

**TWO**

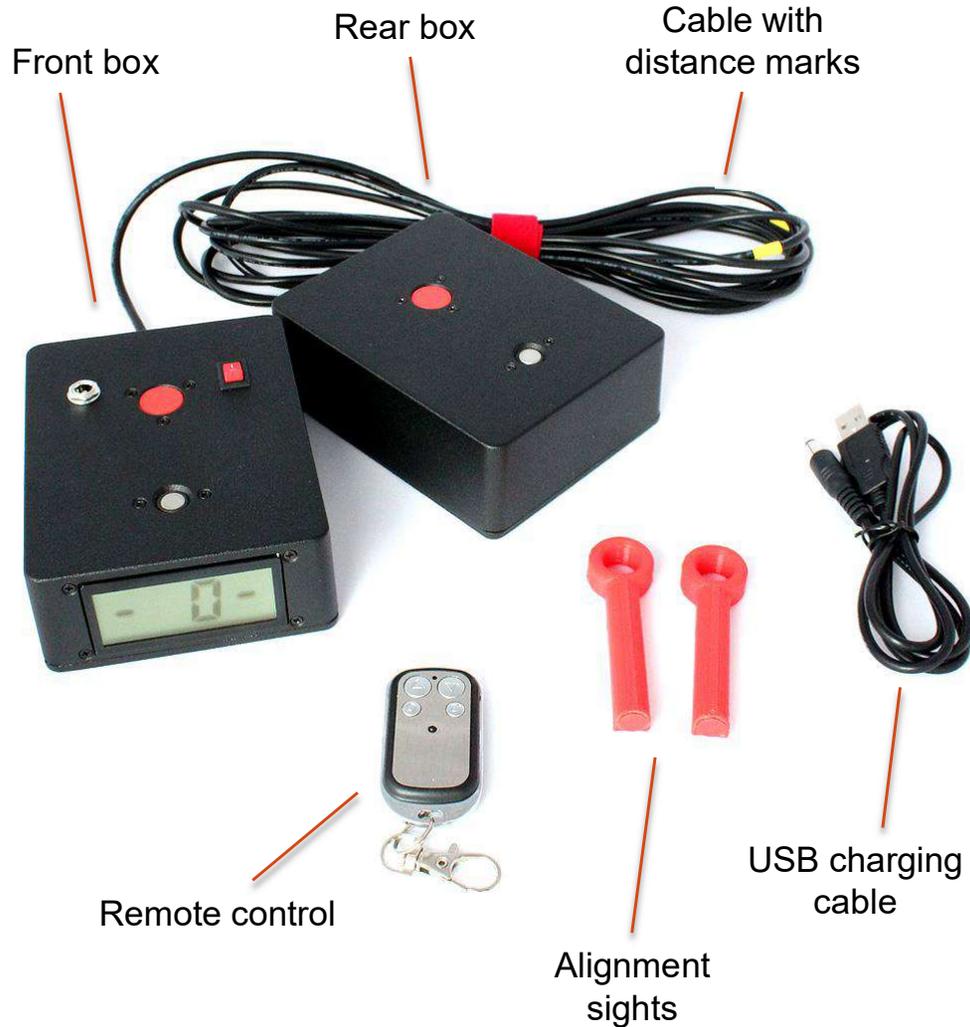
**BOX**

**CHRONO**

**Reference Manual**  
**May 2017**

**[twoboxchrono.com](http://twoboxchrono.com)**

# Overview



Only supersonic bullets  
**over 1250 fps**  
will be detected.



Allow the chrono to dry  
after shooting in the rain.



Turn off the power switch  
when not in use.

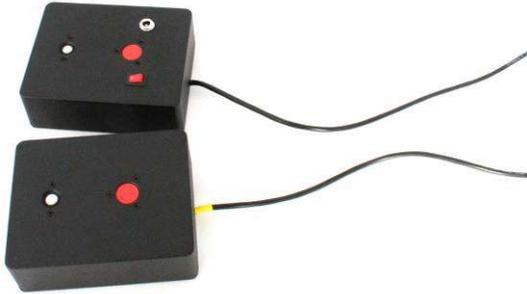


The internal lithium battery:

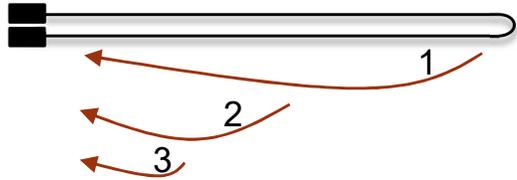
- Runs for **60 hours**.
  - Charges in **3 hours**.
- Charge using the included cable with any USB power source (computer, wall adapter, portable battery pack).
  - At startup, the estimate battery percentage remaining is displayed. From 0%, it should run for 10 more hours.

