

# JOHNSON

## Electronic Self-Leveling Horizontal Exterior Rotary Laser Kit *Model No. 40-6551*



**WARNING:**  
This product contains one or more chemicals, including lead, known to the State of California to cause cancer and birth defects or other reproductive harm.  
**Wash hands after handling.**

## Instruction Manual

*Congratulations on your choice of this Electronic Self-Leveling Horizontal Exterior Rotary Laser. We suggest you read this instruction manual thoroughly before using the instrument. Save this instruction manual for future use.*

This is a Class IIIa laser tool and is manufactured to comply with CFR 21, parts 1040.10 and 1040.11 as well as international safety rule IEC 285.



## Table of Contents

1. Kit Contents	8. Self-Check & Fine Calibration
2. Features and Functions	9. Technical Specifications
3. Safety Instructions	10. Application Demonstrations
4. Location/Content of Warning Labels	11. Care and Handling
5. Location of Parts/Components	12. Product Warranty
6. Operating Instructions	13. Warranty Registration
7. Using the Product	14. Accessories
	15. Trouble Shooting

## 1. Kit Contents

### Description for Model 40-6551

<u>Description for Model 40-6551</u>	<u>Qty.</u>
Electronic Self-Leveling Horizontal Exterior Rotary Laser	1
NiMH Rechargeable Battery Pack	1
6.4V Battery Adapter	1
4 "C" Alkaline Battery Pack (batteries not included)	1
Detector with 9V Battery	1
Instruction Manual with Warranty Card	1
Hard-Shell Carrying Case	1

## 2. Features and Functions

- Large  $\pm 5^\circ$  electronic auto-level range. When beyond the leveling range, the laser line will flash, rotation of the beam will stop, and an audible alarm will activate.
- Vibrate mode ignores slight movements as in windy conditions.
- Height of Instrument/TILT alarm function ensures product accuracy.
- Projects a laser horizontal plane.
- Dust and rain resistant.
- Detector included for more convenient operation.





### 3. Safety Instructions

Please read and understand all of the following instructions, prior to using this tool. Failure to do so, may void the warranty.

#### **DANGER!**

Class IIIa Laser Product  
Max. Power Output:  $\leq 5\text{mW}$   
Wavelength: 625-645nm

**THIS TOOL EMITS LASER RADIATION.  
DO NOT STARE INTO BEAM.  
AVOID DIRECT EYE EXPOSURE.**



#### **ATTENTION**



#### **IMPORTANT**

- Read all instructions prior to operating this laser tool. Do not remove any labels from tool.
- Do not stare directly at the laser beam.
- Do not project the laser beam directly into the eyes of others.
- Do not set up laser tool at eye level or operate the tool near a reflective surface as the laser beam could be projected into your eyes or into the eyes of others.
- Do not place the laser tool in a manner that may cause someone to unintentionally look into the laser beam. Serious eye injury may result.
- Do not operate the tool in explosive environments, i.e. in the presence of gases or flammable liquids.
- Keep the laser tool out of the reach of children and other untrained persons.
- Do not attempt to view the laser beam through optical tools such as telescopes as serious eye injury may result.
- Always turn the laser tool off when not in use or left unattended for a period of time.
- Remove the batteries when storing the tool for an extended time (more than 3 months) to avoid damage to the tool should the batteries deteriorate.
- Do not attempt to repair or disassemble the laser tool. If unqualified persons attempt to repair this tool, warranty will be void.
- Use only original Johnson® parts and accessories purchased from your Johnson® authorized dealer. Use of non-Johnson® parts and accessories will void warranty.



## 4. Location/Content of Warning Labels





## 5. Location of Part/Components





## 6. Operating Instructions

**IMPORTANT:** It is the responsibility of the user to verify the calibration of the instrument before each use.

### Battery Installation

**Note:** Always check to be sure that the laser is off before removing and replacing battery packs.

#### *Alkaline Battery Pack Installation*

1. Put 4 “C” batteries into the battery pack according to polarity direction.
2. Attach the battery pack to the laser.



#### *Ni-MH Rechargeable Battery Charging*

Using the 6.4V battery adapter (included), charge the rechargeable battery pack directly to the battery pack (Fig 1.) or while the battery pack is connected to the laser (Fig. 2). When the charge indicator LED turns from red to green (after approximately five hours) on the 6.4V battery adapter (Fig. 3), the Ni-MH rechargeable battery pack has been fully charged.



