

LaserSoft®



QuickMap 3D®

Android User's Guide



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Printed in the United States of America.

First Edition: March 2016
Second Edition: May 2016
Third Edition: July 2016
Fourth Edition: August 2017
Fifth Edition: December 2017
Sixth Edition: December 2018
Seventh Edition: July 2021
Eighth Edition: August 2023
Ninth Edition: January 2025

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Section 1 - Introducing QuickMap 3D for Android

Thank you for purchasing LaserSoft® QuickMap 3D® (QM3D) for Android from Laser Technology, Inc. (LTI). QM3D is a proven field data collection software for accident/crime mapping available on the Android platform. Combine Laser Technology's highly accurate surveying instruments with QM3D for a complete accident/crime scene mapping solution.

LTI surveying instruments can automatically enter data into QM3D, which can create two-dimensional (2D) and three-dimensional (3D) maps. Depending on the location and environmental challenges dictated by the field, QuickMap can include GPS coordinate data or simply provide XYZ coordinates of mapped points.

QM3D survey files can be downloaded to a computer and imported into most CAD-based drawing programs capable of reading a DXF file, such as IMS Map360 or Crash Zone. Reports can also be opened in Microsoft® Excel and many GPS visualization programs capable of reading a GPX or KML file (Google Earth).

Technical Specifications

LaserSoft QuickMap 3D has been designed to run on Android operating platforms for use in conjunction with Laser Technology surveying instruments.

Specification	Description
Application Version	QM3D for Android Version 9.x
Operating Systems	Android version 10+* * Please check Google Play Store for current compatibility
Supported Devices	<ul style="list-style-type: none"> CT8X2 Tablet (IP 67 rated) - Cedar Tree Technologies, Inc. Most smart devices running Android 10+* * Please check Google Play Store for current compatibility
Connectivity	Bluetooth or WLAN depending on laser in use
Compatible Lasers	<ul style="list-style-type: none"> TruSpeed Sxb Speed Measurement Device TruPulse 200X Laser Range Finder
Hardware	<ul style="list-style-type: none"> MapStar TruAngle (Required for Radial with Angle Mapping Method) X-Grip & Mounting Claw for 7" Tablets (Recommended)
Supported Languages	English, French, Italian and Korean; template is available for translation

Warranty Information

A copy of the LTI Limited Warranty should have shipped with orders including hardware. 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 tablet package includes the associated product literature, such as manuals and warranties. It is your responsibility to contact the manufacturing company to register the tablet.

What's New

LaserSoft QuickMap 3D (QM3D) is a proven field data collection software for crash and crime mapping built for Android devices. When combined with a TruPulse 200X or TruSpeed Sxb, this laser-based data collection app can be used to capture measurements of anything anywhere. QM3D for Android Version 9 has these exciting features:

- New laser connection scheme
- New on-board Help PDF
- Streamlined workflow for Radial with Angle method using GPS

Instrument Configurations

QM3D is designed to work with five possible instrument configurations:

- TruPulse 200X with a TruAngle (Figure 1A)
- TruPulse 200X without a TruAngle
- TruSpeed Sxb with a TruAngle
- TruSpeed Sxb without a TruAngle (Figure 1B)

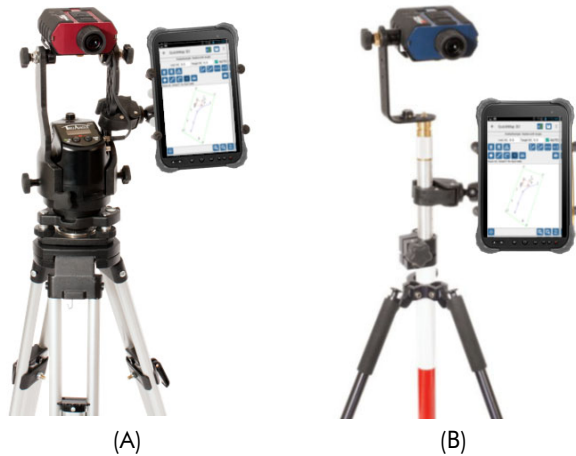


Figure 1

Laser Setup Notes

TruPulse 200X:

1. Ensure that the laser's measurement mode is set to HD (Horizontal Distance) or SD (Slope Distance).
2. When using a retro reflector, ensure the electronic filter is turned on AND that the mechanical foliage filter is affixed to the laser lens.
3. Turn on the laser Bluetooth function.
 - Select bt_on when not using with a TruAngle.
 - Select BT_EnC when using with a TruAngle.
4. Set the desired measurement units in the laser to feet/in or meter/cm.
5. Refer to the TruPulse 200X manual for further instruction.

For full out-of-the box and field setup information, see [Appendix A, Page 85](#).

TruSpeed Sxb:

1. When powered on, the laser defaults to Speed Mode. Press the Mode button on the top of the laser one time to switch from Speed Mode to Survey Mode. A Triangle will display in the lower left corner when looking through the scope.
2. When using a retro reflector, ensure the electronic filter is turned on AND that the mechanical foliage filter is affixed to the laser lens. If these filters are not used, close range measurements (where the retro reflector is within 10 feet of the laser or closer) may permanently damage the laser.
3. Turn on the laser Bluetooth function.
 - Select bt_on when not using with a TruAngle.
 - Select BT_EnCd when using with a TruAngle.
4. Refer to the TruSpeed Sxb manual for further instruction.

For full out-of-the box and field setup information, see [Appendix A, Page 83](#).

MapStar TruAngle Setup Notes

The MapStar TruAngle provides the horizontal angle necessary for 3D mapping from one position using the Radial with Angle mapping method ([Page 27](#)). A user-defined zero is set and all angle measurements from that specific position are based upon that zero. In order to operate this device:

1. Ensure to connect the laser to the TruAngle with the 4-pin cable included in the mapping package.
2. Ensure the laser Bluetooth option is set for BT_Enc (use BT_On if not using a TruAngle).
3. Refer to the MapStar TruAngle manual for further instruction.



(A)

(B)

Figure 2

Section 2 - Get Started with QuickMap

This section describes the download and installation procedure necessary to get started with QM3D. 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 license the program. QuickMap will work unlicensed for a 30-day trial period from the date of initial download.

Get QuickMap from Google Play

To get the QM3D app from Google Play:

1. Use the Google Play search function to find "LaserSoft QuickMap 3D" (Figure 3).
2. Tap the QuickMap icon to install the app as you would any other Google Play application. If you do not already have a Google Play account, you will be prompted to create one.



Figure 3

Pair a Laser with a Tablet

In order for data to be received from the laser to a tablet, the two must be paired via Bluetooth. Once the laser has been paired to a tablet via Bluetooth, the pairing process described here does not have to be done again unless the laser is intentionally unpaired or the tablet is reformatted.

Bluetooth Setup

1. Find and tap the Settings icon on the tablet (Figure 4).
2. Tap Bluetooth on the Settings list (Figure 5A). If Bluetooth is listed as "OFF" toggle it to "ON".
3. Tap the laser device's serial number which should be listed in section for available devices (Figure 5B). If it is not listed, tap search (or scan) for devices and/or ensure that the laser's Bluetooth is set to "BT_Enc" for Radial with Angle surveys and "BT_On" for Range Triangulation or Baseline Offset surveys.



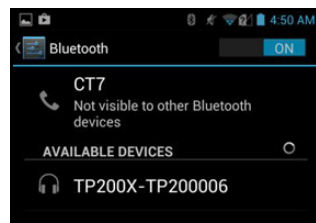
Figure 4

Bluetooth PIN Information: TruPulse 200X PIN = 1234 TruSpeed Sxb PIN = 6912

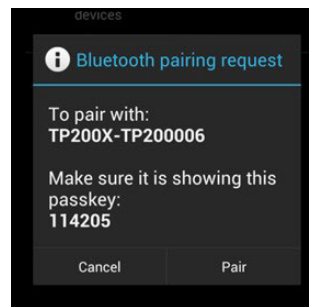
4. Accept any Passkey by tapping "Pair" if prompted (Figure 5C).
5. Once successfully paired, the laser serial number will display in the Paired Devices section (Figure 5D).



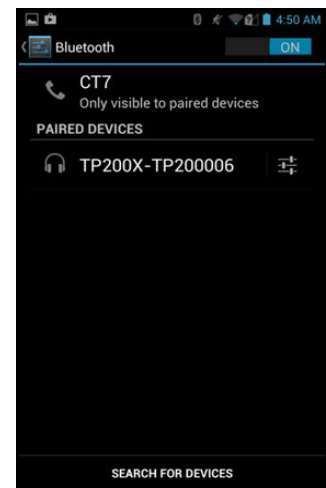
(A)



(B)



(C)



(D)

Figure 5

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.

Launch QuickMap

To launch the QuickMap app:

1. Find the QuickMap icon on the tablet or device (Figure 6A).
2. Tap the QuickMap icon (Figure 6B). The licensing screen will display (Figure 6C).

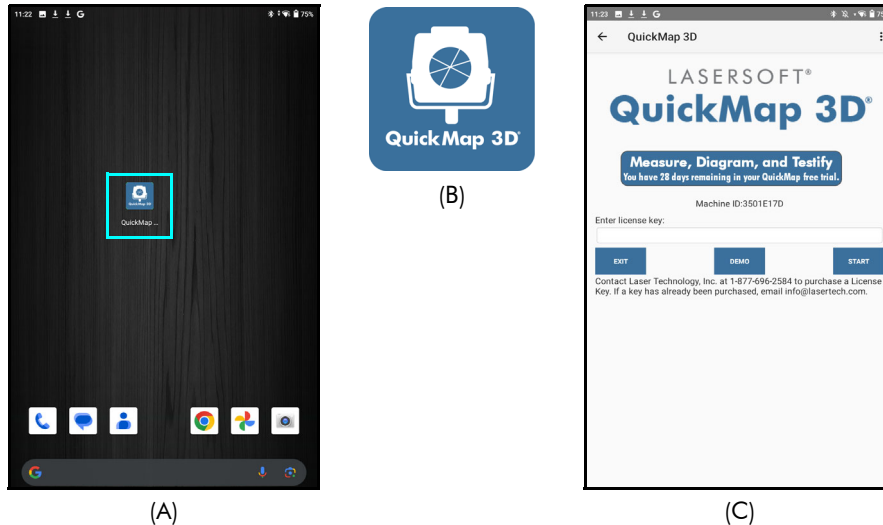


Figure 6

Program Licensing

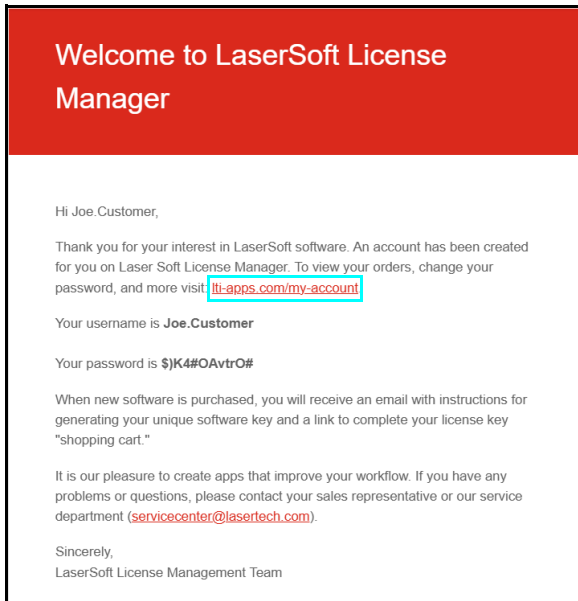
Upon any purchase of QuickMap 3D, Laser Technology generates a customer account on its License Manager website (<https://lfi-apps.com>) that allows you to generate license keys. The first time QuickMap is started, a short video will play before the licensing screen is displayed. QuickMap can be used for 30 days from the date of download before a license key is required. Tap the Demo Status button to proceed past the licensing screen and use the program. At the end of 30 days, QuickMap cannot be used without a license key. www.you

About the 30-day Trial:

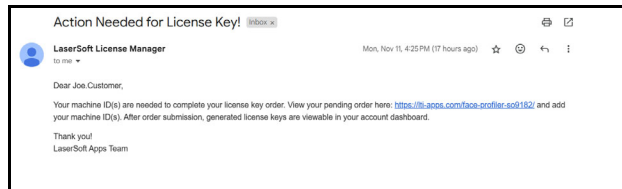
- The Demo Status button is in the center of the licensing screen, underneath the field where the license key is entered. The content on the button changes depending on how many days are left in the trial. In Figure 6A, the button shows DEMO 30 DAYS LEFT.
- QuickMap 3D is fully functional during the trial period. Surveys made 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, follow the example below that shows our FaceProfiler app.

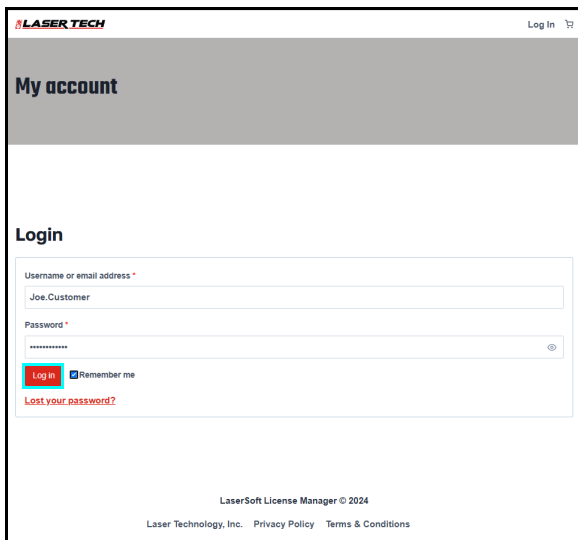
1. As a new customer, you will receive two emails from lasersoft@liti-apps.com.
 - The first email will contain your login and temporary password to the License Manager site <https://liti-apps.com> (Figure 7A)
 - The second email is a notification that there is an order pending in your License Manager cart (Figure 7B).
NOTE if you do not receive these emails, make sure to check your Spam/Junk folder. If you can't find them, contact servicecenter@lasertech.com to confirm your email address is correct.
2. Click on the link in the first email and log in to your account on the License Manager site (Figure 7C). Your dashboard will display (Figure 7D).



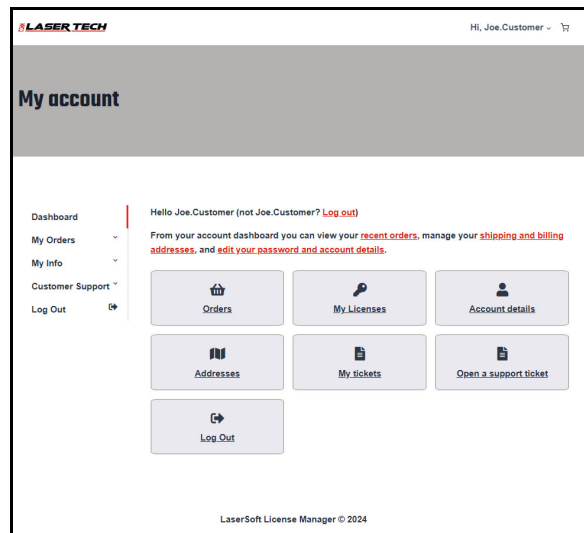
(A)



(B)



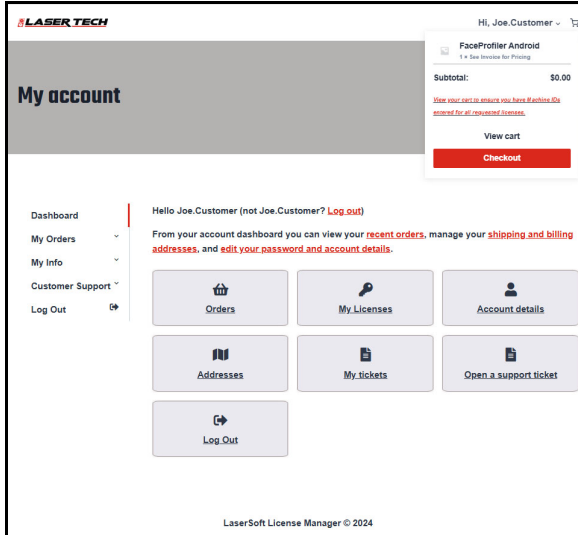
(C)



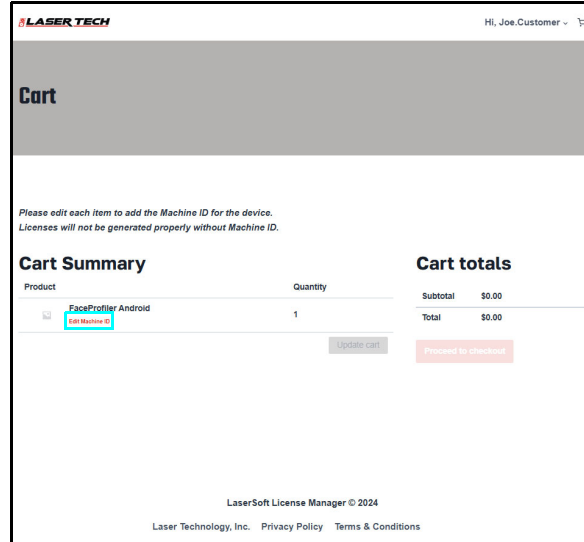
(D)

Figure 7

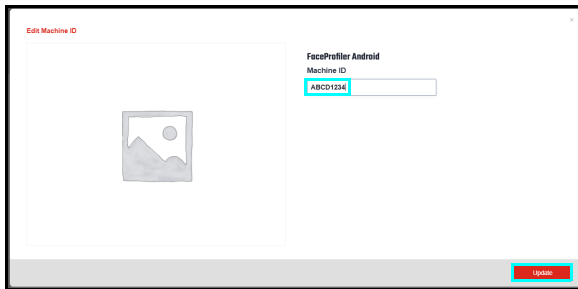
3. Click on the Cart symbol in the upper right corner to display the contents (Figure 8 A).
NOTE Tap on View Cart (**do not proceed to checkout yet**).
4. From the Cart Summary page (Figure 8 B), tap on the "Edit Machine ID" text below the product name.
5. On the Edit Machine ID screen, enter your Machine ID and tap Update (Figure 8 C).
NOTE you can swap back to the QuickMap app, tap on the Machine ID, copy it to the clipboard and then paste it here on this screen (Figure 8 D).



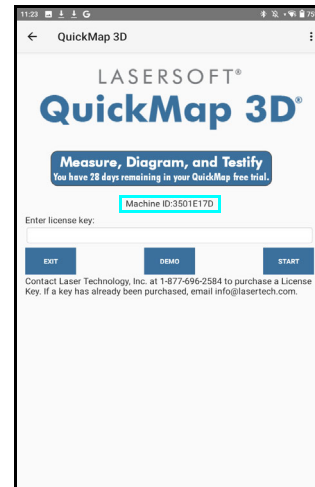
(A)



(B)



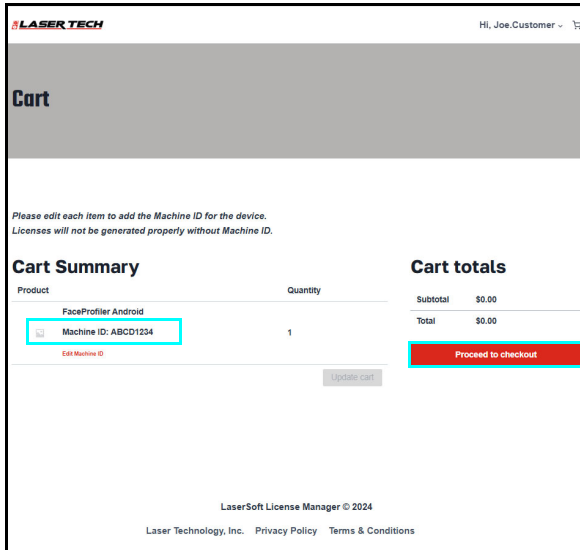
(C)



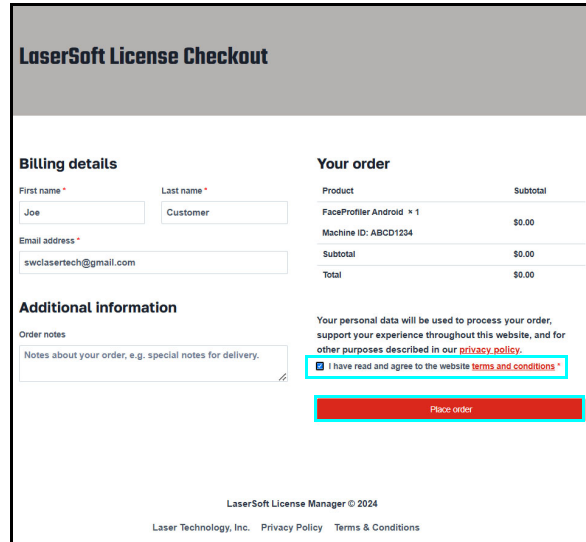
(D)

Figure 8

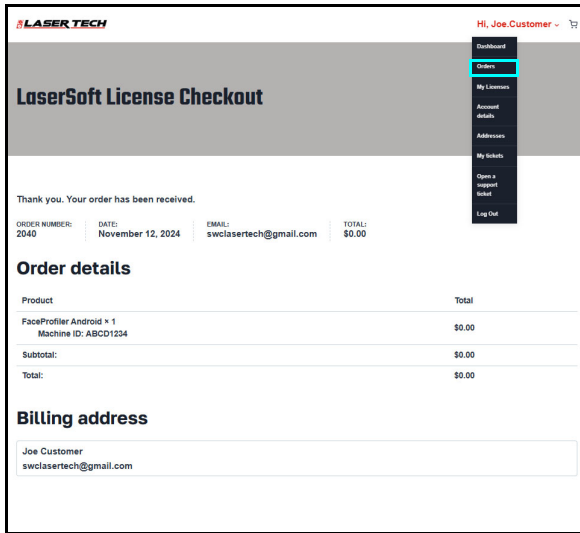
6. Verify your Machine ID is correct on the Cart Summary page and tap Proceed to Checkout (Figure 9 A).
7. From the Checkout page, confirm your details are good, check the Agree to terms box and tap Place Order (Figure 9 B).
8. From the Checkout Confirmation screen, hover over your name in the top right corner and choose Orders from the menu (Figure 9 C).
9. On the Orders page, tap the View button (Figure 9 D).



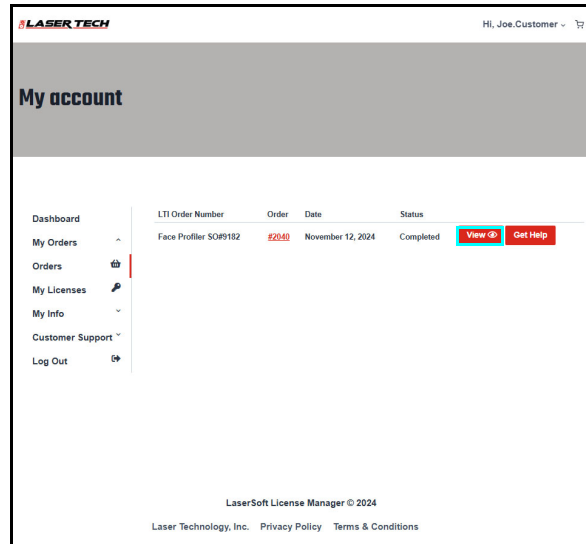
(A)



(B)



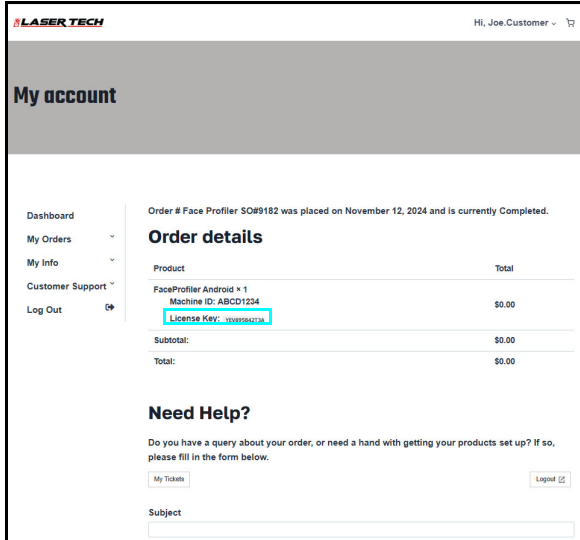
(C)



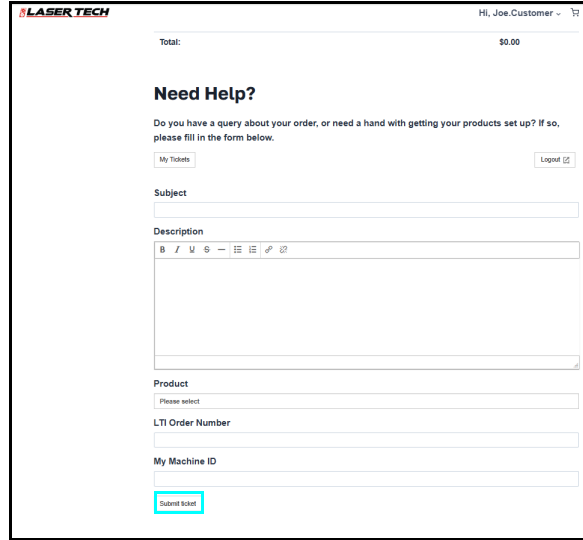
(D)

Figure 9

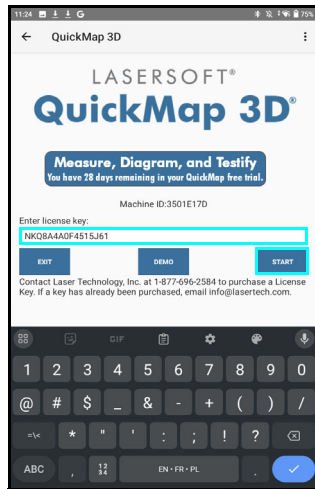
10. On the Order Details screen, hover over the license key and tap it to copy to the clipboard (Figure 10 A).
NOTE if you need Help, please fill out the form on this page, submit the Ticket and we will respond to your questions (Figure 10 B).
11. Open the QuickMap app, tap inside the License Key cell and select paste to enter your key.
 Tap [Start] (Figure 10 C).
12. The Main Menu will display (Figure 10 D).



(A)



(B)



(C)



(D)

Figure 10

If an incorrect key is entered, the QM3D Main Menu will not be displayed. Instead, the display will remain at the QuickMap licensing screen.

For assistance contact: servicecenter@lasertech.com or call 1-877-696-2584.

Please provide your name, company name, as well as the Machine ID displayed on the About page.

Section 3 - Mapping Methods

QM3D offers three unique mapping methods. This section provides an overview of those three methods. This section is only meant as an overview. Professional training on mapping methods in combination with the use of LTI measurement devices and computer software is strongly encouraged. Contact LTI for training options.

