LaserSoft®

Pole Audit for
O-Calc®
User's Guide

Pole Audit

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LTI LaserSoft Pole Audit for O-Calc®
User's Guide 1st Edition
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Section 1 - Introducing Pole Audit for O-Calc

Thank you for purchasing LaserSoft® Pole Audit for O-Calc® from Laser Technology, Inc. (LTI). Pole Audit for O-Calc® is a field data collection program that Electric Utility professionals use to measure the height of attachments on poles for loading analysis and make ready engineering. It will read in a configuration file from Osmose's O-Calc® desktop product, allow the user to edit it in the field and then output a file that can be read back into the desktop app for analysis. Measurements are made directly to attachment points on the poles for wires and all other equipment that may be present. A series of tabs of information is filled out for each pole surveyed and various height, sag and clearance values are measured. The user can take photos and enter descriptions for the poles and the attachment points will be overlain on the image.

LTI surveying instruments automatically send data to Pole Audit for O-Calc, which uses it to perform the calculation desired for each routine. If desired, GPS can be used to geo-reference the data so it will match up with existing maps and satellite imagery.

Pole Audit for O-Calc Report files can be downloaded to a computer and imported into most reporting programs capable of reading a TXT or CSV file. A PDF report that includes all images makes a nice deliverable to the client. Report files can also be opened in many GPS visualization programs capable of reading a GPX or KML format.

Technical Specifications

LaserSoft Pole Audit for O-Calc has been designed to run on Android operating platforms for use in conjunction with Laser Technology surveying instruments.

Specification	Description
Operating Systems	Android version 10+* * Please check Google Play Store for current compatibility.
Supported Devices	Most smart devices running Android 10 or later.
Connectivity	Bluetooth®
Compatible Lasers	• TruPulse 200*** with Bluetooth • TruPulse 200X • TruPulse 360R** • TruPulse 360** with Bluetooth ** Only TruPulse 360, 360R, and 200 Bluetooth-enabled lasers displaying the menu option "BT_Enc" in the heads-up display are compatible for use with a TruAngle. Older models of these lasers may not display this option and are not compatible for use with a TruAngle. *** To send commands from the Android device to TruPulse 200 Bluetooth-enabled lasers (i.e. utilize remote fire), the laser firmware version must be A 2.26 B 2.51 or newer.
Hardware	• Optional - MapStar TruAngle for use with TruPulse 200/360/200X laser • Recommended X-Grip & Mounting Claw for phones/tablets if using with a tripod, 7" version available via LTI, other sizes available here: http://www.rammount.com/search?search_type=search&query=xgrip
Supported Languages	English; template is available for translation

Warranty Information

For purchases including lasers, a copy of the LTI Limited Warranty should have shipped with the order. If needed, please contact LTI to obtain a copy of the LTI Limited Warranty. See the inside front cover for LTI contact information.

NOTE The Data Collector/Tablet package includes the associated product literature, such as manuals and warranties. It is your responsibility to contact the manufacturing company to register the Data Collector.

Main Features

LaserSoft® Pole Audit for O-Calc® is a pole audit data collection app that has specific input/output from Osmose's O-Calc® desktop product. When combined with a Laser Tech measurement system, this laser-based data collection app can be used to capture measurements of anything on a pole. Aside from exclusive connection to this leading Pole Loading Analysis software, it provides the field technician many great features including:

- Enhanced user experience with Android mobile OS
- Support for GNSS so data can be geo-referenced
- Seamless integration with O-Calc® configuration and pole record files
- Send to Email function for Reports and data files
- Complete data collection for Pole Loading Analysis

Instrument Configurations

Pole Audit for O-Calc is designed to work with all different LTI instrument configurations:

- TruPulse 360B/R with or without TruAngle (Figure 1A)
- TruPulse 200X with or without TruAngle (Figure 1B)
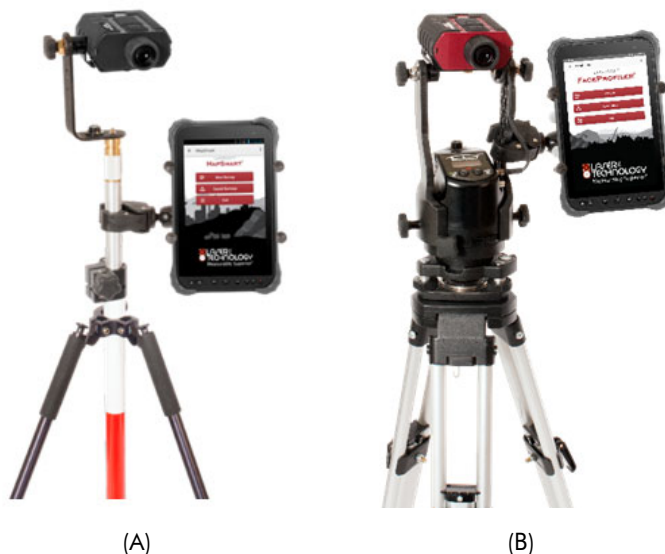- TruPulse 200B with or without TruAngle (not pictured)

(A)   (B)

Figure 1

NOTE There are three measurement routines in the app that require an Azimuth (TP360) or Angle (TruAngle) to complete, the rest can be accomplished with any of the 200 or 360 models. They are:

1. The GPS Offset shot
2. The 2 Shots Offset From Targets sequence
3. The Direction of a Bay

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Section 2 - Get Started with Pole Audit for O-Calc®

This section describes the download and installation procedure necessary to get started with Pole Audit for O-Calc.
It explains how to get the app from Google Play and then launch it. Once the application has been successfully launched, follow the instructions in this section to understand the main menu and configure the settings.

Get Pole Audit for O-Calc® from Google Play

Pole Audit for O-Calc downloads free from the Google Play Store and will work unlicensed for a 30-day trial period from the date of initial download. After 30 days, it will require a license key purchased from Laser Technology to run. To get the Pole Audit for O-Calc app from Google Play:

1. Use the Google Play search function to find "LaserSoft Pole Audit for O-Calc."
2. Tap the Pole Audit for O-Calc icon to install the app as you would any other Google Play application (Figure 2).

    NOTE Pole Audit for O-Calc will need permission to take pictures, access location information and to access photos and files.

Figure 2

Launch Pole Audit for O-Calc®

To launch the Pole Audit for O-Calc app:

1. Find the Pole Audit for O-Calc icon on the smart device (Figure 3A) and tap it.
2. Accept all permissions and the License screen will display (Figure 3B).
3. Tap the **DEMO** button _or_ enter your license key and tap the **START** button. The Settings screen will display (Figure 3C).
4. Enter all values and tap SAVE:
    - **Company**: enter company name (also displays on Main Menu)
    - **Inspector**: enter equipment operator
    - **Safety code**: NESC, GO95 or Other
    - **Distance units**: Feet or Meters to match laser
    - **Beep**: Check for device to emit a beep when it receives laser data
    - **Plot attachment labels**: Requires screen calibration; uncheck to not plot labels and bypass screen calibration
    - **Email address for reports**: Enter an email address to be used when sending Pole Audit for O-Calc report files.
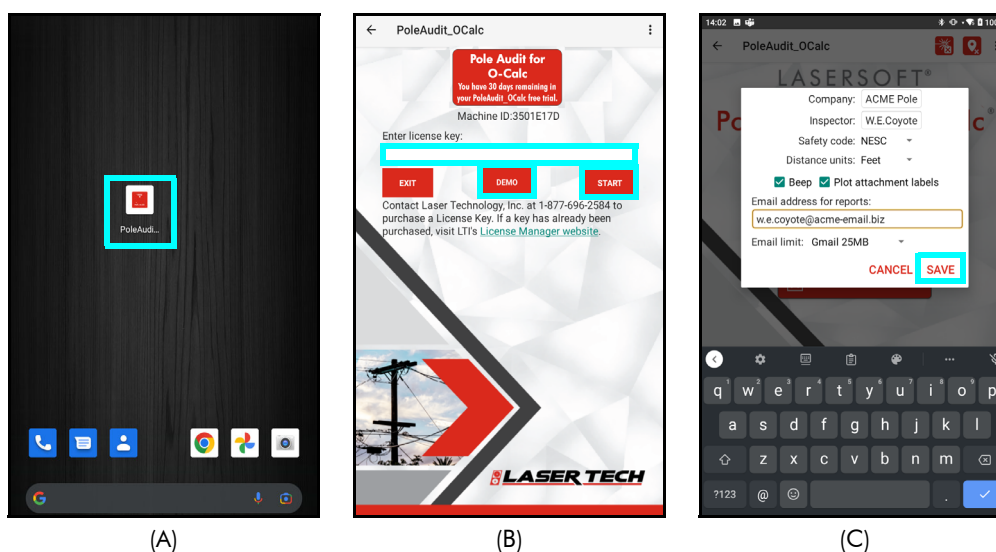
(A)   (B)   (C)

Figure 3

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Program Licensing
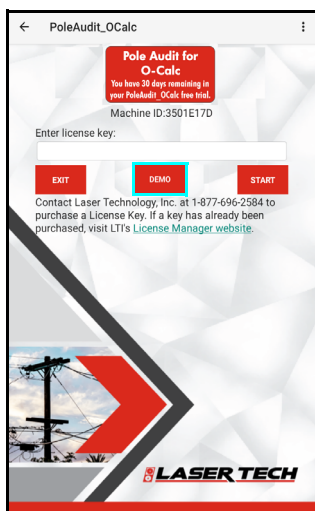
Upon any purchase of Pole Audit for O-Calc, Laser Technology generates a customer account on its License Manager website (http://license.lasertechpartners.com/CustomerLogin.aspx) that allows you to generate license keys. The first time Pole Audit for O-Calc is started, a short video will play before the licensing screen is displayed. Pole Audit for O-Calc can be used for 30 days from the date of download before a license key is required (Figure 4A). Tap the Demo button to proceed past the licensing screen and use the program. At the end of 30 days, Pole Audit for O-Calc cannot be used without a license key.
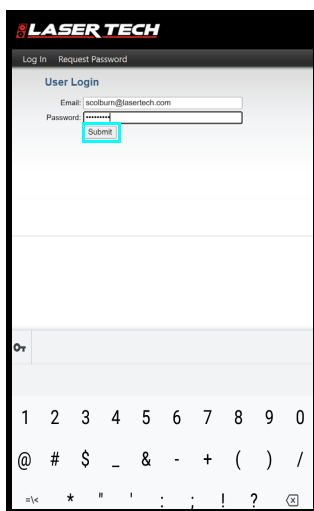

About the 30-day Trial:

- The Demo Status is located in the box below the App title. The status changes depending on how may days are left in the trial.

