

# Speed Tracker

## User Guide



**PITSCO**  
EDUCATION

58668 V0513

## Warranty

Pitsco provides a one-year limited warranty against defects in manufacturing on all items purchased. In a warranty situation, Pitsco will arrange for the return of defective items for evaluation. Qualified Pitsco staff will determine warranty coverage and notify the customer. Items under warranty will be repaired or replaced at Pitsco's discretion. Customers will be billed for all costs associated with non-warranty items.

## Cautionary and Warning Statements

- This equipment is designed and intended for educational purposes only.
- Use only under the direct supervision of an adult who has read and understood the instructions provided in this user guide.
- Read warnings on packaging and in manual carefully.
- Safety glasses required.

## Safety

Teachers should provide adequate supervision when leading this activity in the classroom. As needed, teachers should implement general safety requirements, including but not limited to the following: eye protection, maintaining a safe distance from the racing area, proper ventilation, and instruction on the use of hand tools. Furthermore, teachers should implement the safety requirements required by their district and/or state in combination with the safety requirements mentioned in this user guide. Pitsco, Inc. is not responsible for bodily injury or property damage resulting from the misuse of its products or the teacher's failure to implement proper safety measures within the classroom.

## Materials Included

- 4 side pieces
- 4 cross pieces
- 2 string anchors
- 80' detector assembly wire
- 80' emitter assembly wire
- Control box
- 25' detector assembly wire
- 25' emitter assembly wire
- Roll of monofilament line
- 12-volt power pack

## Items Required (not included)

- Screw eyes
- Roll of duct tape
- A racing vehicle, such as a mousetrap car or an electric vehicle. (Pinewood derby cars can be timed using the Speed Tracker as well. Call Pitsco for details.) **Note:** CO<sub>2</sub> dragsters can be used, but the Speed Tracker does not include a launching device.
- Towel (Beach towel size)
- Scissors

## Constructing the Track

1. Find an area with a flat surface such as a school hallway, gymnasium, or cafeteria floor. The surface must be smooth so your car can glide over it. (Thick carpeting may prevent your car from moving smoothly.) The Speed Tracker can be set up to have a speedway length up to 80'. If you prefer a shorter raceway, the Speed Tracker can be set up to fit inside most classrooms. Note: Do not use the Speed Tracker outside, as sunlight will interfere with the infrared timing device. Because of this, solar-powered vehicles should not be used.
2. Locate the four side pieces and the four cross pieces. Slide the notches of two cross pieces down onto two side pieces (Figure 1). Repeat for the second gate.
3. Locate where the start and finish gates will be on the speedway. Locate the string anchors and secure them to the floor about 4' from the outside of the gate areas. Using duct tape, secure the anchor to the floor (Figure 2).

