its Laser On/Off button for three seconds. The RF remote control/laser detector emits a beep and two "chirps," confirming that automatic power standby is disabled. After automatic power standby is disabled, the RF remote control continues to operate for a maximum period of eight hours.
- To re-enable automatic power standby, press and hold the Laser On/Off button again for three seconds. The command is confirmed by a beep and one "chirp."

Temperature Protection

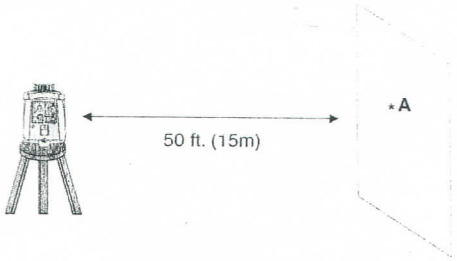
The laser beam automatically shuts off when the base unit temperature reaches 113°F (45°C). Once it cools below 104°F (40°C), power to the laser beams is returned. Current operating settings are retained, and the RT-7690-2 base unit returns to the last functional mode selected.

Calibration

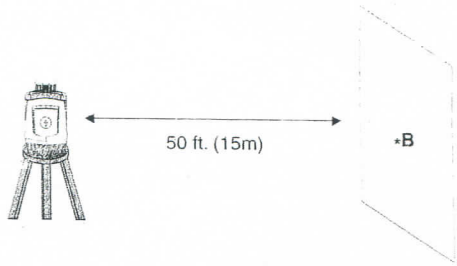
The RT-7690-2 laser system is calibrated before shipment to ensure a superior product, conforming to the specifications provided. Although it was calibrated before leaving the factory, it contains many precision-machined parts that may be affected if the instrument is subject to abuse. Therefore, if the unit is dropped or sustains significant impact, **check its calibration**. It is also recommended that the base unit be periodically calibrated, as a normal maintenance procedure.

To calibrate the RT-7690-2 laser system:

1. Select a site for calibration that allows the base unit to be placed about 50 ft. (15m) away from a smooth vertical surface, such as a wall. Use an Allen wrench to remove the calibration port covers on the side and front of the unit. Store the calibration port covers in a safe place.
2. Set the base unit on a level surface at one end of the range. Position it with the side facing the wall. Ensure the calibration port faces away from the wall.
3. Turn on the power and the level laser beam. Select Line Dither/Scan mode (at the shortest line length) for best laser beam visibility. If the beam is not visible, use the laser detector to locate the beam.
4. Mark the height (center) of the laser beam on the vertical surface of the wall, as **A**.



5. Rotate the base unit 180°, taking care not to change its height. The base unit should be positioned with its opposite side facing the same vertical wall as in step 2. Use the level Line Dither/Scan position arrows to position the laser beam on the original wall.

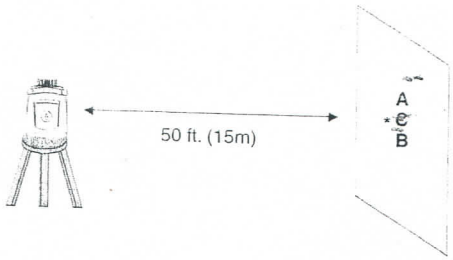


6. Mark the height of the laser beam on the same vertical surface, as **B**. If **B** is positioned at the same height as **A**, proceed to step 11. Otherwise, continue to step 7. The goal of the next few steps is to position the level laser beam at a height halfway between **A** and **B**.
7. Turn off the laser beam and power to the unit.
   ❖ ***Caution:*** *The laser beam must be turned off and the main power switch in the off position before proceeding to the next step.*
8. Insert an Allen wrench into the side calibration port and locate the calibration screw. Rotate it clockwise to lower the beam, or counterclockwise to raise the beam.

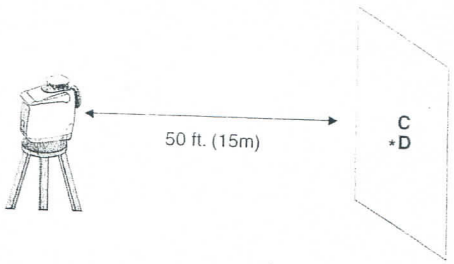
Remove the Allen wrench from the calibration port. Turn on the power, turn on the level laser beam, then check the height of the laser beam. Repeat steps 7 and 8 until the beam is at a height exactly halfway between **A** and **B**.

❖ ***Caution:*** *The Allen wrench must be removed from the calibration port before turning on the power.*

10. Mark this calibrated point on the vertical surface, as **C**.



11. Repeat steps 3-7 to confirm the position of **C**, then proceed to step 12.
12. Rotate the base unit 90° and position it with the front facing the vertical sur face. Mark the height of the laser beam, as **D**.

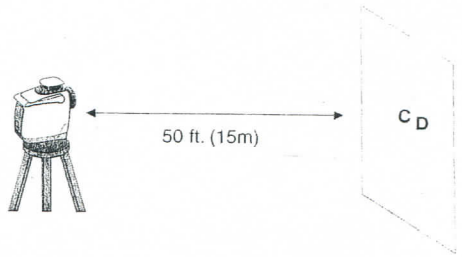


13. Compare the height of **D** with **C**. If the height of **D** matches the height of **C**, calibration is complete. Turn the power switch to the off position. Reattach the calibration port covers, then resume normal operation. If the height of **D** does not match the height of **C**, proceed to step 14.
14. Turn off the laser beam and power to the unit.

❖ ***Caution:*** *The laser beam must be turned off and the power switch in the off position before proceeding to the next step.*

15. Insert an Allen wrench into the front calibration port and locate the calibration screw. Rotate it clockwise to lower the beam, or counterclockwise to raise the beam.

16. Remove the Allen wrench from the calibration port. Turn on the power, turn on the level laser beam, then check the height of the laser beam. Repeat steps 14 and 15 until the beam is at the height of **C**.



❖ ***Caution:*** *The Allen wrench must be removed from the calibration port before turning on the power.*

Calibration is complete.

17. Turn the power switch to the off position. Reattach the calibration port covers, then resume normal operation.

✍ ***Note:*** *Complete calibration of the level laser beam automatically calibrates the plumb laser beam. Separate calibration of the plumb laser beam is not required.*

Care and Maintenance

The RT-7690-2 laser system is a product of superior design and manufacture, and should be treated with care. The following guidelines will help maintain the product and fulfill warranty obligations:

- Keep the laser system, including parts and accessories, out of the reach of small children.
- Do not store in dusty or dirty areas. Although the RT-7690-2 laser system is dust- and dirt-resistant, long-term exposure to these elements may damage internal moving parts.
- Keep dry. The RT-7690-2 laser system is water-resistant; however, precip.. tion, humidity, and liquids which contain minerals that corrode electrical cir- cuits may enter the units.
- Do not store in hot areas above 158°F (70°C). High temperatures can short- en the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store in cold areas below 14°F (-10°C). When the laser system warms to normal operating temperature, moisture can form inside the base unit and/or RF remote control/laser detector, where it may damage the circuit boards.
- To avoid damage and personal harm, do not attempt to open the base unit and/or RF remote control/laser detector. The units should be opened only by qualified service personnel.
- Do not drop, knock, or shake the base unit and/or RF remote control/laser detector. Rough handling impacts calibration accuracy.
- Periodically calibrate the base unit to ensure calibration accuracy.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the base unit and/or RF remote control/laser detector. Wipe with a soft cloth, slightly dampened in a mild soap-and-water solution.
- Keep the base unit laser aperture windows clean by periodically wiping them with a lint-free swab moistened with isopropyl (rubbing) alcohol.