THUNDERBOLT

CONTROLS &

LCD TEXT SCREEN

ENTER

POWER ON/OFF

SPEAKER

STORM APPROACHING ETA 15 MINUTES
FEATURES

WARNING & POWER ON LEDS

SCROLL UP/DOWN

TONES ON/OFF

FIGURE 1
INTRODUCTION

The ThunderBolt Storm Detector is designed to detect and track all thunderstorm activity within 60 miles of your location. It provides detection warning via the two-line LCD (Liquid Crystal Display), the red and green indicator LEDs, and an audible tone. All of the basic operations and functions for the ThunderBolt are selected from the main menu, and basic storm detection is automatic once the unit is powered on.

IMPORTANT! The 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 always be used in conjunction with other sources of information. In particular, remember that the ThunderBolt detects ACTIVE storms, and cannot predict when or where a particular storm may form.

GENERAL OPERATION

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 60-mile operating range, and is also capable of identifying squall lines and super-cells. (Super-cells are strong thunderstorms that are typically larger and more violent than normal storms. They comprise approximately 10% of all thunderstorms.)
Once in normal storm detection mode, the ThunderBolt will first indicate the detection of storm activity via the LCD and the red warning LEDs at the top of the unit (See Figure 1). Once enough data has been accumulated to determine the range to the storm and its approach velocity, additional text screens will display this information in a rotating sequence of screens. As the storm approaches, its range and approach speed are continually displayed, along with an estimate of the time to arrival in your location.

**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 a storm approaches to within 8 miles of the user location, the ThunderBolt warns that the storm is now LOCAL. It will maintain this warning until the detected storm activity recedes to a distance of more than 8 miles. While the storm is local, the ThunderBolt will calculate and display the estimated time for the storm to clear. Note that 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!** Note that storms may form directly over your location, and that advance warning of these storms may be very limited!
The ThunderBolt continually 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 super-cells. Once detected, warnings for these types of storms are displayed in the LCD. Both types of storms are capable of producing high winds, severe rain, and tornadoes, and 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. Always consult your local weather information sources, if available, when the threat of these types of storms are present.

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

The ThunderBolt contains special software routines for detecting and minimizing false triggering from non-storm sources. A special noise-detection feature can be selected from the main menu when first installing the ThunderBolt in a new location. This routine will take 15 minutes to run, during which it detects and maps all the regular sources of electromagnetic noise in the vicinity. Once returned to normal operation, the ThunderBolt will ignore these regular noise sources. The ThunderBolt also continuously monitors the background noise level during normal operation. Short-term periods of high local noise are detected and identified with a warning message on the LCD. If these periods of high local noise are short (less than 10 minutes), there is no interruption of any storm-tracking already in progress. However, if the high local noise level
If the unit continues to display a warning message after relocation, the unit must be powered off and unplugged from any power source. If the unit continues to display a warning message after relocation, the unit must be powered off and unplugged from any power source.

IMPORTANT! If this warning message is displayed, turn the unit off, move it to a different location, and re-start. As soon as any local storm activity has cleared, the Noise Test routine should be selected and run from the main menu. Until the Noise Test has been re-run, the accuracy and detection sensitivity of the unit may be reduced.

The ThunderBolt is powered by a single 9-volt battery. It may also be powered by using the 120 VAC adaptor provided by Spectrum. NOTE: That the use of a non-specified adaptor may cause inaccurate or improper operation of the unit!

Should you have any questions about the use or operation of your ThunderBolt, call Spectrum at the toll-free customer service number shown in this manual between 9a.m. and 5p.m. EST. Or you may post a message for a customer service representative by logging on to the ThunderBolt website at www.spectrumthunderbolt.com
IMPORTANT! Remember that the ThunderBolt is designed to detect and track storm cells and squall lines, not individual strokes of lightning. A single stroke of lightning contains variations due to amperage of the stroke, polarity, and orientation to the ground. All of these factors make it more dependable and accurate to analyze, detect, and track the entire storm cell as it moves. Thunderstorms are also large (6-10 miles across) with lightning activity appearing in different places within the body of the storm, often simultaneously. Once a storm is local, lightning can appear at ANY TIME at your location! Take defensive action before this situation develops!

**BASIC OPERATION**

1. **Battery Installation**

   The ThunderBolt operates on one standard 9-V battery. Clip the connector over the terminals on the battery and securely close the battery compartment door on the back of the unit. Remaining battery life is constantly monitored by the computer. A LOW BATTERY warning message is periodically displayed once remaining battery life drops below approximately 5-7 hours. The battery should ALWAYS be replaced as soon as possible once the LOW BATTERY warning message is displayed.

