Critical Incident / Mass Casualty Mapping

SPIDER Mapping

CSI Mapping

A division of

McKinzie & Associates

SEPTEMBER 2012

The reality of Mass Causality events is that there is more activity in the initial hour after the event than in the ten hours following. Activity is used to describe any motion of persons or property. Large scale catastrophic events requiring a police investigation may cover several hundred meters and up to a kilometer in area. The size of the area and the number of pieces of evidence to be measured and collected would over whelm a single mapping team. Spider Mapping was developed to give Forensic Mapping Teams from different jurisdictions the opportunity to respond to a mutual aid single event and produce a single Map with a uniquely linked database of evidence points. Several teams of Forensic Mapping Specialists now have the ability to respond to a single event with all teams mapping simultaneously but using the same data base of evidence.

This guide is provided to Law Enforcement agencies worldwide as a step by step instruction to Spider Mapping. It is uniquely designed to make use of Micro Survey's Evidence Recorder and MapScenes Forensic CAD software. The process however does not absolutely require them. These software packages were chosen for their evidence history tracking functions that have been examined carefully by many jurists and found to provide integrity to the mapping data.

This unique process allows a single team to respond and assess for example, that six teams will be needed to document the incident site in the time allowed or required. These requirements may be weather related or the location of the event may necessitate the immediate removal of evidence for the good of the public.

The first team responding must be prepared to assign locations for subsequent responding teams. No longer are tedious grids needed as a guide for identifying and locating evidence. The area to be covered may require a FM coordinator be identified just for the location assignments and to act as liaison between Mapping Teams, Investigators and Crime Scene Technicians. There are no political boundaries for terrorists and there should be none for Law Enforcement responding to these events. To be considered part of a response network, each jurisdiction's Mapping Team(s) has a responsibility to the Spider Mapping Network to be prepared with a masterful understanding of the Forensic Mapping system and have maintained their proficiency in the art. Teams in a Mutual Aid area should endeavor to develop a common library for evidence coding.

The following example is a critical incident occurring on the Johnson County Kansas Community College Campus. The cross reference is south of 119th Street and west of Quivira Rd. in Overland Park, Kansas. 38° 55' 33.2" N 094° 43' 40.34" W. In this EXAMPLE, the Teams are assigned Alpha identifiers. Numerical values are suitable as well as agency codes but should not conflict between teams.