## Cable Storage

To avoid twisting, pack the cable as follows:



- Place the boxes side by side and extend the cable.



- Fold the cable in half three times.



- Apply the velcro wrap.
- Place the cable above the boxes as shown.

## Placement & Mounting

- You can mount the boxes in a variety of ways, as long as they do not move after you start firing.
- For optimal performance, place the front box:
  - **6 – 12 feet** in front of the muzzle
  - **Within 5 feet** below the bore line
  - With clear line of sight to the bullet path

Here are some mounting possibilities:

### Simply place directly on the ground.

You may need a thin board to raise one of the boxes into alignment (see page 8).

### Stick to a cardboard box.

Use double-sided tape or masking tape over the top - do not cover the sensor!

### Screw to a board with a 1/4-20" bolt.

This will provide a heavy platform that can rest on a table or chair without adhesive.

### Use two tripods.

Make sure they are rock solid. Hang a weight from the center hook to increase stability.

## Distance

1

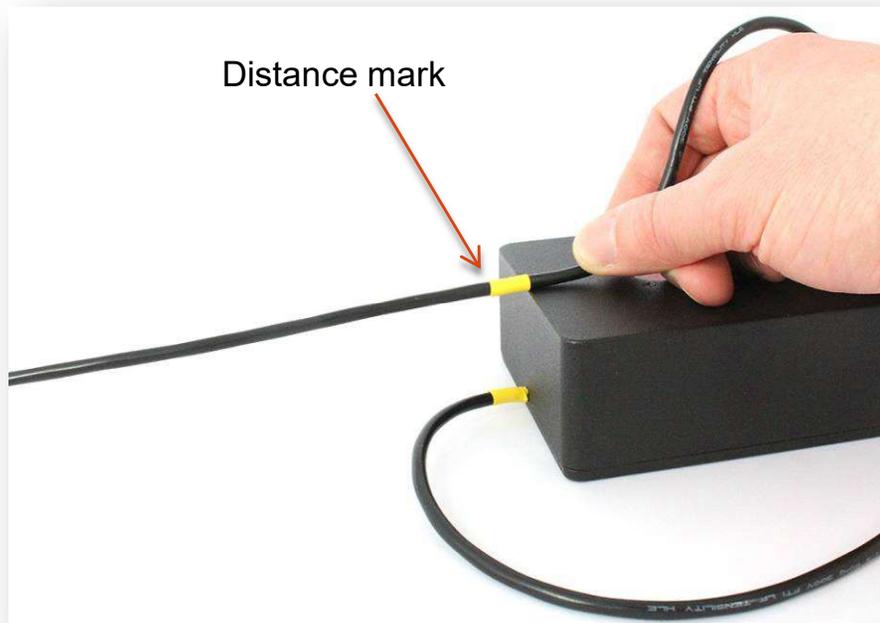
Secure the front box so that it will not move when you apply light tension on the cable.

2

From the rear box, pull the cable and align one of the distance marks to the reference.

3

Drop the slack in the cable.



- You can also measure the sensor-to-sensor distance with measuring tape, or a piece of string marked to the same length.



The chrono must be configured for the correct distance before you shoot (2, 6, 10, or 15 feet).

- On startup, the display will briefly show the current distance setting.
- To change the current setting, use the remote to select the correct distance (see page 12).

**Note:** Ensure the front box is within 15 feet of the muzzle, or the muzzle blast may not be rejected and appear as a second shot in the list.

# Alignment

1

Stand a magnetic sight on the red dot on top of each box.

2

From the front box, look through the sights and 'aim' the boxes at or slightly below the target.

3

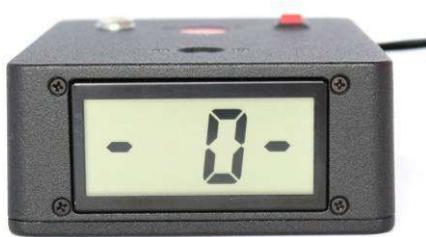
With your rifle in position, ensure you will be firing directly over both boxes.



- By aiming the boxes at the target, the sensors will be parallel to the bullet path. This is important for accuracy of average velocity, but not shot to shot variation.
- Laterally shifting your firing position by a few inches will not cause a problem, but try to fire directly over if possible.
- Pitch angle is important. Try to keep the pitch angle of the bullet path consistent between groups.
- If you find the average velocity is not correct, check that the boxes are well aligned. Raising or lowering one of the boxes is the easiest way to correct for shift.
- The sights are also magnetic on the sides, so you can lay them down on the box while you are shooting.

