
# Electronic Distance Measurement

USA TRACK&FIELD℠ LAKE ERIE

USA TRACK&FIELD℠ CERTIFIED OFFICIAL

# Electronic Distance Measurement

Electronic Distance Measurement, aka “EDM”, is used in eight field events: high jump, long jump, triple jump, pole vault, discus, shot put, hammer throw and javelin.

In most events, a tape measure is used to make the measurements, but the process of getting accurate measurements is troublesome, time consuming and not always entirely accurate.

Today, measurements can be made with systems that utilize lasers.

At the landing point of the athlete (or the object thrown by the athlete), officials set up a prism marker. An EDM unit at the base line for the event bounces a laser beam off the prism and the distance is measured accurately and quickly.

The predominant EMD at this time is the LaserLynx unit, developed by Lynx Developers. The predominant handheld field event administration (HFEA) software at this time is FieldLynx, also developed by Lynx Developers.

While it should be noted that this manual is based on the predominant EMD and HFEA software, it does not mean that the protocol for setup, use and post-competition procedures would be any different for any other combination of handheld, EMD or HFEA software.

# Levels of Certification and Minimum Skill Sets

## Electronic Recorder (ER)

This is an objective, skill-based certification and an official may certify at the highest level at which they can fulfill the corresponding requirements and receive the recommendation of the Electronic Measurement Judge administering the test.

**Grade 1**

Provided with a handheld device or other Electronic Recording Device that has been pre-loaded, and with the event set-up (i.e. scoreboard addresses, database address, height progressions, number of trials, whether or not there will be finals, etc), the

Grade 1 level official will exhibit the following skills:

1. Check-in athletes
2. Set starting height for each competitor (vertical jumps)
3. Enter marks
4. Enter wind readings (horizontal jumps, outdoor)
5. Set up a final (from multiple flights and from 1 flight)

**Grade 2**

Provided with a handheld device or other Electronic Recording Device that has been preloaded, the Grade 2 level official will exhibit the following skills:

1. ***Accomplish the skills for Grade 1***
2. Manage the event set-up
3. Select English or Metric as the means of measurement
4. Height progression (vertical events)
5. Number of trials
6. Number of finalists
7. Add an athlete
8. Send results to a scoreboard
9. Send results to the meet database at the end of each round

**Grade 3**

Provided with a handheld device or other Electronic Recording Device, the Grade 3 level official will exhibit the following skills:

1. ***Accomplish the skills for Grade 1***
2. ***Accomplish the skills for Grade 2***
3. Set-up scoreboard address/connect to a scoreboard
4. Download the event schedule from the meet database
5. Download an event from the meet database

## Electronic Measurer (EM)

This is an objective, skill-based certification and an official may certify at the highest level at which they can fulfill the corresponding requirements and receive the recommendation of the Electronic Measurement Judge administering the test.

**Grade 1**

Provided with an Electronic Recording Device that has been preloaded, a Grade 1 EM Judge will exhibit the following skills:

1. ***Accomplish the skills necessary to be a Grade 2 Electronic Recorder (ER) (FieldLynx operator).***

After someone else has set up the Electronic Measuring Device (LaserLynx), perform the following:

1. Perform all sighting and measurement skills
2. Locate and sight the checkpoint marker to verify calibration
3. Quickly and accurately locate and center on the performance staff reflector
4. Relay to the handheld operator when the mark is to be read (2 man crew)
5. Press/tab the appropriate key/button to record the measurement

**Grade 2**

Provided with an Electronic Recording Device and the Electronic Measurement Device, a Grade 2 EM Judge will demonstrate the following skills:

1. ***Accomplish the skills for Grade 1.***
2. ***Accomplish the skills necessary to be a Grade 2 Electronic Recorder (ER).***

3. Perform all of the setup skills for the apparatus
4. Center and level the tripod
5. Attach the head unit
6. Level the head unit
7. Attach all cabling needed
8. Calibrate the instrument
9. Set the controls in the handheld device
10. Establish the checkpoint
11. Tear down and pack the device after use

## Electronic Measurement Judge (EMJ)

This is an objective, skill-based certification and an official may certify at the highest level at which they can fulfill the corresponding requirements and receive the recommendation of the Electronic Measurement Judge administering the test.

**Grade 1**

1. ***Perform all the functions of a Grade 3 Electronic Recorder (ER) judge.***
2. ***Perform all the functions of a Grade 2 Electronic Measurer (EM) judge.***
3. Capable of supervising either or both a Master level Electronic Measurement Device (EMD) Judge and Electronic Recording Device (ERD) Judge.

The candidate for EMJ must demonstrate the ability to meet the qualifying skill sets at a predetermined national gathering of officials (national meets or meetings) to an existing EMJ.

# FieldLynx Field Event Software

FieldLynx is a software application for the scoring and administration of field events in track & field. The FieldLynx software connects with meet management software (Hy-Tek) and allows operators to access athlete listings, score events, and instantly upload results to computers or scoreboards on the FinishLynx network. Data entry is simple and intuitive and the software easily converts marks between Metric and Imperial measurements.

FieldLynx offers the complete field results production in the palm of your hand (or on a computer). The FieldLynx software allows users to interface seamlessly with devices and applications across the venue, including LaserLynx EDM units, scoreboards, wind gauges, and most track and field database applications. For too long, athletes in field events have competed in isolation. When field results are recorded manually on a clipboard, they have to be carried across the venue or re-typed before they can be shared. With FieldLynx, field event results can be entered directly to a Windows-based mobile device and shared instantly with scoreboards, officials, or announcers throughout the venue.

- **Athlete Check-ins -** Athlete suspension allows participation in other events. Automatically nominate Athlete UP, ON DECK, and ON HOLD
- **Custom Rules -** Accommodate different Rule Books, including IAAF, NCAA, and NFHS high school
- **Five Alive Groups -** Automatically generates “Alive” group for 3, 4, or 5 alive groupings. Can reconfigure groups as necessary.
- **Metric/English Conversion -** Single-click, bi-directional conversions of athlete marks between English and Metric measurements.
- **Shareable -** Share results data via both Serial and Ethernet connections

# Leica Disto™ Electronic Measurement Devices

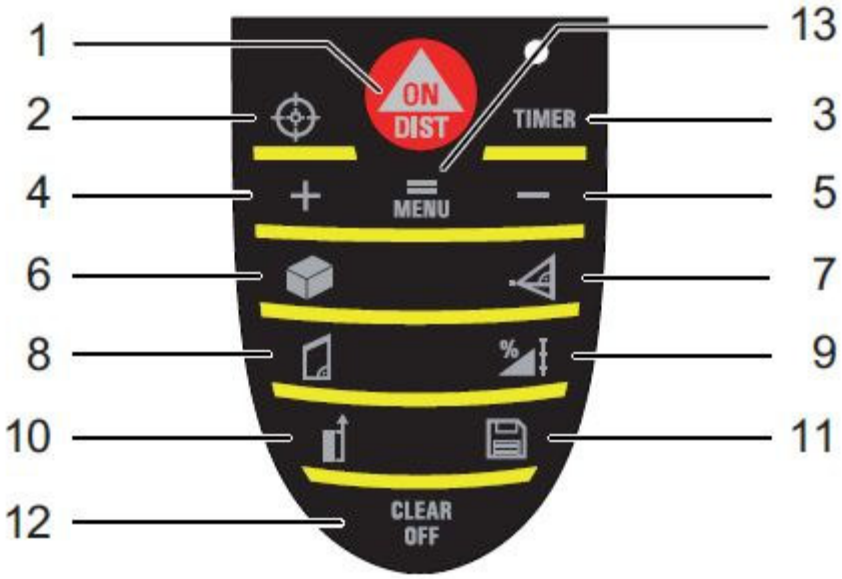
**Leica Disto™ D5**

**Leica Disto™ D510**

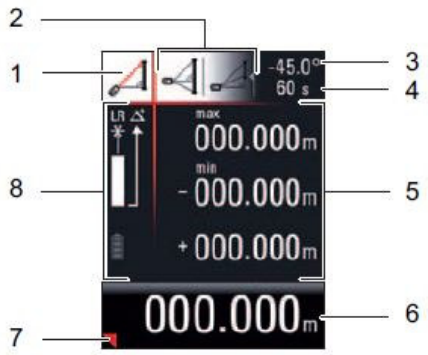
The Leica DISTO™ laser measurement devices are typically used in Horizontal and Vertical jumps. The Leica Disto's take measurements with perfect accuracy, even in poor lighting conditions or when working outside in sunny weather. If the red laser point is not visible to the naked eye, the target can be seen in the crosshairs on the display.

You can measure distances at the touch of a button, in just a few seconds

# Leica Disto™ D5




1 ON / DIST (On/measuring) button
2 Digital pointfinder - button
3 Timer button
4 Plus (+) button
5 Minus (-) button
6 Area / volume button
7 Indirect measurement (Pythagoras) button
8 Trapezium button
9 Functions button
10 Reference button
11 Storage/Memory button
12 Clear/Off button
13 Menu/Equal button




1 Program selection with measurement instructions
2 Program selection submenu
3 Level
4 Timer
5 Measurement field
6 Result bar
7 Detailed display
8 Status bar with (Laser ON, Reference plane, Display Long range mode, Offset, Plus / Minus, Battery status)

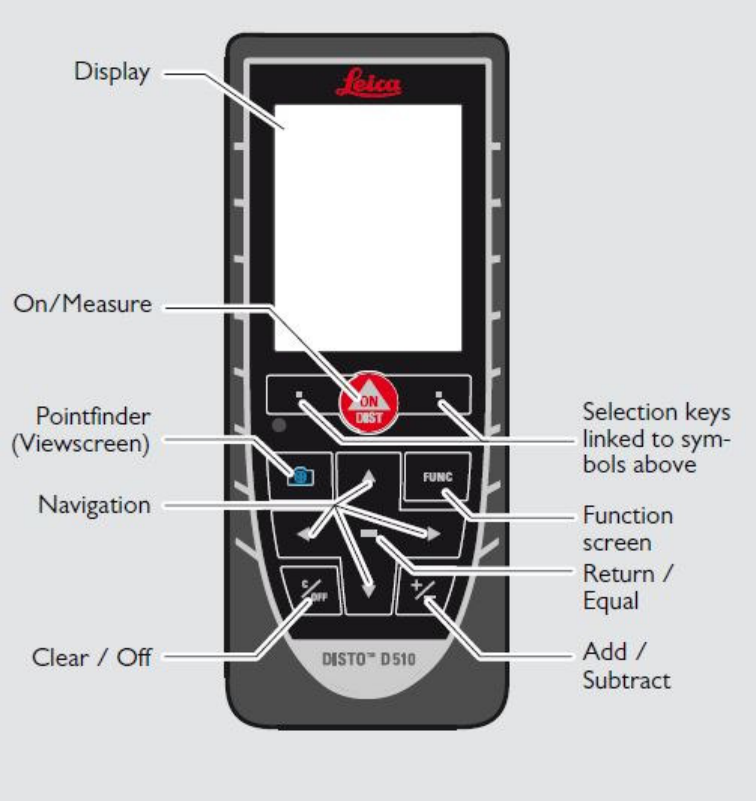
## Message codes

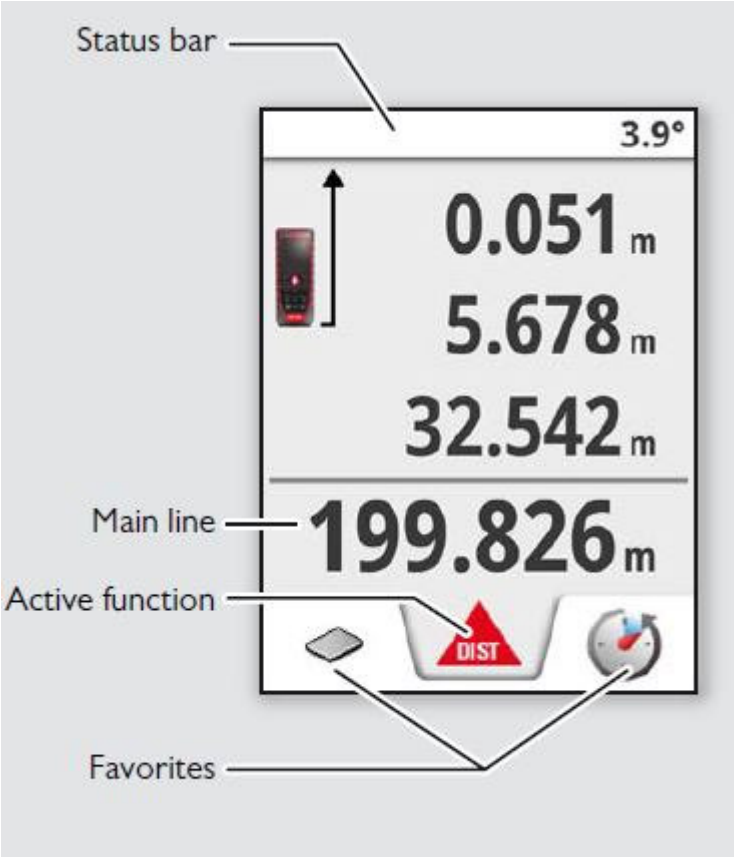
All message codes are displayed with either ⓘ or "Error". The following errors can be corrected:

| ⓘ | Cause | Remedy |
|---|---|---|
| 156 | Transverse tilt greater than 10° | Hold the instrument without any transverse tilt |
| 160 | Main tilt direction, angle too high (> 45°) | Measure angle up to max. ± 45° |
| 162 | The calibration has not been accomplished on a leveled surface and the calibration value is respecitvely within an ineligible area. | Calibrate the device on an absolute horizontal leveled surface. |
| 204 | Calculation error | Repeat procedure |
| 252 | Temperature too high | Cool down instrument |
| 253 | Temperature too low | Warm up instrument |
| 255 | Receiver signal too weak, measurement time too long, distance > 100 m | Use target plate |
| 256 | Received signal too strong | Target too reflective (use target plate) |
| 257 | Wrong measurement, background brightness too high | Darken target (measure in different lighting conditions) |
| 260 | Laser beam interrupted | Repeat measurement |

| Error | Cause | Remedy |
|---|---|---|
| Error | Hardware error | Switch on/off the device several times. If the symbol still appears, then your instrument is defective. Please call your dealer for assistance. |

# Leica Disto™ D510




Status bar
3.9°
0.051 m
5.678 m
32.542 m
Main line
199.826 m
Active function
DIST
Favorites

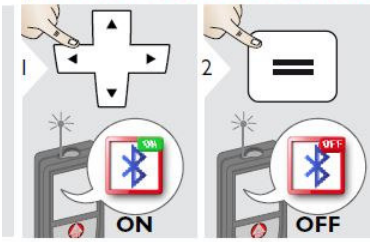
## Message Codes

If the message **Error** does not disappear after switching on the device repeatedly, contact the dealer.

If the message **InFo** appears with a number, press the Clear button and observe the following instructions:

| No. | Cause | Correction |
|---|---|---|
| 156 | Transverse tilt greater than 10° | Hold the instrument without any transverse tilt. |
| 162 | Calibration mistake | Make sure, the device is placed on a absolutely horizontal and flat surface. Repeat the calibration procedure. If the mistake still occurs, contact your dealer. |
| 204 | Calculation error | Perform measurement again. |
| 240 | Data transfer error | Repeat procedure. |
| 252 | Temperature too high | Let device cool down. |
| 253 | Temperature too low | Warm device up. |
| 255 | Received signal too weak, measuring time too long | Change target surface (e.g. white paper). |
| 256 | Received signal too high | Change target surface (e.g. white paper). |
| 257 | Too much back-ground light | Shadow target area. |
| 258 | Measurement outside of measuring range | Correct range. |
| 260 | Laser beam inter-rupted | Repeat measurement. |

## De-/Activate Bluetooth Smart




To switch ON, repeat procedure.


Exit settings.

Default mode:
Bluetooth is switched on.
Bluetooth icon in status line is displayed if device is connected with Bluetooth.

Switch on Bluetooth Smart in Settings.
Connect the device with your smart phone, pad, laptop,…
A blue Bluetooth symbol appears on the laser distance meter if the connection is established.
Bluetooth switches off as soon as the laser distance meter is switched off.
The efficient and innovative Bluetooth Smart module (with the new Bluetooth standard V4.0) works together with all Bluetooth Smart Ready devices. All other Bluetooth devices do not support the energy saving Bluetooth Smart Module, which is integrated in the device.

We provide no warranty for free DISTO™ software and offer no support for it. We accept no liability whatsoever arising from the use of the free software and we are not obliged to provide corrections nor to develop upgrades. A wide range of commercial software can be found on our homepage. Apps for Android® or Mac iOS can be found in special internet shops.
For more details, see our homepage.

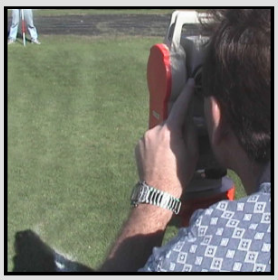
# LaserLynx PRO Distance Measurement

LaserLynx is a laser based electronic distance measurement device that produces accurate, computer generated measurements for field events (throws: Shotput, Javelin, Discus, and Hammer; and horizontal jumps: Long Jump and Triple Jump). LaserLynx combines with FieldLynx event software to integrate laser measurements across the FinishLynx results network with meet management databases and scoreboards.

To measure a throw all the LaserLynx operator needs to do is sight on the LaserLynx prism, held at the point of impact by the Measurement Official, and tap the ACQUIRE button on the FieldLynx unit. Instantly the athlete's Performance is computed and displayed on the screen.

1. Prior to the event, the LaserLynx unit is setup adjacent to the throwing area and leveled.

2. After each throw, the Official marking the throw places the LaserLynx prism at the *point of impact* closest to the throwing circle/arc.



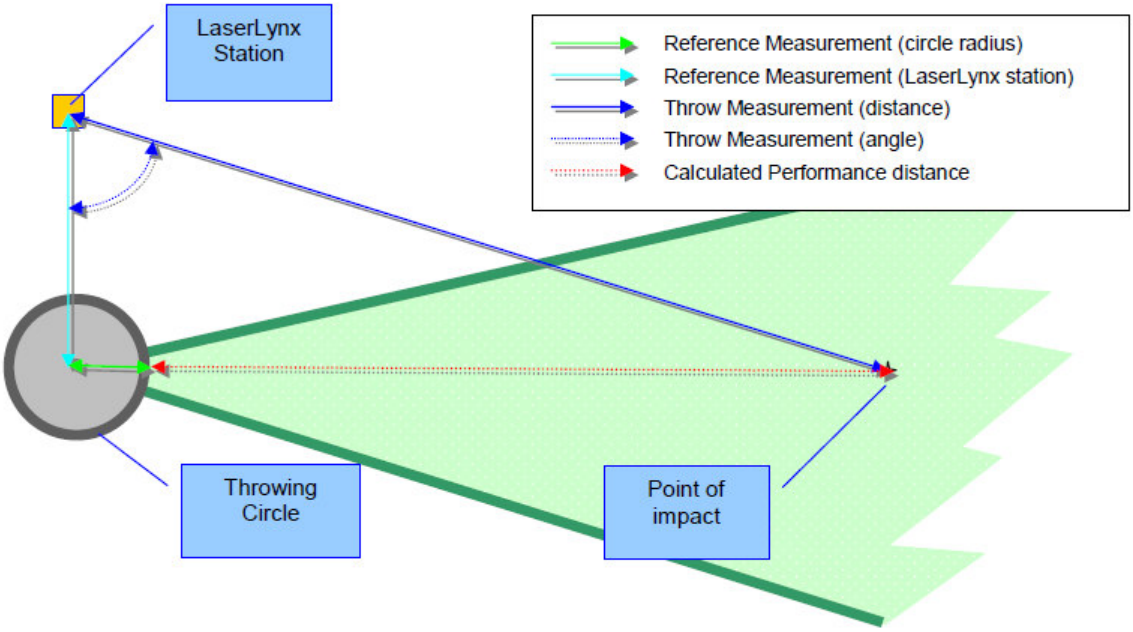
3. Using the built in telescopic sight, the LaserLynx operator aligns the unit on the prism held by the marking official.

4. When the LaserLynx prism is at the center of the crosshairs, the operator taps the **acquire** button on the FieldLynx unit and distance is calculated.

LaserLynx

**data collection**

Geometry has established that given an accurate measurement of two sides of a triangle, and an accurate measurement of the angle between these two known sides, it is possible to compute the length of the third side. By incorporating the radius of the throwing arc or throwing circle into the calculations that it does, LaserLynx is able to accurately measure an athlete's performance without venturing into the throwing area to make the measurement. An athlete's performance is computed as shown below in the diagram by using data that was entered prior to the start of the competition – the LaserLynx Station Reference Measurement (shown below), and the radius of the throwing circle.



| Specifications | LaserLynx Pro |
|---|---|
| Telescope Length: | 150mm |
| Object Lens Diameter: | 45mm (EDM:50mm) |
| Distance Accuracy: | ±( 2mm + 2ppm x D) m.s.e. |
| Calculation Accuracy: | ±2 ppm |
| Angle Accuracy: | 2sec. |
| Distance Range: | 1 Prism: 2,000m \| 3 prism: 2,700m |
| Measuring Time: | *Fine Mode* - 1.0mm: 1.2sec \| 0.2mm: 2.8sec<br>*Coarse Mode* - 0.7sec \| *Tracking Mode* - 0.4sec |
| Ambient temperature range: | -20 to +50 Celsius |
| Battery Life: | Angle & Distance Measurement: 14h<br>Angle measurement only: 60h |
| Eyepiece magnification: | 30x |
| Keyboard & Display: | 24-Key Numeric Keypad \| 2- Sided Dot Matrix Graphic LCD |
| Internal Data Memory: | 24,000 pts |
| Environmental Protection: | IP54 |

**2008 IAAF Facilities Manual P: 203. Section 5.2.2.1 Distance for Throws**: The accuracy of the measured distance is ± 0.005m and of the measured angle ± 10 angular seconds, which is equivalent to an average error for thrown distances of ± 0.005m.

# LASAM Distance Measurement

The LASAM® measuring system is the latest innovation in advanced measurement for meet management. Select the event to be measured, set the LASAM® to mark the exact center of the ring, and the system will measure all throws from a remote position once they are marked. The need to enter the ring after a throw is no longer necessary. This measuring system is accurate to the nearest centimeter and more precise than a steel tape!

