Model 16030

STABILITY PLATFORM

USER'S MANUAL

Lafayette Instrument®

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Description

The Stability Platform measures balancing ability, which is essential to successfully performing many activities. The Model 16030 Stability Platform features fully integrated timing functions for test control and electronic angle measurement for unsurpassed accuracy. The platform control allows a wide range of user controls including variable test times, selectable angle limits, and digital tilt angle readout. With the Stability Platform's rugged design and electronic capabilities, it will provide many years of reliable operation.

Features:

- Electronic tilt angle measurements
- User selectable balance thresholds for left, right and center zones
- Digital angle readout
- Platform re-zero ability
- Built-in timing functions for test and rest timing
- Built-in repeat cycle counter for multiple trials
- Built-in display for test data
- No external timers needed
- Stand alone control via Psymcon interface
- Test Parameter storage
- Analog output voltage proportional to tilt angle
- Remote start
- Event marker to indicate test and rest intervals
- Tone indicator to signal beginning and end of tests
- Compatible with Computerized Data Acquisition systems
- Adjustable platform tension
- Adjustable platform height
- Rugged Aluminum frame construction
- Friction Free tilt action
- Detachable hand rail (optional)
- Computer interface and control with streaming data

Electronic Specifications:

Angle Measurement Resolution:	1.0°
Platform Tilt Range:	± 30°
Measurement Limit Range:	± 90°
Angle Limit Setting Resolution:	1.0°
Analog Output Voltage Range:	0-5 Volts
Analog Output Resolution:	.028V/°
Analog Output Rate:	25 samples/sec
Analog Output Time:	0.040 sec/sample
Test/Rest Time Limit:	999 sec
Test/Rest Time Resolution:	1.0 sec
Repeat Cycle Limit:	25
Test Timing Resolution:	0.001 sec
Timing Accuracy:	.005%
Power Supply:	10V external adapter
Event Mark Output:	0-5V TTL

Platform Specifications:

Platform Dimensions:	42” x 25.5”
Overall Dimensions:	42” x 38” x 22”
Platform Material:	3/4” Plywood
Frame Material:	1/8” Aluminum

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Platform Assembly:

Tools Needed: (2) 1/2" wrenches or sockets

Parts:

(1) – Platform
(1) – A-frame upright with control
(1) – A-frame upright
(1) – Cross brace assembly
(2) – Frame ends (right and left)

All of the necessary hardware (bolts, washers, nuts, etc) to assemble the platform is included with the assembly pieces. Typically, the hardware will have to be removed from its holes and reinserted through the assembled pieces. For best results, avoid fully tightening bolts until all pieces are fitted together.

See the attached assembly drawing for details on the assembly (Page 30).

1. Attach the cross brace to the two uprights. The brace ends will always be on top of the upright cross beams.
2. Attach the frame ends to the sides of the uprights. The frame ends will always be under the upright flanges. The screws for the frame ends should pass through the uprights and the frame end and thread into the support block (feet) of the platform.
3. Tighten all chassis screws. Make sure the base remains square.
4. Loosen the knobs on the platform and remove the screws and clamps.
5. Lift the platform onto the base and reinsert the clamps at the desired height. The clamp should pass through the platform bracket and the swing arm. Reattach the screws and knobs to lock the platform in place.

Connections:

1. Connect the Power Supply from a wall outlet to the power jack on the Stability Platform control head.
2. Connect the Psymcon Display/Button box to the Stability Platform control head using the 25 pin cable.

Basic Test Steps:

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

From the Timing Menu:

1. Select the "Test Time" for each test.
2. Select the "Rest Time" for each test.
3. Select the number of times to repeat the test.

From the Balance Limits Menu:

4. Select the desired angle limit for the left and right side of the platform. Tilting beyond the limits will be considered "out of balance".

From the Test Menu:

5. Select to enable or disable the tone cues for the test.
6. Zero the platform.
7. Run the test.
8. Review the Data Results.

Detailed Menu Descriptions:

Using the menus:

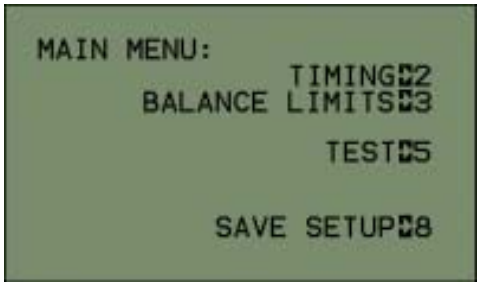
All menus are controlled using the eight buttons to the right of the display screen. The display shows all options for a particular menu on the right side of the screen with a number label corresponding to the button number assigned to that function. Not all menus use all of the buttons. If a number 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 Stability Platform functions and settings are accessed from this menu.

Menu controls:

Button 1:		
Button 2:	Go to the Timing Menu	(TIMING)
Button 3:	Go to the Balance Limits Menu	(BALANCE LIMITS)
Button 4:		
Button 5:	Go to the Test Menu	(TEST)
Button 6:		
Button 7:		
Button 8:	Save all setup parameters	(SAVE SETUP)



Save Setup:

This selection allows the user to store system parameters in memory. These parameters are loaded automatically the next time the device is turned on, eliminating the need to set the parameters after every power up.

To save setup parameters:
Press button 8 in the Main Menu

Parameters saved: Test Time, Rest Time, Repeat Cycle Setting, Right Balance Limit, Left Balance Limit, Tone ON/OFF Setting.

TIMING:

The Timing Menu allows the user to set all of the time parameters for a Stability Platform test. This includes test time, rest time and repeat cycles. The cursor beside the time values indicates which selection is active. There is no need to use external timers or counters to time any of the Stability Platform tests.

Test Time: The subject tries to maintain balance during this time.

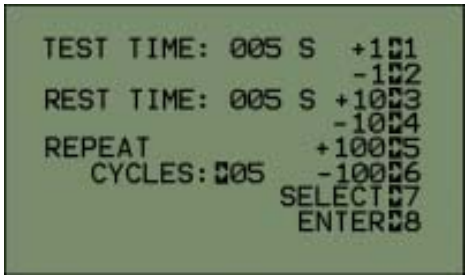
Rest Time: The subject is in a relaxed (unbalanced) state during this time.

Repeat Cycle: A period of one test time and one rest time. If the cycle is set to one, no rest time is included in the test. The repeat cycle number indicates how many times a test cycle will be repeated.

To access the Timing Menu:
Press button 2 while in the Main Menu

Menu controls:

Button 1:	Increment Time by 1 Sec.	(+1)
Button 2:	Decrement Time by 1 Sec.	(-1)
Button 3:	Increment Time by 10 Sec.	(+10)
Button 4:	Decrement Time by 10 Sec.	(-10)
Button 5:	Increment Time by 100 Sec.	(+100)
Button 6:	Decrement Time by 100 Sec.	(-100)
Button 7:	Toggle Between Time Settings	(SELECT)
Button 8:	Return to Main Menu	(ENTER)



Note: The above settings are selected as an example.

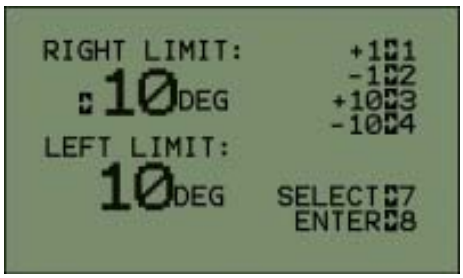
BALANCE LIMITS:

The Balance Limits Menu allows the user to set the balance range of the platform. These limits are used to determine if the platform position is considered “left”, “right”, or “center”. The limits are adjustable from 0 to 90 degrees in 1 degree increments. The platform may not be able to actually swing across this entire range, so the range of the platform should be considered when setting the balance limits. The cursor to the right of the balance value indicates which selection is active.

To access the Balance Limits Menu:
Press button 3 while in the Main Menu

Menu controls:

Button 1:	Increment Balance Limit by 1 Degree	(+1)
Button 2:	Decrement Balance Limit by 1 Degree	(-1)
Button 3:	Increment Balance Limit by 10 Degrees	(+10)
Button 4:	Decrement Balance Limit by 10 Degrees	(-10)
Button 5:		
Button 6:		
Button 7:	Toggle Between Balance Limit Settings	(SELECT)
Button 8:	Return to Main Menu	(ENTER)



Note: The above settings are selected as an example.

TEST:

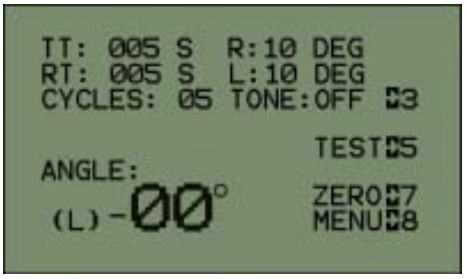
The Test Menu displays all of the setup parameters and shows the real time angle of the platform. If a timed test is not desired, the angle of the platform can be monitored from this screen.

