THUNDERBOLT®

BACKLIT STORM DETECTOR

and Area Warning System

Model 350AWS Series

INSTRUCTION MANUAL

WARNING & POWER LEDs

There are two LED lights - green and red. The green light flashes when the unit is activated, and continuously blinks during normal scanning operation. The red LED is activated when a storm has approached within the user-determined warning range.

LCD TEXT SCREEN

Displays the unit's Menu information and current storm information during operation.

ENTER

Used to select items from the Menu and enter values from the unit's Menu. Also used to immediately move from the Menu to normal scanning operation.

POWER ON/OFF

SPEAKER

Speaker for the Audible Alarm.

THUNDERBOLT®

MODEL 350AWS SERIES

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WIRELESS AWS
Jack for optional AWS transmitter

9V D/C
A/C Adapter jack for optional A/C power operation.

BATTERY COMPARTMENT DOOR
Compartment door for 9V battery.

SCROLL UP

The SCROLL UP or SCROLL DOWN buttons permit user to move through the unit's Menu, as well as access the Menu when the unit is in normal scanning operation.

SCROLL DOWN

TONE ON/OFF

Button allows user to turn the Audible Alarm on or off.

CONTROLS & FEATURES

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This Instruction Manual applies to the ThunderBolt® Extreme, Expedition, Utility, Storm Chaser, Pro and Pro Desk Sets.

PRODUCT OVERVIEW

The ThunderBolt® Storm Detector is a personal, hand-held weather monitor. The ThunderBolt utilizes self-contained, copyrighted, proprietary software and electronic technology to detect and track the motion of thunderstorms. It analyzes lightning activity within storm cells and supercells*, and is capable of identifying the presence of squall lines**, which can occur in conjunction with thunderstorm activity.

IMPORTANT! ThunderBolt uses the latest electronic and computer technology to detect and track thunderstorms. However, thunderstorms can be a rapidly changing weather phenomenon, and the information provided by the ThunderBolt should, whenever available, be used in conjunction with other weather information sources. **Remember that the ThunderBolt detects ACTIVE storms, and cannot predict when or where a particular storm may form, and/or where the first lightning stroke occurs.** Because of the variable factors associated with lightning due to amperage of the stroke, polarity and orientation to the ground, ThunderBolt does not detect and track individual lightning strokes, but analyzes data from entire storm cells as they move.

Storms are detected and analyzed within 75 miles of user location. Measured from the point of user location, ThunderBolt's advanced proprietary technology converts data from the intensity of electromagnetic field emissions of lightning activity within a storm cell into digital signals. The signals are then fed into a microprocessor for analysis. The UNIT tracks and alerts the user through text messages on its Liquid Crystal Display (LCD) screen, red and green Light Emitting Diode (LED) indicators and through audible tone warnings. See page 17 of this manual for a list of text messages and their meanings.

* Supercells are severe thunderstorms typically larger and more violent than normal storms and often result in the formation of tornadoes. They comprise approximately 10% of all thunderstorms.

** Squall lines occur when converging air currents create cumulonimbus cloud activity forming groups of storms and resulting in heavy precipitation.
Both supercells and squall lines are capable of producing high winds, severe rain, and tornadoes.

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INSTALLATION AND SETUP

OPERATING POSITIONS

The ThunderBolt® Storm Detector can be carried individually or installed on a stationary mount. The unit is completely operable while in its carrying pouch with easy access to all controls.

Mounting the ThunderBolt allows it to be installed vertically on a flat surface, such as a desk or wall, allowing the unit to be easily removed for mobile operation.

The ThunderBolt unit will not operate properly if oriented on its side. The unit is designed to operate either vertically (hand-held or using the wall mount or the desk stand), or lying flat on a horizontal surface.

POWER SOURCES FOR THE THUNDERBOLT

1. BATTERIES

The ThunderBolt operates on one standard 9V battery. The battery compartment is located on the back of the lower half of the unit. To open the Battery Compartment Door, use the heel of your palm, or thumbs, to press door downward and away from unit. NOTE: The Battery Compartment Door has been designed to provide a secure fit to withstand rugged use, and may initially be stiff and difficult to open, but will become easy to slide open with regular use. Once opened, clip the connector over the battery terminals and securely close battery compartment door.

Battery life is constantly monitored by the UNIT'S computer. A LOW BATTERY warning message is periodically displayed once remaining battery life drops below 5-7 hours. Always replace battery as soon as possible when warning message is displayed. The battery should be removed if the ThunderBolt is to be stored for an indefinite period of time to avoid accidental leakage and corrosion of terminals.

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2. EXTERNAL AC ADAPTER

A ThunderBolt International-approved low-noise external adapter may be used to power the ThunderBolt® Storm Detector. The adapter jack is labeled 9V DC and is located on the back of the unit above the battery compartment door. A 110 Volt AC and 220 Volt AC Adapter are available from ThunderBolt International, Inc.