When deciding which method to use, consider:

- Equipment that you plan to use. If you are using a TruPulse 200X or a TruSpeed Sxb (with or without a TruAngle), you may choose to create either a 2D or 3D map
- 2D map: QM3D calculates X and Y coordinates for each data point
- 3D map: QM3D calculates X, Y, and Z coordinates for each data point
- Environmental factors such as terrain and curvature of the roadway
- Relative locations of the features to be mapped

Overview of Mapping Methods

Method	Requirements	Compatible Hardware
Radial with Angle	Clear line of sight from the origin point to each feature being mapped.	MapStar TruAngle with a TruSpeed Sxb or TruPulse 200X
Range Triangulation	Able to occupy (stand over) every feature to be mapped. Clear line of sight from each feature to the control points.	TruSpeed Sxb TruPulse 200X
Baseline Offset	Able to walk a straight line from one end of the scene to the other. Clear line of sight to each feature from a point along this straight line (the baseline).	TruSpeed Sxb TruPulse 200x

Radial with Angle Method

This method requires the use of a MapStar TruAngle in combination with a TruSpeed Sxb or a TruPulse 200X. In this method, pivot around an origin point and measure to any feature of the scene in view from the origin point. QM3D uses the distance and angle (heading in degrees from a user-defined reference azimuth) to the feature to calculate X, Y (or X, Y, Z) coordinates for each feature. Figure 11 shows how an accident scene would be mapped using the Radial with Angle method.

To map this scene, physically move to the origin, also referred to as a Control Point or as CP, then define the reference azimuth (zero TruAngle) to a reference point. The reference point should be a permanent object such as a fire hydrant. Then begin taking distance and angle measurements to as many features as can be seen. Once the features are measured, select any one of them as the new Control Point, and move to that point in order to measure the features not visible from CP1. Descriptive notes about the project and data can be entered, which aid in the clarity of the final data for easy diagramming.

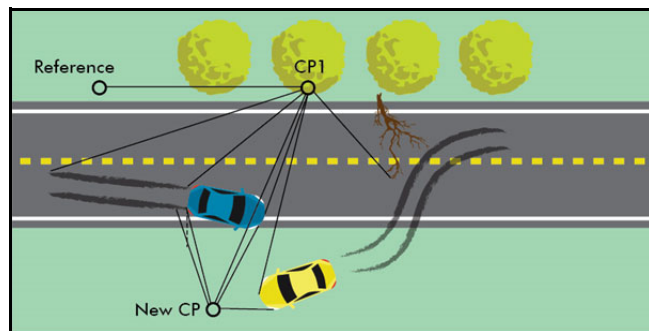


Figure 11

About Selecting the Origin Point

The origin point, also referred to as a control point or CP, defines where to begin collecting data and it can be located anywhere in the scene. It is a good idea to start from the point with the best visibility to most, if not all, of the features to be mapped.

When choosing an origin and reference point:

- Remember, if the user cannot see every feature to be mapped, set a new control point (Page 53), move to that point, and continue mapping.
- Consider plot scaling when choosing an origin. Avoid making a map with imperceptible clusters of points caused by one point being significantly distant from the rest.
- The reference point may be any identifiable, permanent object visible from the origin (CP1). As an example, use a telephone pole, street sign, or building corner as the reference point. More specifically, it's best to mark where on the fire hydrant the reference point was taken. The user will not need to measure the reference point, just site it with the laser and zero the MapStar Angle Encoder or the MapStar TruAngle.

Range Triangulation Method

In Range Triangulation, two measurements are required to map each feature (point) occupy the feature, shoot to CP1, and then to CP2 from that feature. The two measurements are made between two carefully positioned control points.

Measure from the feature to the control points and in some cases measure from the control points to the feature. The two control points and the feature form a triangle, and the geometry of the triangle is used to determine X, Y (or X, Y, Z) coordinates for each feature (Figure 12).

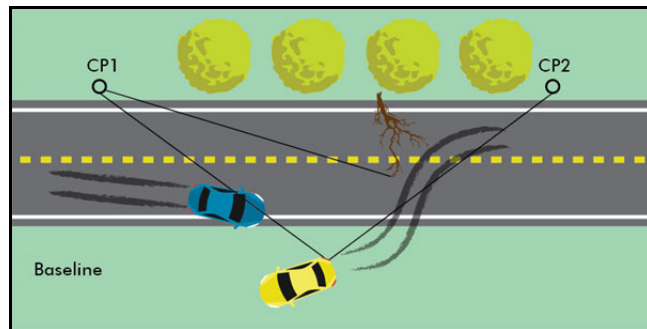


Figure 12

Measurements can be taken in one of two ways.

Preferably stand at the tree branch and measure back to Control Point 1 (CP1), then to Control Point 2 (CP2), this method works for both a 2D and 3D map. Another option for 2D mapping is to measure to the branch from CP1, then move to CP2 and take another measurement to the branch.

Range Triangulation allows for a large degree of mobility in mapping because the user can redefine one or both control points at any time. For instance, a measurement to any feature can be redefined as a control point. In this way, the user can move about an accident scene to establish a good vantage point for mapping any feature. When making a 3D map, the user must measure from the feature to the control points.

About Selecting the Control Points

Range Triangulation uses the geometry of a triangle to calculate each coordinate. The two control points and the feature form the three points of the triangle. Select control points that can be seen from all features. However, if the view to any feature is blocked, set new control points (Page 54) to gain a better vantage point and successfully map each feature.

When choosing control points and mapping features, consider the following:

- Features that are in between or in-line with the control points are very difficult or impossible to map.
- Control points that are too far away from the features that need to be mapped will cause geometry warnings and will result in an unreadable plot.
- Features that are farther than 3 times the distance between the control points will cause geometry warnings. For example, if CP1 and CP2 are 100 feet apart, the features should not be more than 300 feet away from a control point.
- Looking at Figure 12 above, from CP2 the vehicle is blocking the view to the end of the skid mark. From the Measure Menu, the Set New CP2 option redefines CP2 (Page 54), and then continue measurements using the new CP2.

Feature locations that produce poor or invalid data points (Figure 13). Features that fall in the hatched area (1) between the control points or outside of the figure '8' shape will be difficult to map. Set new control points to map those features (Page 54).

Geometry Messages

Geometry Warning - If the feature (data point) being mapped falls into the invalid area (Figure 13), it can present a possible error. The user can choose to accept marginal data and add the point anyway or select cancel and re-measure the point.

Geometry Error - The distances to the control points or features do not geometrically form a triangle, which is likely caused when a measurement to a point is missed. Clear the error message and re-measure (or manually re-add) the data point ensuring that there is a clear line-of-sight.

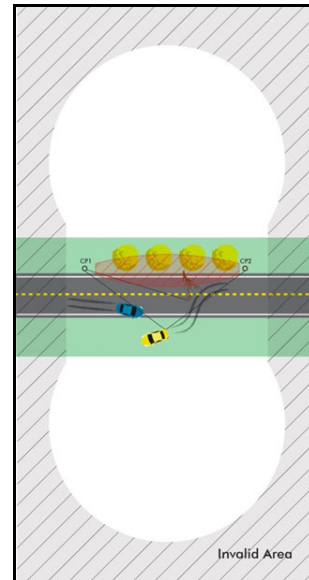


Figure 13

Baseline Offset Method

The Baseline Offset method is similar to Range Triangulation in that two measurements are required to map each point (feature). To begin, select a suitable object to serve as an origin point. The baseline is an imaginary line that runs from the origin point along the path of the accident. The baseline may run in any direction as long as it is perfectly straight. For example, a curb or sidewalk edge could serve as a baseline. Figure 14 shows how an accident scene would be mapped using the Baseline Offset method.

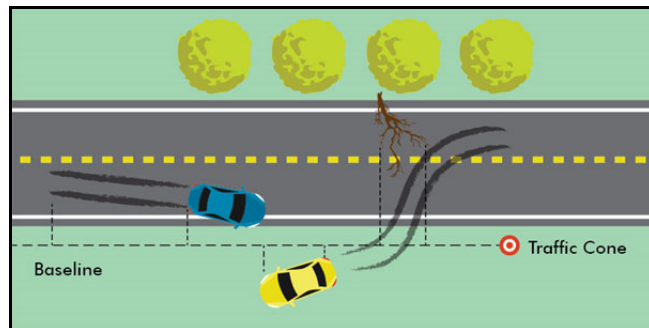


Figure 14

To map this scene, start by establishing the origin point, and then walking along the baseline. In Figure 14, a traffic cone is used as the Origin. Standing directly across from the accident feature at a 90° angle to the baseline, take two measurements. The first measurement is taken to the baseline Origin (traffic cone in this example), and the second measurement is taken to the feature itself. Continue to travel along the baseline and to measure each feature in this same way. Enter descriptive notes about the project and features (data points), which aid in the clarity of the final data for easy diagramming.

About Selecting the Origin and Baseline

Before starting a map, select an origin and a baseline. The baseline is a straight line that starts at the origin and runs along the path of the accident (or scene). When choosing a baseline, keep in mind that the user must be able to stand directly across from (and see) each feature while facing perpendicular to the baseline.

The Origin can be any feature that is already at the site, such as a tree, or it can be an installed point that is convenient to use (such as a traffic cone or a target mounted on a tripod). The Origin marks one end of the baseline, beyond which points cannot be mapped.

NOTE When choosing the Origin, baseline, and while mapping features, if the baseline and origin are too far away from the features that are mapped, the map will have an Origin far off to either edge and an imperceptible mass of data points somewhere in the middle.

Mapping Indoors

- All three data collection methods also work for indoor crime scenes. The results will be the same except on a smaller scale. Figure 15 shows an example of an indoor crime scene, measured using the Radial with Angle method. The investigator was positioned in a doorway and took shots to the broken window glass, the body, the gun, and the pool of blood.

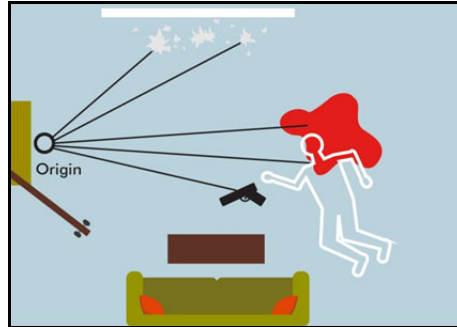


Figure 15

- If space constraints or accuracy requirements prevent the laser to measure distances, use a tape measure and manually enter the range into QM3D.
- A wall in the room could serve as the baseline when using the Baseline Offset method.
- Two corners of the room could serve as control points when using the Range Triangulation data collection method.

Section 4 - Collect Data

Once the equipment has been configured, the software has been installed and licensed, and the measurement method has been determined, it is time to begin collecting data. Ensure all equipment (laser, tablet, and TruAngle - if used) is powered on.

If at any time the tablet shuts down or locks up during the mapping process, power the unit back on and re-open QuickMap 3D to resume mapping. Data is automatically saved after each measurement to allow mapping to continue seamlessly.

Launch QuickMap

To launch the QuickMap 3D app:

1. Find the QuickMap 3D icon on the tablet (Figure 16A).
2. Tap the QuickMap icon (Figure 16B).
If licensed, the Main menu will display (Figure 17).

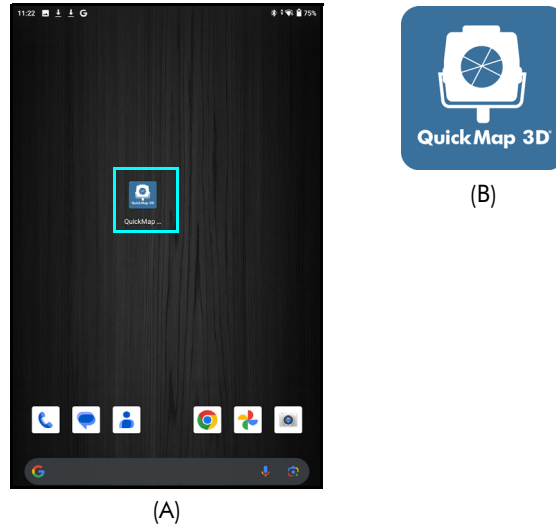



Figure 16

About the Main Menu

Figure 17 shows the QuickMap 3D Main menu:



Figure 17


- Tap the back arrow (←) at the top of the screen to leave QuickMap.
- Tap the Menu button  in the upper right corner of the screen to access:
 - Compass
 - GPS Points
 - Help
 - Settings
 - About QuickMap 3D
- Tap [New Survey] to begin a new crash/crime scene map.
- Tap [Saved Surveys] to select an existing map and:
 - Open
 - Delete
 - Send QM3D survey file via email.
- Tap [Exit] to close QuickMap and return to the tablet main screen.

Compass

QuickMap can display a digital compass to help find north in instances where it may be relevant. The compass can be accessed from the following places:

- QuickMap Main Menu (with no file open)
- Set Origin screens for all mapping methods
- Reference Azimuth screens for all mapping methods

To open the compass:

1. Tap the Menu button  in the upper right corner of the screen.
2. Tap Compass from the list of options (Figure 18A).
3. The compass displays and allows for orientation to north (Figure 18B).

NOTE Like all compasses, this digital compass is affected by magnetic interference. Large metal objects within close range may affect the accuracy of the reading. It should only be used as a general reference.

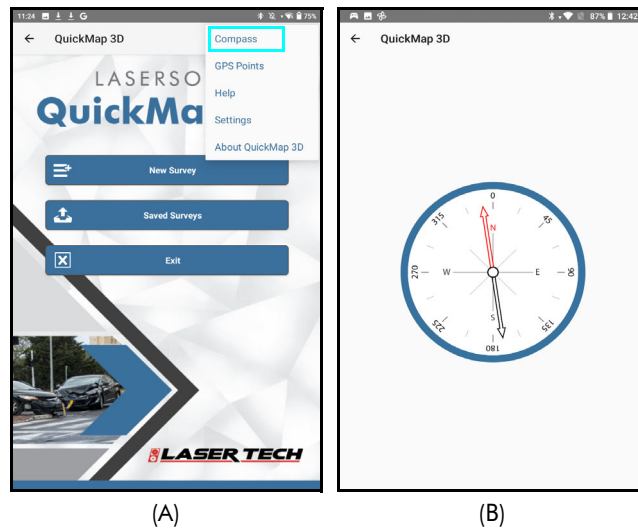


Figure 18

GPS Points

GPS coordinates can be saved for re-use by using the GPS Points option in the QuickMap menu (Figure 15A). Using saved GPS points can be a time-saver in many of the workflows. Instead of standing at those points each time to log them, you can do it only once and then select them from a drop-down list for all future surveys.

To save a GPS Point for future use:

1. Tap the Menu button and select GPS Points (Figure 19A).
2. Tap [Start Fix] to display the coordinates and enter a Name and the Antenna Height for the point (Figure 19B and Figure 19C).
3. Tap [Save] to store the point for re-use. Record positions for as many GPS Points as are needed.
4. When beginning a GPS survey (Page 29), long pressing the blue-colored Occupy Origin and CP titles will bring up the list of saved GPS points to choose from (Figure 19D).

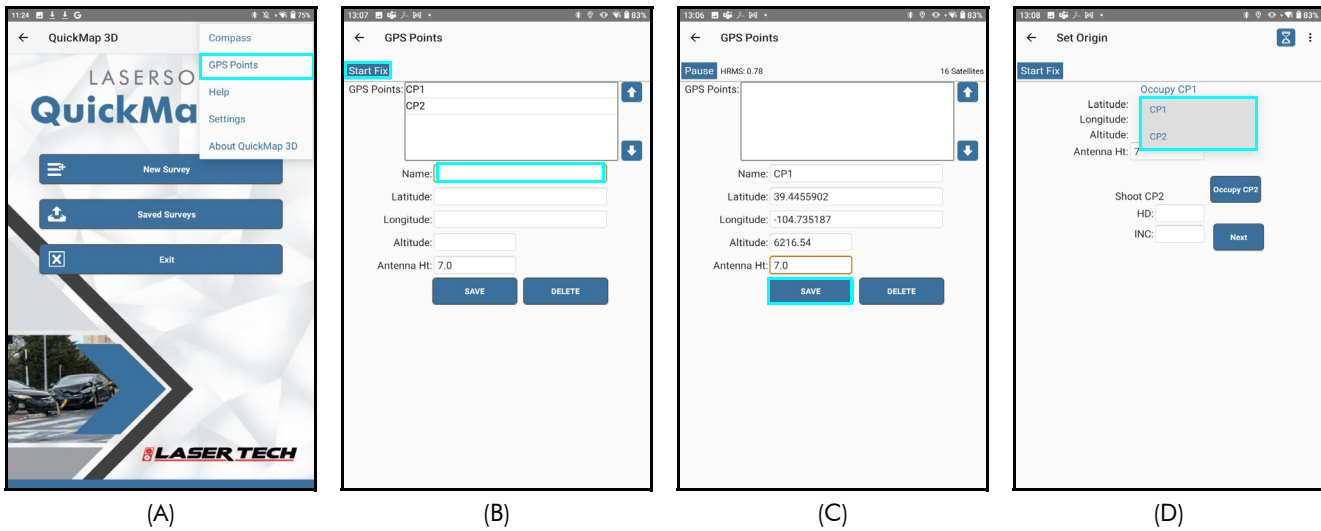


Figure 19

GPS Points List

Any saved GPS points listed can be opened and edited or deleted if necessary. Figure 19C shows the information associated with saved GPS point "CP1."

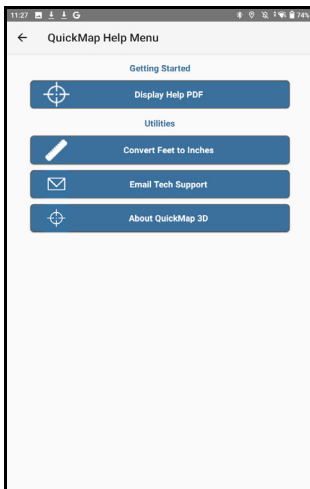
- **Name** - Enter a name to add a new GPS point.
- **Latitude/Longitude/Altitude** - After [Start Fix] is tapped, these fields will display.
- **Antenna Ht** - Enter the height of the GPS antenna above ground here.
 If using a tablet or phone with no external antenna, enter the height of that device to get correct elevation information.

Help

QuickMap 3D Help includes information about the mapping methods, meanings of icons, how to traverse, and how to correct any errors that might have been made during the mapping process. Help is located as a menu option in the upper right corner of the QuickMap screen at any time the program is open (Figure 20A). Tap Help from the menu to display the QuickMap Help Menu (Figure 20B).



(A)



(B)

Figure 20

Help Menu Options:


- **Getting Started**

- Display Help PDF - opens this presentation with full training information.

- **Utilities**

- **Convert Feet to Inches** - for entering into Target/Feature/Instrument Height fields or manual distance entry.
- **Email Tech Support** - if a crash happens, re-open the survey and use this feature to send a diagnostics file and/or the *.QM3D file to technical support for assistance.
- **About QuickMap 3D** - find the software version number, Laser Tech contact information, Machine ID, and Privacy Statement.

File Properties

To see a quick view of the survey properties, tap the Menu button , and then choose File Properties (Figure 21A). The survey properties display (Figure 21B). Tap OK to clear the survey properties window.

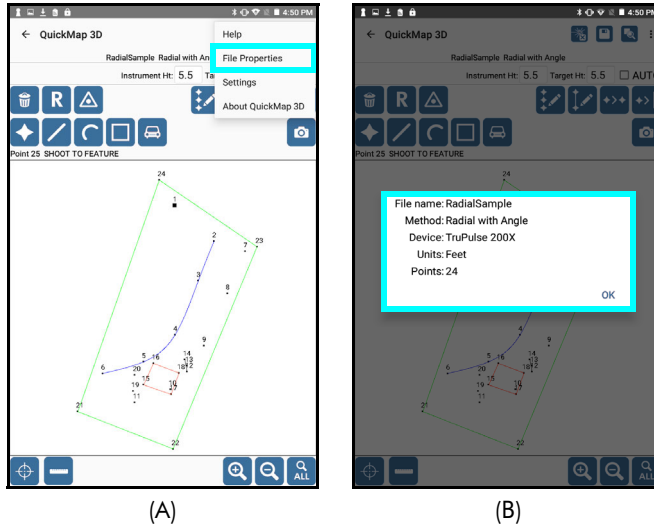



Figure 21

Settings

QuickMap 3D survey file Settings can be found by tapping the Menu button  at any time (Figure 22A). Then select Settings (Figure 22B) to see the current settings and make adjustments to them, if necessary (Figure 22C). Tap Submit to save the settings and return to the previous screen.

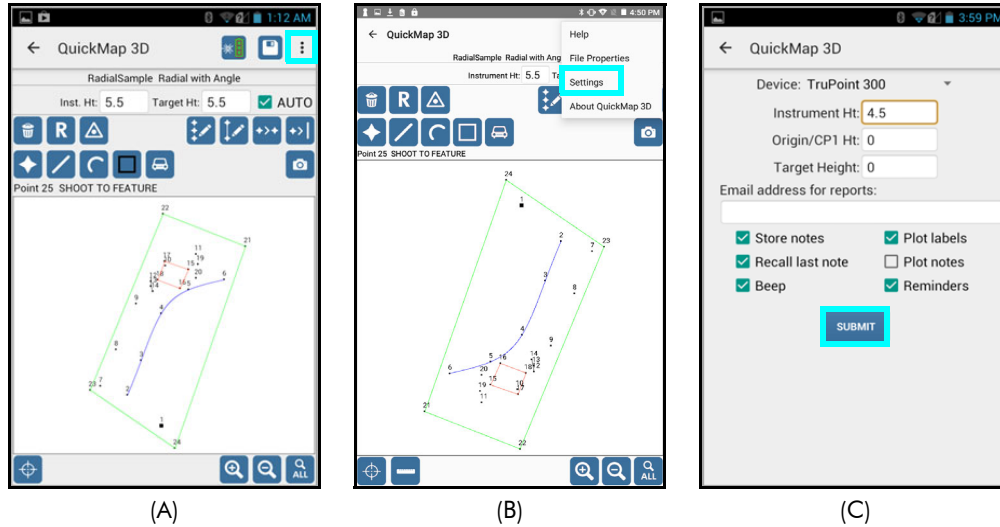


Figure 22

Device

- Displays the equipment selected on the New File Settings screen when the survey file was created. This selection can not be changed.

Instrument Height (3D only)

- Measured from the ground to the center of the sighting scope (Page 25).

Target Height, Feature Height, Origin Height, or CP1 Height

- The height of the target where the laser's sighting scope will be aimed - options displayed depend on the selected mapping method:
 - Radial with Angle - Target height
 - Range Triangulation - CP1 target height
 - Baseline Offset - Origin height and feature height

Email Address for Reports

- Enter an email address that will automatically be used when emailing QuickMap 3D reports or data files.

Store Notes

- Checked: Each time a data point is added, the Description Detail screen will display so a descriptive note may be entered.
- Not checked: Each time a data point is added, the Description Detail screen does not display; however, notes can be added through Point Detail > Edit Point (Page 65).

Recall Last Note

- Checked: If Store Notes is checked, the Description Detail screen will display the last note used in the note field each time it is opened.
- Not checked: If Store Notes is not checked, the note field in the Description Detail screen will be blank each time it is opened

Beep

- Checked: The tablet emits a beep when it receives measurement data.
- Not checked: The tablet does not emit a beep when it receives measurement data.

Plot Labels

- Checked: The Data Collection screen displays data points and point numbers.
- Not checked: The Data Collection screen displays data points only; data point numbers are not displayed.


Plot Notes

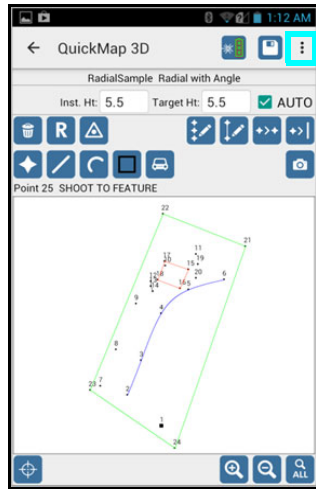
- Checked: The point notes for each shot display on the data collection screen.
- Not checked: Default. The point notes for each shot do not display on the data collection screen.

Reminders

- Checked: Each time a new file is created, a reminder will be displayed prior to the Data Collection screen. The reminder content depends upon which mapping method was selected on the New File Settings screen (Page 24).
- Not checked: This option is toggled off and no reminders will be displayed.

About

QuickMap 3D version information can be found by tapping the Menu button  at any time (Figure 23A). Then select About QuickMap 3D (Figure 23B) to see the current version information (Figure 23C).



(A)



(B)



(C)

Figure 23

New File Settings

From the Main Menu, tap [New Survey] to create a new survey file. The New File Settings screen will display (Figure 24).

To fill out the New File Settings screen:

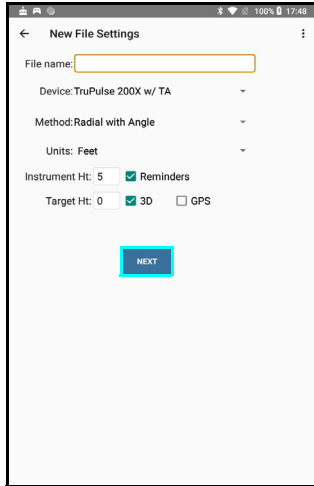


Figure 24

1. Enter/Select the following:
 - File name (a unique name for the map, dates are often used)
 - Tap to select equipment from the Device list
 - Tap Method to change the type of survey method to use
 - Tap Units to change from Feet to Meters, if necessary
 - Enter instrument height (Page 25)
 - Enter the target height (retro reflector, if used)
 - Check boxes:
 - Reminders: Check this box to display reminders that may help throughout the mapping process
 - 3D: Check this box to map in 3D, uncheck for 2D
 - GPS: Tap to include GPS coordinates for the survey, and for the option to include background maps on the Data Collection screen.
2. Tap [Next] to proceed to Set Origin or Control Points depending on the selected mapping method.

NOTE Any blank fields will be highlighted with an exclamation point. Enter the missing information and tap [Next].

File Name

Additional information regarding file name entry:

- File names may include any combination of alphanumeric characters.
- File names may contain a maximum of 1,500 alphanumeric characters.
- 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 file names are not allowed. If an existing name is entered, a prompt will appear indicating that a Duplicate File Name was entered. In order to proceed, the name must be changed.

Method

Select one of three available options: Range Triangulation, Radial with Angle, or Baseline Offset (Figure 25). For detailed information on each of these mapping methods, see Page 13.



Figure 25

Device	Range Triangulation	Radial with Angle	Baseline Offset
TruSpeed Sxb	✓		✓
TruSpeed Sxb with TruAngle		✓	
TruPulse 200X	✓		✓
TruPulse 200X with TruAngle		✓	

Units

Tap to select the desired units of measurement for distance and angle to match those set in the laser. Choose from:

- Feet/Meters

GPS

Tap to include GPS coordinates for the survey and for the option to include background maps on the Data Collection screen.

3D Mapping Option

There are some differences when mapping in 2D or 3D mode and some of the screens will display differently.

- When the 3D box is checked, the program creates a 3D survey map (default setting).
- When unchecked, the program creates a 2D survey map.

Instrument Height

When creating a 3D map, enter the distance from the ground to the center of the sighting scope (Figure 26).

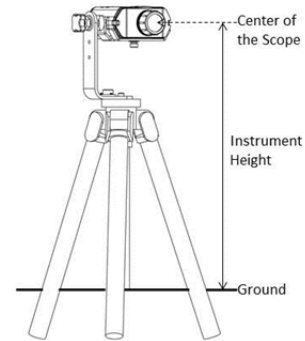


Figure 26

Target/Feature Height

When creating a 3D map, enter the height of the retro reflector or piece of evidence to which you are shooting.

- This option varies depending upon the data collection method:
 - Range Triangulation: CP1 and CP2 Target Height
 - Radial with Angle: Target Height
 - Baseline Offset: Origin and Feature Height
- During data collection, height values may be changed through the Settings Menu ([Page 22](#)) or Editing Options ([Page 65](#)).
- When creating a 2D map, this option is available for notation purposes only. If values are entered, they are stored, but they do not affect map data.