# Video Distance Measurement

With two stereo cameras, this system can measure the long jump and triple jump without placing a prism at the landing point in the pit. By checking on the landing point on the computer screen, the distance from the takeoff board to the landing point can be instantly calculated. As there is no need to place an object in the pit, the risk of human error is eliminated, and storing the image in the system makes possible a review after the event.

Name _____ Association _____ Level _____

*Please Print!!!*

Street _____ City _____ State ____ Zip _____

*Please Print!!!*

Phone: _____ e-mail _____

# Electronic Recorder (ER)

## Levels of Certification and Minimum Skill Sets

### Grade 1 Level

Provided with a handheld device or other Electronic Recording Device that has been pre-loaded, and with the event set-up (i.e. scoreboard addresses, database address, height progressions, number of trials, whether or not there will be finals, etc.), the Grade 1 level official will exhibit the following skills:

- ☐ check-in athletes
- ☐ set starting height for each competitor (vertical jumps)
- ☐ enter marks
- ☐ enter wind readings (horizontal jumps, outdoor)
- ☐ set up a final (from multiple flights and from 1 flight)

### Grade 2 Level

Provided with a handheld device or other Electronic Recording Device that has been preloaded, the Grade 2 level official will exhibit the following skills:

- ☐ manage the event set-up
- ☐ *select English or Metric as the means of measurement*
- ☐ *height progression (vertical events),*
- ☐ *number of trials,*
- ☐ *number of finalists*
- ☐ ***Accomplish the skills for Grade 1 Level.***
- ☐ *add an athlete*
- ☐ *send results to a scoreboard*
- ☐ *send results to the meet database at the end of each round*

### Grade 3 Level

Provided with a handheld device or other Electronic Recording Device, the Grade 3 level official will exhibit the following skills:

- ☐ *set-up scoreboard address/connect to a scoreboard*
- ☐ *download the event schedule from the meet database*
- ☐ *download an event from the meet database*
- ☐ ***Accomplish the skills for Grade 1 level.***
- ☐ ***Accomplish the skills for Grade 2 level.***

# Electronic Measurer (EM)

## Levels of Certification and Skill Sets

### Grade 1 Level

Provided with an Electronic Recording Device that has been preloaded, a Grade 1 level EM Judge will exhibit the following skills:

- ***Accomplish the skills necessary to be a Grade 2 Level Electronic Recorder Judge (FieldLynx operator).***
- After someone else has set up the Electronic Measuring Device (LaserLynx), perform the following:
- *perform all sighting and measurement skills*
- *locate and sight the checkpoint marker to verify calibration*
- *quickly and accurately locate and center on the performance staff reflector*
- *relay to the handheld operator when the mark is to be read (2 man crew)*
- *press/tab the appropriate key/button to record the measurement*

### Grade 2 Level

Provided with an Electronic Recording Device and the Electronic Measurement Device, a Grade 2 level EM Judge will demonstrate the following skills:

- ***Accomplish the skills necessary to be a Grade 3 Level Electronic Recorder Judge (FieldLynx operator).***
- *Perform all of the setup skills for the apparatus*
- *center and level the tripod*
- *attach the head unit*
- *level the head unit*
- *attach all cabling needed*
- *calibrate the instrument*
- *set the controls in the handheld device*
- *establish the checkpoint*
- *tear down and pack the device after use*

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# Electronic Distance Measurement - FieldLynx

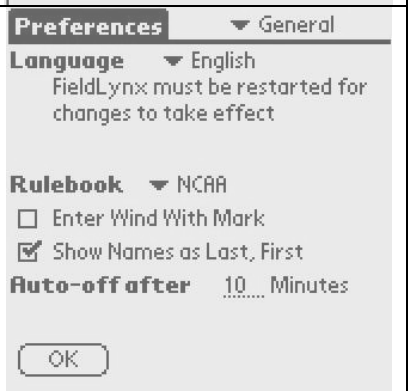
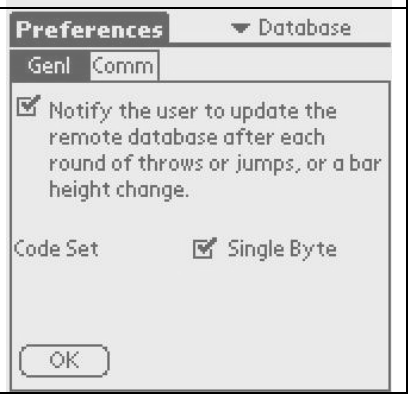
*Hume's Guide for Running Fieldlynx*

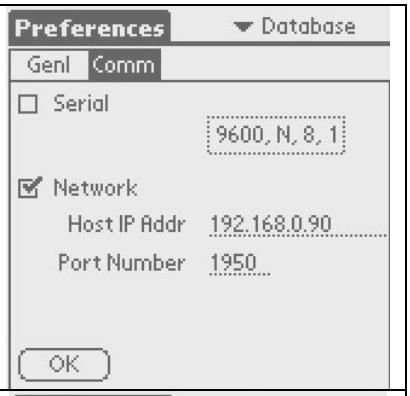
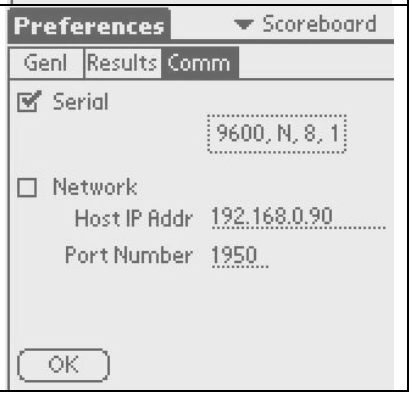
***Polaroid sun glasses do not work real well with the Palm Pilot screen.***

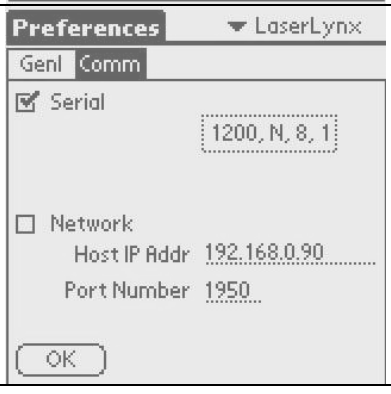
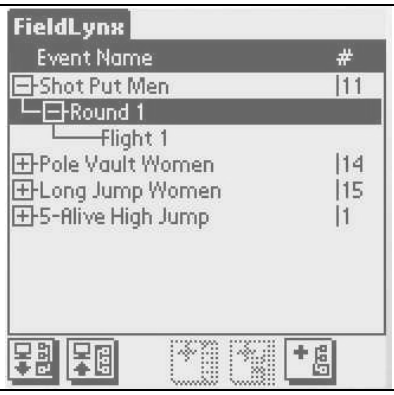

## Table of Contents



## To Begin Fieldlynx and Open an Event

| | |
|---|---|
| **When you are looking at the Palm screen, find the *FieldLynx icon.*** |  |
| **Tap on the FieldLynx icon** |  |
| **The first FieldLynx screen *shows you the events which are loaded.* The + by the event means that there is more to show.** |  |
| **When you use your stylus to "Tap" on the FieldLynx menu, you see this set of selections** |  |
| **On the upper right, you have a pull down menu with a variety of choices. The first choice is "General" and you need to set Language and rule book.** |  |
| **After you deal with "General" go to Database.**<br>**Under "Database General" you need to set your reminder, then select Comm.** |  |

| | |
|---|---|
| **Under "Database Comm" you select connection. Important to make sure your Host IP Address is the IP of the computer running NetExchange.** |  |
| **Under Scoreboard, we have three taps, the information which comes from others.** |  |
| **2nd tab…** |  |
| **3rd tab…** |  |

| | |
|---|---|
| **Under LaserLynx, more "stuff" where someone else has the information.** |  |
| **…and more "stuff"** |  |
| **Continue to tap the + until you reach the bottom level, in this case, *Flight 1*.** |  |
| **Tap on Flight 1 and you see the list of athletes.**<br>**There are two columns, the one which shows the athlete's status, and the one with the athlete's name.**<br>**Tap on the X by Russ Bell.** |  |

**Ooops, you get a dialogue box which reminds you that *you have NOT setup the event.***

**You must setup the event; tell the computer what rules to follow for the event.**

**Tap on OK.**


## To Set Up A Throwing Event

**The dotted line above Russ Bell shows Bell is the name at the top of the page and Beckenhauer is the name at the bottom of the p[age.**

**In order to setup any event, tap on**  **.**


**You must *decide if you are recording your results in metric or English* marks.**

**Tap Next.**


**In the horizontal jumps and throws, you must first decide if everyone will have the same number of attempts, or if you will have trials and finals.**

**Tap on the box to select your choice.**


**After you decide on how you are going to run the vent, fill in the blanks which identify how many attempts and how many advance to the final.**

***Use your stylus to move the cursor to the appropriate blank.***


**When you tap on Next in the above screen, you will have an opportunity to set LaserLynx.**

**Tap on Finish.**


### To Check-In Athletes for Throwing Events

**Now, when you tap on the X by Russ Bell's name, you have the three choices listed below.**


- **You may check in the athlete;**
- **You may Suspend an athlete (more later);**
- **You may force an athlete to be Up (more later).**

***Check in Bell.***

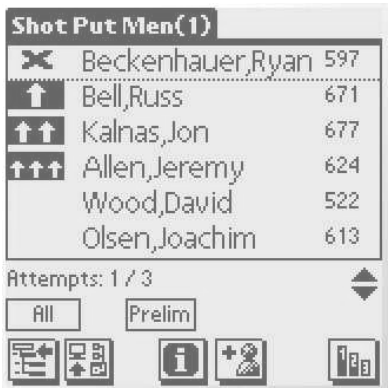
**Check in five athletes.**

**An "X" means the athlete has not been checked in.**

***One arrow,* means the athlete is UP.**

***Two arrows* mean the athlete is on deck.**

***Three arrows* mean the athlete is on hold.**




**Tap on Bell's name and you see the screen where you are to enter your mark.**

- **The X is used for a FOUL.**
- **The P is used for a PASS.**
- **The third icon on the right is an eraser. Highlight a mark and tap on the eraser to erase.**

**Tap on**  **to reach the screen which will let you enter a mark.**


**Use your stylus to tap on the numbers you want.**

**The**  **arrow moves the erases the number to the left of the cursor.**

**The**  **enters the mark and returns to the previous screen.**

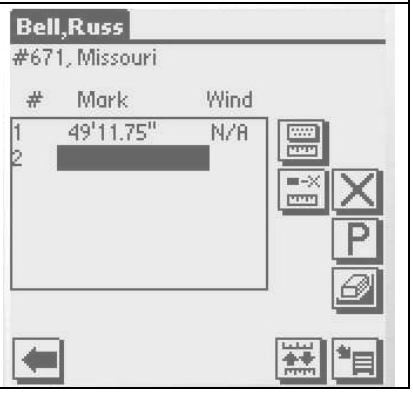

**Oooops, if you did not enter two decimal places after the decimal, you will see this dialogue box.**


**When you reach this screen you should check to make sure the entered the correct mark.**

**Tap on the second icon from the right on the bottom,**  **, to convert a metric mark to English, and back.**


**See, it works!**

**Now tap**  **, the icon in the lower left corner. You will go back one screen and be able to call up your next athlete.**




## To Setup A Horizontal Jump

**You must decide if you are recording your results in Metric or English marks.**

**For the Long Jump I am going to demonstrate English.**

**Tap Next**

**For the long jump, we are going to give each athlete three attempts.**

**Tap on Next.**


**If you are doing a Triple Jump, your next screen allows you to name the jump boards.**

**Tap on the line behind the name, erase Board 1 and type in any name you choose.**


**Yes, you can use LaserLynx on the horizontal jumps, BUT LaserLynx is usually reserved for the long throws.**

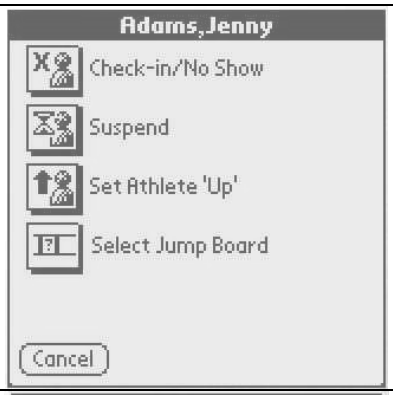
**Tap Finish.**


**The screen shows you that the Attempts have been set to 3 and the athletes will be on the 1st.**


**In the Shot, we set the Attempts to be 3 and asked for a final.**

**There is another box which now says Prelim. When you tap on Prelim, you will create the final and that button says Final.**


**During check-in for horizontal jumps you have a choice to select which board will be used. Usually this will only apply to the triple jump.**

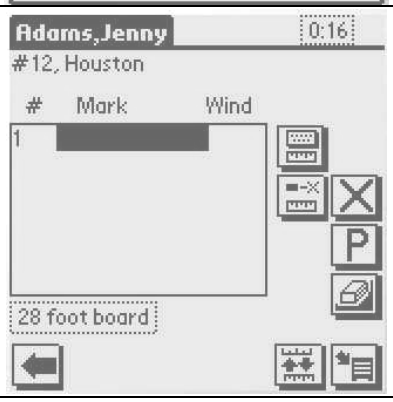



**Tap on your board of choice and say OK.**


**After check-in, when you tap on Jenny Adams' name, you see this screen.**

**Remember "X" means Foul and "P" means Pass.**

**Tap on**  **to begin entering a mark.**




**After you type in numbers for feet you MUST tap Feet.**

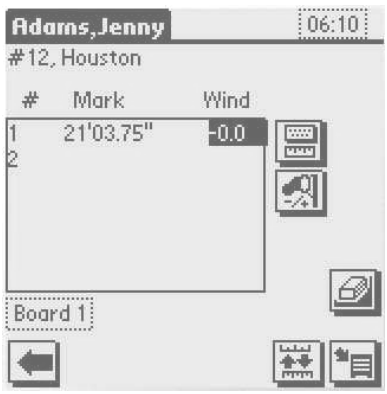
**After you type in numbers for inches, you MUST tap on Inches.**

**Use NM if the jump is not a foul, but not long enough to measure.**

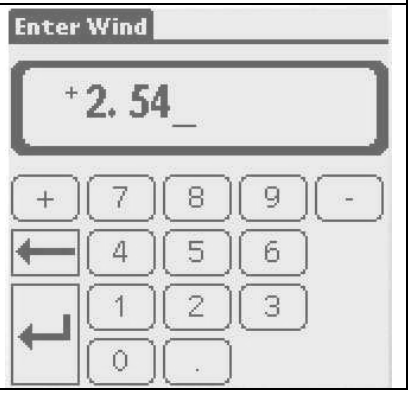

**Tap**  **to go back a screen.**

**Now you are ready to enter the wind reading for your horizontal jump.**

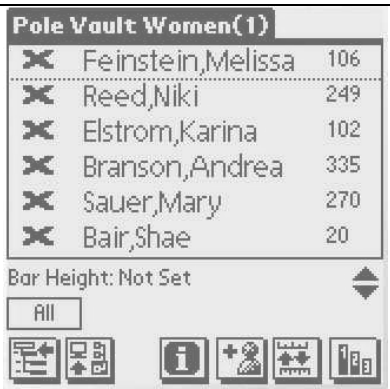
**Tap on the -0.0 under wind and then tap on**  **to**




**To check in an athlete for a horizontal jump**

| | |
|---|---|
| **enter the wind reading.** | |
| **You MUST tap on the [+] or [-] to indicate the direction of the wind.**<br>**Remember, two digits after the decimal point.** |  |

## To Set Up A Vertical Jump

| | |
|---|---|
| **When you reach level of a flight for the high jump, you see the screen on the right.**<br>**Tap on [i] to begin your setup.** |  |
| **Yep, your first chore is to choose to enter results in metric format or English.** |  |

**FieldLynx runs 5-Alive in the manner taught by USATF. If you do not want to use this method, do NOT use 5-Alive. You can call up someone FieldLynx doesn't think should be jumping, BUT it is a pain.**

| | |
|---|---|
| **Your next choice is to "5 Alive" or not.**<br>**The rules say you MAY use 5-Alive, but don't have to. If you do, leave the STOP button checked when you have less than 9 athletes.** |  |

| | |
|---|---|
| **Your next screen lets you set the Starting height, the ending height and the interval.**<br>**Tap on the numbers for starting height and you get the dialogue box which uses the up and down arrows to select your height.** |  |

**You must choose an ending height, BUT you need to be careful. FieldLynx will handle more than 20 heights, but Hy-Tek's Meet Manager will not. Combined event vertical jumps tend to have a far greater spread than invitational events. Don't worry, you can always add a height if you need.**

| | |
|---|---|
| **After you enter your Start, End and Interval heights, you MUST tap on Apply. If you do not you will get a dialogue box which reminds you.** |  |
| **After you Apply, you may View your handy work.** |  |

- **You may need to add a height if your end height is too low.**
- **You may need to add a height or change a height if the last jumper wants to try a non standard height.**
- ***You may need to change heights if, as in a championship meet, where the opening increments are one height, but then changes to something less.***

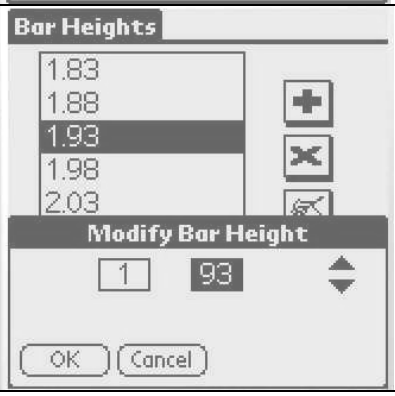
**It is here in View bar heights where you can change your bar heights.**

**When you tap on the  on the side you get this screen.**

**You will ADD a bar height after the highlighted number.**


**If you want to delete a height highlight a height and tap on the x.**


**You may adjust a height by selecting a height to change and taping on the hand holding a pencil.**



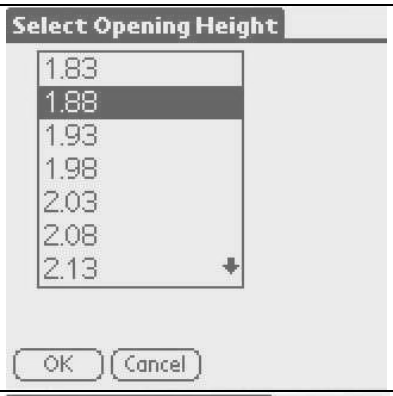

## To Check In An Athlete For A Vertical Jump

**When you tap on the "X" to the left of Niki Reed you get this screen.**

**If you tap on Check-In the athlete will begin at the first height.**

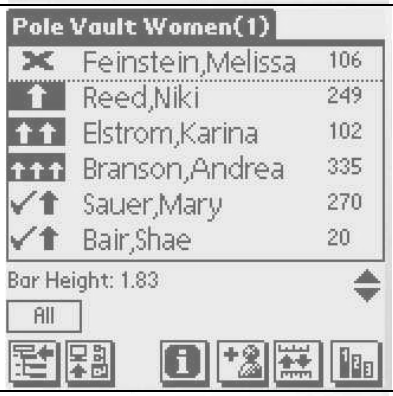
**To set a different opening height, tap on Set Opening Height.**


**Tap on your selected opening height and tap on OK.**




**This screen shows UP, On Deck, On Hold, and the other two in the 5-Alive series.**

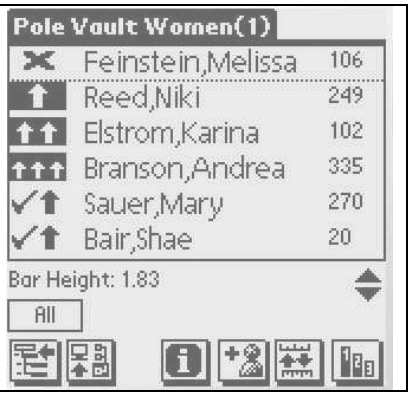
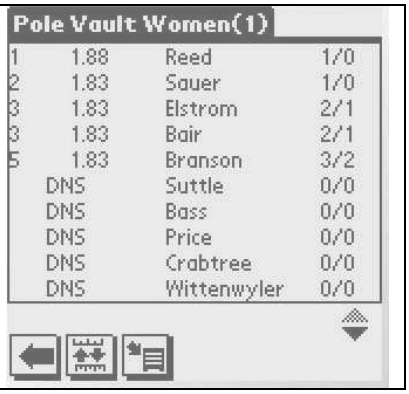
**If you tap on All, you will only see the five in/remaining in 5-Alive.**




**In Niki's case, if I checked her in to open at 1.88. Notice she already has pass down for 1.83.**


**Of course, if I did not check Niki in to open at 1.88, she would open at 1.83.**

- **Tap on O if she makes the height.**
- **Tap on X if she misses the height.**
- **Tap on P if she passes.**

| | |
|---|---|
| **Please note that when you tap on the Award Stand,**  **, lower right, you see the placing AND why.** |   |
| **Note the tie breakers**<br>• **The first number is the jump on which they made their last height.**<br>• **The second number is the number of their misses in the competition.** |   |

You can explore the Lynx site by going to www.finishlynx.com. Every time your pointer is on a choice, you see more drop down menus.

The following is the World Wide Web address for downloading new versions of the FieldLynx demo version 3.0.

http://www.finishlynx.com/products/fieldlynx/overview/body.htm

http://www.finishlynx.com/products/handhelds/software/download/index.htm

You can download a DEMO version. When you download the DEMO version, you have an opportunity to practice EVEN if you do not have a Palm Pilot.

www.finishlynx.com
Downloads
FieldLynx
Download
Demo Version (the 2nd choice)

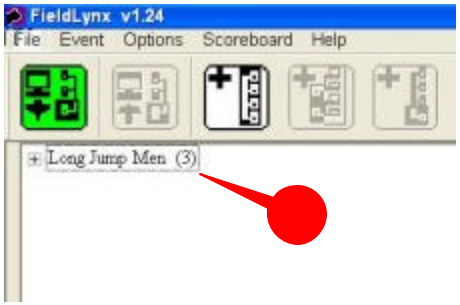
Hugues Lacroix – hlacroix@finishlynx.com
Support - support@finishlynx.com

# FieldLynx™ Horizontal Jumps Quick Start

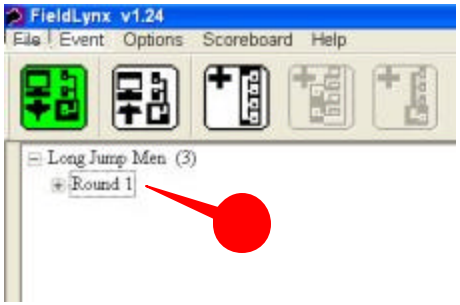
## Step 1: Open the flight sheet for the jumping event

1. Turn on the computer.
2. Tap the Start Icon and Select Programs
3. From the Programs Folder, tap to open FieldLynx. The main screen appears.

