# Bassin Anticipation Timer

## User's Manual


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# System Description

The Bassin Anticipation Timer was developed by Dr. Stanley Bassin at California State Polytechnic University, Pomona. The unit has been developed to test the area of visual acuity related to eye-hand coordination and anticipation. The subject is instructed to watch a light as it travels down the runway. They must anticipate the light reaching the target and press a pushbutton to coincide with the arrival of the light at the target. The LCD readout will display the time difference between the response and the arrival of the light at the target and indicate if the response was early or late.

# Features

- Selectable speed from 1 to 255 MPH
- Different start and ending speed for Accelerate/Decelerate functionality
- Selectable Cue delay from 0.5 to 30.0 seconds
- Random Cue delay setting
- Storage of settings
- Selectable target light (any light on the runway)

- Independent blanking of any light in the runway
- Stand-alone instrument with small portable control panel
- Internal auto-reset fuse
- Flexible user response methods

## System Specifications

- **Number of lights per runway:** 16
- **Distance between lights:** 1.76 Inches (center to center)
- **Light size:** 10mm (diameter)
- **Light color:** Yellow for cue, all others red
- **Maximum number of runways:** 40
- **Power Supply:** 10V, wall mount transformer
- **Fuse:** 1 Amp, auto-reset
- **Speed settings:** 1 - 255 MPH
- **Speed resolution:** 1 MPH
- **Speed Accuracy:** see speed chart in Appendix 1
- **Clock range:** 0 to 9.999 seconds
- **Clock resolution:** 0.001s (1 millisecond)
- **Cue delay range:** 00.5 to 30.0 seconds
- **Cue delay resolution:** 00.1 seconds
- **Runway length (start and end):** 30.0"
- **Runway length (mid):** 28.16"
- **Runway height (all):** 3.625" (excluding feet)
- **Runway width (all):** 3.625"
- **Curved runway arc:** 30 degrees per segment
- **Curved runway radius:** 55.375"

## The Bassin Timer Kit includes the following parts

- 1 - Start runway
- 1 - Middle runway (optional)
- 1 - End runway
- 1 - Psychomotor control panel with LCD (PsymCon)
- 1 - 10V power supply
- 1 - DB-25 cable
- 1 - Hand held response pushbutton
- 1 - Hand held remote initiate pushbutton
- 1 - Contrast adjust screwdriver
- 1 - Target light marker

## Assembly of the Runway

The Bassin Anticipation Timer is a modular unit that must be assembled before use. The connectors for the unit are arranged in such a way that it cannot be assembled incorrectly. NEVER ASSEMBLE THE BASSIN TIMER WITH THE POWER APPLIED. Make sure the power cord is disconnected before changing or adding runways to the Bassin Timer.

1. Connect the start runway to the middle runway. (Note 1)
2. Connect the end runway the middle runway. (Note 2)
3. Latch the runways together using the latches at the end of each segment. (Note 3)
4. Plug the remote response pushbutton into the RCA phono plug. (Note 4)
5. Connect the PsymCon module to the start runway using the 25 pin cable supplied.
6. Connect the power supply to the start runway and plug into an available wall outlet. (Note 5).

### *Notes*

1. The runways must be oriented the same direction to connect.
2. The middle runway can be omitted if desired. The Bassin Timer will function properly with only a start and end runway. Also, additional middle runways can be added (up to 40 total runways) to increase the length of the unit. Additional middle runways are sold separately (part #35573).
3. Do not attempt to move connected runways without first securing the latches. Also, failing to latch the runways may cause intermittent electronic faults.
4. The remote pushbutton is connected to the end runway via an RCA phono jack. The pushbutton may be plugged into either of the two jacks (they perform the same function). Any device that provides a switch closure can be substituted for the remote pushbutton. This includes photocells, switch mats, foot switches, voice keys, etc.
5. The power to the Bassin Anticipation Timer is supplied by a 10V power supply. Do not use any power supply with the Bassin Timer other than the one supplied with the unit.

## Basic test steps

After the unit is assembled and power is applied, a test can be run. A typical Bassin Timer test will have the following steps. See the section on menu descriptions for special instructions on each of the steps.

1. Select the runway start and ending speed.
2. Select the cue delay time and specify if the random setting is to be used.
3. Select the target runway and target light.
4. Place the target indicator over the target light, if desired.
5. Set the blanking parameters for each light.
6. Save the setup parameters if desired.
7. Go to the test menu. The target light will turn on for verification.
8. Initiate the test.
9. The user responds to the test and the control panel displays the results.

# Detailed Menu Descriptions

## Using the menus

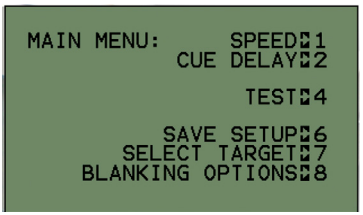
All menus are controlled using the eight buttons to the right of the display screen. The display shows all options for a particular menu on the right side of the screen with a number label corresponding to the button number assigned to that function. Not all menus use all of the buttons. If a number label is missing on a menu, that button has no function for that particular menu.

## Main Menu

The Main Menu runs automatically after the introduction screen. It is the default screen for all operations. All Bassin Timer functions and settings are accessed from this menu.

### Menu controls

**Button 1:** Go to Speed Menu (SPEED)
**Button 2:** Go to Cue Delay Menu (CUE DELAY)
**Button 3:**
**Button 4:** Go to Test screen to execute test (TEST)
**Button 5:**
**Button 6:** Save all setup parameters (SAVE SETUP)
**Button 7:** Go to Target selection screen (SELECT TARGET)
**Button 8:** Go to Blanking Options screen (BLANKING)

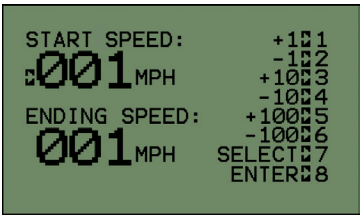



## Speed Menu

The Bassin Timer allows for a separate start and ending speed to be set so that the light will accelerate or decelerate down the runway. Each speed can be set between 1 and 255 MPH. If a constant speed is desired, set the start and ending speed to the same setting. A cursor appears to the left of the speed setting to indicate which speed is being set. Refer to Appendix 1 for a listing of actual calculated speeds. Note: To Access the Speed Menu, Press button number 1 in the Main Menu.