NOTE: The use of a surge protector or line voltage conditioner is highly recommended when using the A/C adapter. If the ThunderBolt is powered for extended periods on A/C line power with the adapter it is recommended that noise tests be run with a ThunderBolt on battery power at least once a week. This will reduce the possibility of A/C line noise desensitizing the ThunderBolt.

IMPORTANT! Use of a non-specified adapter will cause inaccurate or improper operation of the unit and will damage the power supply circuitry. Use of a non-specified adapter will void the ThunderBolt Warranty.

UNIT POWER ON/OFF

To turn on the unit, press the POWER ON/OFF button on the front of the unit (see page 1). The unit has been properly activated when the LED light at the tip of the unit flashes. Release your finger from the ON/OFF button after the LED light has flashed. Within a few seconds after the unit powers on, the ThunderBolt model number will appear on the screen, replaced by TONE IS NOW ON, and then the Main Menu will appear on the LCD display and the green LED light will begin to continuously blink to indicate normal operation.

To turn off the unit, press the POWER ON/OFF button and hold until alarm sound is emitted, and then release the ON/OFF button at any time. This delayed deactivation prevents the unit from being turned off inadvertently by alerting the user.

NOTE: To conserve the life of the batteries, the unit is programmed automatically to turn off after approximately five hours if no buttons are activated. The auto shut-off feature is disabled if the external AC adapter is powering the unit.

* False triggering is when the unit indicates false storm activity because of changes of power voltage or nearby noise interference (see page 10).

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LCD DISPLAY OVERVIEW

The LCD Display, between the LED Light Display and the Unit Controls, provides the user the Menu Options and Text Messages during operation. Only two lines of text can be viewed at a time. NOTE: Menu use follows this section of the manual. Text Messages and definitions are discussed on page 17.

ACCESSING AND USING THE MAIN MENU

The Main Menu appears on the LCD Display when the Unit is activated. Use the SCROLL UP/DOWN (see page 2) buttons to move through the user-selectable choices on the Main Menu. To select an item from the Menu, move the blinking cursor to the desired item number and then press the ENTER button (see page 1). Once initial UNIT programming has been completed, the ThunderBolt® automatically begins a normal storm detection routine (SCANNING mode) if no other button is pressed within approximately 7 seconds. You may return to the Menu at anytime. Simply press and release either of the SCROLL UP/DOWN buttons to call back the Main Menu.

MAIN MENU USER SELECTIONS

There are six user-selectable choices contained in the Main Menu. These will appear on the screen two at a time, according to the list below:

1. STORM DETECT
2. ALARM RANGE
3. ALARM MODE
4. SENSITIVITY
5. NOISE TEST
6. BACKLIGHT ON/OFF

The ALARM RANGE, ALARM MODE, and SENSITIVITY should be set when initially using the unit, and altered whenever a change of situation dictates.

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1. STORM DETECT

Once the ThunderBolt® is powered on and the Main Menu accessed, the unit will automatically return to normal storm detection (or SCANNING) mode if no other menu selection is made within approximately 7 seconds. You may also manually return to normal storm detection by selecting STORM DETECT mode and then pressing the ENTER button, immediately putting the unit into normal storm detection. Once the unit is SCANNING, the cursor will move back and forth, and the selected SENSITIVITY (normal or high) will be displayed.

2. ALARM RANGE

ALARM RANGE allows the user to determine, based on need and/or application, what distance ThunderBolt will begin providing approaching storm warning on its VISUAL ALARM (red LED) and AUDIBLE ALARM (Tone). See page 30 for recommended settings. Selecting this option allows the user to choose the warning range (distance from user location) for activation of the VISUAL ALARM and the AUDIBLE ALARM. Once ALARM RANGE has been selected, the VISUAL ALARM range will appear on the screen. The warning range values are selected by using the SCROLL UP/DOWN buttons to toggle the displayed range to the desired value. Pressing the ENTER button stores the value in memory. Once done, the AUDIBLE ALARM range will automatically appear on the screen. Follow the same procedure to select the value desired, and press ENTER to store in Memory. The unit will then return to the Menu. NOTE: Once stored, these ALARM RANGE values will be stored in memory each time the unit is operated until changed.

NOTE: The audible tone may be turned ON or OFF at any time by using the **TONE ON/OFF** button in the front of the unit (see page 2). This will not change the alarm range stored in memory. Each time the unit is turned on, the audible tone will be ON and must be turned OFF manually, if so desired. See page 12 for more details.