- Pole Audit for O-Calc is fully functional during the trial period. Data collected during this time are accessible during the trial and can be re-accessed when the program is licensed.

- Contact an authorized dealer near you to purchase a license key or call LTI for more information (1-800-790-7364 or 1-303-649-1000).
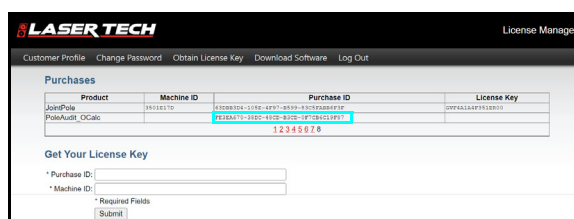

To generate a license key:

1. Notate the temporary password you received from licensing@lasertechpartners.com and open License Manager, http://license.lasertechpartners.com/CustomerLogin.aspx. If you follow the "License Manager website" link from Pole Audit for O-Calc licensing screen on your smart device, **your Machine ID was automatically copied to the clipboard.**

2. Tap the "Email" field to bring up the keyboard. Enter the email address associated with your purchase and the temporary password. Click [Submit] to log in (Figure 4B). If you do not have your temporary password, click the [Request Password] link at the top of the screen. Once successfully logged in, the "Obtain License Key" page displays.

3. Upon logging in, your purchase is displayed (Figure 4C).
   - **Machine ID**: If you followed the link from your smart device (Figure 4A), tap and hold the Machine ID field to paste the value. Or, enter the Machine ID manually (Figure 4C).
   - **Purchase ID**: Copy, tap and hold the "Purchase ID" in the Purchases Table (Figure 4C) and select the "Copy" option. Paste, tap and hold the "Purchase ID" field (Figure 4D) and select the "Paste" option (Figure 4E).
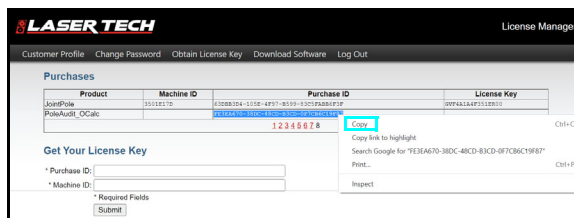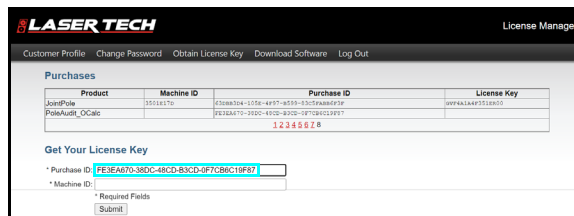

(A) (B) (C) (D) (E)

Figure 4

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4. Click [Submit] and your license key will display below the entry fields, as well as in the Purchases Table.

5. **Copy**, tap and hold, or notate the License Key (Figure 5A) and return to Pole Audit for O-Calc.

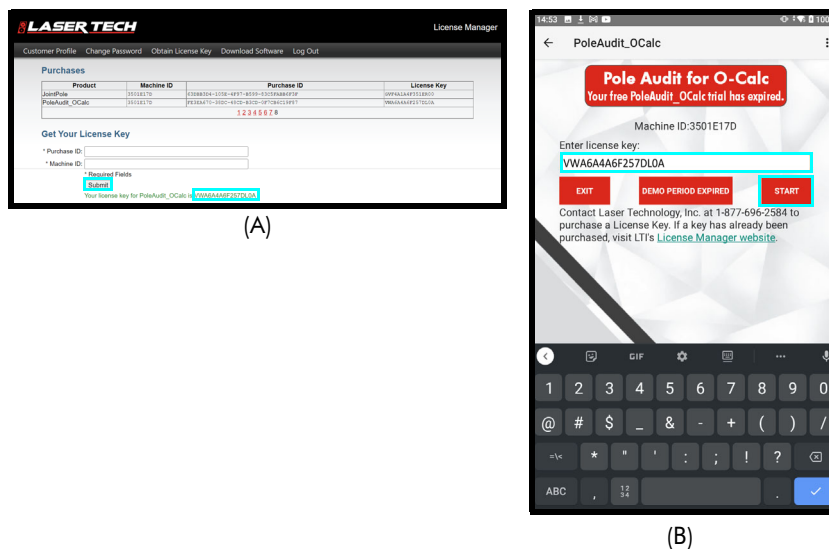6. **Paste** or enter the key in the "Enter License Key" field, tap and hold to display a prompt for pasting (Figure 5B).

7. Tap [Start].

(A)

(B)

Figure 5

If an incorrect key is entered, the app will not start and will remain at the Licensing screen.

For assistance contact: Licensing@lasertechpartners.com or call 1-877-696-2584. Please provide your name, company name, purchase ID (if known) as well as the Machine ID displayed on the Licensing screen.

About the Main Menu

Figure 6 shows the Pole Audit for O-Calc Main menu.
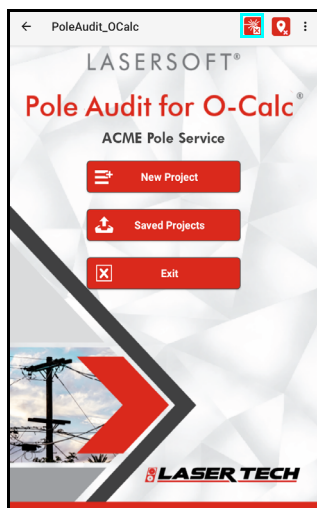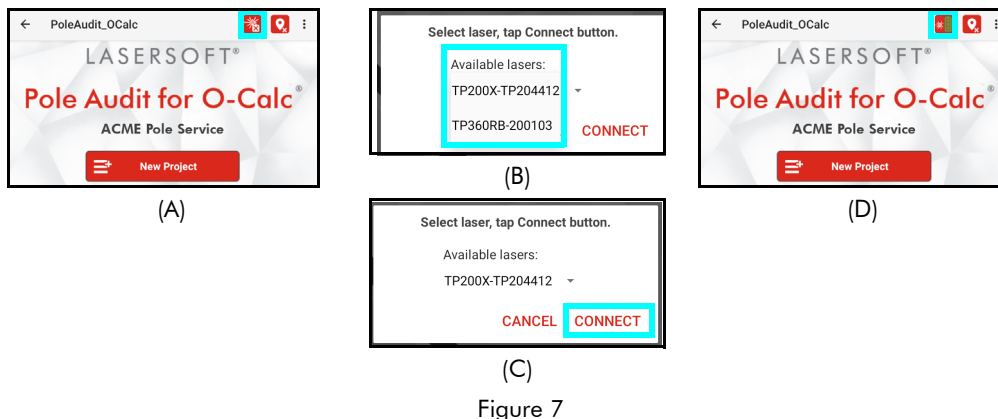
Tap the:

- Back arrow ← at the top of the screen to leave Pole Audit for O-Calc.

- Connection icon to connect a laser

- GPS setting icon to configure and enable GPS

- Menu button in the upper right corner of the screen to access:

    - Help
    - Pole Audit for O-Calc Settings
    - Calibrate Screen
    - About Pole Audit

- [New Project] button to begin a new project (Page 13).

- [Saved Projects] button to select an existing project and:

    - Open it
    - Delete it
    - Send the data file via email

- [Exit] button to close Pole Audit for O-Calc and return to the Android device main screen.

Figure 6

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Laser Connection

1. Tap the Connection icon [icon] from the Main menu (Figure 7A) and a configuration screen will appear.

2. Choose your laser from the list of Available lasers (Figure 7B) and tap CONNECT (Figure 7C).
   If a PIN is required, enter it and continue. Note the Connection icon turns green (Figure 7D).
   If it is colored yellow, replace the laser batteries and restart this process.

(A)

Select laser, tap Connect button.
Available lasers:
TP200X-TP204412
TP360RB-200103   CONNECT

(B)

Select laser, tap Connect button.
Available lasers:
TP200X-TP204412
CANCEL   CONNECT

(C)

(D)

Figure 7

Enable GPS

1. Tap the Enable GPS icon [icon] from the Main menu (Figure 8A) and a configuration screen will appear (Figure 8B).

2. Location Services will display. To select a different source, pull down the list and select your device.

3. Enter the Antenna Ht to calculate a good ground Elevation.

4. Wait for coordinates to display and note the HRMS value, which is an accuracy indicator for the position (Figure 8C). The lower the number the better; and it will automatically update and improve with time.

5. Check the DMS box to store coordinates in Degrees, Minutes and Seconds instead of the default Decimal Degrees (Figure 8D).

6. Tap CLOSE to save settings and return to the Main menu.

   Note the GPS icon has turned green [icon] (Figure 8E).

(A)

GPS
HRMS: 1.0E8   10 Satellites
Source: Location Services
Latitude: 39.4454965
Longitude: -104.7352405
Elevation: 6142.06
Antenna Ht: 4.0
DMS: ☐
CLOSE

(B)

GPS
HRMS: 1.0E8   10 Satellites
Source: Location Services
Latitude: 39:26:43.8072
Longitude: -105:15:53.0892
Elevation: 6143.04
Antenna Ht: 4.0
DMS: ☑
CLOSE

(C)

GPS
HRMS: 1.0E8   14 Satellites
Source: Location Services
Latitude: 39:26:43.9026
Longitude: -105:15:53.1654
DMS: ☑
CLOSE

(D)

(E)

Figure 8

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Help Menu

Pole Audit for O-Calc Help includes information about connecting lasers to devices, the meaning of each information tab and laser measurement routine; and the ability to send data and diagnostic files to LTI Tech Support. Help is located as a menu option in the upper right corner of the Pole Audit for O-Calc screen at any time the program is open (Figure 9A).