### Menu controls

**Button 1:** Increment speed by 1 MPH (+1)
**Button 2:** Decrement speed by 1 MPH (-1)
**Button 3:** Increment speed by 10 MPH (+10)
**Button 4:** Decrement speed by 10 MPH (-10)
**Button 5:** Increment speed by 100 MPH (+100)
**Button 6:** Decrement speed by 100 MPH (-100)
**Button 7:** Toggle between start and end speed (SELECT)
**Button 8:** Return to Main Menu (ENTER)



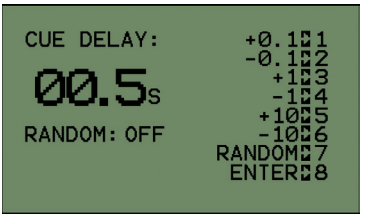

Note: When setting different start and ending speeds, the runway will not always perform the speed change as expected due to variations in runway size and total speed change. Refer to Appendix 2 for detailed instructions on how to calculate actual ending speed.

## *Cue Delay Menu*

The cue delay is the length of time that the yellow warning light is lit after initiating a test and before the lights run down the runway. Note: To Access the Cue Delay Menu, Press button number 2 in the Main Menu.

### *Menu controls*

**Button 1:** Increment Cue Delay by 0.1 seconds (+0.1)
**Button 2:** Decrement Cue Delay by 0.1 seconds (-0.1)
**Button 3:** Increment Cue Delay by 1.0 seconds (+1)
**Button 4:** Decrement Cue Delay by 1.0 seconds (-1)
**Button 5:** Increment Cue Delay by 10 seconds (+10)
**Button 6:** Decrement Cue Delay by 10 seconds (-10)
**Button 7:** Toggle Random Delay ON/OFF (RANDOM)
**Button 8:** Return to Main Menu (ENTER)

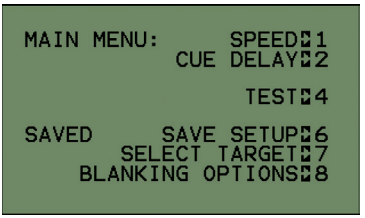



Note: When RANDOM is on, a random delay is set for the cue light. The random value always falls between minimum and maximum value where the maximum value is the setting on the menu and the minimum value is half of the setting. The settings that will be used to determine the random maximum and minimum limits are shown on the Cue Delay Menu and in the Test Screen.

## *Save Setup*

The Save Setup menu selection stores all of the setup parameters in memory. The Bassin Timer will automatically load the stored parameters when power is applied. Due to limited storage capability, only one set of parameters can be stored at a time. The Main Menu Screen will show a "Saved" message when parameters are successfully stored.

Note: To Store Parameters, Press button number 6 in the Main Menu.



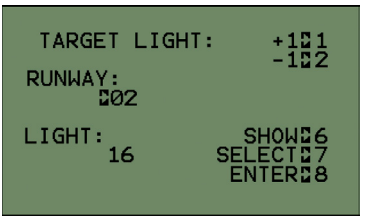

## *Select Target*

The Bassin Timer allows any light in the runway to be designated as the target light. A cursor to the left of the setting shows if the runway number or the light number is selected. Pressing button 6 will light the target light on the runway to confirm the setting. The target light marker can be placed over the target light if desired.

Note: To Access the Select Target Screen, Press button number 7 in the Main Menu.

### *Menu controls*

**Button 1:** Increment Target Setting by 1 (+1)
**Button 2:** Decrement Target Setting by 1 (-1)
**Button 3:**
**Button 4:**
**Button 5:**
**Button 6:** Light up target light on runway (SHOW)
**Button 7:** Toggle between runway and light selection (SELECT)
**Button 8:** Return to Main Menu (ENTER)

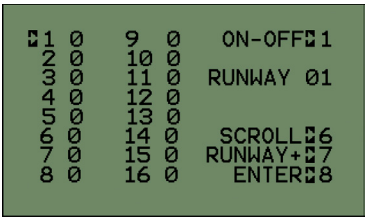


## *Blanking Options*

The Bassin Timer allows any light on the runway to be blanked independently. All the lights for each runway are listed on the Blanking menu screen. Pressing button 1 sets the selected light to either be on during the test or blanked, where an "O" means the light will be on and an "X" means the light will be off. Please note that the cursor always resets to light number 1 when the next runway is selected. Currently, only manual entry of the blanking options is allowed. Note: To Access the Blanking Options Screen, Press button number 8 in the Main Menu.

### *Menu controls*

**Button 1:** Toggle selected light ON or OFF (ON-OFF)
**Button 2:**
**Button 3:**
**Button 4:**
**Button 5:**
**Button 6:** Scroll to next light (SCROLL)
**Button 7:** Go to next runway (RUNWAY+)
**Button 8:** Return to Main Menu (ENTER)




Note: The blanking options are stored in memory when the Save Setup button is pressed. These parameters automatically reload when the Bassin Timer is restarted. If the runway has non-functioning lights, check the Blanking Parameters before troubleshooting the system or calling Lafayette Instrument technical support. Another user may have unknowingly stored different parameters than expected.

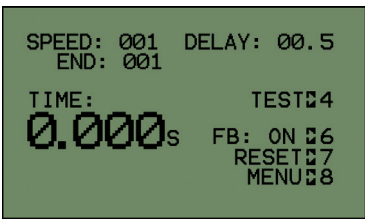
## *Test Screen*

A Bassin Timer test is run by pressing button 4 in the Main Menu. On entering the Test Screen, the target light is re-lit to confirm the target for the subject. The test menu displays the speed and cue delay settings so that the user can make sure no settings have been inadvertently changed. The test runs with the cue light turning on for the specified period of time and the lights running down the runway at the specified speed. The subject presses the response button and the time is displayed on the LCD along with an early or late label. With feedback enabled, the light freezes on a subject response. It also stops at the end of the runway, remaining lit, if a response is not made before the final light.

With feedback disabled, the light continues unaffected on a subject response and continues till the end of the runway, leaving the last runway light off. In this mode, the light appears to "run off" the end of the runway regardless of any responses made by the subject. Note: To Access the Test Screen, Press button number 4 in the Main Menu.

### *Menu controls*

**Button 1:**
**Button 2:**
**Button 3:**
**Button 4:** Execute Bassin Test (TEST)
**Button 5:**
**Button 6:** Feedback ON/OFF (FB:)
**Button 7:** Reset runway and time (RESET)
**Button 8:** Return to Main Menu (MENU)




Note 1: The Bassin test can be reset at any time during the test including during the cue delay.
Note 2: The maximum response time is 9.999 seconds. After this time the test ends and the "Late" label is displayed.

# Miscellaneous Features

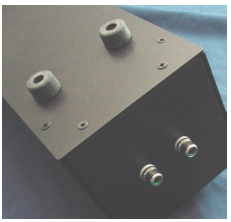

## Remote Initiate

The Bassin Timer has a jack on the front panel of the Start Runway for Remote Initiate. An anticipation test can be started by a switch closure on this input. The provided hand switch or any other switch may be used as long as it has a compatible connector. When using the computer, a test may be initiated at any time. When using the PsymCon LCD panel, a test may only be initiated when the device is in the TEST screen (Press button number 4 from the Main Menu).