Fig. 1



Fig. 2

**Note:**

- (1) For the first two charges of new rechargeable batteries, it is recommended to charge for 12 plus hours.
- (2) The unit can still work during charging with the adapter.
- (3) Do not charge alkaline batteries to avoid explosion.



Fig. 3



- (4) Used (discharged) batteries are hazardous waste and should be disposed of properly.

### Before Using the Laser

When you charge the new battery or one which has not been used for long periods of time, it may not reach full charge until after you have discharged it fully in use and recharge it several times.

### Instrument Usage

1. Put in Ni-MH rechargeable battery pack, or 4 "C" alkaline battery pack.
2. Place the laser on a tripod, connect it to the tripod using the 5/8" screw thread at the bottom of the laser.

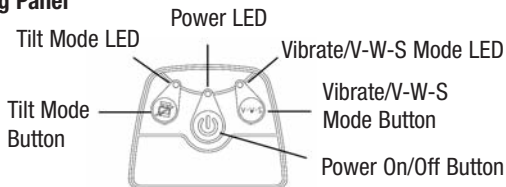
**Note:** If the laser is inclined beyond the self-leveling range, the laser will deliver an audible alarm. You will need to re-position the laser.



3. Press power button to turn power on.
4. Press the Tilt button to lock in the height of the laser.
5. After finishing operation or before moving the laser, turn the power off.

## 7. Using the Product

### Operating Panel



#### Power LED

LED On = power on

LED Off = power off

LED Flashing = low battery

#### Tilt Mode LED

LED Flashing Slowly = laser is entering Tilt mode

LED On = laser Tilt mode is on

LED Flashing Quickly = laser has been moved and height of laser  
may have been changed

LED Off = Tilt mode is turned off

#### Vibrate/V-W-S Mode LED


LED On = laser is in vibrate/V-W-S mode

LED Off = laser is not in vibrate/V-W-S mode





## Power On/Off

1. Press the power on/off button to power the laser on. The power LED will light up and the laser will electronically self-level itself, with rotation occurring once the unit is level at 600 rpms. The laser will automatically enter into the Tilt mode and the Tilt LED will flash slowly for 30 seconds then become solid. 
2. Press the power on/off button again to power off.


## Low Battery Indication

If the power LED is flashing, the battery is low. To ensure normal operation, replace alkaline batteries or charge the rechargeable Ni-MH battery pack.

## Alarm If Beyond Range

If the laser is inclined beyond the self-leveling range of  $\pm 5^\circ$ , it will deliver an audible alarm, and will not rotate. You will need to re-position the laser until it is within the leveling range.

## Tilt Mode Button

After turning on the laser, the laser will self-level and begin to rotate. The Tilt mode LED will blink for 30 seconds after the laser begins to rotate. During these 30 seconds if the laser is moved, the laser will stop rotating, re-level and begin to rotate again. After 30 seconds, the Tilt mode LED will stop blinking and will become solid. If the laser is moved when the Tilt mode LED is solid, the laser will stop rotating. The laser beam will blink on and off and the Tilt mode LED will blink quickly alerting the user the height of the laser may have been changed. Pressing the tilt mode button on the laser keypad will 





turn off the tilt mode and will allow the laser to re-level and start rotating again. Press the tilt mode button again to enter tilt mode.

### **Vibrate V-W-S Button**

Press the Vibrate V-W-S button and the Vibrate V-W-S LED will turn on, which means the laser is in vibrate mode.



Vibrate mode allows continuous operation during high winds, vibrations and shocks. Slight movements are ignored and the laser only enters Tilt mode if significant movement occurs. Press the Vibrate V-W-S button again to turn vibrate off.