Index

0.4 Miles Across
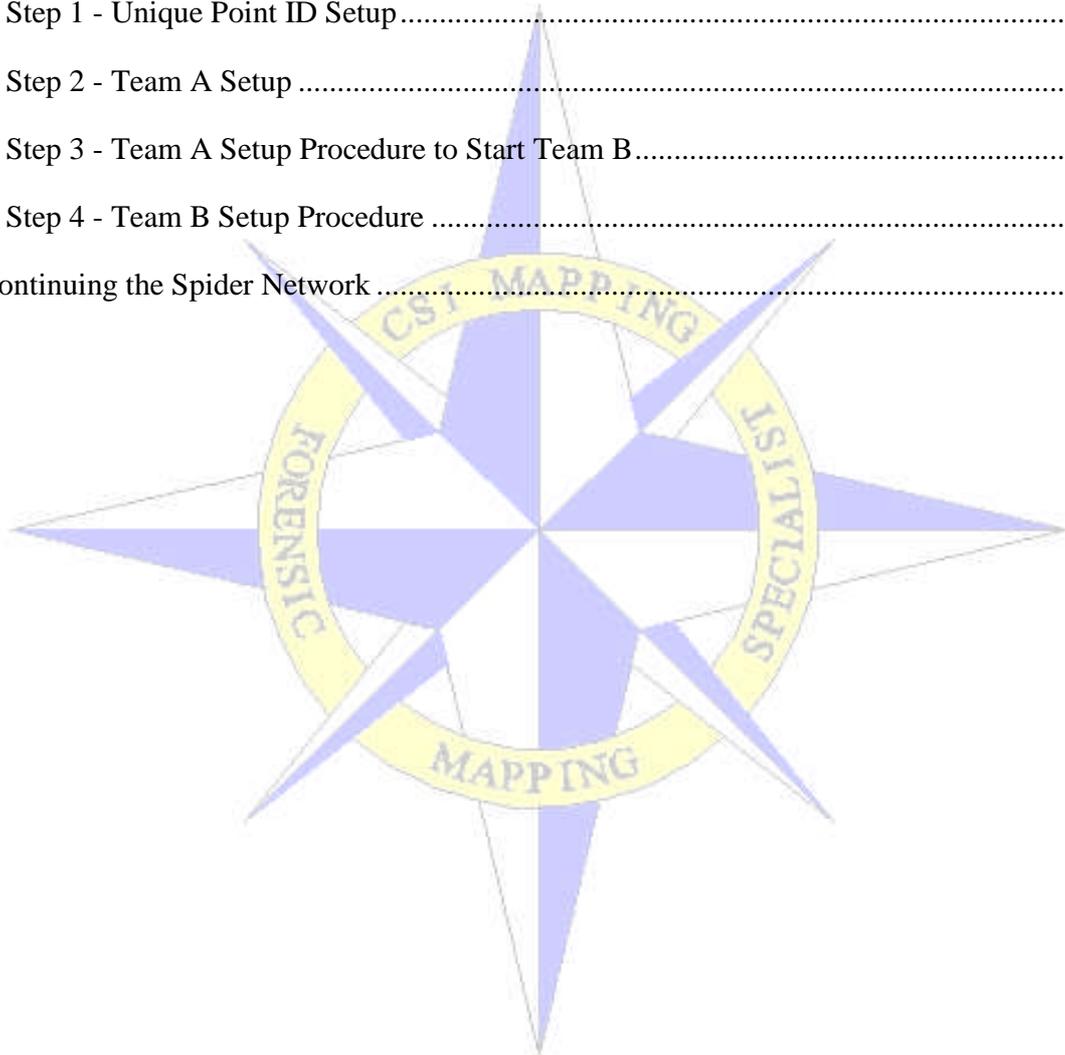
Setup and Data Collection Procedures

Step 1 - Unique Point ID Setup

The first step in this process is to set the EVR software in Point ID mode instead of Point Number mode. The following steps walk the reader through this process.
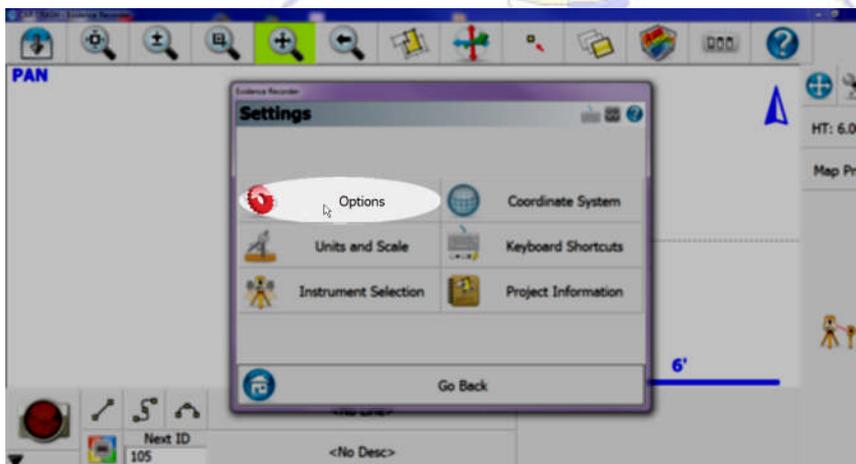
Start the EVR software on the data collector and open an existing project or create a test project to get to the main mapping screen. The main menu screen should look like the one shown on page 5. From here follow the instructions outlined below.
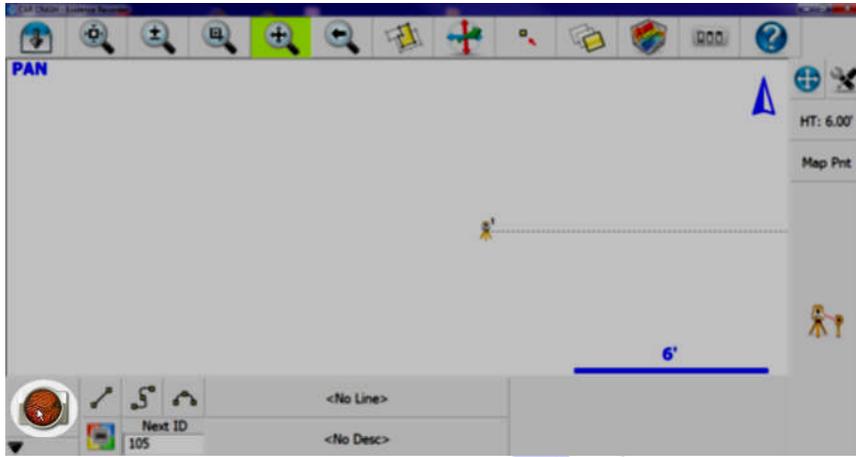
Select Start
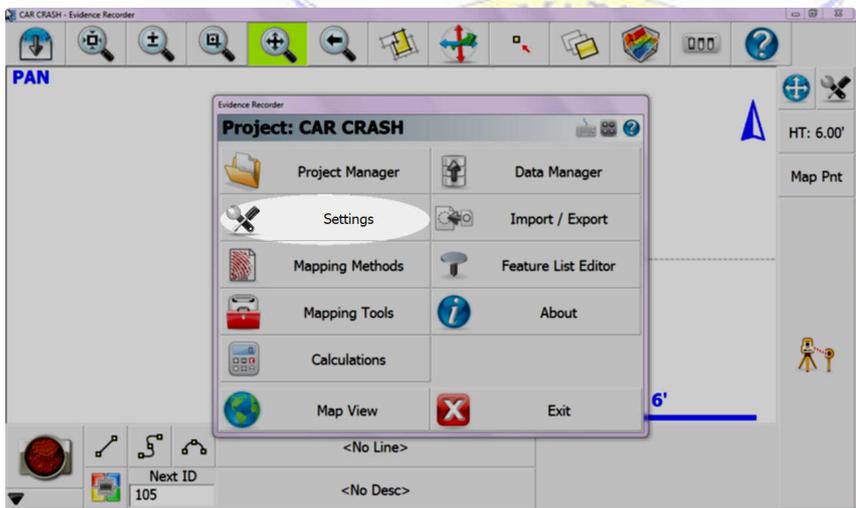
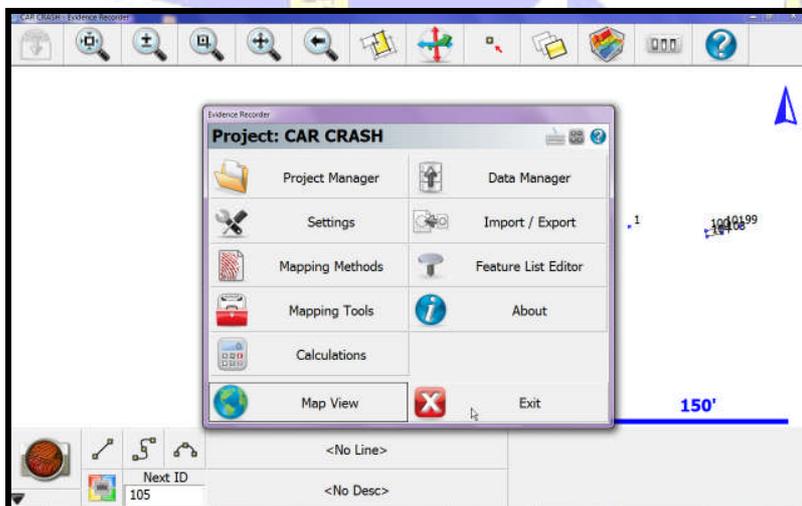*Select Settings*

Select Options
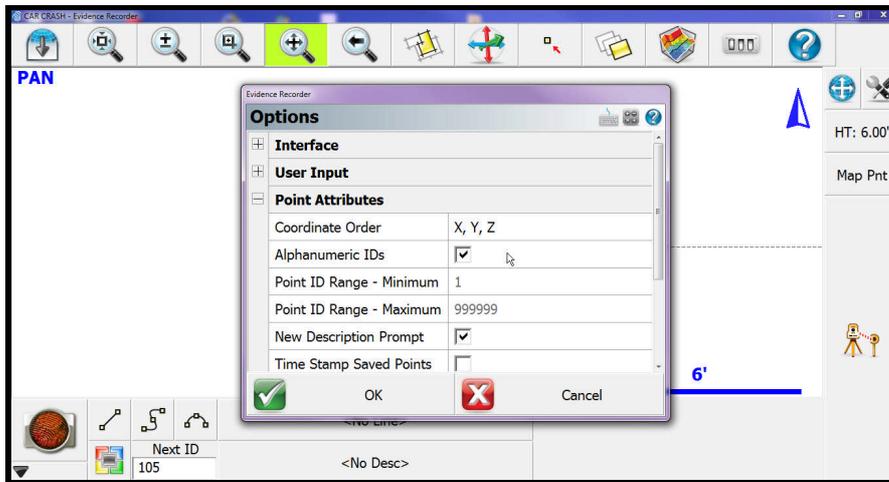
Arrow down to where you see the Point IDs and Descriptions Line.

Check the box beside *Enable Alpha-Numeric IDs*

Evidence Recorder 9 has started this as a default setting

Then Select "**OK**"

Select Map View and return to the main screen.

Go to menu home and exit the software.

Step 2 - Team A Setup

Start EVR on the data collector and create a new project. Give the project a name as you normally would, followed by the letter assigned to your team (ie. 2318A), Select the library and defaults and select yes when it asks if you want to establish a reference point.

Each team should be utilizing the same library for consistent code processing.

3D mapping library may be downloaded at http://www.csimapping.com/3d-library.html

Your screen should appear something like the one below.

Enter "**TeamA**" in the Point ID space and Select "Store Point".

