

**NOTICE TO USERS:**

The THOR GUARD L50 Lightning Prediction System is manufactured by THOR GUARD, Inc. for the express purpose of assisting the user in determining and evaluating the existence and extent of a potential for lightning discharges in the area being monitored by THOR GUARD. This product is in no way intended, nor is it represented to be, any form of protection for persons or property, whatsoever; and THOR GUARD, Inc. shall not be held liable for any damages or losses the user may experience from the effects of lightning, storm related damages, or personal injuries. The THOR GUARD L50 system will automatically test every day at a pre-selected time. It is the user's responsibility to ensure the system is connected to a properly grounded source of power and that the unit displays a green light following its test. If the test should fail (red light), the user, after immediately following the "Testing & Cleaning" instructions in this booklet to solve the problem, should call THOR GUARD, Inc. at the number provided below.



**THOR GUARD, Inc.**

1193 Sawgrass Corporate Parkway  
Sunrise, FL 33323  
(954) 835-0900  
(888) 571-1212  
Fax: (954) 835-0808  
E-mail: [service@thorguard.com](mailto:service@thorguard.com)



*Integrated Lightning Prediction and Warning Systems*

MODEL L50

LIGHTNING PREDICTION SYSTEM

INSTRUCTION

&

INSTALLATION MANUAL

## SETUP FOR THE MOBILE L 50 THOR GUARD SYSTEM

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1. You have been supplied two pieces of source information (this "Instruction & Installation Manual", and a "Quick Reference" card). In addition, a video tape is available. It would be advisable to review all of the printed material to familiarize yourself with the equipment.

2. Finding a good location for both the Sensor and the Base Console is critical. The Sensor may be located on a tripod at ground level as long as it is not under trees or otherwise obstructed from a clear view of the sky by buildings, etc. (30° arc). The legs of the tripod may be secured by either sandbags or tent stakes so it won't be toppled by the wind (see Page 3, re: "wood blocks" for feet).

3. The Sensor may also be located on the roof of trailers or other temporary structures. The sections in this Manual relating to Sensor and cable treatment should also be reviewed. Note: It is not advisable, however, if you have to run the Sensor cable through a door you will need to buy a 1' long piece of 3/4" clear plastic tubing (or an equivalent), split lengthwise and taped to the cable where it runs through the door. This will prevent the door from cutting the cable when it closes.

4. To mount the Sensor on a tripod you may utilize either a 3'-5' length of 1 1/2" PVC, or threaded galvanized pipe. You may find the PVC easier to travel with and breakdown. A threaded reducer is enclosed for use with the pipe.

5. It is critical that the L50 base console be properly grounded!! This may be accomplished either by accessing a grounded a/c outlet for the power adapter, or by connecting the enclosed ground wire to a known ground source and also to the "ground" screw located on the rear panel of the L50.

Note: If a/c is not available and a 12 volt (battery) source is the only option, and there is no obvious grounding source, then a grounding rod may be connected to the "ground" screw by means of the enclosed wire. The grounding rod should be at least 5' long so you can sink approximately 4' into the ground (to retrieve the rod you will need to leave 12", or so, above the ground).

6. If you have purchased the 12 volt battery package with charger and adapter, it would be advisable to also purchase a voltmeter to monitor the charge on the battery. The battery should power the L50 for a full day and the charger should be capable of re-charging the battery overnight (12 hrs.).

7. After setup, always push the "RESET" button on the back panel to clear any buildup of charges on the Sensor, or until the L50 settles on an "All Clear". It will help to have the Sensor Cable connected to the back panel and a good ground connection, prior to the application of power.

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## HYPERSTATIC SENSOR INSTALLATION

### Choosing the Sensor Location

The location of the Sensor will be dependent upon the desired location of the THOR GUARD Console, the type of existing roofing material, the design of the roof, and the proximity of other equipment that may adversely affect the performance of the system. If a roof location is not possible, the Sensor may be mounted on a post or pole, as long as it has a clear view of the atmosphere. The following should be considered when locating the Sensor:

- As close to the Console as possible.
- At least 10' from lightning rods.
- At least 15' from air conditioning units, vents, fans, etc.
- At least 20' from other antennas; e.g. TV, VHF, etc.
- As far from trees as possible to discourage birds and spiders.
- Outside a 60 degree cone from building structures, trees, or poles.
- As far as possible from electric charger units or large transformers.
- As high as possible and isolated from any metal roof.
- High enough so that curious hands cannot inadvertently touch the Hyperstatic Plate thereby setting off the system.
- MAKE SURE THAT ANY MAST OR TRIPOD UTILIZED TO MOUNT THE SENSOR IS **NOT** GROUNDED.
- SENSOR MUST BE ACCESSIBLE FOR REGULAR CLEANING.