## Detector Usage

### Two-Sided Laser Detector with Clamp Model No. 40-6715

*The 40-6715 laser detector is an indispensable accessory when using rotary laser levels. The main function of the detector is to detect the position of the laser signals that are transmitted by rotary lasers. This detection quickly and precisely provides the user with the horizontal and vertical references.*

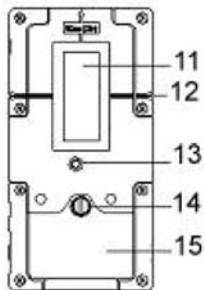
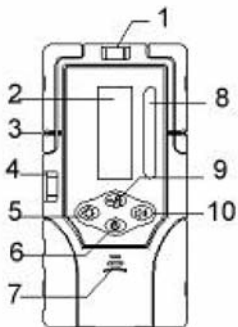
*This product features high sensitivity, a double-faced display, low power consumption, good reliability and easy manipulation. It can be used with most types of rotating lasers.*

#### 1. Technical Specifications

Detecting accuracy:	Fine: $\pm 0.039''$ ( $\pm 1\text{mm}$ ) Coarse 1: $\pm 0.098''$ ( $\pm 2.5\text{mm}$ ) Coarse 2: $\pm 0.394''$ ( $\pm 10\text{mm}$ )
Automatic Shut-off:	6 minutes $\pm 1$ minute
Power Supply:	9V battery, 30 hrs continuous use (with LCD illumination off)
Sound indicator:	slow short beep, rapid short beep and continuous sound
LED display:	down arrow, up arrow, horizontal on grade bar
Dimensions:	6.30" x 3.35" x 1.10" (160 x 85 x 28mm)
Weight:	1 lb. (0.45kg)
Others:	Rain and dust resistant

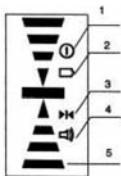
## 2. Components

### (a) Exterior Instruction



- 1) Horizontal vial
- 2) Front display window
- 3) Front on grade mark
- 4) Vertical vial
- 5) LED key
- 6) Power key
- 7) Beeper
- 8) Reception window
- 9) Fine/Coarse accuracy key
- 10) Beeper key
- 11) Back display window
- 12) Back on grade mark
- 13) Bracket screw thread
- 14) Battery cover screw
- 15) Battery cover

## (b) Display



1. Power on symbol
2. Low battery indicator
3. Fine/Coarse symbol
4. Beeper symbol
5. Position indication arrows



**Power Key:** Turn on/off the power



**Fine/Coarse Accuracy Key:** Switch detecting accuracy



**LED Key:** Turn on/off the LCD's light



**Volume Key:** Cycles between high, low and off

### 3. Operation Guide

#### (a) Battery Installation

- Open the battery cover door by turning the battery cover screw counter-clockwise.

Put the battery into the battery case noting the polarity shown in the battery compartment.

- Put the battery cover door back, and tighten the screw.

- Note:**
- 1) Remove the battery when the unit is being stored for a long time.
  - 2) When the low battery indicator is displayed, change the battery soon.



Figure 1



## 4. Operating Instructions

### Power On

Press the power key to turn the unit on. The LCD display will illuminate all the indicator segments for 0.5 second (Fig.2). When the indicator segments are no longer illuminated, the detector is ready for use.



Figure 2

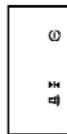


Figure 3

**Note:** The LCD display will still have the power, detection and sound indicators illuminated (Fig. 3).

### Fine/Coarse accuracy key

Power on and press the fine/coarse accuracy key, the unit will cycle between three accuracy options: fine, coarse 1, coarse 2. The accuracy symbol displayed on the LCD will change.



Fine



Coarse 1



Coarse 2

### Volume Key

Power on and press the volume key, the unit will cycle between a high sound, low sound and mute.



High sound



Low sound



Mute

The sound symbol displayed on the LCD will change accordingly.





