

# ProChrono Pal

## Operating Manual

### Operating Instructions ProChrono Pal Chronograph

Congratulations! You have purchased a fine quality Chronograph. This chronograph is designed and manufactured in the USA. It's quality and accuracy are built in. With proper use and care, it will give you many years of pleasant, trouble free use.

#### Features

- Shooting area nearly twice as large as comparably priced chronographs.
- Durable plastic diffusers
- New, easy to use pushbutton control system.
- Velocity Functions:
  - Duplicate Velocity indication indicates from 1 to 9 duplicate velocities.
  - Low Battery Indication.
  - Error Indication.
  - Shows shot number for each shot detected.
  - Review of statistics.
- Statistics:
  - High Velocity.
  - Low Velocity.
  - Average Velocity.
  - No of shots in string.
- Metric/FPS selectable.
- Available Accessories.
  - Indoor Lighting Setup.

#### Warning

When using the ProChrono Pal Chronograph, it is your responsibility to provide safe conditions for discharging your firearm. Proper eye and ear protection must be used, along with a suitable backstop. Your firearm must be aligned in the middle of the guide rod shooting area in order to avoid hitting the ProChrono Pal Chronograph and causing a dangerous ricochet. Deflection shields are NOT to be placed in front of the ProChrono Pal, as they may cause a projectile to ricochet toward the shooter or bystanders.

Velocity readings obtained with the ProChrono Pal Chronograph should not be used to obtain cartridge combustion pressure. In order to avoid possible injury when using reloaded ammunition, make it a standard practice to watch for excess pressure indications.

Competition Electronics, Inc., assumes no liability for any property damage or personal injury which may result from the improper use of this product.

#### Battery Installation

The recommended battery for proper operation of the ProChrono Pal chronograph is a 9-volt ALKALINE battery, such as the coppertop Duracellä, or equivalent. The dual battery compartment is located on the bottom of the ProChrono Pal chronograph and its cover is removed by pushing the tab toward the battery cover and lifting. Make sure the power switch on the left side of the ProChrono Pal is in the rear position, which is off. Simply snap the battery connector onto the battery and place the battery in the compartment that the battery connector is in. Replace the battery hatch cover.

#### General Operation

The ProChrono Pal chronograph operates on the principle of measuring the time it takes for an object to travel from the first projectile sensor to the second projectile sensor. The sensors, mounted internally in the case, gather light through the two slits in the top of the case. If you can imagine looking up at the sky through a tube, you will see what the sensors see. The only light

they see is what is directly above them. Any light blockage caused by an object passing over them is converted to a signal that is detected by the ProChrono Pal. The elapsed time between the sensors is converted to velocity and is displayed on the LCD screen on the front of the ProChrono Pal.

### **Outdoor Lighting Setup**

The ProChrono Pal chronograph may be mounted on a camera tripod or set on a table. Mount the diffusers on sunny or very bright days using the following procedure. Follow this procedure for both the front and rear diffuser assemblies, First, insert the two 3/16" guide rods into the holes in each side of the plastic diffuser. After this, insert one of the 3/16" guide rods mounted on the diffuser into one of the holes in the ProChrono Pal next to the sensors. Finally, insert the other guide rod into the hole on the opposite side of the case.

**IMPORTANT:** Check the boreline-to-scope distance, and aim the crosshairs on the scope that much higher than the middle of the shooting area.

A bow can be used one arrow's length away, just so the arrow can leave the bow completely before it travels over the ProChrono Pal. If you are not back far enough, the velocities will be too low and will be inconsistent.

To chronograph shotgun loads, stand back at a distance of 5 feet from the muzzle of the gun to the front of the ProChrono Pal. If you stand farther away, the shot spreads out causing inaccurate velocity readings. Also, the wad will separate from the shot column and may hit the ProChrono Pal. The velocity obtained will be slightly higher than factory specs. The ProChrono Pal measures the velocity of the first pellet which is going at a slightly higher velocity than the mass.

### **How the ProChrono Pal Works**

Turn on the ProChrono Pal by moving the power switch on the side of the case toward the display. The display should briefly read "8.8.8.8" and then go to ready (rdY).

Finally, the chronograph will display "0".

Move back 10 feet and fire a shot. The display will show your velocity and will hold it until the next shot. Each time a shot is fired, the unit briefly displays the shot no. Then, it will display the shot velocity.

If two shots of the same velocity are fired sequentially, the unit will flash the following message:

duPX

Where X is the number of the duplicate velocity. If additional shot velocities are also the same, the value for X will increment. If 10 sequential duplicate shot velocities are recorded, the X value will be reset to 1.

### **Push Button Control**

#### **Review**

The "Review" button will cause the ProChrono Pal to display the statistics. The display will cycle through High Velocity, Low Velocity, Average Velocity, and number of shots.

#### **Meters per Second/Feet per Second Selection**

The ProChrono Pal defaults to velocity readout and statistics calculation in feet per second. To activate Metric velocity readout and statistics calculation, first turn the unit off. Then press the "Review" push button and hold it down while you turn on the unit. This puts the ProChrono Pal in metric mode. Velocities and statistics will be in meters per second. You must do this each time the unit is turned on.

### **Low Battery Indication**

The ProChrono Pal has a low battery indicator built into the unit. If the battery is nearly dead, the word "Bat" will flash on the display.