Tap [Help] from the menu to display the Pole Audit for O-Calc Help Menu (Figure 9B).
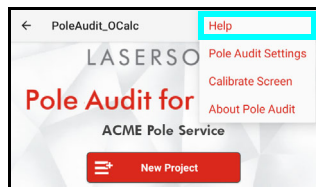
(A)
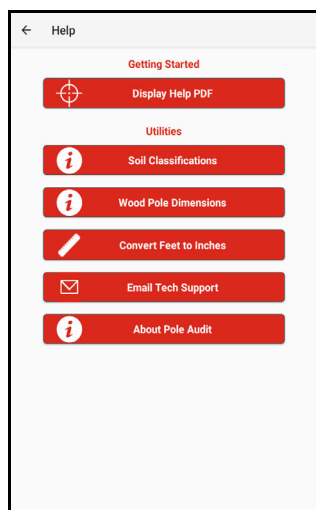
(B)
Figure 9

Help Menu Options:

Getting Started
- **Display Help PDF** - Description and measurement tips for each information tab:
  - Location
  - Bays
  - Attachments
  - Notes
  - Photos

Utilities
- **Soil Classifications** - look up the classification number (0-8) that best represents the soil type.
- **Wood Pole Dimensions** - look up ANSI dimensions of Species, Class, Length and circumference.
- **Conversion Chart** - convert inches to decimal feet.
- **Email Tech Support** - If a crash happens, re-open the project and use this feature to send a diagnostics file and/or the data file to technical support for assistance.
- **About Pole Audit** - find the software version number, Laser Technology contact information and a link to the user's manual.

Pole Audit Settings

Tap [Pole Audit Settings] from the menu (Figure 10A) to display the Settings screen (Figure 10B).
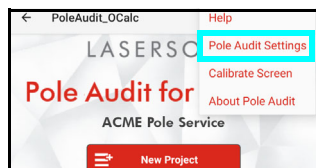
(A)
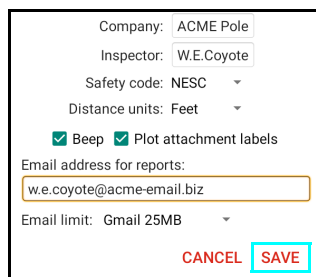
(B)
Figure 10

1. Enter/Select the following:
   - **Company**
   - **Inspector**
   - **Safety code** - NESC, GO95 or other
   - **Distance units** - Feet or Meters to match laser.
   - **Beep** - Check for the Android device to emit a beep when it receives measurement data.
   - **Plot attachment labels** - Check to show the Pole ID, total height, attachment heights and equipment on photos.
   - **Email address for reports** - Enter an email address that will automatically be used when sending Pole Audit for O-Calc reports.
   - **Email limit** - choose provider, for sending reports and photos.
2. Tap:
   - SAVE - to record any changes that have been made and return to the previous menu.
   - CANCEL - to exit screen without making any changes.

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Calibrate Screen

Upon taking a photo of a pole, there is an option to plot labels onto it, showing the Pole ID, total height, attachment heights and equipment (see Settings Screen on Page 8). To do this, a screen calibration process must be completed.

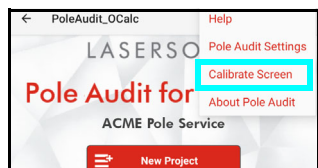**NOTE** If you do not require the photo labels, the screen calibration can be bypassed.

Figure 11

1. Tap [Calibrate Screen] from the menu (Figure 11).
2. Tap and hold in the circle next to the crosshair and slide it across the page (Figure 12A).
3. Move the crosshair until it matches up with the **X** by **1**.
4. Tap the **Next** button (Figure 12B).
5. Repeat this procedure for the **X**'s next to **2**, **3** and **4**.
6. Then tap the **Check** button to confirm the calibration is good (Figure 12C).
   - If it fails, repeat the procedure.
   - If it passes, all crosshairs will display and then tap the **Save** button (Figure 12D).

(A)   (B)   (C)   (D)
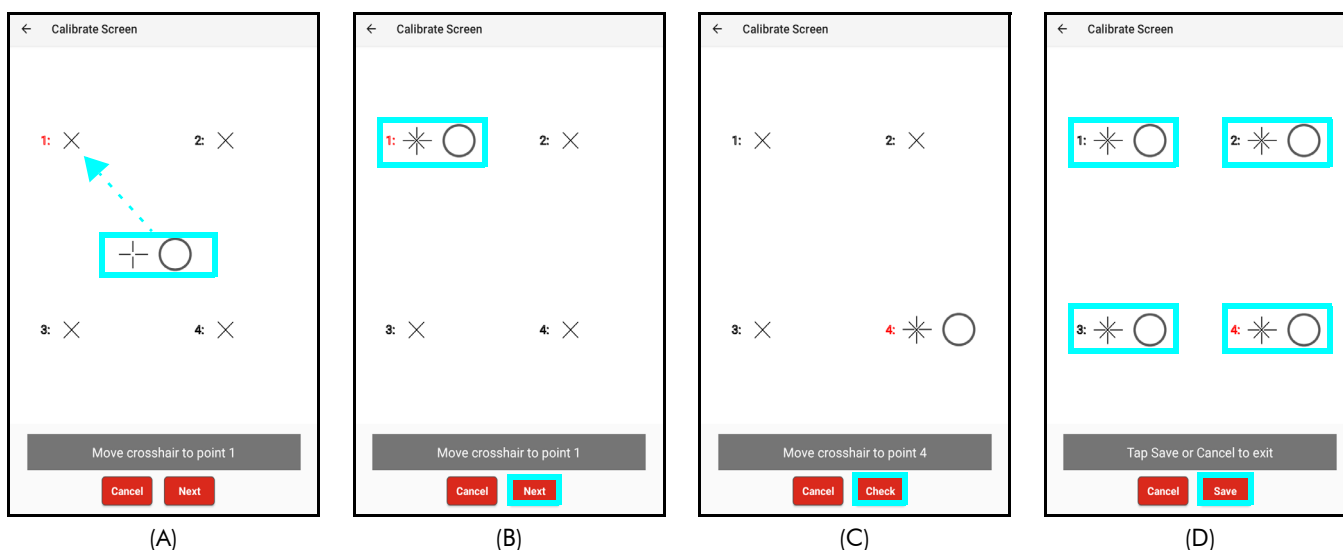
Figure 12

About Pole Audit for O-Calc

(A)

(B)
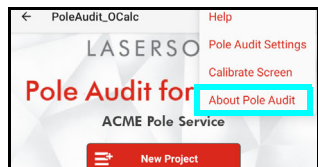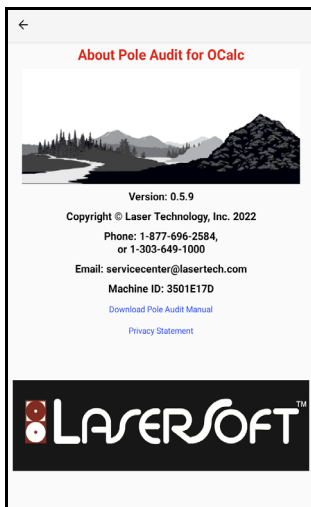
Figure 13

Tap [About Pole Audit] from the menu (Figure 13A).

The About screen (Figure 13B) displays the product name and version number, as well as LTI contact info, the Machine ID, links to the user's manual, and privacy statement.

Section 3 - Collect Data

Once the equipment has been configured, the software has been installed and licensed, it is time to begin collecting data. Ensure all equipment is powered on.

If at any time the smart device shuts down or locks up during the data collection process, power the device back on and re-open Pole Audit for O-Calc to resume data collection. Data is automatically saved after each measurement to allow data collection to continue seamlessly.

Laser Setup Notes

TruPulse 200 / 360B/R:
Ensure that the laser's measurement mode is set to HD (Horizontal Distance) or SD (Slope Distance). When using a reflector, ensure the electronic filter is turned on AND that the mechanical foliage filter is affixed to the laser lens. The laser Bluetooth function needs to be turned on with "BT_On" selected. If using a TruAngle, select the Bluetooth options "BT_Enc" instead. Set the desired measurement units in the laser to feet or meter. Refer to the TruPulse 200B, 360B or TruPulse 360R manual for further instruction.

TruPulse 200X:
Ensure that the laser's measurement mode is set to HD (Horizontal Distance) or SD (Slope Distance). When using a reflector, ensure the electronic filter is turned on AND that the mechanical foliage filter is affixed to the laser lens. The laser Bluetooth function needs to be turned on with "BT_Enc" selected if using a TruAngle, and "BT_On" selected if not. Set the desired measurement units in the laser to feet/in or meter/cm. Refer to the TruPulse 200X manual for further instruction.

NOTE When mapping with a retro reflector, ensure that the electronic filter is turned on AND that the mechanical filter is affixed to the laser's receive lens. If these filters are not used, close range measurements (10 ft or less) may permanently damage the laser. Please see the hardware manual for further details.

Calibrate the Compass in a TruPulse 360B/R

1. Stand outdoors facing +/-15 of North; ensure there are no large metal objects in close vicinity.
   See Appendix D for more details on magnetic hygiene.

2. While looking through the scope of the laser, long press the down arrow button until "Units" displays.

3. Short press the down arrow until "H_Ang" displays and press Fire to select the option.

4. Short press the down arrow until "HACAL" displays and press Fire to select the option.

5. Short press the down arrow one time so the display rotates between "HACAL" and "Yes."
    Press fire to select the option ("C1_Fd" will display in the scope) and begin this routine:

   NOTE At each laser position, starting with ❶ shown in Figure 14, press Fire and wait about one second before shifting the laser to the next position:

Figure 14

6. Once the calibration is complete, look through the scope to see a message of "PASS" which means you are good to go. Press Fire to return to the menu. If the display reports a "FAIL" message, make sure you are aiming North and repeat the calibration making each rotation/fire press deliberate and one second each. If the unit continues to Fail perform the Tilt calibration and then repeat the Compass cal. See TruPulse 360/R user's manual for further assistance with compass calibration.

MapStar TruAngle

The MapStar TruAngle provides the horizontal angle necessary for 3D mapping from one position using the Radial with Angle mapping method. A user-defined zero is set and all angle measurements from that specific position are based upon that zero.