**Note:** There will be two beeps when turning the unit on and off. There will be one beep when changing functions.



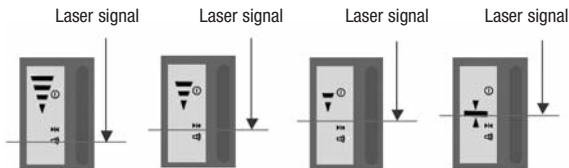


### Detecting Laser Level Signals

While detecting laser signals, the LCD will display as follows: (take the set-up state of high sound and fine detection as an example)

			
The laser signal is down	The laser signal is up	Horizontal bar indicated on-grade	No laser signal is detected
Sound: rapid short beeps	Sound: slow short beeps	Sound: continuous sound	Sound: no sound

When the laser signal is near the on-grade mark, the displayed up and down arrows will decrease as the distance to the on-grade mark decreases.



1. When detecting a horizontal laser signal, it is important to have the horizontal bubble vial centered, as the deflection of the receiver will influence its receiving accuracy.



2. When detecting a vertical laser signal, it is important to have the vertical bubble vial centered, as the deflection of the receive will influence its receiving accuracy.
3. Keep the reception window facing the laser while detecting.
4. Hold the unit stable while detecting.



### ***LED Function***

Power on and press the LED key, the LCD will now be backlit.

### ***Automatic Shut-off Function***

When the unit does not receive a laser signal for 6 minutes, the unit will power off automatically.

### ***Low Battery Display Function***

When the battery sign blinks on the LCD, the battery is low and needs to be replaced. If the battery is very low, the unit will power off automatically. Replace the battery.





### ***Rod Clamp***

Connecting to the rod clamp.



Connecting to the grade rod.



### ***5. Detector Maintenance***

- Keep the unit, particularly the reception window, clean. If it does get dirty, use a cloth to wipe it clean.

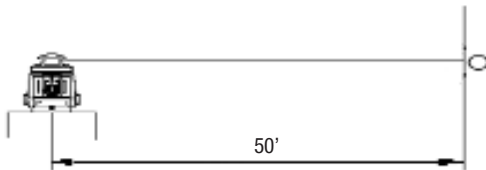
## 8. Self-Check and Fine Calibration

**IMPORTANT:** It is the responsibility of the user to verify the calibration of the instrument before each use.

The instrument must be self-checked before operation. If the accuracy is found beyond tolerance, user can make adjustment according to directions as follows.

### X-Direction Accuracy Self-Check

1. For clarity, we define the direction of handle as X-direction, and the other direction as Y-direction
2. Place the unit on a platform or tripod that is 50' away from a wall indoors, with the handle facing the wall head-on. Turn the unit on.
3. Using the detector mark on the wall where the beam hits the wall and mark the beam as point A.
4. Turn the instrument by 180 degrees, mark the beam as point B.
5. Measure the vertical distance between point A and point B. If A & B are more than 1/32" apart at 50', the unit is out of calibration.
6. As shown, turn the instrument by 90° and place it on the platform, with the operating panel facing you. Perform



Y-direction self-check with the same method as X-direction self-check, and mark point C and point D by turns.

7. If point C and point D are within 1/32" at 50', the accuracy is within tolerance. Otherwise reference section 12 of this document.

### **Fine Calibration via Remote Control (sold separately)**

1. Access calibration mode by simultaneously pressing the "Power" and "Tilt" buttons on the keypad.
2. Press on/off button and Tilt mode button at the same time, then release the on/off button and continue pressing the Tilt mode button. After the Tilt LED and V-W-S LED start to flash, release the Tilt mode button and the instrument will enter into X-calibration status, the Tilt LED flashes and V-W-S LED light is on and the instrument keeps rotating.
3. Release the "Tilt" button. Note that the rotating head of the laser is not rotating and the laser is flashing. The unit is now in calibration mode and all other operations will be performed with the unit's remote control (sold separately).
4. Use the remote control to access the calibration.

Pressing the "X/Y" button changes calibration control between the X-axis and Y-axis. The X-axis is selected when the Tilt button is flashing while all other buttons are solid. The Y-axis is selected when the V-W-S light is solid. Once the desired axis has been selected, the "UP Arrow" and "Down Arrow" buttons are used to adjust the position of the horizontal laser beam plane.