Reminders

When this box is checked, reminder messages will be displayed throughout the mapping session that may assist in the data collection process. Reminders vary depending on the mapping method chosen at the New File Settings screen ([Figure 24 on Page 24](#)). If the box is unchecked, no reminder messages will display while mapping. It is possible to turn this option off using the Settings menu at any time during the mapping session.

Set Control Points/Origin

When using a TruPulse 200X or TruSpeed Sxb, upon tapping [Next] to advance from the New File Settings screen, one of the following screens will be displayed. The specific screen that displays depends upon the mapping method that was selected when setting up the file.

Screen Views

Mapping Method

2D Set Origin Screen

3D Set Origin Screen

Radial with Angle

Range Triangulation

Baseline Offset

Figure 27

Radial With Angle

After choosing and physically locating the origin and reference point, complete the Set Origin screen (Figure 27 on previous page). Notice that default values (zeros) have been assigned. There are two options:

Option 1 - Choose to keep the default values of "0.00". Tap [Next] to advance to the Radial with Angle Data Collection screen, or tap the back arrow in the upper left corner of the screen to return to the New File Settings screen. These default values are used in most cases.

OR

Option 2 - If starting from a known coordinate position, enter the known X, Y (or X, Y, Z) coordinate for that instrument position and the known Reference Azimuth to your reference point. Tap [Next] to advance to the Radial with Angle Data Collection screen, or tap the back arrow in the upper left corner of the screen to return to the New File Settings screen.

TruAngle Quick Start

1. Connect laser to TruAngle with 4-pin to 4-pin cable.
2. Power on the TruAngle, screen displays "ind" (index) (Figure 28A).
3. Rotate the TruAngle until screen displays flashing "0.00."
4. Aim the laser at desired reference (0°) point, tighten down the TruAngle so it cannot rotate or move off target, and press the left-hand button or fire the laser to zero. The "0.00" will stop flashing (Figure 28B).
5. Press fire on the laser a second time to add the reference target as a point in your survey (optional).



(A)



(B)

Figure 28

Range Triangulation

After determining the two control points (CP1 and CP2), complete the Set Control Points screen (Figure 27 on Page 26). These default values are used in most cases. Leave the zeros as they are and tap [Next].

NOTE The only time values might be entered is if X, Y or X, Y, Z are known values for the Origin (instrument position).

Set CP2 Manually

1. Tap in the fields to enter the X, Y (or X, Y, Z) coordinates of CP2 in relation to CP1; i.e. measure the distance between the CPs with the laser and manually enter this value as either the X or Y coordinate for CP2.
2. Tap [Next] to advance to the next screen, or tap the back arrow in the upper left corner of the screen to return to the New File Settings screen.

Set CP2 Using the Laser

1. Tap [HD AZ CP2] to set CP2 using the laser to automatically enter the location. The screen will change to Figure 29.
2. With the equipment centered over CP1, aim at the point you designated as CP2 and press the Fire button on the laser. The measured distance value will display in the HD field.
NOTE If an accurate AZ value is desired, use the Compass feature to determine it.
3. Tap [Next] to advance to the Range Triangulation Data Collection screen, or tap the back arrow in the upper left hand corner to return to the New File Settings screen.

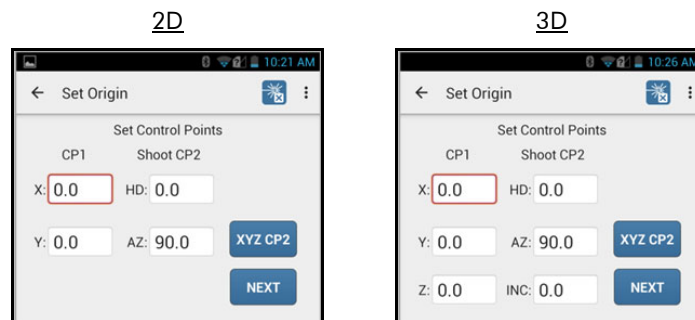


Figure 29

Baseline Offset

After choosing the Origin and the baseline of the scene, complete the Set Origin screen (Figure 27 on Page 26). These default values are used in most cases - but may be edited.

Set Origin Manually Using Default or Known Values

1. Notice that zero-values appear. These default values are used in most cases. The only time other values might be entered is if there are known X, Y or X, Y, Z values for the Origin (instrument position).
2. Measure the Origin Height and enter it in the Origin height field (3D only).
3. Accept the default baseline azimuth of 90.00 or, if using a known X, Y, Z, enter the approximate Azimuth manually. Stand on the Origin, sighting down the baseline and record the Azimuth using the Compass feature.
4. Tap [Next] to continue to the Baseline Offset Data Collection screen, or tap the back arrow in the upper left corner of the screen to return to the New File Settings screen.

Use GPS to Set Control Points/Origin

QuickMap can set the Origin of any new survey using a GPS coordinate from location services (including coordinate data routed to location services from an external GPS unit) in the Android device being used. QuickMap can also bypass Android location services and receive data directly from a GPS unit that is connected to the Android device via Bluetooth. Once an Origin or Control Point has been set with GPS, all points measured in a survey will include a GPS coordinate that is mathematically calculated based on that Origin coordinate.

If the GPS checkbox is marked in the New File Settings screen (Figure 24 on Page 24), the Set Origin screen for the survey will display as follows depending on the mapping method selected.

To Set a GPS Origin for Radial with Angle Surveys

1. Position the Android device (or external GPS device) directly over the Origin point.
2. Tap [Start Fix] and QuickMap will automatically begin searching for satellites, and reporting the number found and the HRMS value (Figure 30A).
3. Enter an antenna height (the height above ground of your Android device or external antenna).
4. GPS coordinate information will continue to update every time a lower HRMS value is detected. When the displayed value is acceptable, tap [Next] to lock the position. The HRMS value is stored in the Note field (Figure 60 on Page 62).
5. Repeat steps 1-3 directly over the Reference point for the survey, and tap [Next] to continue to the Data Collection screen (Figure 30B). The Reference Azimuth is stored in the Note field (Figure 60 on Page 62). Aim at the reference point and zero the TruAngle. Ensure that the reference position is at least 100 feet/30 meters away and that there is a clear line of sight to it from the Origin.

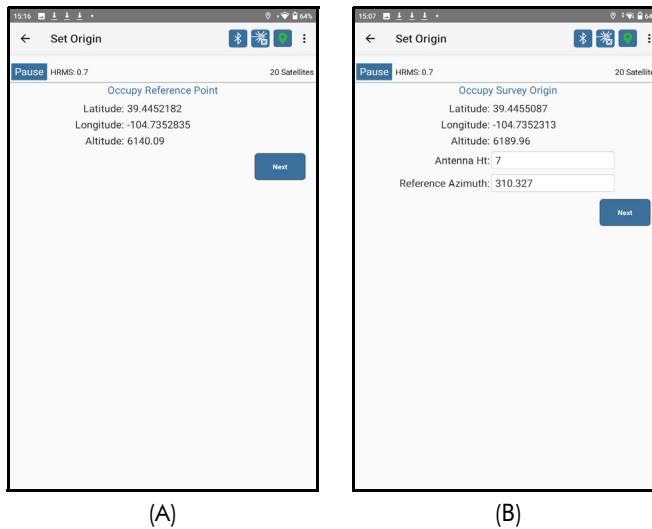


Figure 30

NOTE The Origin and Reference Point may also be defined by selecting a point from the GPS Points list (Page 19). When there are points available in this list, the Occupy Survey Origin and Reference Point text will be blue. Long press the blue text to bring up the list of points and make your selection.

To Set a GPS Origin for Range Triangulation Surveys

1. Position the Android device (or external GPS device) directly over CP1.
2. QuickMap will automatically begin searching for satellites, and reporting the number found and the HRMS value (Figure 31A).
3. Enter an antenna height (the height above ground of your Android device or external antenna).
4. GPS coordinate information will continue to update every time a lower HRMS value is detected. When the displayed value is acceptable, tap [Occupy CP2] to lock the position and continue to set the coordinate for CP2 (Figure 31B).
5. QuickMap will automatically begin searching for satellites.
6. Tap [Next] to lock the position for CP2 and continue to the Data Collection screen. The HRMS value is stored in the Note field (Figure 60 on Page 62).

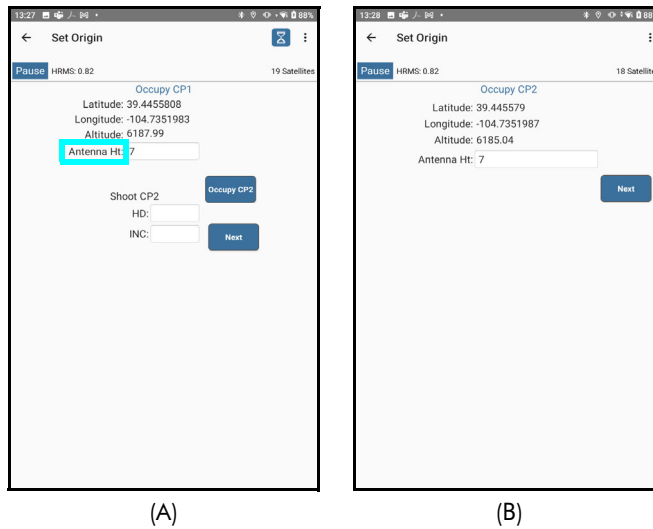


Figure 31

NOTE The Control Points may also be defined by selecting a point from the GPS Points list (Page 19). When there are points available in this list, the Occupy CP1 and CP2 text will be blue. Long press the blue text to bring up the list of points and make your selection.

To Set a GPS Origin for Baseline Offset Surveys

1. Position the Android device (or external GPS device) directly over the Origin point.
2. QuickMap will automatically begin searching for satellites, and reporting the number found and the HRMS value (Figure 32A).
3. Enter an antenna height (the height of your Android device or external antenna).
4. GPS coordinate information will continue to update every time a lower HRMS value is detected.

When the displayed value is acceptable, tap **NEXT** to lock the position and continue to the set the coordinate down the baseline (Figure 32B).

5. QuickMap will automatically begin searching for satellites.
6. Tap [Next] to lock the position for the Baseline and continue to the Data Collection screen.

The Reference Azimuth is stored in the Note field (Figure 60 on Page 62).

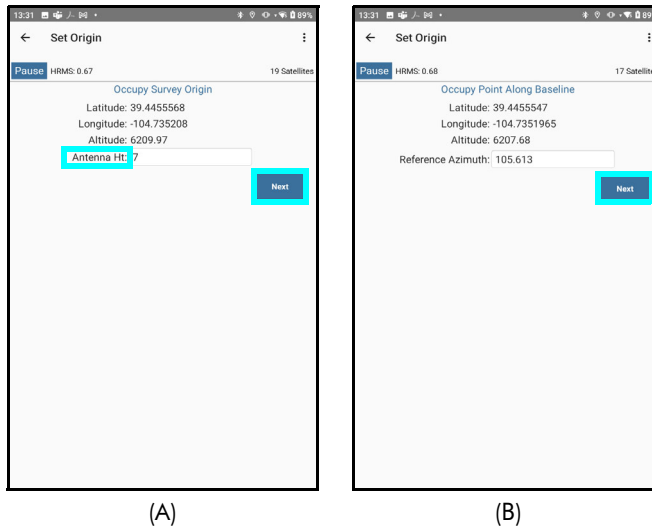


Figure 32

NOTE The Origin and Point Along the Baseline may also be defined by selecting a point from the GPS Points list (Page 19). When there are points available in this list, the Occupy Origin and Point Along Baseline text will be blue. Long press the blue text to bring up the list of points and make your selection.

Data Collection Screen Overview

After control point(s) and/or Origin is set, one of the following Data Collection screens will display depending on the selected mapping method and whether 2D or 3D was chosen on the New File Settings screen. Each screen view is shown on below.

Screen Views

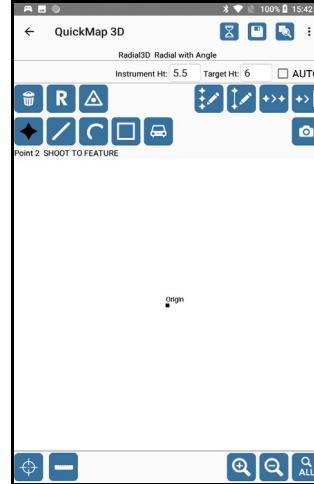
Mapping Method

Radial with Angle

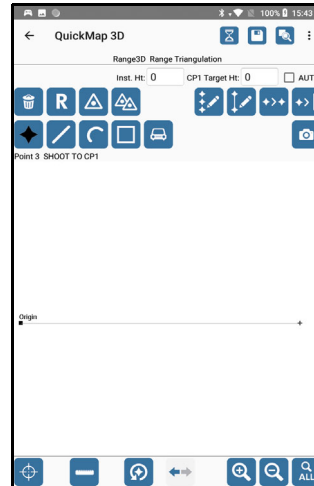
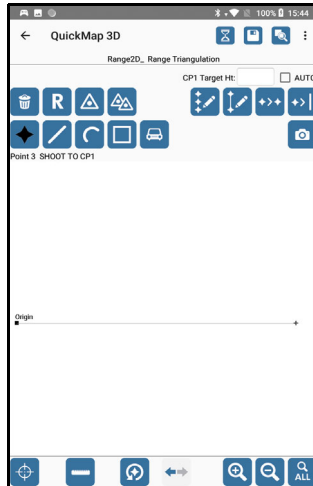
2D Data Collection Screen



3D Data Collection Screen



Range Triangulation



Baseline Offset

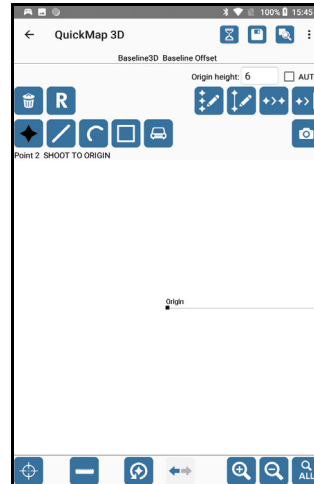
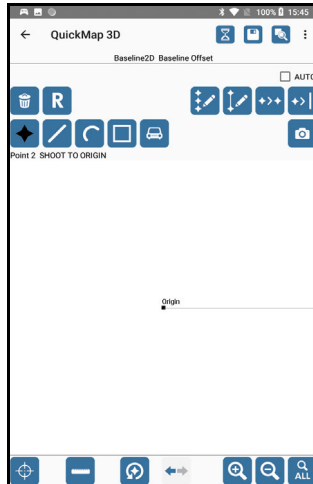


Figure 33

Screen Overview Detail

Figure 34 displays the Radial with Angle Data Collection screen.

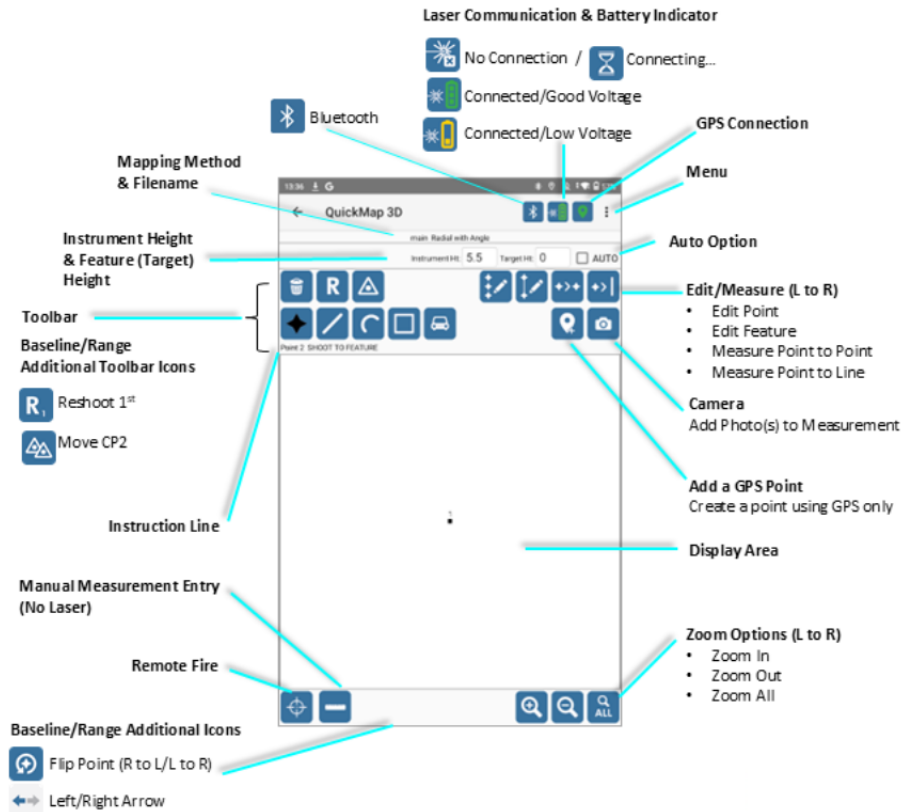


































Figure 34

Item / Icon	Description
Bluetooth Icon	Tap this indicator to open a list of all the available lasers. Select your laser from the list and tap START. Tap this indicator again if connection is lost to the laser.
Laser Communication & Battery Indicator	Indicates Bluetooth laser connection and battery status. This indicator will display as an hourglass while it attempts to connect after selecting your laser. It will change to green or yellow status (low battery) once connected. If no connection is achieved, tap the BT icon to select the laser again. If no connection can be achieved, replace the laser battery.
GPS Connection	Tap this indicator to initiate the GPS on your device. Choose the default Source selection of Location Services or pull down the list to connect directly to a GPS receiver. Wait for the coordinates to display and then close the screen. The indicator will change to green when the GPS is connected.
Menu	From the Main Screen: Access Compass, GPS Points, Help, Settings, and About QuickMap 3D. From the Data Collection Screen: Access Background Maps, Save As..., Point Detail, Help, File Properties, Settings, and About QuickMap 3D.
Auto Option	When the Store Notes option is ON (Page 57), this is an Auto Note feature. When checked, as data points are added (point, line, curve, or area) the Description Detail screen will be displayed for the first data point. That same Object Name and point note, will be assigned to the successive notes added, until a different feature type is selected or this option is turned OFF. When not checked and the Store Notes option is ON, as data points are added (point, line, curve, area, or vehicle) the Description Detail screen will be displayed after each data point added.

Item / Icon	Description
Edit/Measure	Use these tools to edit a single point or feature as well as to get quick measurements from any point to any other point or line in the display area.
Camera	Tap this icon to take a photo or series of photos associated with the last measured point or feature. Photos are named after the point and stored with saved reports (Page 73).
Display Area	Shows the data points. The display is updated as points are added, changed, or deleted.
Zoom Options	Use touch zoom functionality to zoom in to and out of the display area. Touch and drag to pan. Icons are also available for zooming when using the stylus or if wearing gloves (Page 59).
Manual Measurement Entry	Ruler icon - tap to enter a measurement value in the event that a target cannot be acquired by the laser (target and laser are too close to each other or the target is obscured). This feature is available for Range Triangulation and Baseline Offset mapping methods ONLY.
Baseline/Range Additional Icons	<p>These icons appear at the bottom of Range Triangulation and Baseline Offset Data Collection screens in order to perform additional functions that are not necessary using the Radial with Angle mapping method.</p> <ul style="list-style-type: none"> • Use the left/right arrows to tell QuickMap on which side of the baseline or on which side of the line between CP1 and CP2 in which evidence is located prior to taking the measurement. • Use Flip Point to correct any point that was inadvertently placed on the wrong side - tap it to instantly move the point to the opposite side. • Tap the ruler icon to enter in a manual HD measurement, for times when a measurement is unachievable with the laser due to obstruction etc. • The Reshoot, or "R" button changes to R(1) after the first shot is taken when using the Range Triangulation and Baseline Offset mapping methods because they both require two measurements to map each point or feature. • Move CP2 is only necessary in the Range Triangulation mapping method.
Remote Fire	Use to fire the laser without physically pressing the fire button on the device.
Instruction Line	Shows the status of the current map and prompts for data entry.
Tool Bar	Appears to the upper left of the Display Area. Each button has a unique image so its function can be associated with the command or task. The Help screens list the buttons and names/functions. Tap a button to select or deselect it. Point, line, curve, area, and vehicle buttons are filled black while active, and remain active until deselected or another button is selected.
Target Height & Instrument Height	<p>Target Height: The height on a target where the laser's sighting scope will be aimed. In Baseline Offset, this field will be labeled FH (Feature Height): the height on the feature where the laser's sighting scope will be aimed.</p> <p>Instrument Height (3D only): the height from the ground to the center of the laser's sighting scope</p> <p>The displayed values are carried over from the New File Settings screen and exist here so that heights can be adjusted temporarily, and then returned to default.</p>
Filename & Mapping Method	Displays the filename entered in the New File Settings screen as well as the selected mapping method for the survey.

Icon Description Table

Icon	Description	Find out More
	Bluetooth - Tap to open a list of all the available lasers. Select your laser from the list and tap START. Tap this indicator again if connection is lost to the laser.	Page 7
	Laser Connection Indicator - Indicates whether or not a laser is connected and if so, the current battery level. Green means connected with good power.	Page 33
	- Change laser batteries as soon as possible.	
	- No laser is connected/communicating.	
	- The app is working to connect to the laser.	
	GPS Connection Indicator - Tap to initiate the GPS on your device. Choose the default Source selection of Location Services or pull down the list to connect directly to a GPS receiver. Wait for the coordinates to display and then close the screen. The indicator will change to green when the GPS is connected.	
	Fire - tap to fire the laser remotely.	Page 40
	Point Feature - tap to select (white area becomes shaded black) and add a point feature to the map.	Page 40
	Line Feature - tap to select (white area becomes shaded black) and add a line feature to the map.	Page 46
	Curve Feature - tap to select (white area becomes shaded black) and add a curve feature to the map.	Page 47
	Area Feature - tap to select (white area becomes shaded black) and add an area feature to the map.	Page 48
	Vehicle Feature - tap to select (white area becomes shaded black) and add a vehicle feature to the map.	Page 49
	Add a GPS Point - tap to add a new point to the survey with GPS.	Page 44
	Camera - Add a photo of a measurement.	Page 52
	Delete Point - tap to delete a data point from the map.	Page 50
	Reshoot - tap to reshoot any measurement. For mapping methods that require two data points to create a measurement, the icon will switch to (R1) to indicate that the first measurement has been taken and can be reshoot if necessary.	Page 51
	New Control Point - tap to set a new control point and move instrument position.	Page 53
	New Control Point (2) - tap to set a new control point for CP2 in a Range Triangulation survey.	
	Edit Point - Found on the Point Detail screen (not the main Data Collection screen); tap to edit the heights or notes associated with any point.	Page 65
	Edit Point Series - tap to edit heights for a group of points.	Page 67
	Edit Feature - tap to edit heights for the group of data points that make up a line, curve, or area feature.	Page 68

Icon	Description	Find out More
	Point to Point - tap to find the measurement data between any two data points in the survey.	Page 57
	Point to Line - tap to find the measurement data between any data points.	Page 58
	Zoom In - tap to zoom in the map display area.	Page 59
	Zoom Out - tap to zoom out the map display area.	
	Zoom All - tap to zoom to the map display area view that includes all of the points in the display screen.	
	Ruler (Manual Measurement Entry) - tap to enter a measurement value in the event that a target cannot be acquired by the laser (target and laser are too close to each other or the target is obscured). This feature is available for Range Triangulation and Baseline Offset mapping methods ONLY.	Page 43
	Flip Point - tap to flip the last measured data point from Left to Right orientation or vice versa.	Page 71
	Left/Right Arrow - tap to indicate on which side of the Baseline or the line between CP2 and CP1 that the next data point will be assigned. When tapped, the gray arrow will turn red to indicate the orientation change.	Page 39
	Save Reports - tap to save and/or email reports from the map data of the open survey file (.DXF, .CSV, etc.).	Page 73
	Background Maps - Tap to change GPS point color and/or add background maps from ArcGIS or Google options.	Page 37
	Point Detail - tap to display the Point Detail screen. This icon appears to the right of the Save icon at the top right of the screen if the Android device has finer display resolution.	Page 60


Background Maps

When the GPS checkbox is marked on the New File Settings screen (Page 24), QuickMap offers the ability to display background maps on the data collection screen with eight options. In addition to background maps display, the GPS Point color can be changed so that they display properly on top of the different colors that can be presented when background maps are enabled.

Background Map Options:

- Plain Background (default white)
- ArcGIS Streets
- ArcGIS Streets with Relief
- ArcGIS Terrain with Labels
- ArcGIS Topographic
- Google Normal Map
- Google Hybrid Map
- Google Terrain Map
- Google Satellite Map

To enable Background Maps

1. Choose the default Background Map to use in a GPS file on the GPS Settings screen (Page 19). QM3D will use the Plain background by default.
2. To select or change a background map from the data collection screen, tap the Background Maps icon  (Figure 35A).
3. Select a map from the list that displays (Figure 35B). QuickMap will always open with the default white background.
4. The Data Collection screen displays with the selected background map enabled (Figure 35C).

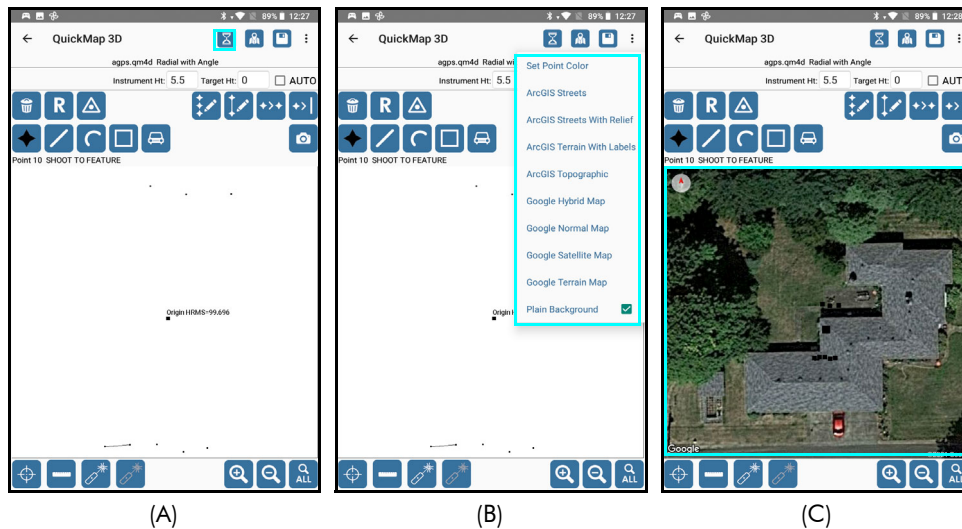

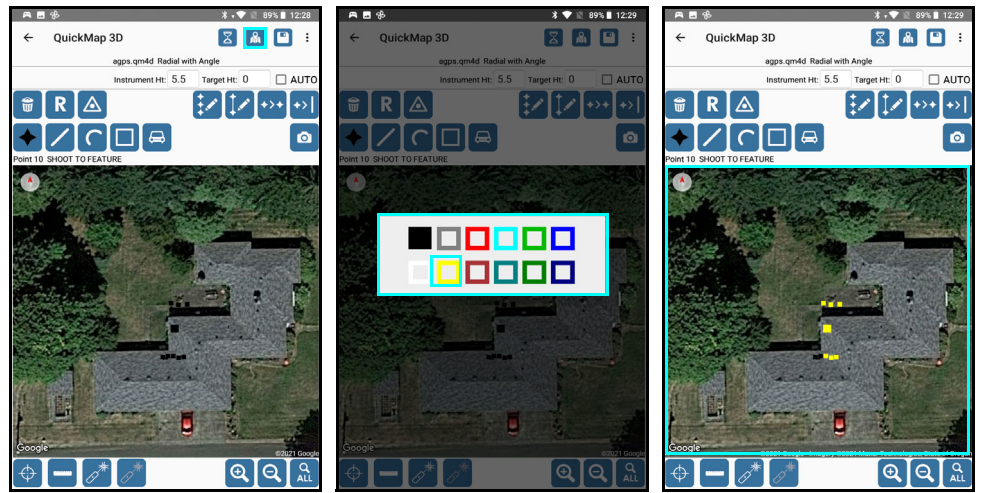


Figure 35

To Set Point Color

1. Open or begin a GPS-enabled survey.
2. Tap the Background Maps icon  (Figure 36A) and select "Set Point Color".
3. Tap the color to apply to the points (Figure 36B). The points display in the selected color (Figure 36C).