To operate this device:

- Connect the laser to the TruAngle with the 4-pin cable included in the mapping package. Make sure to connect it to the port labeled "LASER" on the TruAngle.

- Ensure the laser Bluetooth option is set for BT_Enc.

(A)

Quick Start for TruPulse 200X + TruAngle System

1. Connect laser to TruAngle with 4-pin to 4-pin cable.

2. Power on the TruAngle, screen displays "ind" (index) (Figure 15A).

3. Rotate the TruAngle until screen displays flashing "0.00."

4. Turn on Bluetooth (BT_ENC) in the laser and pair it to the Android device (see Page 6 for further explanation).

5. Aim the laser at the desired reference (0) point and press the left-hand button (or fire the laser) to zero. The "0.00" will stop flashing (Figure 15B).

(B)

Figure 15

Pair a Laser with an Android Device

For data to be received from the laser to an Android Device, the two must be paired via Bluetooth. Once the laser has been paired to a Android device via Bluetooth, the pairing process described here does not have to be done again unless the laser is intentionally unpaired or the Android device is reformatted.

Bluetooth Setup - TruPulse 200X, 360B, 360R, 200B

1. Find and tap the Settings icon on the Android Device (Figure 16).

2. Tap [Bluetooth] on the Settings list (Figure 17A).
   If Bluetooth is listed as "OFF," toggle it to "ON."

Figure 16

3. Tap the laser device's serial number which should be listed in the AVAILABLE DEVICES section (Figure 17B). If it is not listed, tap search (or scan) for devices and/or ensure that the laser's Bluetooth is set to "BT_On" or "BT_Enc" if connected to a TruAngle.

Bluetooth PIN Information:	TruPulse 200X PIN =	1234
	TruPulse 200B/360B/360R PIN =	1111

4. Accept any Passkey by tapping [Pair], if prompted (Figure 17C).

5. Once successfully paired, the laser serial number will display in the Paired Devices section (Figure 17D).

| (A) | (B) | (C) | (D) |

Figure 17

NOTE If the laser is powered off when viewing the current or available Bluetooth devices in range of the Android device, the laser may be described as "Not Connected" even if the two have already been paired. Power the laser on and the device should then display as a paired device.

Additional Information

Localization

English is the default language for most Android devices; however, it can be changed.

To change the language:

1. Power on the Android device.
2. Tap the Settings icon on the device home screen.
3. Tap [Language & Input].
4. From the list of languages displayed, select the language to use for the text display on the device.
5. Press the Home button on the device to return to the device Home screen.

Serial Data Format

The Pole Audit for O-Calc app accepts data from LTI instruments that use a data format which is based on the NMEA 0183 Standard for Marine Electronic Navigational Devices, Revision 2.0. For more detailed information about serial data format, refer to the user's manual that shipped with the LTI instrument.

Start a New Project

From the Main Menu, tap New Project (Figure 18A) to collect new Pole Audit for O-Calc measurements.
The New Project Settings screen will display (Figure 18B).

(A)   (B)

Figure 18

1. Enter/Select the following:
   - **Project Name** - May include any combination of alphanumeric characters (1500 max). Four invalid characters include / \ & or space. An error message will be displayed if the file name includes invalid character(s). Clear the message by clicking [OK] and enter a name using valid characters. Duplicate project names are not allowed. If an existing name is entered, a prompt will appear indicating that a Duplicate Project Name was entered. To proceed, the name must be changed.
   - **GPS** - Will be used when checked to set the coordinates for the Origin point of your measurements. This will allow you to plot the data on Google Earth or a similar program.
   - **Inspector** - Is carried over from the Settings screen or can be entered here.
   It is the person performing the data collection.
   - **Configuration file** - Is selected from the list.
   These files are created in the O-Calc ® desktop app and are copied over to the Android device.
   - **Load Case** - Is selected from the list.
   - **Project note** - Is a general description for the work and may include any characters (1500 max).

2. Tap the [NEXT] button to save the New Project entries that have been made and advance to the Pole Record List for the project.

<u>IMPORTANT NOTE</u>
This document is based on a sample O-Calc configuration file which will be used in describing the work flow.
Your configuration file may look different and yield different results, however the basic work flow will be the same.

New Pole Record

Tapping [Next] from the New Project screen advances to the Pole Record List for the project (Figure 19).

Tap the button at the bottom right of the screen to start a new Pole record.

Pole Record Overview

The information tabs now display for the current pole (Figure 20).
The particular fields displayed are dependent on the configuration file being used. Working from left to right across the page:

Figure 20

Figure 19

- **LOCATION** - enter all the data for the pole, including the location, Type, Species and Class, as well as measure the Len AGL with the laser.

- **BAYS** - Identify the number and type of Bays from this pole and the distance to the next pole.

- **ATTACHMENTS** - Add equipment to the pole and assign a height value.

- **NOTES** - Enter a Note for the pole, as well as Line Sag measurements and condition issues.

- **PHOTO** - Take an image of the pole and overlay attachment labels.

LOCATION Tab

Figure 21

- **Street** - Road on which pole is located.
  The [GPS] button will display when selected.

- **Pole ID** - Enter alpha/numeric pole ID.

- **Type** - Choose from Distribution, Service, Streetlight, Transmission.

- **Material** - Specify if the pole is composed of Wood, Concrete, Fiberglass or Steel.

- **Species** (if Wood is specified) - Choose from the pull-down list.

- **Soil Class** - Choose a value from 0 to 8.

- **Pole Class** - Choose the correct value based on your pole material.

- **Size GL** - Circumference at ground level, in inches.

- **Len AGL** - Total pole length above ground level, in inches.

- **Lean** - Pole lean in degrees of inclination.

- **Direction** - Compass bearing of pole lean.

NOTE there are two types of red buttons that will take measurements with the laser:

 Fire button: For single shot measurements, put the cursor in this field and fire the laser to receive the data.

 Measurement Routine button: for multi-shot sequences, tap this button and follow the prompts in the pop-up window.

Tap the [GPS] button to display the coordinates (Figure 22A).

1. Enter the Antenna height to get an accurate ground Elevation

2. If you have the antenna at the pole, tap SAVE.

3. If you are offset from the pole and want to locate it with a TruPulse 360, enter the Instrument and Target Heights for the shot.

4. Shoot to the pole and the coordinates at the bottom will turn from gray to black (Figure 22B)

5. Tap SAVE to store these coordinates for the pole and a check mark appears on the [GPS] button (Figure 22C).

(A)

(B)

(C)

Figure 22

Measure the Len AGL with the Laser

Tap the [button] button (Figure 23) and follow the prompts. This data will be saved to the tab.
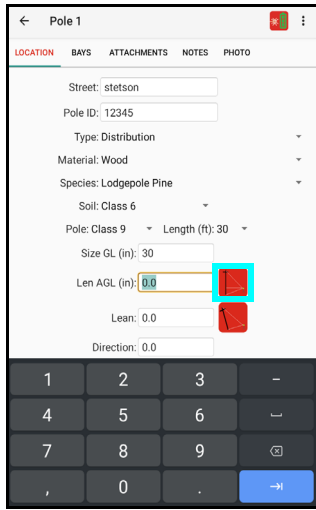
Figure 23
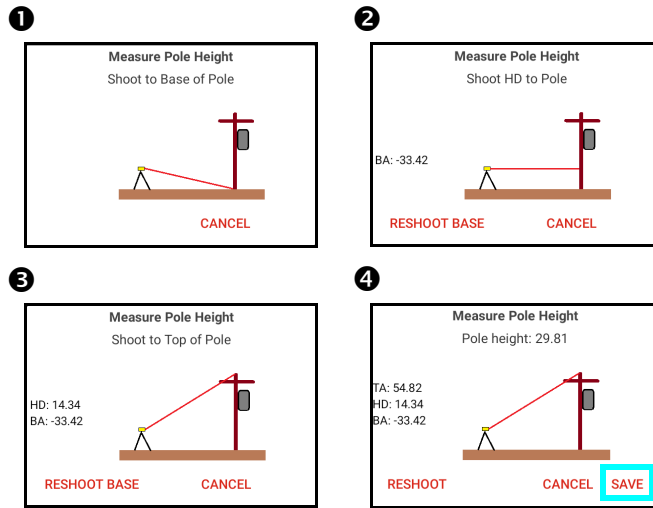
Measure the Lean of the Pole with the Laser

Tap the [button] button (Figure 24A) and follow the prompts.
This data will be saved to the tab (Figure 24B).
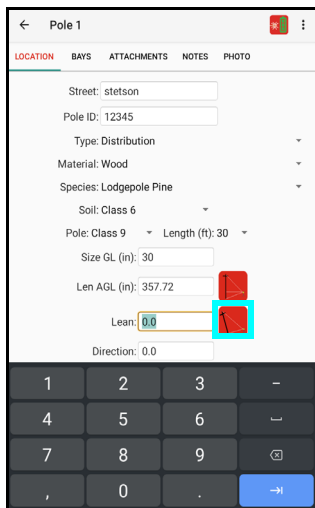
(A)
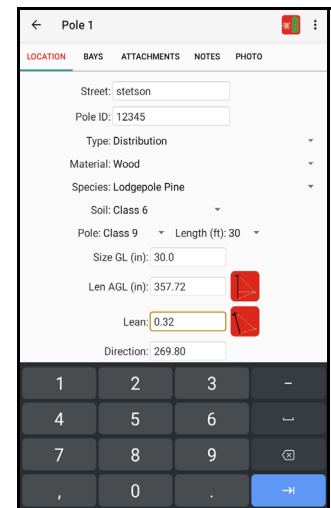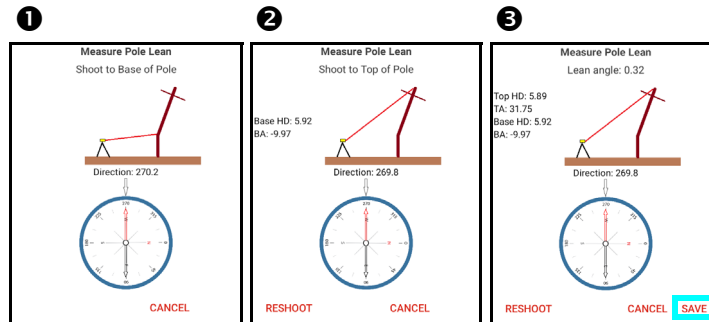
(B)

Figure 24

BAYS Tab

- **ADD**: Tap the [+] button to add another Bay type.