### Running the Triaxial Cable

You have been supplied with a predetermined length of special, triaxial cable, in most cases, already connected to the Sensor. The path available for the cable will also dictate the final location of the Sensor and Console. Apart from avoiding the obvious obstacles, attention should be given to the following:

- If you have a "mobile" system the cable will already be attached to the Sensor so make sure your cable run is clear of obstacles like doors, etc.
- The cable does not carry any a/c power, so in most instances it won't be necessary to enclose it in conduit.
- When routing the cable, do not parallel lightning rod grounding wires or a/c power runs and **never tie-wrap to another cable of any type**.
- Avoid sharp bends, metal edges, or anything that might tear outer jacket.
- Conceal and secure as much as possible.
- Avoid pulling too tightly and stretching or crimping the cable.
- Leave a "service loop" when you mount the Sensor.
- A separate sheet has been enclosed to demonstrate how to splice the cable.

## HYPERSTATIC SENSOR INSTALLATION

### Mounting the Sensor

The Sensor was designed to be mounted 5'-10' above any surface using a 3'-5' piece of 1 1/2" PVC pipe, or a similar length of 1" galvanized pipe, in which case one would utilize the enclosed, threaded reducer. It is advisable to set the Sensor at a level that is accessible for cleaning, regardless of which type of mast is utilized.

**NOTE:** A PROPER SURVEY PRIOR TO INSTALLATION SHOULD HAVE DETERMINED THE CORRECT LENGTH FOR THE CABLE. IF NEEDED, THIS CABLE MAY BE SPLICED PER ENCLOSED INSTRUCTIONS.

Most installations will accept one of the following mounting techniques:

1. Mount directly to a wall using a pair of appropriate wall mounts (from Radio Shack, or equivalent) and a short piece (3'-5') of 1" galvanized pipe:

4"	#15-883
8"	#15-886
12"	#15-885

Or, Eaves Mount #15-891  
Or, directly to a wall with pipe clamps
2. Mount directly to pipe stub or antenna mast with stainless hose clamps.
3. Tripod (also found at Radio Shack, or equivalent):

3'	#15-516
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How the tripod is mounted depends upon the material and construction of the desired roof location. Please note that care should be taken if you choose to penetrate any roofing material in order to secure the legs of the tripod. Lag bolts and screws should be accompanied by liberal amounts of waterproof silicone. **DO NOT GROUND THE TRIPOD TO A LIGHTNING ROD OR BUILDING.**

If it is not feasible to bolt directly to the roof, another alternative is to cut three (3) 8" x 8" x 2" pressure treated wood blocks and affix them to each tripod leg using 3/8 x 11/4" lag screws. Using liberal amounts of sealant, then affix the wood feet to (3) round (or square) concrete stepping stones, rough side up (available at most home/garden centers). Seal around the bottom of the wood blocks so that the sealant extends at least 1/2" up the side of the blocks. In some cases it will also be necessary to glue rubber mats to the bottom of the cement blocks to protect the roofing material.

If you desire to move the Sensor on a regular basis or create a more mobile potential for the system, then a tripod may be the most practical method of mounting.