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3. ALARM MODE

This option allows for the setting of an additional trigger distance for an audible alarm with a faster tone rate, which may be extremely useful for certain applications. This feature allows the ThunderBolt® to automatically increase its alarm level as a storm approaches to a closer distance than the range selected for normal storm detection. To set the ALARM MODE, select ALARM MODE from the Menu, and follow the same procedure as the ALARM RANGE. Once the value has been stored, the unit will return to the Menu.

4. SENSITIVITY

There are two storm detection sensitivity settings: NORMAL and HIGH (see the information following this paragraph for a description of each setting). Select SENSITIVITY from the Menu, and SET SENSITIVITY will be displayed. To set HIGH, push the SCROLL UP key. Or, to set NORMAL, push the SCROLL DOWN key. Then press the ENTER key. The setting is entered into the computer and the memory is updated. ThunderBolt then returns to the Menu, and then back to the SCANNING mode within 7 seconds if no further action is taken within the MENU.

SCANNING SENSITIVITY NORMAL: This setting produces greater accuracy in storm tracking and speed calculation, but increases the time between a storm first being detected, and a calculated speed and Estimated Time of Arrival (ETA) being displayed.

SCANNING SENSITIVITY HIGH: This setting provides the fastest possible information, but sacrifices accuracy for speed. The information will gradually become more accurate as the unit gathers data. Use this option in situations where maximum warning time is required to prepare for storm arrival, or in certain indoor applications where the surrounding building may be reducing the signal strength.

Both HIGH and NORMAL modes are effective and selection by the user should be made based on preference and/or application needs.

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5. NOISE TEST

The purpose of the NOISE TEST is to detect and map the periodic, non-storm, electromagnetic interference (EMI) in the planned operating location for the ThunderBolt®, so that the unit only recognizes the electromagnetic activity of storm cells. There are numerous sources of electromagnetic energy that exist in our environment, such as computers and heavy machinery. Such non-storm related sources might result in electromagnetic interference and cause a false trigger, subsequently displaying inaccurate readings. The unit contains special software routines for detecting and minimizing "noise" from EMI sources.

To activate the NOISE TEST, select NOISE TEST from the Menu. NOISE TEST, START/EXIT will appear on the screen. The cursor will be blinking on EXIT. Push either SCROLL UP or SCROLL DOWN button to START, then push ENTER. The NOISE TEST will automatically begin and will take 15 minutes to run. NOTE: Pressing ENTER, or any other button, will stop the NOISE TEST routine before completion. No data will have been stored and the test will need to be run from the beginning at a later time. Once the NOISE TEST is completed, the unit automatically returns to normal operation, and the ThunderBolt will then ignore these background sources of EMI. NOTE: Some environments may be too saturated with EMI emission for the unit to accurately function at all. If there is too much background EMI, the WARNING: HIGH BACKGROUND NOISE message will be displayed. Turn the unit off and move to a different location, then restart the routine.

IMPORTANT! Each ThunderBolt has a NOISE TEST completed prior to shipping, so it is not vital to run a test during the unit's first use, unless usage is in an obviously noisy environment.
A NOISE TEST should not be run if there is storm activity occurring within 50 miles of your location. Doing so will introduce errors and inaccuracy to normal operation and may decrease the sensitivity of the unit. If possible, check other weather sources before running the test. During the summer storm season in subtropical or tropical climates, running the test during typical non-storm times of day is advisable.

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6. BACKLIGHT ON/OFF

In ThunderBolt's Main Menu, the user has the option to turn the backlight ON or OFF.

IMPORTANT! When the unit is turned on for the first time, the unit has been pre-set with the LCD backlight ON. When the backlight has been turned OFF in the Main Menu, the backlight cannot be activated by pushing the ENTER button. To reactivate the backlight, it must be turned ON in the Main Menu.

NOTE: Regardless if the LCD backlight is programmed ON or OFF (whether on battery or AC power) the LCD backlight will still illuminate briefly during POWER ON.

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AUDIBLE ALARM TONE OPERATION

The TONE may be turned ON or OFF any time the normal scanning screen is displayed by pressing the Tone ON/OFF button and holding it until TONE IS NOW ON or TONE IS NOW OFF appears on the LCD screen.

Once storm activity has been detected you may turn the TONE ON or Off by first pushing either the SCROLL UP or SCROLL DOWN button to reenter the Menu. Next, push ENTER for the scanning screen to reappear, and then press the Tone ON/OFF button as instructed in the previous paragraph. The unit will then automatically return to Menu before returning to normal scanning operation, and will then quickly resume the current storm display.

OPERATION OF THE LCD SCREEN BACKLIGHT

ThunderBolt's LCD screen has a built-in backlight for use in low light situations. When the unit is on battery power, the user controls the use of the backlight. This has been done by design to minimize the battery drain caused by the required power consumption of the backlight. Operation of the backlight is as follows:

BATTERY POWER INSTRUCTIONS

POWER ON: When the ThunderBolt is powered on, the LCD screen will illuminate for approximately five seconds. The backlight will then turn off and the unit will continue to boot, as described on page 7.