Tell it "**Yes**" when it asks if you wish to occupy the reference point that you have just created. The following screen should appear.
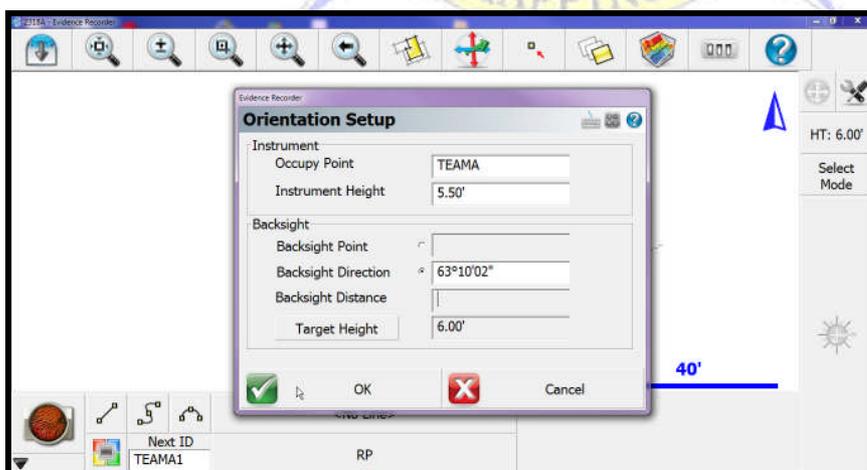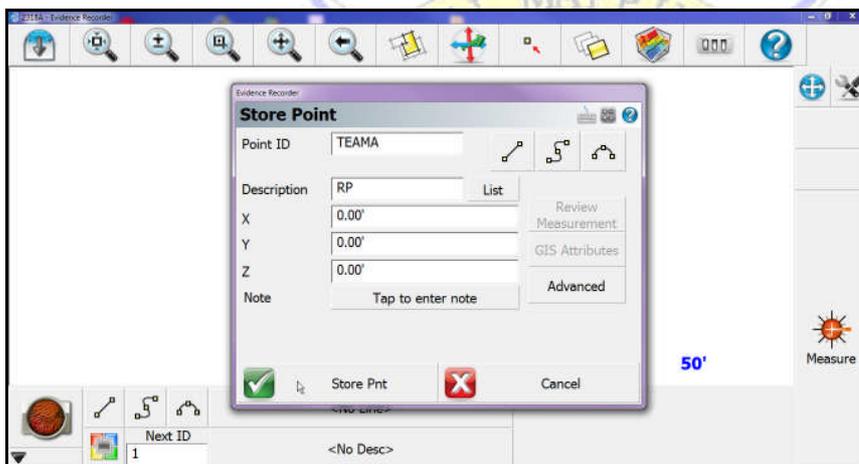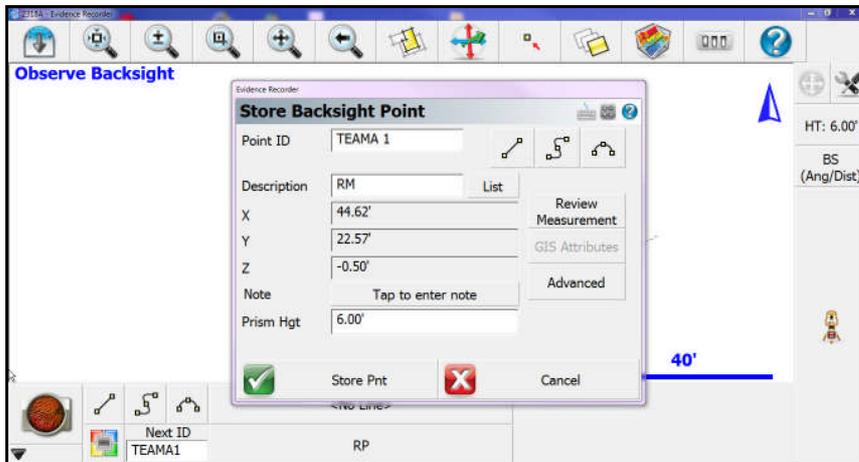
Enter the backsight direction of the reference measurement and the Instrument Height that you have measured and Press "Continue". Press "Continue" at the next informational screen to see the following.
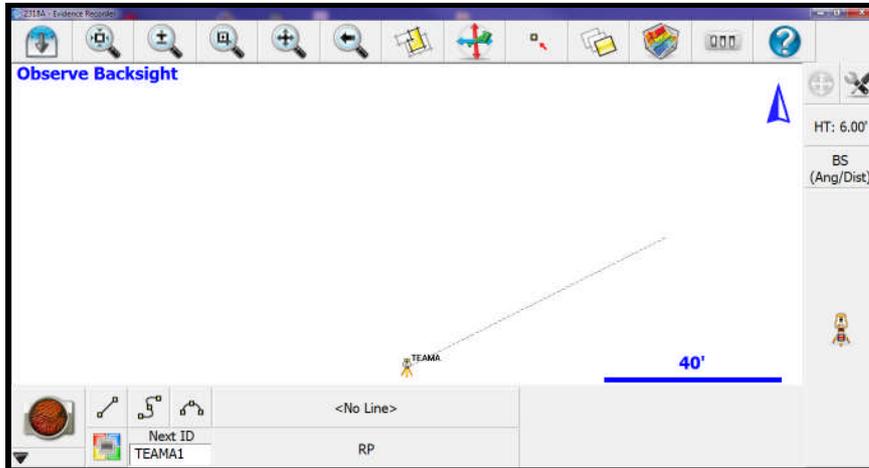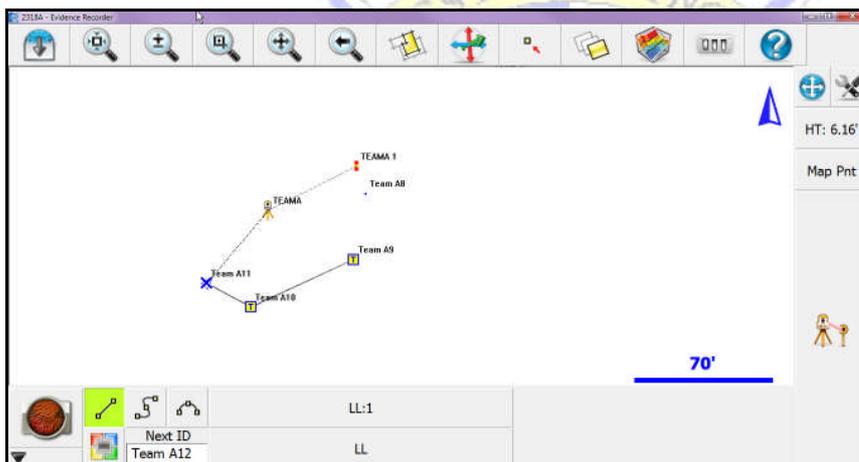

Press the measure button.
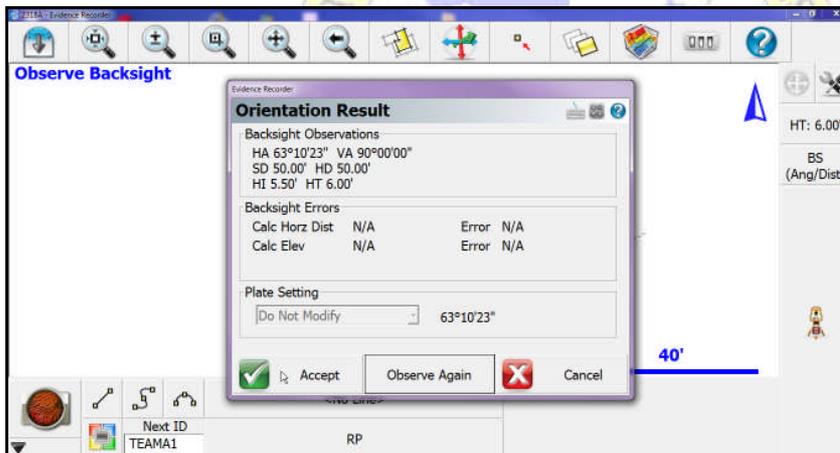

Make sure the HT is correct, then press "Accept"

The point ID should be TeamA 1. If it does not have this value by default, enter it in the Point ID box above. Make sure the Description is correct and then press "store point".