To access the Test Menu:

Press button 5 while in the Main Menu.

Menu controls:

Button 1:
Button 2:
Button 3: Enables/Disables the Tone (TONE)
Button 4:
Button 5: Go to the "Run Test" Menu (TEST)
Button 6:
Button 7: Sets the Zero Point of the Platform (ZERO)
Button 8: Return to Main Menu (MENU)



Tone ON/OFF control:

Pressing the "TONE" button (3) toggles the tone enable for the test. When the tone is enabled, it will beep once at the beginning of the test time and four times at the end of the test time. If multiple cycles are run, it will beep once at the beginning of each cycle and four times at the end of each cycle.

Zero setting:

Pressing the "ZERO" button (7) sets the platform angle reading at 0 degrees. All angle measurements will then be referenced from the new zero. If the platform is not level when it is zeroed, the angle measurements will be skewed by the same amount as the angle of the platform. A bubble level is mounted to the platform to aid in zeroing the platform. The platform is automatically zeroed when turned on. The platform can be rezeroed at any time except during a test.

Angle readout:

The angle readout always shows the current position of the platform with reference to the zero point of the platform. The position is always monitored as long as the platform is powered on, even when the angle display is not shown on the screen. The angle display will indicate an "(L) -" when the tilt is to the subject's left and an "(R) +" when the tilt is to the subject's right.

Run Menu:

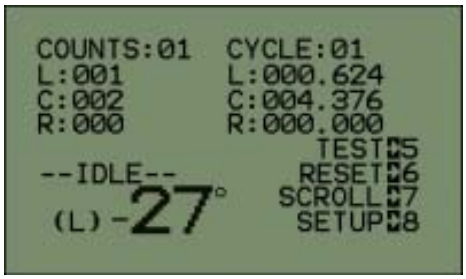
The Run Menu is used to initiate tests and display angle and time data for tests. It shows the status of the test and allows the user to scroll through the test results.

To access the Run Menu:

Press button 5 while in the Test Menu.

Menu controls:

Button 1:
Button 2:
Button 3:
Button 4:
Button 5: Initiates the Test (TEST)
Button 6: Reset the Times and Counts to Zero (RESET)
Button 7: Scrolls Through the Test Data (SCROLL)
Button 8: Return to the Test Menu (SETUP)



Test Initiate:

The test is started by pressing the "TEST" button (5) in the Run Menu. If a test is in progress, pressing the "TEST" button again will pause the test. Data from paused test cycles will be considered incomplete and discarded. Completed cycles will be taken as valid data. Pressing the TEST button while the test is paused will restart the test. The test will restart at the beginning of the cycle in which it was paused. Pressing the "RESET" button (6) while the test is paused will cancel the test and clear all test data.

Remote Initiate:

A test may be started remotely by another hardware device. A switch closure on the Remote Initiate jack on the control head front panel will initiate a test. The remote initiate can not be used to pause a test, but it can be used to restart a test after pause.

Test Status Display:

The Test Status Display shows the progress of the test and the current cycle. The following indicators may be shown on the display:

IDLE: No test is in progress
TEST: Test time is in progress
REST: Rest time is in progress
C:XX: Current cycle in progress

Reset:

The Reset function clears all time and count values for a test. It also resets the test to the beginning of cycle 1. Reset does not affect the zero point of the angle measurement. If "RESET" is pressed while a test is paused, it will cancel the test and clear all of the test results.

Scroll:

The "SCROLL" button (7) steps through the data results. Scrolling is not allowed when the test is in progress.

Data Results:

The data results are displayed individually for each test cycle. When the test is in progress, the time for each zone (left, center, right) is displayed at the top of the screen. As each test cycle ends, the data is automatically scrolled and updated so that the current and previous cycles are displayed. When a test is completed, the times and counts for a single trial are displayed. The count value is the number of times the platform was in each zone during the test.

Other Functions:

Analog Output:

The Stability Platform provides an analog output voltage that is directly proportional to the angle of the platform. This allows the angle data to be monitored by a computer data acquisition system. The output voltage will zero at about 2.48 Volts (may vary slightly). The output voltage will increase as the platform tilts to the right and decrease as the platform tilts to the left.

The analog output is accessed from the 3.5mm stereo jack on the front of the Stability Platform control head.

Analog output Specifications:

ZeroPoint:	2.48V
Max. Output:	4.97V (+90°)
Min. Output:	0.0V (-90°)
Output Resolution:	0.028V/°
Output Rate:	25 samples/sec
Output Time:	0.040 sec/sample

Event Marks:

The Event Mark output provides a digital timing synchronization signal to external equipment. The signal outputs +5 Volts when a test is in progress and 0 volts during rest times and when tests are not in progress.

The Event Mark is accessed through the 3.5mm stereo jack on the front of the stability platform control head.

DataLab 2000 Interface:

The Stability Platform can be interfaced to the DataLab 2000 data acquisition system. To connect, simply connect the Analog Output and the Event Mark on the Stability Platform to two channels on the DataLab General Purpose Interface (GPI) Bed. The connection can be made using (2) 3.5mm stereo patch cords.

DataLab 2000 Calibration:

The DataLab 2000 software can be calibrated to show the angle data on the signal graph.

To access the Configuration Menu:

Go to Configure>>Channels from the toolbar in the Acquisition Screen.

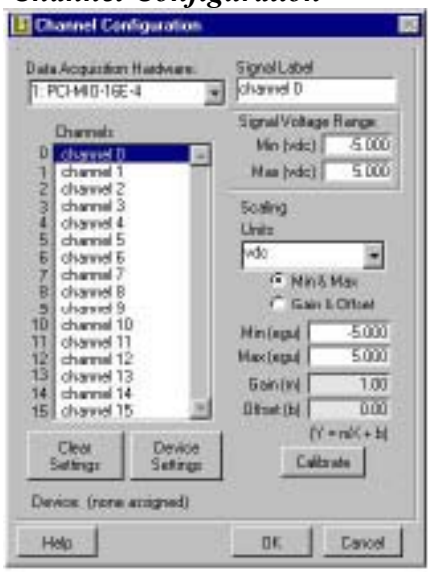
Event mark Configuration:

1. Select the channel of the Event Mark.
2. Manually enter the Event Mark Settings.

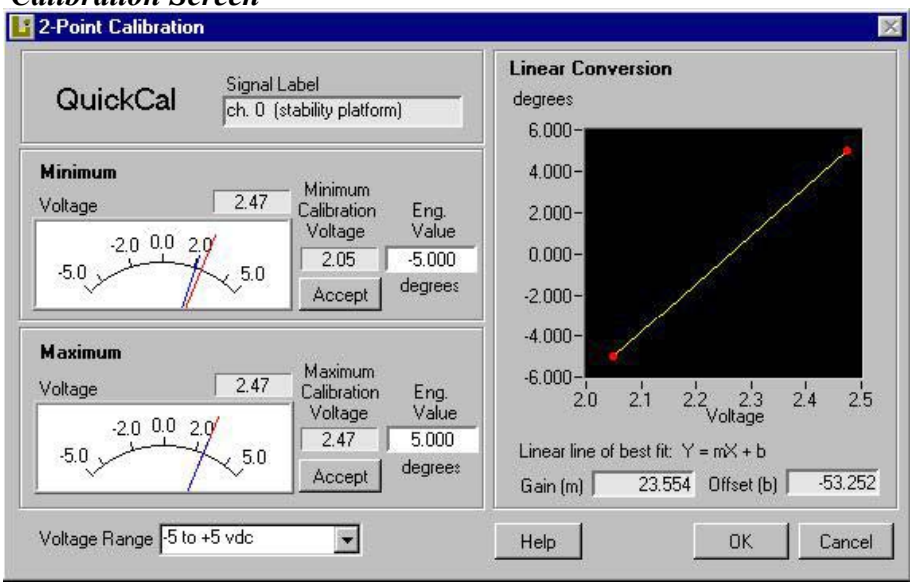
Event Mark Settings:

Min (VDC) Range: -5 Volts
Max (VDC) Range: +5 Volts
Min (egu): -5 Volts
Max (egu): +5 Volts
Gain: 1.0
Offset: 0.0

Channel Configuration



Calibration Screen



Analog Output Calibration:

1. Make sure the Stability Platform is powered on and in the "TEST" screen. This screen has the angle data readout showing in the lower left corner of the LCD screen.
2. Enter the DataLab Configuration screen by going to Configure>>Channels from the toolbar in the Acquisition Screen.
3. Select the Channel of the Stability Platform Analog Output.
4. Change the Scaling units to "degrees".
5. Enter the Calibration screen by pressing the "Calibrate" button.
6. In the calibration screen, hold the platform all the way to the left. While holding the platform, press the "Accept" button for the "Minimum Calibration Voltage".
7. Enter the angle reading from the LCD screen into the "Eng. Value" box for the minimum setting. Be sure to include the minus sign if the reading is negative.
8. Hold the platform all the way to the right. While holding the platform, press the "Accept" button for the "Maximum Calibration Voltage".
9. Enter the angle reading from the LCD screen into the "Eng. Value" box for the maximum setting (do not enter the plus sign).
10. The computer should assign gain and offset values for the calibration (See the right side of the computer screen). Accept the calibration by clicking the "OK" button.