## Output Trigger

The Bassin Timer provides two output signals to initiate secondary devices or provide timing signals. One signal initiates when the target light is reached, and the other when the subject responds. The first of the signals is located on the front panel of the Start Runway (labeled "OUTPUT TRIGGER"). The signal can be accessed by using an RCA type cable (not included). The front panel signal is synchronized with the target light on the runway. When the target light is reached, the output drops from +5 volts to zero volts. The signal returns to +5 volts at the end of the test. The second output is located on the end panel of the End Runway. This panel has two jacks which are wired together and are interchangeable. One is for the remote response pushbutton and the other is for outputting an initiate or timing signal. The output signal drops from +5 volts to zero volts when the user presses either the remote response pushbutton or the button mounted into the end of the runway. The signal returns to +5 volts on release of the pushbutton.

## Changeable Feet



The Bassin Timer is designed with feet mounts on three sides so that it can rest on any side. To change the feet position, simply unscrew the rubber feet and reattach them in the corresponding screw holes on another side of the runway. The runway can also be flipped end to end so that the lights can run the opposite direction.

## Contrast Adjust


The LCD display has an adjustable contrast setting. In the event that the LCD screen is too faint to see or the background is too dark, the user can adjust the contrast. To adjust, use a small flathead screwdriver (included with the system) to turn the internal dial on the PsymCon control panel. The adjustment dial is on the left side of the control box beside the cable entry port for the runways.

## Resetable Fuse:

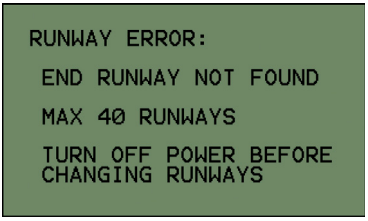
The Bassin Timer is equipped with a resetable fuse. If an electrical fault occurs, the fuse will "blow" resulting in the device not working. To reset the fuse, simply turn off the power and remove the power supply. The fuse may need several seconds to reset. Reattach the power supply and turn the unit back on. If the fuse blows again, a permanent fault condition may be present, which will require the unit to be sent back to Lafayette Instrument Company for service.

Please contact Lafayette Instrument customer service to obtain a Return Goods Authorization (RGA) before returning equipment.

## Error Message

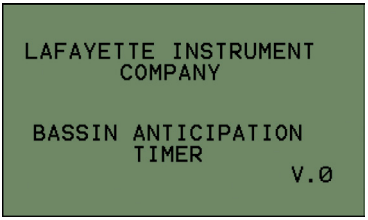
The Bassin Timer has a built-in diagnostic to determine errors in the runway setup. An error will occur if the runways are disconnected or the maximum number of runways (40) has been exceeded.

Please turn off power before attaching runways or fixing runway connection problems.




## Version Identifier

The code version for the Bassin Timer is shown on startup in the lower right hand corner.




# Appendix 1:

## Speed Accuracy tables

Speed values are determined by an equation to calculate how long each light must remain lit at a selected speed given that the lights are 1.76" apart. These time values are loaded into the Bassin code. The actual speed values were determined by measuring the light timing signal for each speed and working backwards to calculate what the speed would actually be for the measured time value. The tables for the actual measured speed are given in the following pages.

## Actual measured speeds for the Bassin timer

| Speed (mph) | Inches/s | Time (seconds) | Period (seconds) | Measured Period (seconds) | Measured Speed (mph) |
|---|---|---|---|---|---|
| 1 | 17.60 | 0.100000 | 0.200000 | 0.199999000 | 1.000 |
| 2 | 35.20 | 0.050000 | 0.100000 | 0.100001000 | 2.000 |
| 3 | 52.80 | 0.033333 | 0.066667 | 0.066667800 | 3.000 |
| 4 | 70.40 | 0.025000 | 0.050000 | 0.050001800 | 4.000 |
| 5 | 88.00 | 0.020000 | 0.040000 | 0.040001800 | 5.000 |
| 6 | 105.60 | 0.016667 | 0.033333 | 0.033333900 | 6.000 |
| 7 | 123.20 | 0.014286 | 0.028571 | 0.028571800 | 7.000 |
| 8 | 140.80 | 0.012500 | 0.025000 | 0.025001900 | 7.999 |
| 9 | 158.40 | 0.011111 | 0.022222 | 0.022223900 | 8.999 |
| 10 | 176.00 | 0.010000 | 0.020000 | 0.020001900 | 9.999 |
| 11 | 193.60 | 0.009091 | 0.018182 | 0.018183900 | 10.999 |
| 12 | 211.20 | 0.008333 | 0.016667 | 0.016667900 | 11.999 |
| 13 | 228.80 | 0.007692 | 0.015385 | 0.015385000 | 13.000 |

| *Speed (mph)* | *Inches/s* | *Time (seconds)* | *Period (seconds)* | *Measured Period (seconds)* | *Measured Speed (mph)* |
|---|---|---|---|---|---|
| 14 | 246.40 | 0.007143 | 0.014286 | 0.014287900 | 13.998 |
| 15 | 264.00 | 0.006667 | 0.013333 | 0.013333900 | 14.999 |
| 16 | 281.60 | 0.006250 | 0.012500 | 0.012501900 | 15.998 |
| 17 | 299.20 | 0.005882 | 0.011765 | 0.011765900 | 16.998 |
| 18 | 316.80 | 0.005556 | 0.011111 | 0.011111900 | 17.999 |
| 19 | 334.40 | 0.005263 | 0.010526 | 0.010525900 | 19.001 |
| 20 | 352.00 | 0.005000 | 0.010000 | 0.010001900 | 19.996 |
| 21 | 369.60 | 0.004762 | 0.009524 | 0.009523950 | 21.000 |
| 22 | 387.20 | 0.004545 | 0.009091 | 0.009091960 | 21.997 |
| 23 | 404.80 | 0.004348 | 0.008696 | 0.008695970 | 22.999 |
| 24 | 422.40 | 0.004167 | 0.008333 | 0.008333950 | 23.998 |
| 25 | 440.00 | 0.004000 | 0.008000 | 0.007999960 | 25.000 |
| 26 | 457.60 | 0.003846 | 0.007692 | 0.007691970 | 26.001 |
| 27 | 475.20 | 0.003704 | 0.007407 | 0.007407965 | 26.998 |
| 28 | 492.80 | 0.003571 | 0.007143 | 0.007143970 | 27.996 |
| 29 | 510.40 | 0.003448 | 0.006897 | 0.006897970 | 28.994 |
| 30 | 528.00 | 0.003333 | 0.006667 | 0.006667970 | 29.994 |
| 31 | 545.60 | 0.003226 | 0.006452 | 0.006451970 | 30.998 |
| 32 | 563.20 | 0.003125 | 0.006250 | 0.006249970 | 32.000 |
| 33 | 580.80 | 0.003030 | 0.006061 | 0.006061970 | 32.993 |
| 34 | 598.40 | 0.002941 | 0.005882 | 0.005881970 | 34.002 |
| 35 | 616.00 | 0.002857 | 0.005714 | 0.005713970 | 35.002 |
| 36 | 633.60 | 0.002778 | 0.005556 | 0.005555970 | 35.997 |
| 37 | 651.20 | 0.002703 | 0.005405 | 0.005405980 | 36.996 |
| 38 | 668.80 | 0.002632 | 0.005263 | 0.005263980 | 37.994 |
| 39 | 686.40 | 0.002564 | 0.005128 | 0.005127970 | 39.002 |
| 40 | 704.00 | 0.002500 | 0.005000 | 0.004999980 | 40.000 |
| 41 | 721.60 | 0.002439 | 0.004878 | 0.004877980 | 41.001 |
| 42 | 739.20 | 0.002381 | 0.004762 | 0.004761970 | 41.999 |
| 43 | 756.80 | 0.002326 | 0.004651 | 0.004651970 | 42.993 |
| 44 | 774.40 | 0.002273 | 0.004545 | 0.004545970 | 43.995 |
| 45 | 792.00 | 0.002222 | 0.004444 | 0.004443970 | 45.005 |
| 46 | 809.60 | 0.002174 | 0.004348 | 0.004347980 | 45.998 |