(A)

(B)

(C)

Figure 36

Define the Orientation of Features

When mapping features, it is necessary to consider each feature's orientation relative to the Origin or Control Points.

Radial with Angle

In this method, all shots are fore shots meaning that the user occupies a known position and shoots to an unknown. It is not necessary to define feature orientation.

Range Triangulation

While using the Range Triangulation mapping method, points that will be mapped may be located on either side of the line that connects CP1 with CP2. The left/right arrow button at the bottom of the Data Collection screen (Figure 37) tells QuickMap on which side of the line to place the point. Before measuring, determine which side is appropriate for the point and ensure the left/right arrow is toggled appropriately. Tapping the left/right arrow icon with the stylus will toggle the view.



Figure 37



Right - Determined from the perspective of standing at CP2 and looking at CP 1; when the right arrow is highlighted, the feature will display to the right of the Control Points.



Left - Determined from the perspective of standing at CP2 and looking at CP1; when the left arrow is highlighted, the feature will display to the left of the Control Points.



Flip Point - If a measurement is accidentally placed on the wrong side of the control points, tap the Flip Point icon at the bottom of the screen to instantly move the point to the correct side of the control points. For more information about Flip Point functionality, see [Page 71](#).

Baseline Offset

While using the Baseline Offset mapping method, points that will be mapped may be located on either side of the baseline. The left/right arrow button at the bottom of the Data Collection screen (Figure 38) tells QuickMap on which side of the baseline to place the point. Before measuring, determine which side is appropriate for the point and ensure the left/right arrow is toggled appropriately. Tapping the left/right arrow icon with the stylus will toggle the view.

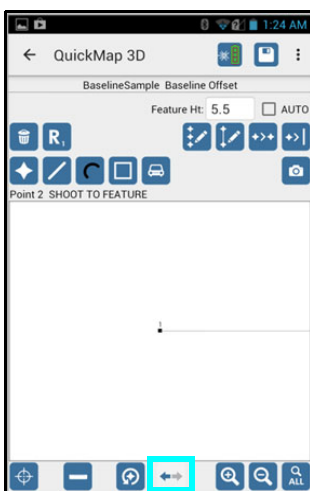


Figure 38



Right - Determined from the perspective of standing at a position along the baseline that is perpendicular to the feature and facing the Origin; when the right arrow is highlighted, the feature will display to the right side of the baseline.








Left - Determined from the perspective of standing at a position along the baseline that is perpendicular to the feature and facing the Origin; when the left arrow is highlighted, the feature will display to the left of the baseline.



Flip Point - If a measurement is accidentally placed on the wrong side of the baseline, tap the Flip Point icon at the bottom of the screen to instantly move the point to the correct side of the baseline. For more information about Flip Point functionality, see [Page 71](#).

Adding Evidence Points to the Survey


- When you tap the Point , Line , Curve , Area , or Vehicle  icon, it will shade to black and be the active type until changed.
- The Store Notes checkbox in Settings (Page 22) only controls Point features. The Description Detail screen will always display for Line, Curve, Area and Vehicle features (Page 65).
- Data points may be added to any feature automatically from the laser, or manually with the Ruler button.
- After taking a shot with the laser, an audible sound, or beep, signifies that measurement data has been successfully received. If there is no beep and the screen does not change, make sure the connection icon is green, the device's volume is turned up and press fire again.
- When the Description Detail screen displays, a Note may be entered for a Point feature, if desired. When it is displayed for a Line, Curve, Area or Vehicle feature, a Name must be entered or picked from the Name list. Again, a note is optional.
- When using AUTO mode, the Note will be repeated for all Point features and the Feature Name and note will be repeated for all Line, Curve, Area and Vehicle features. Uncheck AUTO to change the Name or Note.
- Example screens shown below are for 3D surveys, 2D files will not show the Instr and Target Ht fields.
- Different feature types are given different colors on the map:
 - Points: black (default)
 - Lines: black
 - Curves: blue
 - Areas: green
 - Vehicles: red

Adding a Point Using a Laser

The steps required to add a data point using a laser depend upon the mapping method used.

Radial with Angle - TruPulse 200X or TruSpeed Sxb

When adding a point to a Radial with Angle survey, all shots are fore shots; shooting from the Control Point to the target (or retro reflector).

1. Occupy the CP (or Origin).
2. Tap the Point button  (Figure 39A).
3. Aim and fire the laser at the target feature (or retro reflector).
4. Complete the Description Detail screen, if applicable and tap Submit (Figure 39B).
5. The new point (Point 7 in this example) displays (Figure 39C).

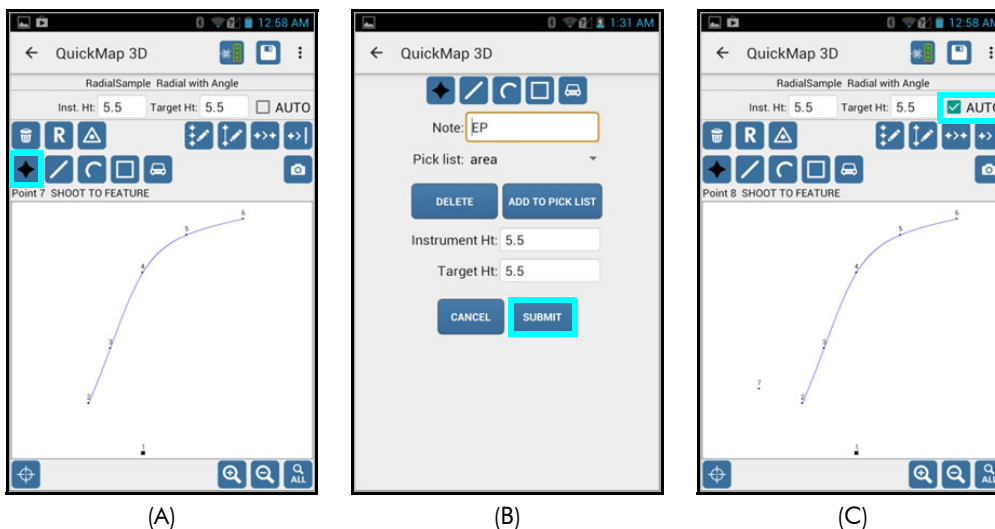



Figure 39

NOTE To measure points that do not have a clear line of sight from the current Control Point, use an adjustable height target at the evidence point or skip the point and map everything else using the current CP. Set a new CP later to pick up any remaining points. For more information about setting a new CP, see Page 53.

Range Triangulation

When adding a point to a Range Triangulation survey, each point requires two measurements to be taken in order to be placed in the display area; shoot from the feature (evidence location) to CP1 and then to CP2.

1. Occupy the feature (or evidence location).
2. Tap the Point button  (Figure 40A).
3. Determine if the point should be added to the right or left of the line that connects CP1 with CP2 and ensure the left/right arrow is toggled appropriately.
4. Aim and fire the laser at CP1. The Instruction Line will prompt "Point # Shoot to CP2" (Figure 40B).
5. Aim and fire the laser at CP2.
6. Complete the Description Detail screen, if applicable and tap [Submit].
7. The new point (Point 3 in this example) displays (Figure 40D).


NOTE To measure points that do not have a clear line of sight from a feature to the current CPs, use an adjustable-height target at the CP or skip the point and map everything else using the current CPs. Set a new CP1 (or CP2) later to pick up any remaining points. For more information about setting a new CP, see [Page 53](#).



Figure 40

Baseline Offset

When adding a point to a Baseline Offset survey, all points require two measurements to be taken in order to be placed in the display area; first to the Origin, then to the feature.

1. Standing at a position along the baseline that is perpendicular to the feature, determine if the point should be added to the right or left of the baseline. Ensure the left/right arrow is toggled appropriately.
2. Tap the Point button  (Figure 41A).
3. Aim and fire the laser at the Origin. The Instruction Line will prompt "Point # Shoot to Feature" (Figure 41B).
4. Aim and fire the laser at the feature.
5. Complete the Description Detail screen, if applicable and tap [Submit].
6. The new point displays, Point 7 in this example (Figure 41D).

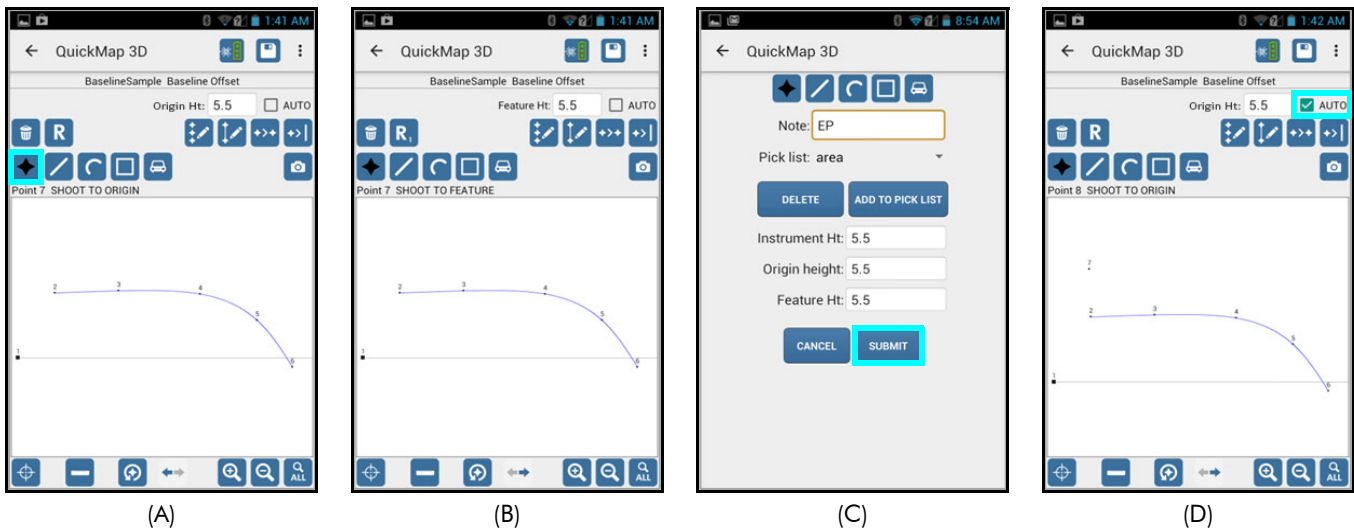


Figure 41


Important notes about adding point features:

- The Origin marks the end of the baseline, beyond which points cannot be mapped; and there is no way to move the Origin once a file is started.
- Make sure the target at the Origin is visible all along the baseline and use an adjustable height target at the evidence points, to get over any obstructions.

Add a Point Manually

If some evidence points are too close to the tripod to be measured with the laser, the distance can be measured with a tape and entered manually. If using a tape instead of a laser, data points can be entered manually in Range Triangulation and Baseline Offset surveys.

To manually enter a data point (available for all laser types and survey methods):

1. Tap the ruler icon  at the bottom of the screen (Figure 42A).
2. Enter the taped distance value into the HD field using the onscreen keyboard.
3. INC can be left "0" if unknown but in the Radial with Angle method the ANG value must be entered. Use the TruAngle to determine this reading and tap [OK] (Figure 42B).
4. Complete the Description Detail screen, if applicable, and tap [Submit]. The new point will display on the map.

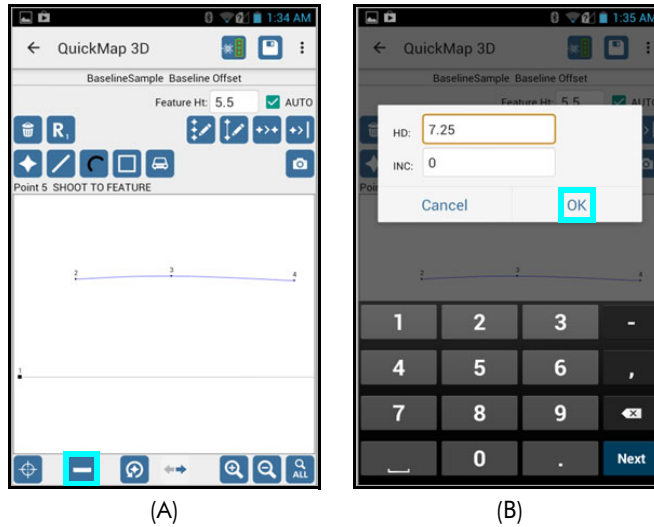


Figure 42

NOTE Refer to the conversion chart in [Appendix B \(Page 87\)](#) to equate fractional inches shown on a measuring tape to feet (the decimal equivalent required by QM3D). The conversion chart is also available within QuickMap 3D's built-in help ([Page 20](#)).

Adding a Point with GPS

Creating a point with GPS only is available in all mapping methods.


1. Position the tablet (or external GPS device) directly over the feature to be mapped.
2. Tap the Add a GPS Point icon  (Figure 43A).
3. Tap [Start Fix] to display the coordinates (Figure 43B).
4. Enter an Antenna Height for this point and tap [Save] to record the point (Figure 43C).
5. <optional> Enter a description in the Note field and tap [Add to Pick List] (or select an existing description from the Pick List drop-down menu) and tap [Submit] (Figure 43D).
6. The new point displays, Point 2 in this example (Figure 43E).



Figure 43

Add Points to a Saved Survey

It is possible to revisit a scene and add data points to an existing survey. The steps to complete this process differ slightly depending on the equipment combination in use. The following steps assume that you have left a nail (or some other target) at your instrument position(s) and reference; or Origin; or CPs, when the original survey was mapped.

NOTE To verify that you have correctly re-entered the survey, shoot in a point that was mapped in the original survey. The new point should be on top of or very close to the point shot in the original survey."

Radial with Angle Method - TruPulse 200X or TruSpeed Sxb + TruAngle

1. Set up on the last instrument position occupied when the original survey was mapped.
2. Power on all equipment.
3. Open QuickMap and tap [Saved Surveys].
4. Zero the TruAngle:
 - *If there was only one instrument position in the survey (the Origin), aim the laser at the original reference point for the survey and zero the TruAngle on that point.*
 - *If there was more than one instrument position in the survey, aim the laser at the previous instrument position (not the original reference) and zero the TruAngle on that point.*

NOTE For help with zeroing a TruAngle, see [Page 27](#).

5. Begin adding new data points to the survey.


Baseline Offset Method -TruPulse 200X or TruSpeed Sxb

1. Set up a target on the Origin point used when the original survey was mapped.
2. place the laser along the same Baseline used in the original survey.
3. Power on all equipment.
4. Open QuickMap and tap [Saved Surveys].
5. Begin adding new data points to the survey.

Range Triangulation Method -TruPulse 200X or TruSpeed Sxb

1. Set up targets on the exact same CP1 and CP2 points used when the original survey was mapped.
NOTE Be sure to measure the Target Height on CP1.
2. Power on all equipment.
3. Open QuickMap and tap [Saved Surveys].
4. Begin adding new data points to the survey.

Add a Line Feature

1. Tap the Line button  (Figure 44A).
2. Aim and fire the laser at the target or CPs, depending on which method you're using.
3. The first shot to a new Line feature will bring up the Description Detail screen and you are required to enter a new Feature Name or pick one from the list. Tap [Submit].
NOTE AUTO mode may now be used to add points to the same Line without seeing the Description Detail screen.
4. The new line data point displays. In this example the line includes Points 12 and 13 (Figure 44C) and then Point 14 was added (Figure 44D).

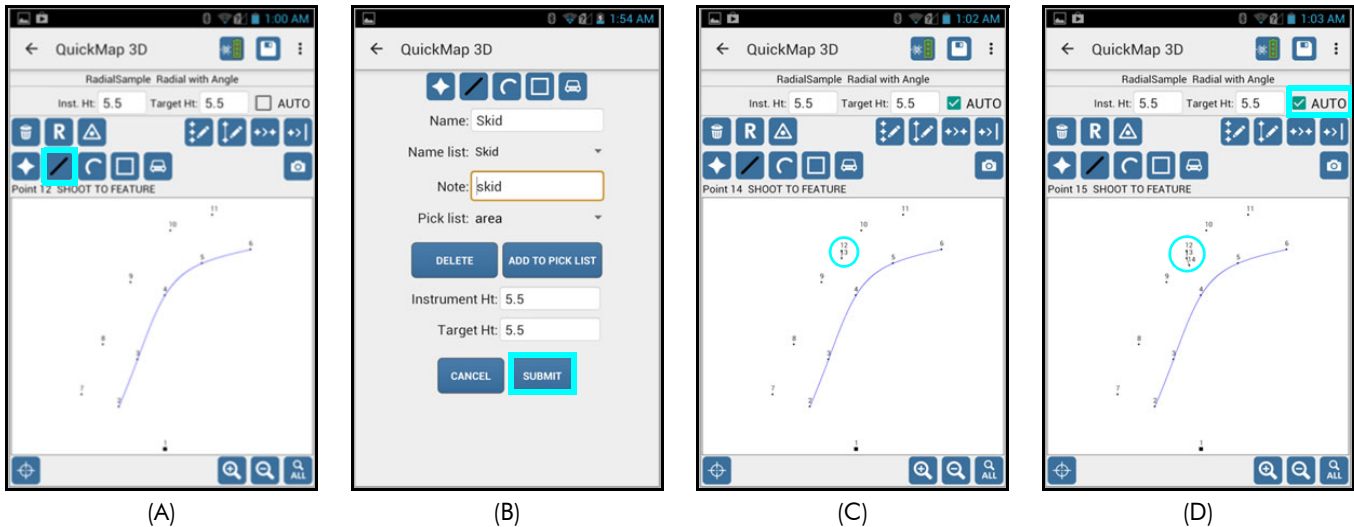



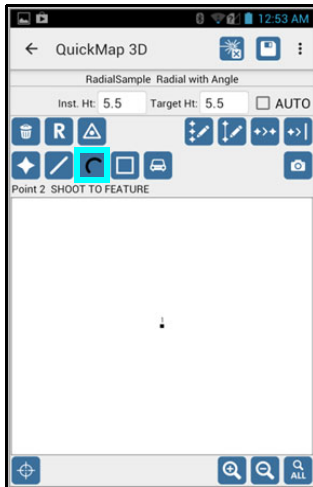
Figure 44

Important notes about adding line features:

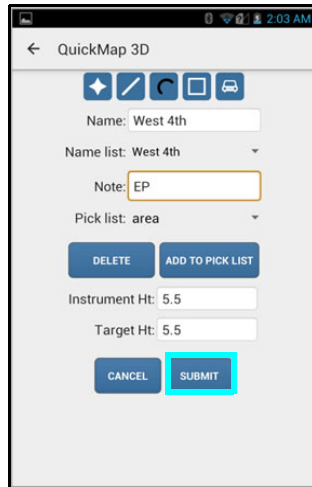
- Data points that make up the line feature must be added in sequential order.
- To insert a data point out of order, add it as a point feature and then use the Edit Point option to change the feature type from point to line ([Page 65](#)).

Add a Curve Feature

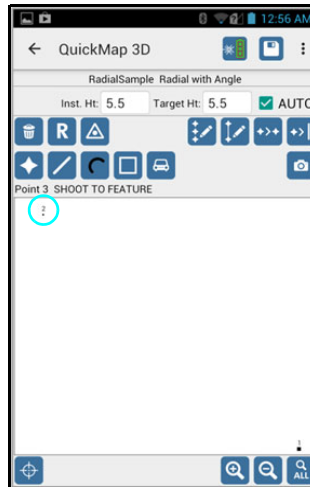
1. Tap the Curve button  (Figure 45A).
2. Aim and fire the laser at the target or CPs, depending on which method you're using.
3. The first shot to a new Curve feature will bring up the Description Detail screen and you are required to enter a new Feature Name or pick one from the list. Tap [Submit].
NOTE AUTO mode may now be used to add points to the same Curve without seeing the Description Detail screen.
4. The new curve data point displays, Point 2 in this example (Figure 45C).
5. As the rest of the curve is mapped, it displays as shown in Figure 45D and Figure 45E.



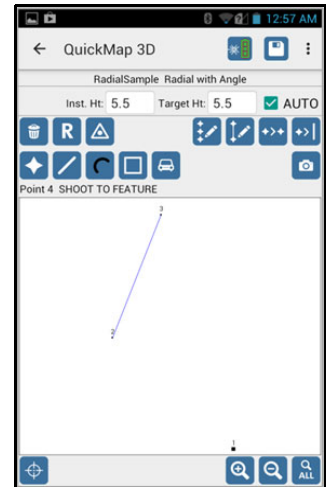
(A)



(B)



(C)



(D)




(E)
 Figure 45

Important notes about adding curve features:

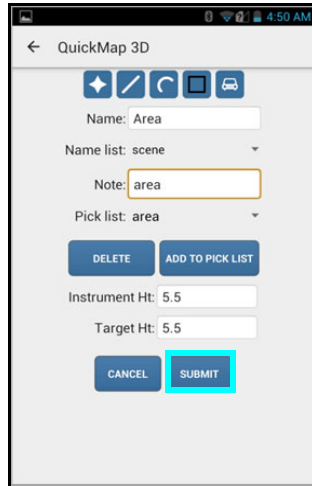
- Data points that make up the curve feature must be added in sequential order.
- To insert a data point out of order, add it as a point feature and then use the Edit Point option to change the feature type from point to curve (Page 65).
- Keep in mind that the Data Collection screen is a dynamic display. As data points are added, the curve's appearance may change. Due to physical limitations of the, curves may appear more jagged than expected. The same curve will appear smooth once the project is transferred to the PC and opened in a drawing program.

Add an Area Feature

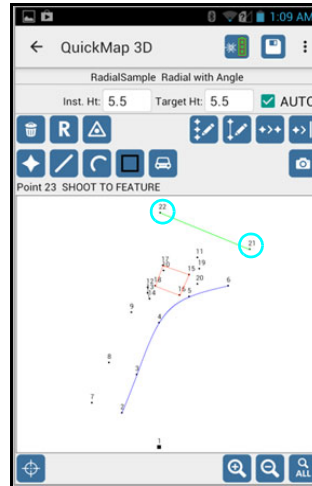
1. Tap the Area button  (Figure 46A).
2. Aim and fire the laser at the target or CPs, depending on which method you're using.
3. The first shot to a new Area feature will bring up the Description Detail screen and you are required to enter a new Feature Name or pick one from the list. Tap [Submit].
NOTE AUTO mode may now be used to add points to the same Area without seeing the Description Detail screen.
4. The new area data points (Point 21 and 22 in this example) display (Figure 46C).
5. As the rest of the area is mapped, it displays as shown in Figure 46D and Figure 46E.



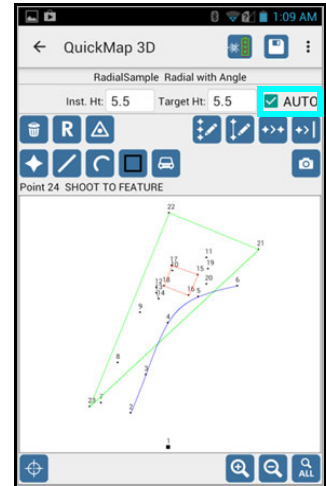
(A)



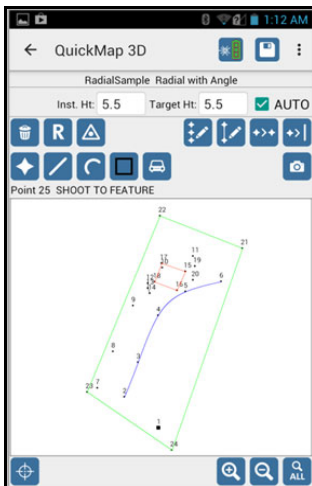
(B)



(C)



(D)




(E)

Figure 46

Important notes about adding area features:

- Data points that make up the area feature must be added in sequential order.
- To insert a data point out of order, add it as a point feature and then use the Edit Point option to change the feature type from point to area ([Page 65](#)).

Add a Vehicle Feature

1. Tap the Vehicle button  (Figure 47A).
2. Aim and fire the laser at the target or CPs, depending on which method you're using.
3. All shots taken to a Vehicle feature will bring the Description Detail screen up and you are required to choose the wheel you are shooting in: LF, RF, LR or RR. Tap [Submit].
NOTE AUTO mode cannot be used when shooting Vehicle features.
4. The new vehicle data points (Point 15, 16, 17, and 18) in this example) display (Figure 47C).

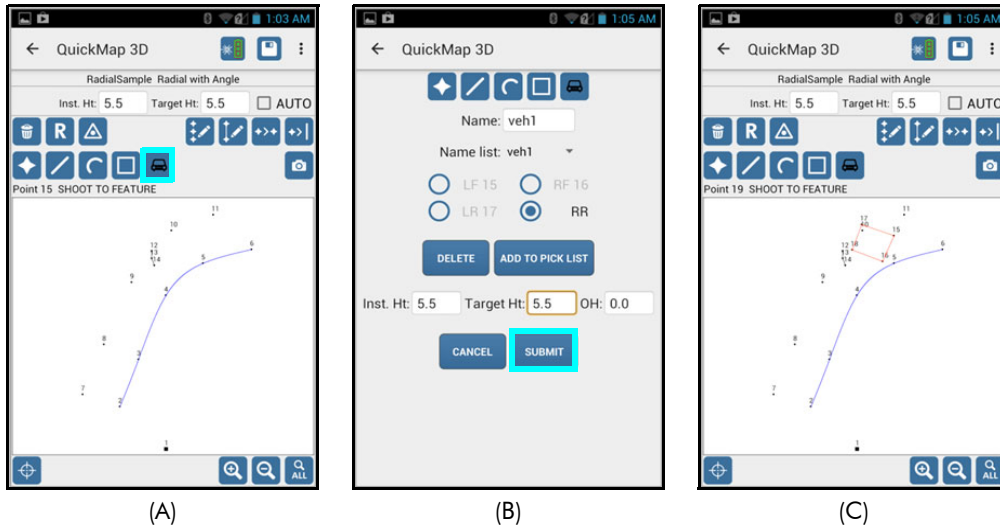



Figure 47

Important notes about adding vehicle features:

- LF = Left Front; RF = Right Front; LR = Left Rear; RR = Right Rear
- Use an adjustable height target to measure to the wheels that are out of sight on the far side of the vehicle.

Delete a Point

It is possible to delete any mapped point while using any of QuickMap's mapping methods.

The Delete button  is located in the toolbar in the upper left area of the Data Collection screen (Figure 48A).