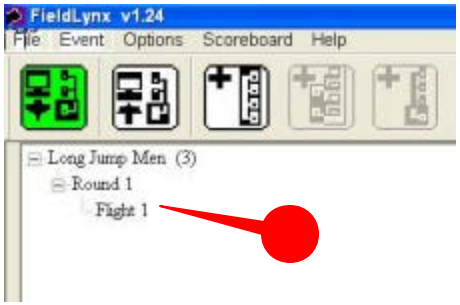
4. Tap next to the jumping event.



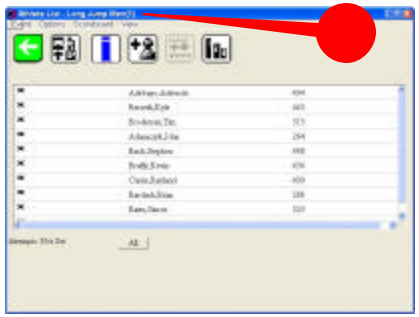

5. Tap next to **Round 1**.




6. Tap **Flight 1**.




7. The flight sheet appears.



## Step 2: Set up the jumping event

1. Tap to set up the horizontal jumping event.
2. Follow the instructions on the screen.
   - Set Measure to Metric or English, then tap Next.
   - Set up the Attempts.
   - If you are using LaserLynx, click Next and setup the laser control measurements, to save tap on Finish button.

## Step 3: Check in competitors

On the flight sheet, tap next to the competitor's name and then tap to check in the competitor. Later, you can:

- Tap to suspend a competitor.
- Tap to make a competitor up next.

After check-in, arrows are next to competitors' names:

- One Arrow - competitor is up.
- Two Arrows - competitor is on deck.
- Three Arrows - competitor is on hold.

## Step 4: Enter a competitor's mark

1. Tap on the competitor who is up next. The mark entry screen appears. Tap:
   - and enter the values using the keyboard.
     Then, tap .
   - to scratch the mark.
   - to pass the mark.
   - to erase the mark and enter a new one.
2. Tap under the word, **Wind**, to enter the wind reading.
3. Tap to return to the flight sheet. Repeat for all competitors.

*(See Over)*

## Step 5: Send results

Go to the flight sheet and tap  .

### Add a competitor or edit an existing competitor

Tap  , enter the competitor's information, and then tap **OK**.

### Display standings

If you want to see the competitors listed in order of current standings, go to the flight sheet and tap  .

### Convert quickly to English or Metric

Tap  .

### If you are measuring with a laser

When entering a competitor's mark, tap  .

### If you are connected to a wind gauge

When entering a competitor's wind reading, tap  .

### If you are sending results to a scoreboard

Go to the mark entry or standings screen and tap  .

## Quick Reference

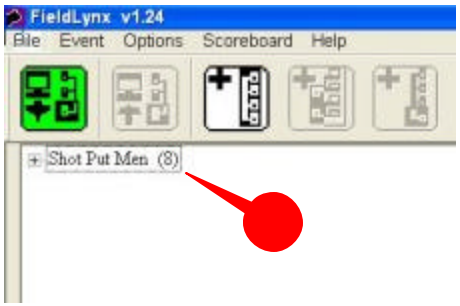
| If you want to… | Tap here. |
|---|---|
| Open FieldLynx |  |
| Open a flight |   |
| Set up the jumping event |  |
| Check in a competitor | , then  |
| Suspend a competitor |  |
| Make a competitor up next |  |
| Record a mark |  , then  |
| Scratch a mark |  |
| Pass a mark |  |
| Erase a mark |  |
| Enter a wind reading |   |
| Return to the flight sheet |  |
| Send results |  |

# FieldLynx™ Windows Throws Quick Start

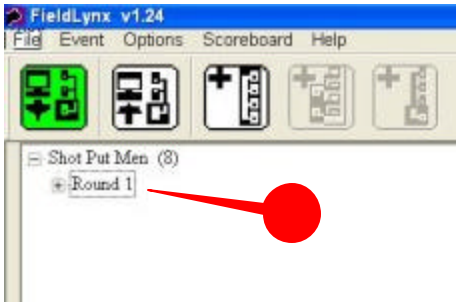
## Step 1: Open the flight sheet for the throwing event

1. Turn on the computer.
2. Tap the Start Icon and Select Programs
3. From the Programs Folder, tap to open FieldLynx. The main screen appears.

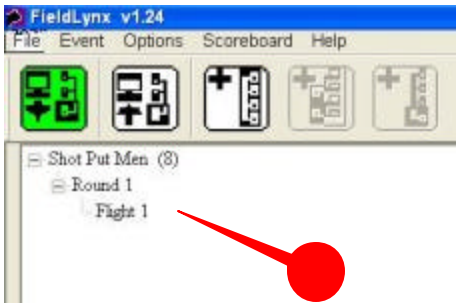
4. Tap next to the throwing event.



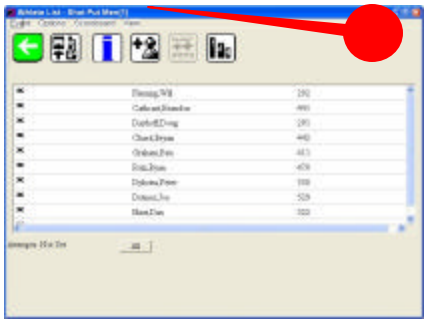

5. Tap next to **Round 1**.




6. Tap **Flight 1**.




7. The flight sheet appears.



## Step 2: Set up the throwing event

1. Tap to set up the throwing event.
2. Follow the instructions on the screen.
   - Set Measure to Metric or English, then tap Next.
   - Set up the Attempts.
   - If you are using LaserLynx, click Next and setup the laser control measurements, to save tap on Finish button.

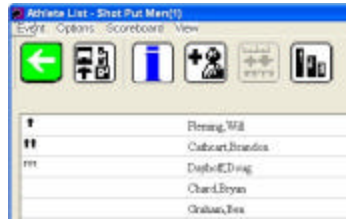
## Step 3: Check in competitors

On the flight sheet, Tap next to the competitor's name and then tap . Later, you can:

- Tap to suspend a competitor.
- Tap to make a competitor up next.

After check-in, arrows are next to competitors' names:

- Single Arrow - competitor is up.
- Two Arrows - competitor is on deck.
- Three Arrows - competitor is on hold.



## Step 4: Enter a competitor's mark

1. Tap on the competitor up next (single arrow). The mark entry screen appears:
2. Record the competitor's mark.
   - Tap: and enter the values using the keyboard. Then, tap .
   - to scratch the mark.
   - to pass the mark.
   - to erase the mark and enter a new one.

*(See Over)*

3. Tap  to return to the flight sheet. Repeat for all competitors.

### Step 5: Send results

Go to the flight sheet and tap  .

---

### Add a competitor or edit an existing competitor

Tap  , enter the competitor's information, and then tap **OK**.

### Display standings

If you want to see the competitors listed in order of current standings, go to the flight sheet and tap  .

### Convert quickly to English or Metric

Tap  .

### If you are measuring with a laser

When entering a competitor's mark, tap  .

### If you are sending results to a scoreboard

Go to the mark entry or standings screen and tap  .

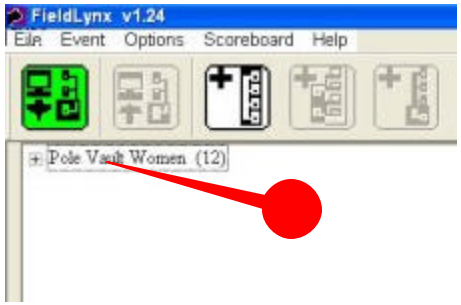
## Quick Reference

| If you want to… | Tap here. |
|---|---|
| Open FieldLynx |  |
| Open a flight |   |
| Set up the throwing event |  |
| Check in a competitor | , then  |
| Suspend a competitor |  |
| Make a competitor up next |  |
| Record a mark |  , then  |
| Scratch a mark |  |
| Pass a mark |  |
| Erase a mark |  |
| Return to the flight sheet |  |
| Send results |  |

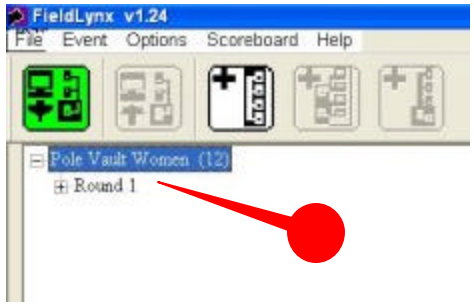
# FieldLynx™ Windows Vertical Jumps Quick Start

## Step 1: Open the flight sheet for the Vertical event

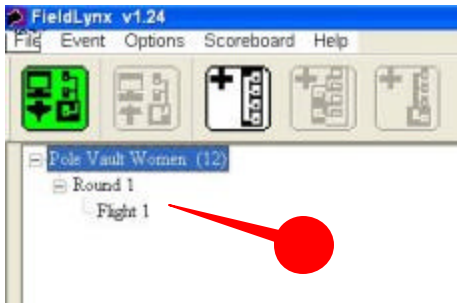
1. Turn on the computer.
2. Tap the Start Icon and Select Programs
3. From the Programs Folder, tap to open FieldLynx. The main screen appears.
4. Tap ⊞ next to the jumping event.



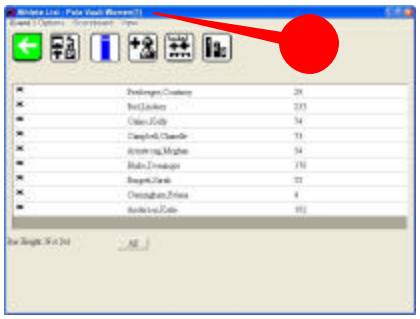

5. Tap ⊞ next to Round 1.




6. Tap Flight 1.




7. The flight sheet appears.



## Step 2: Set up the vertical jumping event

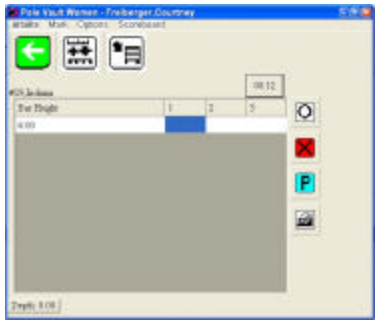
1. Tap to set up the jumping event.
2. Follow the instructions on the screen.
   - Set Measure to Metric or English
   - Set the Alive group (3, 4, 5, or All)
   - Set up the Attempts.
   - Tap on Finish

## Step 3: Check in competitors

1. Tap next to the competitor's name and then tap Later, you can tap in the up/deck/hold area to do the following:
   - Tap to enter a competitor's starting height.
   - Tap to suspend a competitor.
   - Tap to make a competitor up next.
2. After check-in, arrows are next to competitors' names:
   - Single Arrow - competitor is up.
   - Two Arrows - competitor is on deck.
   - Three Arrows - competitor is on hold.

## Step 4: Record a performance

1. Tap on the competitor who is up next (single arrow). The mark entry screen appears:



To record the competitor's performance. Tap:

- if the competitor clears the height.
- if the competitor misses the height

*(see over)*

- if the competitor chooses to pass the attempt.

- to erase the mark and enter a new one.

2. Tap to return to the flight sheet. Repeat for all competitors.

### Step 5: Send results

1. Go to the flight sheet and tap .

---

### Add or modify bar heights

Tap . Then, tap Next, Next, and then View. At the Bar Heights screen, tap:

- to add a bar height to the current list.
- to delete a bar height from the list.
- to modify a bar height on the list.

### Add a competitor or edit an existing competitor

Tap , enter the competitor's information, and then tap **OK**.

### Display standings

Go to the flight sheet and tap.

### Convert quickly to English or Metric

Tap .

### If you are sending results to a scoreboard

Go to the mark entry or standings screen and tap .

## Quick Reference

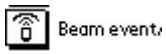
| If you want to… | Tap here. |
|---|---|
| Open FieldLynx | |
| Open a flight | Flight 1 |
| Set up the jumping event | |
| Check in a competitor | , then |
| Suspend a competitor | |
| Make a competitor up next | |
| Enter a competitor's starting height | |
| Clear a height | |
| No height | |
| Pass an attempt | |
| Erase an entry | |
| Return to the flight sheet | |
| Send results | |

# FieldLynx for Vertical Jumps by Jim McGloin


1. Start page…if you get lost, return here and start over.
2. Event start page…click on '***FieldLynx***' to load event.


3. Download event(s)…click here.
4. Load event(s) number from schedule…and then
5. Click here to load event(s)


6. If beaming to another Palm…click on ***'FieldLynx'*** as in step 2




7. Line up the two Palms and beam event.

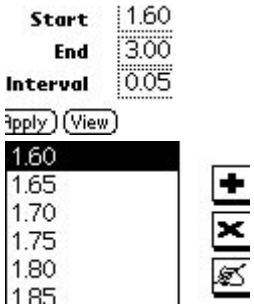

8. If not beaming, click on + sign again to see flights.


9. Click on ***'Flight 1'*** to see event line-up


10. On the event line-up page find…


11. This is where you set-up the event.


12. Choose Metric or English.
13. Choose alive or all.
14. Set the progression




15. Choose start height and interval.
16. View your progression.

17. Add, delete or change a height.

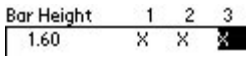

18. Done, finish and return to line-up.



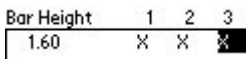

19. Click on **X** to check in athlete.


20. Check in at opening height or set height.

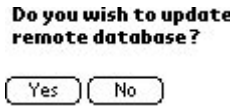

21. Click on desired opening height.
22. Athletes up, on deck, on hold.


23. May has a good jump.




24. Three and out.

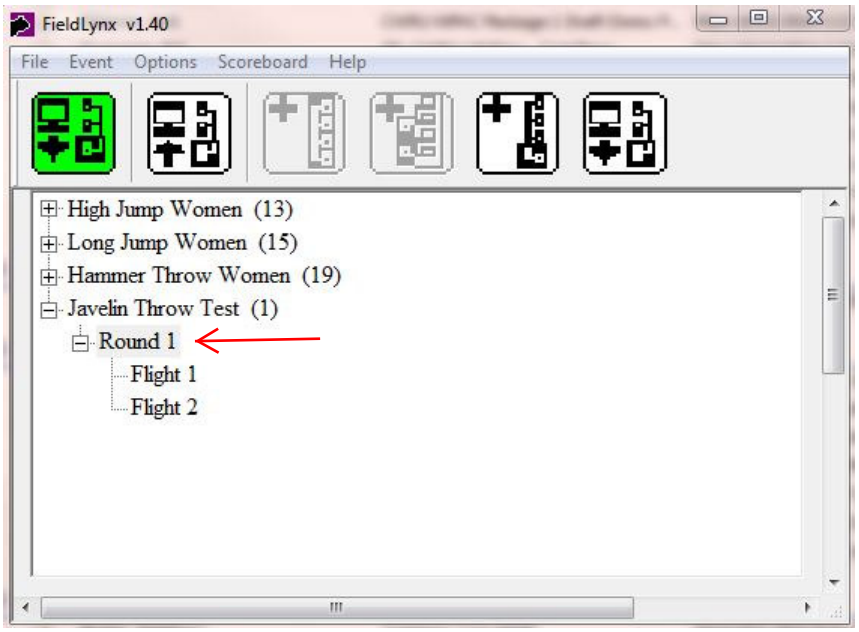



25. Also out of the competition.
26. Click **Yes** to upload results to Hy-Tek Meet Manager.

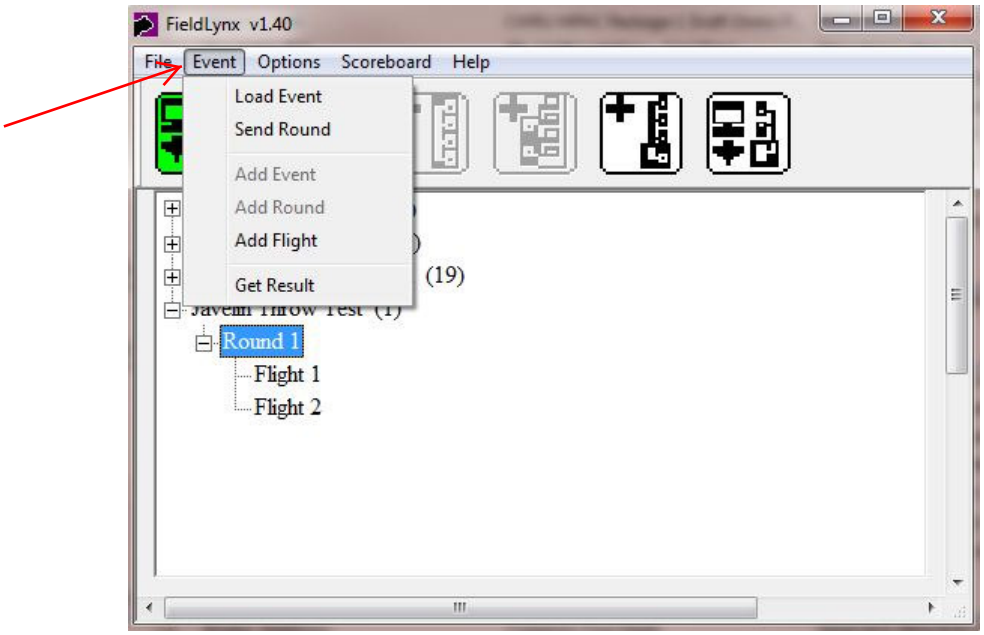
# How to Setup Finals in FieldLynx

After all flights have been completed, follow the steps below:

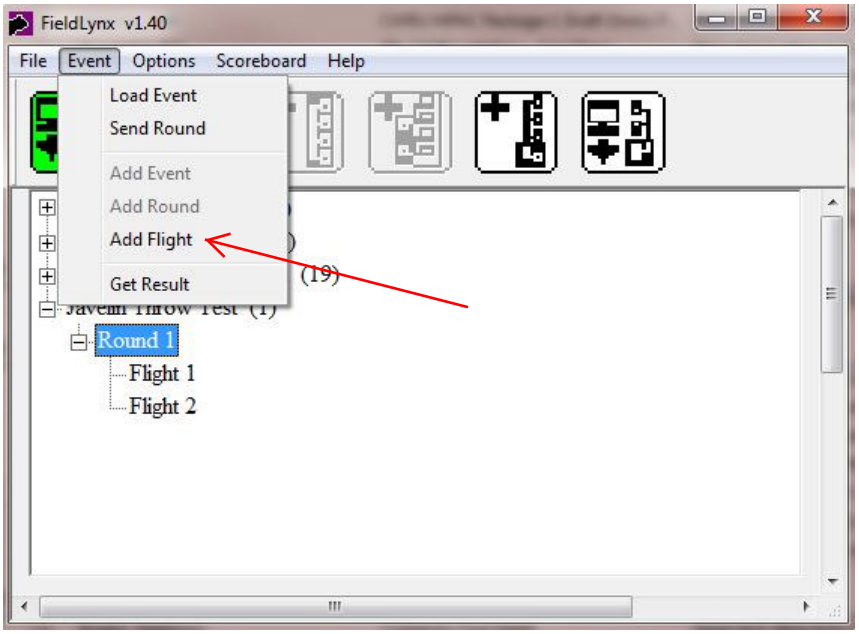
1. Click on “Round”



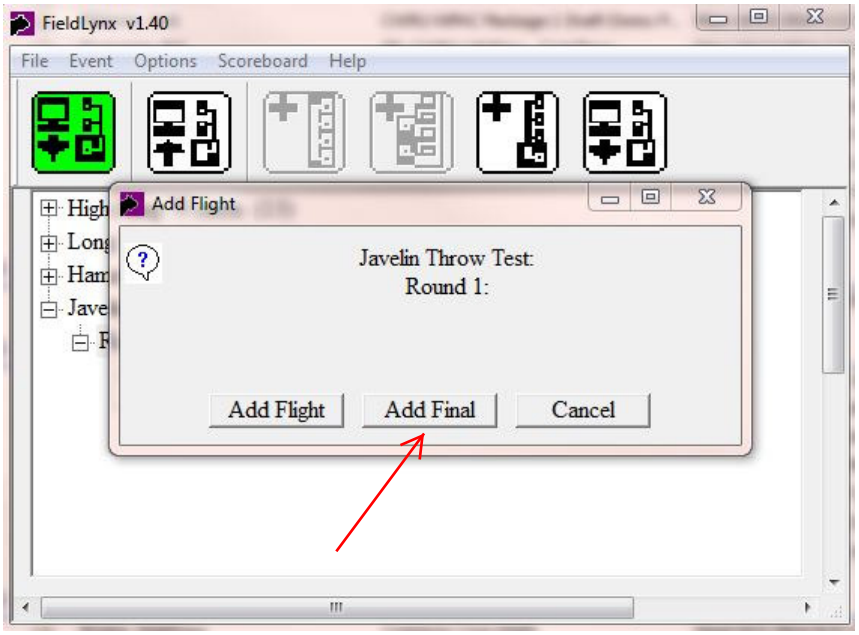

2. Click on “Event”



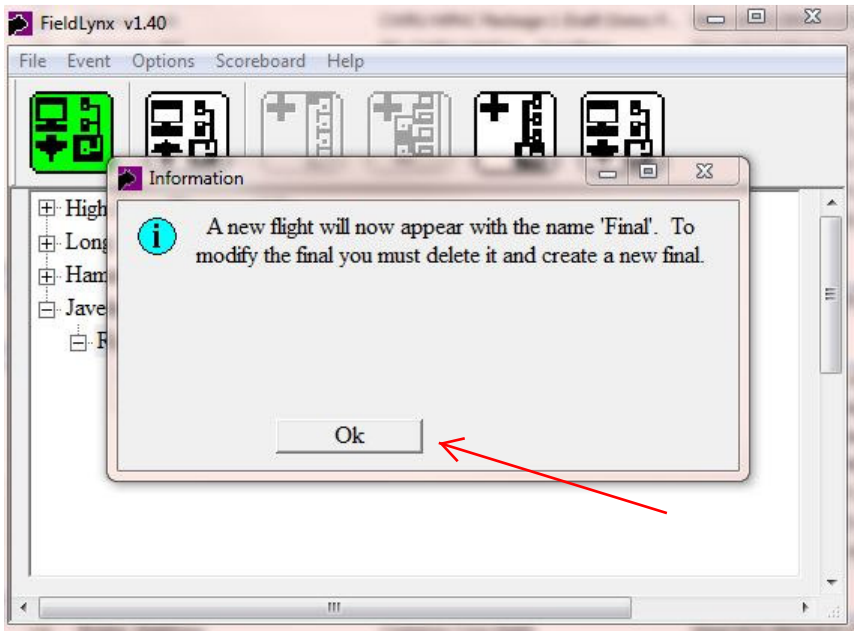
3. Click on “Add Flight”



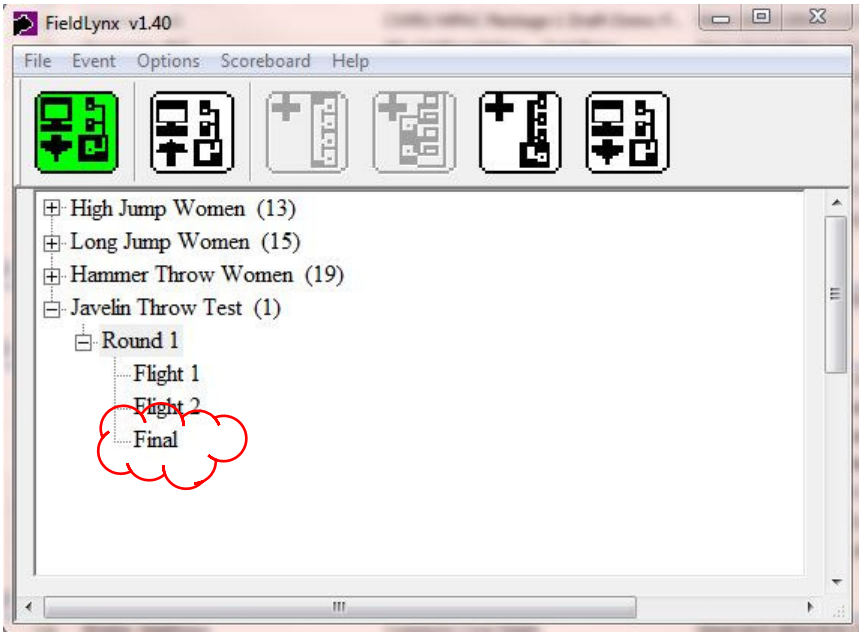

4. Click on “Add Final”



5. Click On “OK”




**The Final is created!**



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# How to Combine Results from Multiple Pits into One Final in FieldLynx

1. Make sure NetExchange 3.20 is installed and running on the database computer.

2. Setup each device for "straight" attempts. For example, 3 attempts (instead of a jump-reorder-jump).

3. Administer each flight on their independent devices.

4. Send the results from each device back to NetExchange.

5. Determine which device will administer the final and load the results from the other device onto this device.

6. Select the round for this flight.

7. The "Get Results" button now appears on the toolbar. Click on it.

8. Select the flight number that was administered on the other device and click OK.

9. The results from the other device will appear in the round lists as a completed flight.

10. Adjust the setup for the flights in order to be able to create a Final.

11. Go into the setup for any of the flights and change from straight attempts to jump-reorder-jump and enter the correct numbers for initial attempts, take to final and final attempts.