## **X-axis Calibration**

1. Place the unit into calibration mode as discussed above.
2. Position the unit so that the X-axis is directing to the target.
3. Press “X/Y” key on the remote control to toggle calibration control to the X-axis.
4. Press the “UP Arrow” and “Down Arrow” buttons respectively to adjust the laser height to coincide with the zero position of the target.
5. Press the “Enter” button on the remote control to accept the calibration value, noting that the status indicator goes “off”.
6. After calibration is completed, make sure to power off the unit and then power on again to activate the calibration.

## **Y-axis Calibration**

1. Place the unit into calibration mode as discussed above.
2. Position the unit so that the Y-axis is directing to the two targets.
3. Press “X/Y” button on the remote control to toggle calibration control to the Y-axis.
4. Press the “UP Arrow” and “Down Arrow” buttons respectively to adjust the laser height to coincide with the zero position of the target.
5. Press the “Enter” button on the remote control to accept the calibration value, noting that the status indicator goes “off”.
6. After calibration is completed, make sure to power off the unit and then power on again to activate the calibration.





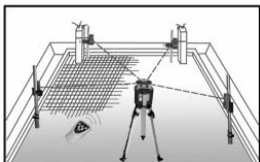
## 9. Technical Specifications

Laser Wavelength	635nm±10nm
Laser Classification	Class IIIa
Maximum Power Output	≤5mW
Accuracy	±1/8"/100 ft. (±1mm/10m)
Interior Range	Up to 200 ft. (60m) diameter depending on light conditions
Exterior Range	Up to 2000 ft. (600m) diameter with detector
Auto-Leveling Range	±5°
Power Supply	Rechargeable battery pack or 6.4V adapter (included) 4 "C" alkaline batteries (not included)
Battery Life	24 hours with rechargeable battery pack; 36 hours with alkaline batteries
Dimensions	8.62" x 6.30" x 7.95" (219 x 160 x 202mm)
Weight	4.65 lbs. (2Kg)
Working Temperature	14°F to 113°F (-10°C to 45°C)
Center Screw Thread	5/8" – 11
Rotation Speed	600 rpm
IP Protection Class	65

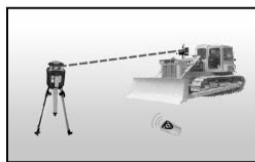




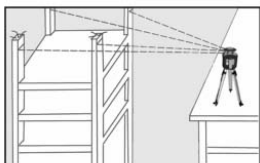
## 10. Application Demonstrations



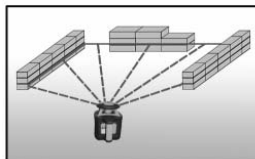
Squaring Leveling



Grading



Elevation



Set Forms





## 11. Care and Handling

- This laser unit is a precision tool that must be handled with care.
- Avoid exposing unit to shock vibrations and extreme temperatures.
- Before moving or transporting the unit, make sure that the unit is turned off.
- Remove the batteries when storing the unit for an extended time (more than three months) to avoid damage to the unit should the batteries deteriorate.
- Always store the unit in its case when not in use.
- Avoid getting the unit wet.
- Keep the laser unit dry and clean, especially the laser output window.  
Remove any moisture or dirt with a soft, dry cloth.
- Do not use harsh chemicals, strong detergents or cleaning solvents to clean the laser unit.

## 12. Product Warranty

Johnson Level & Tool offers a three year limited warranty on each of its products. You can obtain a copy of the limited warranty for a Johnson Level & Tool product by contacting Johnson Level & Tool's Customer Service Department, as provided below, or by visiting our web site at [www.johnsonlevel.com](http://www.johnsonlevel.com). The limited warranty for each product contains various limitations and exclusions.