Begin mapping as normal. You can see the alpha-numeric codes for the line above by selecting view point ID's.

Step 3 - Team A Setup Procedure to Start Team B

First, determine the instrument location that Team B will use to start their portion of the map and set a PK nail for their location. **Remember**, this location must be visible from Team A's current instrument location. Note the current Next ID value, in this case it is "**Team A6**". Switch to Map Point for this measurement and take a sideshot reading to the PK nail you have set for Team B. The display should appear as follows.
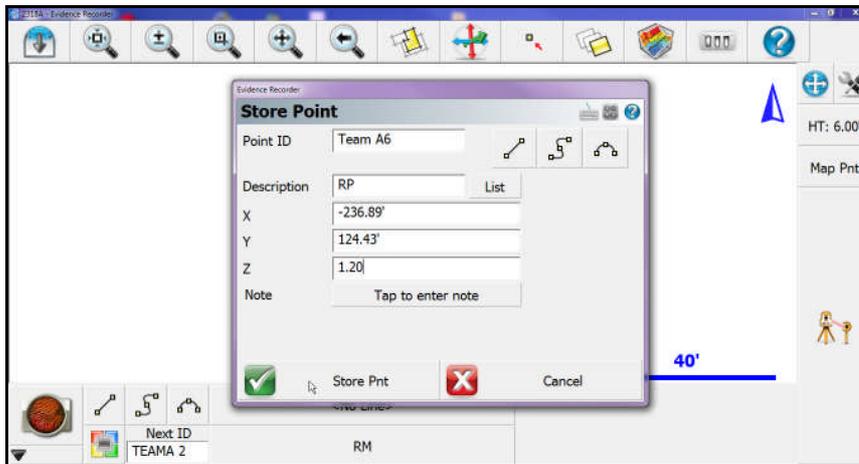
Record the X, Y, and Z Data on a notepad and make available to Team B for their setup. Then press store point.

Identify a second location that is visible from both Team A and Team B's instrument locations and set a PK nail at that point. While still in the Map Point measurement mode Shoot the second PK nail position using the code "RC" Reference Control.
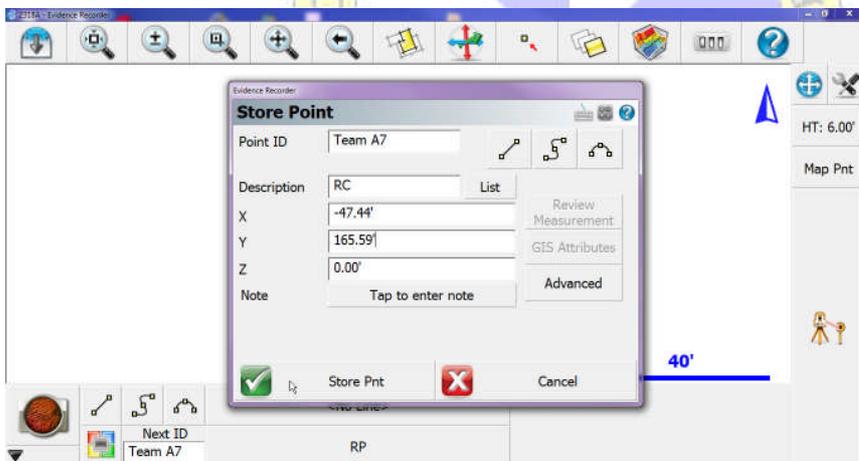

From here you can immediately observe the coordinates and record the values for Team B to use.

At this point you can continue with your mapping efforts. As additional teams arrive the same procedure can be used to start each team. Give each arriving team an alpha-numeric code with the next letter of the alphabet (Team C, Team D, etc.).

Step 4 - Team B Setup Procedure

Team B will set up their total station over the PK nail at location Team B as measured by Team A. The steps below outline this process.

Start EVR 9 after connecting it to the total station. First, follow the procedure outlined in Step 1 described above. Once that is completed, start a new scene as outlined below.
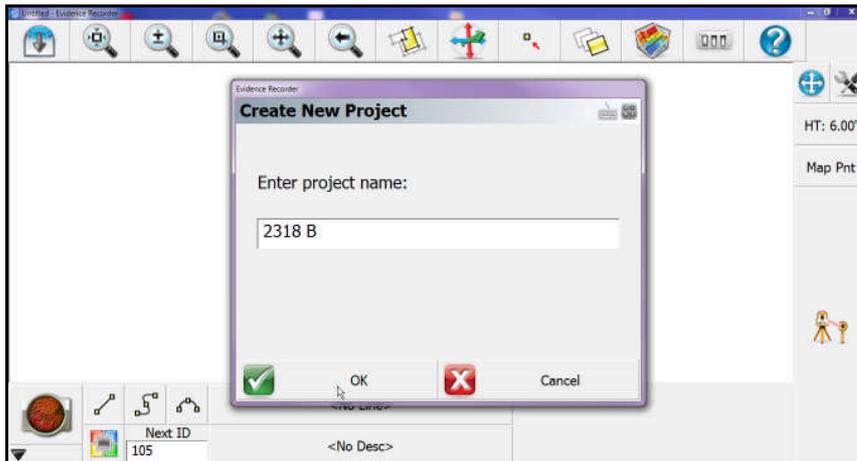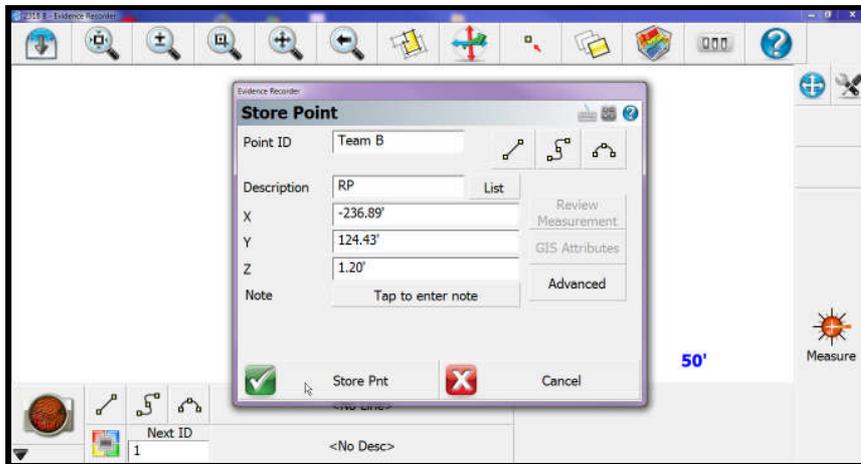

Start a new drawing and give it the case name/number from Team A followed by your assigned team letter designation. For example the new project name above, our case name is 2318 B.
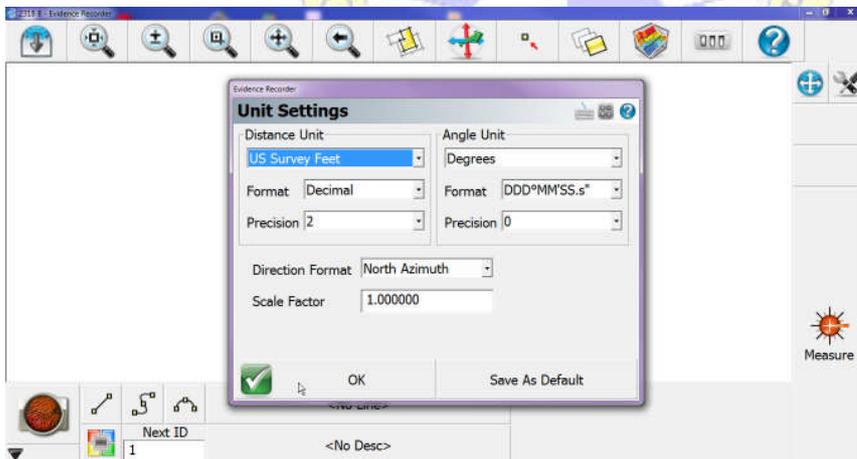
Select the proper library and hit continue at the library prompt. Check your default settings and hit OK when correct settings displayed.