2. **External AC Adaptor**

   The ThunderBolt may be powered by the external adaptor supplied with the unit. The adaptor jack is labeled “9V DC” and is located on the back of the unit above the battery compartment door.
3. Power ON/OFF

Pressing the ON/OFF button on the front of the unit turns the power on. The green and red LEDs located behind the lens at the top of the unit blink several times to verify operation. The MAIN MENU appears on the display, and the green LED blinks to indicate operation.

The SCROLL UP/DOWN buttons are used to move up and down the items on the MAIN MENU. Selecting an item from the menu is done by moving the blinking cursor to the numbered item desired, and then pressing the ENTER button. After initial power-up, the ThunderBolt automatically begins normal storm detection if no other button is pressed within 10 seconds.

The ThunderBolt is programmed to automatically turn off after eight hours if no buttons are activated. This is meant to conserve battery life if the unit is accidentally stored while turned on. This automatic-off feature is disabled if the unit is being powered by the external 120 VAC adaptor.

4. Normal Operation

There are five user-selectable choices on the MAIN MENU:

1. STORM DETECT
2. ALARM RANGE
3. ALARM MODE
4. SENSITIVITY
5. NOISE TEST
STORM DETECT

Selecting STORM DETECT puts the unit into normal storm detection mode. The display will indicate “SCANNING” and also show which sensitivity level has been selected, either HIGH or NORMAL (See SENSITIVITY below).

Once storm activity has been detected, the display will indicate detection, and the red LED will begin to flash. If the audible TONE is ON, it will sound once every 15 seconds. Once enough data has been accumulated to calculate storm range and approach speed, these will be displayed on the screen, along with ESTIMATED TIME of ARRIVAL (ETA) in minutes.

As the storm is tracked, the displayed range, speed, and ETA will be updated every 3-5 minutes. This tracking process will continue until the ThunderBolt determines that the storm will not approach within 10 miles of the user’s location. As a detected storm moves closer, the intensity and blink rate of the red LED will increase, and the tone will sound at an increasing rate. (The tone may be turned on or off at any time by pressing the TONE ON/OFF button on the front of the unit.)

IMPORTANT! Remember that 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. The ThunderBolt will err on the side of caution until the storm track is well determined. 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 will 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 displaying ranges of less than 20 miles and ETAs of less than 30 minutes are HIGH LEVEL threats and should trigger maximum safety responses.

The ThunderBolt constantly analyzes the incoming data for signatures of squall lines and super-cells. If either of these conditions is detected, a text message appears on the screen. Both of these weather patterns are HIGH LEVEL threats for high winds and possible tornado activity. Extreme caution should be exercised when these conditions are approaching your location.

Once storm activity approaches within 8 miles of the user’s location, the screen displays a STORM LOCAL warning. The ThunderBolt then calculates the expected time for storm activity to clear the user’s location. (Clearing a location means NO detected storm activity within eight miles for 15 minutes.)

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. Keep in mind that 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.
ALARM RANGE
Selecting this option allows the user to choose the warning range for activation of the red LED and the audible tone. Warning ranges are selected by using the SCROLL UP/DOWN button to toggle the displayed range in miles to the value desired. Pressing the ENTER button stores the value in memory. Once stored, these values will be used every time the unit is operated until changed by the user. NOTE: The audible tone may be turned on or off at any time by using the front panel button. This will not change the alarm range stored in memory.

ALARM MODE
Selecting this option allows the setting of an additional trigger distance for an augmented audible alarm. This feature allows the ThunderBolt to automatically increase its alarm level as a storm approaches.

SENSITIVITY
Selecting this option allows the user to select either a HIGH or NORMAL storm detection sensitivity. HIGH sensitivity will maximize the distance at which storms are detected and tracking begins. It will tend to plot storms as approaching faster than they might actually be moving, and should be used in situations where maximum caution and time are required to prepare for storm arrival.

The NORMAL 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 ETA being displayed on the screen.
BACKGROUND NOISE TEST

This option runs a 15-minute sampling routine which detects and maps the periodic noise sources in the planned operating location for the ThunderBolt. Once completed, this allows the unit to ignore regular, non-storm electromagnetic interference (EMI) in the environment. If the background EMI at the selected location is too high to allow normal storm detection, a warning message will be displayed at the end of the noise test. If no problems are found, the unit will automatically return to the main menu. NOTE: Once started, the noise test can be exited at any time by pressing the ENTER button on the front panel. If the test is stopped before completion, no data is stored and the test will need to be run from the beginning at a later time. The Noise Test should be re-run periodically to insure accurate operation.