NORMAL SCANNING: When the unit is SCANNING, the LCD's back-light will be turned off. Under normal lighting conditions, the user may read the SCANNING message on the LCD screen without the backlight activated. Under low light situations, the user may at any time activate the backlight by pressing the ENTER button. The backlight will illuminate for approximately five seconds.

STORM DETECTION: As when SCANNING, the unit's backlight will remain off until the user activates the backlight, following the same procedure described in NORMAL SCANNING. When an approaching storm activates the VISUAL and AUDIBLE ALARMS, the user may choose during low light situations to activate the backlight to read the specific storm information on the LCD text screen.

AC POWER INSTRUCTIONS

AC POWER: When ThunderBolt is running on AC power, the LCD backlight will be illuminated continuously, unless otherwise turned off through the Main Menu.

AREA WARNING SYSTEM (optional)

If your unit is a ThunderBolt X1, Utility, or Storm Chaser, it comes equipped with an active connector port for the optional **Area Warning System** (AWS). This port is labeled **EX SPK** ON THE BACK OF THE UNITS ABOVE. Complete instructions for using the **Area Warning System** are provided when you purchase these items.

You will need to purchase the AWS Field Base, Home Base, or Power Base Unit which contains the transmitter for connection to the EX SPK port, along with remote warning units to build a warning network. Visit the ThunderBolt website (www.TBI-USA.com) for details on the **Area Warning System**.

BASIC UNIT OPERATION

STORM DETECTION

The ThunderBolt® detects and tracks the motion of storm cells by detecting the lightning activity within the cell. The unit is capable of detecting multiple storm cells within its 75-mile operating range, and is also capable of identifying squall lines and severe storms. NOTE: ThunderBolt is programmed to report on the LCD screen only the closest approaching storm cell to the user on its LCD screen.

Once in basic STORM SCANNING mode, the ThunderBolt warns of any detected thunderstorm activity using text messages displayed on the LCD. Depending on the exact type of weather situation being detected, the information is displayed using a series of two-line messages on the screen. These messages cycle approximately every 10 seconds, so that any particular message will reappear within a short period. It is important to remember that the ThunderBolt continually accumulates data from the ongoing storm activity, and that more accurate information can be displayed with more data in the computer memory. This makes it important to have the ThunderBolt operating for as long as possible before storm activity is nearby. **Don't wait until you think storms are close before turning on the unit! If the ThunderBolt is turned on with thunderstorm activity already close by, it may take several minutes for the most accurate information to be calculated and displayed. More importantly, the storm may already be LOCAL (within 8 miles of the user), putting the user in danger before ThunderBolt can provide a warning.**

IMPORTANT! Any time the ThunderBolt displays detected storm activity immediately after POWER ON, take extra precautions until enough data has accumulated to give an accurate location of the storm. Storm activity should be assumed to be LOCAL and appropriate precautions taken until at least fifteen minutes of storm data has been allowed to accumulate. This is especially important if the APPROXIMATE RANGES displayed are 20 miles or less!

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Once ThunderBolt® detects initial storm activity, the screen will display a warning that strikes have been detected, and then the range in miles to the last CLOSEST strike detected. This information will be displayed and updated until enough data has been accumulated to display the range to the leading edge of the storm, along with indication of storm motion. The time required for accumulation of this data may vary depending on the actual levels of activity within the storm. If no movement toward you has been detected, a NO APPROACH DETECTED message will be displayed along with storm distance. **If the storm is approaching, the storm speed, along with ETA, will be displayed.**

IMPORTANT! The ETA displayed is the estimation of when the leading edge of the storm activity will reach within 8 miles of your location. This may happen without any obvious signs of storms being directly overhead. Also note that storms may form directly over your location, and that advance warning of these storms may be very limited.

The ThunderBolt continuously analyzes the intensity of the storm activity it detects, and attempts to provide additional warning about the presence and approach of both squall lines and supercells. Once detected, warnings for these types of storms are displayed in the LCD. Extreme caution should be taken if these warnings are displayed. Also note that storm cells may evolve quickly from a normal cell into these more dangerous forms of weather. Consult your local weather information sources, if available, when the threats of these types of storms are present.

IMPORTANT! Keep in mind that all of the approach speeds and estimated arrival times are based on data that the ThunderBolt accumulates over periods of time. **Thunderstorms can change both their intensity and activity on very short notice. The information displayed by the ThunderBolt must be used as an approximation that can change quickly as the storm changes.** Once any part of storm cell activity

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has been detected within 8 miles of your location, the screen display will indicate STORM IS LOCAL. This means that lightning activity directly overhead is now possible at any moment, and extreme precautions should be taken! ThunderBolt® will maintain this warning until the detected storm activity (the rear edge of the storm cell) recedes to a distance of more than 8 miles.

