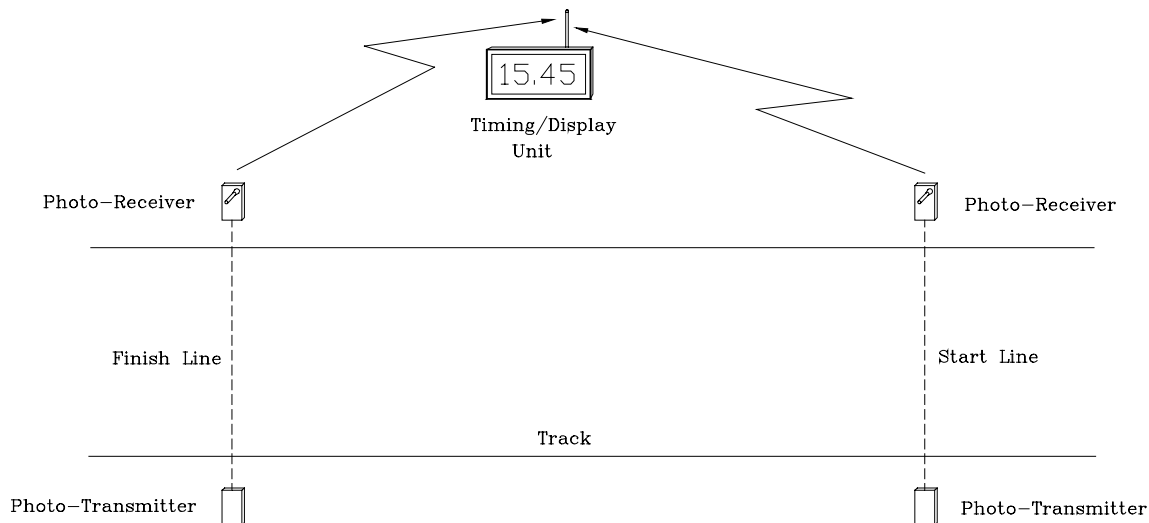


Introduction

The Match Play Timer is used to time track and field events which start at point “A” and finish at point “B” (such as a 100 yard dash). A photosensor pair is used at the starting point to automatically start timing when a runner crosses the starting line. A second photosensor pair is used at the finish line to automatically stop timing when the runner crosses the finish line. Timing is performed by a unit separate from the photosensors. To make setup and operation simple, all units operate from internal, disposable batteries and a one-way wireless link is used from the photo-sensor to the timing unit to signal the timer to start or stop.



Wireless Radio Link

The wireless radio link used in the Match Play Timer is a one-way link from each photo-receiver to the timing/display unit. The wireless link operates under FCC regulations Part 15, Section 249:

- Operating frequency is selectable on the following eight channels:

Channel	Frequency	Channel	Frequency
0	903.3	4	912.3
1	906.3	5	915.3
2	907.8	6	919.8
3	909.3	7	921.3

- Both the radio transmitter and receiver are frequency synthesized with a crystal stabilized phase locked loop (PLL) to eliminate the need for periodic adjustment or tuning.
- To improve interference rejection in noisy radio environments, FSK (Frequency Shift Keying) modulation is used instead of AM or OOK (On/Off Keying).
- Full $\frac{1}{4}$ wave whips are used on both the transmitter and receiver.

When the light beam is broken, the photo-receiver transmits an identifying message to the Timing Unit to indicate that the beam was broken. The message is repeated 28 times on one channel and then 28 times again on a second channel (425 ms on each channel for a total of 850 ms transmission time).

Photo-Receiver (contains RF Transmitter)

The photo-receiver detects the infrared beam of light that is emitted by the opposing photo-transmitter. When the photo-receiver detects a broken beam, it transmits a message to the main timing unit via a one-way radio link. The following table outlines specifications particular to the photo-receiver:

Packaging	Plastic case approximately 2.5 x 3.8 x 1.0 inches with an easily accessible battery compartment.
Power	A 9 volt alkaline battery provides a minimum of 80 hours of operation.
Radio Link	8 channel, 900 Mhz, FSK transmitter. A ¼ wave, flexible antenna exits through the top of the case. The transmitter activates whenever the unit detects the infrared beam has been broken.

Timing / Display Unit (contains RF Receiver)

The main timing unit functions as both the timing and display mechanism. Time is displayed on a four digit, liquid crystal display (LCD), with 3 inch tall digits. The timing unit is automatically started and stopped by the start and finish line photosensors via a one-way radio link to the timing unit.

Packaging	Metal case approximately 14 x 6 x 2 inches with an easily accessible battery compartment.
Power	The unit is powered by two 9 volt alkaline batteries. The batteries provide a minimum of 80 hours of operation.
Radio Link	8 channel, 900 Mhz, FSK receiver. A ¼ wave, flexible antenna exits through the top of the case.