12. Select the round for the event you are administering and click "Create Final". Follow the on-screen instructions.

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# Electronic Distance Measurement - Horizontal Jumps

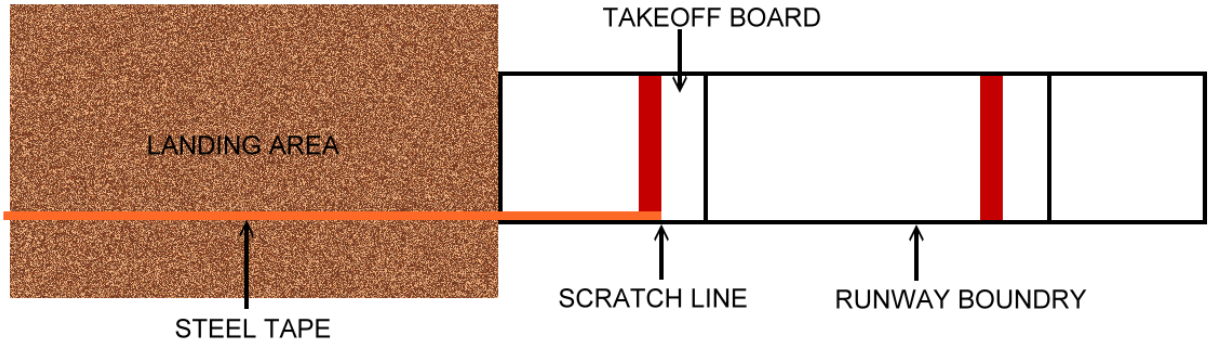
**Mark Heckel, Master Official**
**Three Rivers Association, USA Track & Field**

**448 Dogwood Lane Hughesville,**
**PA 17737**
**mtheckel@windstream.net**
**570.584.3128**

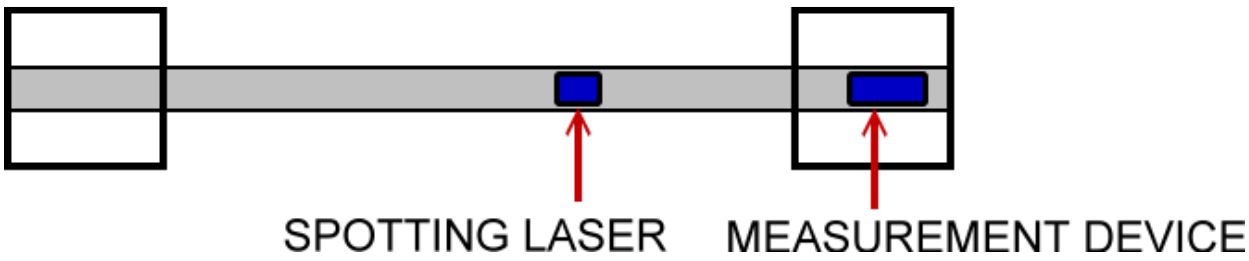
I. Basic setup of the beam

You can use a standard, certified steel tape to create the baseline for your setup. In the illustration below, the steel tape is laid perpendicular to the scratch line of the take-off board. To ensure that it is perpendicular, we use the lane boundary line. Since the take-off board must be perpendicular to the lane boundary line, this serves as a guide for alignment.

We place the "0" end of the tape at the scratch line, and extend it into the pit (preferably through the pit) to a distance that is approximately the length of the longest anticipated jump.

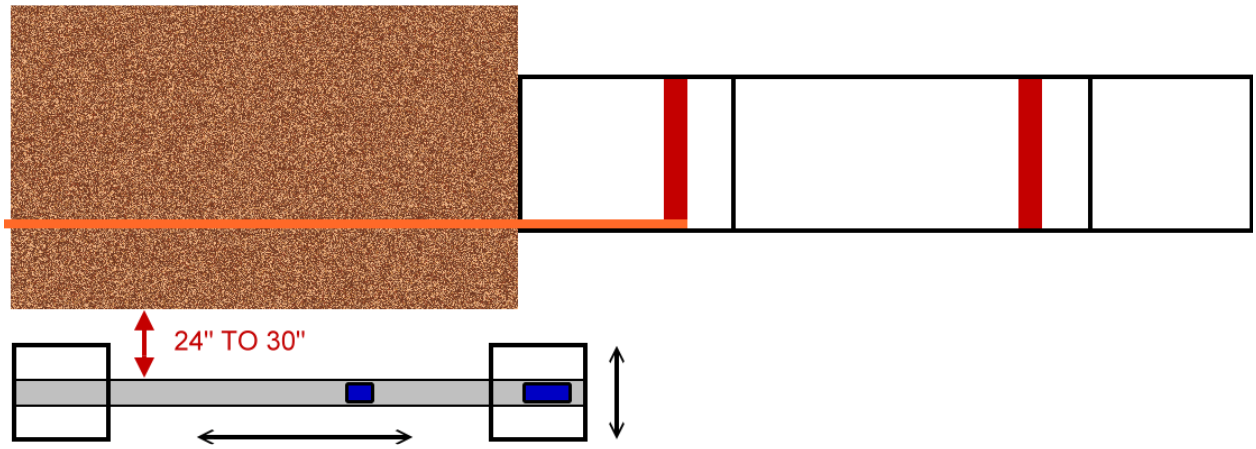



Next, we set up the beam that will be holding both the spotting laser and the reading device. Attach the reading device securely near the end of the beam that is closest to the takeoff board. Attach the spotting laser to the trolley that will move along the beam. Be sure to use a lubricant that is workable on the beam so that the trolley slides easily from one end to the other.



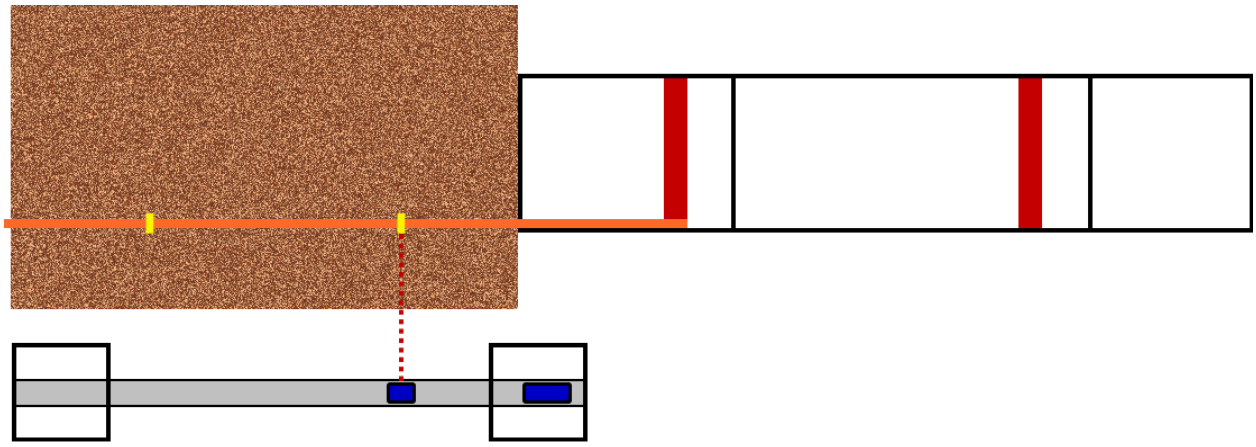
When you are setting up the beam, ideally, it should allow for the spotting laser to be able to travel as far back as the leading edge of the pit nearest to the take-off board. Since any attempt in which the athlete makes the land area, without otherwise committing a foul, is considered a legal attempt, it must be measured. If the spotting laser cannot be pulled back far enough (close enough) to the edge of the pit, an alternative method of measurement will be required for those jumps.

In general, the beam should be level both in the direction of the landing area, and perpendicular to the landing area. It should be placed a minimum of 24” to 30” from the nearest edge of the landing area. You may need to use shims to level the beam, or the built in leveling mechanism on the beam. In addition, you may need sandbags or other stable weight to keep the bases from shifting.




Once the beam has been placed and leveled, you should take at least two (2) sample measurements to calibrate the measuring device. It is recommended that these two measurements be around the minimum and maximum distances that are anticipated during the competition.

Using the already in place steel tape, align the marking stake at one of the marks. Note the distance on the steel tape (for example, 4.50m). Using the spotting laser, align it with the edge of the white stripe on the marking stake that is closest to the take-off board.



**Setting the measurement device to metric**

1. Press and hold the “menu” key to enter the setup menu.
2. Press + or – to navigate through the keys.
3. Press “menu” briefly to enter the menu sub menu
4. Press + or – to make alterations to the submenu.
5. Press and hold “menu” to accept the settings.
6. Press the “clear/off” key for longer to quit the settings function.

**Verifying Laser Accuracy**

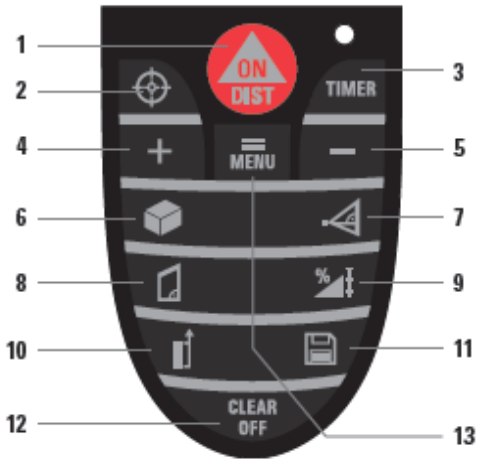
At the beginning of every meet check the accuracy of the laser.

1. Lay out a certified steel tape on the runway or apron. You can use any distance you want for the measurement; we’ll say 5.00 meters for this example.
2. Lay the laser and stand on the tape with zero at base of stand.
3. Place a target at exactly 4.97 meters. Any small, stable object will work as the target.
4. Shoot the laser at the target. The reading should be 5.00 because we’ve included .03 meters in the offset for the thickness of the crossbar. Remember it’s the top of the bar you’re trying to measure.
5. Recalibrate the offset if necessary.

**Calibrating the measurement device**


These instructions are based on using the Leica Disto A5; however, the process is essentially the same on all Leica units.

# Leica DISTO™ D5




| | Buttons |
|---|---|
| 1 | ON / DIST (On/measuring) |
| 2 | Digital Pointfinder |
| 3 | Timer |
| 4 | Plus (+) |
| 5 | Minus (-) |
| 6 | Area / volume |
| 7 | Indirect measurement (Pythagoras) |
| 8 | Trapezium |
| 9 | Functions |
| 10 | Reference |
| 11 | Storage / Memory |
| 12 | Clear / Off |
| 13 | Menu / Equal |

- when it has to be **right**

Leica Geosystems

Turn the unit on by pressing the On/Dist key.


Press the **Menu** button. You will see **Unit** on the flashing screen. Press the button again until **Offset** appears on the screen.

Press the **=** key. The screen will display the current offset. Using the **+** and **–** keys, reset the offset to 0.000m. Press the **=** key to confirm the offset is set to 0.000m.


With the spotting laser still on the check mark, press the **On/Dist** key. The measurement from the end of the measuring device nearest the scratch line to the spotting laser will appear. (For example, the distance may appear as 3.500m). Since the marker rod is at 4.50m, we need to set the offset to 1.000m.

Repeat the process of accessing the **Offset** menu.

This time, use the **+** and **–** keys to set the offset at 1.000m.

Press the **=** key to confirm the offset and lock it in.

Without moving the spotting laser, press the **On/Dist** key to take another measurement. The new distance on the screen should now read approximately 4.500m. Remember that the last digit to the right is ignored when reading the measurement. A reading of 4.508m would be 4.50m.

Move the spotting laser to the second checkmark, read and verify the distance.

As an in-event checkmark, pick a distance that you can quickly move the spotting laser to. Place a small marker, such as a small piece of tape, on the ground outside the landing area that will not be disturbed. This can serve as a checkmark during the competition.

Record this distance on a separate sheet of paper. Between flights or between trials and finals, you can move to the check mark and verify that the beam has not moved.

**Measuring the landing mark**

1. Once the athlete has exited the pit, insert the stake into the sand. Make sure the stake is placed so the middle of the white tape is inside the depression made by the jumper, rather than in front of the depression. The tape must be on the side facing the guide rail.

2. Slide the scope carriage down the rail until the spotting scope beam is aligned with the edge nearest the take-off board of the white line on the stake. Once it is aligned, step back from the rail.

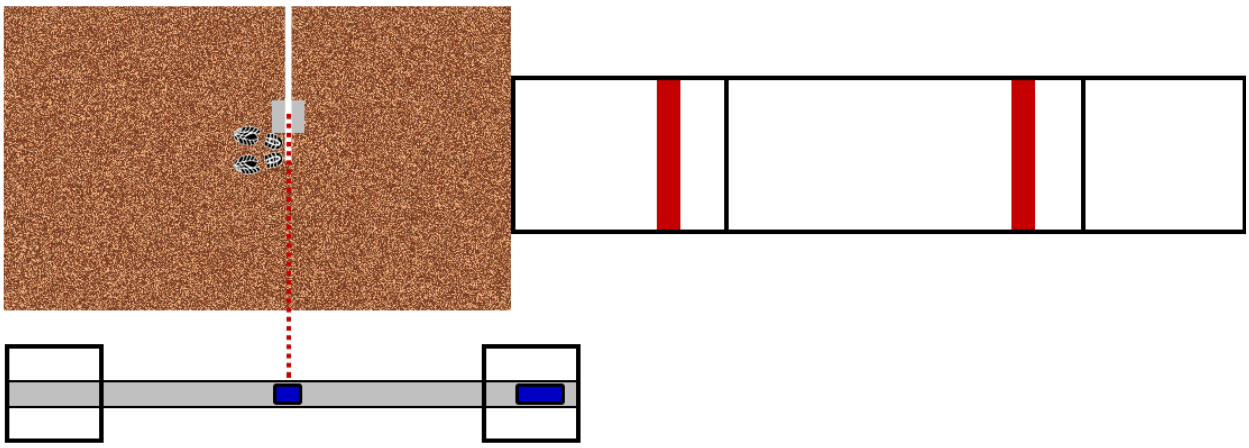
3. Record the distance with the measuring laser. Press the **On/Dist** button to turn the laser on.

4. The screen will display three hashes, signifying the laser is on and ready to take a measurement.


5. Press the **On/Dist** button again to take a measurement.

6. Press the **On/Dist** button again to reset the laser but keep the measurement on screen.


7. Press the **On/Dist** button again to record the next measurement.
8. If you continue to take measurements by pressing the **On/Dist** button and do not press the **Clear/Off** button in between, the device will display the previous three measurements taken.



**When the competition is over**

Even though you have periodically checked your check mark, you should repeat the process that you used in setting up. Run the steel tape out parallel to the lane boundary, and measure the same points that you measured during the setup process. Your measurements should match.

***Notes:***

- Be sure to have a couple of towels available to cover the spotting laser and the measuring device between rounds, especially in wet or sunny conditions.
- You will also need some type of lubricant for the beam. Depending on its material makeup, silicon or WD-40 will work very well.
- You may need to periodically wipe down the beam, as sand and grit will tend to accumulate on it.
- Green lasers work best for outdoor competition, while red lasers tend to work best for indoor competition.
- Have a tablet or small notebook to record your setup measurements and your checkmark measurement.
- A small torpedo level should be part of your kit to check the level of the beam.
- Have some wood shims in case they are needed to level the beam.
- A steel tape of at least 25’ (long jump) or 50’ (triple jump) should be used. Normally, these are part of the horizontal events crew bag.

## Disto A5 Error Codes

### Message Codes

All message codes will be displayed with either "InFo" or "Error".
The following mistakes can be corrected:

| InFo | Cause | Remedy |
|---|---|---|
| 204 | Calculation error | Repeat procedure |
| 206 | No endpiece detection | Attach the endpiece properly. If error still occurs, replace the endpiece. |
| 252 | Temperature too high | Cool down instrument |
| 253 | Temperatur too low | Warm up instrument |
| 255 | Receiver signal too weak, measurement time too long, distance › 100 m | Use target plate |

| InFo | Cause | Remedy |
|---|---|---|
| 256 | Received signal too powerful | Use target plate (grey side) |
| 257 | Wrong measurement, ambient brightness too high | Use target plate (brown side) |
| 260 | Laser beam interrupted | Repeat measurement |

| Error | Cause | Remedy |
|---|---|---|
|  | Hardware error | Switch on/off the device several times and check if the symbol still appears. If so please call your dealer for assistance. |

## Disto D5 Error Codes

| Error Code | Cause | Remedy |
|---|---|---|
| 156 | Transverse tilt greater than 10 degrees | Hold the instrument without any transverse tilt. Standards on 0. |
| 160 | Main tilt direction, angle too high > 45 degrees | Measure angle up to max +/- 45 degrees |
| 162 | The calibration has not been accomplished on a leveled surface and the calibration value is respectively within an ineligible area | Calibrate the device on an absolute horizontal leveled surface. |
| 204 | Calculation error | Repeat procedure |
| 252 | Temperature too high, above 122 F | Cool down instrument |
| 253 | Temperature too low, below 32 F | Warm up instrument |
| 255 | Receiver signal too weak.<br>Measurement time too long.<br>Distance too long, > 100m | Use white or grey target color. |
| 256 | Received signal too strong.<br>Target too reflective | Use white or grey target color. |
| 257 | Erroneous measurement.<br>Too much backlight. | Darken target (measure in different lighting conditions) |
| 260 | Laser beam interrupted | Repeat measurement |
| Error | Hardware error | Switch on/off the device several times.<br>If the symbol still appears, then your instrument is defective. |

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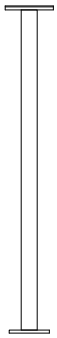
# LJ TJ LASER MEASURING DEVICE
## PART LIST

18" REINFORCED BASE
700205 (2)

| SHIP LIST | | |
|---|---|---|
| 2 | 700205 | 18" REINFORCED BASE |
| 2 | 7373010 | SCOPE LEG ASSEMBLY |
| 1 | 7373025 | SCOPE RAIL |
| 1 | 7373030 | LASER CARRIAGE |
| 1 | 7373035 | SCOPE CARRIAGE |
| 1 | E73710 | DISTO A5 US HANDHELD |
| 2 | 7373040 | LASER TAPE STAKE |
| 1 | M27582 | GREEN SPOTTING LASER |
| 1 | 7373060 | HARDWARE KIT, LJ LASER |

SCOPE LEG ASSEMBLY
7373010 (2)

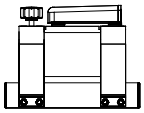


E7373060 HARDWARE KIT:

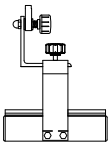
| | | |
|---|---|---|
| 4 | M2268 | 3/8" X 3" HEX BOLT GR5 ZINC |
| 4 | M2014 | 1" SELF-LOCK STRIP (2" LONG) |
| 2 | 7373032 | CLAMP PLATE |
| 2 | M1776 | CAP PLATE |
| 2 | M1806 | INTERNAL MOUNTING PLATE |
| 2 | M2273 | WASHER FLAT 5/16" PLATED |
| 2 | M1279 | 5/16"-20 x 1" HEX BOLT PLATED |

SCOPE RAIL
252" STD EXTRUSION #11373 (720110)
7373025 (1)

LASER CARRIAGE
7373030 (1)



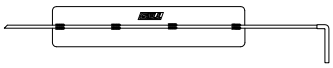
SCOPE CARRIAGE
7373035 (1)



DISTO A5 US HANDHELD
E73710 (1)

GREEN SPOTTING LASER
M27582 (1)

LASER TAPE STAKE
7373040 (2)



THIS WARNING IS GIVEN IN COMPLIANCE WITH CALIFORNIA'S PROPOSITION 65:
**WARNING**
This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.