Computer Control:

The Stability Platform is able to be controlled with the Lafayette Instrument Psymsoft software. This software allows control of the test timing and storage of the test data. The Stability Platform can also stream real time data to the computer for storage and analysis. Contact Lafayette Instrument for availability of the Psymsoft software.

Hand Rail:

The Stability Platform can be equipped with an optional hand rail. The rail provides a hand hold for subjects while they are on the platform.

Assembly: The rail is shipped in three pieces. To assemble, simply slide the top of the rail into the base pieces and insert and tighten the knobs.

Setup: The rail is designed to sit under the stability platform. The weight of the platform keeps the rail in place. To set up, lift up one side of the stability platform and slide the rail base under the feet of the platform. The platform feet will sit inside the two ringed recesses on the rail base.

The rail is purchased separately from the stability platform. It can be fitted with any version of the stability platform. Contact Lafayette Instrument for ordering information.

Rail Specifications:

Material:	¾" square tube steel
Height:	49.75"
Width:	36.75"
CrossbarHeight:	31.75"
BaseFeet:	18" x 3.5"

Platform Height:

The Stability Platform can be adjusted to four different heights. As the height of the platform is increased, the center of gravity is moved closer to the pivot point of the platform, thus increasing the difficulty of the balancing task. The platform is adjusted by removing the knobs from the sides of the platform and moving the platform clamps to the desired setting. The platform height settings are spaced 1.5" apart.

Platform setting 1 (lowest setting):

Tilt Range:	±15°
Platform Height:	6.0" from base
	11.5" from pivot point

Platform setting 2:

Tilt Range:	±20°
Platform Height:	7.5" from bas
	10.0" from pivot point

Platform setting 3:

Tilt Range:	±25°
Platform Height:	9.0" from base
	8.5" from pivot point

Platform setting 4 (highest setting):

Tilt Range:	±30°
Platform Height:	10.5" from base
	7.0" from pivot point

Platform Tension:

The Stability Platform is equipped with tension brackets and straps to adjust the tension of the platform. The tension impedes the swing of the platform, making the balancing task less difficult. The tension is adjusted by placing straps on the bottom of the platform. Each strap is stretched between the bracket holes on the platform base and on the platform itself. Given the number of bracket hole positions, a virtually unlimited number of strap configurations is possible. The following tables and charts show the characteristics of common strap configurations. The specific setup used will depend on the desired tension characteristics. The recommended configurations can be modified to suit a particular application, but the user should be careful not to exceed the minimum and maximum strap tension for each platform height setting.

Terms and Conventions for Tension Tables:

Strap weights:

"LD" is a light duty/regular duty strap
"HD" is a heavy duty strap

The platform comes with three pairs of straps: two pairs of light duty/regular duty and one pair of heavy duty straps. Extra straps or replacement straps can be ordered separately through Lafayette Instrument Company.

Replacement Strap Part Numbers:

Heavy Duty:	# 4-233-017
Light Duty/Regular Duty:	# 4-233-018

Platform Positions:

"1" is the lowest position
"4" is the highest position

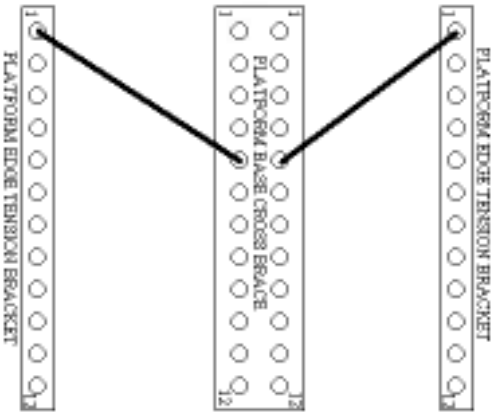
Test Methods:

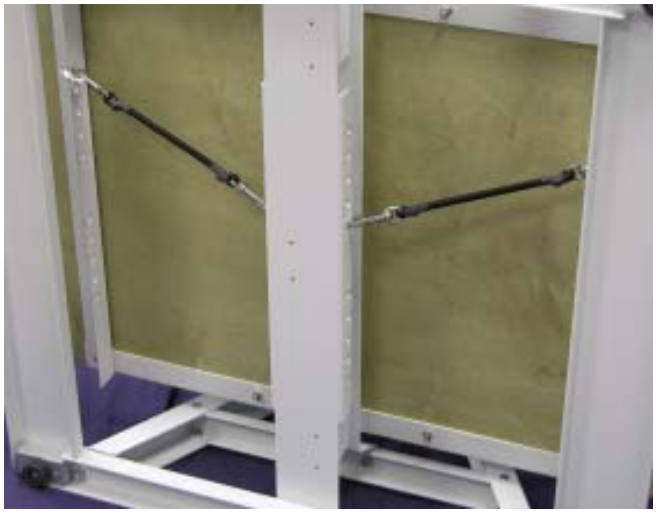
The values in the tension tables represent the amount of force in pounds required to tilt the platform the specified number of degrees. The force applied was measured using a hand held force dynamometer. The readings were all taken from the center of the non-skid pad on the platform.

Strap hole offset:

The tension of the platform is adjusted by stretching or relaxing the straps. The strap hole offset gives the number of holes along the tension bracket between the strap ends. The larger the offset, the more tension on the strap. The strap placement recommendations are accompanied by hole diagrams that represent the tension brackets on the bottom of the platform as looking down on the platform.

Ex: Strap hole offset (1-to-5)





The 1-to-5 setting indicates that the strap will be stretched between the first hole on the tension bracket to the fifth hole on the platform cross brace. Straps are always placed in pairs and are typically symmetrical.

Each Platform setting has a maximum and minimum allowable strap hole offset. Settings below the minimum offset will create slack in the straps and result in inconsistent tension. Settings above the maximum offset will damage the strap and/or hinder the motion of the platform. Do not exceed the maximum settings.

Platform setting 1: (Lowest setting)
Minimum Offset: 1-to-5
Maximum Offset: 1-to-10

Platform setting 2:
Minimum Offset: 1-to-4
Maximum Offset: 1-to-9

Platform setting 3:
Minimum Offset: 1-to-1
Maximum Offset: 1-to-8

Platform setting 4: (Highest setting)
Minimum Offset: 1-to-1
Maximum Offset: 1-to-5

Maximum strap stretch (any setting): 22”

Tension Setting Characteristics:

The tension tables and graphs represent three different tension settings: low, medium and high tension. Each tension setting will give the platform slightly different tilt response characteristics.

Low tension: Provides the most consistent response throughout the tilt range of the platform. The tension is basically linear across the entire range. This setting may produce a slight "tension gap" at the center point as the tilt crosses over from one strap to the other.

Medium tension: Provides a slight non-linear response across the tilt range of the platform. The maximum tension provided by the straps is greater than in the low tension settings.

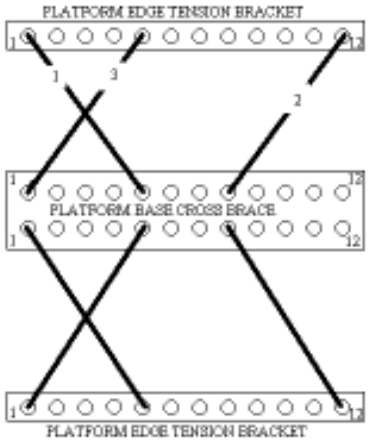
High Tension: Provides an exaggerated non-linear response. Since the straps are always under tension, there is no gap in the center of the range when the tilt crosses from one strap to the other. This setting provides the smoothest tilt action. The side effect of the high tension is that the straps actually cancel each other out in the lower tilt angle ranges and less tension is produced than in the low tension setting. The maximum tension provided at the high tilt range is greater than the other two settings.