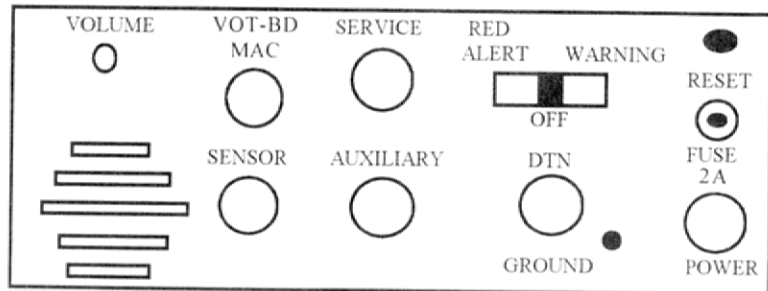
Choosing the Console Location

The Console should be located where it can be monitored by responsible personnel. Requirements include:

- Adequate space for not only the Console, but cables and power supply.
- A dedicated 110 volt, 60 cycle AC power outlet for the power supply. Avoid outlets where the unit may be unplugged for any reason. It is advisable that you acquire a power strip or uninterrupted power supply (UPS) to insure a secure source of power.

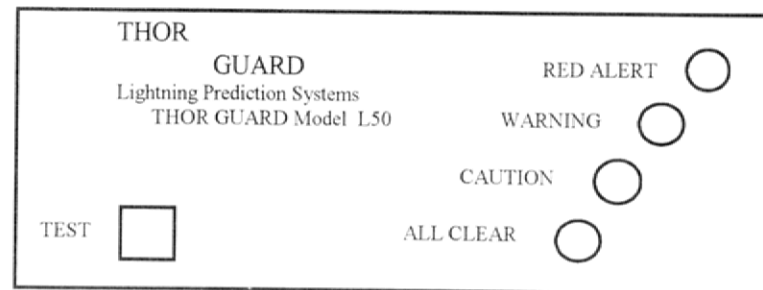
Installation & Orientation

- Plug the cable into the connector labeled SENSOR, on the rear panel.
- Next, attach the power cord from the enclosed power supply. After startup it may be necessary to push the RESET button to clear any lingering energy on the Sensor Plate. **NOTE: IF YOU'RE A/C POWER SOURCE DOES NOT HAVE A GROUNDED PLUG (3 WAY) THEN YOU WILL NEED TO GROUND THE CONSOLE BY UTILIZING THE GROUND POST ON THE REAR PANEL. SOME WIRE HAS BEEN INCLUDED FOR YOU TO GROUND THE SYSTEM TO THE CENTER SCREW ON THE A/C OUTLET, OR OTHER QUALIFIED GROUND SOURCE.**
- Next, move the RED ALERT/WARNING switch to the OFF position and attach the plug for a Voice of THOR air horn warning system (VOT) or any other external switching that needs to be accomplished (AUXILIARY). You may now choose whether to have your alert/switching activated at the WARNING, or the RED ALERT activity level.
- The VOLUME control is for the internal alarm that will alert anyone within close proximity to the Console that electrical energy has moved into the geographic area being monitored by the system. This output may be adjusted to personal preference.



REAR PANEL

- The plug labeled SPARE has been provided for expansion, if desired.
- A RESET button has been provided in the event the internal computer should experience "lock-up". If this occurs, the RESET button should be depressed and held for at least five (5) seconds, to recycle the computer.
- Keep the enclosed TEST plug handy to test the base unit if needed.
- The TEST button on the front panel may be used to either test the system (any time the ALL CLEAR light is blinking) or to reset the automatic 24 hour test time, by depressing the TEST button for approximately ten (10) seconds (until a beep is heard). **NOTE: THE SYSTEM WILL NOT TEST WHEN THE SENSOR IS READING A CAUTION, OR HIGHER CONDITION. SEE MORE ON TESTING IN "TESTING AND CLEANING" (PAGE 8).**
- When there is no storm activity and the system is operating properly, the only light illuminated (in addition to the solid green Test light) will be the blinking, **green ALL CLEAR** light. **IF AT ANY TIME YOU OBSERVE THAT THIS LIGHT IS NOT BLINKING, CHECK TO SEE THAT THE POWER IS CONNECTED. OTHERWISE, THE SYSTEM WILL NOT BE MONITORING THE ATMOSPHERE.**
- The **white** CAUTION light will be illuminated when THOR GUARD first senses the potential presence of electrical storm activity.
- When THOR GUARD senses that the storm activity is building in the surrounding area, the **yellow** WARNING light will illuminate. This is a definite threat and should be taken seriously.
- The blinking of the RED ALERT light indicates that THOR GUARD is sensing the potential for electrical storm activity in the immediate area, and definitive action should be immediately taken.