| *Speed (mph)* | *Inches/s* | *Time (seconds)* | *Period (seconds)* | *Measured Period (seconds)* | *Measured Speed (mph)* |
|---|---|---|---|---|---|
| 47 | 827.20 | 0.002128 | 0.004255 | 0.004255970 | 46.993 |
| 48 | 844.80 | 0.002083 | 0.004167 | 0.004167970 | 47.985 |
| 49 | 862.40 | 0.002041 | 0.004082 | 0.004081970 | 48.996 |
| 50 | 880.00 | 0.002000 | 0.004000 | 0.003999980 | 50.000 |
| 51 | 897.60 | 0.001961 | 0.003922 | 0.003921980 | 50.995 |
| 52 | 915.20 | 0.001923 | 0.003846 | 0.003845980 | 52.002 |
| 53 | 932.80 | 0.001887 | 0.003774 | 0.003773980 | 52.994 |
| 54 | 950.40 | 0.001852 | 0.003704 | 0.003703990 | 53.996 |
| 55 | 968.00 | 0.001818 | 0.003636 | 0.003635980 | 55.006 |
| 56 | 985.60 | 0.001786 | 0.003571 | 0.003571980 | 55.991 |
| 57 | 1003.20 | 0.001754 | 0.003509 | 0.003509980 | 56.980 |
| 58 | 1020.80 | 0.001724 | 0.003448 | 0.003447980 | 58.005 |
| 59 | 1038.40 | 0.001695 | 0.003390 | 0.003389980 | 58.997 |
| 60 | 1056.00 | 0.001667 | 0.003333 | 0.003333970 | 59.989 |
| 61 | 1073.60 | 0.001639 | 0.003279 | 0.003279980 | 60.976 |
| 62 | 1091.20 | 0.001613 | 0.003226 | 0.003225990 | 61.996 |
| 63 | 1108.80 | 0.001587 | 0.003175 | 0.003175980 | 62.973 |
| 64 | 1126.40 | 0.001563 | 0.003125 | 0.003125980 | 63.980 |
| 65 | 1144.00 | 0.001538 | 0.003077 | 0.003077980 | 64.978 |
| 66 | 1161.60 | 0.001515 | 0.003030 | 0.003029990 | 66.007 |
| 67 | 1179.20 | 0.001493 | 0.002985 | 0.002985980 | 66.980 |
| 68 | 1196.80 | 0.001471 | 0.002941 | 0.002941990 | 67.981 |
| 69 | 1214.40 | 0.001449 | 0.002899 | 0.002899980 | 68.966 |
| 70 | 1232.00 | 0.001429 | 0.002857 | 0.002857980 | 69.979 |
| 71 | 1249.60 | 0.001408 | 0.002817 | 0.002817980 | 70.973 |
| 72 | 1267.20 | 0.001389 | 0.002778 | 0.002777990 | 71.994 |
| 73 | 1284.80 | 0.001370 | 0.002740 | 0.002739990 | 72.993 |
| 74 | 1302.40 | 0.001351 | 0.002703 | 0.002703990 | 73.965 |
| 75 | 1320.00 | 0.001333 | 0.002667 | 0.002667990 | 74.963 |
| 76 | 1337.60 | 0.001316 | 0.002632 | 0.002631990 | 75.988 |
| 77 | 1355.20 | 0.001299 | 0.002597 | 0.002597990 | 76.983 |
| 78 | 1372.80 | 0.001282 | 0.002564 | 0.002563990 | 78.003 |
| 79 | 1390.40 | 0.001266 | 0.002532 | 0.002531990 | 78.989 |

| *Speed (mph)* | *Inches/s* | *Time (seconds)* | *Period (seconds)* | *Measured Period (seconds)* | *Measured Speed (mph)* |
|---|---|---|---|---|---|
| 80 | 1408.00 | 0.001250 | 0.002500 | 0.002499990 | 80.000 |
| 81 | 1425.60 | 0.001235 | 0.002469 | 0.002469990 | 80.972 |
| 82 | 1443.20 | 0.001220 | 0.002439 | 0.002439990 | 81.968 |
| 83 | 1460.80 | 0.001205 | 0.002410 | 0.002409990 | 82.988 |
| 84 | 1478.40 | 0.001190 | 0.002381 | 0.002381990 | 83.963 |
| 85 | 1496.00 | 0.001176 | 0.002353 | 0.002353990 | 84.962 |
| 86 | 1513.60 | 0.001163 | 0.002326 | 0.002325980 | 85.985 |
| 87 | 1531.20 | 0.001149 | 0.002299 | 0.002299980 | 86.957 |
| 88 | 1548.80 | 0.001136 | 0.002273 | 0.002273990 | 87.951 |
| 89 | 1566.40 | 0.001124 | 0.002247 | 0.002247990 | 88.968 |
| 90 | 1584.00 | 0.001111 | 0.002222 | 0.002219900 | 90.094 |
| 91 | 1601.60 | 0.001099 | 0.002198 | 0.002197990 | 90.992 |
| 92 | 1619.20 | 0.001087 | 0.002174 | 0.002173990 | 91.997 |
| 93 | 1636.80 | 0.001075 | 0.002151 | 0.002151980 | 92.938 |
| 94 | 1654.40 | 0.001064 | 0.002128 | 0.002127990 | 93.985 |
| 95 | 1672.00 | 0.001053 | 0.002105 | 0.002105990 | 94.967 |
| 96 | 1689.60 | 0.001042 | 0.002083 | 0.002081990 | 96.062 |
| 97 | 1707.20 | 0.001031 | 0.002062 | 0.002061990 | 96.994 |
| 98 | 1724.80 | 0.001020 | 0.002041 | 0.002041990 | 97.944 |
| 99 | 1742.40 | 0.001010 | 0.002020 | 0.002019990 | 99.010 |
| 100 | 1760.00 | 0.001000 | 0.002000 | 0.001999990 | 100.001 |
| 101 | 1777.60 | 0.000990 | 0.001980 | 0.001979990 | 101.011 |
| 102 | 1795.20 | 0.000980 | 0.001961 | 0.001961990 | 101.937 |
| 103 | 1812.80 | 0.000971 | 0.001942 | 0.001941990 | 102.987 |
| 104 | 1830.40 | 0.000962 | 0.001923 | 0.001923990 | 103.951 |
| 105 | 1848.00 | 0.000952 | 0.001905 | 0.001905990 | 104.932 |
| 106 | 1865.60 | 0.000943 | 0.001887 | 0.001887990 | 105.933 |
| 107 | 1883.20 | 0.000935 | 0.001869 | 0.001869990 | 106.952 |
| 108 | 1900.80 | 0.000926 | 0.001852 | 0.001851990 | 107.992 |
| 109 | 1918.40 | 0.000917 | 0.001835 | 0.001835990 | 108.933 |
| 110 | 1936.00 | 0.000909 | 0.001818 | 0.001817990 | 110.012 |
| 111 | 1953.60 | 0.000901 | 0.001802 | 0.001801990 | 110.988 |
| 112 | 1971.20 | 0.000893 | 0.001786 | 0.001785990 | 111.983 |