Tension Tables:

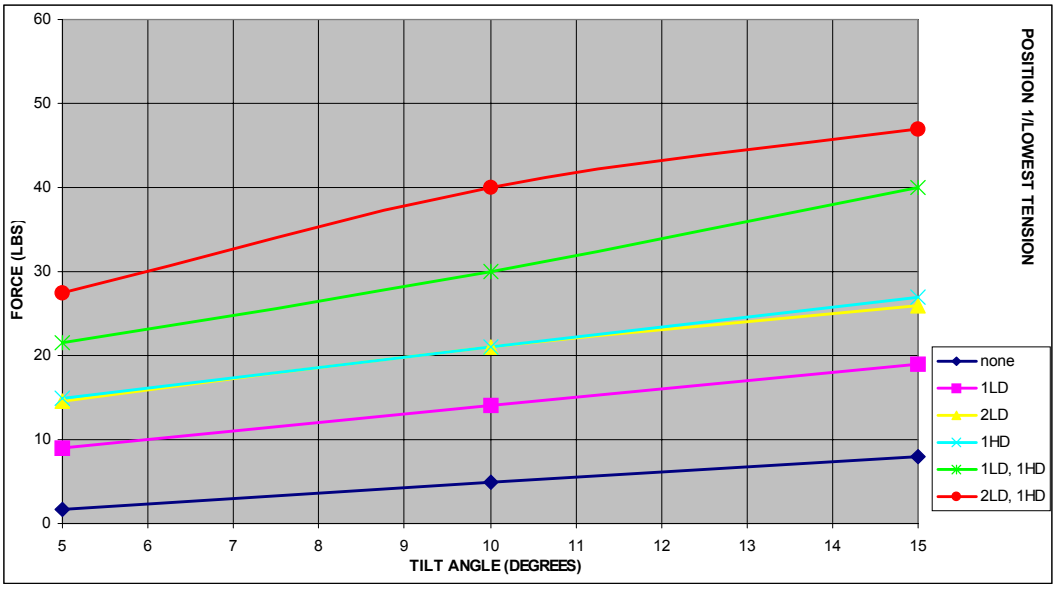
The following tables and graphs characterize the common tension settings for the Stability Platform. The tables and graphs represent the amount of force in pounds required to tilt the platform a set number of degrees with each strap and platform configuration. The numbers represent the order of placement if more than one pair of straps is used. The graphs are sorted by platform height and tension characteristics.

Setting 1-L:

Tension: Low
Platform Position: 1 (lowest setting)
Strap Hole Offset: 1-to-5
Strap Stretch: 14” to 18”
Platform Tilt Range: 0 to ±15°



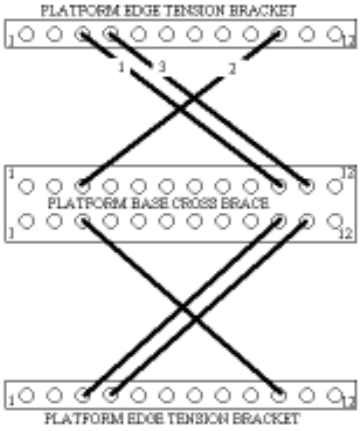
Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	8-10	14-16	14-16	21-23	27-29
10	5	13-15	20-22	20-22	29-31	39-41
15	8	18-20	25-27	26-28	39-41	46-48



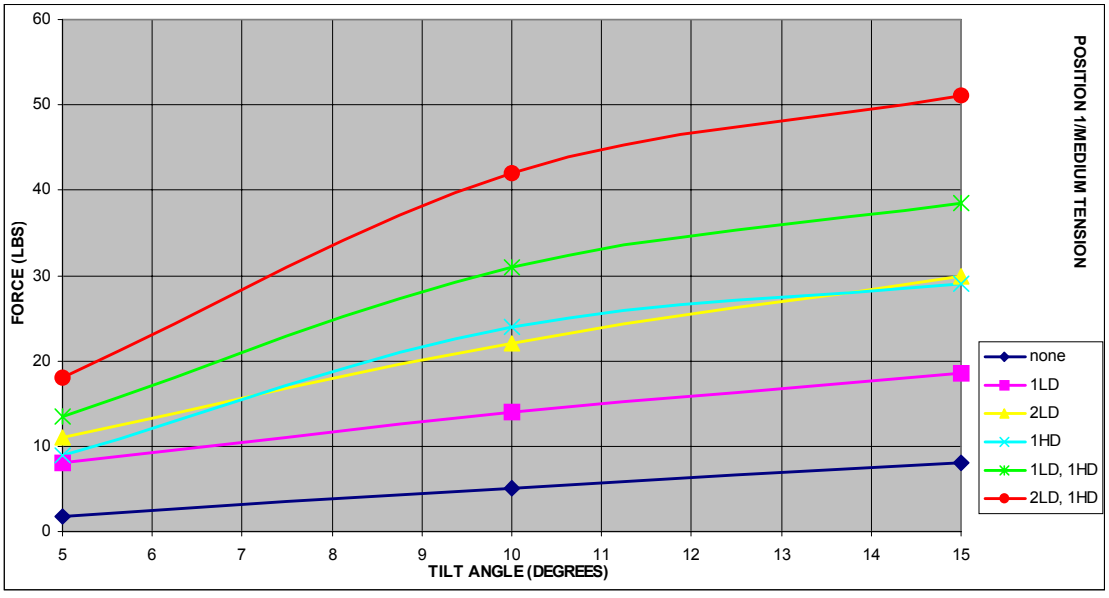
Tension Tables: (continued)

Setting 1-M:

Tension: Medium
Platform Position: 1 (lowest setting)
Strap Hole Offset: 1-to-8
Strap Stretch: 15" to 19"
Platform Tilt Range: 0 to ±15°



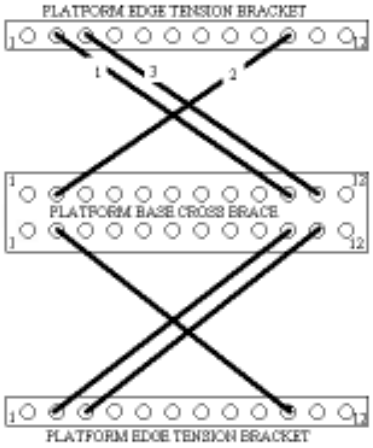
Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	7-9	10-12	8-10	13-15	17-19
10	5	13-15	21-23	23-25	30-32	41-43
15	8	18-20	29-31	28-30	38-40	50-52



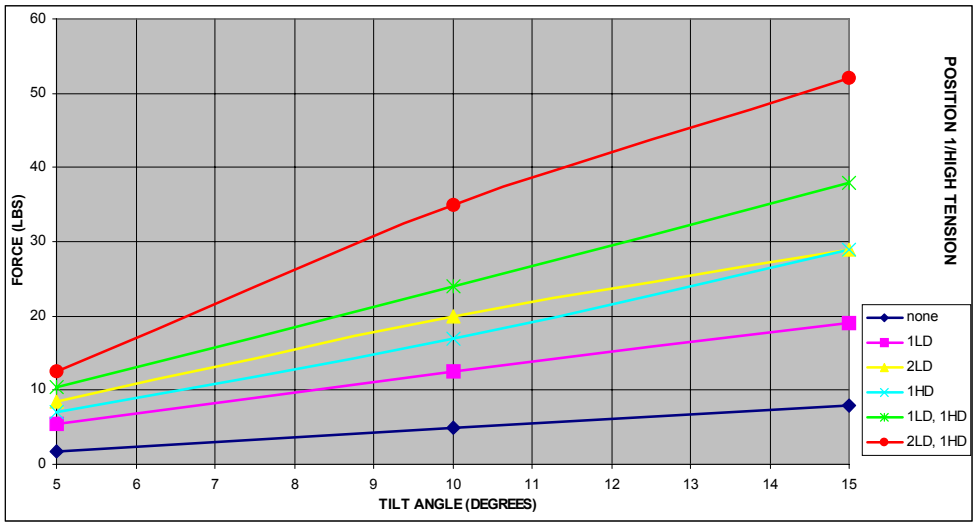
Tension Tables: (continued)

Setting 1-H:

Tension: High
Platform Position: 1 (lowest setting)
Strap Hole Offset: 1-to-9
Strap Stretch: 16” to 22”
Platform Tilt Range: 0 to ±15°



Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	5-7	8-10	6-8	10-12	10-14
10	5	12-14	19-21	16-18	23-25	34-36
15	8	18-20	28-30	28-30	37-39	51-53