Once a storm has become LOCAL, ThunderBolt will calculate and display an estimated TIME TO CLEAR. Clearing a location means NO detected storm activity within 8 miles for 15 minutes. If any activity at all occurs while the storm is LOCAL, the TIME TO CLEAR will reset itself. Note this is only an estimate! The storm motion may change while still in your vicinity, and the time for it to clear to a safe distance may change quickly.

IMPORTANT! The TIME TO CLEAR is updated continuously using actual storm speed, as well as the approach of storms outside the 8-mile local zone. These factors may cause the TIME TO CLEAR estimate to change and lengthen once it begins. Also note that this is ONLY intended as an estimate of the time necessary to completely clear dangerous activity from your location. Storm motion and activity can occur faster than the ThunderBolt can accumulate enough data for accurate estimates.

This time estimate is broken into 15-minute segments, and is updated as storm data continues to be collected. The estimate displayed may change or run longer based on the actual storm activity. This will often happen with storms that develop directly overhead with very little associated movement.

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IMPORTANT! Remember that most storms detected at ranges greater than 20 miles will appear to be approaching, and will be given an ETA, until enough data is accumulated to be certain of passing safely out of local danger range. In actual operation, this will mean that storms detected at long range will appear to gradually veer off from your location. In actuality, the ThunderBolt® may warn of a potential storm strike until enough data indicates there is little or no possibility of a direct hit. For most storm situations, the ThunderBolt will be able to determine the likelihood of a direct hit or near pass from the storm by the time it has closed to within 15-20 miles. Storms that display a range of less than 20 miles and an ETA of less than 30 minutes are HIGH LEVEL threats and should trigger maximum safety responses.

TEXT MESSAGES

While in STORM DETECT mode, ThunderBolt has been programmed to communicate certain messages during specific weather conditions. In normal operation, the user will see a repeating series of messages specific to that situation. Messages cycle approximately every 10 seconds so that any particular message will reappear within a short period. The typical text messages that will appear during various situations are listed and defined below:

ThunderBolt is scanning in the SENSITIVITY HIGH mode and has not detected any storm activity. See page 9 for more detail on SENSITIVITY HIGH.

ThunderBolt is scanning in the SENSITIVITY NORMAL mode and has not detected any storm activity. See page 9 for more detail on SENSITIVITY NORMAL.

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ThunderBolt® has detected initial lightning activity.

This display represents the closest detected stroke during the period of initial data collection. The number indicated is the distance the lightning stroke occurs from the user.

ThunderBolt has plotted the storm location. Storm approach and ETA will follow if the storm is approaching. The number indicated is the distance the storm is occurring from the user.

A severe storm has been detected. Remember to check other weather sources for additional information and advisories.

ThunderBolt has detected the presence of squall lines or multiple storm cells. The user will receive information on the storm closest to his/her location. Exercise extreme caution when these conditions are indicated. Both can result in high winds and tornado activity.

The speed of the approaching storm has been indicated. This information does not always mean the storm will reach the user. Storms are unpredictable and can suddenly change direction or totally dissipate.

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ThunderBolt® has calculated the storm distance and approach speed and determined, based on current conditions, that the storm will reach striking distance of the user in the time indicated on the screen.

The storm has moved within 8 miles and is now within striking distance of the user. SEEK SAFE SHELTER!
NOTE: The user may not yet hear thunder or see lightning (perhaps looking at blue sky/non-threatening conditions) as the storm may be on the edge of the 8-mile range and cannot yet be detected by sight or hearing.

This is not a common screen and will appear only when a storm develops within the 8-mile LOCAL range. There will not be any previous storm warning on the unit because the storm developed within this range. This occurrence is more common in subtropical and tropical regions when small storm cells can develop rapidly during the summer season.

Once storm activity has become LOCAL (within 8 miles of user) the ThunderBolt will indicate, based on current conditions, the amount of time in minutes it will take for the storm to safely clear the eight mile range. The unit is limited to four time frames (LESS THAN 15, 15-30, 30-45, and MORE THAN 45 MINUTES). Once this time appears, ThunderBolt internally begins a countdown of this time. **If during this countdown, the unit detects any new lightning strokes within the 8-mile range, it will automatically reset the time back to the time it originally indicated.** Therefore, the TIME TO CLEAR time can be greater than indicated as the unit detects new activity.

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POINTS TO REMEMBER

You can only view two lines of text at one time. Use the SCROLL UP/DOWN buttons to move through the menu selections. To change any of the user settings, press and release either of the scroll keys to call up the MAIN MENU.