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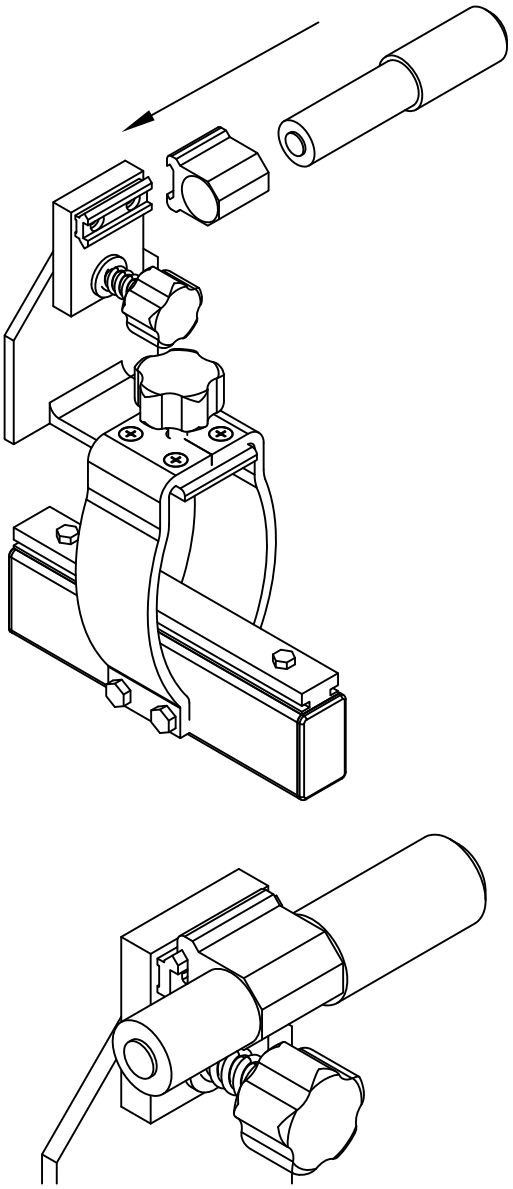
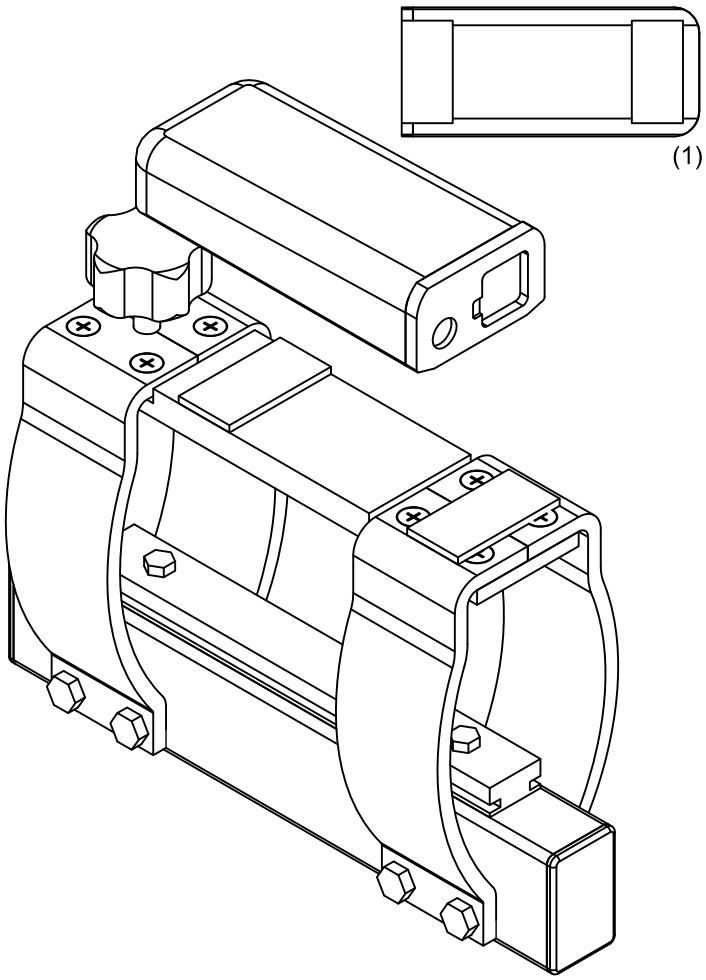
# LJ TJ LASER MEASURING DEVICE
CARRIAGE ASSEMBLY



## Scope Carriage

**What you'll need:**
- (1) M27582 Green Spotting laser
- (1) 7373035 Scope carriage
- Allen wrench (provided with laser)

To assemble the scope carriage, attach the laser clamp (provided with laser) to the rail. Then slide the laser into the clamp and tighten it to secure the laser.




## Laser Carriage

**What you'll need:**
- (4) M2014 1" Self-Lock Strip (2" long)
- (1) E73710 DISTO A5 Handheld laser
- (1) 7373030 Laser carriage

To assemble the laser carriage, reveal the adhesive backing on 2 of the self-lock strips and attach them to the bottom of the Leica DISTO A5 laser as shown in diagram 1 above. Press the self-lock of the remaining 2 strips to the pieces already on the bottom of the laser. Remove the covering off the adhesive back. Align the front of the laser with the front of the carriage and press down firmly until the laser is securely fastened.

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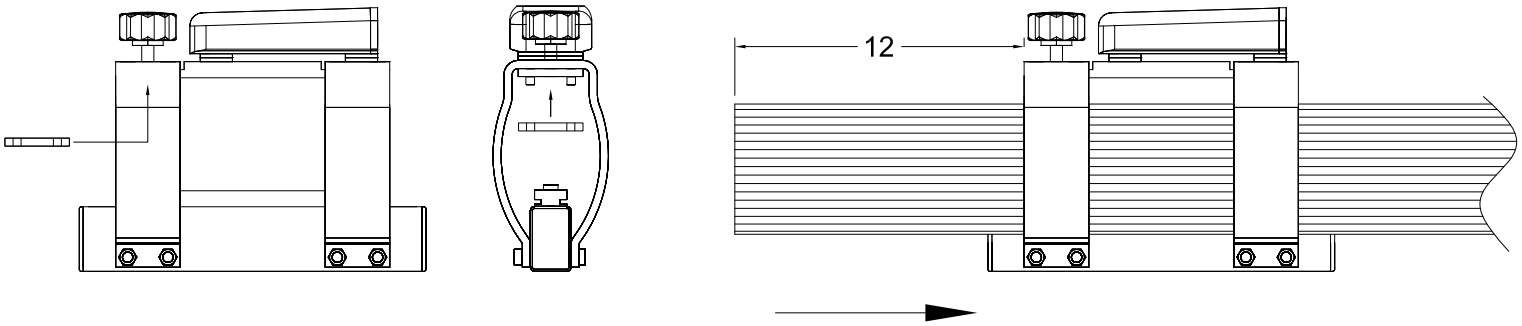
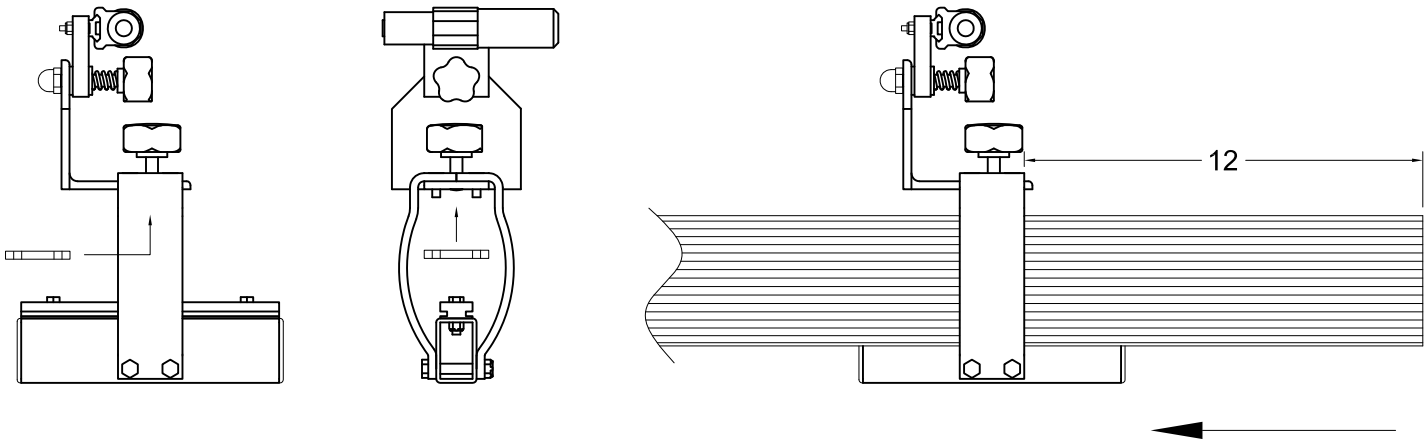
# LJ TJ LASER MEASURING DEVICE
## RAIL - CARRIAGE ASSEMBLY

## What you'll need:

- Laser carriage
- Scope carriage
- Rail
- Adjustable wrench
- Hardware:
  A. (2) 7373032 clamp plate




**Laser Carriage:**
First, put the clamp plate on the laser carriage, as shown, and slide onto the left side of the rail. Make sure the laser points down the rail. Then, secure the carriage to the rail about 12 inches in from the end.




**Scope Carriage:**
First, put the clamp plate on the scope carriage, as shown, and slide onto the right side of the rail. Make sure the flat side of the scope mount is facing the laser. Then, secure the carriage to the rail about 12 inches in from the end.

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# 7002 FOLDED BASE ASSEMBLY INSTRUCTIONS

Assemble the base and fasten it to the upright as shown below.

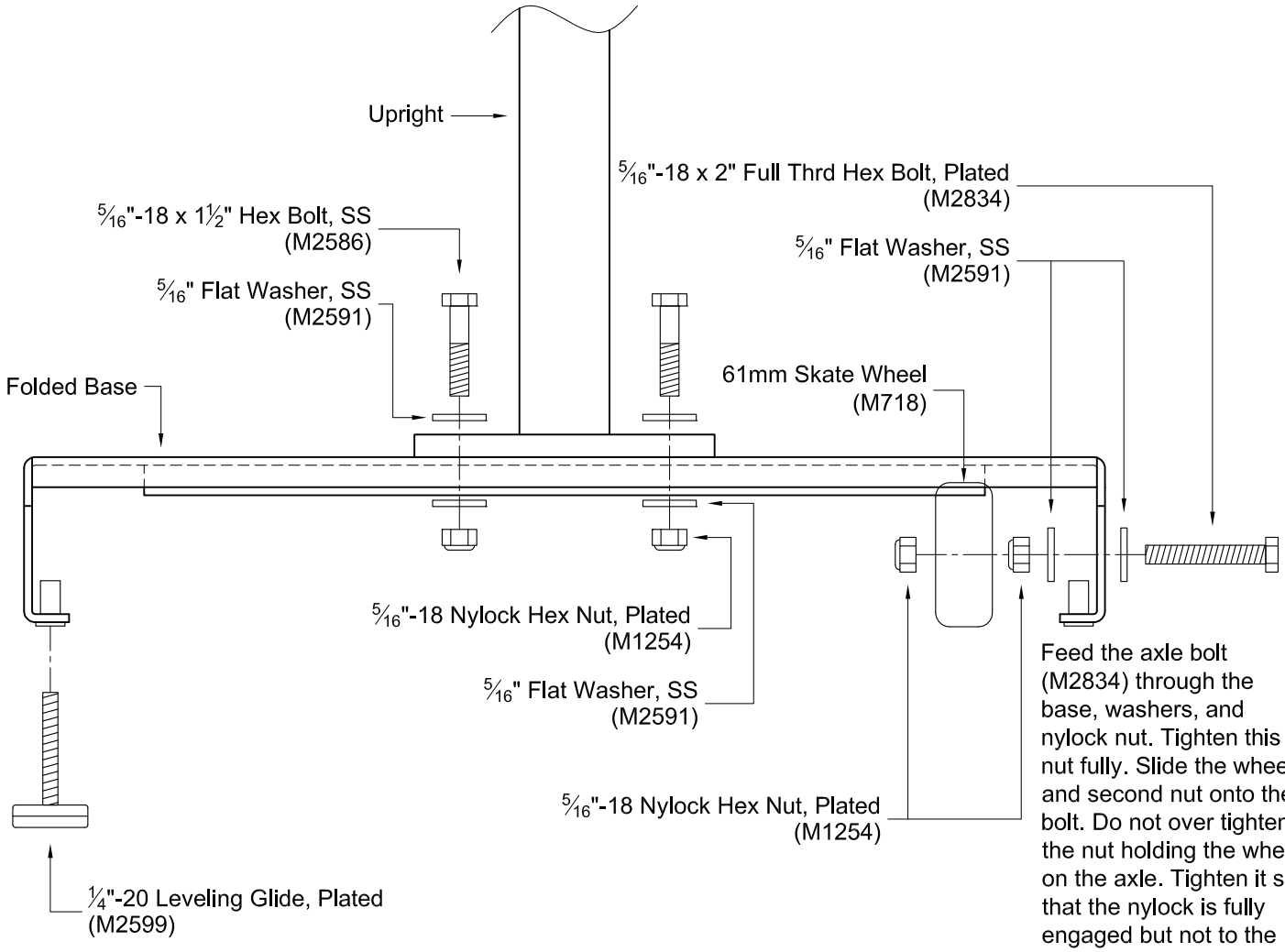
**Do not over tighten the nylock nut that holds the skate wheel in place. The wheel must be able to spin.**

Check equipment for loose connections and re-tighten once per year.

Tools Required:
(2) ½" Wrench

Hardware:

| | | |
|---|---|---|
| (4) | M2599 | ¼"-20 Leveling Glide, Zinc-Plated |
| (2) | M718 | 61mm Skate Wheel |
| (4) | M717B | Bearing (2 per skate wheel) |
| (2) | M2834 | 5/16"-18 x 2" Full Thread Hex Bolt, Zinc-Plated |
| (4) | M2586 | 5/16"-18 x 1½" Hex Bolt, SS |
| (8) | M1254 | 5/16"-18 Nylock Hex Nut, Zinc-Plated |
| (12) | M2591 | 5/16" Flat Washer, SS |




Feed the axle bolt (M2834) through the base, washers, and nylock nut. Tighten this nut fully. Slide the wheel and second nut onto the bolt. Do not over tighten the nut holding the wheel on the axle. Tighten it so that the nylock is fully engaged but not to the point where it touches the wheel.

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# LJ TJ LASER MEASURING DEVICE
## RAIL - BASE ASSEMBLY

### What you'll need:

- Rail with carriages attached
- Assembled base and uprights
- Wrench

### Hardware:

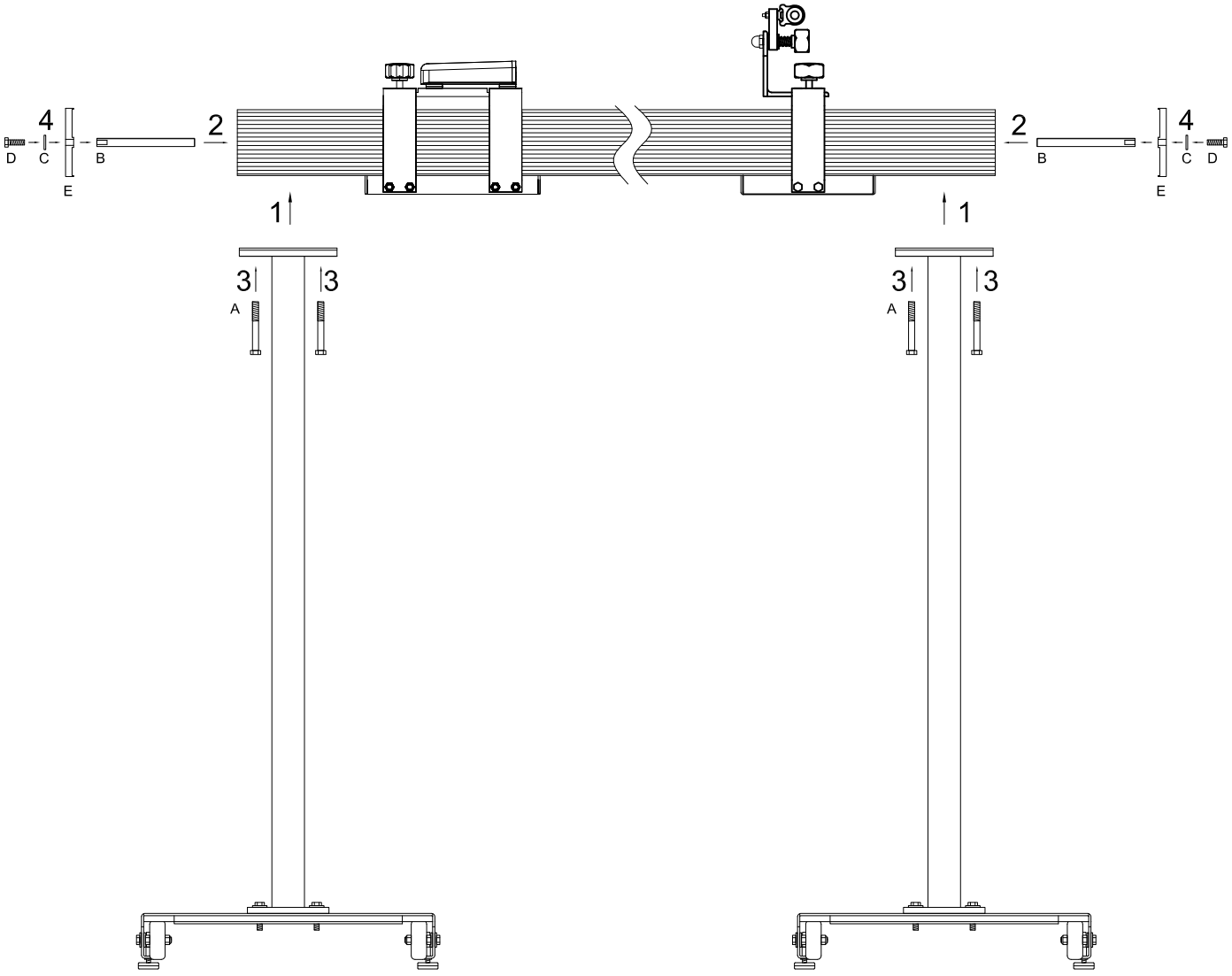
| | | | |
|---|---|---|---|
| A. | (4) | M2268 | 3/8"-16 x 3" hex bolt |
| B. | (2) | M1806 | internal mounting plate |
| C. | (2) | M2273 | 5/16" flat washer |
| D. | (2) | M1279 | 1" hex bolt |
| E. | (2) | M1776 | cap plate |

1. Align the holes in the base uprights with the holes in the rail. Make sure the the bases are facing the same direction (wheels on the same side).

2. Insert the internal mounting plate (B).

3. Attach the rail to the uprights with the 3/8" thumb screws (A).

4. Put on cap plates (E) and attach with 5/16" flat washer (C) and 1" hex bolt (D).

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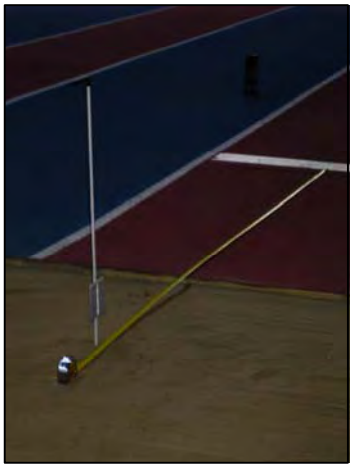
# LJ TJ LASER MEASURING DEVICE
## UNIT SETUP AND CALIBRATION

1


2


3


4


**To setup the single rail system:**

1. If necessary, adjust the feet on the bases so each upright is straight up and down.

2. Align the scope rail parallel with the sand pit keeping each side within ±1" of each other. This does not have to be perfect. With a 21' rail, having a 6" difference will cause only a 1/12 " difference, or about 2mm.

3. Mark any point in the pit with the stake and use a tape measure to take a measurement.

4. Align the laser on the rail to direct its beam in the center of the white line on the stake. Once it is aligned, step back from the rail.

5. Record the distance with the Leica DISTO™ A5 laser. See pg 10 for how to take a measurement.

6. Take the difference between the laser measurement and the actual measurement and program that into the offset. See pg 11 for how to enter an offset.

7. Repeat steps 3 - 5 at a different marked point to confirm that the measurements are accurate.

If you wish to change the unit of measurement see page 12.

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# LJ TJ LASER MEASURING DEVICE
UNIT OPERATION

1

**To operate the LJ TJ Laser Measuring Device:**

1. Once the athlete has exited the pit, insert the stake into the sand. Make sure the stake is placed so it is inside the depression made by the jumper, rather than in front of the depression. The flat plate should face the rail.

2. Slide the scope carriage down the rail until its beam is in the center of the white line on the stake. Once it is aligned, step back from the rail.

3. Record the distance with the Leica DISTO™ A5 laser.

2

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# LJ TJ LASER MEASURING DEVICE
## UNIT OPERATION WITH TWO BOARDS

1


Measurement Reference Icon (1) (Set to measure from back)

2

3

4


5

"Storage" key (5)

**To set up for use of this unit with two boards:**

1. Make sure the measurement reference is set to the back end of the laser by checking the icon on the screen (if it is not set to measure from the back, turn the unit off and then back on—it will measure from the back by default).
2. Align the back end of the Leica DISTO™ D5 laser with the foul line on one of the boards (Board #1).
3. Place an object (such as a clip board) at the foul line of the other board (Board #2).
4. Make sure that there is no offset programmed before measuring between the boards. See pg 11 for more information on setting or clearing an offset.
5. Measure the distance with the laser.
6. Press and hold the "Storage" Key until the unit beeps.
7. Now that the offset between the boards is set, set up the entire unit for use measuring from Board #1.

**To measure jumps from Board #1:**

1. Use the standard measurement procedure. See pg 7.

**To measure from Board #2:**

1. Take the measurement as if measuring from Board #1.
2. Press the "+" Key to add a number to the measurement.
3. Press the "Storage" Key to pull up the stored distance between the boards.
4. Press the "=" Key to confirm the use of the stored number.
5. Press the "=" Key again to confirm addition of the two measurements.

