

Bassin Anticipation Timer User's Manual



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Table of Contents

System Description	3
Features	3
Specifications	4
Parts	4
Assembly of the Runway	5
Basic Test Steps	5
Detailed Menu Descriptions:	6
Using the Menu	6
Main Menu	6
Speed Menu	6
Cue Delay Menu	7
Save Setup	7
Select Target	7
Blanking Options	8
Test Screen	8
Miscellaneous Features:	9
Remote Initiate	9
Output Trigger	9
Changeable Feet	9
Contrast Adjust	9
Resettable Fuse	10
Error Message	10
Version Identifier	10
Appendix 1: Speed Accuracy Tables	11
Appendix 2: Determining Ending Speed	18



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

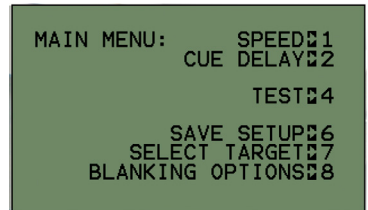
All menus are controlled using the eight buttons to the right of the display screen. The display shows all options for a particular menu on the right side of the screen with a number label corresponding to the button number assigned to that function. Not all menus use all of the buttons. If a number 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)

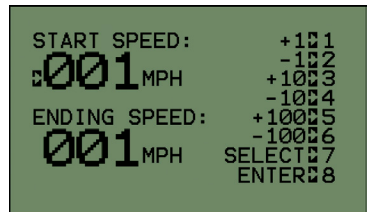


Speed Menu

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.

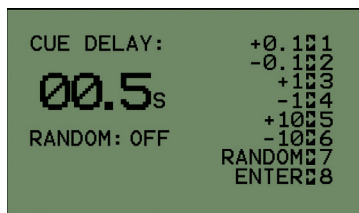
Lafayette Instrument Bassin Anticipation Timer

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)

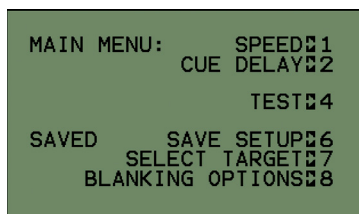


Note: When RANDOM is on, a random delay is set for the cue light. The random value always falls between minimum and maximum value where the maximum value is the setting on the menu and the minimum value is half of the setting. The settings that will be used to determine the random maximum and minimum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



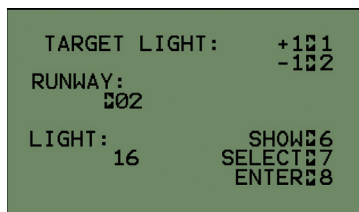
Select Target

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)

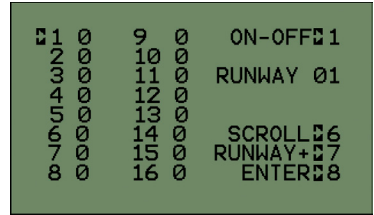


Blanking Options

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.

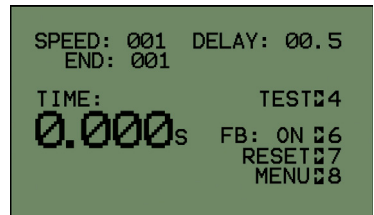
Test Screen

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.

Lafayette Instrument Bassin Anticipation Timer

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).

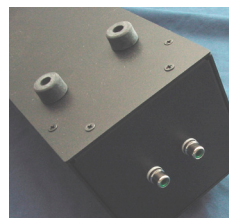


Output Trigger

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.



Resettable Fuse:

The Bassin Timer is equipped with a resettable 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.

```

RUNWAY ERROR:
END RUNWAY NOT FOUND
MAX 40 RUNWAYS
TURN OFF POWER BEFORE
CHANGING RUNWAYS
    
```

Version Identifier

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

```

LAFAYETTE INSTRUMENT
COMPANY

BASSIN ANTICIPATION
TIMER
V. 0
    
```

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

Lafayette Instrument Bassin Anticipation Timer

<i>Speed (mph)</i>	<i>Inches/s</i>	<i>Time (seconds)</i>	<i>Period (seconds)</i>	<i>Measured Period (seconds)</i>	<i>Measured Speed (mph)</i>
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

Model 35575 User's Manual

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

Lafayette Instrument Bassin Anticipation Timer

<i>Speed (mph)</i>	<i>Inches/s</i>	<i>Time (seconds)</i>	<i>Period (seconds)</i>	<i>Measured Period (seconds)</i>	<i>Measured Speed (mph)</i>
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

Model 35575 User's Manual

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

Lafayette Instrument Bassin Anticipation Timer

<i>Speed (mph)</i>	<i>Inches/s</i>	<i>Time (seconds)</i>	<i>Period (seconds)</i>	<i>Measured Period (seconds)</i>	<i>Measured Speed (mph)</i>
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

Model 35575 User's Manual

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

Lafayette Instrument Bassin Anticipation Timer

<i>Speed (mph)</i>	<i>Inches/s</i>	<i>Time (seconds)</i>	<i>Period (seconds)</i>	<i>Measured Period (seconds)</i>	<i>Measured Speed (mph)</i>
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 $\#\text{lights}$ 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 $\#\text{lights}$ 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

$\Delta\text{speed} = 30$ MPH

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

Since $\#\text{lights}$ 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

$\Delta\text{speed} = 31$ 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 Δ speed = 90 MPH

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

Since the Δ speed 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:

- Quantity
- Part Number
- Description
- Your purchase order number or method of pre-payment
- 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

Domestic Terms

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.

International Payment Information

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.

Exports

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 "CC" 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.
5. Failure by the customer to perform normal and reasonable maintenance on instruments will void warranty claims.
6. 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.