ThunderBolt® detects ACTIVE storms and cannot predict when or where a particular storm may form and/or where the first lightning stroke occurs.

Thunderbolt detects and analyzes storm activity within 75 miles from user location. ThunderBolt continuously accumulates data from the ongoing storm activity and that more accurate information can be displayed with more data in the computer memory. This makes it important to have the unit operating for as long as possible BEFORE storm activity is nearby.

Any time the ThunderBolt displays detected storm activity immediately after the unit is powered on, that activity should be assumed to be LOCAL (within 8 miles of user location) and extra safety precautions taken until at least 15 minutes of data have been accumulated. This is especially important if the approximate ranges displayed are 20 miles or less.

The ETA displayed is the estimation of when the leading edge of a storm will reach within 8 miles of your location. This may happen without any obvious signs of storms being directly overhead. The sky may be completely blue and clear.

REMEMBER: Storms may form directly over your location and advance warning of these storms may be very limited. Thunderstorms are large, often 6-10 miles across with lightning activity appearing in different places, often simultaneously. Once a storm is LOCAL, lightning can appear at ANY TIME in your location. Lightning strikes may land 6-10 miles ahead of the leading edge of the storm in absolutely clear skies. This represents one of the most dangerous of all lightning situations and is commonly called **"The Bolt out of the Blue."** 30% of all lightning victims are struck from the storm's leading edge, while 60% of lightning injuries occur from strokes thrown from the storm's trailing edge.

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WHEN DO YOU NEED TO RUN A NOISE TEST?

IMPORTANT! Each ThunderBolt has a **NOISE TEST** completed prior to shipping, so it is **not** vital to run a test before the unit's first use.

In fact it is recommended that you allow the ThunderBolt to operate with the pre-installed **NOISE TEST** at your location to see if you have any interference problems.

What you will be watching for is the ThunderBolt false triggering (displaying storm activity when there are no storms in your vicinity). These false-positive signals are caused by electronics in the operating vicinity of your ThunderBolt. If you experience false-positive signals please follow the instructions on the next page..

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IMPORTANT! A **NOISE TEST** should not be run if there is storm activity occurring within 50 miles of your location. Doing so may desensitize the unit. The Noise Test should always be run on battery.

WHAT TO DO IF YOU THINK YOUR UNIT HAS BEEN DESENSITIZED

If a **NOISE TEST** is performed at a location when it is not necessary, it is possible to accidently lower the detection sensitivity of the unit.

1.) DO NOT RE-RUN THE NOISE TEST AT THE SAME LOCATION.
(This could make the problem worse rather than better)

2.) The simple solution is to move the ThunderBolt to a different location without any electronics in close vicinity or storm activity within a 50 mile radius and re-run the NOISE TEST two successive times as described on Page 10. (This could be taking the ThunderBolt to a quiet location within the building or just outside).

This will return the unit to its factory settings.
(Running the noise test twice in a row ensures that the noise test level is reduced completely to zero)

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TYPES OF LIGHTNING AND HOW THUNDERBOLT® WILL RESPOND

There are three types of cloud-to-cloud lightning, which are not dangerous. ONLY CLOUD-TO-GROUND LIGHTNING IS A THREAT TO LIFE! ThunderBolt will only warn of cloud-to-ground lightning.

THE THREE TYPES OF CLOUD-TO-CLOUD LIGHTNING

IN-CLOUD LIGHTNING: This occurs completely within a cumulonimbus cloud. Sometimes called an anvil crawler or “spider lightning,” it will light up the entire cloud with spider legs traveling up the sides of the cloud and branching out at the anvil top.

CLOUD-TO-CLOUD LIGHTNING: Less common, this is lightning that travels from one cloud to another .

SHEET LIGHTNING: This lighting is also within the cloud and lights up the cloud like a sheet of light. This lighting is usually seen close to the horizon and from a considerable distance. It is not dangerous.

In-cloud lightning, cloud-to-cloud lightning, and sheet lightning together are the most common types of lightning, accounting for almost 80% of all lightning strokes. They can light up the sky and clouds, and may be accompanied with an audible low rumble of thunder, and/or rain (rain only storms do not constitute a dangerous storm situation and will not register on a ThunderBolt). These three types of cloud-to-cloud lightning can be deceptive to the human eye, and may have the appearance of deadly cloud-to-ground lightning, but they only look dangerous.

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CLOUD-TO-GROUND LIGHTNING

Cloud-to-ground lightning is a lightning discharge between a cumulonimbus cloud and the ground. There are several types, but all are dangerous. This type of lighting can strike without any visible or audible warning. Statistically, 30% of all lightning injuries and fatalities occur from the front edge of a storm (typically before anyone has seen lightning or heard thunder), and 60% occur from the backside of the storm (when it appeared safe to return outdoors).