| *Speed (mph)* | *Inches/s* | *Time (seconds)* | *Period (seconds)* | *Measured Period (seconds)* | *Measured Speed (mph)* |
|---|---|---|---|---|---|
| 113 | 1988.80 | 0.000885 | 0.001770 | 0.001769990 | 112.995 |
| 114 | 2006.40 | 0.000877 | 0.001754 | 0.001753990 | 114.026 |
| 115 | 2024.00 | 0.000870 | 0.001739 | 0.001739990 | 114.943 |
| 116 | 2041.60 | 0.000862 | 0.001724 | 0.001723990 | 116.010 |
| 117 | 2059.20 | 0.000855 | 0.001709 | 0.001709990 | 116.960 |
| 118 | 2076.80 | 0.000847 | 0.001695 | 0.001695990 | 117.925 |
| 119 | 2094.40 | 0.000840 | 0.001681 | 0.001681990 | 118.907 |
| 120 | 2112.00 | 0.000833 | 0.001667 | 0.001667990 | 119.905 |
| 121 | 2129.60 | 0.000826 | 0.001653 | 0.001653990 | 120.920 |
| 122 | 2147.20 | 0.000820 | 0.001639 | 0.001639990 | 121.952 |
| 123 | 2164.80 | 0.000813 | 0.001626 | 0.001625990 | 123.002 |
| 124 | 2182.40 | 0.000806 | 0.001613 | 0.001613990 | 123.917 |
| 125 | 2200.00 | 0.000800 | 0.001600 | 0.001599990 | 125.001 |
| 126 | 2217.60 | 0.000794 | 0.001587 | 0.001587990 | 125.945 |
| 127 | 2235.20 | 0.000787 | 0.001575 | 0.001575990 | 126.904 |
| 128 | 2252.80 | 0.000781 | 0.001563 | 0.001561990 | 128.042 |
| 129 | 2270.40 | 0.000775 | 0.001550 | 0.001549990 | 129.033 |
| 130 | 2288.00 | 0.000769 | 0.001538 | 0.001537990 | 130.040 |
| 131 | 2305.60 | 0.000763 | 0.001527 | 0.001525990 | 131.062 |
| 132 | 2323.20 | 0.000758 | 0.001515 | 0.001515990 | 131.927 |
| 133 | 2340.80 | 0.000752 | 0.001504 | 0.001503990 | 132.980 |
| 134 | 2358.40 | 0.000746 | 0.001493 | 0.001491990 | 134.049 |
| 135 | 2376.00 | 0.000741 | 0.001481 | 0.001481990 | 134.954 |
| 136 | 2393.60 | 0.000735 | 0.001471 | 0.001469990 | 136.055 |
| 137 | 2411.20 | 0.000730 | 0.001460 | 0.001459990 | 136.987 |
| 138 | 2428.80 | 0.000725 | 0.001449 | 0.001449990 | 137.932 |
| 139 | 2446.40 | 0.000719 | 0.001439 | 0.001437990 | 139.083 |
| 140 | 2464.00 | 0.000714 | 0.001429 | 0.001427990 | 140.057 |
| 141 | 2481.60 | 0.000709 | 0.001418 | 0.001417990 | 141.045 |
| 142 | 2499.20 | 0.000704 | 0.001408 | 0.001407990 | 142.046 |
| 143 | 2516.80 | 0.000699 | 0.001399 | 0.001397990 | 143.063 |
| 144 | 2534.40 | 0.000694 | 0.001389 | 0.001387990 | 144.093 |
| 145 | 2552.00 | 0.000690 | 0.001379 | 0.001379990 | 144.929 |