# Shooting

- After startup, the chrono will display -0- to indicate there are no shots recorded. Now you are ready to fire.



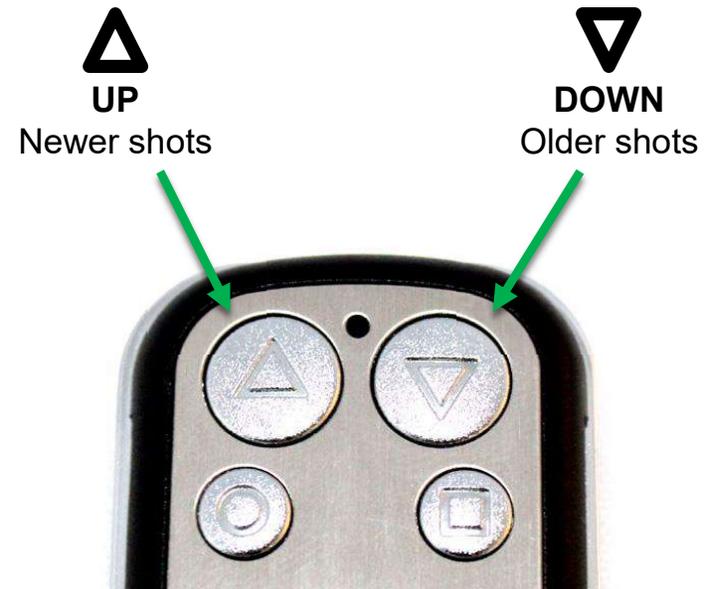
- As you fire, the most recent shot will be displayed.
- If multiple shots arrive, the display will slowly advance to allow each shot a minimum of 5 seconds on the display.

If you fire and nothing happens...

- Is the correct distance set?
- Are your bullets supersonic?
- Are you viewing an older shot?

# Shot List

- The shot list ensures you won't lose your data even if you or others keep shooting.
- The first shot is -1-, the second shot is -2-, and so on. Up to 500 shots will be stored.



- When viewing an older shot:
  - New shots will be recorded, but not displayed.
  - The shot number will be displayed periodically.
  - Four dots on the display will blink.
- To display new shots as they arrive, hold  until the most recent shot is displayed.

## Menu Options

- Press  to enter the menu.
- Press  or  to choose an option.
- Press  to select an option.
- Press  again to confirm.



- **Save** } Save / load shot storage
- **Load** }
- **Clear** — Erase the shot list
- **2 ft** } Sensor spacing distance
- **6 ft** }
- **10 ft** }
- **15 ft** }

## Shot Storage

- You can save the shot list to **storage**, which is memory that will not be erased when the device is powered off.
- This allows you to transcribe your velocities at home, rather than as you are shooting.



## Average vs. Variation

- Chronographs are clocks; they measure **time**.
- The reported **velocity** is based on an assumption that the bullet path is parallel and the sensors are at a specific distance.
- Exact positioning of the two boxes affects the average velocity, but not variation. As long as the boxes remain stationary, shot-to-shot differences will be correct.
- **A constant 'offset' in the data will not affect your ability to measure consistency.**
- It is recommended to align the sensors reasonably quickly using the procedures outlined in this manual, and accept that a small offset is normal.
- If desired, you can fire some calibration shots of known velocity to determine the offset.
- The best way to determine absolute muzzle velocity of your ammunition is to measure elevation at long range and compare to ballistics tables.

## Shooting With Others

- The sensors are very sensitive and will detect nearby shots within about 30 feet.
- Because other shooters are firing from different positions, their reported velocities will probably be clearly different than yours (often by 100 fps or more).

Here are three strategies to deal with multiple shooters:

Each shot is displayed for a minimum of 5 seconds.

After you fire, you will have time to identify your shot.

Ignore the display and fire your group.

Use the remote to backtrack and identify your shots.

Review your data at home.

Up to 500 shots can be saved so you can find your shots later.

- Two simultaneous shots will confuse the sensors only if they sound like one shot. It should work fine with fully automatic fire.

If you have any questions or concerns, please contact:

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Good shooting!

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The **Two-Box Chrono** is warranted to be free from any defects in material or workmanship under normal use for the period of one (1) year from the shipping date. During the warranty period, any product or parts of the product that prove to be defective due to improper material or workmanship under normal use and maintenance will be repaired or replaced at no charge to the user. This warranty is extended only to the original purchaser and is non-transferrable. This product is intended for non-commercial use. Any other use of this product will void this warranty.