ANVIL-TO-GROUND: This lightning produces a stroke emanating from the anvil shaped cloud, often in a horizontal direction then veering toward the ground. This can occur miles ahead of the storm, striking without warning in what might still be a clear blue sky.

ThunderBolt recognizes both cloud-to-cloud and cloud-to-ground lightning. but will only react to the user when it detects a cloud-to-ground stroke, which confirms that a real thunderstorm is occurring.

In the beginning, it may be difficult for you to distinguish between what may appear to be cloud-to-ground lightning but is really cloud-to-cloud lightning, but you will acquire the ability to tell the difference through continued use of ThunderBolt. Remember, in-cloud lightning may appear to be close and dangerous and may appear like cloud-to-ground because of its spectacular appearance in the sky, but trust ThunderBolt to warn you if it's cloud-to-ground lightning. If you have any doubt about the conditions and what ThunderBolt is reporting, error on the side of caution and call Customer Support.

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COMMON QUESTIONS ABOUT OPERATION

The ThunderBolt® indicates "STORM IS LOCAL" but no visual indication of a storm or any audible thunder occurs?

This usually indicates low intensity electrical activity coming from a cloud formation that may not be a storm as we typically define one. This is a common phenomenon in subtropical or tropical climates, but it can occur almost anywhere. This represents one of the most dangerous weather situations, resulting in many deaths and injuries, because there is no visual or audible warning (no clouds, lightning, thunder). This is commonly referred to as the "Bolt out of the Blue." This is a situation when you should not put your faith in your own common sense. Use the ThunderBolt, as well as all other weather sources available, to help make the safest decision.

Also check the location of the Thunderbolt unit. If the unit is near a computer or other electronic source, the high noise generated by such equipment can cause a "false trigger," resulting in inaccurate readings. If this is the case, move the unit away from the possible source of interference and re-run the NOISE TEST routine.

I hear thunder and/or see lightning, but ThunderBolt is not indicating "STORM IS LOCAL?"

Several factors may be the cause.

1. If the unit is turned on at the first indication of a storm, it will take time to gather data for analysis. The time for analysis varies with storm size and intensity. **Do not wait until you see or hear evidence of an approaching storm - by that time, it is already LOCAL.** ThunderBolt will provide the most useful and accurate information when turned on and in use through the duration of all outdoor activities.

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2. Storm activity may be cloud-to-cloud lightning that occurs within the cloud, but does not emit lightning strokes to the ground. Such activity, at night, can literally light up the sky. There may also be audible low rumble thunder. ThunderBolt® recognizes this activity, but will not indicate it because it is not necessarily a dangerous situation, so the unit will not display the STORM IS LOCAL warning. This is a situation when common sense and precaution should be exercised.

Should the activity develop into cloud-to-ground lightning, the ThunderBolt will provide detection warning.

3. Low intensity activity may have developed within LOCAL range - a common occurrence in subtropical or tropical climates, or any region similar to Florida. This is a situation when too little data has occurred, due to the low intensity of the activity, for the ThunderBolt to respond quickly. Again, this is a situation when common sense and precaution should be exercised.

4. If none of the above explanations appear to apply, call Customer Service and Support at ThunderBolt International, Inc. toll-free at 800-244-2202.

Storm appears to have cleared, but the ThunderBolt continues to display “TIME TO CLEAR” information?

This feature has been designed to countdown the estimated TIME TO CLEAR time before the unit goes back to normal scanning mode. Should any lighting stroke occur within 8 miles during this countdown, ThunderBolt will automatically reset the TIME TO CLEAR back to the original estimated time. Due to this feature, it is possible the activity has cleared while ThunderBolt is in its countdown. Verify by turning the unit off for 30 seconds to reset it. Then turn it on again. After resuming SCANNING mode, and no sign of storm activity registers, the storm has most likely cleared the local area.

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PRODUCT SUPPORT

CARE AND MAINTENANCE

ThunderBolt® has been manufactured from the highest quality materials and components. It should provide years of service with minimal maintenance. The following important tips will maximize the operational life of your ThunderBolt.

Weatherproofing: ThunderBolt is weather resistant, but NOT waterproof. NEVER immerse ThunderBolt in water without the optional Aquapac accessory.

Battery Condition: Whenever ThunderBolt is used under damp, humid or rainy conditions, batteries should be removed and the terminals dried off to prevent corrosion.

Storage: If ThunderBolt is to be stored for an extended period of time, remove the batteries and store the unit away from high temperatures, humidity, or corrosive substances.

IMPORTANT! ThunderBolt contains no user serviceable parts and is not intended to be opened, except for battery insertion. **Opening the main case will void the Product Warranty.**

CUSTOMER SERVICE AND SUPPORT

ThunderBolt International, Inc. is committed to your satisfaction. The ThunderBolt service and customer support system is designed to ensure fast and friendly solutions to any problems you may have with this product. The toll-free Customer Service and Support department number is 1-800-244-2202.