- **DELETE**: Highlight a Bay and tap the [🗑] button to remove it.
- **CHANGE**: Tap a Bay to highlight it and tap it again to open a pop-up screen, where you can:

(A)

(B)
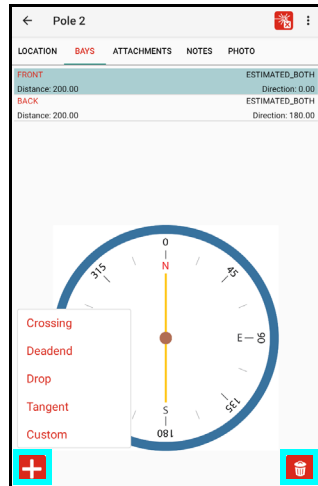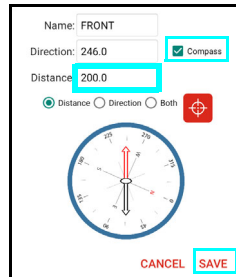
- Change the Name
- Measure the Direction using the devices compass (box checked) or enter it manually.
- Tap Distance and fire the laser to measure the bay distance or tap the Fire button to remote trigger the laser. This value can also be manually entered. Tap Direction to download the Azimuth from a TruPulse 360. Tap Both to measure the distance and direction with the 360.

Tap:

- SAVE - to record any changes that have been made and return to the previous menu.
- CANCEL - to exit screen without making any changes.

Figure 25

ATTACHMENTS Tab

1. Tap the [+] button to add an Attachment (Figure 26A).

2. Choose the type from the sub-menus (Figure 26B). The particular fields displayed are dependent on the configuration file being used.

3. A pop-up window will appear (Figure 26C) where you can:
   - Specify parameters for the Attachment.
   - Tap the [ ] button to measure the height or enter it manually.
   - Choose the bays.

4. Tap:
   - SAVE - to record any changes that have been made and return to the previous menu.
   - CANCEL - to exit screen without making any changes.

(A) (B) (C)
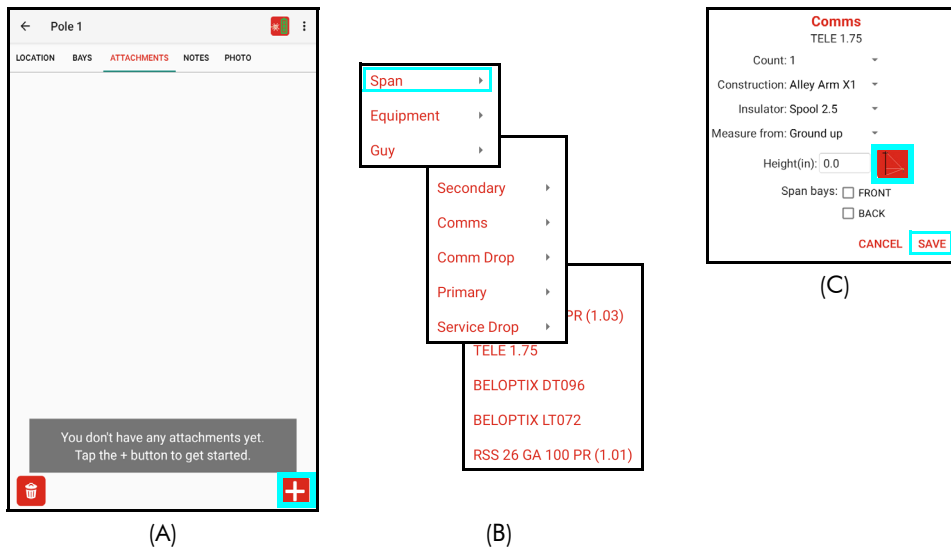
Figure 26

Measure the Height with the Laser

Tap the [ ] button and follow the prompts. This data will be saved to the tab.

NOTE If you are standing in the same location you measured the Len AGL on the Location tab, you do not have to repeat the Base angle and HD to pole shots. Simply aim at the Attachment point and collect the top angle for the Height.

If you have moved, tap the 'Reshoot Base' button to restart the sequence.
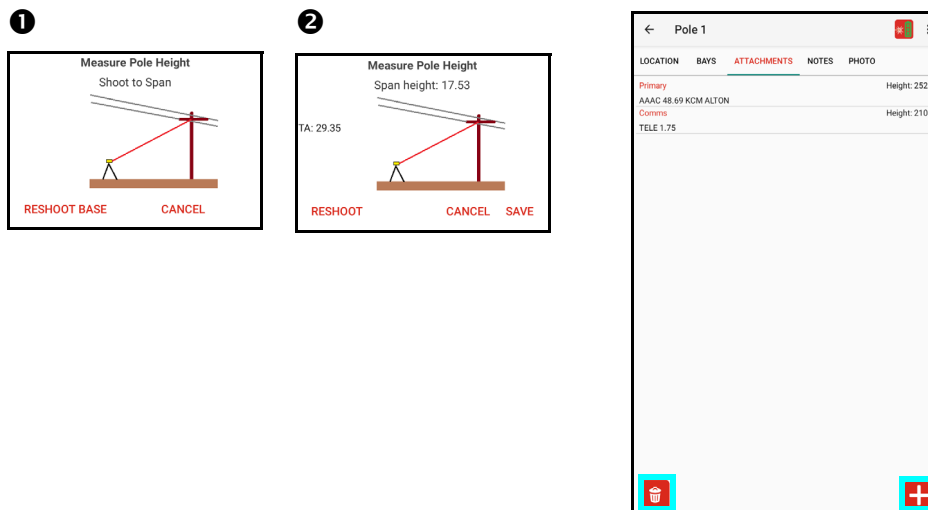
- **ADD:** Tap the [+] button to add another Attachment type.

- **DELETE:** Highlight an Attachment and tap the [ ] button to remove it.

- **CHANGE:** Tap an Attachment to highlight it and tap it again to re-open it.

Figure 27

NOTES Tab
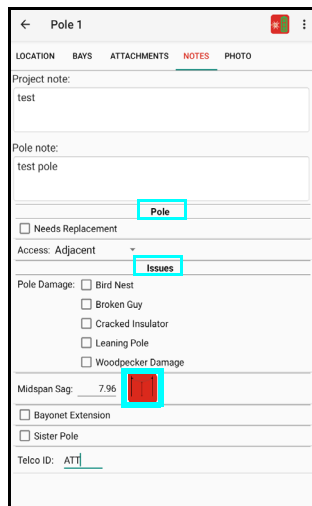
(A)   (B)
Figure 28

1. Update the Project note and enter a Pole note specific to this location.

2. **Pole** section: Specify whether it needs replacement and the available access.

3. **Issues** section: Check the items found during inspection.

4. If you have a user-defined field of the Number type in your configuration file, the laser measurement button will display, and that button will pop up the measurement choices shown.

   For example, to measure a Midspan Sag height, tap the ▮▮ button (Figure 28A) and a menu will prompt you to select a measurement type (Figure 28B), which in this case will be Sag/Clearance. Use the other types to record other measurements.

5. Check whether a Bayonet Extension or Sister Pole are present.

6. Enter the Telco ID.

Sag/Clearance

1. Tap the ▮▮ button and select [Sag/Clearance].

2. Follow the prompts (Figure 29) and the data will be saved to the NOTES tab.
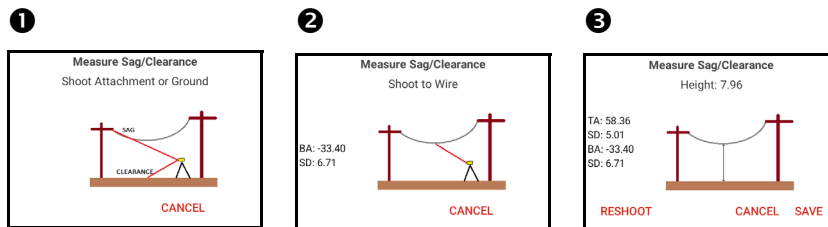
Figure 29

NOTE To measure the Line sag, take the first shot to the attachment point and the second to the wire. The result will be the Line sag.

1 Shot to Target

1. Tap the ▮▮ button and select [1 Shot to Target].

2. Follow the prompts (Figure 30) and the data will be saved to the NOTES tab.
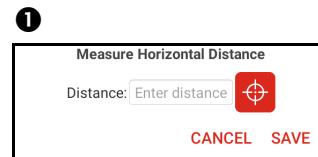
Figure 30

2 Shots Offset From Targets

1. Tap the ▮▮ button and select [2 Shots Offset From Targets].

2. Follow the prompts (Figure 31) and the data will be saved to the NOTES tab.
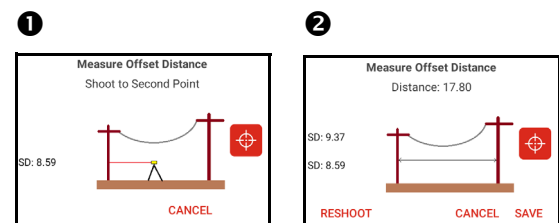
Figure 31

Height

1. Tap the ▮ button and select [Height].

2. Follow the prompts (Figure 32) and the data will be saved to the NOTES tab.

❶

Measure Object Height
Shoot to Base of Pole

CANCEL

❷

Measure Object Height
Shoot HD to Pole

BA: -36.10

RESHOOT BASE   CANCEL

❸

Measure Object Height
Shoot to Object on Pole

HD: 10.00
BA: -36.10

RESHOOT BASE   CANCEL

❹

Measure Object Height
Object height: 18.56

TA: 48.40
HD: 10.00
BA: -36.10

RESHOOT   CANCEL   SAVE
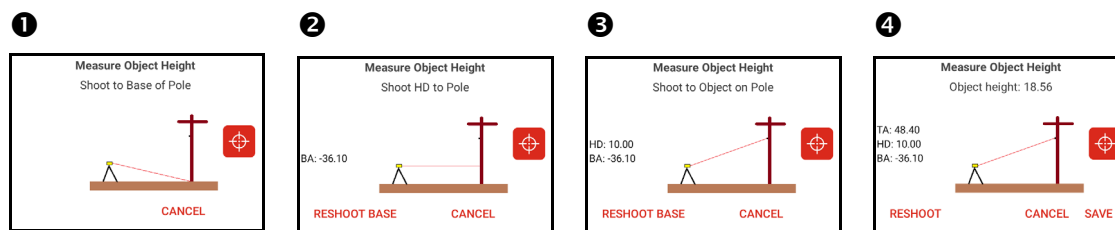
Figure 32
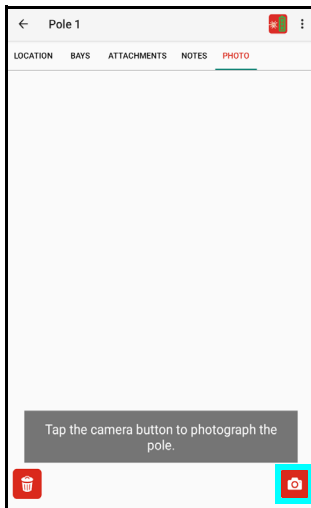
PHOTO Tab

Figure 33

- Tap the [camera] button to add a Photo (Figure 33).