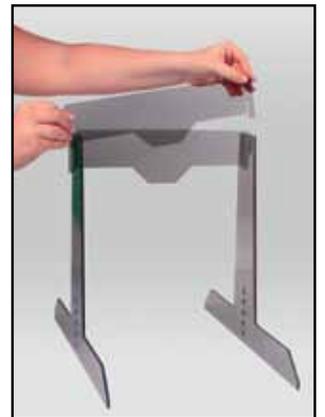


Figure 1

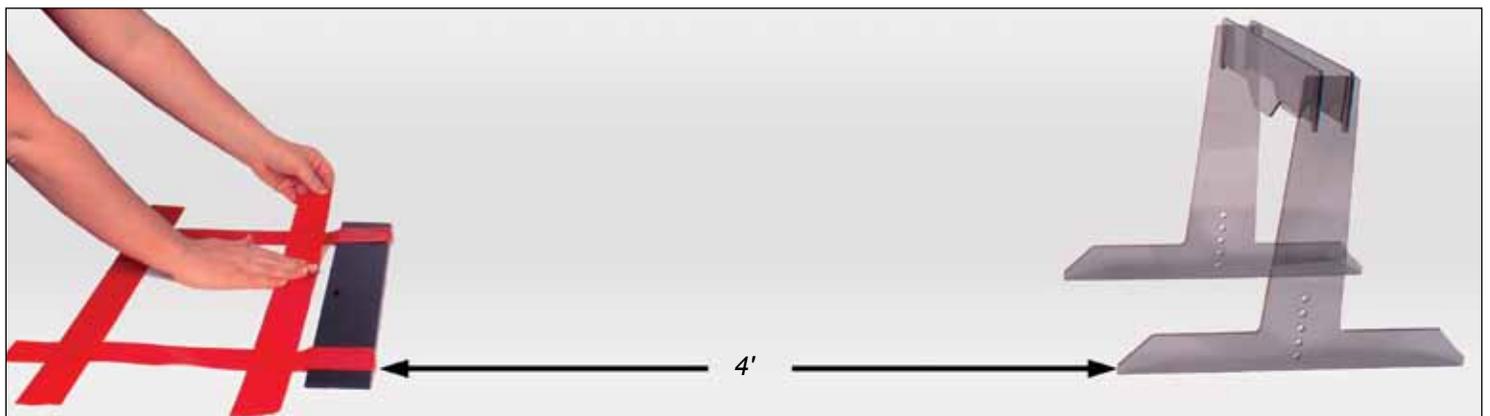


Figure 2

4. Each string anchor has a small post protruding from its center. Take the roll of monofilament line and tie a small loop onto the free end of the line. Loop the line around the metal post of the finish gate's string anchor and walk to the start gate end, letting the line unwind from the roll as you go. About two feet from the start gate's string anchor, cut the line with scissors. Tie this end of the line into a loop as well (Figures 3a-c).

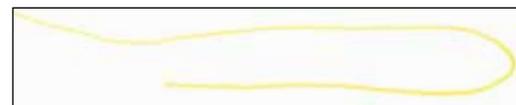


Figure 3a



Figure 3b



Figure 3c

5. After you've chosen a vehicle, locate two or three screw eyes and insert them into the bottom side of your car (Figure 4). Insert the free end of the monofilament line through the screw eyes (Figure 6) – be sure the front of the car will point in the racing direction of the speedway. Set down the car. Stretch the line and loop the end of it over the post on the start gate's string anchor (Figure 5). Make sure the line runs down the center of the gates and that it is taut. If you are using a mousetrap car, have a partner hold it in place until you are ready to start racing. Roll up the towel and lay it on top of the monofilament line between the finish gate and its string anchor to safely stop the vehicle.

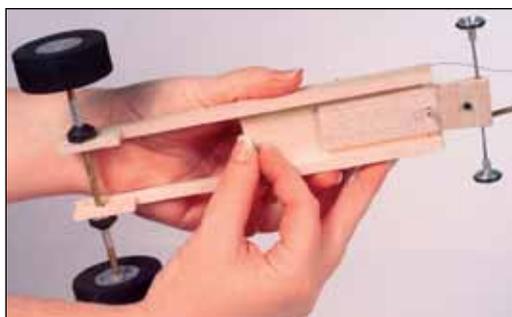


Figure 4



Figure 5



Figure 6

## Setting up the Timing System

1. Locate the 80' wires. Plug the sensor ends of each wire into the holes on the side pieces of the finish gate. Decide which holes you want to use (there are five on each side) based on how tall your vehicle is. The two sensors must be directly across from one another to form an infrared beam. Choose holes that are low enough so your vehicle will drive through the beam as it passes through the gates.
2. There are four wires in your kit, two 80' wires and two 25' wires. One of the 80' and one of the 25' wires both have red tips around the plugs. The other 80' and 25' wires have white tips around the plugs. Locate the control box and note the labels next to the plug inlets. The top two inlets are labeled "Emitter" and the bottom two are labeled "Detector."

3. Plug the 80' wire with the white tip into the right side Emitter inlet, and plug the 80' wire with the red tip into the Detector inlet just below it. Plug the 25' wire with the white tip into the left side Emitter inlet, and plug the 25' wire with the red tip into the Detector inlet just below it (Figure 7).
4. Plug one end of the 12-volt power pack into an electrical outlet, and plug the other end into the control box. There is an inlet on the side of the box for this plug (Figure 8).
5. The words "Speed Tracker" will automatically appear on the screen of the control box. Hit the Reset button so the display reads "0.0 seconds." The control box is programmed to measure the number of seconds it takes a race car to get from the start gate to the finish gate. When the vehicle drives through the start and finish gate infrared beams, it will automatically turn the control box timer on and off.



Figure 7



Figure 8

## Changing the Timing System

**Note:** Use the Mode button to change the timing method. The control box is programmed to give you the option of measuring in seconds, feet per second, miles per hour, meters per second, and kilometers per hour. Follow these steps to change timing methods:

1. Press Mode. The screen will say "Select Units."
2. Use the Up and Down keys to select a unit.
3. Wait until the screen asks for the "P.G. (photogate) Distance."\*
4. Use the Up and Down keys to estimate the distance between the start and finish gates. (Each time these buttons are pressed, the measurement changes by one unit, such as one meter or one foot.)
5. Press Reset and get your vehicle ready to race.

\*If measuring a vehicle's speed by seconds alone, there is no need to enter a photogate distance. If measuring a vehicle's speed in feet per second, meters per second, miles per hour, or kilometers per hour, a photogate distance must be entered.

Now you're ready to show off your best time with the Speed Tracker! The single-lane string anchors are designed to hold only one monofilament line at a time, so if you want to race other cars, you must use the Speed Tracker one at a time and compare your fastest times.

If you're getting ready for a competition, the Speed Tracker will display your time for each run, so you can modify the vehicle to travel faster each time.

**PITSCO**  
E D U C A T I O N

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