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LIMITED WARRANTY

ThunderBolt International, Inc agrees to repair or replace a defective unit at no charge for up to three years (Utility, X1) or two years (PRO, Storm Chaser) from the original date of purchase. This warranty does not include any physical damage to the unit or any of its accessory items and does not cover damage to the ThunderBolt® unit resulting from the use of accessories not manufactured or authorized for use by ThunderBolt International, Inc. Any modifications or repairs by unauthorized service personnel will void this warranty. The warranty card included in the product package MUST be completed and returned to ThunderBolt International, Inc. within 30 days of purchase to validate the warranty. If the warranty card included has not been completed and returned to ThunderBolt International, Inc. and the unit is presented for warranty service, a copy of the original sales receipt will be required. You are responsible for all shipping charges to ThunderBolt International, Inc. ThunderBolt International, Inc. will pay for Ground UPS back to the customer.

No other express warranty has been made or will be made with respect to the unit and no person is authorized to provide any other warranty in connection with the sale of our products beyond the description on the face hereof.

Implied warranties, including any warranties of merchantability or fitness for a particular purpose are limited to one year from the date of original purchase. ThunderBolt International, Inc. reserves the right to perform modifications or improvements on its products without incurring the obligation to install the changes on units previously sold, delivered or serviced. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

THUNDERBOLT INTERNATIONAL'S LIABILITY SHALL BE LIMITED TO THE COST OF REPAIR OR REPLACEMENT OF THE UNIT, AND THUNDERBOLT INTERNATIONAL, INC. SHALL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

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SERVICE POLICY

This Service Policy is valid in the United States only. This applies to ThunderBolt® units returned to our service facility in Florida and is subject to change without notice.

ThunderBolt International, Inc. reserves the right to deem any product unserviceable when replacement parts are no longer reasonably available or impossible to obtain.

After the original warranty period, a standard service charge will be assessed for each repair (physical damage and missing parts are not included). Please call our Customer and Support Department to verify the service charge for your unit. The standard service charge includes UPS or Parcel Post freight only. If charges are not prepaid, the unit will be returned C.O.D. Repairs are warranted for ninety (90) days.

The ThunderBolt toll-free number and address are listed on the back cover of this manual.

ThunderBolt® Storm Detector Accessories

Custom Nylon Carry Pouch	$29.95
Weatherized Wall Mount	$19.95
Custom Fit Rugged Carrying Case	$24.95
120 Volt-AC Adapter	$19.95
220 Volt-AC Adapter	$24.95
Desk Stand	$24.95
Aquapac	$39.95
Small Pelican Lockable Carry Case	$39.95
Rechargeable Lithium Battery Pack	$139.95

Accessories may be ordered by calling toll-free 1-800-244-2202, or by visiting our website at www.tbi-usa.com. Prices and items may change; call for more information.

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RECOMMENDED SETTINGS

The ThunderBolt's proprietary software is designed to adapt to most normal user situations and provide excellent results. In addition, the software automatically adjusts to certain conditions to maintain optimum performance. There are situations in which the user can select settings for SENSITIVITY and DETECTION RANGE to help maximize the required performance of the ThunderBolt®.

1. INDOOR APPLICATIONS

The ThunderBolt is designed to detect signals normally in most indoor applications. Certain kinds of buildings, particularly large, all-metal structures, can cause a loss of signal on the frequencies used for storm detection. If you are using the ThunderBolt in such a building, it is recommended you use the HIGH SENSITIVITY setting. This is selected from the Main Menu.

2. WARNING TIME & DETECTION RANGE

It is recommended that detection ranges always be set to allow for at least 30-45 minutes of warning for approaching storms. Since storms can often move at ground speeds in excess of 30 miles per hour, this means setting the alarm ranges (both audible and visual) for at least 20 MILES. For situations involving outdoor safety of children or employees, and where additional time may be required to move people to safety, it is recommended that this range setting be increased to allow for additional warning time. Remember - a storm from 20 miles away and moving at 30-35 miles per hour can become a threat for local lightning activity in less than 30 minutes.

3. FAST RESPONSE

When using the ThunderBolt in situations where the fastest reaction time to developing storms is more important than accuracy in ranging, use the HIGH SENSITIVITY setting. This will introduce an error in the initial distance readings of 5-8 miles, but it will provide faster indication of storm activity developing in the area closest to the user.

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Wesley Chapel, FL 33544
800-244-2202
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www.TBI-USA.com

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FCC REQUIREMENTS

This product complies with the specifications of Part 15 of the FCC rules for a Class B digital device.

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