- Follow the prompts to take and accept the image.

- Tap the [trash] button to delete the image (Figure 34).

- Tap the [camera] button to re-take the image.

Figure 34

Plot Attachment Labels

For this feature to work, this option needs to be checked in the Settings screen (Page 8) and the screen calibration performed (Page 9).

1. You will see markers for the top and bottom of the pole appear on the photo (Figure 35A).

2. Tap and hold in the circle next to the bottom crosshair and slide it to the base of the pole in the photo. Do the same thing for the top of the pole with the upper crosshair (Figure 35B).

3. The Attachment labels and heights will now appear. Note the Pole ID at the base and the total height at the top. Due to the camera angle, some attachment points may not line up (Figure 35C).

4. Tap on the attachment so the text turns red. Up [↑] and Down [↓] arrows will appear at the bottom of the page and can be used to nudge the label to the correct position. Do this as many times as necessary. This action does not affect the good height value from the laser, it only makes the image look correct (Figure 35D).

5. Review the image and make sure it looks good (Figure 35E). Tap another tab and continue collecting information or tap the back arrow (←) to return to the Pole record list.
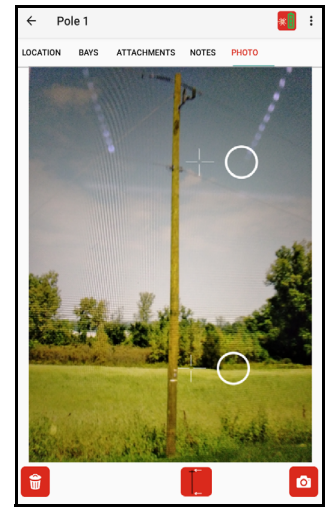
(A)
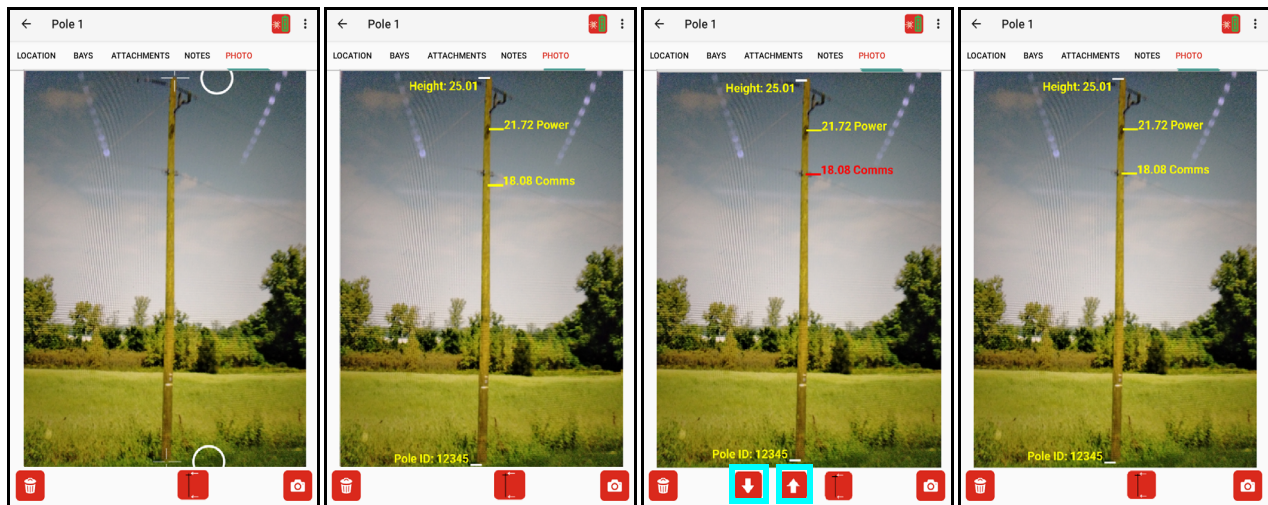
(B)

(C)

(D)

(E)

Figure 35

Pole record List

When leaving the tabs from your first pole record, or when opening a Saved Project, you will enter the Pole record list (Figure 36). Use this screen to Delete or Add Pole records.

NOTE A Pole record may be re-opened and edited as many times as needed.

Delete a Pole

1. Tap on a Pole record to highlight it on the list.

2. Tap the [🗑] button to remove it. There will be a prompt to continue or cancel and the Pole record will be removed from the project.

Add a Pole

1. Tap the [+] icon and the Pole tabs will display.

2. Fill out all the information on the tabs and take the measurements needed with the laser.
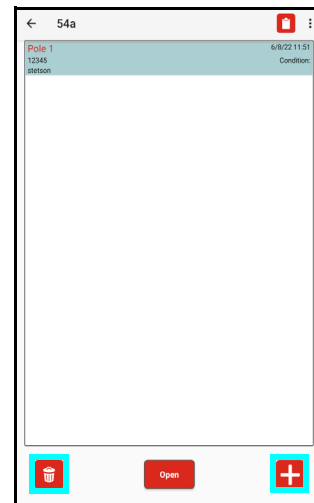
Figure 36

Generate a Report

When a Project has been completed and all the Pole records have been checked for quality in the field, reports of several different types can be generated from the app. They will contain Project and Pole information, any images taken and all laser measurements results.

1. At the Pole record list, tap the icon in the upper right portion of the screen (Figure 37A). The Report Menu will display (Figure 37B).

2. Note that the "*.lcanx" files are in the list of Saved reports. These are the pole record files that will import into O-Calc Pro desktop. There is one for each Pole record.

3. Tap the Send button and choose the options.

    •   Send the highlighted file only

    •   Pole files: send all *.lcanx files for O-Calc

    •   All reports: send these and all report files

    •   Include photos: check to include

(A)   (B)

Figure 37

4. Highlight these files and tap the button to send them via email.

5. Pull down the Report format list and select a type (Figure 38):

    •   **Text Report (*.txt)**: produces a tab delimited text file with no images.

    •   **Spreadsheet Report (*.csv)**: generates a comma delimited text file (no images) that will open directly in Excel.

    •   **GPX (*.gpx)**: creates a geo-referenced output file with descriptions that will open in GIS software such as ArcGIS - GPS ONLY.

    •   **KML (*.kml)**: creates a geo-referenced output file with descriptions that will open in Google Earth - GPS ONLY.

    •   **All Above Formats**: will create a copy of the report in each of the formats listed.

    NOTE The GPX and KML output files are only available on this list when GPS has been used to set Pole locations .

Figure 38

6. Select one of the Save buttons:

    •   will save the files and open the email client, creating a message with the reports attached. If you have entered an address to send reports to in the Settings screen this will automatically be used. Otherwise, enter an address and send the message.

    •   will save a copy of the selected file(s) and make them available for transfer later.

    Once Reports have been generated, they will be listed at the bottom of the Report menu. All images that were taken for the project will be listed here also. Any of these files may be selected by tapping on them to highlight, and they can be either deleted or sent via email .

7. Tap the back arrow (←) to return to the Pole record list. Continue to add poles to this project or tap the back arrow to return to the Main menu.
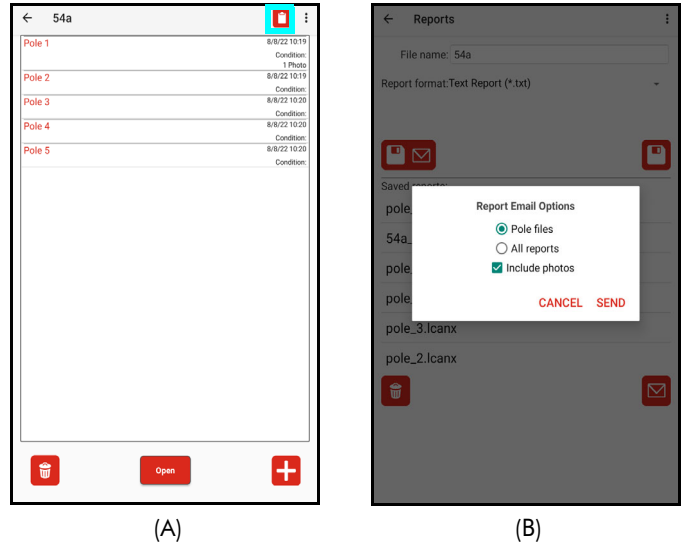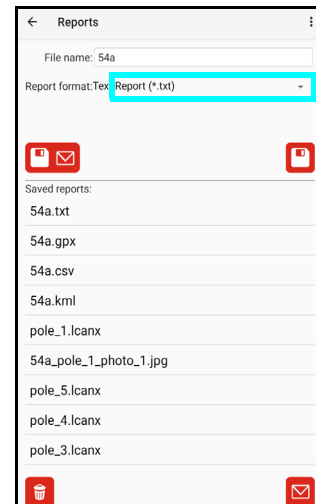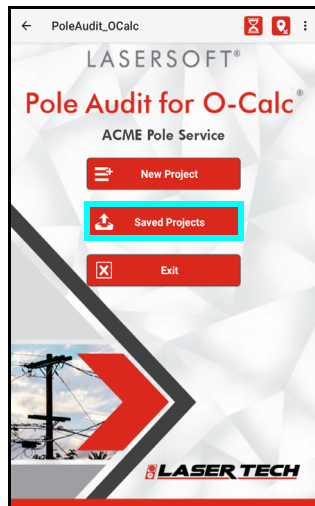
Saved Projects

1. Tap the [Saved Projects] button from the Main Menu (Figure 39A).

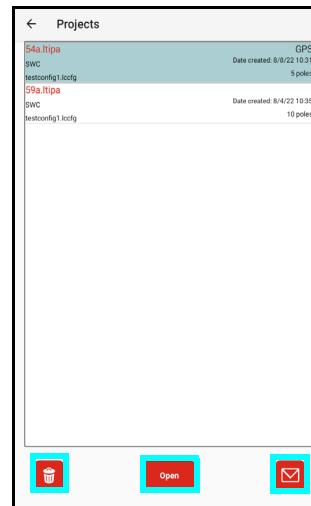2. Tap on a Project (Figure 39B) to highlight it and then tap:

   - **Open** to re-open the project

   - 🗑 to remove it from the device

   - ✉ to email the project file, configuration file and all report files that have been created. You can also attach the photos.