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# LJ TJ LASER MEASURING DEVICE
## Leica DISTO™ A5 Laser


The Leica DISTO™ A5 laser has many functions, many of which serve no purpose for the E73730 Laser Measuring Device. This manual addresses the functions associated with the E73730 Laser Measuring Device. To learn more about the functions not associated with our equipment, consult the Leica DISTO™ D5 laser manual.

**To turn the unit on:**
Press the "On/Dist" key

**To turn the unit off:**
Press and hold the "Clear/Off" key

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# LJ TJ LASER MEASURING DEVICE
## TAKING A MEASUREMENT


1. To turn the Leica DISTO™ D5 laser on, press the ”On/Dist” button.


2. The laser screen will display three hashes, signifying the laser is on.


3. Press the “On/Dist” button again to take the measurement.


4. Press the “On/Dist” button again to reset the laser but keep the measurement on screen.


5. Press the “On/Dist” button again to record the next measurement.


6. If you continue to take measurements by pressing the “On/Dist” button and do not press the “Clear/Off” key in between, the device will display the previous 3 measurements taken.

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# LJ TJ LASER MEASURING DEVICE
## SETTING AN OFFSET


1. To program an offset into the Leica DISTO™ D5 laser, press and hold the “Menu” button down until the menu displays.


2. Press “+” or “-” to scroll through the menu to offset and press the “=” button.


3. The screen will then display the current offset.

4. To change the offset, press the “+” and “-“ buttons until the desired offset is reached. Press and hold the “=” button until it beeps to save the offset.


5. Now when a measurement is taken, the offset programmed in will automatically be added to the measurement.

NOTE: The offset does not clear when the laser is turned on and off. The only way to clear it is to go into the menu under offset and set it back to 0.00 or you can go into the menu under reset and it will clear all the settings, including the offset.

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# LJ TJ LASER MEASURING DEVICE
## CHANGING UNIT OF MEASUREMENT


1.To change the unit of measurement, press and hold the “Menu” button. Press “+” or “-” to navigate to the units.


2. Press the “=” key, and the current style of measurement will be highlighted between red lines. Use the “+” and “-“ keys to change it. Press and hold the “=” key to store your selection.

NOTE: There are several unit options, however you will use two: 0’00” 1/32 for English or 0.000m for Metric. Because the rule requires measurements to be rounded down, do not use the 0.00m setting, as it will round up. Instead just ignore the final digit on the 0.000m setting.


# Electronic Distance Measurement - Vertical Jumps

# Laser Measurement for the Vertical Jumps

Laser measurement for the vertical jumps is becoming more common, particularly at USATF championship meets. It's relatively quick & easy to use and produces very accurate measurements.

- The Lieca Disto D5 model laser is a good choice – it has a built in camera screen which makes targeting the bar easy. While you can use a laser without a camera screen, it's more difficult to spot the laser beam on the bar especially at high heights with a bright sun background.
- Buy or make a stand for the laser to attach to the laser. You want the laser camera screen at eye level so it's easy to see. Also, you don't want to be on your knees looking at the laser from the ground. Gill makes a stand specifically for this purpose.

## Step 1: Entering an Offset for the Crossbar & Stand

Calibrate the laser so that the distance you measure is accurate from the ground to the top of the crossbar.

1. Turn on laser. Leave the laser off the stand for now.
2. Press and hold "menu" key
    a. Press + or – to navigate through menu to find the "offset" function.
    b. Press "menu" key briefly to enter the "offset" submenu.
    c. Adjust offset value up or down to reach zero by using the + or - key.
    d. Set zero value by pressing and holding "menu" key again. To clear offset press "off" for longer.
3. Now, measure the height of a control object with the laser on the ground. You can measure the height of a door jamb, or the distance between two baseboards. Call this "Distance A".
4. Put the laser on the stand, and measure the height of the control object again. Call this "Distance B".

5. Calculate the difference between the two measurements. "A" – "B" = "C"
6. Add .030 meters to this calculation "C" to account for the diameter of the crossbar.
7. Go back to the "offset" menu and do as follows:
    a. Press and hold "menu" key
    b. Press + or – to navigate through menu. Select "offset" function in the menu.
    c. Press "menu" key briefly to enter the "offset" submenu.
    d. Enter calculation "C" as an offset in laser by pressing the + key to desired offset.
8. Set desired value by pressing and holding "menu" key again. To clear offset press "off" for longer. The laser is now ready.

**Step 2: Setting the Measurement to Metric**

1. Press and hold the "menu" key to enter the setup menu.
2. Press + or – to navigate through the keys.
3. Press "menu" briefly to enter the menu sub menu
4. Press + or – to make alterations to the submenu.
5. Press and hold "menu" to accept the settings.
6. Press the "clear/off" key for longer to quit the settings function.

**Step 3: Verifying Laser Accuracy**

At the beginning of every meet check the accuracy of the laser.

1. Lay out a certified steel tape on the runway or apron. You can use any distance you want for the measurement; we'll say 5.00 meters for this example.
2. Lay the laser and stand on the tape with zero at base of stand.
3. Place a target at exactly 4.97 meters. Any small, stable object will work as the target.
4. Shoot the laser at the target. The reading should be 5.00 because we've included .03 meters in the offset for the thickness of the

crossbar. Remember it's the top of the bar you're trying to measure.

5. Recalibrate the offset if necessary.

**Step 4: Laser Operating Instructions**

The laser must bounce off a bar that is neither too dark nor too reflective. If either situation occurs you will get an error message as shown on bottom table. Experiment to see if you get a reading. I create a target to ensure I measure form the exact center of the bar each measurement.

1. Create a target in the exact middle of the bar by wrapping black tape on both sides of a white tape strip center section. Make the black tape ends about 6 inches apart. The black lets you see the bar against a bright background.
2. Draw a cross target on the ground facing side of the white tape strip.
3. Turn on laser unit: Press "on" button
4. Activate monitor: Press "target"
    a. Zoom in: Press "target" up to 4X to zoom in.
    b. Adjust brightness: Press + or – to adjust brightness.
5. Ensure laser is activated: Press "on" button (indicator shows 0.00). Check beam with hand.
6. Determine distance: Sight target and press "on" quickly. Result will display.
7. Clear reading: Press "on" to remove result.
8. Turn off: Press "clear/off" slowly. Always turn the laser off and place under a white towel when not using it outdoors.

You may have to repeat some of the above steps in warm weather or when the bar color is not perfect, and repeat steps 5 & 6 if you miss hitting the target.

## Disto D5 Error Codes

| Error Code | Cause | Remedy |
|---|---|---|
| 156 | Transverse tilt greater than 10 degrees | Hold the instrument without any transverse tilt. Standards on 0. |
| 160 | Main tilt direction, angle too high > 45 degrees | Measure angle up to max +/- 45 degrees |
| 162 | The calibration has not been accomplished on a leveled surface and the calibration value is respectively within an ineligible area | Calibrate the device on an absolute horizontal leveled surface. |
| 204 | Calculation error | Repeat procedure |
| 252 | Temperature too high, above 122 F | Cool down instrument |
| 253 | Temperature too low, below 32 F | Warm up instrument |
| 255 | Receiver signal too weak.<br>Measurement time too long.<br>Distance too long, > 100m | Use white or grey target color. |
| 256 | Received signal too strong.<br>Target too reflective | Use white or grey target color. |
| 257 | Erroneous measurement.<br>Too much backlight. | Darken target (measure in different lighting conditions) |
| 260 | Laser beam interrupted | Repeat measurement |
| Error | Hardware error | Switch on/off the device several times.<br>If the symbol still appears, then your instrument is defective. |

## Gill High Jump/Pole Vault Measuring Stick


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# E73705 PV/HJ LASER MEASURING STICK
SPECIFICATIONS


No more guess work with manual vertical measuring devices. No more getting on the ground to use a laser. The 59” tall laser measuring stick brings the laser closer to eye level. Measure high jump and pole vault crossbars quickly and accurately. Convenient to use, this system will make other systems obsolete. Simply use the viewfinder to line up the crossbar and press the button! It’s that easy. Measurements can be taken using Metric or English units. Minimum measurement is 1.54m or 60.5”. There is no maximum measurement.

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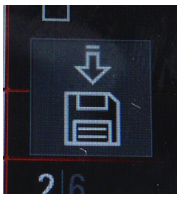
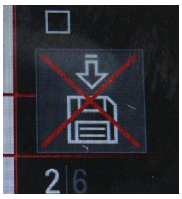
# E73705 PV/HJ LASER MEASURING STICK
## CALIBRATION INSTRUCTIONS

SAVED



NOT SAVED


Calibration

1. Set the crossbar to a height above 1.54m (60.5in).
2. Reset the laser offset to zero.
   - Press and hold MENU
   - Use the + and - to move up and down until you reach the offset icon.
   - Press MENU to set the offset.
   - Press CLEAR to set the offset back to zero.
   - Press and hold MENU to store the information. A disk icon will appear on the screen if the information has been saved.
3. Measure the crossbar height with the laser on the ground.
4. Write down this measurement (Meas. 1).
5. Put the laser on the stick.
   - Make sure the mushroom head strip “pops” when you attach it. This means that the laser is fully secured.
6. Re-measure the crossbar (Meas. 2).
7. Subtract Meas. 2 from Meas. 1 to get Meas. 3.
8. Add .029m to Meas. 3 to account for the crossbar. This is the offset.
9. Enter the offset in laser.
   - Use the + and - to increase or decrease the offset. The longer you hold down the button the faster it scrolls through the numbers.
   - Once the correct offset is entered press and hold MENU to store it.
10. Measure the bar one last time to verify correct offset. Make any minor adjustments and the laser is ready to use.

NOTE: The unit of measure should be set on 0.000m for competitions and the third zero is ignored.

THIS WARNING IS GIVEN IN COMPLIANCE WITH CALIFORNIA'S PROPOSITION 65:
**WARNING**
This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.



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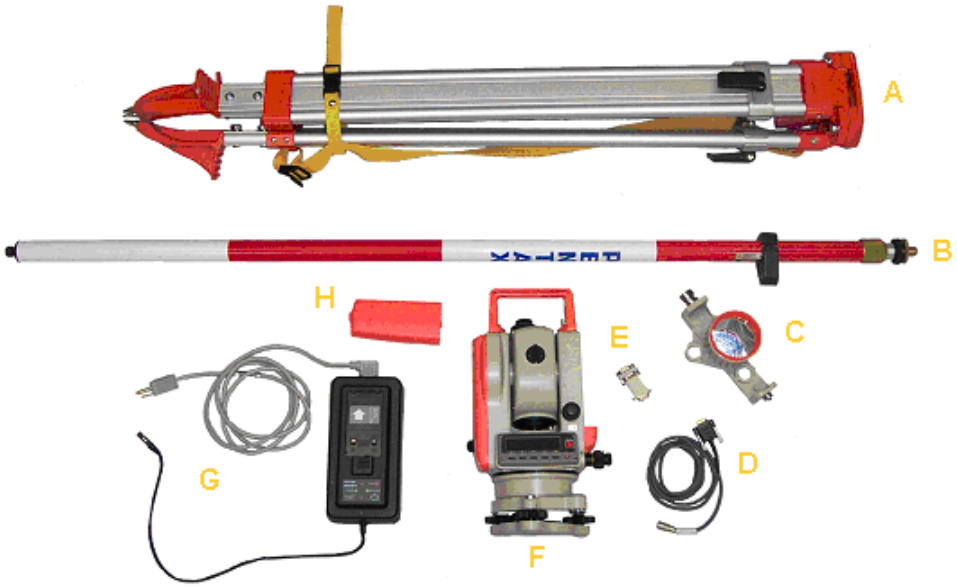
E73705_inst2


# Electronic Distance Measurement - LaserLynx

# LaserLynx Pro components

The LaserLynx PRO unit includes a tripod, prism, prism pole, on-board battery, spare battery, and data cable. LaserLynx links distance data to any netbook, laptop, or hand-held computer using FieldLynx software. With the addition of SeriaLynx, the LaserLynx measurement data can also be shared wirelessly across the results network. Share data quickly and securely with meet management databases, scoreboards, infield displays, databases and with CIS applications. LaserLynx makes distance measurement for field events easy.




A. Tripod

B. Target pole

C. Prismatic reflector

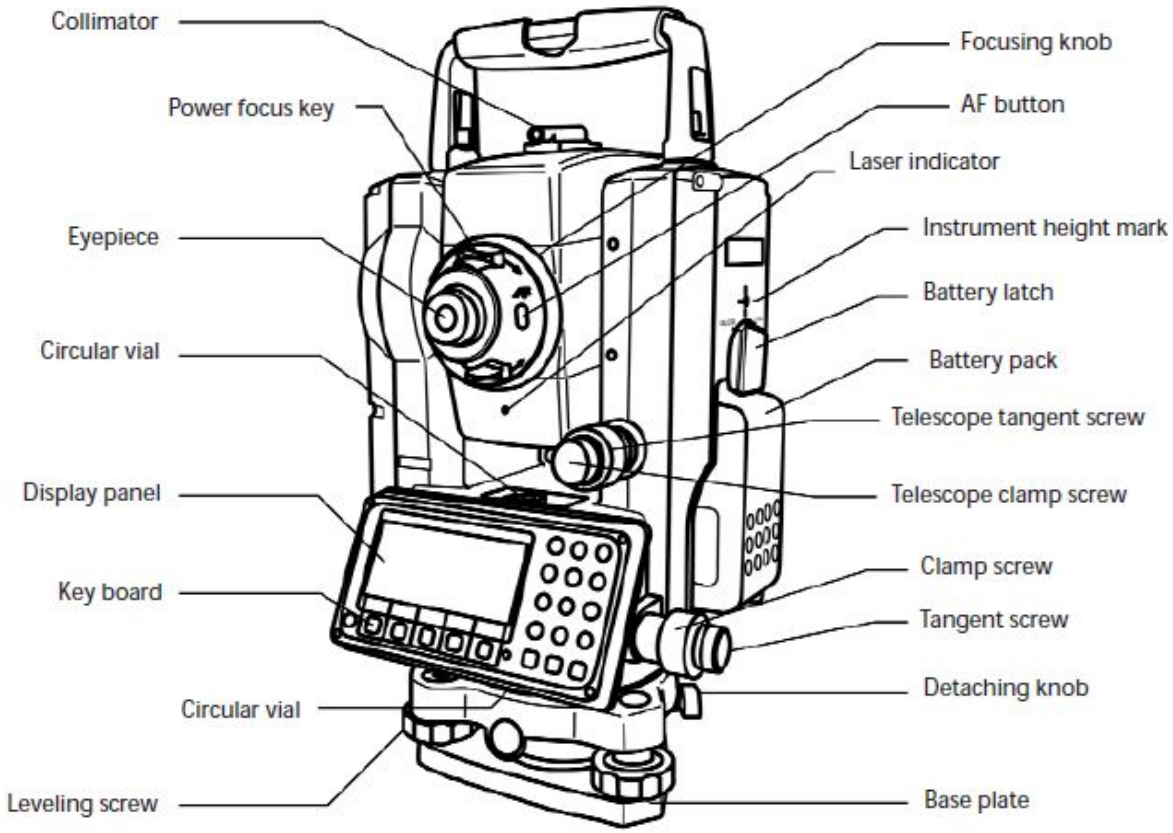
D. Serial cable

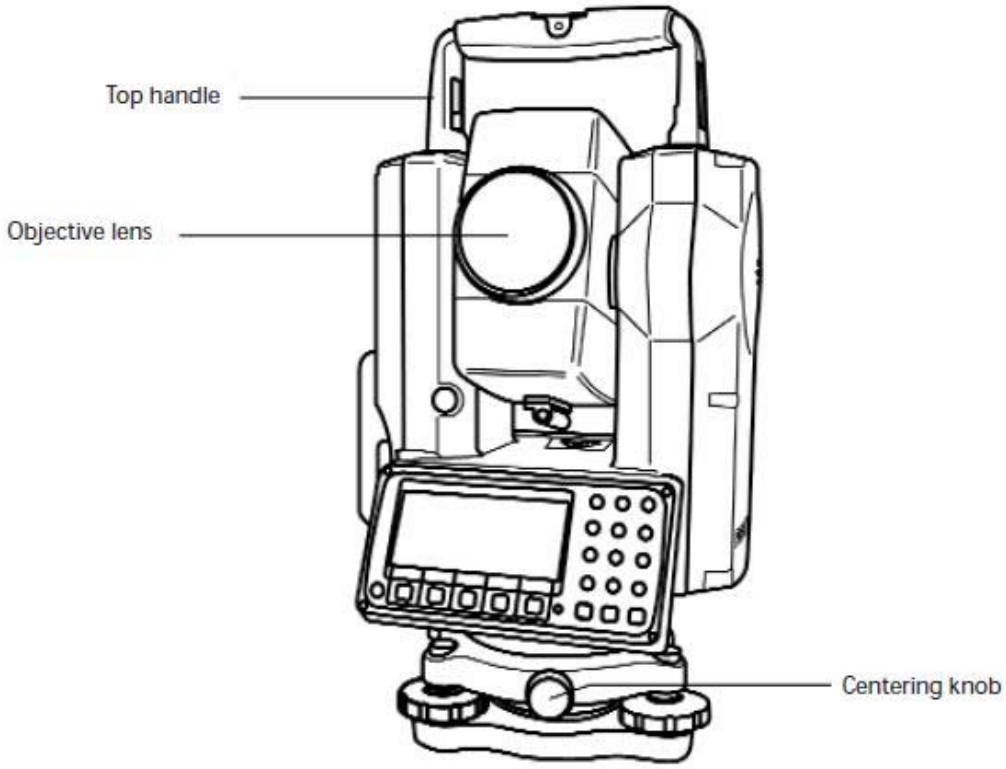
E. Null modem/gender changer (**note:** no longer used)

F. Sighting unit

G. Battery charger

H. Battery


Collimator
Power focus key
Eyepiece
Circular vial
Display panel
Key board
Circular vial
Leveling screw
Focusing knob
AF button
Laser indicator
Instrument height mark
Battery latch
Battery pack
Telescope tangent screw
Telescope clamp screw
Clamp screw
Tangent screw
Detaching knob
Base plate


Top handle
Objective lens
Centering knob

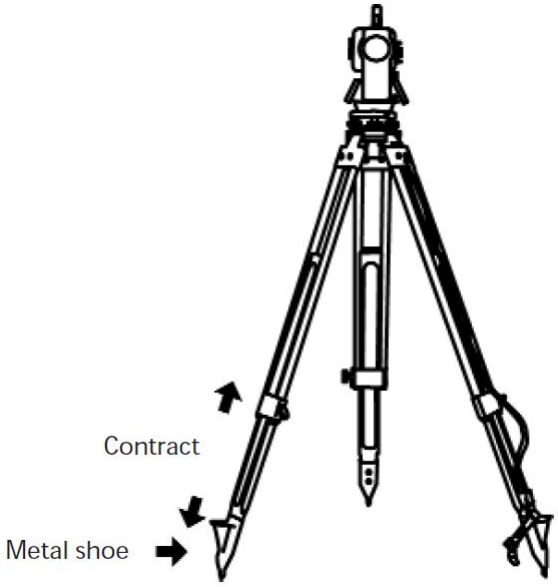
# Setting up the LaserLynx Pro laser

**Step 1: Set up the tripod**

1. Determine the best orientation for the tripod to the landing sector where the majority of the throws will fall. Be sure that the open side of the tripod is facing the operator for ease of access to the tripod and transit. Set up the tripod approximately 10 meters away from the throwing circle. You should have a clear line of sight to anywhere a fair throw might land.

2. Open the legs of the tripod equal width apart.

3. Flip the levers on the tripod legs and extend them so that the top of the tripod is at about chest height.




4. Step back and look at the tripod. Then, adjust the legs so that the tripod tabletop appears as level as possible. You will make finer adjustments to level the tripod later.

5. Push the tripod feet securely into the ground so that the tripod is stationary and secure.

**Note:** In situations on artificial turf or other surface material where the tripod cannot be planted firmly in the ground, and if there is a possibility that the tripod may be moved, use sandbags or other weights to make the tripod as immoveable as possible.

6. Make sure that the eyepiece is at a level where you must lean forward slightly to look through it. This keeps your feet further away from the legs of the tripod and minimizes the potential of moving it.

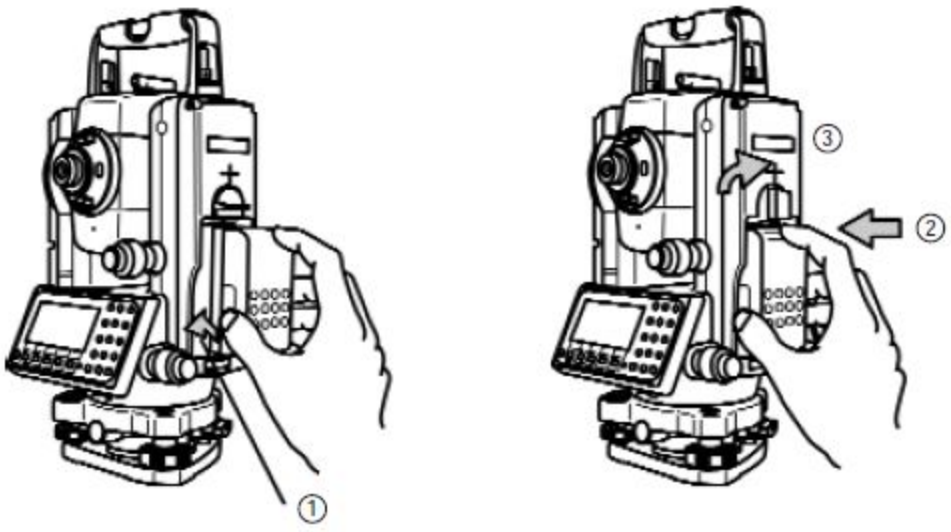
**Safeguard the tripod:** Avoid setting up the tripod so that one of the tripod legs is between your legs when you look through the eyepiece. This helps you avoid tripping on a tripod leg and moving the tripod.

**Step 2: Connect the battery to the sighting unit**

Make sure the battery is charged before you first use the laser. Please refer to the manufacturer's manual that came with the LaserLynx for battery charging instructions. Then, follow these instructions to connect the battery to the sighting unit.