IMPORTANT! The noise test MUST be run when no real storm activity is occurring within 40 miles of your location. Running the noise test with actual storm activity within range will introduce errors and inaccuracy to the normal operation of the ThunderBolt.
CARE AND MAINTENANCE

ThunderBolt has been manufactured of the highest quality materials and components. It should provide you with years of service with minimum maintenance. A few important tips will maximize the operational life of your ThunderBolt.

Remember, ThunderBolt is weather-resistant, but is NOT waterproof. Your ThunderBolt should NEVER be immersed in water.

Whenever you have used your ThunderBolt under damp, humid or rainy conditions, it is recommended you remove the batteries and dry the battery terminals to prevent corrosion.

If ThunderBolt is to be stored for an extended period of time, the batteries should be removed and the unit should be stored away from high temperature, high humidity, or corrosive substances.

IMPORTANT! Your ThunderBolt contains no user serviceable parts and is not intended to be opened, other than to insert or remove the 9-volt battery. Opening the case will void the Product Warranty.

CUSTOMER SERVICE AND SUPPORT

As a ThunderBolt customer, we are committed to your satisfaction for the life of your ThunderBolt product. The ThunderBolt service and customer support system is designed to ensure fast and friendly solutions to any problems you may have with this quality ThunderBolt product.
THUNDERBOLT ACCESSORIES

WALL MOUNT (JB-01) (Standard)
The wall mount bracket is designed to allow mounting and operation of the unit on any flat, vertical surface. Once the wall mount is attached to the surface with adhesive strips or screws, the ThunderBolt can be dropped into place. Edge grips will hold the unit firmly in the mount even with significant vibration or motion. Steady upward pressure will remove the unit.

EXTERNAL SPEAKER DRIVER AND SPEAKERS (Optional)
The External Speaker Driver unit plugs into the jack labeled “EX.SPK.” on the rear of the unit above and to the left of the battery compartment. The Driver unit (TD-01) can activate any number of wireless external speakers (TSP-01) that are located within approximately 500 feet of the ThunderBolt unit. This allows one ThunderBolt to activate a network of audible warning alarms in across a larger area where high alarm volume is required.

Call Spectrum toll-free (877)738-7330 or check the ThunderBolt website, spectrumthunderbolt.com, for ordering information.
ONE-YEAR LIMITED WARRANTY

Spectrum Electronics, Inc. 3200 Henderson Blvd. Suite 100, Tampa, FL 33609 agrees to repair or replace this product for one year from the original date of purchase absolutely free. 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. Any modifications or repairs by unauthorized service personnel will void this warranty. The warranty card included in with the product package MUST be completed and returned to Spectrum Electronics, Inc. in Tampa, FL within 30 days of purchase to validate the warranty. If the warranty card included has not been completed and returned to Spectrum Electronics, Inc., when a unit is presented for warranty service, a copy of the original sales receipt will be required. You are responsible for all shipping charges to Spectrum Electronics, Inc. Spectrum Electronics, 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. SPECTRUM RESERVES THE RIGHT TO PERFORM MODIFICATIONS OR IMPROVEMENTS ON ITS PRODUCTS WITHOUT INcurring THE OBLIGATION IN 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.

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

SERVICE POLICY

This Service Policy is valid in the United States only. This applies to ThunderBolt units returned to our factory in Tampa, FL, and is subject to change without notice.

Spectrum Electronics 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 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 in this manual.
FACTS ABOUT LIGHTNING AND THUNDERSTORMS

• Thunderstorms and the associated lightning cause an average of 200 deaths and many times more injuries in the U.S. every year. Most of these deaths and injuries could be prevented by the warning provided by ThunderBolt.

• The average lightning stroke is 5-8 miles long. A lightning stroke is incredibly powerful; up to 30 million volts at 100,000 amp flow in less than 1/10 of a second.

• The average thunderstorm is 6-10 miles wide and moves at a rate of 25 miles per hour.

• Once the leading edge of a thunderstorm approaches to within 10 miles, you are at immediate risk due to the possibility of lightning strokes coming from the storm's overhanging anvil cloud. This is the reason many lightning deaths and injuries occur with clear skies overhead.

• On average, the thunder from a lightning stroke can only be heard over a distance of 3-4 miles, depending on terrain, humidity and background noise around you. By the time you hear the thunder, the storm has already approached to within 3-4 miles!

• The sudden cold wind that many people use to gauge the approach of a thunderstorm is the result of down drafts and usually extends less than 3 miles from the storm's leading edge. By the time you feel the wind, the storm can be less than 3 miles away!

• Approximately 100,000 thunderstorms occur in the U.S. each year. Approximately 10% of all thunderstorms are severe enough to produce high winds, flash floods and tornadoes.