(A)   (B)   (C)

Figure 39

Transfer Reports/Data to a PC

In addition to email, saved reports can also be transferred to a PC via the USB cable that accompanies the Android device. When Pole Audit for O-Calc is installed, it creates a folder for storing program settings, reports, and *.ltipa format project files. The location is Android/data/com.lasertech.poleaudit_ocalc/files/. The *.ltipa project files can only be opened within Pole Audit for O-Calc and are located in a sub-folder named "Data". In addition to transferring project reports to a PC, it is also a good idea to copy *.ltipa files over as well once all edits and changes to the project are complete. An *.ltipa file can always be copied back over to the Android device if it becomes necessary to add more data to a project or make any other changes - and then reports can be re-created based on the updated file.

1. Connect the Android device to a PC with the USB cable that accompanies the device. Android devices typically connect as if they are a "Removable Disk" or external hard drive. Please refer to the manual that shipped with your device to understand how it connects to a PC.

2. Swipe down from the top of the Android device screen, select Settings, and tap Connected devices (Figure 40A).

3. Tap "USB" from the Currently Connected list (Figure 40B).

4. Select the File Transfer option (Figure 40C).

5. On the PC, open File Explorer and then navigate to and select the Android device. In this example, it is "CT8X2". When the device is selected, its contents display on the right side of the File Explorer screen (Figure 40D).
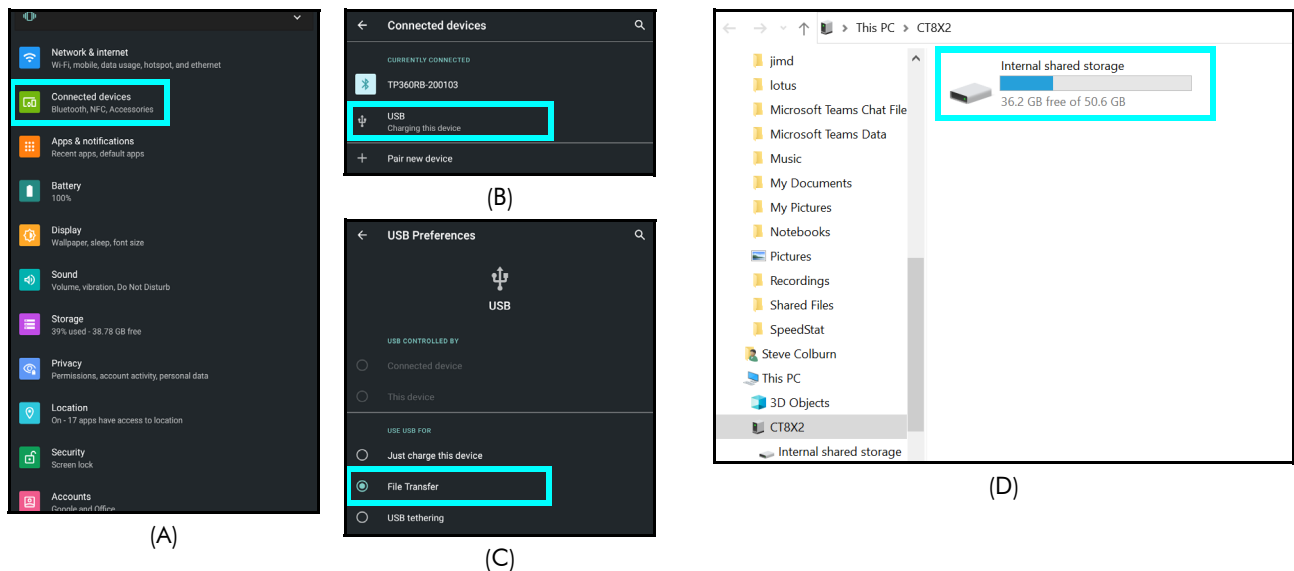
Figure 40

6. Navigate to the Android/data/com.lasertech.poleaudit_ocalc/files folder (Figure 40A).

7. Double-click the folder that coincides with the project name and the saved reports will display (Figure 41B). Copy any of the individual reports or copy the entire folder to transfer all the reports for the project by highlighting them and then right-click/copy with your mouse.

8. Create a folder on your PC for storing your Pole Audit for O-Calc reports and *.ltipa files. Double-click the folder, and then right-click/paste with your mouse.
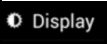

Figure 41

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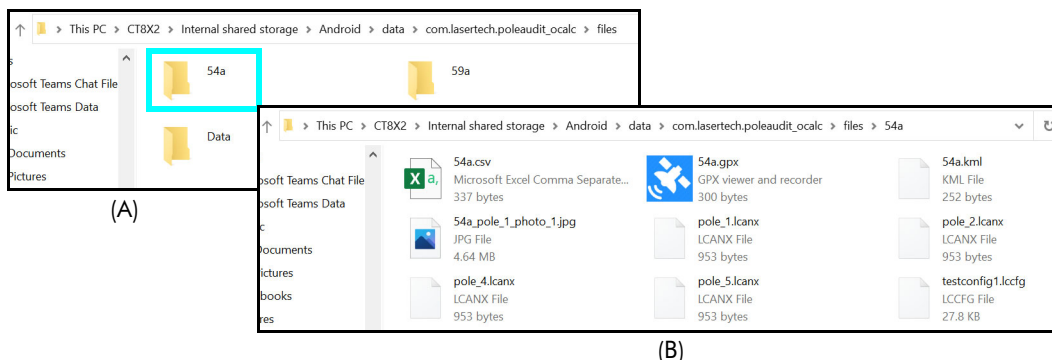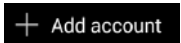
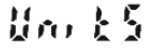## Appendix A - Pole Audit for O-Calc for Android Quick Start Guide

This quick reference guide is divided up by specific LTI lasers used with a ruggedized Android tablet. If using an Android device not purchased from LTI, the steps referencing tablet set up will be similar but may have some variances. Refer to the Android device's manual for information on setting up Wi-Fi, email accounts, and connecting Bluetooth devices if necessary.

Step 1 for All Lasers - Install Pole Audit for O-Calc and Get Licensed

1. Turn on tablet, tap [Settings], tap [Display] to set SLEEP to NEVER.

2. Tap [Settings], then tap [+ Add account] to add a Google account or get assistance from IT to set up a dedicated email account for your reports.

3. Tap [Play Store], then Search for: "LaserSoft Pole Audit for O-Calc" [Pole Audit] and INSTALL the app.

4. From the Main screen, tap [⊞], then tap [Pole Audit] to open app.

5. Tap and hold [Machine ID: 748DDB3C] to copy or notate Machine ID on paper.

6. Tap [License Manager website] link, then log in with your Email and temporary password sent from LTI.

7. Paste or type the Machine ID into [Machine ID:].

8. From the Purchases Table, copy and paste or type in your purchase ID into [Purchase ID:].

9. Tap [Submit], then copy or notate the License Key.

10. Tap [Pole Audit], then paste or type in the License Key and then tap [START].

11. Charge the tablet.

12. Go to Step 2 for TruPulse 360R/B for laser setup (below), or to Step 2 for TruPulse 200X + TruAngle .

TruPulse 360B/R
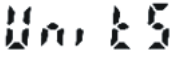
Step 2 - Toggle On Bluetooth

1. Press [FIRE ⏻] to power the unit on.

2. Long press [⌃] until *UnitS* .

3. Press [⌃] until *bt* .

4. Press [FIRE ⏻] then press [⌃] until *bt on* .

5. Press [FIRE ⏻] to confirm.

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Step 3 - Change Units of Measure to Feet (if necessary)

1. Long press ⌃ until ⨿ᴜⁿⁱ𝗍𝗌 .

2. Press ⏻ then press ⌃ until 𝗨𝗻𝗶𝘁𝗦 𝗙𝗘𝗘𝗧 .

3. Press ⏻ and then press ⏻ again to accept feet/degrees as units of measurement.

Step 4 - Connect TruPulse 360B/R with Android Device via Bluetooth

1. Tap ⚙, then tap 📱 Connected devices Bluetooth, NFC, Accessories .
2. Turn on tablet's Bluetooth.
3. Tap the laser model/serial number under AVAILABLE DEVICES.
4. Enter PIN number: 1111 or accept any passkey.
5. Exit to the Main screen.

TruPulse 200X + TruAngle

Step 2 - Toggle On Bluetooth

1. Press ⏻ to power the unit on.

2. Press MODE until (bt SETUP oFF) .

3. Press ⌃ until (bt SETUP EnC) .

4. Press ⏻ to accept.

Step 3 - Change Units of Measure to Feet

1. Press MODE until (UnIt M SETUP dEg° CM) .

2. Press ⌃ to scroll through unit options (UnIt M SETUP PEr CM) , (UnIt F SETUP dEg° IN) .

3. Press ⏻ to accept the units of measurement (HD - - - - F - - IN) .

Step 4 - Sync Android Device with TruPulse 200X via Bluetooth

1. Tap ⚙, then tap 📱 Connected devices Bluetooth, NFC, Accessories .
2. Turn on the tablet's Bluetooth.
3. Tap the laser model/serial number under AVAILABLE DEVICES.
4. Enter the PIN number: 1234 or accept any passkey.
5. Exit to the Main screen.