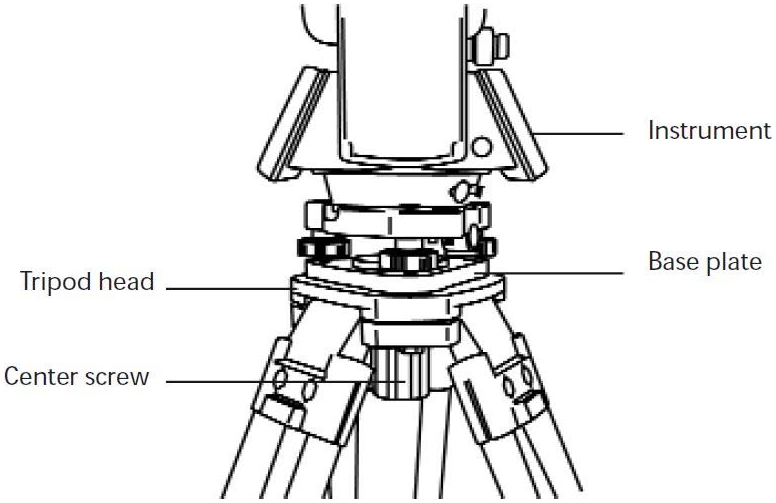
1. Notice the LaserLynx label on the sighting unit.

2. Facing the LaserLynx label, slide the orange battery pack along the left side of the sighting unit until the battery pack clicks into place.




**Warning!** If you change a battery during a competition, you must redo the control measurement or your measurements will not be accurate! You will learn how to set up the control measurement in the next chapter.

Ste**p 3: Connect the sighting unit**



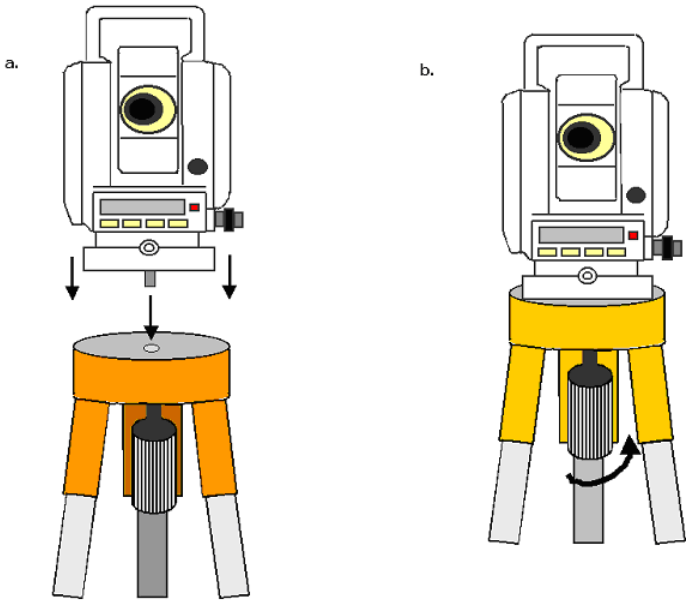
1. Position the transit (herein the “head end”) so that the circular bubble level is easily readable from the open side of the tripod (the side on which the operator will stand). The laser aperture should be facing the throwing circle. The laser aperture is located on the opposite side of the laser from the eyepiece.


2. Remove the lens cap from the laser aperture.

3. Slide the sighting unit around on the tripod tabletop until the threaded hole lines

up with the securing screw and the handle beneath the tripod tabletop.

4. Turn the handle to secure the sighting unit to the tripod tabletop.




**Step 4: Level the tripod**

Now that the sighting unit is attached to the tripod, you must make fine adjustments to level the tripod.

## Sighting unit diagram


A. Site

B. Eyepiece

C. Fine adjustment knob - tilt

D. Tilt release knob

E. Fine adjustment knob - rotation

F. Rotation release knob

G. Zero-set button

H. Precision level adjusters

1. Notice the round level on the sighting unit, near the bottom of the base.

2. Using the precision level adjusters (labeled "H" in the sighting unit diagram) on the head end, make sure that the head end is in the lowest possible position.

3. Using the legs of the tripod, raise and/or lower them to get the circular bubble level in the approximate center of the level. Secure the tripod legs.

4. Attach the serial cable between the head end and the handheld device.

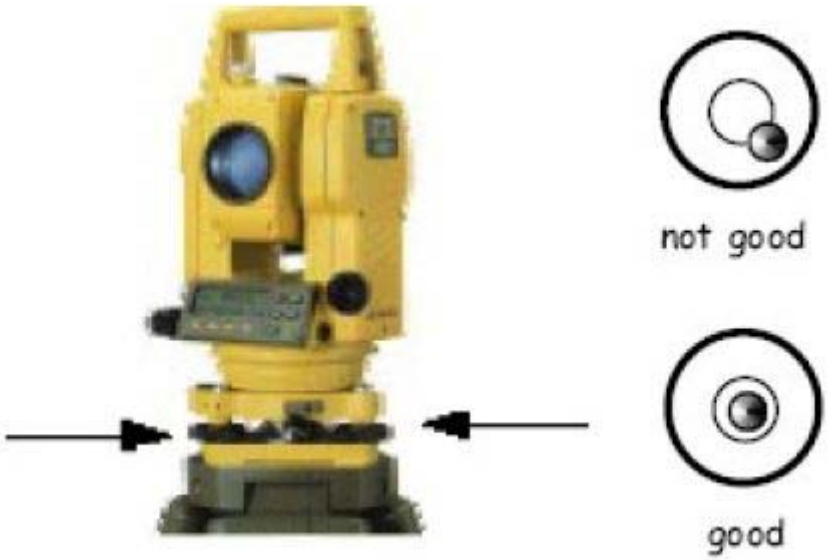
**Note:** This affects the balance of the head end, and should be attached now, as opposed to after leveling has been completed.

5. Turn the precision level adjusters (labeled "H" in the sighting unit diagram) until the bubble is centered in the middle of the level.

**Note:** The bubble levels will be on the right side and the front of the head end as it is situated on the tripod. Some newer devices may have the levels on the display of the head end unit. To view them, power the unit on, before beginning the leveling process.

6. Locate the additional levels on the sighting unit. Continue to move the precision

level adjusters until the bubble in all of the cylindrical levels is also centered.




**When all of the bubbles on the sighting unit levels are centered, the tripod is level.**

**Step 5: Set up the target pole**

1. Screw the prismatic reflector into the target pole, turning until secure.

2. Flip the target pole so that the prismatic reflector is touching the ground.

    a. Ask someone acting as a marker to set the target pole in the center of the throwing circle.

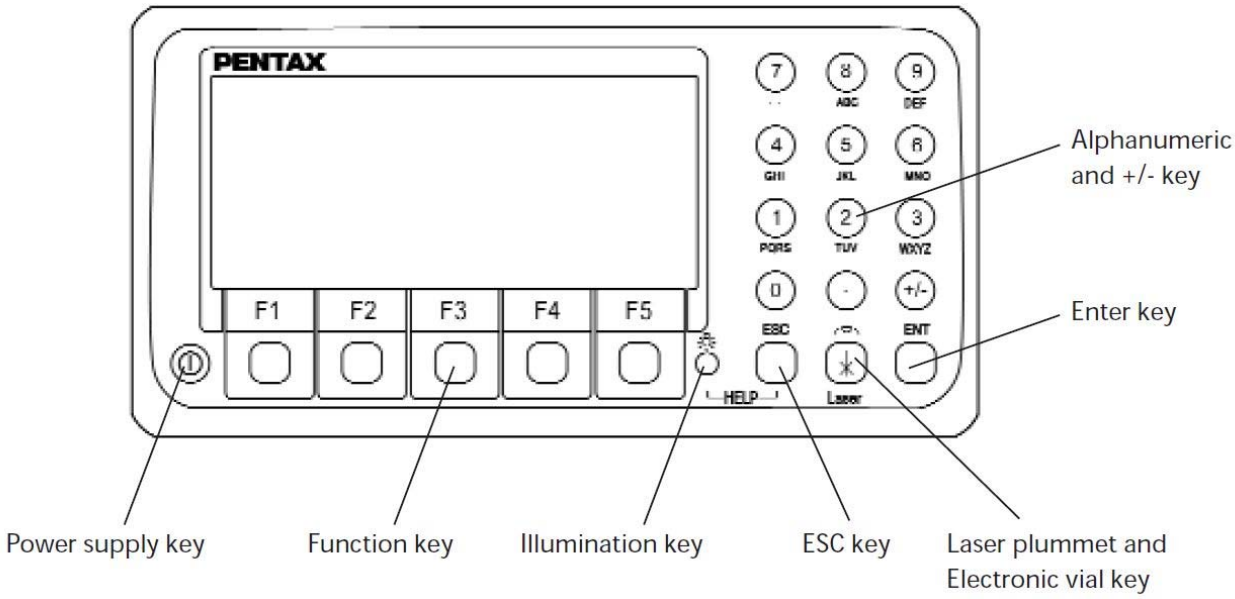
b. Have the marker face the prismatic reflector toward the laser aperture on the sighting unit while holding the target pole as upright and as still as possible.

**Step 6: Use the site to find the prismatic reflector**

1. Turn the rotation release knob counter-clockwise so that the sighting unit moves freely on its base.

2. Look through the site on top of the sighting unit and rotate the sighting unit until you can see the target pole while looking through the site. Once the target pole is in view, turn the rotation release knob clockwise to lock it.

3. Turn the head end on and check battery power. If less than 75% battery life remaining, turn the unit off and replace it with a fully charged battery.




**Note:** It is best practice to have an additional battery on hand that is charging. If the battery needs to be charged, put the fresh battery on the head end and the depleted battery on the charger.

4. If the laser aperture is locked in place, turn the tilt-release knob counter-clockwise to unlock it.

5. With the laser turned on, move the laser aperture all of the way up and all of the way down so that it moves above and below the horizon. You are finding the vertical scope when you do this. You will hear a short beep when the laser aperture finds the vertical scope.


**Note:** After a few minutes of idle time, the laser may turn itself off. If this happens, press the red LCD button to turn on the laser again, and rotate the laser aperture through the horizon again to find its vertical slope. Any time that you turn on the laser, you must find its vertical slope. To avoid this, make sure that you lock the rotation release by turning the knob when not in use.

6. Look through the site on top of the sighting unit once more and move the laser aperture until you can see the prismatic reflector on the bottom of the target pole. When you can see the prismatic reflector through the site, turn the tilt release knob clockwise to lock it. Then, continue to the next step.

**Step 7: Focus on the prismatic reflector**

1. Now that you have the prismatic reflector in view using the site, look through the eyepiece on the sighting unit.

2. Turn the large, fine adjustment knobs beneath the smaller rotation and tilt release knobs until the prism is centered when looking through the lens.

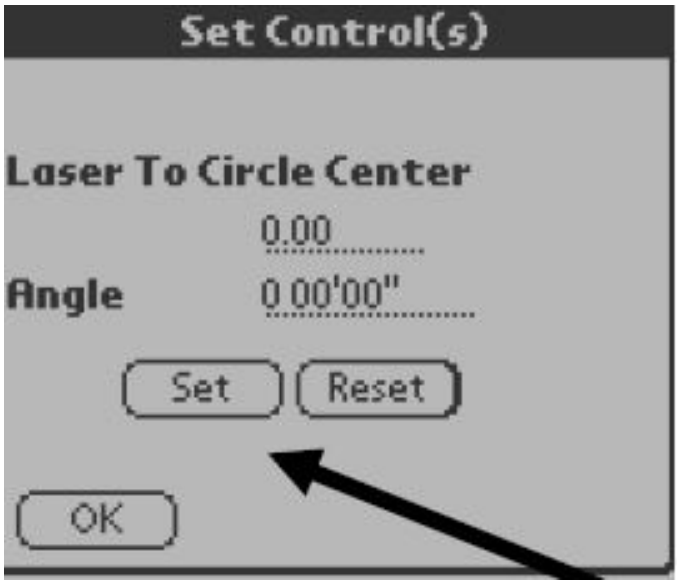
3. Notice that the eyepiece has two adjustment rings. Turn the smaller adjustment ring until you see crosshairs when looking through the lens.

4. Turn the larger adjustment ring on the eyepiece to focus the prism until the image is crisp. The crosshairs on the lens should center on the middle of the prism. If not, make sure that the marker is holding the target pole as upright as possible and turn the fine adjustment knobs until the crosshairs on the lens center on the middle of the prism.

**Step 8: Setting Up LaserLynx in FieldLynx**

1. In **FieldLynx** tap "Set" on the Set Controls screen on the handheld device or computer. The head end will beep three times, and the distance from the transit to that point (the center of the circle, etc.) will be displayed, along with the angle. Record the distance on a separate sheet of paper or other notepad. In the horizontal jumps, you will repeat this procedure for the other side of the board.

2. In the throws, verify that the circle radius is correct for the event that you will be measuring.




3. Complete the event setup in the handheld device.

4. At this point, check-in at least one competitor for the event.

5. Using a fiberglass (or steel, preferred if available and the only acceptable tape for national level competition) tape, select a point along one sector line to place a secondary reflector (if available) or other marker to establish a “check point”. If there is a permanent surveying monument convenient to the sector, you are encouraged to use it. Select a distance that is about 1/3 the length of the longest throw you anticipate (usually 30-40 meters) and place the checkpoint marker there.

6. Follow the same procedure for finding and adjusting the head end that you used in establishing the first known.

7. Bring up an athlete and tap the electronic measurement button in the field event administration software.


8. The head end and the handheld unit will beep. A distance will appear on the head end display, and momentarily after that, a distance will appear on the handheld display. Verify the distance on the handheld with the tape distance, and record the handheld distance on a separate piece of paper or notepad. Erase the distance from that athlete's performance.

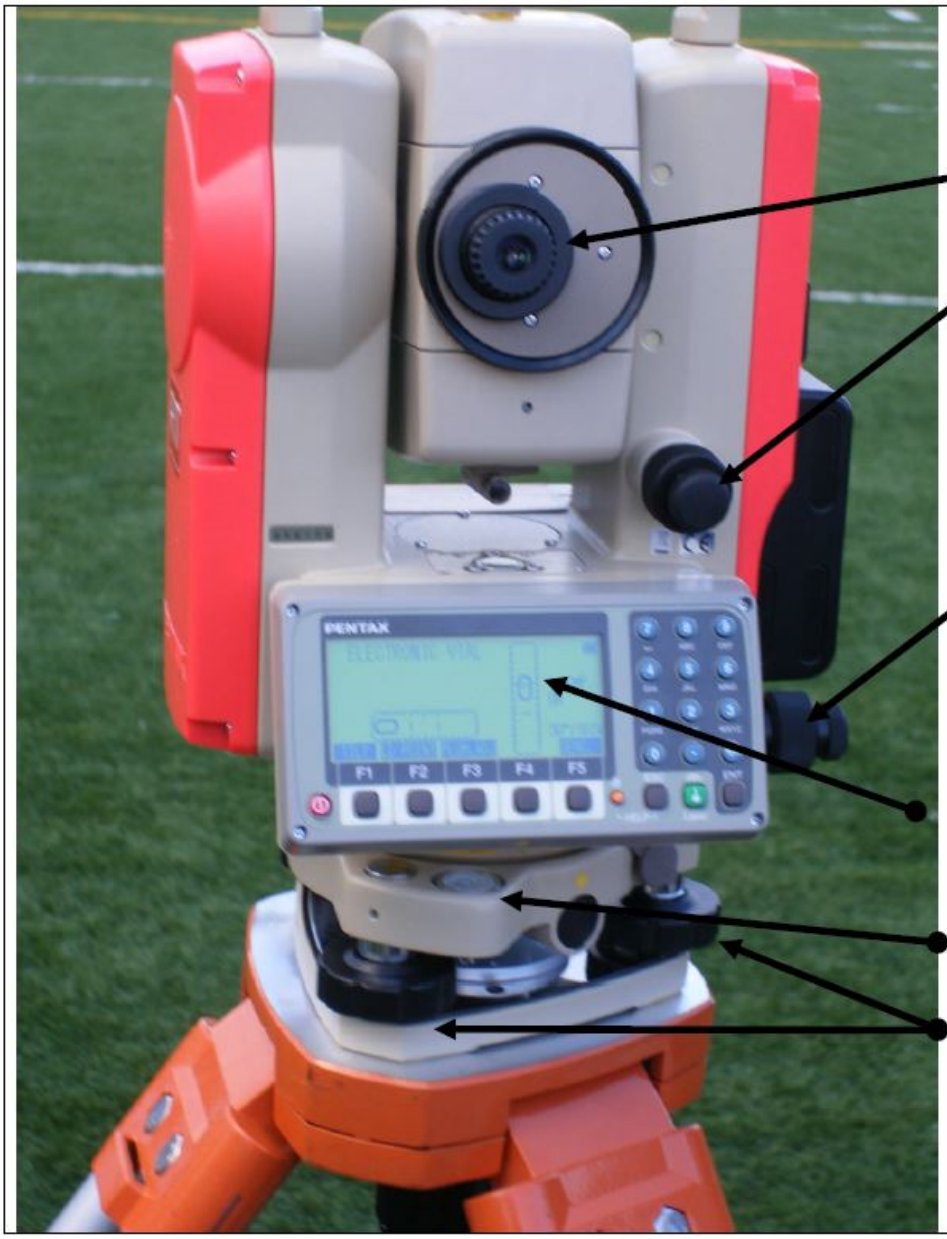
9. Continue to check-in athletes for the event.

10. Review with the judges in the impact area, and the official who will have the stick, any hand signals and body language that you will use during the competition.

11. The person holding "the stick" should not move until they receive a signal that the measurement is complete. This signal can be given by the laser operator OR by the head of the event.

12. The person holding “the stick” should do their best to balance the bubble on the stick, thus assuring a vertical hold for the stick.

# Electronic Measurement Device (EMD) Set-Up Protocol




Eye piece focus ring

Fine tuning knobs:

- small one is for locking the position;
- large one is for fine adjustment

The bubbles which show your balance.

Lower bubble level.

Leveling thumb wheels for leveling the laser unit.

**Step 9: Taking a zero-set measurement**

If you are using the LaserLynx Pro, we recommend that before you take the control measurement, you take a zero-set measurement for reference. Throughout the competition, you can reference the zero-set measurement to make sure that the tripod has not been moved or bumped. This is especially helpful during indoor competitions, when the tripod is more likely to be moved or bumped.

1. Set up the tripod.

2. Turn on the laser.

3. Find a fixed point somewhere on the horizon. Select something that will not move during the competition. For example, use the corner of a wooden sign at the end of the stadium.

4. Focus the laser on the fixed point.

5. Press the zero-set button on the laser LCD twice so that it reads 0. On the LaserLynx Pro, the zero-set button resembles a down arrow, like this: À.

6. Frequently throughout the competition, aim the laser back at the fixed point on the horizon. When you do so, the LCD on the laser should read

**Note:** If it reads anything other than 0, it means that the tripod was bumped or moved, and you must redo the control measurement.

**Step 10: Use in competition**

1. When the first competitor is called up, call them up on your handheld device.

2. If you are working alone, secure the handheld device through a strap on the tripod or by some other means. If you are working as a team, have the handheld operator watch for called fouls at the circle, while you are watching the flight of the implement or the jump of the athlete.

3. Use the peep sight to roughly locate the landing of the implement or the athlete in the landing pit.

4. Lock down the head end using the macro positioning knobs.

5. Use the eyepiece and the micro positioning knobs to find the reflector on the stick. Once the laser is within the reflector, the transit will beep.

6. Continue to align the cross hair in the eyepiece as close to the center of the reflector as possible.

7. When you are in the center of the reflector, tap the read icon on the handheld screen. In a two-man team, simply announce, “read” and have the handheld operator tap the icon.

8. The head end will beep, and a distance will appear on its LCD screen.

9. Make sure that the display is steady. If the head end beeps again, or if the distance disappears, make sure that the official with the marking pole has not moved.

10. The distance will appear on the handheld device.

11. If you are using an external performance display board that may be connected directly or via wireless to the handheld device, the information will appear on the display.

12. Leave the head end in the locked position until the next competitor is in the circle or on the runway.

**Comment:** the reason that we do this is so that the throw can be reconstructed if need be. For example, if an athlete protests a call, the throw must still be measured and recorded elsewhere in case the protest is upheld. So long as the next throw has not occurred, even if the official with the stick has moved, the stick can be replaced in virtually the same spot if the head end is locked and has not moved.

13. Continue through the event.

14. Between flights or rounds, you can verify the distance to your checkpoint to make sure that nothing has changed.

**Note:** If a battery needs to be changed, it should only be done at the end of a round, or preferably a flight. It is better done between flights, or between trials and finals, since you will have slightly more time to do the recalibration, and this will not overly disrupt the flow of the competition.

**Step 10: Post competition**

1. Verify the distance to your checkpoint.

2. If you are the chief electronic measurement judge (EMJ), certify to the field referee or head field judge that the check measurements match.

**Note:** In the event of a record, you will also need to sign and verify the record form. Make note of the pre- and post-competition verification checks, in case the accuracy of the measurement is called into question.

3. Begin tear down of the equipment. If this is the end of the day's competition, remember to remove the reflector from the marking pole for safekeeping.

## When FieldLynx Fails

It is possible to use an Electronic Measurement Device (i.e. Total Station) to measure a throw without using a LaserLynx Palm or iPaq or any handheld. The EMD was designed for surveyors and measuring between two points is pretty basic. You'll still need to subtract the radius of the circle from the total station calculation, but that can be performed on a simple calculator.

There are several special functions built into the Pentax 325N Electronic Total Station that allow the surveyor to handle a variety of measurement situations. One of the special functions is called Remote Distance Measurement (RDM).

The user manual states, with RDM measurement, the horizontal distance, the slope distance, difference in height and the percentage of slope between the reference point and the observation point are measured. The distance between one observation point and another observation point is measured as well.

For the USATF Official measuring long throws, the base point is the center of the throwing circle. The various observation points are the landing marks of the javelin, discuss, hammer or shot. The distance of the throw is the horizontal distance as measured and displayed on the Pentax 325N Electronic Total Station less the radius of the throwing circle (i.e. 8 meters for the javelin throw, 1.25 meters for the discus, and 1.06 meters for the hammer, weight and shot.)

Here are steps for using the RDM special function on using the Pentax 325N Electronic Total Station.