| *Speed (mph)* | *Inches/s* | *Time (seconds)* | *Period (seconds)* | *Measured Period (seconds)* | *Measured Speed (mph)* |
|---|---|---|---|---|---|
| 146 | 2569.60 | 0.000685 | 0.001370 | 0.001369990 | 145.986 |
| 147 | 2587.20 | 0.000680 | 0.001361 | 0.001359990 | 147.060 |
| 148 | 2604.80 | 0.000676 | 0.001351 | 0.001351990 | 147.930 |
| 149 | 2622.40 | 0.000671 | 0.001342 | 0.001341990 | 149.032 |
| 150 | 2640.00 | 0.000667 | 0.001333 | 0.001333990 | 149.926 |
| 151 | 2657.60 | 0.000662 | 0.001325 | 0.001323990 | 151.059 |
| 152 | 2675.20 | 0.000658 | 0.001316 | 0.001315990 | 151.977 |
| 153 | 2692.80 | 0.000654 | 0.001307 | 0.001307990 | 152.906 |
| 154 | 2710.40 | 0.000649 | 0.001299 | 0.001297990 | 154.084 |
| 155 | 2728.00 | 0.000645 | 0.001290 | 0.001289990 | 155.040 |
| 156 | 2745.60 | 0.000641 | 0.001282 | 0.001281990 | 156.007 |
| 157 | 2763.20 | 0.000637 | 0.001274 | 0.001273990 | 156.987 |
| 158 | 2780.80 | 0.000633 | 0.001266 | 0.001265990 | 157.979 |
| 159 | 2798.40 | 0.000629 | 0.001258 | 0.001257990 | 158.984 |
| 160 | 2816.00 | 0.000625 | 0.001250 | 0.001249990 | 160.001 |
| 161 | 2833.60 | 0.000621 | 0.001242 | 0.001241990 | 161.032 |
| 162 | 2851.20 | 0.000617 | 0.001235 | 0.001233990 | 162.076 |
| 163 | 2868.80 | 0.000613 | 0.001227 | 0.001225990 | 163.133 |
| 164 | 2886.40 | 0.000610 | 0.001220 | 0.001219990 | 163.936 |
| 165 | 2904.00 | 0.000606 | 0.001212 | 0.001211990 | 165.018 |
| 166 | 2921.60 | 0.000602 | 0.001205 | 0.001203990 | 166.114 |
| 167 | 2939.20 | 0.000599 | 0.001198 | 0.001197990 | 166.946 |
| 168 | 2956.80 | 0.000595 | 0.001190 | 0.001189990 | 168.069 |
| 169 | 2974.40 | 0.000592 | 0.001183 | 0.001183990 | 168.920 |
| 170 | 2992.00 | 0.000588 | 0.001176 | 0.001175990 | 170.069 |
| 171 | 3009.60 | 0.000585 | 0.001170 | 0.001169990 | 170.942 |
| 172 | 3027.20 | 0.000581 | 0.001163 | 0.001161990 | 172.119 |
| 173 | 3044.80 | 0.000578 | 0.001156 | 0.001155990 | 173.012 |
| 174 | 3062.40 | 0.000575 | 0.001149 | 0.001149990 | 173.915 |
| 175 | 3080.00 | 0.000571 | 0.001143 | 0.001141990 | 175.133 |
| 176 | 3097.60 | 0.000568 | 0.001136 | 0.001135990 | 176.058 |
| 177 | 3115.20 | 0.000565 | 0.001130 | 0.001129990 | 176.993 |
| 178 | 3132.80 | 0.000562 | 0.001124 | 0.001123990 | 177.938 |

| *Speed (mph)* | *Inches/s* | *Time (seconds)* | *Period (seconds)* | *Measured Period (seconds)* | *Measured Speed (mph)* |
|---|---|---|---|---|---|
| 179 | 3150.40 | 0.000559 | 0.001117 | 0.001117990 | 178.892 |
| 180 | 3168.00 | 0.000556 | 0.001111 | 0.001111990 | 179.858 |
| 181 | 3185.60 | 0.000552 | 0.001105 | 0.001103990 | 181.161 |
| 182 | 3203.20 | 0.000549 | 0.001099 | 0.001097990 | 182.151 |
| 183 | 3220.80 | 0.000546 | 0.001093 | 0.001091990 | 183.152 |
| 184 | 3238.40 | 0.000543 | 0.001087 | 0.001085990 | 184.164 |
| 185 | 3256.00 | 0.000541 | 0.001081 | 0.001081990 | 184.845 |
| 186 | 3273.60 | 0.000538 | 0.001075 | 0.001075990 | 185.875 |
| 187 | 3291.20 | 0.000535 | 0.001070 | 0.001069990 | 186.918 |
| 188 | 3308.80 | 0.000532 | 0.001064 | 0.001063990 | 187.972 |
| 189 | 3326.40 | 0.000529 | 0.001058 | 0.001057990 | 189.038 |
| 190 | 3344.00 | 0.000526 | 0.001053 | 0.001051990 | 190.116 |
| 191 | 3361.60 | 0.000524 | 0.001047 | 0.001047990 | 190.842 |
| 192 | 3379.20 | 0.000521 | 0.001042 | 0.001041990 | 191.940 |
| 193 | 3396.80 | 0.000518 | 0.001036 | 0.001035990 | 193.052 |
| 194 | 3414.40 | 0.000515 | 0.001031 | 0.001029990 | 194.177 |
| 195 | 3432.00 | 0.000513 | 0.001026 | 0.001025990 | 194.934 |
| 196 | 3449.60 | 0.000510 | 0.001020 | 0.001019990 | 196.080 |
| 197 | 3467.20 | 0.000508 | 0.001015 | 0.001015990 | 196.852 |
| 198 | 3484.80 | 0.000505 | 0.001010 | 0.001009990 | 198.022 |
| 199 | 3502.40 | 0.000503 | 0.001005 | 0.001005990 | 198.809 |
| 200 | 3520.00 | 0.000500 | 0.001000 | 0.000999992 | 200.002 |
| 201 | 3537.60 | 0.000498 | 0.000995 | 0.000995992 | 200.805 |
| 202 | 3555.20 | 0.000495 | 0.000990 | 0.000989994 | 202.021 |
| 203 | 3572.80 | 0.000493 | 0.000985 | 0.000985994 | 202.841 |
| 204 | 3590.40 | 0.000490 | 0.000980 | 0.000979997 | 204.082 |
| 205 | 3608.00 | 0.000488 | 0.000976 | 0.000975997 | 204.919 |
| 206 | 3625.60 | 0.000485 | 0.000971 | 0.000969997 | 206.186 |
| 207 | 3643.20 | 0.000483 | 0.000966 | 0.000965997 | 207.040 |
| 208 | 3660.80 | 0.000481 | 0.000962 | 0.000961994 | 207.902 |
| 209 | 3678.40 | 0.000478 | 0.000957 | 0.000955997 | 209.206 |
| 210 | 3696.00 | 0.000476 | 0.000952 | 0.000951997 | 210.085 |
| 211 | 3713.60 | 0.000474 | 0.000948 | 0.000947994 | 210.972 |