Select yes to create a new reference point.

Enter the appropriate information in the spaces above. Team A will provide this information to Team B. It is the measured data Team A recorded in the previous step. When all information is properly entered press Store Point. Click yes to occupy reference point and establish total station communications when prompted.
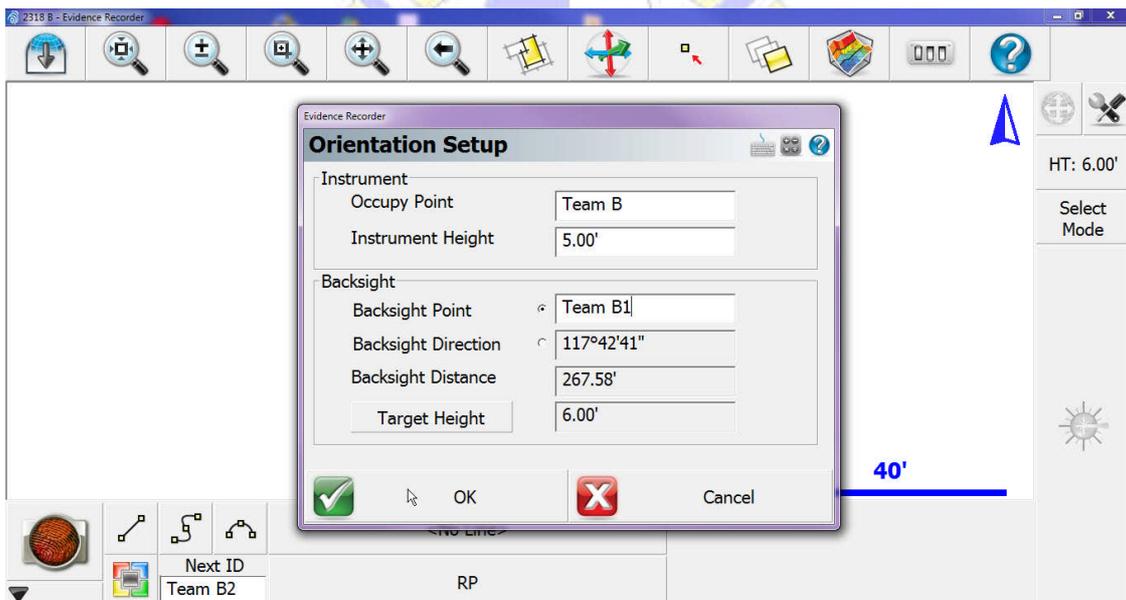
Click the Point Backsight method and press the Backsight Pnt button as shown above.

Select New
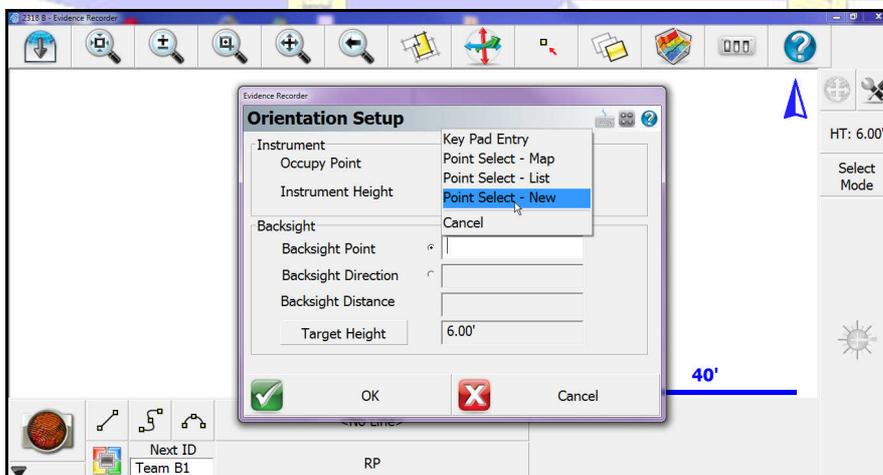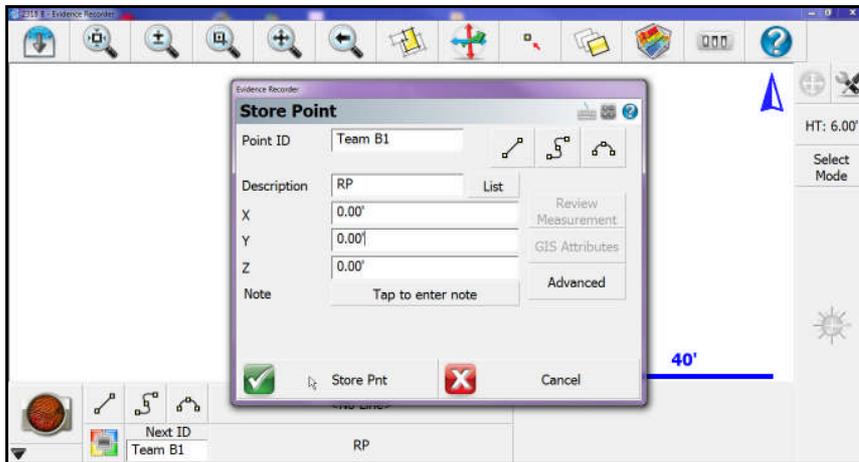
Enter the Point ID, Description, X, Y, and Elevation information for Team A's total station point as provided by Team A and press Store Point as shown in the above example and then press continue at the next screen.


Enter the Team B location, instrument Height and press OK.

Make sure coordinate data is correct then press OK.

If you can get a prism over/ under the Team A PK nail sight it and press the measure (read) button. **NOTE:** A tribach prism attachment is well advised for this step. It allows for precise set location data. Nearly all tripods, tribachs and prism are interchangeable for this process. When a Prism is used to shoot the set backsite to