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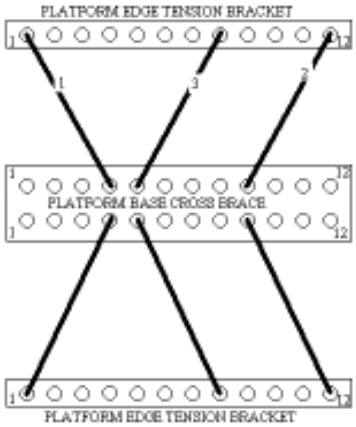
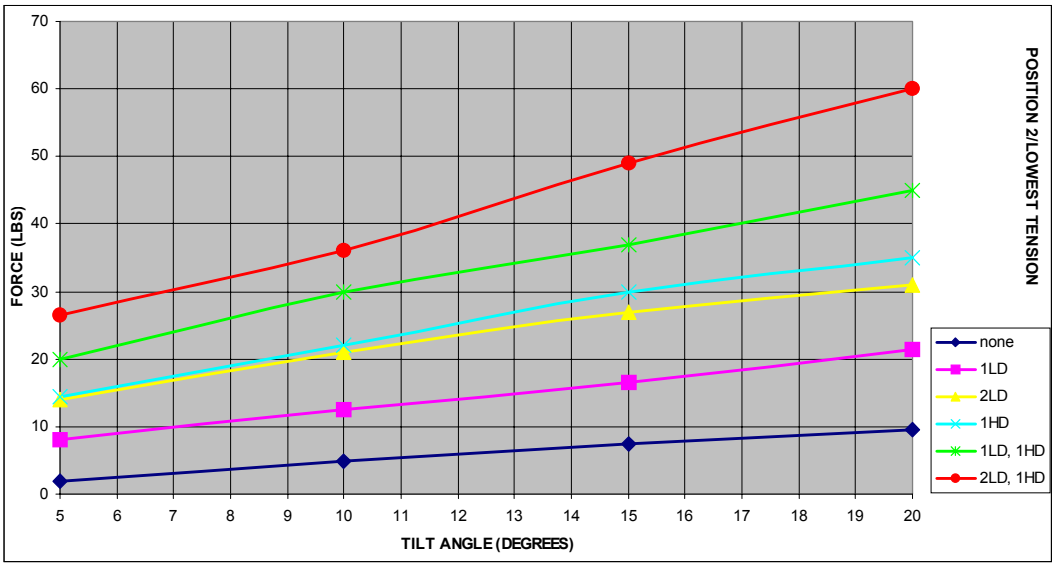
Tension Tables: (continued)

Setting 2-L:

Tension: Low
Platform Position: 2
Strap Hole Offset: 1-to-4
Strap Stretch: 13.5" to 19"
Platform Tilt Range: 0 to ±20°



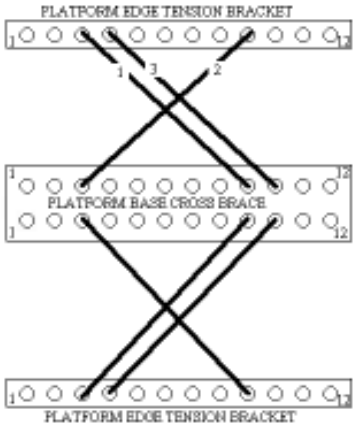
Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	7-9	13-15	14-16	19-21	26-28
10	5	12-14	20-22	21-23	29-31	35-37
15	8	16-18	26-28	29-31	36-38	48-50
20	10	21-23	30-32	34-36	44-46	59-61



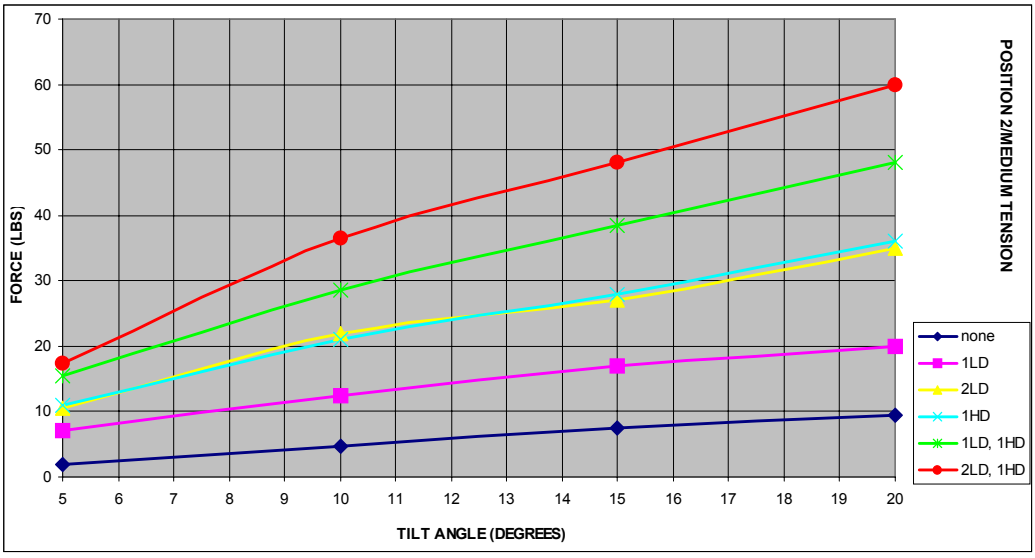
Tension Tables: (continued)

Setting 2-M:

Tension: Medium
Platform Position: 2
Strap Hole Offset: 1-to-7
Strap Stretch: 15” to 20”
Platform Tilt Range: 0 to ±20°



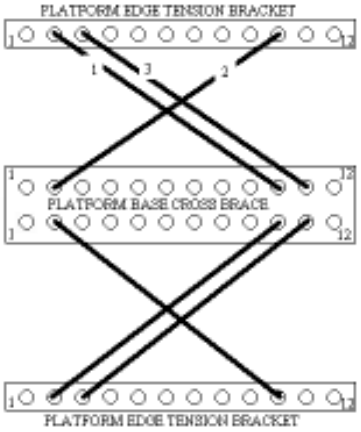
Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	6-8	10-12	10-12	15-17	17-19
10	5	12-14	21-23	20-22	28-30	36-38
15	8	16-18	26-28	27-29	38-40	47-49
20	10	19-21	34-36	35-37	47-49	59-61



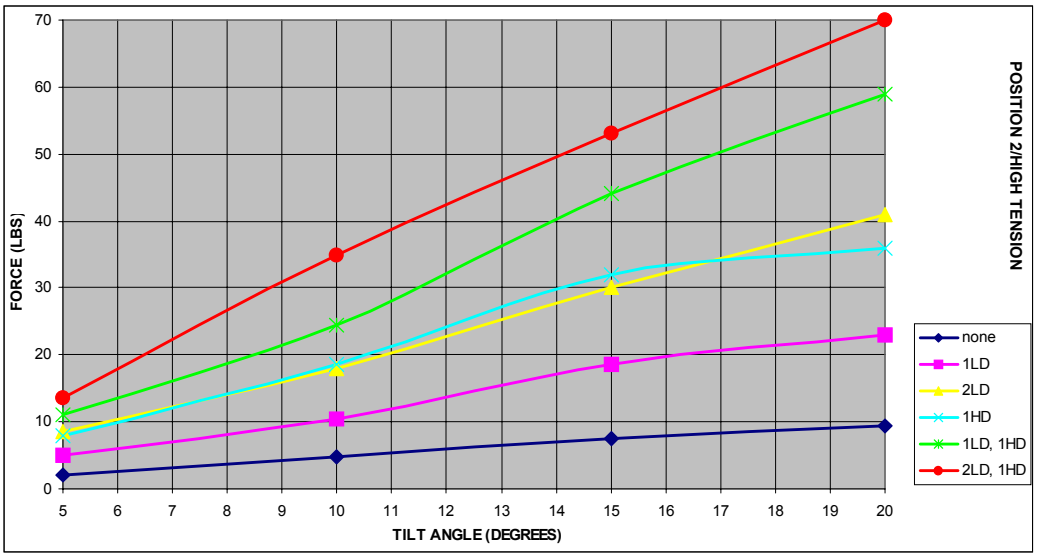
Tension Tables: (continued)

Setting 2-H:

Tension: High
Platform Position: 2
Strap Hole Offset: 1-to-9
Strap Stretch: 16" to 21"
Platform Tilt Range: 0 to ±20°



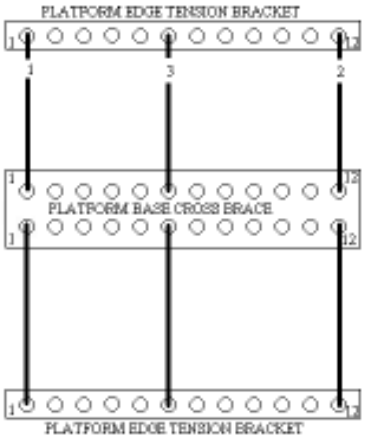
Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	4-6	8-10	7-9	10-12	13-15
10	5	10-12	17-19	18-20	24-26	34-36
15	8	18-20	29-31	31-33	43-45	52-54
20	10	22-24	40-42	35-37	57-62	67-72