To delete a point:

1. Determine the point number of the point to be deleted. In this example, Point 4 will be deleted.
2. Tap the Delete icon (Figure 48A).
3. Enter the point number, and tap Next (Figure 48B) to delete the point or tap Cancel to abandon the operation.
4. Tap OK to confirm the deletion, or tap Cancel to abandon the operation (Figure 48C).
5. The deleted point number is removed from the display area (Figure 48D).

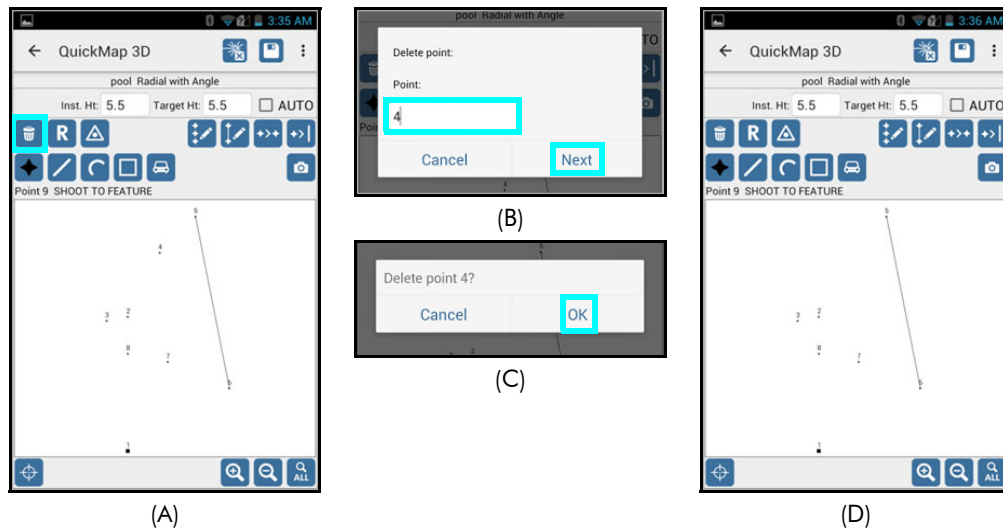


Figure 48

Important notes regarding point deletion:

- When a point is deleted, that point number is deleted from the data file. The remaining point numbers are not re-assigned. Attempting to find a point number that was previously deleted will result in an error message being displayed.
- Deleting the last point measured is a special case, and is actually the same as reshooting the point (Page 51). The next point added is assigned the same point number as the deleted point.
- Deleting points that were used as control points will cause all points measured from that control point to be deleted as well.
- Deleting a point may also be performed on the Point Detail screen (Page 60).
- There is no way to “undo” a point deletion.

Re-shoot a Point

It is possible to re-shoot the last point measured if something went wrong when the point was measured the first time.

The Reshoot button **R** is located in the toolbar in the upper left area of the Data Collection screen (Figure 49) in all mapping methods. To re-shoot a point other than the last point measured, see Point Detail on [Page 65](#).

To re-shoot an established point:

1. Tap the Reshoot button (Figure 49). Notice the Cancel Reshoot button has displayed, tap this button to abandon the operation at any time.
2. Follow the prompts in the Instruction Line (located below the toolbar above the display area) as you walk through re-shooting the point. For Baseline/Range surveys, two measurements must be taken to reshoot the last point.
3. The point number of the last shot taken will have the updated measurement assigned to it.

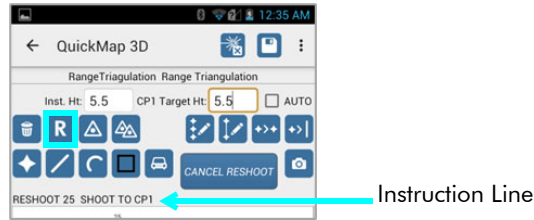


Figure 49

While using the Baseline Offset or Range Triangulation mapping methods, it is a common mistake to begin to execute the measurement without having moved the equipment position. Typically, this mistake is realized after taking the first shot of the 2-shot routine. It is possible to re-shoot JUST the first shot in the routine before the measured point exists on the map.

To re-shoot the first shot of the 2-measurement routine in a Baseline or Range survey:

1. After taking the first shot, to Origin in Baseline or to CP1 in Range, tap the Reshoot(1) button **R₁** (Figure 50). Move the equipment to the intended position, if necessary.
2. The Instruction Line directs to re-shoot to the Origin or to CP1 depending on what mapping method you are using. Take the measurement and then continue to take the 2nd shot in the routine to place the point on the map.





Figure 50

Add a Photo

From the Tablet Camera:

One or more photos may be added to each data point as it is measured. After adding a data point to the survey,

use the Camera icon  to take a photo(s) of the evidence. Photos are stored in the folder with the survey reports and named to match the description of the data point. If more than one photo is taken, a (2), (3), etc. is placed after the photo description.

1. Tap the Camera icon  on the Data Collection screen (Figure 51A).
2. Aim/zoom to evidence (Figure 51B), and press the blue button at the bottom of the screen to capture an image.
3. Tap the checkmark icon in the lower right corner of the screen to accept the image. If necessary, the image can be retaken.
4. When prompted, tap OK to add another picture associated with the most recent measurement taken or tap Cancel to return to the QuickMap Data Collection screen and continue mapping (Figure 51C).

NOTE These steps reflect the procedure for taking a photo when using the CT7 ruggedized tablet. If using a different Android tablet, steps 2 and 3 will be similar but may differ slightly from how they work on the CT7.

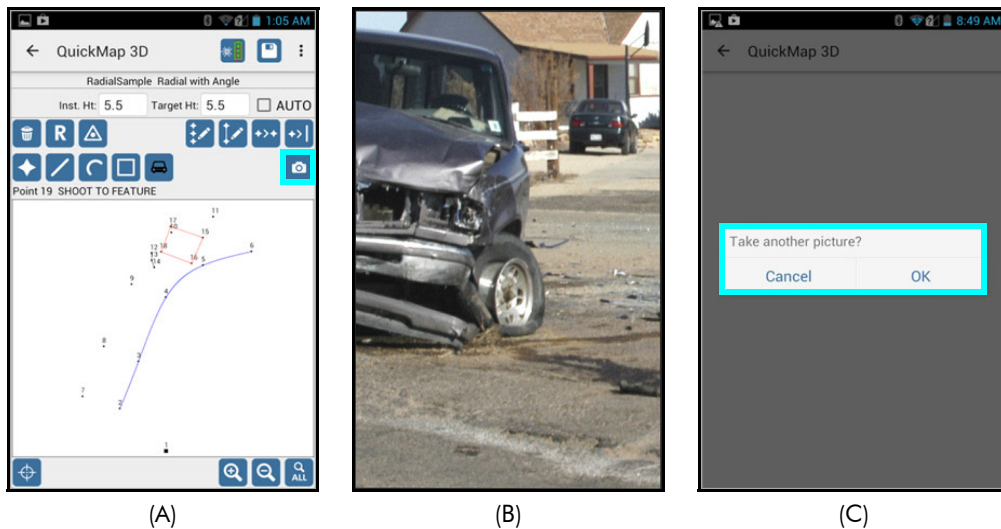



Figure 51

Move to a New Control Point

At times, when mapping a scene, there is not visibility to every feature on the scene from the origin (initial control point). When it becomes necessary to move a control point(s), a different point on the map can be selected to use as the new control point so that equipment can be moved to that position and mapping can continue. Moving control points can be done multiple times, if necessary, but should be kept to a minimum.

Radial with Angle - TruPulse 200X or TruSpeed Sxb + TruAngle

To move to a new control point:

1. If it doesn't already exist, create a point feature for the position to which you want to move.
2. Tap the Control Point icon  (Figure 52A).
3. Enter the point number for the new control point and tap [Next].
In this example, point 24 was selected (Figure 52B).
4. Leave a target at the original equipment position, re-position and level equipment at the new control point, double check instrument height and adjust if necessary.
5. Aim at the original equipment position (that you moved from), and zero the TruAngle.
Aim the laser at the target, tighten down the brake, and press the Zero button on the TruAngle. The TruAngle display will show 0.00. Tap [OK] (Figure 52C). This step is imperative for keeping data points measured from the new position correct, relative to the data points mapped from the original position.
6. Notice that point 1 now displays with a small square, and data point 24 (the new control point) now displays with the large square (Figure 52D). Point 24 is now the control point for the survey. For 3D surveys, verify the instrument height in the new position, and edit the Inst. Ht: field, if necessary, before continuing to take measurements.

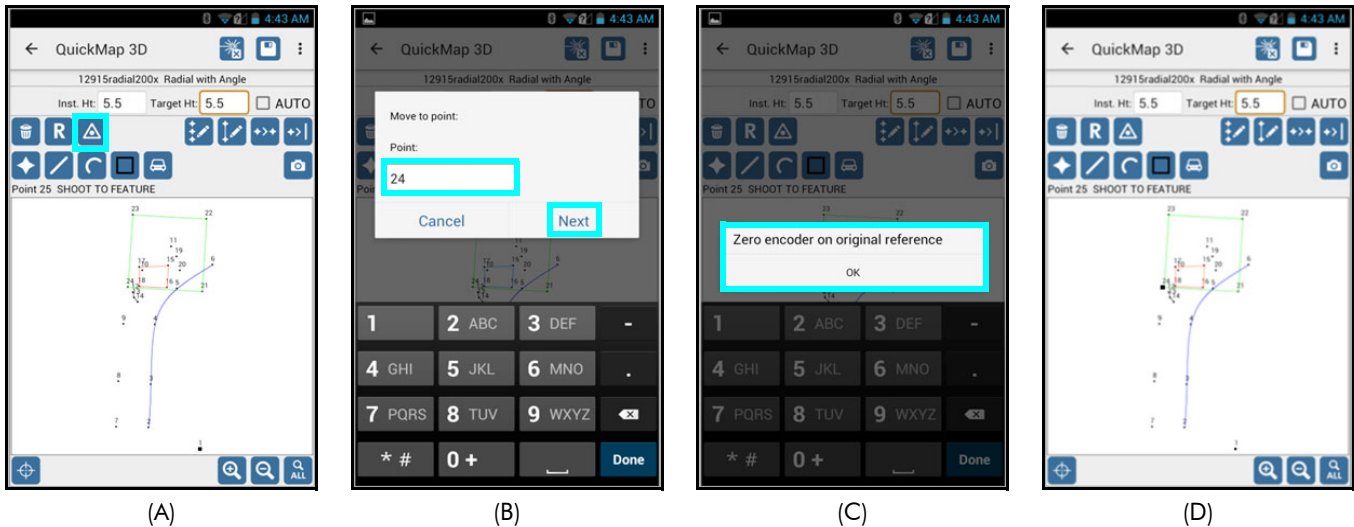




Figure 52

NOTE To verify the move was performed correctly, shoot a point in that was measured before the traverse. The new point should appear on top of the old one. Most scenes can be measured from one control point, however, set as many new control points as necessary to encompass an entire scene.

Range Triangulation

To move CP1 or CP2:

1. If it doesn't already exist, create a point feature for the position to which you want to move CP1 or CP2.
2. Tap the Move icon  for CP1 or  for CP2, depending on which of the control points you are trying to move (Figure 53A).
3. Enter the point number for the new control point and tap [OK]. In this example, point 3 was selected CP2 (Figure 53B).
4. Move the target for CP2 to the new position and adjust the height for visibility, if necessary. If you are mapping in 3D and you move CP1, make sure to record the new target height before proceeding.
5. Notice that the line that once connected points 1 and 2 now connect points 1 and 3.
Point 3 has been successfully reassigned to CP2 (Figure 53C).

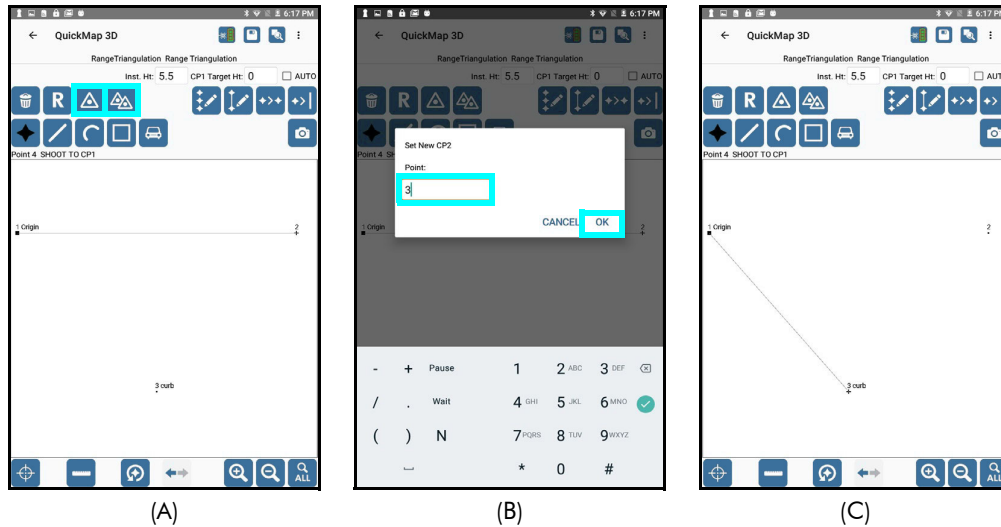


Figure 53

NOTE A good way to verify that the new control point was correctly set is to measure a feature that was measured from the previous position to create a second point for that feature. If the move was successfully achieved, the two points will display directly on top of each other or very near to it.

Baseline Offset

Each point along the baseline that you stop at to measure a feature, is essentially a new Control Point. Therefore, all evidence points must be measured to from somewhere along this line. Neither the location of the Origin or the baseline Azimuth can be changed once a file has been started.

Recover Your Instrument Position

Throughout the mapping process, events can occur that may disrupt the zero for your equipment setup, such as the following:

1. The tripod is accidentally kicked or moved off the instrument position.
2. TruAngle batteries must be replaced in the middle of the survey process.

This process only refers to the Radial with Angle method, as you are constantly moving your instrument position in the other methods.

TruPulse 200X or TruSpeed Sxb + TruAngle

1. Ensure the tripod is set up properly on the instrument position.
 2. Turn the TruAngle off and then back on again.
 3. Re-index the TruAngle (turn 360° until "IND" becomes flashing 0.00).
 4. Zero the TruAngle:
 - a. If there was only one instrument position in the survey (the Origin), aim the laser at the original reference point for the survey and zero the TruAngle on that point.
 - b. If there was more than one instrument position in the survey, aim the laser at the previous instrument position (not the original reference) and zero the TruAngle on that point.
- NOTE** For help with zeroing a TruAngle, see [Page 27](#).
5. Begin adding new data points to the survey. To verify that you have correctly re-entered the survey, shoot in a point that was mapped in the original survey. The new point should be on top of or very close to the point shot in the original survey.

Change Target Height

When collecting data for a 3D map, it may become necessary to enter a new value for the Target Height. Each of the data collection methods includes a Target Height value which was entered on the New File Settings screen ([Page 24](#)) when the survey was created. The table below lists the Target Height value associated with each data collection method.

When collecting data for a 3D map, it may also become necessary to edit the Instrument Height ([Page 25](#)).

Data Collection Method	Target Height Options
Radial with Angle 3D	Target Height
Range Triangulation 3D	CP1 Target Height
Baseline Offset 3D	Origin & Feature Height

To change a Target Height:

From the Data Collection screen ([Page 32](#)), enter a new value into the Target Ht field. When changed, the new height(s) will be carried through for the remainder of measurements in the map unless it is changed back by the user. If the data has already been stored, use one of the following remedies.

- If an existing data point is using an incorrect height value, the incorrect value may be edited using the QuickMap Menu option for Point Detail ([Page 65](#)).
- If a series of data points is using an incorrect height, the incorrect value may be edited by tapping the Edit Point Series icon on the Data Collection screen ([Page 67](#)).
- If a Feature is using an incorrect height value, the incorrect value may be edited using the Edit Feature icon on the Data Collection screen ([Page 68](#)).

Section 5 - Review Data

After measurements have been taken, QuickMap 3D can display the collected raw measurements, XYZ or GPS coordinates, and associated heights for each data point. Additionally, distances can be calculated between any two measured points in a survey. In this section, find out how to review measurements and coordinates, calculate distances, and zoom the Data Collection screen.


Calculate Distances

At any time a survey is open, and the Data Collection screen is displayed, QM3D can calculate two types of distances:

- Point to Point Distance
- Point to Line Distance

Point to Point Distance

To use the Point to Point Distance feature to display the distance between any two measured data points in a survey:

1. Tap the Point to Point icon  in the Edit/Measure toolbar in the upper right corner of the Data Collection screen (Figure 54A). In this example, the distance between points 21 and 22 is calculated.
2. Enter the point number of the first point - the point you are starting from - and tap Next (Figure 54B).
3. Enter the point number of the second point - the point you are going to - and tap Next (Figure 54C).
4. The calculated measurements between the two points display (Figure 54D). Tap OK to clear the calculation results window.

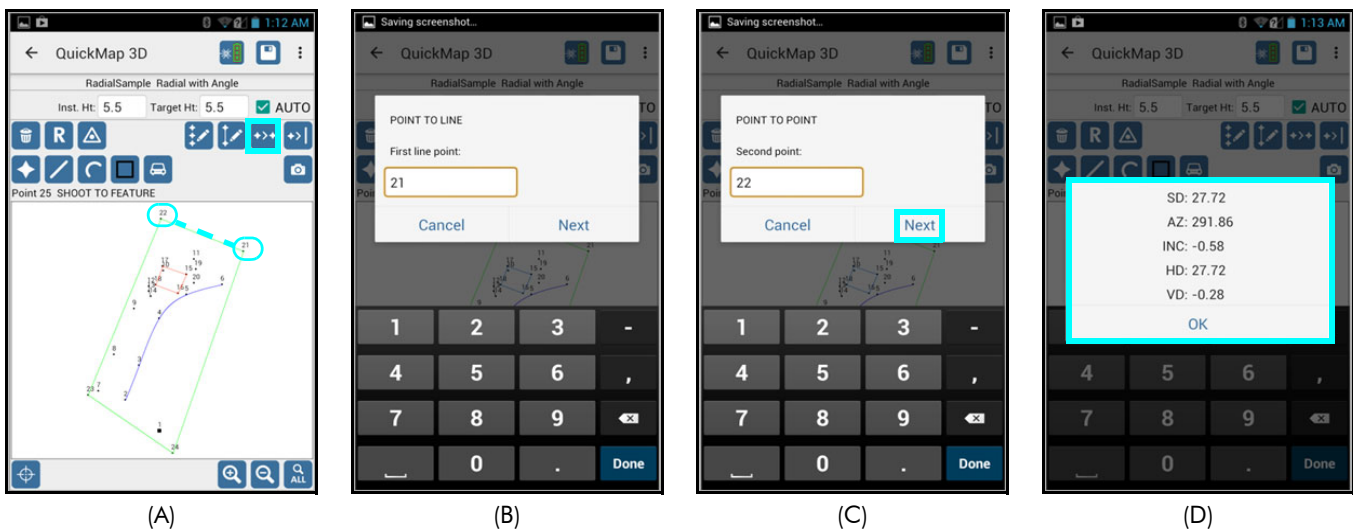


Figure 54


Explanation of Calculation Results

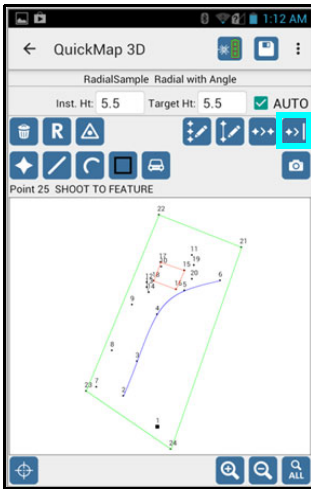
- **SD:** Slope Distance (Feet or Meters)
- **AZ:** Angle from the first point to the second point based on the zero reference set when the survey was started (Degrees)
- **INC:** The inclination from the first point up or down to the second point (Degrees)
- **HD:** Horizontal Distance (Feet or Meters)
- **VD:** Vertical Distance from the first measured point up or down to the second measured point (Feet or Meters)

NOTE Any two data points can be selected, whether they are individual point features or part of a line, curve, area, or vehicle feature.

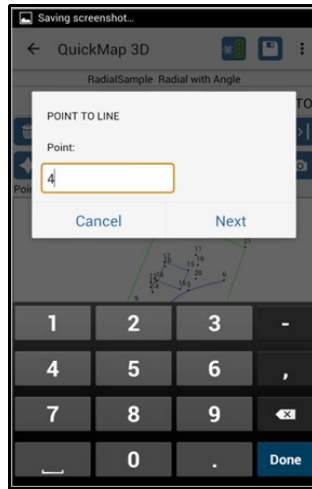
Point to Line Distance

To use the Point to Line Distance feature to display the distance between a measured point and a line segment:

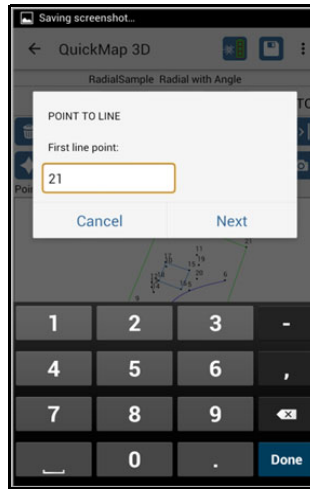
1. Tap the Point to Line icon  in the Edit/Measure toolbar in the upper right corner of the Data Collection screen (Figure 55A). In this example, the distance between point 4 and the line between points 21 and 22 is calculated.
2. Enter the point number of the first point - the point you are starting from - and tap Next (Figure 55B).
3. Enter the point number for the first point in the line that you are going to and tap Next (Figure 55C).
4. Enter the point number for the second point in the line that you are going to and tap Next (Figure 55D).
5. The calculated measurements between the point and the line display (Figure 55E).
 Tap OK to clear the calculation results window.



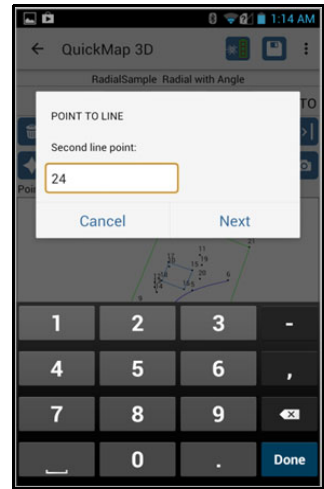
(A)



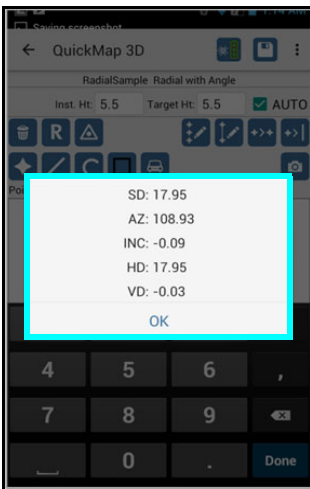
(B)



(C)



(D)



(E)

Figure 55

Explanation of Calculation Results:




- **SD:** Slope Distance (Feet or Meters)
- **AZ:** Angle from the first point to the second point based on the zero reference set when the survey was started (Degrees)
- **INC:** The inclination from the first point up or down to the second point (Percent)
- **HD:** Horizontal Distance (Feet or Meters)
- **VD:** Vertical Distance from the first measured point up or down to the second measured point (Feet or Meters)

NOTE Any two data points can be selected to define the line segment, whether they are individual point features or part of a line, curve, area, or vehicle feature. An error message will be displayed if a perpendicular line cannot be drawn between the data point and the line segment.

Zoom Options

Any time a survey is open, the view of the Data Collection screen display area can be changed using zoom functionality. Use touch zoom functionality to zoom into and out of the display area. Touch and drag to pan. Icons are also available for zooming when using the stylus (or if wearing gloves). Zoom icons are located in the lower right corner of the Data Collection screen (Figure 56A).

Zoom Icon Descriptions:

-  **Zoom In** - Tap to magnify the current view, thus creating a smaller view of the survey area (Figure 56B).
-  **Zoom Out** - Tap to reduce the current view, thus creating a larger view of the survey area. This feature does not zoom farther away than the full view of the survey area.
-  **Zoom All** - Tap to reset the display area to the default, 100% full map view.

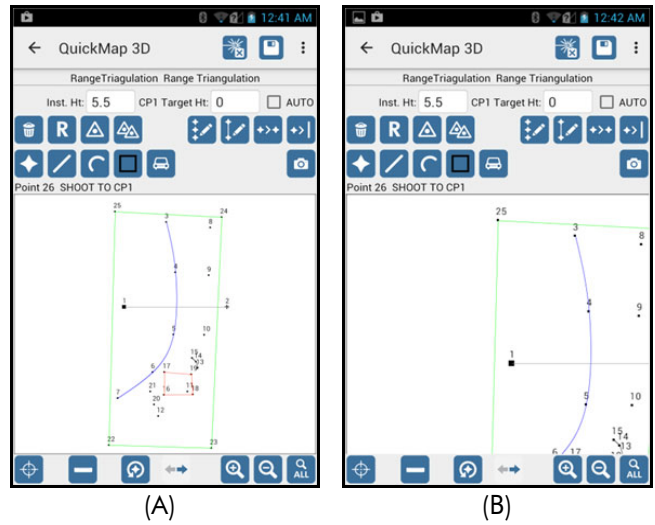



Figure 56

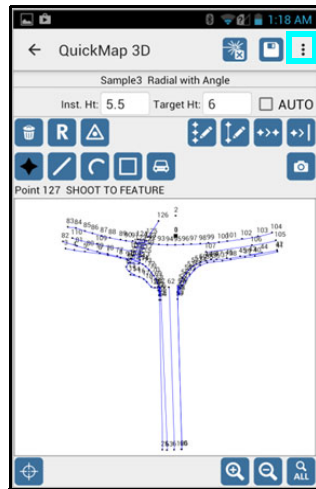
Point Detail

Use Point Detail to review three different screens of data about the file.

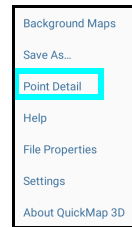
- Raw Shot Values
- XYZ Values
- Shot Table

To open Point Detail:

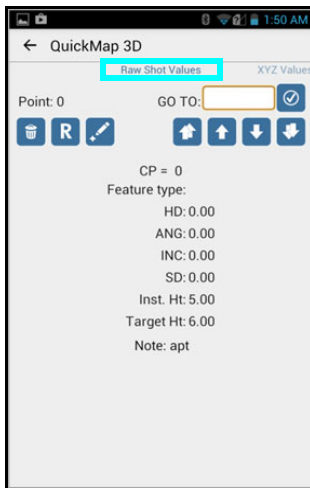
1. Tap the Menu button  on the Data Collection screen (Figure 57A).
2. Select Point Detail from the drop-down list (Figure 57B).
3. The Point Detail - Raw Shot Values screen displays (Figure 57C). Point Detail includes modular functionality, which means that the XY(Z) and Shot Table screens are displayed by swiping to the left.
4. From the Raw Shot Values screen, swipe to the left one time to display the XY(Z) Values screen (Figure 57D).
5. From the XY(Z) Values screen, swipe to the left one time to display the Shot Table screen (Figure 57E).