FRONT PANEL

## OPERATIONS

### Operating the System

THOR GUARD is a lightning prediction system which continually monitors the electrostatic field and anticipates the potential of a lightning strike at, or near your facility. The Hyperstatic Sensor feeds the electrostatic data, by way of the special triaxial cable, to your THOR GUARD Console. This data is continually evaluated, processed and compared to hundreds of hours of thunderstorm activity, by the computer, to ultimately produce a reliable prediction of the probability of lightning. In addition to normal storm activity, the system also monitors conditions that could produce a potentially dangerous circumstance, called a "Bolt Out Of The Blue."

This system was preset and calibrated at the factory to monitor a range of between six (6) and fourteen (14) miles in radius from the Sensor location. In the event you determine your setting is either too sensitive, or not sensitive enough, you may query the factory to see if adjustments can be made.

The THOR GUARD L50 was designed to be as automatic and easy to operate as possible. The warning lights on the front panel may be interpreted as follows:

**ALL CLEAR:** This button will normally be blinking **green** if there is power to the Console and if the system is sensing no local storm activity. This will also be the button you should push to trigger an external "all clear" signal (if you are interfaced with external alarms) after an alert and the subsequent clearing of the storm threat. It is advisable to wait until the THOR GUARD returns to a CAUTION condition before sounding the ALL CLEAR.

**CAUTION:** When the system first recognizes the presence of electrostatic energy within the area being monitored, the **white** Caution light will be illuminated. Although the primary purpose of this warning is to alert you of a change in surrounding conditions, fast moving storms can and will make this level of warning important to monitor.

**WARNING:** The **yellow** Warning light indicates that electrical storm energy is migrating and shifting in your surrounding area. At this time you should also hear the Console's internal alarm activate. In some situations this represents enough of an increased safety threat to also activate the external alarms, if you have any. The control switch for this function is on the Rear Panel (see Page 4).

**RED ALERT:** In addition to indicating a potentially dangerous lightning condition, the **Red Alert** switch may be depressed to activate any external alarms. **It is definitely advisable to now curtail any outside activity.**

## TROUBLESHOOTING

### QUESTIONS AND ANSWERS

- **Q.** None of the lights are visible on the Console.
- **A.** Power has been interrupted. Check wall plug and transformer. If these are okay, then check FUSE, and replace with a 2.0 amp fuse.
- **Q.** The system appears to be too sensitive or not sensitive enough to storms.
- **A.** Remember that THOR GUARD senses changes in the conditions that create lightning. You may have energy that migrates through your area without finding a moist conductor to bring it to ground, in the form of a visible lightning discharge. We can't SEE the electricity as it invades our area, but THOR GUARD can. However, if your system persists in appearing to be out of step with reality, then call the Factory to see if adjustments should and can be made to change the sensitivity of your Console.
- **Q.** The external alarms do not seem to be activating (if applicable).
- **A.** Make sure the switch is not in the OFF position (rear panel) and that power is available for the Voice of THOR or other alarm controlling device. In line timers may also be the problem.
- **Q.** The TEST light is blinking Red.
- **A.** The Sensor may be wet or need to be cleaned. Although the system will continue to operate, the sensitivity may be altered and the overall performance could deviate from normal. The system will continue to test itself over the next six hours. If the unit should pass any test during this period, the test light will return to green. If it is still failing after six hours, all the lights will blink and operations will stop until you take action (P.8).
- **Q.** During a TEST the green test light starts blinking.
- **A.** During the TEST cycle the test light will blink. After a positive test the light will turn to a solid green. When the system senses a problem it will automatically retest itself. If it fails the test again, the test light will turn red and will start blinking (above). **CLEAN SENSOR!**
- **Q.** How do I know when it is safe to re-engage in outdoor activity following an electrical storm warning.
- **A.** Ultimately, it is YOUR responsibility to establish a lightning risk policy that best fits your situation. (Example: A school may operate under different parameters than a golf course.) As the potential for electrical storm activity is reduced in the area monitored, THOR GUARD will show the probability of risk decreasing through a gradual, downward movement of the lights on the front panel (Review warning levels on Page 6).