| *Speed (mph)* | *Inches/s* | *Time (seconds)* | *Period (seconds)* | *Measured Period (seconds)* | *Measured Speed (mph)* |
|---|---|---|---|---|---|
| 212 | 3731.20 | 0.000472 | 0.000943 | 0.000943994 | 211.866 |
| 213 | 3748.80 | 0.000469 | 0.000939 | 0.000937999 | 213.220 |
| 214 | 3766.40 | 0.000467 | 0.000935 | 0.000933997 | 214.133 |
| 215 | 3784.00 | 0.000465 | 0.000930 | 0.000929997 | 215.054 |
| 216 | 3801.60 | 0.000463 | 0.000926 | 0.000925996 | 215.984 |
| 217 | 3819.20 | 0.000461 | 0.000922 | 0.000921994 | 216.921 |
| 218 | 3836.80 | 0.000459 | 0.000917 | 0.000917997 | 217.866 |
| 219 | 3854.40 | 0.000457 | 0.000913 | 0.000913997 | 218.819 |
| 220 | 3872.00 | 0.000455 | 0.000909 | 0.000907998 | 220.265 |
| 221 | 3889.60 | 0.000452 | 0.000905 | 0.000903998 | 221.239 |
| 222 | 3907.20 | 0.000450 | 0.000901 | 0.000899998 | 222.223 |
| 223 | 3924.80 | 0.000448 | 0.000897 | 0.000895997 | 223.215 |
| 224 | 3942.40 | 0.000446 | 0.000893 | 0.000891998 | 224.216 |
| 225 | 3960.00 | 0.000444 | 0.000889 | 0.000887998 | 225.226 |
| 226 | 3977.60 | 0.000442 | 0.000885 | 0.000883998 | 226.245 |
| 227 | 3995.20 | 0.000441 | 0.000881 | 0.000879998 | 227.273 |
| 228 | 4012.80 | 0.000439 | 0.000877 | 0.000877998 | 227.791 |
| 229 | 4030.40 | 0.000437 | 0.000873 | 0.000873995 | 228.834 |
| 230 | 4048.00 | 0.000435 | 0.000870 | 0.000869996 | 229.886 |
| 231 | 4065.60 | 0.000433 | 0.000866 | 0.000865996 | 230.948 |
| 232 | 4083.20 | 0.000431 | 0.000862 | 0.000861998 | 232.019 |
| 233 | 4100.80 | 0.000429 | 0.000858 | 0.000857998 | 233.101 |
| 234 | 4118.40 | 0.000427 | 0.000855 | 0.000853997 | 234.193 |
| 235 | 4136.00 | 0.000426 | 0.000851 | 0.000849998 | 235.295 |
| 236 | 4153.60 | 0.000424 | 0.000847 | 0.000847998 | 235.850 |
| 237 | 4171.20 | 0.000422 | 0.000844 | 0.000843998 | 236.967 |
| 238 | 4188.80 | 0.000420 | 0.000840 | 0.000839998 | 238.096 |
| 239 | 4206.40 | 0.000418 | 0.000837 | 0.000835998 | 239.235 |
| 240 | 4224.00 | 0.000417 | 0.000833 | 0.000833998 | 239.809 |
| 241 | 4241.60 | 0.000415 | 0.000830 | 0.000829998 | 240.964 |
| 242 | 4259.20 | 0.000413 | 0.000826 | 0.000825998 | 242.131 |
| 243 | 4276.80 | 0.000412 | 0.000823 | 0.000823998 | 242.719 |
| 244 | 4294.40 | 0.000410 | 0.000820 | 0.000819998 | 243.903 |

| *Speed (mph)* | *Inches/s* | *Time (seconds)* | *Period (seconds)* | *Measured Period (seconds)* | *Measured Speed (mph)* |
|---|---|---|---|---|---|
| 245 | 4312.00 | 0.000408 | 0.000816 | 0.000815998 | 245.099 |
| 246 | 4329.60 | 0.000407 | 0.000813 | 0.000813998 | 245.701 |
| 247 | 4347.20 | 0.000405 | 0.000810 | 0.000809998 | 246.914 |
| 248 | 4364.80 | 0.000403 | 0.000806 | 0.000805996 | 248.140 |
| 249 | 4382.40 | 0.000402 | 0.000803 | 0.000803998 | 248.757 |
| 250 | 4400.00 | 0.000400 | 0.000800 | 0.000799999 | 250.000 |
| 251 | 4417.60 | 0.000398 | 0.000797 | 0.000795998 | 251.257 |
| 252 | 4435.20 | 0.000397 | 0.000794 | 0.000793998 | 251.890 |
| 253 | 4452.80 | 0.000395 | 0.000791 | 0.000789997 | 253.166 |
| 254 | 4470.40 | 0.000394 | 0.000787 | 0.000787994 | 253.809 |
| 255 | 4488.00 | 0.000392 | 0.000784 | 0.000783994 | 255.104 |

# *Appendix 2:*

## *Determining Actual Ending Speed for Variable Speed Experiments*

Due to the calculations involved in determining end runway speed, the Bassin Timer cannot always accurately match the ending speed setting entered by the user. To determine the actual ending speed, the speed index must be calculated. The speed index can be expressed in two ways:

1. Number of lights per MPH change.

   OR

2. Amount of MPH change per light.

To calculate the index, first determine the change in speed (Δ speed). For example, if the start speed is 32 MPH and the end speed is 2 MPH, the change in speed is 30 MPH.

$$\Delta\text{speed} = |\ \text{start speed} - \text{end speed}\ | \quad \text{(absolute value)}$$

Next, determine the total number of lights in the runway. DO NOT count lights in the runway that are behind the target light, or the cue light. For example, if there are 3 runways and the target is the 14th light of runway 3, then there are 46 lights in the runway.

$$\#\text{lights} = (\#\text{ runways} * 16) - \#\text{lights after target light}$$

If the #lights is greater than the change in speed then:

$$\text{Index} = \frac{\#\text{lights}}{\Delta\text{speed}} \quad \text{(number of lights per MPH change)}$$

If Δspeed is greater than the #lights then:

$$\text{Index} = \frac{\Delta\text{speed}}{\#\text{lights}} \quad \text{(amount of MPH change per light)}$$

The index is always rounded to the nearest whole number value (integer):
1.6 becomes 2.0, 1.5 becomes 1.0

Once the index is known, the ending speed can be determined by calculating the change per light and finding what the speed will be for the last light.

**Example 1:**
Start speed: 32 MPH # lights = 48
End Speed: 2 MPH Δspeed = 30 MPH

Index = 48/30 = 1.6 which rounds up to 2

Since #lights is greater than speed change, then the index is 2 lights per MPH change (or 1 MPH change for every two lights). By changing 1 MPH for every two lights, the speed will only have reached 8 MPH on the 48th light, so the ending speed is 8 MPH not 2 MPH. The runway would need to have 60 lights to reach the correct speed when changing 1 MPH for every two lights in this example. The results can be dramatically changed with small adjustments. If the end speed is changed to 1 MPH:

**Example 2:**
Start speed: 32 MPH # lights = 48
End Speed: 1 MPH Δspeed = 31 MPH

Index = 48/31 = 1.5 which rounds DOWN to 1

The speed now changes 1 MPH per 1 light. This means that the speed will reach 1 MPH on the 31st light. Since the speed cannot drop below 1 MPH, lights 32-48 will ALL be 1 MPH. The speed will perform as set in this example, but the action will not be exactly as expected. By intelligently selecting the target light or by adding and subtracting runways the user can obtain results close to what is desired.

**Example 3:**

| | |
|---|---|
| Start speed: 100 MPH | # lights = 48 (three runways) |
| End Speed: 10 MPH | Δspeed = 90 MPH |

Index = 90/48 = 1.8 which rounds up to 2

Since the Δspeed is greater than the #lights, the index is MPH change per light. This means that every light will decrease in speed by 2 MPH. This means that by the 48th light, the speed will have reached 4 MPH, not 10 MPH as specified.