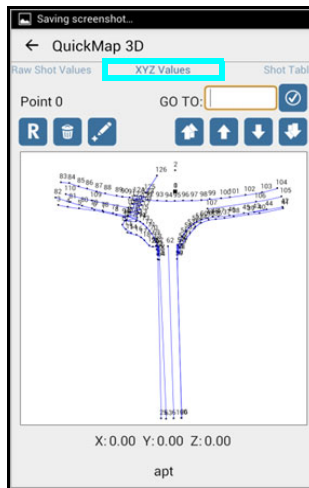
(A)



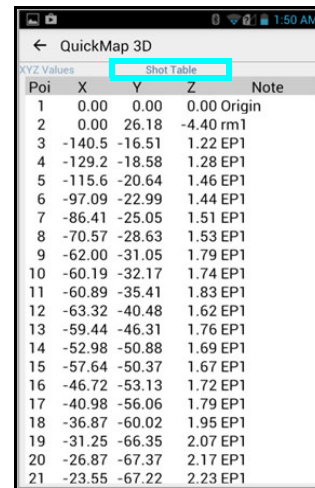
(B)



(C)













(D)



(E)

Figure 57

Field / Icon	Description
Point:	Indicates which data point is currently selected. Information displayed on the Raw Shot Values and XYZ Values screen is associated with the selected point.
GO TO: 	Choose a new data point for which to review values. Enter the data point in the GO TO field and then tap the checkmark icon to the right of the entry field to confirm. Double check that the new point number was selected by ensuring that it is listed as the Point: (X) in the upper left corner of the screen.
	Tap to delete the current selected data point. A prompt to confirm the deletion will display so the deletion may be accepted or canceled (Page 50).
	Tap to reshoot the current selected data point. The Data Collection screen will display with instruction line prompting to reshoot (or manually re-enter) the data point (Page 51).
	Tap to display the Description Detail screen (Page 65) and edit the note description, feature type, or height for any data point.
	Skips to the last measured data point in the survey file.
	Moves to the next data point in the file.
	Moves to the previous data point in the file.
	Skips to the first data point in the file (the CP or Origin).
	Tap the back arrow in the upper left corner of the Point Detail screen to leave Point Detail and return to the Data Collection screen.
	For Range Triangulation and Baseline Offset surveys, tap to change the orientation of the current selected data point from left to right or vice versa. This icon is not available for Radial with Angle surveys.

NOTE If a measured point has any images associated with it, those images will appear in a list at the bottom of the Raw Shot Values screen (Figure 58).

- A long-press of the image name will bring up a full resolution view of the image.
- Tap Delete to remove the image from the data file, or tap OK to keep it.

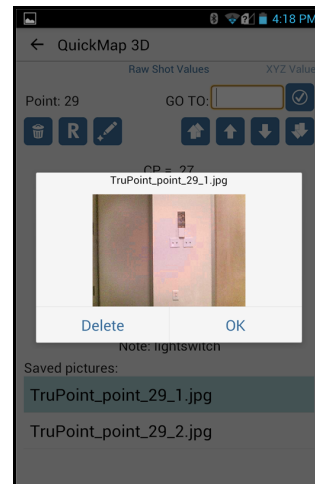




Figure 58

Display Raw Shot Values

The Point Detail Raw Shot Values screen displays measurement and description data assigned to each individual data point in an open survey. Data points may be reviewed, deleted, re-shot, and/or edited from this screen.

To access the Raw Shot Values screen:

1. Tap the Menu button  on the Data Collection screen (Figure 59A).
2. Select Point Detail from the drop-down list (Figure 59B). For devices with finer resolutions, tap the Point Detail icon  located at the top of the screen.
3. The Point Detail - Raw Shot Values screen displays (Figure 59C). Point Detail includes modular functionality, which means that the XY(Z) and Shot Table screens are displayed by swiping to the left.

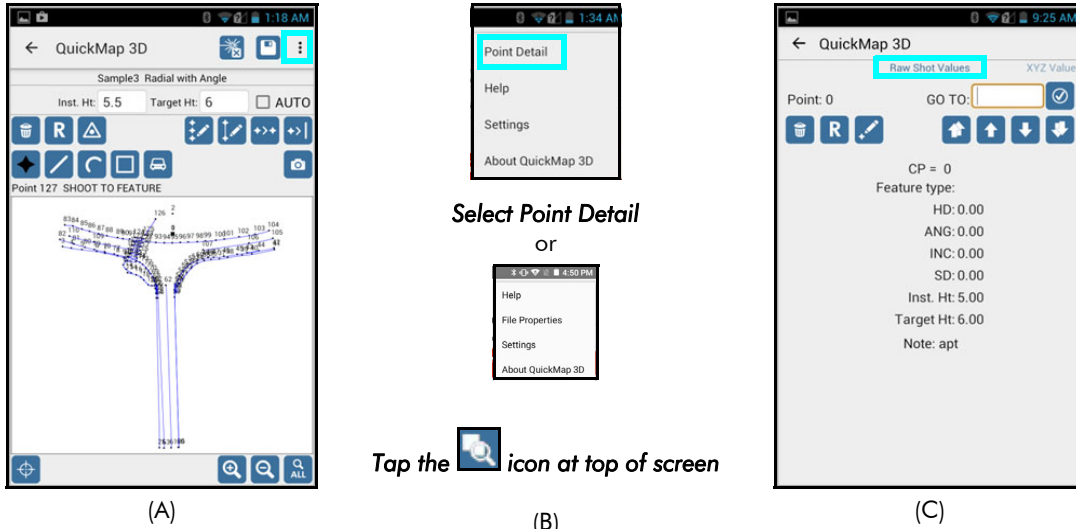


Figure 59

The Point Detail Raw Shot Values screen displays differently depending on the mapping method selected when the survey was created. Here is a sample of the Raw Shot Values screen for each mapping method:

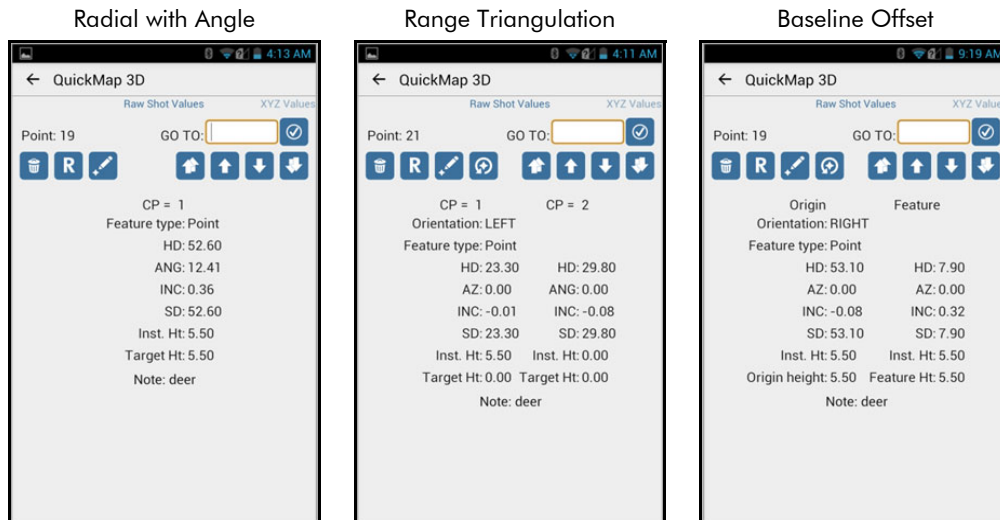




Figure 60

NOTE To change the current selected point number in order to view the raw shot values for a different point number, enter the desired point number in the GO TO: field and tap the checkmark. The Point indicator in the upper left corner of the screen will display the current selected point number. Also, the up and down arrows can be used to navigate to other data points in the survey. For Range Triangulation and Baseline Offset surveys, the Flip Point icon also displays on this screen so a data point's orientation may be changed from left to right or vice versa.

Display XYZ Values

The Point Detail XYZ Values screen displays a map view and the XY(Z) coordinates (and Latitude, Longitude and Altitude coordinates for GPS files) of each data point in the file. Points may be reviewed, deleted, re-shot, and/or edited from this screen.

To access the XYZ Values screen:

1. Tap the Menu button  on the Data Collection screen (Figure 61A).
2. Select Point Detail from the drop-down list (Figure 61B). For devices with finer resolutions, tap the Point Detail icon  located at the top of the screen.
3. The Point Detail - Raw Shot Values screen displays. Point Detail includes modular functionality, which means that the XY(Z) and Shot Table screens are displayed by swiping to the left.
4. From the Raw Shot Values screen, swipe to the left one time to display the XYZ Values screen (Figure 61C).

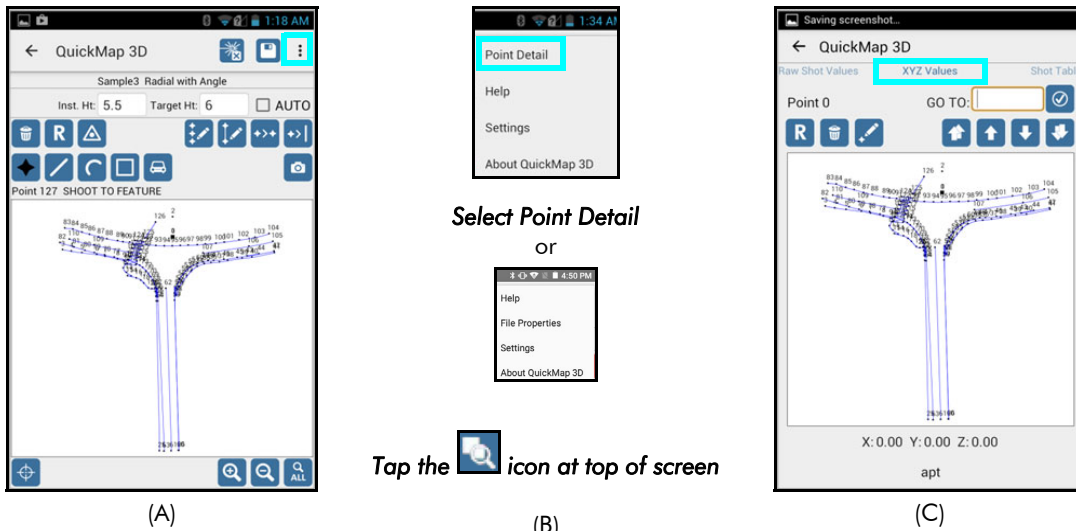




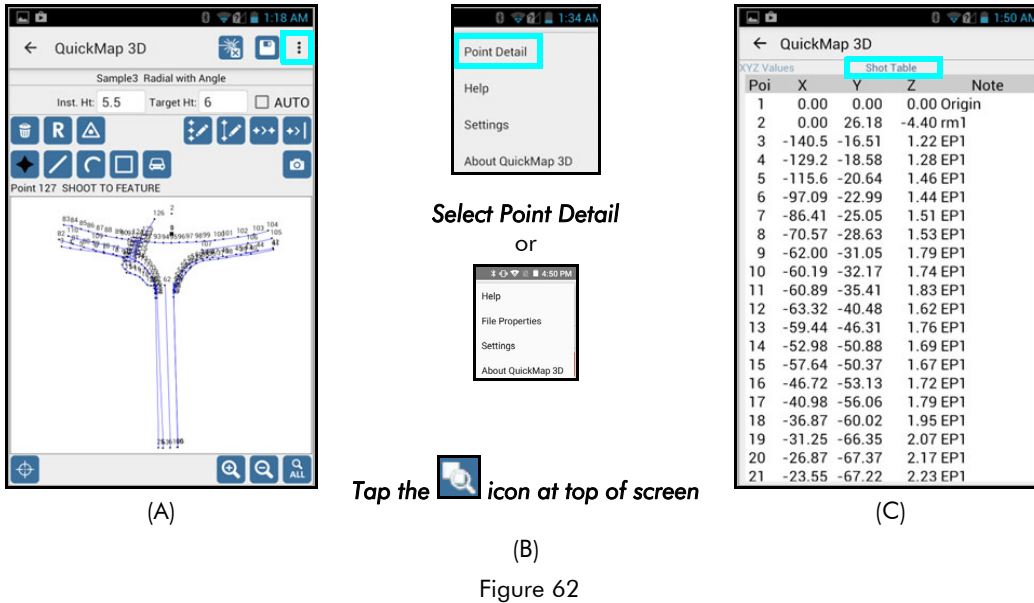
Figure 61

NOTE To change the current selected point number in order to view the XYZ values for a different point number, enter the desired point number in the GO TO: field and tap the checkmark. The Point indicator in the upper left corner of the screen will display the current selected point number. Also, the up and down arrows can be used to navigate to other data points in the survey. For 2D surveys, all Z values will display as "0.00." For Range Triangulation and Baseline Offset surveys, the Flip Point icon also displays on this screen so a data point's orientation may be changed from left to right or vice versa.

Display Tabular Data

The Point Detail Shot Table screen includes the point number, XYZ coordinate, and Note (if any) for each data point in an open survey in a tabular format.

1. Tap Menu button  on the Data Collection screen (Figure 62A).
2. Select Point Detail from the drop-down list (Figure 62B). For devices with finer resolutions, tap the Point Detail icon  located at the top of the screen.
3. The Point Detail - Raw Shot Values screen displays. Point Detail includes modular functionality, which means that the XY(Z) and Shot Table screens are displayed by swiping to the left.
4. From the Raw Shot Values screen, swipe to the left two times to display the Shot Table screen (Figure 62C).



NOTE To see continued data not available in the initial view, scroll down by tapping near the bottom of the Shot Table screen and swiping upward. For 2D surveys, all Z values will display as "0.00." GPS coordinates are not displayed in the Shot table. They can be viewed in the XYZ Values screen ([Page 63](#)).

Section 6 - Edit Data

Any data point in an open survey can be edited at any time. Data points can be edited individually or as a group if it becomes necessary to change values for more than just one point. These changes can be made in 2D and 3D maps; however, in 2D maps, height changes entered do not affect data points and are for notation purposes only. In 3D maps, the measured data points adjust to any height changes.

Edit a Data Point

Individual data points are edited via the Point Detail screen. From the Point Detail Raw Shot Values or XYZ Values screens, tap the Edit Point icon to bring up the Description Detail screen, from which all changes to selected data points can be made. The Description Detail screen as it appears in each mapping method is shown here:

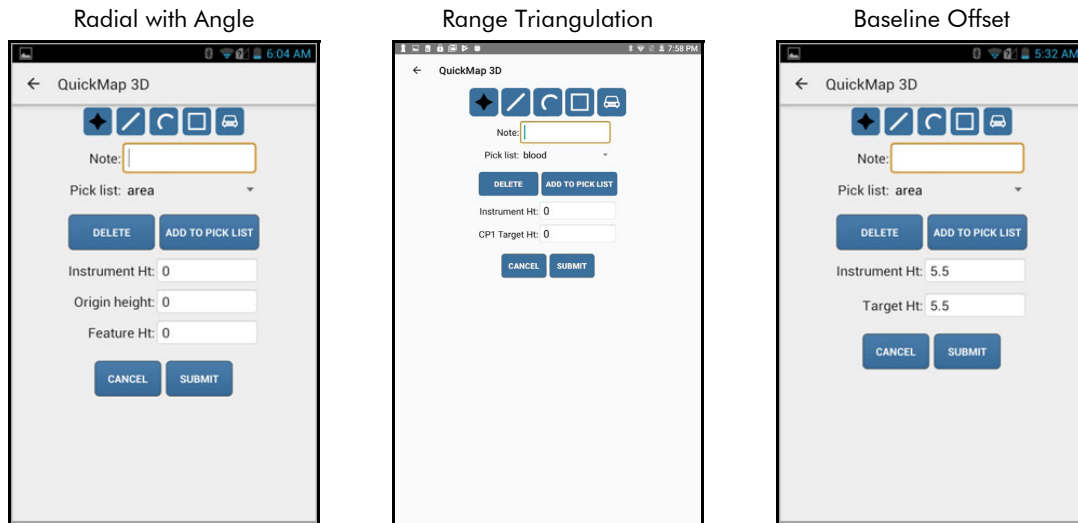


Figure 63

To edit an individual data point, access the Point Detail screen (Page 60):

1. With the Point Detail Raw Shot Values or XYZ Values screen displayed, select the data point to be edited using the GO TO field or the navigation arrows. The Point indicator in the upper left corner of the screen displays the current selected data point. In this example, point 19 is selected.
2. Tap the Edit Point icon (Figure 64A) and the Description Detail screen displays (Figure 64B).

From the Description Detail screen, the following changes can be made to the selected data point:

- Change the Feature Type - the current assigned feature type for the data point is highlighted in black. Tap the feature type it should be changed to in order to reassign the data point. See Page 69 for more detail.
- Change the Feature Name - enter a new name in the field. This option is only available for line, curve, area, or vehicle feature data points.
- Change the Note - Type the new note in the note field or select an existing note from the Pick List.
- Change Heights - To adjust the Instrument Height, Target Height, Origin Height, CP Height or Feature Height for the data point. Enter a new value into the relevant field.

NOTE Height options available on this screen depend on the mapping method selected when the map was created.

3. Tap Submit to save the changes or Cancel to forget them and return to the Data Collection screen.



Figure 64

Edit a Point Series

The Edit Point Series function allows for the editing of height values associated with one or more data points. The appearance of the Edit Point Series screen varies depending on the mapping method selected when the survey was created. The Edit Point Series screen as it appears in each mapping method is shown here:

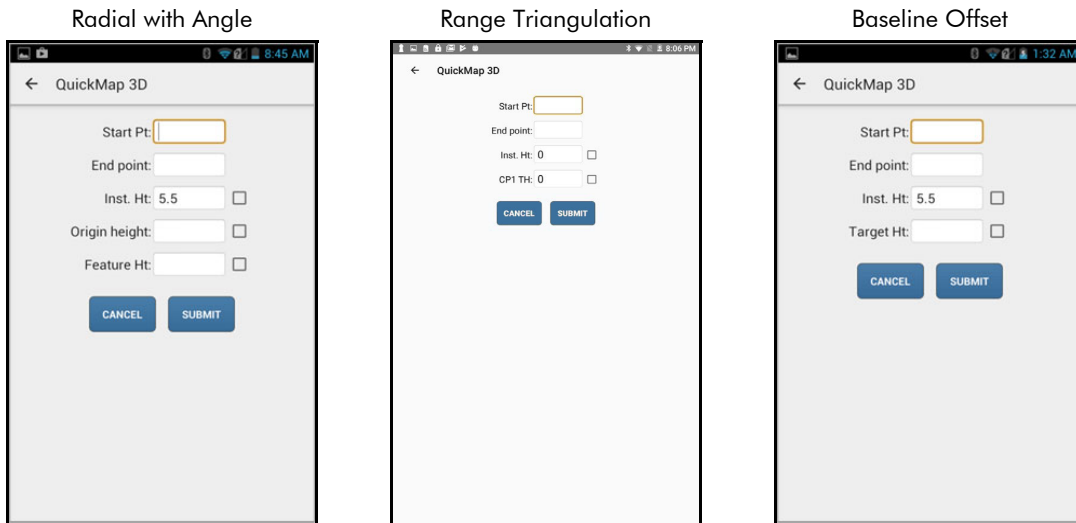



Figure 65

To use the Edit Point Series function:

1. With a survey file open, tap the Edit Point Series icon  on the Data Collection screen (Figure 66A).
2. Enter the start point number and the end point number of the series of data points to be edited (Figure 66B). If adjusting the height of just one data point, enter the same point number in the Start and End point fields.
3. Enter the new height value in the applicable field(s) (fields depend on the mapping method selected when the survey file was created - the survey in this example was done with the Radial with Angle mapping method).
4. Tap Submit to save the changes, or tap Cancel to abandon the operation and return to the Data Collection screen.

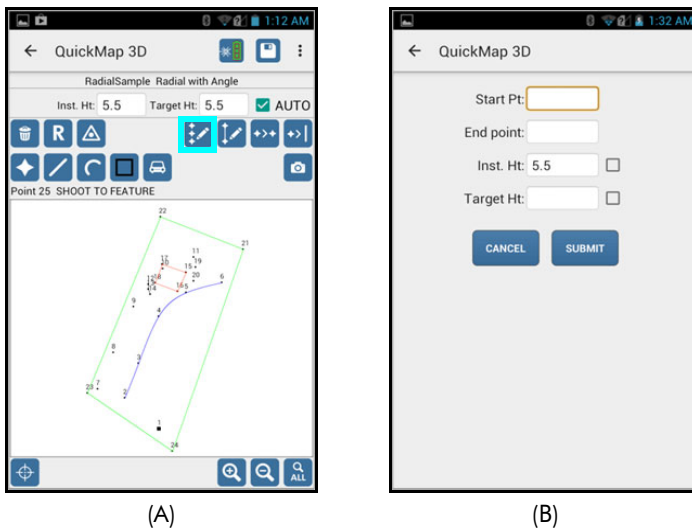


Figure 66

NOTE The Edit Point Series function is typically used to correct heights when the retro reflector, instrument height or other targets had been raised or lowered and the new target height had not been entered on the Data Collection screen at the time the measurements were taken. If unsure of the start and end point numbers, review the Point Detail Shot Table (Page 64) to help figure out what they are (by note description or measurement value, if necessary).

Edit a Feature

The Edit Feature function allows for the editing of height values associated with all data points assigned to a specific feature. The appearance of the Edit Feature screen varies depending on the mapping method selected when the survey was created. The Edit Feature screen as it appears in each mapping method is shown here:

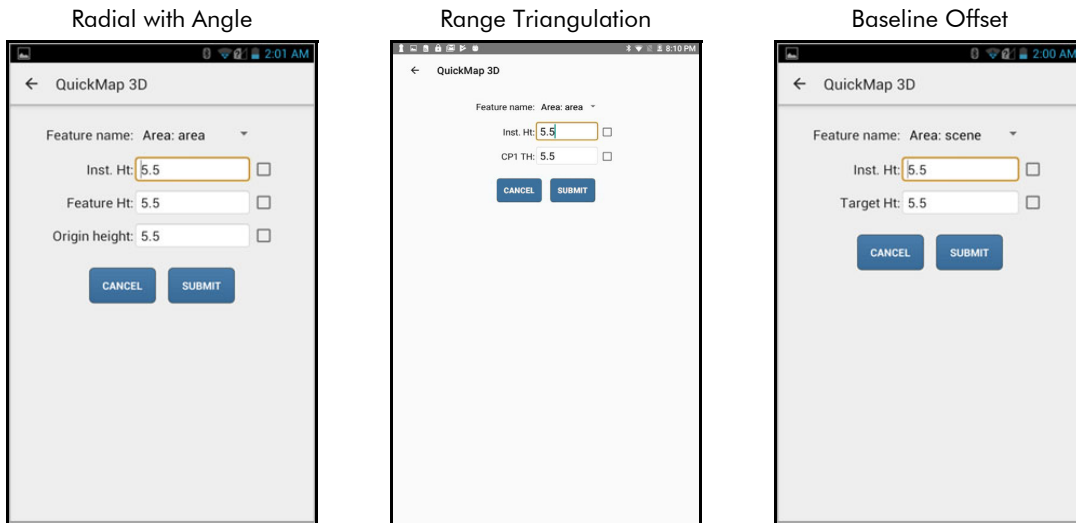


Figure 67

To use the Edit Feature function:


1. With a survey file open, tap the Edit Feature icon  on the Data Collection screen (Figure 68A).
2. Select the feature name to be edited (Figure 68B). The drop down list will include all features that have been added to the survey by Feature name and Note as "Feature name": "Note".
3. Enter the new height value in the applicable field(s). The fields depend on the mapping method selected when the survey file was created. The survey in this example was done with the Baseline Offset mapping method (Figure 68C).
4. Tap Submit to save the changes, or tap Cancel to abandon the operation and return to the Data Collection screen.




Figure 68

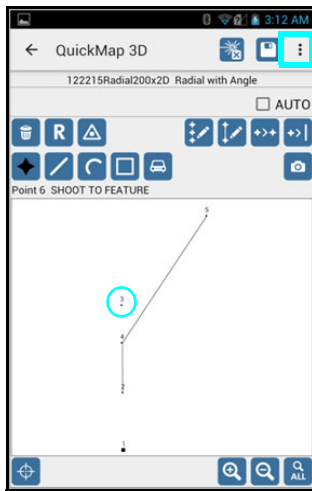
NOTE The Edit Feature function is typically used to correct heights when the retro reflector, instrument height or other targets had been raised or lowered and the new target height had not been entered on the Data Collection screen at the time the measurements were taken. It allows for the target heights of all data points within the feature be adjusted at one time.

Change the Feature Type

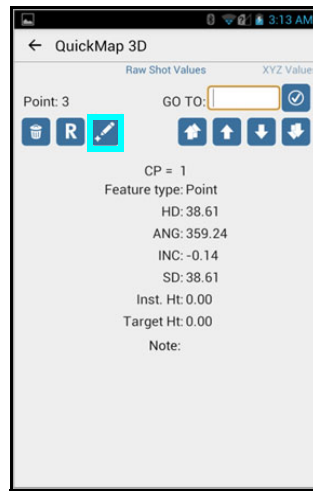
Data points that make up a line, curve, or area feature must be added in sequential order. If a data point is missed during a sequential measurement, it is possible to add the data point out of order by changing the feature type. Data points of any feature type can be changed to any other feature type at any time.

To change the feature type of a data point:

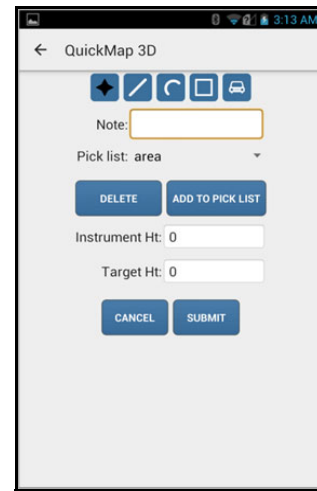
1. Tap Menu in the upper right corner of the screen and select Point Detail (Figure 69A).
2. The Point Detail - Raw Shot Values screen displays (Figure 69B). If the data point you want to change was not the last data point you added to the survey, enter the data point number in the GO TO field and tap the Checkmark button. Verify that the current selected point (listed as "Point: X" in the upper left area of the screen) is the point number for the data point you want to change. For this example, point 3 will be changed from a point feature to a line feature.
3. Tap the Edit Point icon  (Figure 69B) and the Description Detail screen will display (Figure 69C). Notice that the Point Feature type is shaded black - the reason for this is that "Point" is the current feature type of the data point that will be changed in this example.



(A)




(B)



(C)

Figure 69

(Continued on next page)

4. Tap the Line feature icon  (Figure 70A).
5. The Connect Point screen displays (Figure 70B). Select a connection type and tap Submit. In this example, Point 3 is being inserted between Point 4 and Point 5. Use the drop-down menu to choose from available options for connection.

More about the Connect Point screen:

- Beginning - Select this option to connect the new data point in the featuregroup to the beginning of the feature.
 - End - Select this option to connect the new data point in the feature group to the end of the feature.
 - Insert - Select this option to connect the new data point in the feature group between two specific data points in the feature.
6. The data point has now been changed from a point feature to a line feature and is included in the line (Figure 70C).