another set location an angle only measurement is not required and a direct shot to the prism is acceptable.
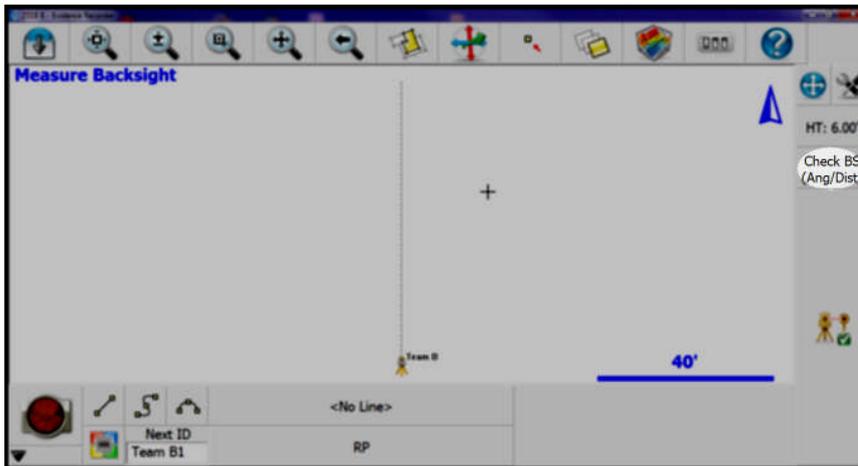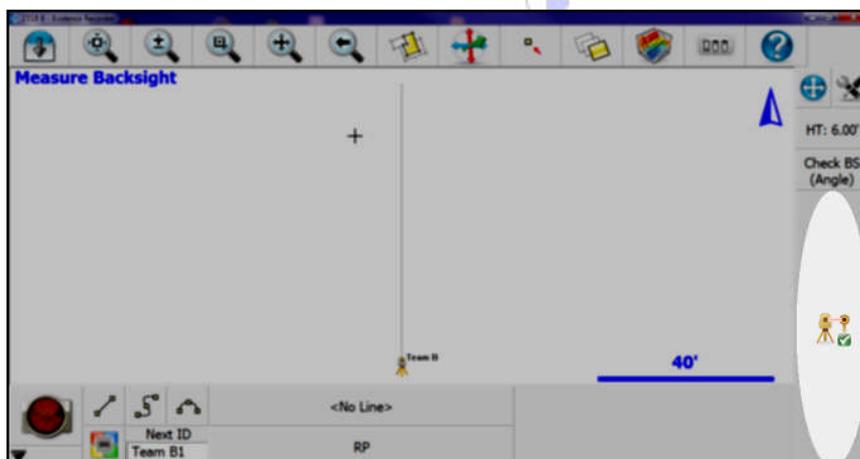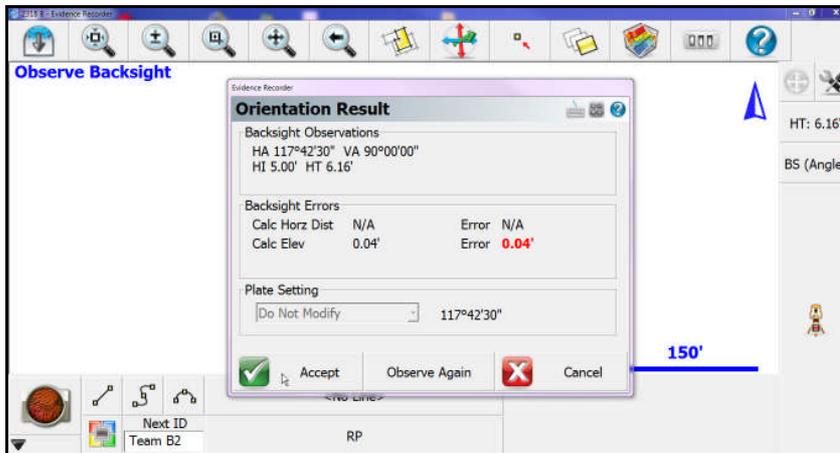

Press the BS
Ang/Dist Button

Select Angle Only
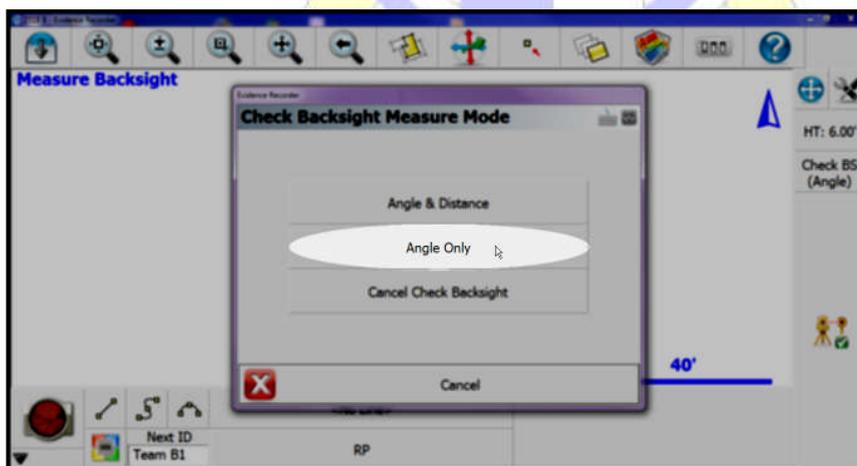

Press the Measure/Read button.

Press the Set Dir Button, Make sure HI and HT are correct and Press Accept.

If you used angle only, no slope distance will be displayed and the Calc values and Err values will read N/A. The image below uses the angle/dist method and displays the measured error values. In either case, *__make sure the plate setting indicates Do Not Modify.__*

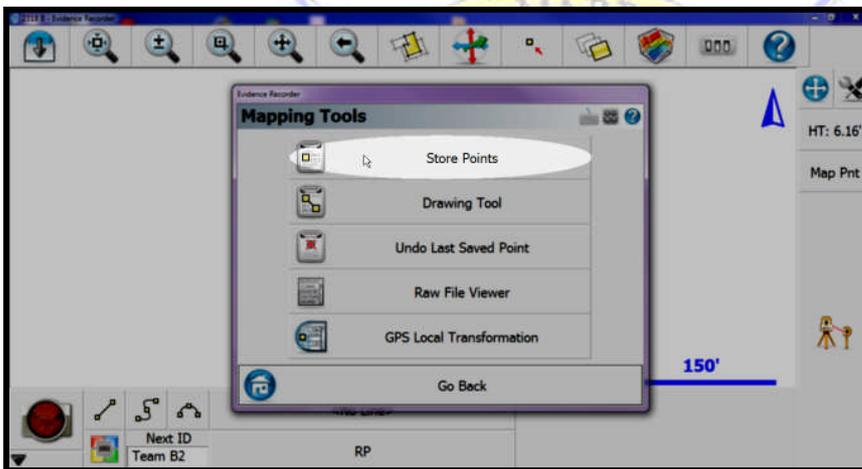Press Accept if error values acceptable to you if not press sight again.