If the target light is changed to light 13 on runway 3, the total lights becomes 45. This means that the ending speed of 10 MPH will be achieved when the light crosses the target and the specified end speed will be the actual test end speed.

*Lafayette Instrument Company is the sole provider of the equipment for this test configuration. If you have questions concerning the equipment or its use please contact Lafayette Instrument Company. Tel: (765)-423-1505*

# Terms and Conditions

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**Phone, Fax, Email or Mail-in Orders**
All orders need to be accompanied by a hard copy of your purchase order. All orders must include the following information:

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- Your tax status (include tax-exempt numbers)
- Shipping address for this order
- Billing address for the invoice we'll mail when this order is shipped
- Signature and typed name of person authorized to order these products
- Your telephone number
- Your email address
- Your FAX number

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There is a $50 minimum order. Open accounts can be extended to most recognized businesses. Net amount due 30 days from the date of shipment unless otherwise specified by us. Enclose payment with the order; charge with VISA, MasterCard, American Express, or pay COD. We must have a hard copy of your purchase order by mail, E-mail or fax. Students, individuals and private companies may call for a credit application.

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There is a $50 minimum order. Payment must be made in advance by: draft drawn on a major US bank; wire transfers to our account; charge with VISA, MasterCard, American Express, or confirmed irrevocable letter of credit. Proforma invoices will be provided upon request.

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If ordering instrumentation for use outside the USA, please specify the country of ultimate destination, as well as the power requirements (110V/60Hz or 220V/50Hz). Some model numbers for 220V/50Hz will have a "*C" suffix.

**Quotations**
Quotations are supplied upon request. Written quotations will include the price of goods, cost of shipping and handling, if requested, and estimated delivery time frame. Quotations are good for 30 days, unless otherwise noted. Following that time, prices are subject to change and will be re-quoted at your request.

**Cancellations**
Orders for custom products, custom assemblies or instruments built to customer specifications will be subject to a cancellation penalty of 100%. Payment for up to 100% of the invoice value of custom products may be required in advance. Cancellation for a standard Lafayette Instrument manufactured product once the product has been shipped will normally be assessed a charge of 25% of the invoice value, plus shipping charges. Resell items, like custom products, will be subject to a cancellation penalty of 100%.

**Exchanges and Refunds**
Please see the cancellation penalty as described above. No item may be returned without prior authorization of Lafayette Instrument Company and a Return Goods Authorization (RGA#) number which must be affixed to the shipping label of the returned goods. The merchandise should be packed well, insured for the full value and returned along with a cover letter explaining the reason for return. Unopened merchandise may be returned prepaid within thirty (30) days after receipt of the item and in the original shipping carton. Collect shipments will not be accepted. Product must be returned in saleable condition, and credit is subject to inspection of the merchandise.

**Repairs**
Instrumentation may not be returned without first receiving a Return Goods Authorization Number (RGA). When returning instrumentation for service, please call Lafayette Instrument to receive a RGA number. Your RGA number will be good for 30 days. Address the shipment to:
Lafayette Instrument Company
3700 Sagamore Parkway North
Lafayette, IN 47904, USA.

Shipments cannot be received at the PO Box. The items should be packed well, insured for full value, and returned along with a cover letter explaining the malfunction. An estimate of repair will be given prior to completion ONLY if requested in your enclosed cover letter. We must have a hard copy of your purchase order by mail or fax, or repair work cannot commence for non-warranty repairs.

**Damaged Goods**
Damaged instrumentation should not be returned to Lafayette Instrument prior to a thorough inspection. If a shipment arrives damaged, note damage on delivery bill and have the driver sign it to acknowledge the damage. Contact the delivery service, and they will file an insurance claim. If damage is not detected at the time of delivery, contact the carrier/shipper and request an inspection within 10 days of the original delivery. Please call the Lafayette Instrument Customer Service Department for repair or replacement of the damaged merchandise.

**Limited Warranty**
Lafayette Instrument Company warrants equipment manufactured by the company to be free of defects in material and workmanship for a period of one year from the date of shipment, except as provided hereinafter. The original manufacturer's warranty will be honored by Lafayette Instrument for items not manufactured by Lafayette Instrument Company, i.e. resell items. This assumes normal usage under commonly accepted operating parameters and excludes consumable products.

Warranty period for repairs or used instrumentation purchased from Lafayette Instrument is 90 days. Lafayette Instrument Company agrees either to repair or replace, at its sole option and free of part charges to the customer, instrumentation which, under proper and normal conditions of use, proves to be defective within the warranty period. Warranty for any parts of such repaired or replaced instrumentation shall be covered under the same limited warranty and shall have a warranty period of 90 days from the date of shipment or the remainder of the original warranty period whichever is greater. This warranty and remedy are given expressly and in lieu of all other warranties, expressed or implied, of merchantability or fitness for a particular purpose and constitutes the only warranty made by Lafayette Instrument Company.

Lafayette Instrument Company neither assumes nor authorizes any person to assume for it any other liability in connection with the sale, installation, service or use of its instrumentation. Lafayette Instrument Company shall have no liability whatsoever for special, consequential, or punitive damages of any kind from any cause arising out of the sale, installation, service or use of its instrumentation. All products manufactured by Lafayette Instrument Company are tested and inspected prior to shipment. Upon prompt notification by the Customer, Lafayette Instrument Company will correct any defect in warranted equipment of its manufacture either, at its option, by return of the item to the factory, or shipment of a repaired or replacement part. Lafayette Instrument Company will not be obliged, however, to replace or repair any piece of equipment, which has been abused, improperly installed, altered, damaged, or repaired by others. Defects in equipment do not include decomposition, wear, or damage by chemical action or corrosion, or damage incurred during shipment.

**Limited Obligations Covered by this Warranty**

1. In the case of instruments not of Lafayette Instrument Company manufacture, the original manufacturer's warranty applies.
2. Shipping charges under warranty are covered only in one direction. The customer is responsible for shipping charges to the factory if return of the part is required.
3. This warranty does not cover damage to components due to improper installation by the customer.
4. Consumable and or expendable items, including but not limited to electrodes, lights, batteries, fuses, O-rings, gaskets, and tubing, are excluded from warranty.
7. Failure by the customer to perform normal and reasonable maintenance on instruments will void warranty claims.
8. If the original invoice for the instrument is issued to a company that is not the company of the end user, and not an authorized Lafayette Instrument Company distributor, then all requests for warranty must be processed through the company that sold the product to the end user, and not directly to Lafayette Instrument Company.

**Export License**
The U.S. Department of Commerce requires an export license for any polygraph system shipment with an ULTIMATE destination other than: Australia, Japan, New Zealand or any NATO Member Countries. It is against U.S. law to ship a Polygraph system to any other country without an export license. If the ultimate destination is not one of the above listed countries, contact us for the required license application forms.