Do not return this product to the store/retailer or place of purchase. Non-warranty repairs and course calibration must be done by an authorized Johnson® service center or Johnson Level & Tool's limited warranty, if applicable, will be void and there will be NO WARRANTY. Contact one of our service centers for all non-warranty repairs. A list of service centers can be found on our web site at [www.johnsonlevel.com](http://www.johnsonlevel.com) or by calling our Customer Service Department. Contact our Customer Service Department for Return Material Authorization (RMA) for warranty repairs (manufacturing defects only). Proof of purchase is required.





**NOTE:** The user is responsible for the proper use and care of the product. It is the responsibility of the user to verify the calibration of the instrument before each use.

For further assistance, or if you experience problems with this product that are not addressed in this instruction manual, please contact our Customer Service Dept.

In the U.S., contact Johnson Level & Tool's Customer Service Department at 888-9-LEVELS.

In Canada, contact Johnson Level & Tool's Customer Service Department at 800-346-6682.

### 13. Warranty Registration

Enclosed with this instruction manual you will find a warranty registration card to be completed for your product. You will need to locate the serial number for your product that is located on the bottom of the unit. **PLEASE NOTE THAT IN ADDITION TO ANY OTHER**

**LIMITATIONS OR CONDITIONS OF JOHNSON LEVEL & TOOL'S LIMITED WARRANTY, JOHNSON LEVEL & TOOL MUST HAVE RECEIVED YOUR PROPERLY COMPLETED WARRANTY CARD AND PROOF OF PURCHASE WITHIN 30 DAYS OF YOUR PURCHASE OF THE PRODUCT OR ANY LIMITED WARRANTY THAT MAY APPLY SHALL NOT APPLY AND THERE SHALL BE NO WARRANTY.**







## 14. Accessories

Johnson® accessories are available for purchase through authorized Johnson® dealers. Use of non-Johnson® accessories will void any applicable limited warranty and there will be NO WARRANTY. If you need any assistance in locating any accessories, please contact our Customer Service Department.

In the U.S., contact Johnson Level & Tool's Customer Service Department at 888-9-LEVELS.

In Canada, contact Johnson Level & Tool's Customer Service Department at 800-346-6682.





## 15. Trouble Shooting

- If the unit does not turn on or turns off after a short time, clean the battery terminals. Alkaline: Check the battery polarity or install new alkaline batteries. Rechargeable: Attempt to recharge the batteries by charging for 12-14 hours, unplug the unit and then turn the unit on until battery runs out. Repeat this process 2-3 times.
- If the laser rotating head will not spin, check to see if the TILT light and laser beam are flashing. Press the TILT button on the unit or the remote to exit the "tilt" mode and enter into the auto level status. Clean the battery terminals. Alkaline: Check the battery polarity or install new alkaline batteries. Rechargeable: Attempt to recharge the batteries by charging for 12-14 hours, unplug the unit and then turn the unit on until battery runs out. Repeat this process 2-3 times.
- If the laser beam does not illuminate, clean the battery terminals. Alkaline: Check the battery polarity or install new alkaline batteries. Rechargeable: Attempt to recharge the batteries by charging for 12-14 hours, unplug the unit and then turn the unit on until battery runs out. Repeat this process 2-3 times.
- If the unit is out of calibration less than 1/8" at 50', follow calibration procedure in manual.
- If the unit is out of calibration more than 1/8" at 50', contact an authorized Johnson service center or Johnson Level & Tool's customer service department.





- If the unit will not take a charge, does the battery charger LED light change to red as soon as it is plugged in? If no, it is most likely an issue with the charger. If the unit is within the warranty period, contact Johnson Level & Tool's customer service department to request a replacement charger under warranty. If the unit is not within the warranty period, go to [www.johnsonlevel.com](http://www.johnsonlevel.com) to purchase a new charger. If yes, contact an authorized Johnson service center or Johnson Level & Tool's customer service department.
- If the unit will not calibrate, contact an authorized Johnson service center or Johnson Level & Tool's customer service department.
- If the unit beeps and/or flashes constantly, check to see if the unit is being tilted to angles beyond the self-leveling range. If the unit is being used for a level application, place onto a surface that is within the self-leveling range. If it is still beeping and/or flashing, the unit is out of calibration.