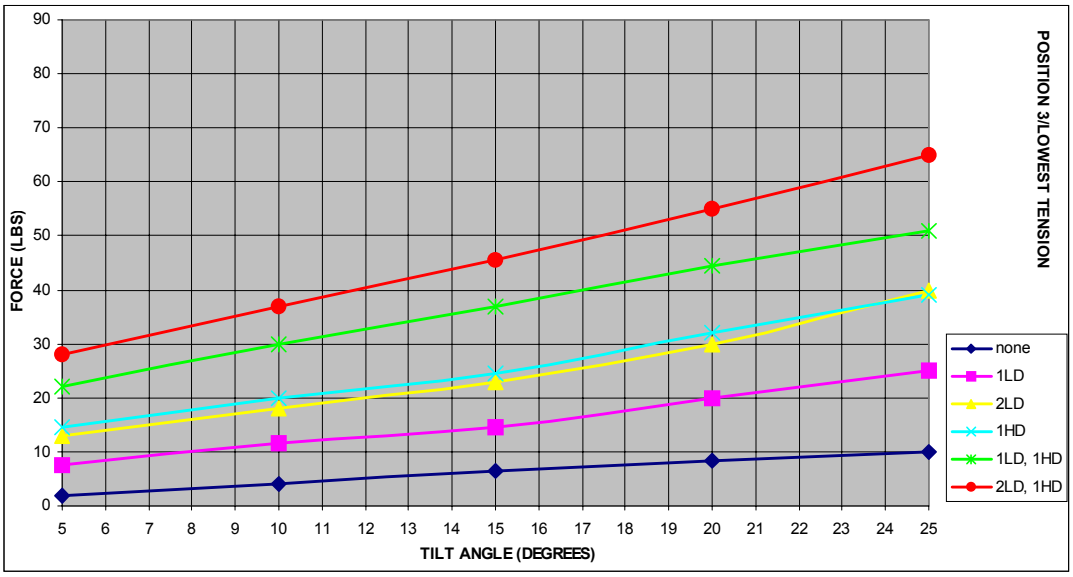
Tension Tables: (continued)

Setting 3-L:

Tension: Low
Platform Position: 3
Strap Hole Offset: 1-to-1
Strap Stretch: 13.5” to 20”
Platform Tilt Range: 0 to ±25°



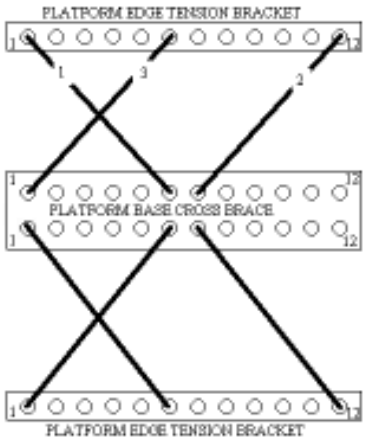
Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	7-9	12-14	14-16	21-23	27-29
10	4	11-13	17-19	19-21	29-31	36-38
15	6	14-16	22-24	24-26	36-38	45-47
20	8	19-21	29-31	31-33	44-46	54-56
25	10	24-26	39-41	38-40	50-52	63-67



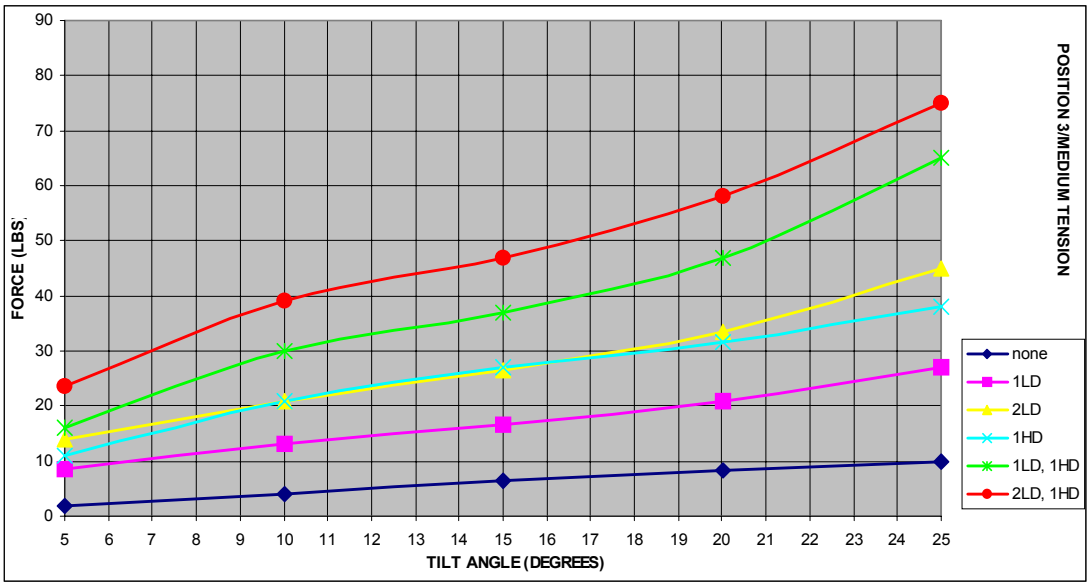
Tension Tables: (continued)

Setting 3-M:

Tension: Medium
Platform Position: 3
Strap Hole Offset: 1-to-6
Strap Stretch: 14" to 21"
Platform Tilt Range: 0 to ±25°



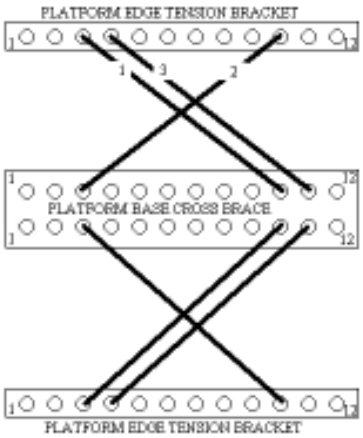
Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	8-10	13-15	10-12	15-17	23-25
10	4	12-14	20-22	20-22	29-31	38-40
15	6	16-18	26-28	26-28	36-38	46-48
20	8	20-22	33-35	31-33	46-48	57-59
25	10	26-28	44-46	37-39	62-68	73-77



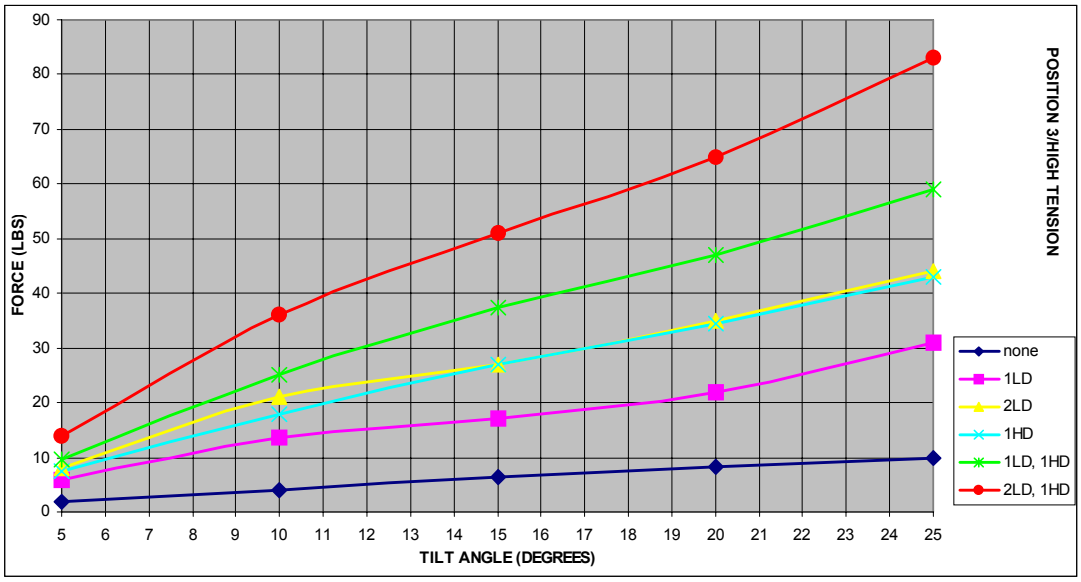
Tension Tables: (continued)

Setting 3-H:

Tension: High
Platform Position: 3
Strap Hole Offset: 1-to-8
Strap Stretch: 16” to 22”
Platform Tilt Range: 0 to ±25°



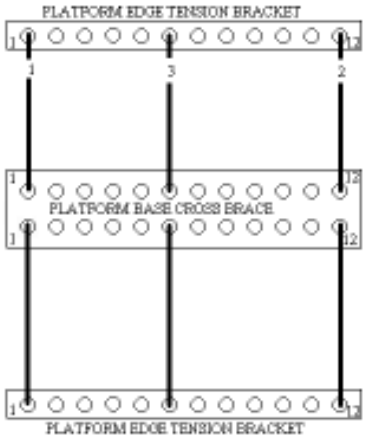
Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	5-7	7-9	7-9	9-11	13-15
10	4	13-15	20-22	17-19	24-26	35-37
15	6	16-18	26-28	26-28	37-39	50-52
20	8	21-23	34-36	34-36	46-48	64-66
25	10	30-32	43-45	42-44	57-61	81-85