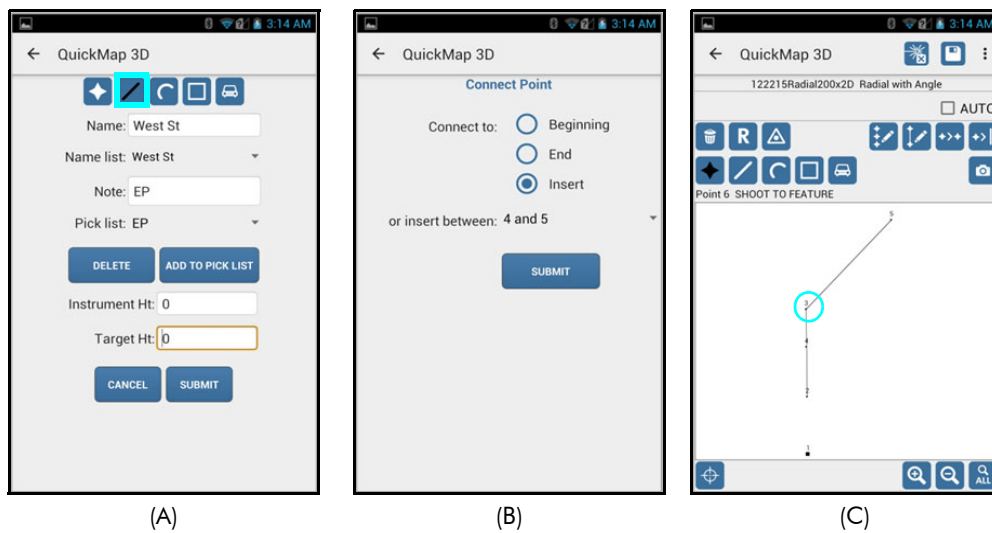



Figure 70

Flip a Data Point

The Flip Point function can be used to change the orientation of a data point for surveys created with the Range Triangulation or Baseline Offset mapping method. These mapping methods require assignment of points to the left or right of the baseline or the line between CP1 and CP2. If any data point(s) - whether part of a feature or not - was oriented incorrectly, it can be quickly and easily moved to the correct orientation. For more information about defining the orientation of data points, see [Page 39](#).

Flip the Most Recently Added Data Point

To flip the data point that was most recently added to a survey (the last shot taken):

1. Tap the Flip Point icon  at the bottom center of the Data Collection screen (Figure 71A).
2. The last measured data point in the survey will move to the opposite side of the line (Figure 71B). In this example, the data point (Point 25) orientation was on the right side of the line joining CP2 to CP1 and was flipped to the left side.

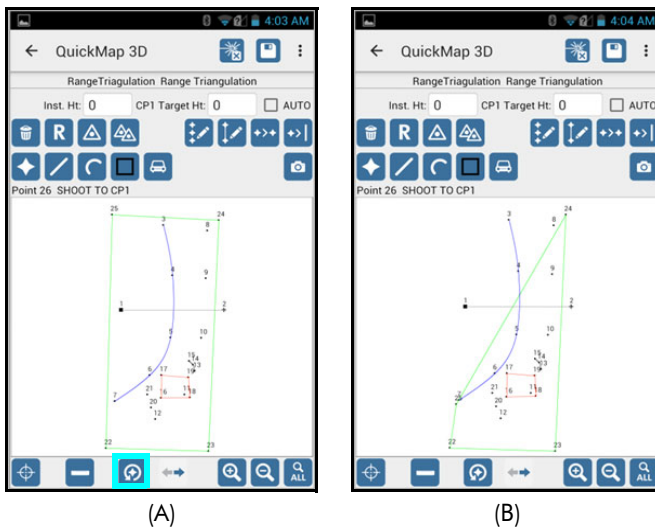



Figure 71

NOTE To flip the most recently added data point back to its original orientation, tap the Flip Point icon again.

Flip Any Data Point in the Survey

To flip any data point in the survey:

1. Tap Menu in the upper right corner of the screen and select Point Detail (Figure 72A).
2. The Point Detail - Raw Shot Values screen displays (Figure 72B). If the data point you want to change was not the last data point you added to the survey, enter the data point number in the GO TO field and tap the Checkmark button. Verify that the current selected point (listed as "Point: X" in the upper left area of the screen) is the point number for the data point you want to change. For this example, Point 8 will be flipped from the right side of the baseline to the left.
3. Tap the Flip Point icon  (Figure 72B), and notice that the orientation for the point has changed from right to left (Figure 72C).
4. Tap the back arrow in the upper left corner of the screen to leave Point Detail and return to the Data Collection screen. Notice that Point 8 has moved from the right to the left side of the baseline (Figure 72A and Figure 72D).

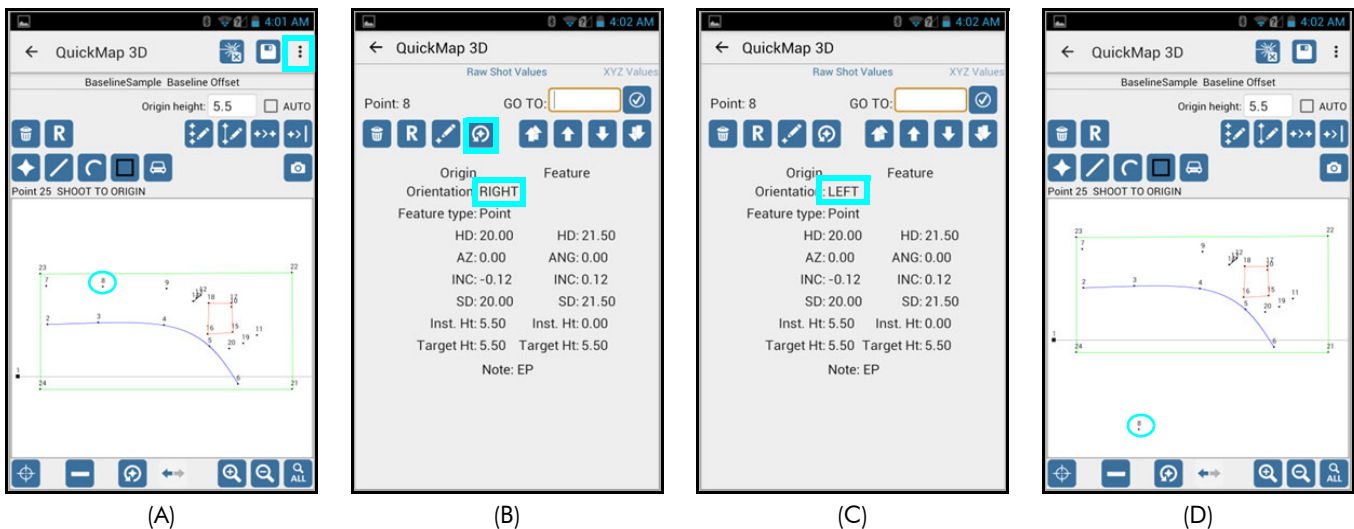


Figure 72

NOTE To flip a data point back to its original orientation, repeat these steps.



Section 7 - Reports & Pick Lists

QuickMap 3D can generate reports for survey data that are saved on the tablet and are transferable to a PC via cable connection or email. Saved reports can be created in a variety of different formats:

- **GPS Exchange** - *.GPX file that can be interchanged between GPS devices and software. View data in GIS programs such as ArcGIS and others. This report format is only displayed when the survey was created using GPS.
- **KML** - *.KML file is a file format used to display geographic data in an Earth browser such as Google Earth. This report format is only displayed when the survey was created using GPS.
- **ASCII** - *.asc "plain text" file that can be imported into programs like IMS Map 360, Crash Zone and others.
- **Text** - *.txt file that can be opened with a text editor or spreadsheet program.
- **Spreadsheet** - *.csv file that can be opened with a spreadsheet program.
- **CAD** - *.dxf file that can be opened with a CAD-based drawing program.
- **Raw** - *.raw file that can be opened with a text editor, spreadsheet program or many CAD-based drawing programs.
- **Graphic small** - *.png file (picture of the points and features) that can be opened with most graphics applications. The size of the images is 600x600.
- **Graphic large** - *.png file (picture of the points and features) that can be opened with most graphics applications. The size of the images is 1200x1200.
- **All Above Formats**

Save a Report

To save a QuickMap 3D report for a survey:

1. With the survey file open, tap the Save icon  in the upper right corner of the screen (Figure 73A).
2. Choose to keep the filename used when the survey was created or enter a new one. Tap the Report Format drop down list to select a format to save (Figure 73B). Also, tap the Text size drop-down menu to increase the text size of the plot labels when the data is opened in a CAD program for diagramming.
3. Tap the Save icon  (Figure 73C).
4. The report has been saved on the tablet and appears in the Saved Reports section in the bottom half of the screen (Figure 73D). Saved reports display in this section with the most recently saved report at the top.

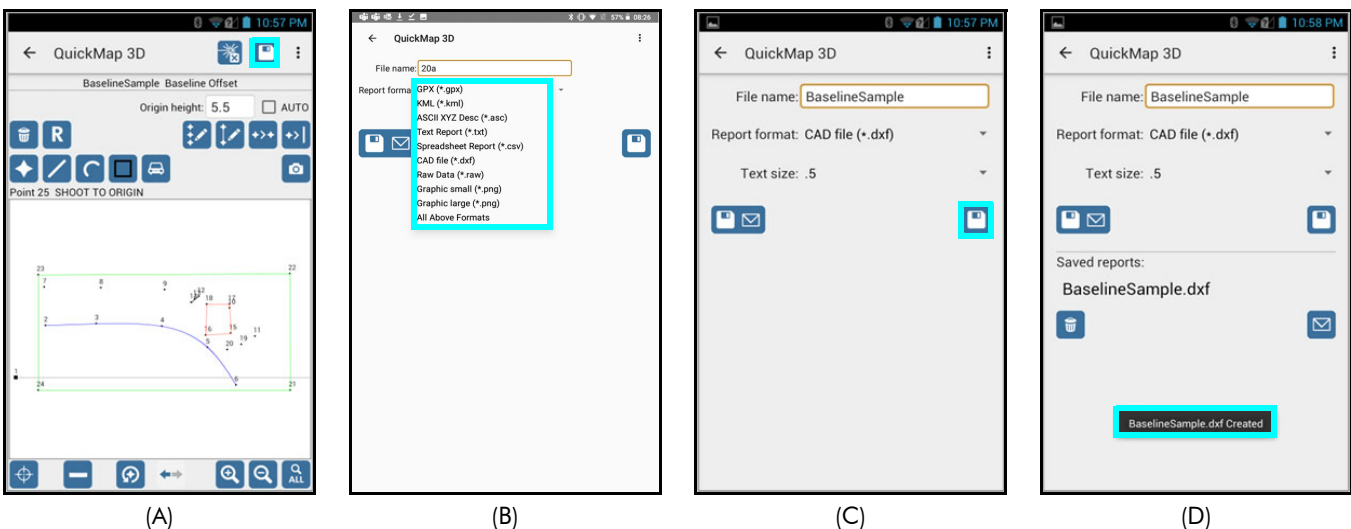





Figure 73

Save and Send a Report

To save and send a QuickMap 3D report for a survey:

1. Ensure the tablet has access to WIFI and that an email account has been added.
2. With the survey file open, tap the Save icon  in the upper right corner of the screen (Figure 74A).
3. Choose to keep the filename used when the survey was created or enter a new one. Tap the Report Format drop down list to select a format to save (Figure 74B). Also, tap the Text size drop-down menu to increase the text size of the plot labels when the data is opened in a CAD program for diagramming.
4. Tap the Save & Send icon  (Figure 74C).
5. The email options available on the Android device will display.
In this example, Gmail will be used to send the report (Figure 74D).
6. The report file is automatically attached to the email (Figure 74E) and:
 - Sends from the default email address set up on the tablet.
 - Sends to the email address(es) assigned in QuickMap Settings (Page 57) - or a different email address can be entered.
 - Includes the report file name as the email subject line.
7. Tap Send  (Figure 74E).

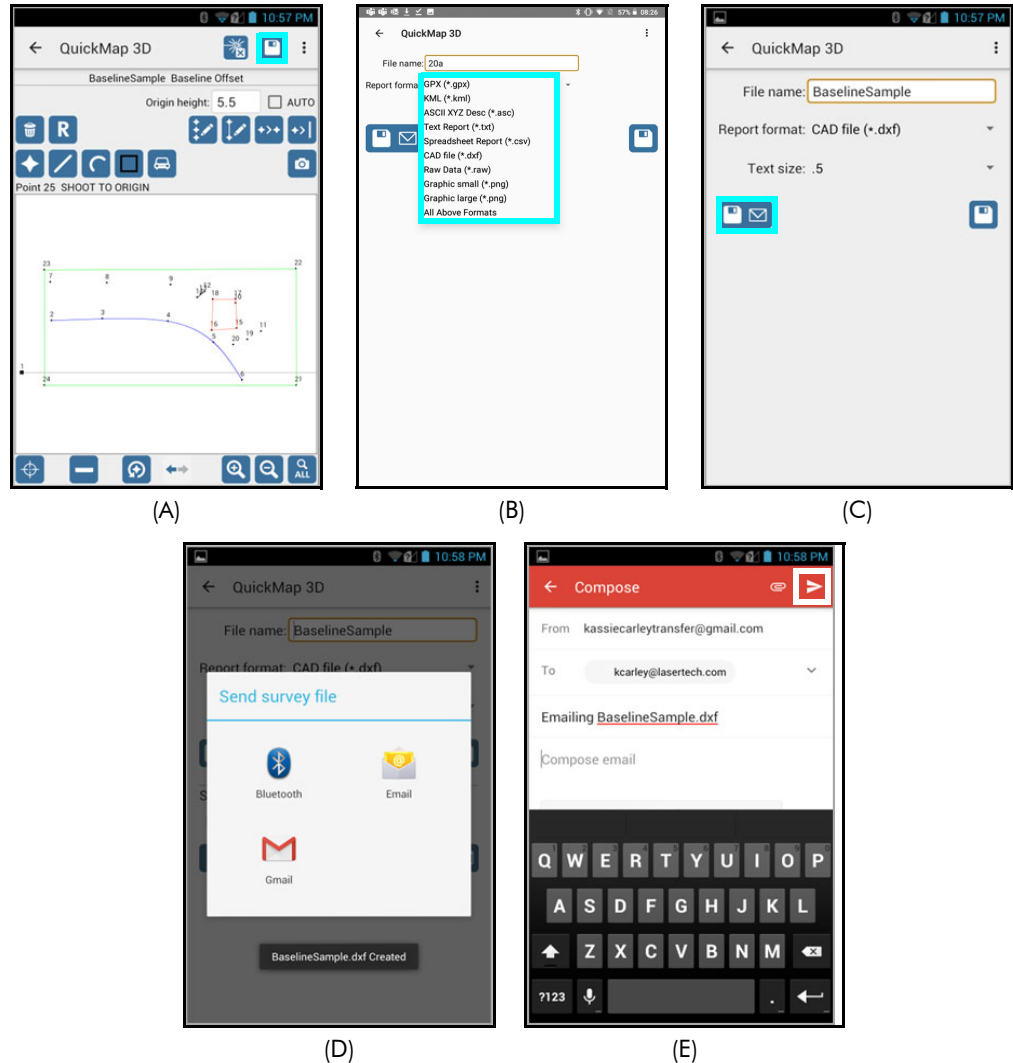


Figure 74

NOTE If using a cable to transfer saved reports to a PC, the reports can be found in the QuickMap folder. Within the QuickMap folder, a folder is automatically created and named after the survey. All reports and photos saved for a survey can be found in that folder (Figure 75).

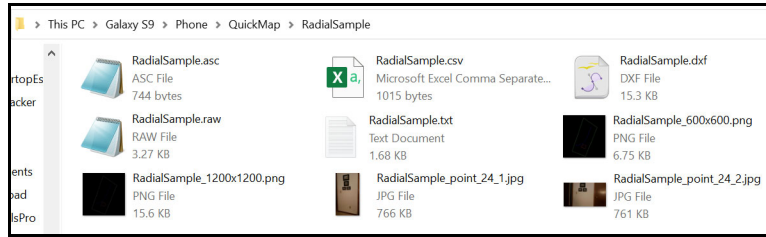




Figure 75

Manage Saved Reports

Reports saved on a tablet can be sent or deleted from within QuickMap 3D. They can also be copied as a group using a cable connection to a PC. In order to manage saved reports for any survey, the survey must first be opened.

Send a Saved Report

1. Tap the Save icon  in the upper right corner of the Data Collection screen (Figure 76A). All previously saved reports for any survey are accessed via the Save icon.
2. The Saved Reports section displays in the lower half of the Save screen. Tap the saved report you wish to send, and then tap the Send icon (Figure 76B).
3. The email options available on the Android device will display. In this example, Gmail will be used to send the report (Figure 76C).
4. The report file is automatically attached to the email (Figure 76D) and:
 - Sends from the default email address set up on the tablet.
 - Sends to the email address(es) assigned in QuickMap Settings (Page 57) or a different email address can be entered.
 - Includes the report file name as the email subject line.
5. Tap Send  (Figure 76D).

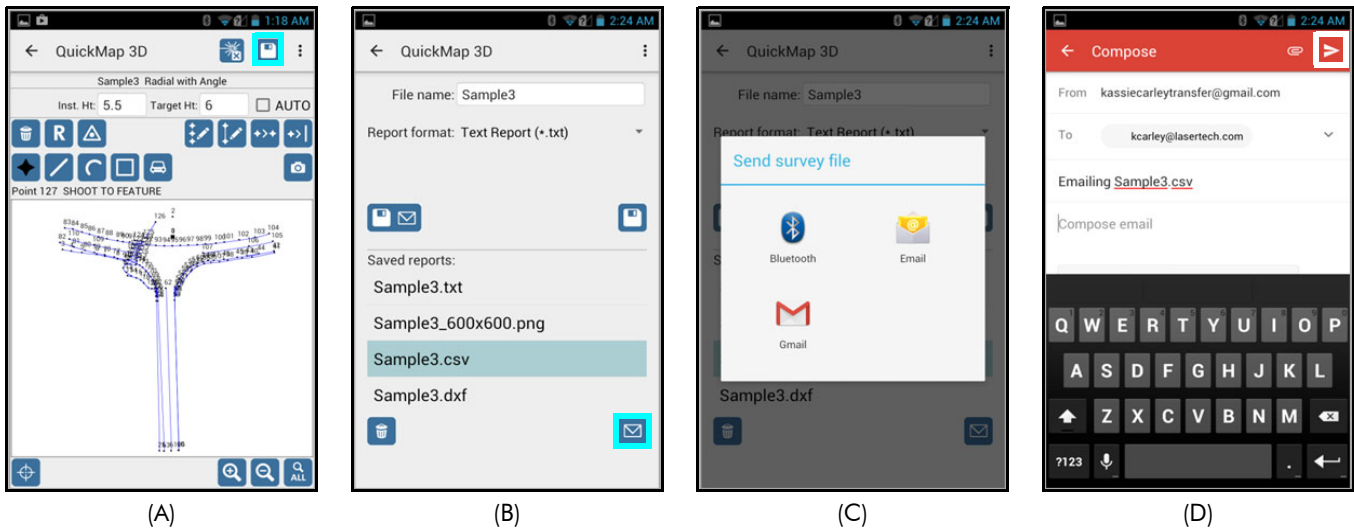



Figure 76

Delete a Saved Report

1. Tap the Save icon  in the upper right corner of the Data Collection screen (Figure 77A).
2. The Saved Reports section displays in the lower half of the Save screen. Tap the saved report you wish to delete, and then tap the Delete icon (Figure 77B).
3. Tap OK to confirm the deletion of the report (Figure 77C), or tap Cancel to abandon the operation.
4. The deleted report no longer appears in the Saved Reports section (Figure 77D).

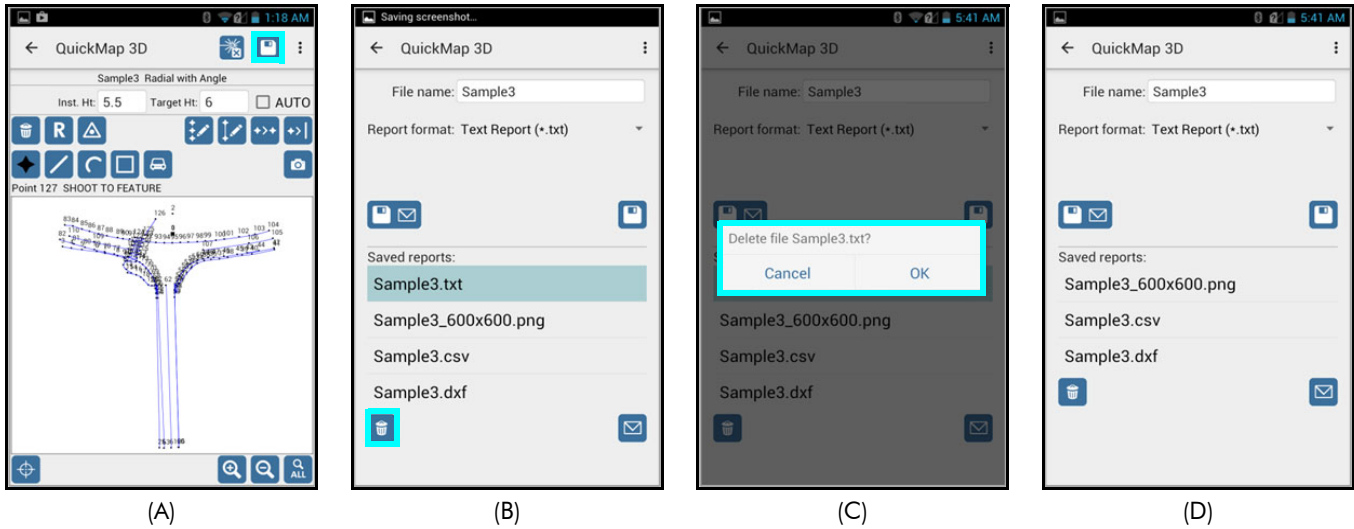


Figure 77

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 QuickMap 3D is installed on an Android device, it creates a folder called QuickMap for storing program settings, reports, and the QM3D format survey files. The QM3D survey files can only be opened within QuickMap 3D and are located in a sub-folder called "Data". In addition to transferring survey reports to a PC, it is also a good idea to copy the QM3D files over as well once all edits and changes to the survey are complete. A QM3D file can always be copied back over to the Android device if it becomes necessary to add more data points to a survey or make any other changes - and then reports can be re-created based on the updated file.

1. Connect the tablet 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 search for the USB Configuration option (Figure 78A).
3. Tap to select "Select USB Configuration".
4. Select MTP (Media Transfer Protocol) (Figure 78B).
5. On the PC, open File Explorer and then navigate to and select the Android device. In this example, it is "Galaxy S9\Phone". When the device is selected, its contents display on the File Explorer screen.
6. Double-click the QuickMap folder (Figure 78C).

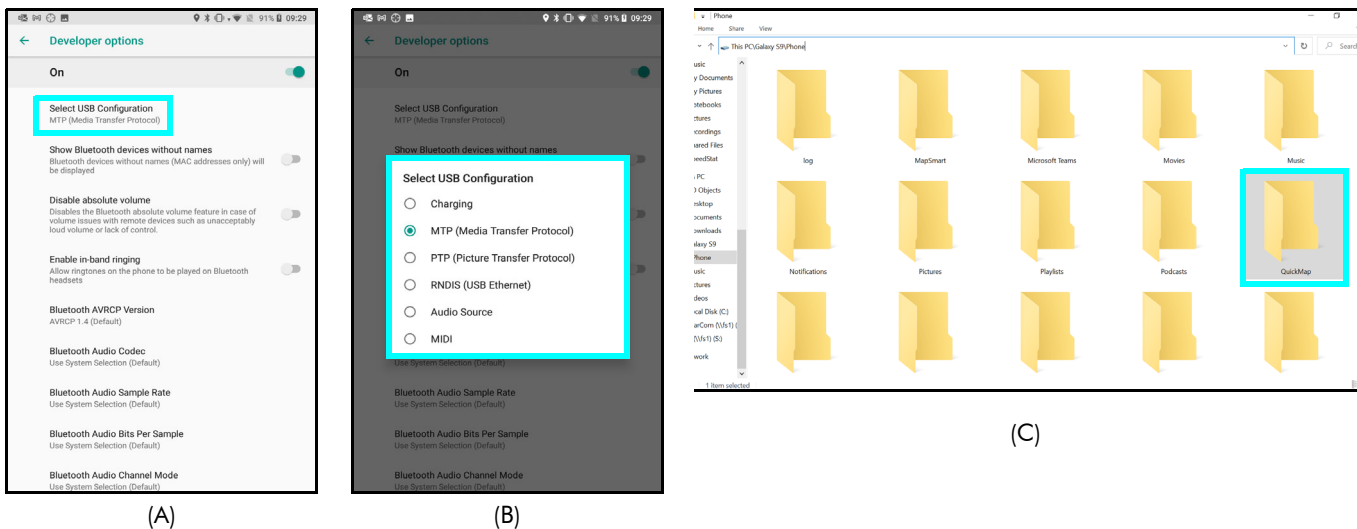


Figure 78

7. Double-click the folder that coincides with the survey name and the saved survey reports will display (Figure 79). Copy any of the individual reports, or copy the entire folder to transfer all the reports for the survey by highlighting them and then right-click/copy with your mouse.

8. Create a folder on your PC for storing your QuickMap reports and QM3D files. Double-click the folder, and then right-click/paste with your mouse.

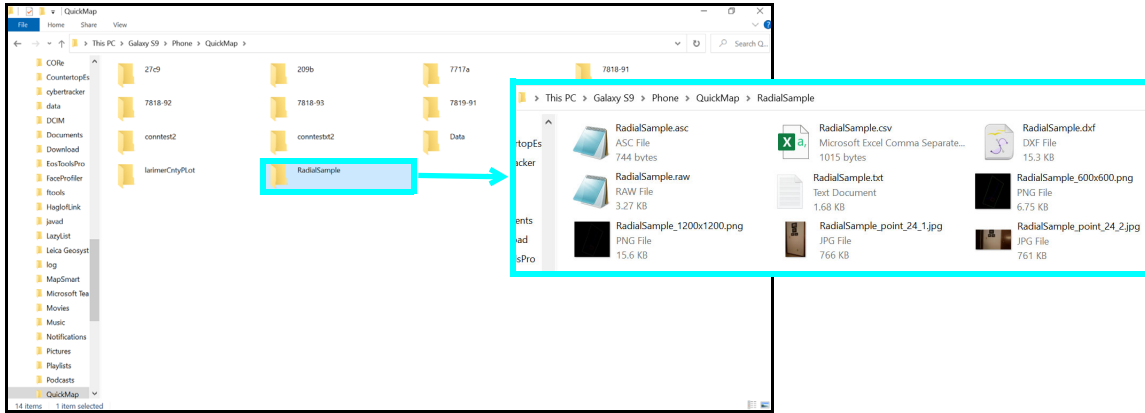


Figure 79

Delete All Saved Reports

For the purpose of managing your Android device's memory and resources, it can be helpful to delete reports and QM3D files from the Android device after they have been safely transferred to a PC. When QuickMap 3D is installed, it creates a folder called QuickMap for storing program settings, reports, and QM3Dformat survey files. The QM3D survey files can only be opened within QuickMap 3D and are located in a sub-folder called "Data". Do not delete the Data folder unless all the QM3D files have been placed safely on a PC. If the Data folder is deleted, it cannot be recovered and the deletion cannot be undone. As long as the QM3D files are kept on the tablet or somewhere on a PC, they can be opened in QuickMap to re-create any reports, if necessary.

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 search for the USB Configuration option (Figure 80A).
3. Tap to select "Select USB Configuration".
4. Select MTP (Media Transfer Protocol) Figure 80B.
5. On the PC, open File Explorer and then navigate to and select the Android device. In this example, it is "Galaxy S9\Phone. When the device is selected, its contents display on the File Explorer screen.
6. Double-click the QuickMap folder (Figure 80C).