## Accessing the RDM Special Function

1. Press the [POWER-SUPPLY] key to turn on the Total Station.

2. Press the [Laser] or [ESC] button. That will take you to the MODE A screen. The display above the numbered function buttons will change to

```
MEAS    TARGET    0 SET    DISP    MODE
```

3. Press the MODE [F5] button. That will take you to MODE B. The display above the numbered function buttons will change to

```
S.FUNC   ANG SET   HOLD    COOR    MODE
```

4. Press the S.FUNC [F1] button. That will take you to the Special Function Menu.

```
1.DATA STORAGE
2.COORDINATES
3.COORD.STAKEOUT
4.OFSETT SHOTS
5.RESECTION
6.RDM
7.REM
8.DIST STAKOUT
9.MEMORY MANAGER
```

5. Press the [UP-ARROW] or [DOWN-ARROW] button until you see 6. RDM.

6. Press the [OK] button.

## Operating the RDM special function

1. The center of the throwing circle is the Reference point. Have an official hold the prism pole in the center of the throwing circle. (This process is identical setting the Controls in the LaserLynx software.)

2. The Total Station allows you to enter the prism height. We do not need the elevations so do not enter a value. When prompted with INPUT PRIZM H, press the [ENT] button. Sight the reference point. Then press the [MEAS] button. The Total Station will display the distance to the center of the throwing circle.

3. The target point is the point where the implement landed. An official will place the prism

pole at the target point. As before, the Total Station allows you to enter the prism height. When prompted with INPUT PRIZM H, press the [ENT] button. Then, sight the target point and press the [MEAS] button. The Total Station will display the distance between the center of the throwing circle (reference point) and the prism marker in the field (P1).

4. Use a calculator to subtract the circle radius from value on the display to obtain the distance the implement was thrown. On the next throw, sight the prism pole at the new target and press the [ENT] button. The distance between the center of the throwing circle (reference point) and the prism marker in the field (P1) will display on the screen. This The Total Station has the ability to display the straight line distance between the last two throws (P1 and P2). Press the [DIST] button to display the straight line distance between the last two throws (P-P). For our task and a measurement official, that information is unnecessary. Press the [DIST] button again to display the distance between the center of the throwing circle and the prism marker in the field.

   **Note:** You will notice, after pressing the [MEAS] button, the horizontal distance is displayed instantly. This is considerable faster than transmitting the raw data from the total station to a handheld and calculating the distance in the handheld. If you have a helper to run the calculator, you may be able to measure and display the measurement as fast as or faster than using a handheld with the total station.

# LaserLynx Setup on Pocket PC


01 - Turn on the PocketPC


02 - Select the FieldLynx icon


03 - Check FL plugins


04 - LaserLynx plugin is available


05 - Check FL Preferences


06 - Select which rulebook to use


07 - Select the LaserLynx Total Station


08 - Set for Tringular measurement


09 - Check the communication settings


10 - Ready to add a new event


11 - Select event and enter details


12 - New event has been created


13 - Add athletes


14 - Enter new athlete and details


15 - Enter event details


16 - Set Metric or English


17 - Set numnber of attempts


18 - Set LaserLynx controls


19 - Set the circle radius


20 - Click Set to get data from total station


21 - Data is automatically transfered to t...


22 - Control settings are ready


23 - Check in the athletes


24 - One athlete checked in


25 - All athletes checked in. Nick is up.


26 - Nick's mark is entered here


27 - Enter the mark manually...


28 - ... or click laser measurement


29 - Data is transferred from the total st...


30 - ...and the throw measurement is cal...

31 - The mark is displayed

32 - Data for calculations is stored

33 - ... and is available.

34 - Throw may be reconstructed with co...

35 - Metric marks displayed in place ord...

36 - ... and may be displayed in English

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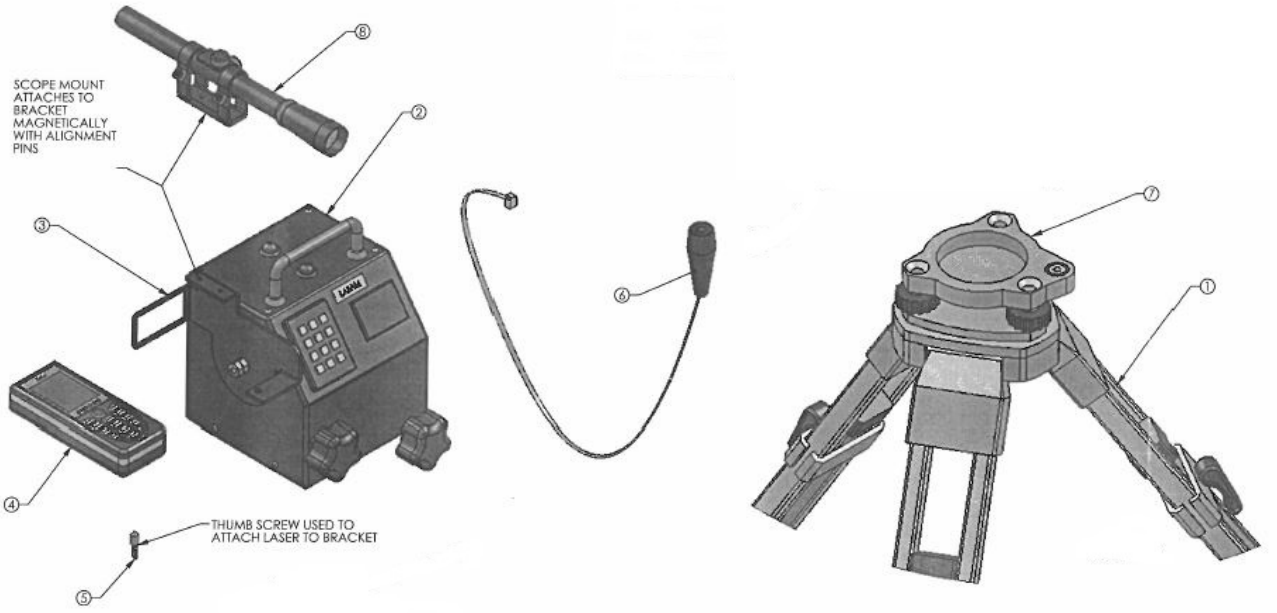
# Electronic Distance Measurement - LASAM

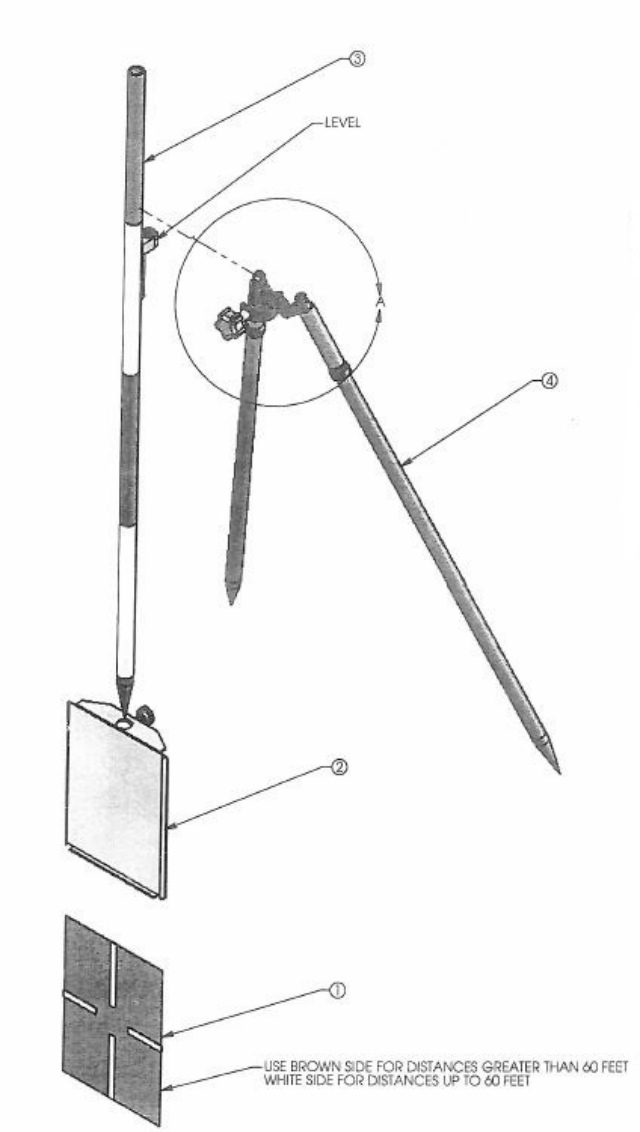
The LASAM® measuring system is the latest innovation in advanced measurement for meet management. Select the event to be measured, set the LAMAS® to mark the exact center of the ring, and the system will measure all throws from a remote position once they are marked. The need to enter the ring after a throw is no longer necessary. This measuring system is accurate to the nearest centimeter and more precise than a steel tape! Technical assistance is available through Gill Athletics.

## LASAM components

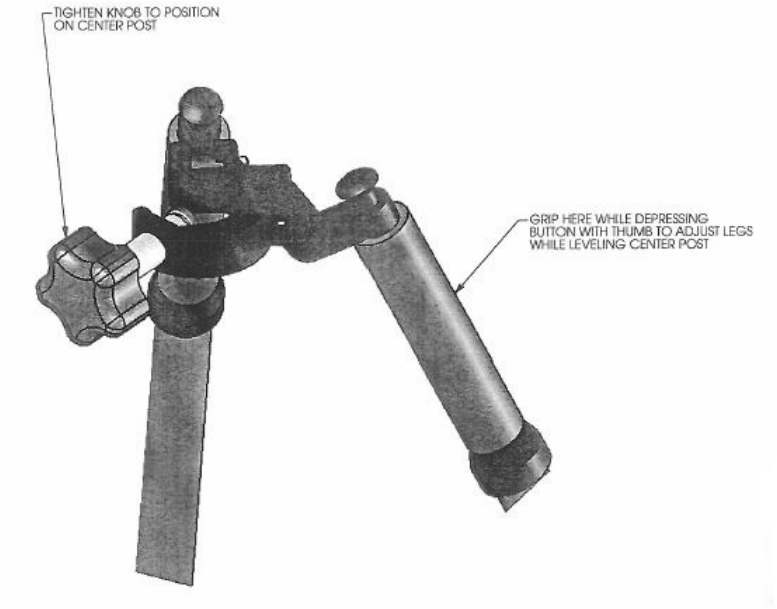


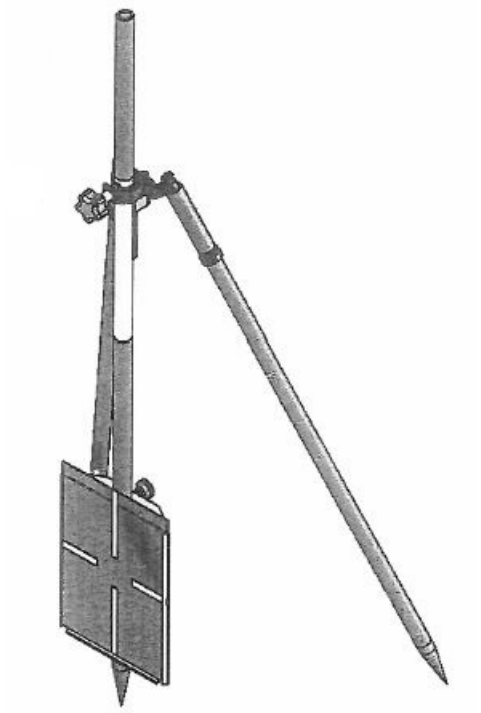

1. Tripod
2. Microprocessor
3. Laser Bracket
4. Laser
5. Thumb Screw
6. Push Button
7. Tribrach
8. Scope Assembly

COMPLETED ASSEMBLY

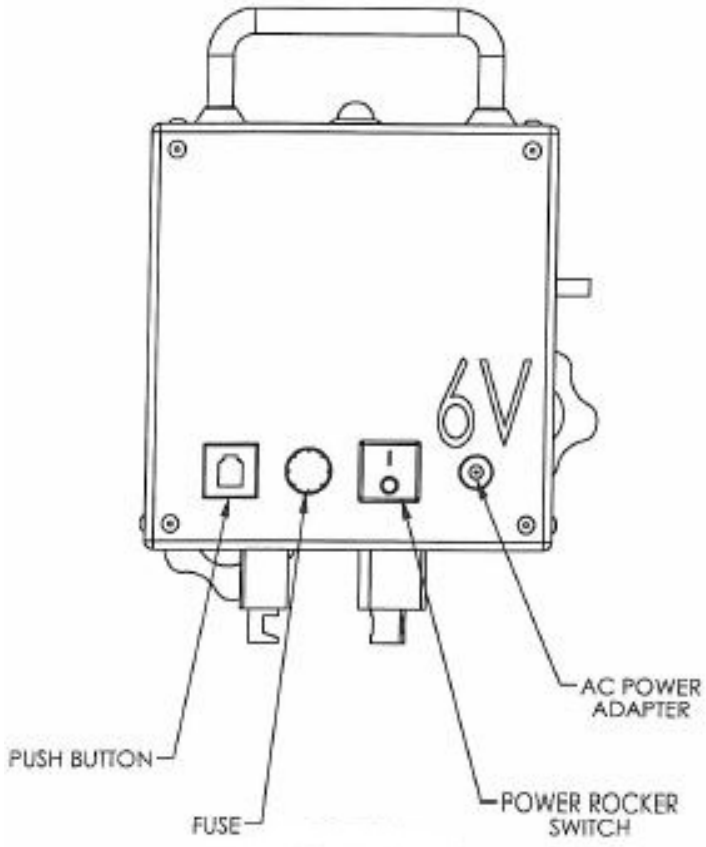



1. Target
2. Holder
3. Range Pole
4. Bipod


TIGHTEN KNOB TO POSITION ON CENTER POST
GRIP HERE WHILE DEPRESSING BUTTON WITH THUMB TO ADJUST LEGS WHILE LEVELING CENTER POST

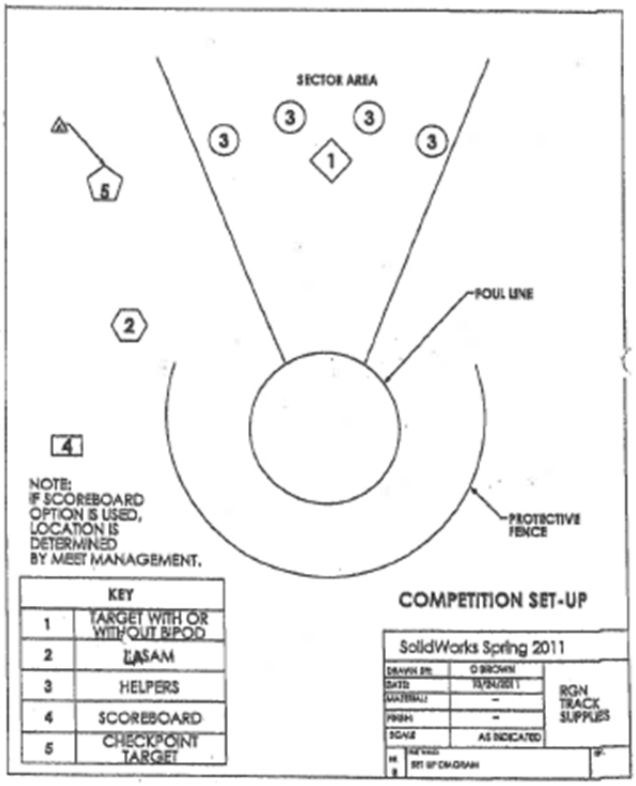


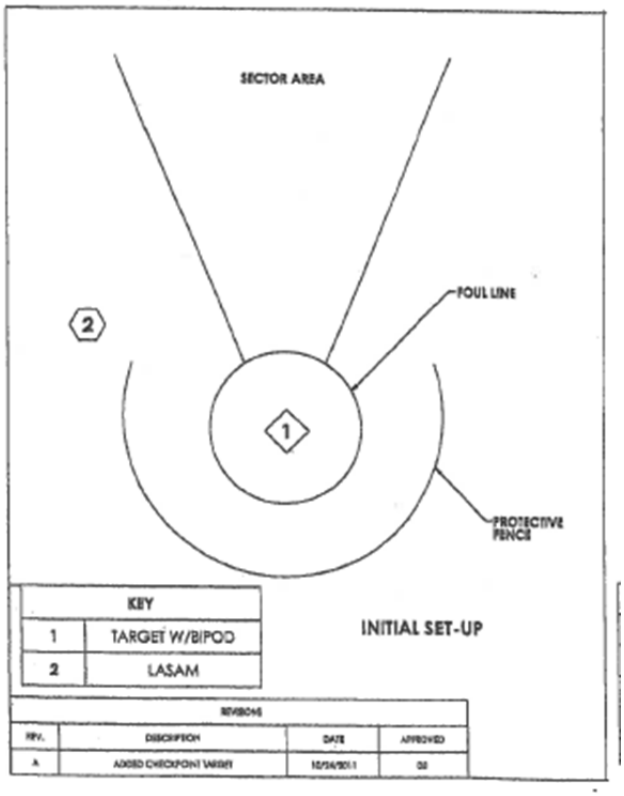
BACKSIDE VIEW OF
MICROPROCESSOR BOX



# Setting up the LASAM

1. Set tripod in a remote position about 4 meters outside the net and 4 meters past the front of the circle. Check initial and competition set-up prints for visual assistance.






2. Use the 8” level to set and level the tripod. Attach tribrach to tripod with leveling bubble toward radius of circle.

3. Place LASAM white marked post toward tribrach leveling bubble slot.

4. Install holder with target on the lower end of range pole installed in the bi-pod. Set and level this range pole on the radius point of the circle and aim the white target toward the LASAM so that the laser beam will strike it perpendicular to its surface to establish a starting point. It may be necessary to lift the net for an unobstructed laser beam to the target. This is the only time necessary to perform this task for this event.

5. To measure:

    a. Lightly press Disto red ON button. When the battery icon appears, check for bars present, replace batteries if low or empty, and then press the

bluetooth button.

b. Press LSAM rocker switch on.

c. When the bluetooth icon changes to dark blue color and beeps to indicate linking up, then follow screen instructions.

d. Press remote control red button to continue.

e. Select measurement unit.

f. Select event.

g. Level Disto to reach 0.0 on Disto screen. The press red remote button.

h. Continue with directions on LASAM screen. Following these sequences prepares the LASAM for measurement when the lead official is ready to call athletes for their competitive efforts.

**NOTE:** When the optional scoreboard is present, press its ON switch prior to starting this measure process.

6. A scope is provided to aid in locating the red laser dot in the outdoor arena. Some "sighting in" may be necessary. It is best to do this in your practice time before competition and with only the Disto on. The Disto point-finder (left side of ON button) also called a range-finder may now be useful. When activated the operator selects 1x, 2x or 4x, to aid in placing the boxed crosshairs with red dot on the target. The scope has vertical and horizontal screws to adjust as needed to bring crosshairs to the laser red dot. When accomplished, turn Disto off as the scope is now "sighted in" for future use. Excessive use of digital point finder means extra battery drain.

7. 2-3 helpers are needed in the sector area for marking landing spots and holding

the target. The target is reversible. Use the brown surface over 30m and the reverse side for other distances. Signals of some sort should be established between target holder and LASAM operator to communicate.

8. It is wise to use the target system set-up in the bi-pod configuration until the helper feels confident in his/her ability to set and plumb up the range pole prior to signaling ready for measure. When confident, the bi-pod is not needed. After a measurement is established, the directions on the LASAM screen will direct the operator to prepare for the next measurement on the target.

9. Additional caution/advice follows. Press no additional Disto buttons. This may interfere with the normal set-up of the device and provide incorrect measurements. If a button is accidentally pressed do not panic, and if you cannot clear up the situation, it may better to power the device off and start over.

   **NOTE:** Remember at start up time it is necessary to press TWO DISTO BUTTONS ONLY – ON and the BLUETOOTH ICON which is just to the right of the ON button. In normal measurement process the digital point finder may be the only additional button necessary. DO NOT GO INTO THE MENU OF THE DISTO.

10. To power off the device, press the DISTO CLEAR OFF button and the black rocker off switch 0 symbol on the LASAM.

11. A checkpoint target is included with the LASAM. It is suggested in laser measuring work that a small target is placed at an inconspicuous spot 1-2 m outside the landing sector and its distance of perhaps 15 to 20 m from the competition circle be recorded. The operator is to use this target merely as a “checkpoint” re-measure from time to time during the competition just to make sure all is well with the measuring work.

    **NOTE:** The LASAM is not waterproof. It is necessary that a pop style tent be available for rainy conditions.

**NOTE:** The device has its own 6V internal battery. A charger is included. Charge LASAM for 8-12 hours prior to use. The LASAM black rocker switch must be in the OFF position when charging. NEVER ATTEMPT TO USE THE LASAM WHILE CHARGING.

An Auxiliary 6V battery is included for all day track & field competitions. Use the "S" hook provided to suspend the battery bag below the tribrach. Install the auxiliary battery power plug into the power jack of the LASAM normally used for charging. This provides additional long lasting 6V power. A charger is also provided. Full charge is accomplished in 8-12 hours.

**NOTE:** The Disto uses two alkaline or lithium AA batteries. Always keep fresh sets of batteries with the unit. Replace batteries when battery icon is visible and low on bars. It is wise to start each competition with new batteries and if a change is needed during competition take care of it between flights or prior to a finals session.

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This Electronic Distance Measurement (EDM) manual was prepared by Dave Woytek of the USATF Lake Erie Association.

The information contained in this manual is comprised of instructions and protocols developed by numerous sources. The information provided was written so as to apply to any handheld device, any handheld field event administration (HFEA) software package, and any electronic measurement device (EMD).



## Acknowledgments

USATF Training Sub-Committee. *Electronic Measurement Device (EMD) Protocol for Long Throws*

USATF New England Association. *Protocol for setting up the Electronic Distance Measuring Device.*

Heckel, Mark. *Electronic Distance Measurement- Horizontal Jumps*

Hume, James. *Electronic Measurement Device (EMD) Set-Up Protocol*

Hume, James. *Hume's Guide for Running FieldLynx*

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Kuo, Justin. *Remote Distance Measurement*

McGloin, James. *FieldLynx for Vertical Jumps*

Gill Athletics. *E73705 PV/HJ Laser Measuring Stick*

Gill Athletics. *E73730 LJ TJ Laser Measuring Device*

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Leica Geosytems AG Disto™. *D5 Manual*

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PENTAX Industrial Instruments Co., Ltd. *PENTAX Electronic Total Station Instruction Manual*

PENTAX Industrial Instruments Co., Ltd. *PENTAX Electronic Total Station Quick Reference Guide*

RGN Track Supplies. *LASAM® Instruction Manual*

Seiko Sports Timing. *Electronic Distance Measurement System (EDM)*

Seiko Sports Timing. *Video Distance Measurement System (VDM)*

TimeTronics. *EDM Manual*