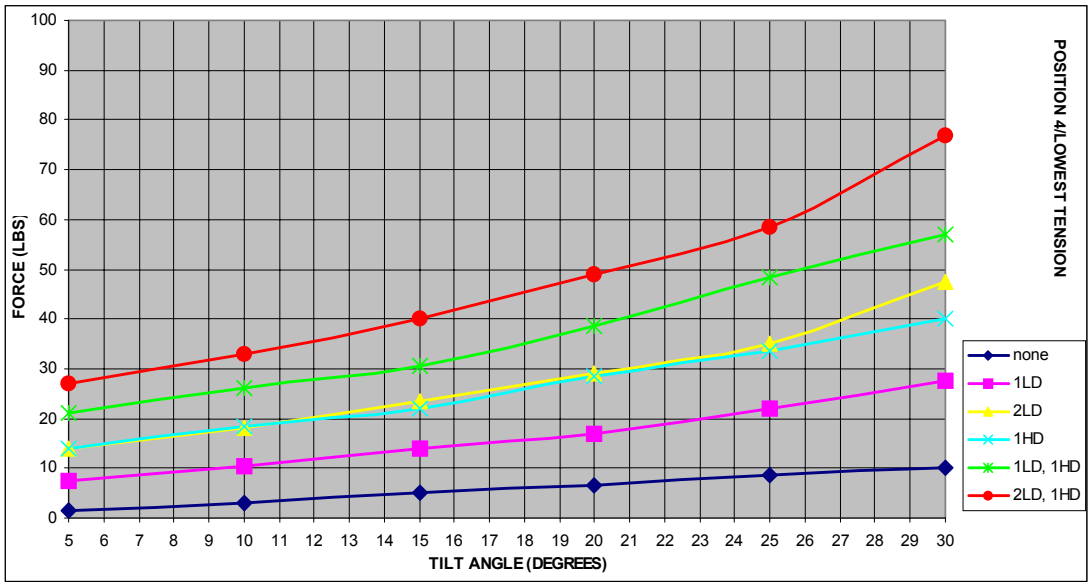
Tension Tables: (continued)

Setting 4-L:

Tension: Low
Platform Position: 4
Strap Hole Offset: 1-to-1
Strap Stretch: 14" to 22"
Platform Tilt Range: 0 to ±30°



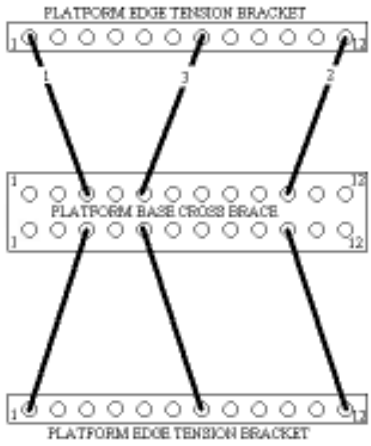
Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	7-9	13-15	13-15	20-22	26-28
10	3	10-12	17-19	18-20	25-27	32-34
15	5	13-15	23-25	21-23	30-32	39-41
20	6	16-18	28-30	28-30	38-40	48-50
25	8	21-23	34-36	33-35	48-50	58-60
30	10	27-29	47-49	39-41	55-59	75-79



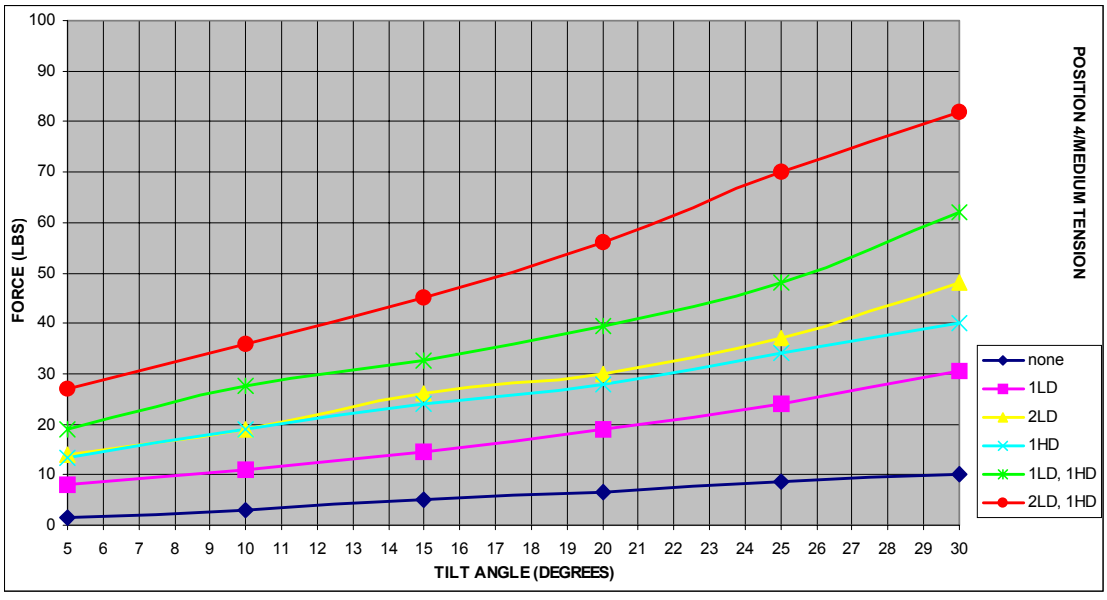
Tension Tables: (continued)

Setting 4-M:

Tension: Medium
Platform Position: 4
Strap Hole Offset: 1-to-3
Strap Stretch: 14.5” to 22”
Platform Tilt Range: 0 to ±30°



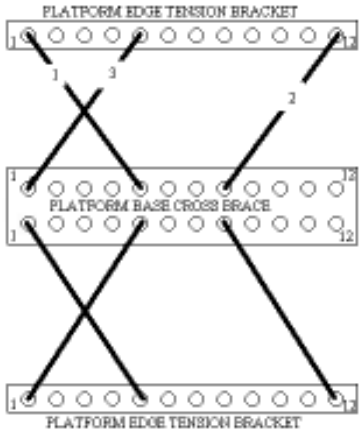
Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	7-9	13-15	13-15	18-20	26-28
10	3	10-12	18-20	18-20	27-29	35-37
15	5	14-16	25-27	23-25	32-34	44-46
20	6	18-20	29-31	27-29	39-41	55-57
25	8	23-25	36-38	33-35	47-49	68-72
30	10	30-32	47-49	39-41	60-64	80-84



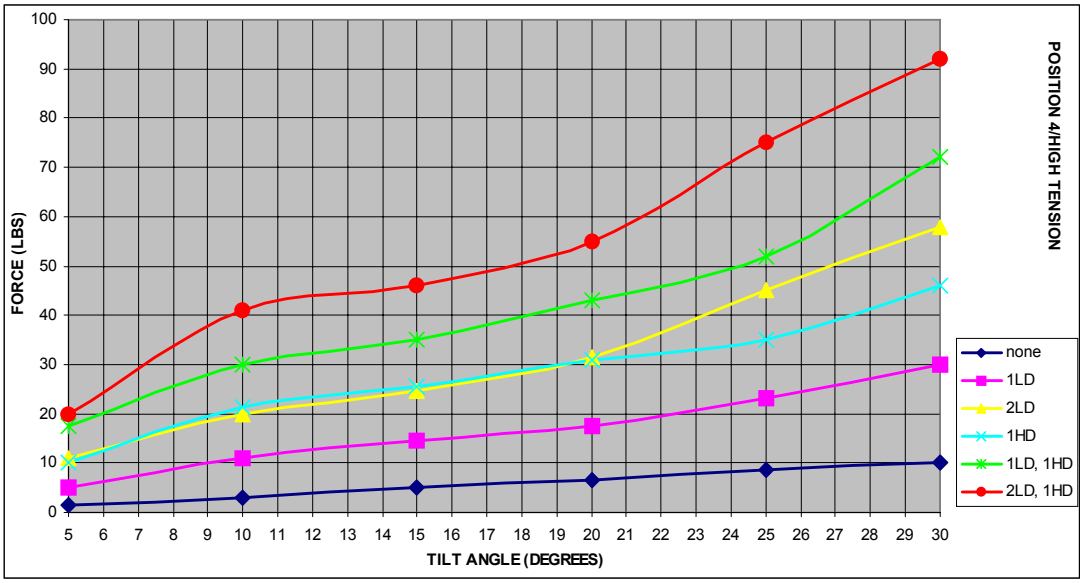
Tension Tables: (continued)