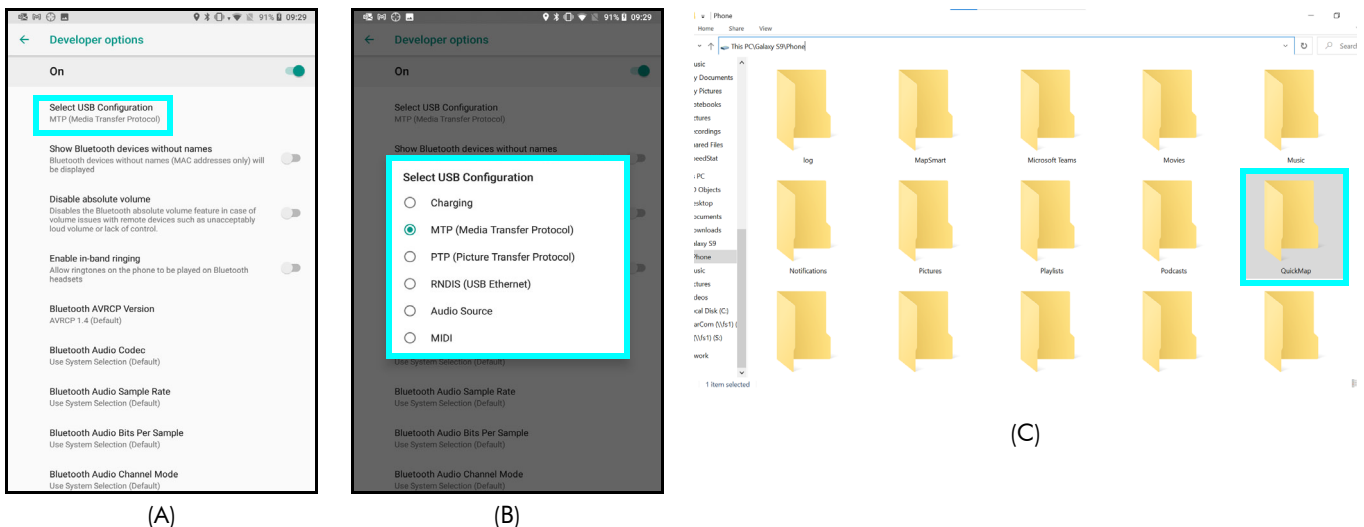


Figure 80

7. Double-click the folder that coincides with the survey name and the saved survey reports will display (Figure 81). To delete all saved reports on the tablet, highlight all the survey folders and right-click/delete with your mouse.

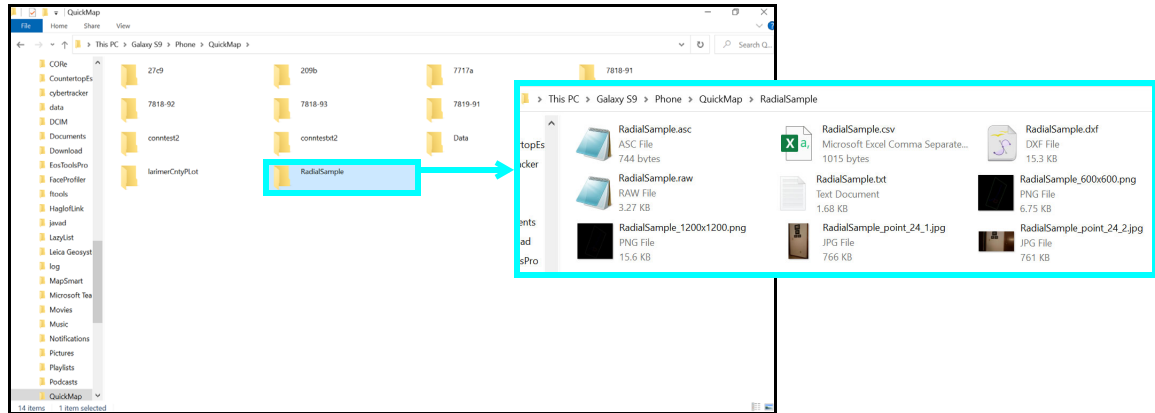


Figure 81

Pick List

The Pick List is a collection of notes used to describe data points in QuickMap 3D surveys. Notes are helpful for further clarifying data points during the diagramming process. Here are a few examples of some common Pick List notes:

EP =Edge of Pavement
VEH1 =Vehicle 1
FOG =Fog Line
CL =Center Line
SKID =Skid Marks
CRB =Curb
SW =Sidewalk
CW =Crosswalk

There is only one Pick List per tablet and it is accessible universally across all surveys that are created in QuickMap. The Pick List can be created in two ways:

- As data points are added to a survey, Pick List notes can be entered and include an option to "Add to Pick List." This is a "build as you go" method for Pick List creation.
- Create a Pick List on a PC, and then transfer it to a the QuickMap Data folder on the tablet. If the Pick List is built this way, new notes can still be added at any time. Additionally, notes can be deleted from the Pick List at any time while adding or editing data points with QuickMap.

Add a Pick List Note

Each time a data point is added, QuickMap displays the Description Detail screen so that a description may be entered for that data point. An exception to this is if Auto is selected on the Data Collection screen. If Auto is selected, the last note entered is assigned to all the following data points until Auto is unchecked.

1. On the Description Detail screen (Figure 82), enter the desired description into the Note field.
2. Tap [Add to Pick List]. From now on, this note description will be available for selection from the drop-down menu under the Pick List field and will not have to be typed in again.
3. Tap Submit to save the note and return to the Data Collection screen.

Select a Pick List Item

Because Pick Lists are built by the user, the Pick List drop-down menu will be empty until notes have been added. Once a note has been added, that note will remain as an option in the Pick List drop-down menu unless deleted by the user.

1. On the Description Detail screen (Figure 82), tap the drop-down arrow ▼ to the right of the Pick List field.
2. Tap to select the desired note for the data point. The selected item will appear in both the Pick list field and the Note field.
3. Tap Submit to save the note and return the Data Collection screen.

Delete a Pick List Item

1. On the Descriptive Detail screen (Figure 82), tap the drop-down arrow ▼ to the right of the Pick List field.
2. Tap the desired note. The selected item will appear in both the PickList www.gfield and the Note field.
3. Tap Delete to delete the item.
4. Tap Submit to return to the Data Collection screen.

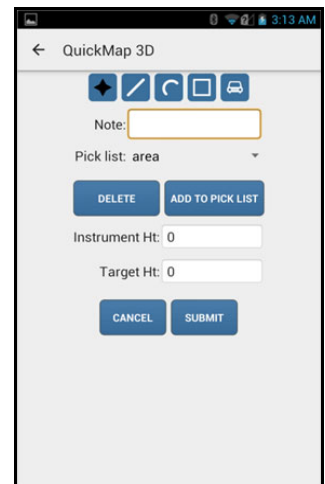


Figure 82

Create a Pick List on the Computer

The Pick List is a text file that is stored on the tablet. In addition to building the pick list one shot at a time, an option exists to create a Pick List with multiple entries prior to using QuickMap. To accomplish this, a text file must be created on a computer and then transferred to the tablet.

- Use a program such as Microsoft Notepad to create the text file (Figure 83). Notepad is typically found by clicking on the Windows icon to access All Programs > Accessories on PCs running Windows Vista, Windows 7, Windows 8 or Windows 10.
 - Enter one item per line as shown.
 - Left justify text and do not indent.
 - Save the Pick List notepad file as "picklist.txt".

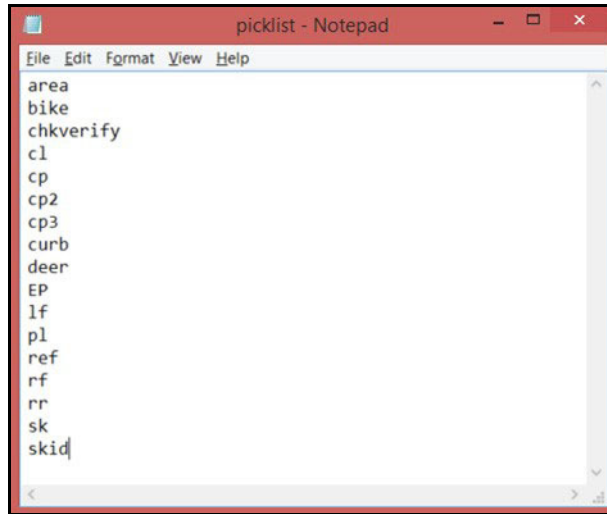


Figure 83

- The text file can be transferred to the tablet using Windows Explorer. See [Page 78](#) for more information on connecting a tablet to a computer.
- The Pick List file must be saved to My Device\QuickMap\Data (Figure 84). NOTE In this example "My Device" is "Galaxy S9\Phone".
- To make changes to an existing Pick List edit the picklist.txt file stored on the tablet.

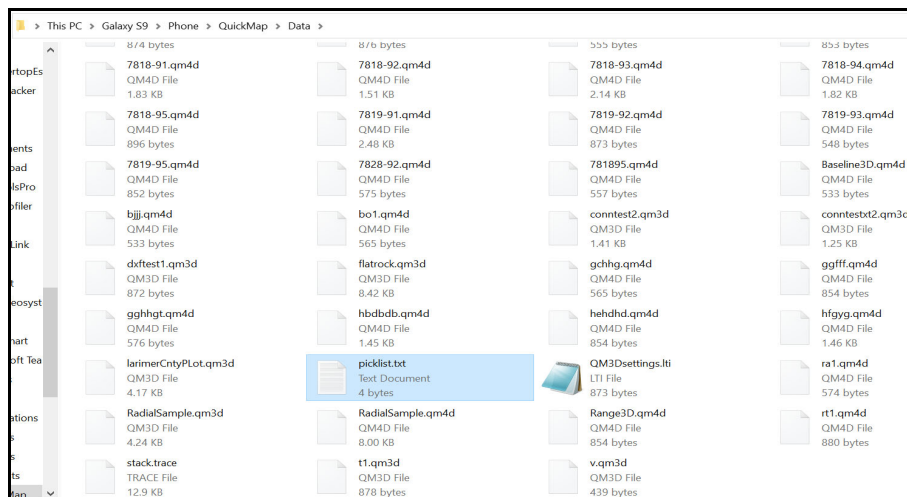

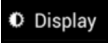









Figure 84

Appendix A - QuickMap 3D for Android Quick Start Guide

This quick reference guide is divided up by specific LTI lasers used with the tablet.







Step 1 for All Lasers - Add WLAN, Install QM3D, Get Licensed

1. Turn on tablet, tap , tap  to set SLEEP to NEVER.
2. Tap  to select a wifi network and complete process.
3. Tap , then tap  to add a Google account or get assistance from IT to set up a dedicated email account for your reports.
4. Tap , then Search for: "LaserSoft QuickMap 3D"  and INSTALL the app.
5. From the Main screen, tap , then tap  to open app.
6. Tap and hold  to copy or notate Machine ID on paper.
7. Go to the License Manager site and log in with your email and temporary password sent from LTI.
8. From the Cart, tap Enter Machine ID, paste your number in and the Checkout.
9. From the Orders page, view the Detail
10. On the Order Detail page, tap on the License key to copy it to the clipboard.
11. Tap , then paste or type in the License Key and then tap .
12. Charge tablet.
13. Go to Step 2 for TruSpeed Sxb for laser setup or go to Step 2 for TruPulse 200X laser setup.










TruSpeed Sxb

Step 2 - Toggle On Bluetooth Link


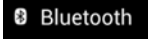


1. Press  until .
2. Press  until ,
- then press  to confirm selection .






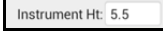



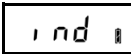





Step 3 - Toggle On Electronic Filter and Survey Mode

1. While in Speed Mode, press  until .
2. Press  .
3. Press  to confirm selection .
4. Press  to toggle on Survey Mode with electronic filter on .
5. Apply the mechanical filter  to the front lens on the TruSpeed Sxb.

Step 4 - Sync Tablet's Bluetooth with TruSpeed Sxb

1. Tap , then tap .
2. Turn on tablet Bluetooth.
3. Tap the laser model/serial number under AVAILABLE DEVICES.
4. Enter PIN number: 6912 or accept any passkey.
5. Exit to main screen.







Final Step TruSpeed Sxb - Setting Up for Your First Shot

1. Power ON all components.
2. Tap  and connect to the laser by tapping the [BT] icon, then tapping on the laser from the list, and then tapping START. Notice that  turns into  at the top of the QM3D screen. Tap  to refresh connection if necessary.
3. Tap [New Project] and enter the file name.
4. Tap , then enter Units that match the laser.
5. Measure from center of laser to ground and enter value .
6. Measure center of prism to ground and enter value , then tap .
7. Leave all origin values at zero and tap .
8. On TruAngle, rotate 360 degrees until  becomes flashing .
9. Aim laser at desired reference point (retro reflector), and press  on laser and  stops flashing.
10. Press  again to add the reference data point to your map.
11. Enter "REF" for the description and tap .
12. Finish mapping the rest of the scene.








TruPulse 200X








Step 2 - Toggle On Bluetooth

1. Press  to power the unit on.
2. Press  until .
3. Press  until .
4. Press  to accept.

Step 3 - Change Units of Measure to Feet



1. Press  until .
2. Press  to scroll through unit options , .
3. Press  to accept the units of measurement .

Step 4 - Toggle On Electronic Filter

1. Press  until .
2. Press  to choose .
3. Press  to accept selection.

4. Apply the mechanical filter  to the front lens on the TruPulse 200X.


Step 5 - Sync Tablet's Bluetooth with TruPulse 200X

1. Tap , then tap .
2. Turn on tablet Bluetooth.
3. Tap the laser model/serial number under AVAILABLE DEVICES.
4. Enter the PIN number: 1234 or accept any passkey.
5. Exit to main screen.

Final Step TruPulse 200X - Setting Up for Your First Shot

Same as Final Step TruSpeed Sxb - Setting Up for Your First Shot ([Page 84](#))

Access QuickMap Help

Tap  and choose Help.

Display the Help PDF to get help with:

- Laser/tablet Bluetooth connection:
 - * Low voltage on tablet or laser can hinder Bluetooth connection.
 - ** Pair laser to only one device at a time.
- Available mapping methods.
- Corrections to data point heights, notes, and orientation.
- Moving control point and equipment to a new position.
- Converting inches to decimal feet for height entries.
- Sending program diagnostics and/or survey *.QM3D file to LTI technical support (while on WIFI only).

Appendix B - Conversion Table (Inches to Feet)

The chart below converts fractions of inches into decimal equivalents. Conversions are also available in QuickMap's built-in Help ([Page 20](#)).

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 QuickMap 3D for Android does not support tablets running Android operating systems 4.0 or older. To check the version of the operating system of the tablet, navigate to "Settings" and then "About". Remedy steps may vary slightly depending on the tablet.

Problem	Remedy
No communication between laser and the tablet.	<ul style="list-style-type: none"> • Make sure the battery has enough power and replace it if marginal. • Tap the Laser Connection Indicator icon at the top of the data collection screen and try to take another measurement. • Ensure that the laser is paired to the tablet via Bluetooth (Page 7). Lasers can only be paired to one device at a time.
QuickMap program closed unexpectedly.	If there is a 30-minute or more delay between shots, the laser will go to sleep. The connection to the tablet is lost which causes QuickMap to close unexpectedly. Re-establish check bluetooth connection in tablet Settings, re-open QuickMap, and continue mapping. Go to QuickMap Help and select Email Tech Support to send a diagnostic file to support@lasertech.com.
The tablet locked up or doesn't seem to be working properly.	Power the tablet 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 QM3D.	Error messages are often self-explanatory. Clear the message and correct the error before proceeding. If the error continues, restart QM3D. If the error persists, reset the tablet (see above). Go to QuickMap Help and select Email Tech Support to send a diagnostic file to support@lasertech.com.
A 3D map was started without entering the applicable height values.	Enter the value on the Data Collection screen or the Settings screen (Page 57). If data points have already been added, enter the value(s) on the Edit Point Series screen (Page 65).
A point was accidentally deleted.	Reshoot or manually re-add the data point. Point deletions cannot be undone.
Cannot see tablet as a "Removable Disk" when connection to a PC with the USB cable.	When the tablet is connected with the USB cable, swipe down from the top of the tablet screen and check the USB connection options. Ensure that "MTP (Media Transfer Protocol)" is selected.
Cannot save reports when trying to transfer them to a PC using a cable.	The tablet 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.
GPS coordinates won't display in the GPS Settings screen or New File screens.	<ul style="list-style-type: none"> • Go to Settings/Location mode on the tablet and make sure it is ON. • If using an external GPS, make sure it is running, paired to the tablet and selected in the Device field on the GPS Settings screen in QuickMap 3D.
An error message was displayed while working in QM3D.	Error messages are often self-explanatory. Clear the message and correct the error before proceeding. If the error continues, restart QM3D. If the error persists, reset the tablet (see above). Go to QuickMap Help and select Email Tech Support to send a diagnostic file to support@lasertech.com

TruPulse 200X and TruSpeed Sxb

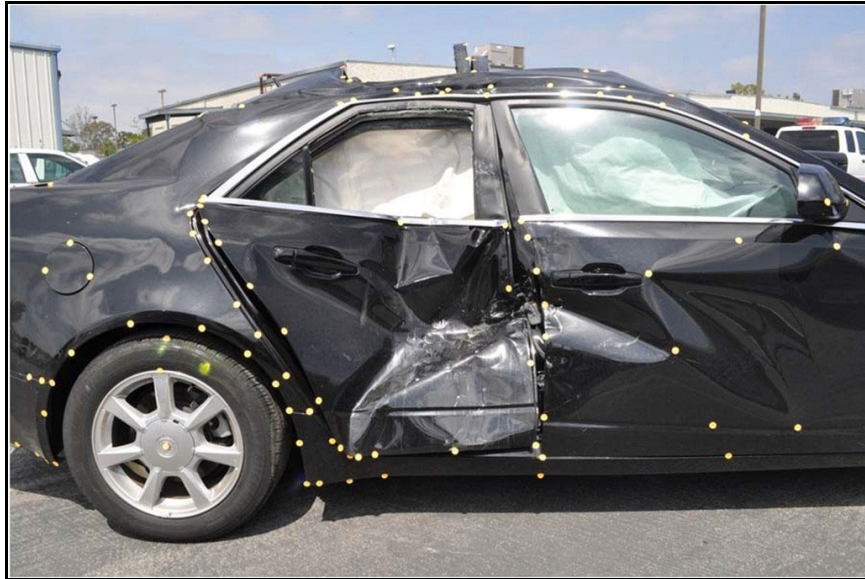
Problem	Remedy
No communication between laser and the tablet.	<ul style="list-style-type: none"> • Verify that the Bluetooth feature in the laser is set to BT_Enc (when using a TruAngle) or BT_On (without a TruAngle). • If using a TruAngle: ensure that the 4pin to 4pin cable connecting the laser to the 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.
Points are displaying in a straight line (Radial with Angle mapping method).	<ul style="list-style-type: none"> • If using the Tribrach/Tribrach adapter, ensure the TruAngle is spinning on correct axis – and as not broken loose from the Tribrach adapter. • Check the laser Bluetooth setting and make sure that it is set to BT_Enc. • Ensure the TruAngle firmware is version 1.17 or newer. TruAngle firmware version 1.17 or newer: the laser sends distance and inclination values to the TruAngle. Next the TruAngle captures the horizontal angle and inputs that value into the serial string and sends it back to the laser. The serial string is then transmitted to the tablet via Bluetooth. TruAngle firmware Version 1.14 or older does not have this functionality, but can be updated to 1.17. Contact the LTI Service Department for details.

Appendix D - Profiling a Damaged Vehicle

QM3D can be used to profile a crush or other damaged area of a vehicle. The data can be saved and imported into a third party program for further analysis.

Tips for doing a crush measurement:

- Mount the equipment on a tripod.
- Place the equipment close to the vehicle, while maintaining clear line-of-sight to all points.
- Use Radial with Angle method to produce the most accurate measurements.
- Use a new QM3D file rather than mapping the crush and the scene together.
- If possible map the crush at a secure location not at the crash scene.
- Reflectors can be used at key points of the crush as seen below. This will create a surface of equal reflectance. The laser has a Filter Mode to exclusively work with reflectors. For more information, refer to laser's user's manual.



(A)



(B)

Figure 85

Appendix E - Additional Information

Localization

English is the default language of most tablets; however, it can be changed.

To change the language:

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

NOTE Text in other programs may still be displayed in English which is the tablet's default language.

Serial Data Format

The QM3D app accepts data from LTI instruments that use a data format which is based on the NEMA 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.

Appendix F - Uninstalling QM3D

To completely uninstall QM3D and all related files/reports.

1. Transfer any needed files/reports to a computer (Page 78).
2. Uninstall the QM3D app.
3. Delete remaining files.

NOTE Save any needed files by generating reports and transferring them to a computer with *.QM3D files (Page 78).

Uninstall QM3D

This example is based on the CT7 ruggedized tablet. Other Android tablets may be very similar. Refer to the manual for the specific Android device used to find the process for uninstalling apps.

1. From the device home screen, tap Settings.
2. Scroll down and select Apps from the Settings list (Figure 86A)
3. Select Manage Apps (Figure 86B).
4. Scroll down and select QuickMap 3D from the list of apps (Figure 86C).
5. Tap [Uninstall] to remove the program (Figure 86D).

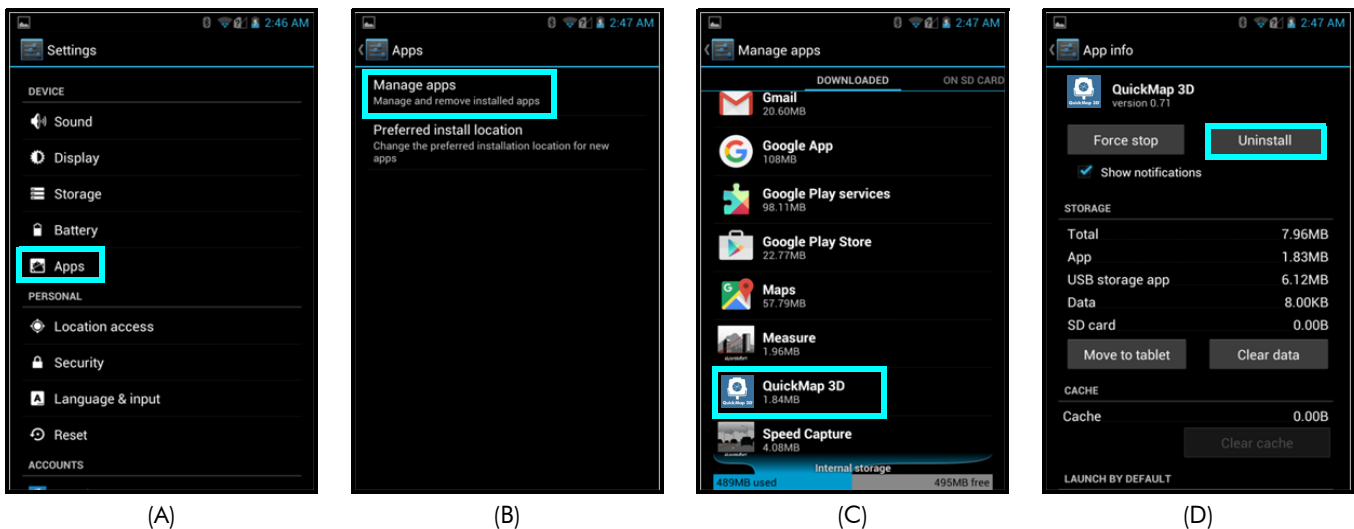


Figure 86

Delete Remaining Files

NOTE This will remove all previously saved files, reports and settings from the tablet - including the program licensing.

1. From the device home screen, tap the circular button at the bottom of the screen to access the installed apps.
2. Tap the File Explorer icon (Figure 87A).
3. Tap the option "sdcard0" (Figure 87B).
4. From the list of available folders, tap QuickMap (Figure 87C).
5. The Data folder (containing the QM3D files for each survey) and folders for every survey from which a report has been generated are displayed (Figure 87D).
6. Tap and hold the folder to display a list of file options and tap Delete (Figure 87E).
7. Tap OK to confirm the deletion, or Cancel to abandon the operation (Figure 87F).
8. Repeat steps 5-7 for each folder until they are all deleted.

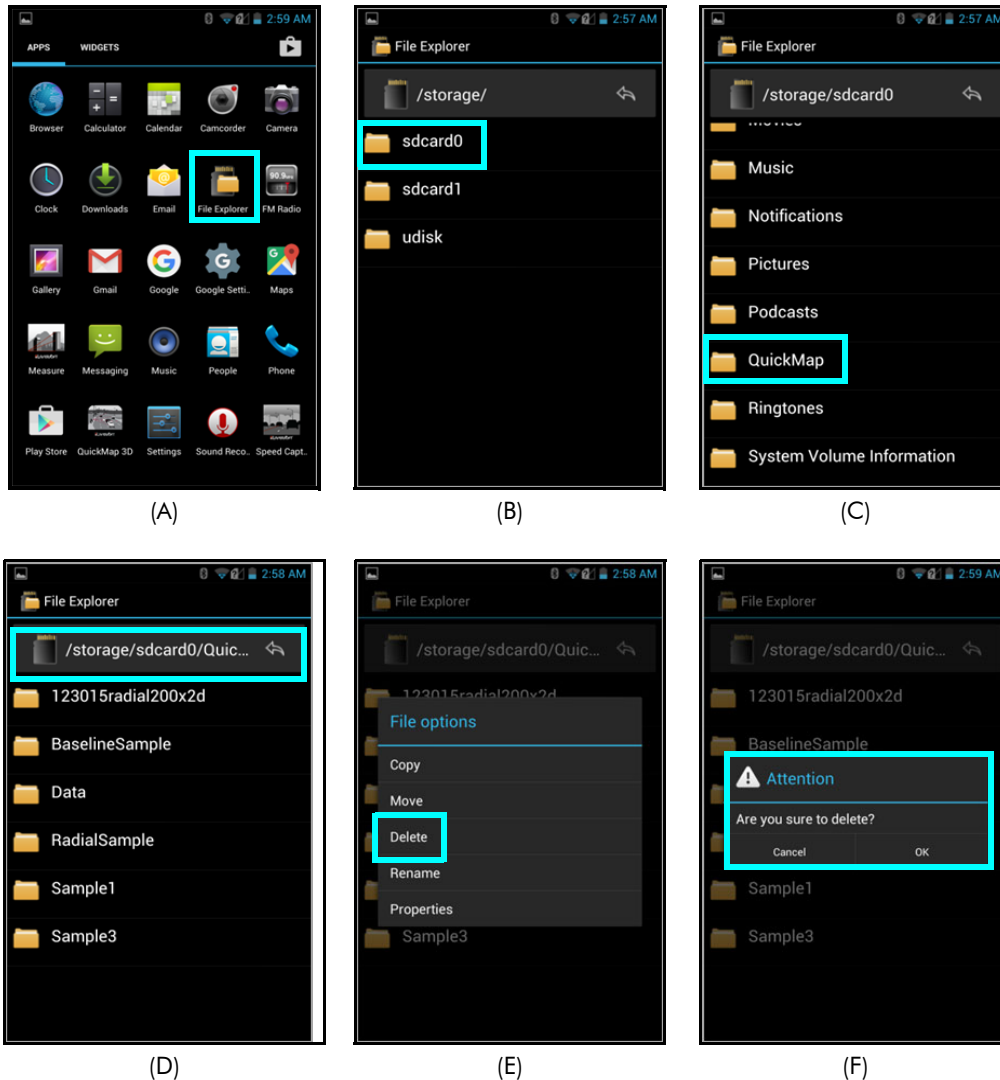


Figure 87