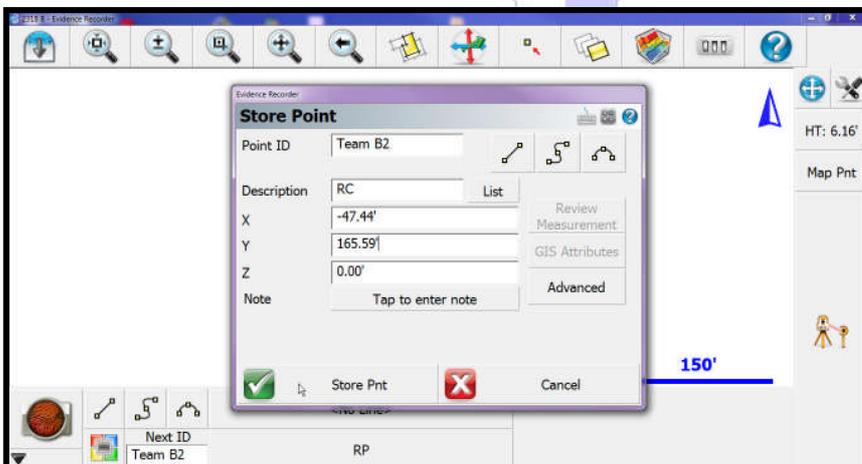We should be back at the main menu screen.
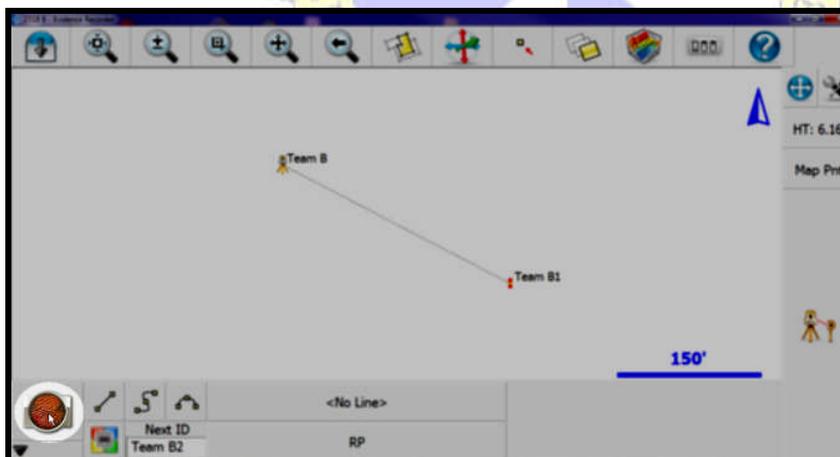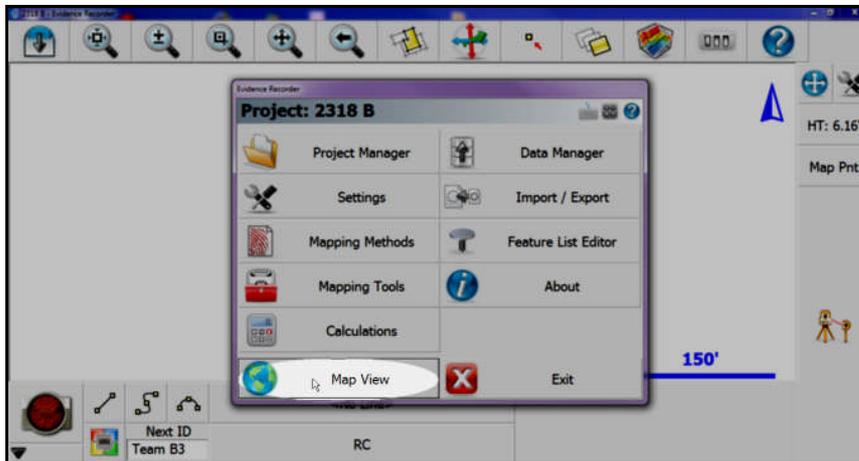

Select Start
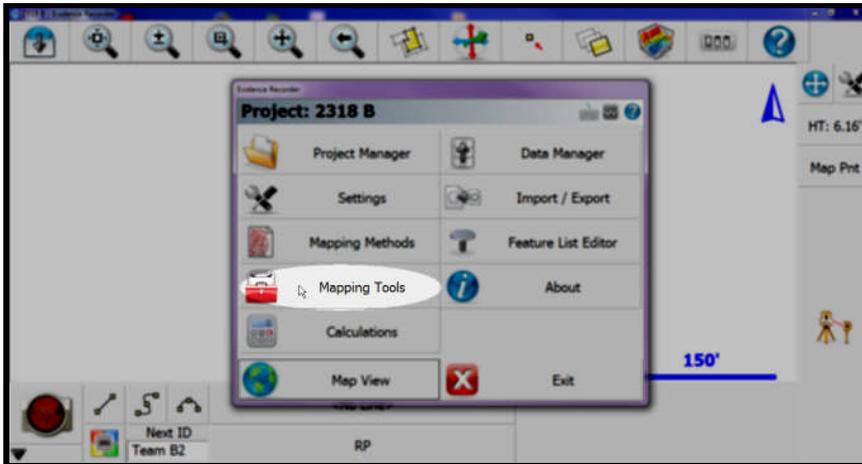
Select Mapping Tools if this screen appears or proceed to the next item if it does not.
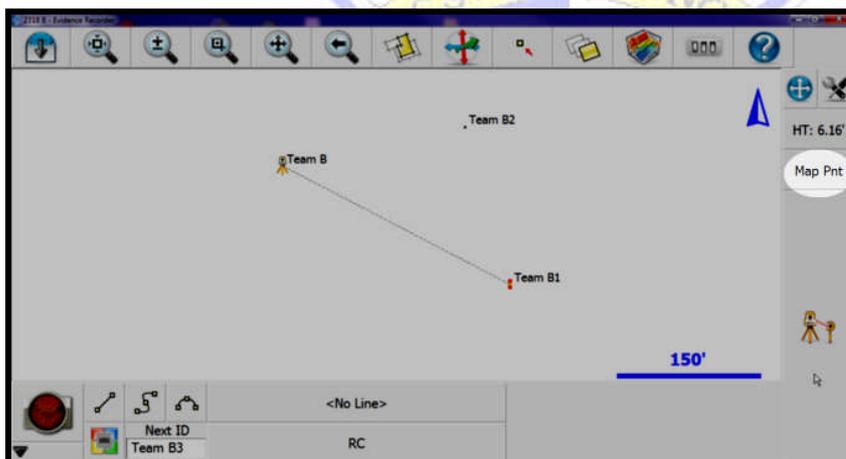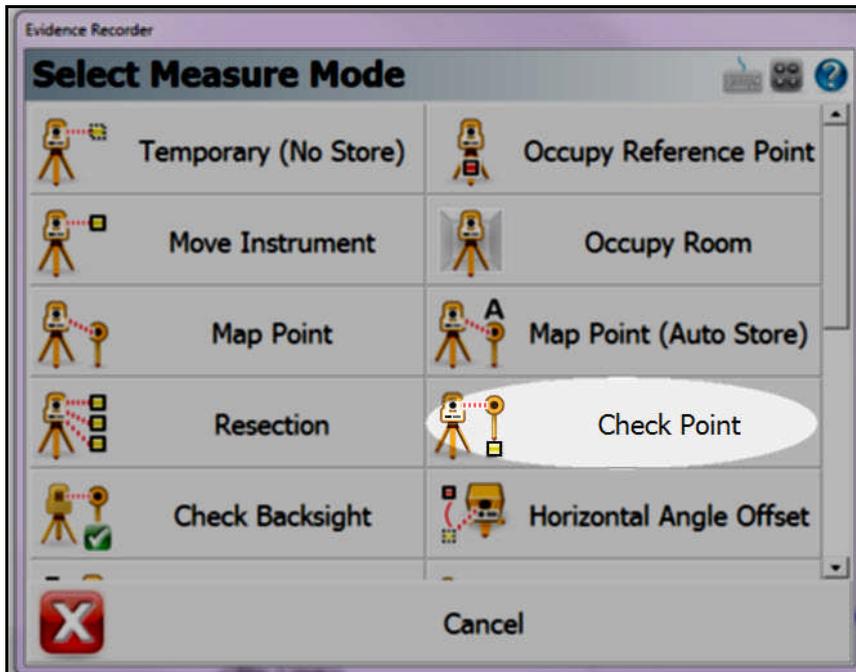

Select Store Points

Enter the data provided by Team A for this point which is the Reference Control Point (RC) and Press Store Point when finished.