#### **Error Indication**

The ProChrono Pal provides error indication by flashing the word "Err" on the display. An error occurs when the velocity is below 21 feet per second or the second sensor does not pick up the object.

Muzzle blast is another cause of errors and can be corrected by moving back a few feet further. Radar sites, TV stations and radio stations, electric fences or any other electrical noise generators can cause errors.

## **Operating Considerations**

The ProChrono Pal operates best on cloudy days. If you look up at the sky through a rectangular tube, you see what the projectile sensor sees. On a sunny day, the amount of light coming through the tube is actually less than on a cloudy day, because the clouds diffuse the light and redirect it straight down into the projectile sensor. This is the best condition for the projectile to cast a good shadow on the sensor. The plastic diffuser actually simulates a cloud above the sensor. That's why it's advisable to use the diffusers on sunny days or any lighting condition. The diffuser does not have to cast a shadow on the slot to work properly. The second problem experienced with sunny days is the sun reflecting off the projectile. These reflections can cancel out the shadow, as well as cause bad velocity readings. Using the diffusers will eliminate most reflection problems. If reflection problems persist, the best solution is to operate the ProChrono Pal in the shadow of a building or an opaque wall. Trees, however, do not provide a good solid shadow. Make sure the projectile sensors still have a clear view of the sky, but the projectile path over the sensors is in the shadow. This way, the sun can't reflect off the projectile, but the maximum amount of light from the sky is still available to operate the sensors. Another option is to blacken the projectile with a black marker. This greatly reduces reflections.

## **Warning**

When using sabots or gas checks, there is a chance they may depart from the projectile path and hit the ProChrono Pal. This usually damages the display.

## **Specifications**

Velocity Range:	21-7,000 feet per second
Temperature Range:	32-100 degrees Fahrenheit
Size:	16x4x3-1/4 inches
Power Requirements:	One 9-volt alkaline battery (not included)
Mounting Hole Thread:	1/4x20
Guide Wire Size:	3/16x16 inches

## **Other Available Products and Options**

There are a number of accessories available to enhance the functionality of your ProChrono Pal chronograph and make using it more enjoyable.

### **Indoor Lighting Kit**

An optional indoor lighting kit is available for use indoors or under low lighting conditions.

### **Protective Paintball Shield**

Competition Electronics has an optional Splat-Guard which can protect your chronograph from paint.

**WARNING:** Use with paintball guns only!

### **ProChrono Digital Chronograph**

The ultimate Chronograph from Competition Electronics!

- Holds 9 shot strings of up to 99 shots each in power down memory.

- Delete individual shots, or entire shot strings.

- Review all the shots.

- Review statistics for each shot string, including standard deviation, extreme spread, high velocity, low velocity, average velocity, no of shots in string, and can be used with our ProChrono Remote control, below.

### **ProChrono Digital Remote Control**

Control your ProChrono Digital from up to 20 feet away.

Interface to printer (optional, below) or download velocities and statistics to your PC.

### **Portable Thermal Infrared Printer**

This printer can be used to print out shot velocities and statistics. Requires remote control, above.

### **ProChrono Paintball Chronograph**

Now there's a chronograph made especially for the paintball enthusiast!

Includes High, Low, Ave velocity and number of shots fired.

**\*\*\*\*\*LIMITED WARRANTY\*\*\*\*\***

COMPETITION ELECTRONICS, INC., warrants the ProChrono Pal manufactured by it to be free from defects in material and workmanship for a period of 2 years from date of purchase by the original purchaser for use. COMPETITION ELECTRONICS, INC., at it's option, will repair or replace without charge, or refund the purchase price of, any product which fails during the warranty period by reason of a defect in material or workmanship found upon examination by COMPETITION ELECTRONICS, INC., to have been the cause of the failure. This warranty does not cover any failures attributable to abuse, mishandling, failure to follow operating instructions, alteration or accident.

To make claim under this warranty, the purchaser must return the product to COMPETITION ELECTRONICS, INC., at the address shown below, properly packed and with shipping charges prepaid. All claims must be made within (30) days after the product failure and, in any event, within thirty (30) days after the expiration of the 2 year warranty. All claims must be accompanied by a sales slip or other written proof of date of purchase.

TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE EXCLUDED; ANY IMPLIED WARRANTIES NOT EXCLUDED ARE LIMITED IN DURATION TO 2 YEARS FROM DATE OF PURCHASE. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXPRESSLY EXCLUDED FROM THE REMEDIES AVAILABLE TO THE PURCHASER, AND THE REMEDIES PROVIDED IN THIS WARRANTY SHALL BE EXCLUSIVE TO THE EXTENT PERMITTED BY LAW.

(Note: Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the foregoing limitations and exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.)

If any product returned by the purchaser is found by COMPETITION ELECTRONICS, INC., to require service not covered by warranty, COMPETITION ELECTRONICS, INC., will so advise the purchaser and request further instructions. COMPETITION ELECTRONICS, INC., will recondition to working order any ProChrono Pal returned to it regardless of condition upon the purchaser's remittance of payment of 1/2 of current retail price, if it is still manufactured by COMPETITION ELECTRONICS, INC.

Copyright © 2000  
Competition Electronics, Inc.  
3469 Precision Dr.  
Rockford, IL 61109  
Tel. 815-874-8001  
FAX: 815-874-8181  
[www.competitionelectronics.com](http://www.competitionelectronics.com)  
PC Pal Op Ins.qxd  
ProChrono Pal