## TESTING AND CLEANING

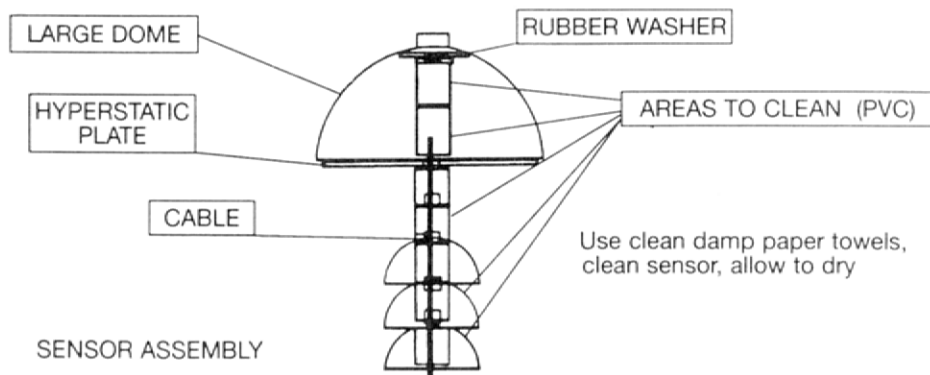
The THOR GUARD L50 has been programmed to run an internal diagnostic test of the entire system every 24 hours. The test time will be set (or reset) when power is first applied (or reapplied) to the unit. A test may be run anytime, by depressing the TEST button (until it starts blinking), unless there is storm activity in the area. If all the lights on the L50 start to blink:

PLEASE NOTE THAT IF ALL THE LIGHTS ARE BLINKING THIS WILL INDICATE THE SYSTEM IS IN A FAILURE MODE AND YOUR THOR GUARD WILL NO LONGER BE OPERATIONAL!

- Check that the Sensor connection on the Rear Panel is properly engaged.
- Move the switch for any external alarms to the OFF position, then;
- Clean the Sensor on the roof of all dirt that may have accumulated on any of the white plastic PVC parts, any cobwebs between the large stainless Dome (on top) and round plate, and any excess dirt on the plate, itself. This should be accomplished with ONLY clean paper towels (dampen only with water), as cleaning rags may contain solutions that will contaminate the surfaces. Then dry the area cleaned with other paper towels. The large Dome may be slightly tilted to allow your hand entry, but care should be taken to avoid damage to any of the small, wire connections. NOTE: REGULAR CLEANING OF THE SENSOR WILL MINIMIZE THESE FAILURES.

Push the RESET and run the TEST again. If it doesn't pass, you should disconnect the Sensor cable from the Base Unit, insert the enclosed Test plug, and re-test the system. If it fails this test then a problem has developed in the Base, so call the factory or your representative. If it passes, there may be too much moisture inside the Sensor. Wait for dryer conditions and test again.

SENSOR MUST BE ACCESSIBLE FOR REGULAR CLEANING



## WARRANTY & SERVICE INFORMATION

### THOR GUARD Model L50 Limited Warranty

THOR GUARD, INC. ("the warrantor") will repair this product with new or refurbished parts, free of charge, in the USA for two(2) years from the date of original purchase in the event of a defect in material or workmanship. In the event of a problem, please direct all inquires to THOR GUARD, INC., 1193 Sawgrass Corporate Parkway Sunrise, FL 33323, Telephone (954) 835-0900, or Fax (954) 835-0808. This warranty is extended only to the original purchaser. This warranty only covers failures due to defects in materials or workmanship which occur during normal use. It does not cover damage which occurs in shipment or failures which are caused by products not supplied by the warrantor or failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, modification, lightning, line power surge, introduction of sand, dust humidity and liquids or commercial use of this product, or service by anyone other than a THOR GUARD factory or authorized representative, or damage that is attributable to acts of God.

#### Limits and Exclusions

There are no express warranties except as listed above. THE WARRANTOR SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to you.

This warranty gives you specific rights and you may also have other rights which vary from state to state. If a problem with this product develops during or after the warranty period, you may contact your representative or our General Offices in Sunrise, FL.

An extended warranty is also available for this product after the expiration of the initial period. Details pertaining to this extended warranty may be obtained from your representative or THOR GUARD, Inc.