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Final Steps for All Lasers - Start a Project & Store a Result

*For standard projects without GPS.

1. Power ON all components.

2. Tap [Pole Audit] and then tap [New Project].

3. Connect to a Laser and GPS (if needed) by tapping the connection icons at the top of the Main menu.

4. Enter the filename for the Project, select whether GPS will be used and enter an Inspector.

5. Choose your Configuration file from the pull-down list.

6. Choose the Load case to use for this project.

7. Enter a Project note and then tap [NEXT].

8. From the Pole record list, tap [+] to add a new Pole record.

9. Fill out the tabs of information for the pole and make measurements with the laser.

10. Complete the information for the pole and tap the Back arrow (←) to return to the Pole record list.

Appendix B - Conversion Table (Inches to Decimal Feet)

The chart below converts fractions of inches into decimal equivalents. Conversions are also available
in Pole Audit for O-Calc 's built-in Help (Page 8).

Inches	Feet	Inches	Feet	Inches	Feet	Inches	Feet
1/8"	0.0104	3 1/8"	0.2604	6 1/8"	0.5104	9 1/8"	0.7604
1/4"	0.0208	3 1/4"	0.2708	6 1/4"	0.5208	9 1/4"	0.7708
3/8"	0.0313	3 3/8"	0.2813	6 3/8"	0.5313	9 3/8"	0.7813
1/2"	0.0417	3 1/2"	0.2917	6 1/2"	0.5417	9 1/2"	0.7917
5/8"	0.0521	3 5/8"	0.3021	6 5/8"	0.5521	9 5/8"	0.8021
3/4"	0.0625	3 3/4"	0.3125	6 3/4"	0.5625	9 3/4"	0.8125
7/8"	0.0729	3 7/8"	0.3230	6 7/8"	0.5729	9 7/8"	0.8229
1"	0.0833	4"	0.3333	7"	0.5833	10"	0.8333
1 1/8"	0.0938	4 1/8"	0.3438	7 1/8"	0.5938	10 1/8"	0.8438
1 1/4"	0.1042	4 1/4"	0.3542	7 1/4"	0.6042	10 1/4"	0.8542
1 3/8"	0.1146	4 3/8"	0.3646	7 3/8"	0.6146	10 3/8"	0.8646
1 1/2"	0.1250	4 1/2"	0.3750	7 1/2"	0.6250	10 1/2"	0.8750
1 5/8"	0.1354	4 5/8"	0.3854	7 5/8"	0.6354	10 5/8"	0.8854
1 3/4"	0.1458	4 3/4"	0.3958	7 3/4"	0.6458	10 3/4"	0.8958
1 7/8"	0.1563	4 7/8"	0.4063	7 7/8"	0.6563	10 7/8"	0.9063
2"	0.1667	5"	0.4167	8"	0.6667	11"	0.9167
2 1/8"	0.1771	5 1/8"	0.4271	8 1/8"	0.6771	11 1/8"	0.9271
2 1/4"	0.1875	5 1/4"	0.4375	8 1/4"	0.6875	11 1/4"	0.9375
2 3/8"	0.1979	5 3/8"	0.4479	8 3/8"	0.6979	11 3/8"	0.9479
2 1/2"	0.2083	5 1/2"	0.4583	8 1/2"	0.7083	11 1/2"	0.9583
2 5/8"	0.2188	5 5/8"	0.4688	8 5/8"	0.7188	11 5/8"	0.9688
2 3/4"	0.2292	5 3/4"	0.4792	8 3/4"	0.7292	11 3/4"	0.9792
2 7/8"	0.2396	5 7/8"	0.4896	8 7/8"	0.7396	11 7/8"	0.9896
3"	0.2500	6"	0.5000	9"	0.7500	12"	1.000

Appendix C - Troubleshooting Tips

NOTE Pole Audit for O-Calc for Android does not support Android devices running Android operating systems older than 10.0.
To check the version of the operating system of the Android device, navigate to "Settings" and then "About."
Remedy steps may vary slightly depending on the specific device used.

Problem	Remedy
No communication between laser and the Android device.	• Ensure all system components have adequate power levels. Replace laser batteries and/or re-charge the device if they are low. • Tap the Laser Connection Indicator icon at the top of the Main screen and try to take another measurement. • Verify that the Bluetooth feature in the laser is set to BT_Enc (when using a TruAngle) or BT_On (without a TruAngle). • Ensure that the laser is paired to the Android device via Bluetooth (Page 4). Lasers can only be paired to one device at a time. • If using a TruAngle: ensure that the 4pin to 4pin cable connecting the laser to the TruAngle laser connector is securely in place. Also verify that the TruAngle firmware is version 1.17 or better. Refer to the TruAngle manual for more information.
GPS connection icon won't turn green.	Go to Android Settings and make sure Location is turned on.
The Height, Span or Clearance values do not look right.	Tap the RESHOOT button to return to the shot sequence screens and retake any suspect measurements. They can be repeated until the operator is satisfied.
The Android device locked up or doesn't seem to be working properly.	Power the Android device off and back on again. Press and hold the power button to see the options for resetting the device. No matter what, each measurement is saved as it is taken, and no data will be lost.
An error message was displayed while working in Pole Audit for O-Calc.	Error messages are often self-explanatory. Clear the message and correct the error before proceeding. If the error continues, restart Pole Audit for O-Calc. If the error persists, reset the Android device (see above). Go to Pole Audit for O-Calc Help and select Email Tech Support to send a diagnostic file to support@lasertech.com
Cannot see the Android device when connected to a PC with the USB cable.	When the Android device is connected with the USB cable, swipe down from the top of the Android device screen, select Settings and check the USB Connection. Ensure that you are allowing file transfer and not just charging or image transfer only.
Cannot save reports when trying to transfer them to a PC using a cable.	The Android device cannot be connected to the computer when reports are being saved. Unplug the cable, save the reports, and then plug the cable back in to access saved reports.

Appendix D - TruPulse 360 Magnetic Interference Guidelines

Minimum 6"
- Metal Rim Eyeglasses
- Pen/Pencil
- Metal Watch Ban
- Pocket Knife
- Metal Zipper/Buttons

- Belt Buckle
- Batteries
- Binoculars
- Cell Phone
- Keys

- Camera
- Camcorder
- Survey Nails
- Metal Tape Measure

Minimum 18"
- Clipboard
- Data Collector
- Computer

- GPS Antenna
- 2-Way Radio
- Hand Gun

- Hatchet
- Cell Phone Case w/ Magnetic Closure

Minimum 6'
- Bicycle
- Fire Hydrant
- Road Sign
- Sewer Cap or Drain

- Steel Pole
- ATV
- Guy Wire
- Magnets

- Chain-Link Fence
- Barb-Wire Fence
- Trimble Nomad w/ Stylus Magnet

Minimum 15'
- Electrical Box
- Small Car/Truck

- Powerline

- Building Concrete & Steel

Minimum 30'
- Large Truck

- Metal Building

- Heavy Machinery

Appendix E - Uninstall Pole Audit for O-Calc

This example is based on Android tablet OS version 10. Other Android devices may be very similar.
Refer to the manual for the specific Android device used to find the process for uninstalling apps.

1. Transfer any needed project files or reports to a computer (Page 24).

2. Go to Settings, scroll down and select [Apps & Notifications] from the Settings list (Figure 42A)

3. Scroll down and select Pole Audit for O-Calc from the list of apps (Figure 42B).

4. Tap [Uninstall] to remove the program (Figure 42C).

5. Leave the "Keep app data" box unchecked and all remaining app files will be deleted.
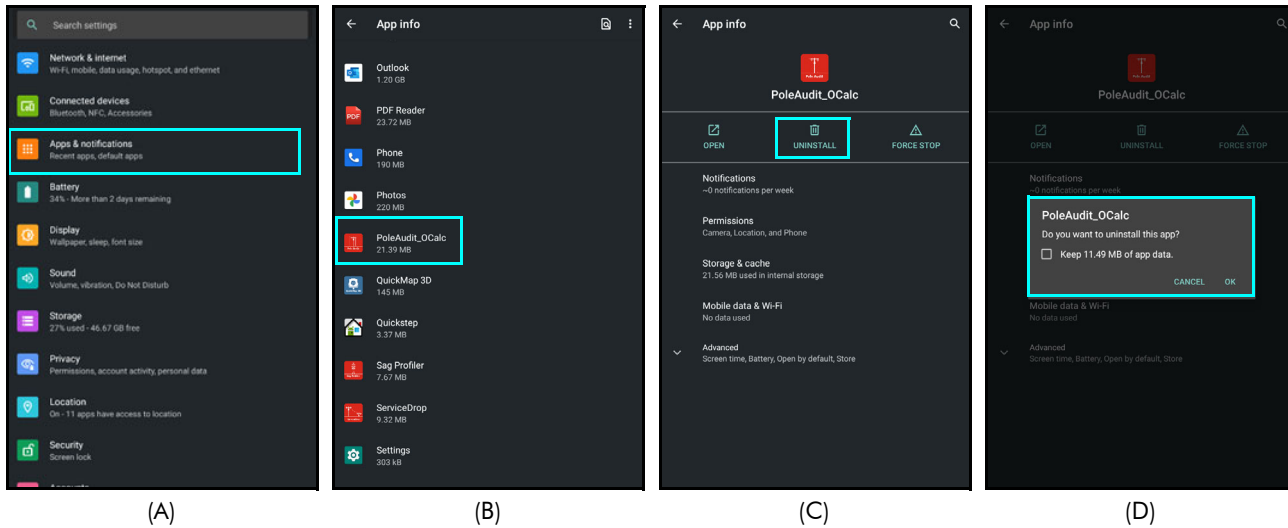Tap OK to uninstall and delete app data. (Figure 42D).

| (A) | (B) | (C) | (D) |

Figure 42