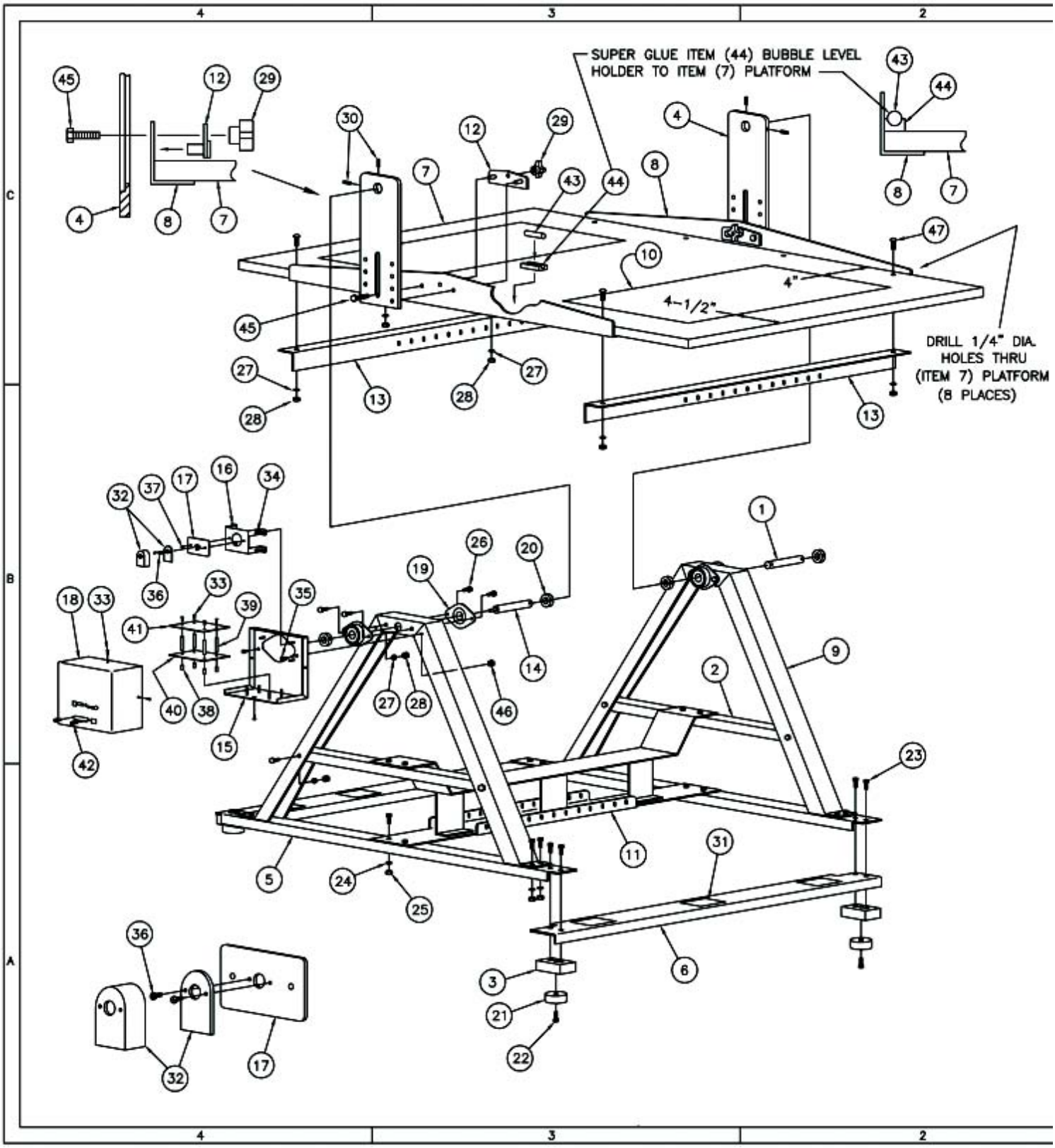
Setting 4-H:

Tension: High
Platform Position: 4
Strap Hole Offset: 1-to-5
Strap Stretch: 15" to 22"
Platform Tilt Range: 0 to ±30°



Tilt Angle Degrees	# straps	Force (lbs.) 1LD	2LD	1HD	1LD 1HD	2LD 1HD
5	2	4-6	10-12	9-11	17-19	19-21
10	3	10-12	19-21	21-23	29-31	40-42
15	5	14-16	24-26	25-27	34-36	45-47
20	6	17-19	31-33	29-31	42-44	54-56
25	8	22-24	44-46	34-36	51-53	73-77
30	10	29-31	56-60	44-48	70-74	90-94




SUPER GLUE ITEM (44) BUBBLE LEVEL HOLDER TO ITEM (7) PLATFORM
DRILL 1/4" DIA. HOLES THRU (ITEM 7) PLATFORM (8 PLACES)
4"
4-1/2"

NO.	P/N	QTY.	DESCRIPTION
1	1-03691	1	SHORT SHAFT
2	1-03697	2	SUPPORT CROSS BAR
3	1-03704	4	SUPPORT BLOCK
4	1-03712	2	PIVOT ARM
5	1-03713	2	SUPPORT BASE
6	1-03714	2	FRAME END
7	1-03719	1	PLATFORM
8	1-03720	2	PLATFORM BRACKET
9	1-03724	2	A-FRAME SUPPORT
10	1-05221	2	12" x 18" NON-SKID PAD
11	5-03701	1	CROSS BRACE ASSEMBLY
12	5-03696	2	CLAMP PLATE ASSEMBLY
13	1-03978	2	TENSION STRAP OUTER BRACKET
14	1-03974	1	ENCODER SHAFT
15	1-03975	1	HOUSING BASE
16	1-03979	1	ENCODER MOUNTING BRACKET
17	1-03973	1	ENCODER CENTERING PLATE
18	1-03976	1	HOUSING COVER
19	4-332-037	4	BEARING
20	4-333-004	4	3/4" I.D. STEEL SET COLLAR
21	4-131-007	4	RUBBER FOOT
22	4-212-027	4	1/4-20 x 1" HEX HD. BOLT
23	4-212-006	24	5/16-18 x 3/4" HEX HD. BOLT
24	4-221-134	24	5/16 LOCK WASHER
25	4-221-040	16	5/16-18 HEX HD. NUT
26	4-212-026	16	1/4-20 x 5/8" HEX. HD. BOLT
27	4-221-069	24	1/4 LOCK WASHER
28	4-211-007	24	1/4-20 HEX NUT
29	4-211-054	2	5/16-18 INSERTED KNOB
30	4-212-446	4	1/4-20 x 1-1/4" SET SCREW
31	4-131-022	6	3-3/4" SQR. NEOPRENE RUBBER
32	3-981-002	1	ENCODER
33	4-212-113	8	#4-40 x 5/16" PAN HD. SCREW
34	4-211-009	4	#6-32 KEP NUT
35	4-212-038	2	#10-32 x 1/2" PAN HD. SCREW
36	4-212-129	2	#2-56 x 1/4" PAN HD. SCREW
37	4-212-093	2	#6-32 x 3/8" PAN HD. SCREW
38	4-214-003	4	#4-40 x 3/8" LONG STANDOFF
39	4-214-015	4	#4-40 x 2" LONG STANDOFF
40	5-215-9016	1	LOWER PC BOARD
41	5-234-9161	1	UPPER PC BOARD
42	4-212-423	2	#4 JACKSCREWS
43	4-132-022	1	BUBBLE LEVEL
44	4-333-010	1	BUBBLE LEVEL HOLDER
45	4-212-271	2	5/16-18 x 1" HEX. HD. BOLT
46	4-211-011	2	#10-32 KEP NUT
47	4-212-445	8	1/4-20 x 1-1/4" CARRIAGE BOLT

Ordering Information:

All phone orders must be accompanied by a hard copy of your order. All must include the following information:
1) Complete billing and shipping addresses
2) Name and department of end user
3) Model number and description of desired item(s)
4) Quantity of each item desired
5) Purchase order number or method of payment
6) Telephone number

DOMESTIC TERMS

There is a $50 minimum order. Open accounts can be extended to most recognized educational institutions, hospitals and government agencies. Net amount due 30 days from the date of shipment. Enclose payment with the order; charge with VISA, MasterCard; or pay COD. We must have a hard copy of your order by 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 transfer to our account; charge with VISA, MasterCard; or confirmed irrevocable letter of credit. Proforma invoices will be provided upon request.

RETURNS

Equipment may not be returned without first receiving a Return Goods Authorization Number (RGA).

When returning equipment 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, U.S.A. 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. Please also state the name of the Lafayette Instrument representative authorizing the return. 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.

WARRANTY

Lafayette Instrument guarantees its equipment against all defects in materials and workmanship to the ORIGINAL PURCHASER for a period of one (1) year from the date of shipment, unless otherwise stated. During this period, Lafayette Instrument will repair or replace, at its option, any equipment found to be defective in materials or workmanship. If a problem arises, please contact our office for prior authorization before returning the item. This warranty does not extend to damaged equipment resulting from alteration, misuse, negligence or abuse, normal wear or accident. In no event shall Lafayette Instrument be liable for incidental or consequential damages. There are no implied warranties or merchantability of fitness for a particular use, or of any other nature. Warranty period for repairs or used equipment purchased from Lafayette Instrument is 90 days.

DAMAGED GOODS

Damaged equipment should not be returned to Lafayette Instrument prior to thorough inspection.

When 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. When damage is not detected at the time of delivery, contact the carrier and request an inspection within 10 days of the original delivery. Please call the Lafayette Instrument Customer Service Department for a return authorization for repair or replacement of the damaged merchandise.

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