Press Map View

Press Map Point

Press Check Point

You can select Point ID Team B2 by selecting it from the screen, entering the ID in the box, or by pressing list as shown below.
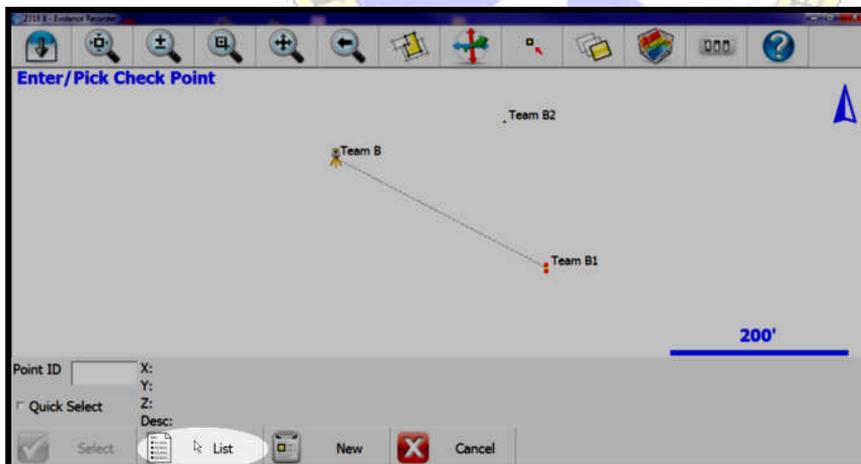
Point ID		X	Y	Z	Description	Note	Date
Point Database							
Team B		-236.89'	124.43'	1.20'	RP		2012-09-14 14:01:53
Team B1		0.00'	0.00'	0.00'	RP		2012-09-14 14:07:25
Team B2		-47.44'	165.59'	0.00'	RC		2012-09-14 14:27:42

Select Team B2 and press OK
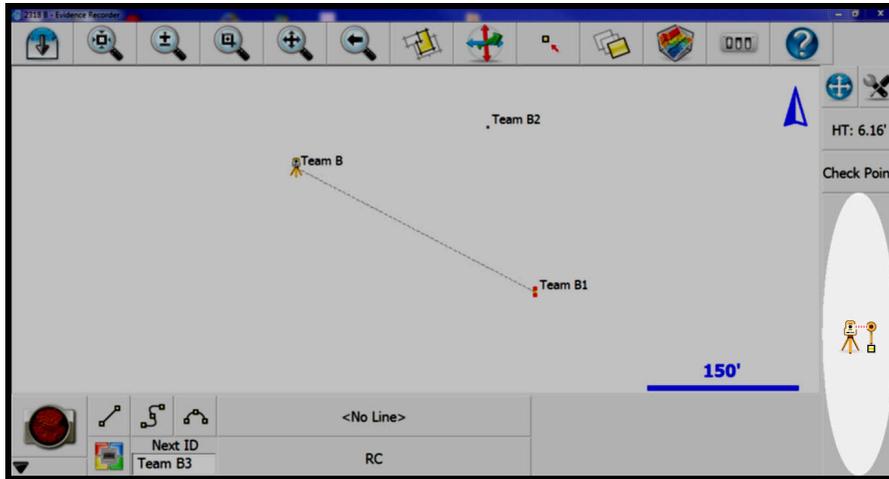
Sight on the PK nail at location Team B2 (RC) and then press the Measure button.
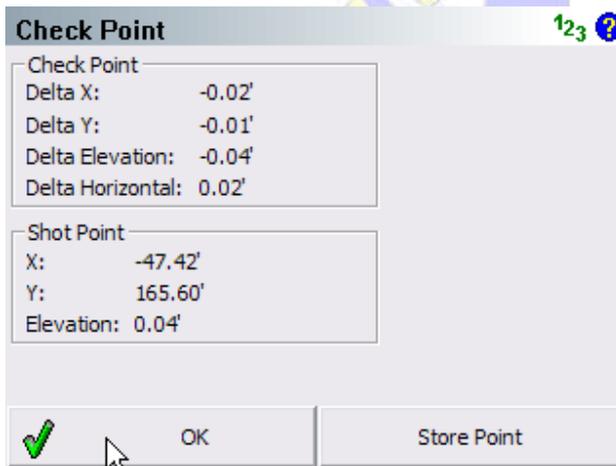
Check the error values. If within an acceptable range to you may Press OK to return to the main map screen or press store point to document the shot

Team B may now begin mapping the evidence and geometry from their location.

Continuing the Spider Network

As additional teams arrive to assist they can be assigned new areas to map by Team A or B. Operationally, a member of the Team A mapping web (if an extra member is available) may want to work as a liaison between all the mapping teams and coordinate the efforts of the entire Spider Map. However this is ultimately done, the newly arriving teams will follow the above instructions as they begin their part of the mapping effort.

Each arriving Team must first perform Step 1 and then proceed to Step 3 skipping the Step 2 process. The designation for Team A in Step 3 and the following steps may be any Team letter designation and will be the existing team that is identifying the coordinates for the newly arriving Team. The Team "alpha" designation will become the letter assigned to the newly arriving Team for the remaining steps in the process. The entire process is repeated as needed.

After completion of mapping for the primary position in the web; the station having

N 0, E 0, and Z 0 as their setup coordinates map upload the EVR job into Forensic CAD, (MapScenes, Capture or PointCloud).

While the primary map is open as the current drawing use the Sync Wizard to import each additional map from the web. There is no specific order that these must be processed in as each has a data relationship to the 0,0,0 coordinates from the primary station position.

The maps will seamlessly be integrated into the primary map. Each of the database files may be independently viewed from the Active Drawing technology editor. Select "file" and open then select the data file from imported maps.
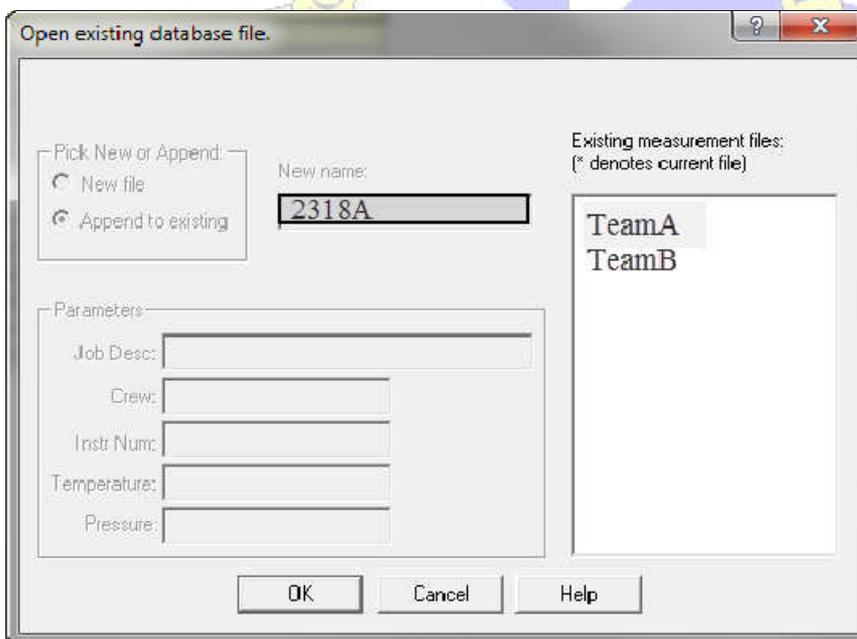
The map validation procedure may be applied to any of the existing databases from the web.