

Leica SurvCE Training

Data Processing



Table of Contents

1.0	Introduction	2
2.0	Processing in Leica SurvCE	2
3.0	Processing in X-Port	7

1.0 Introduction

Objectives

In this exercise you will learn how to process raw data collected in the field and create an ASCII point file.

At the end of the exercise you should be able to perform the following:

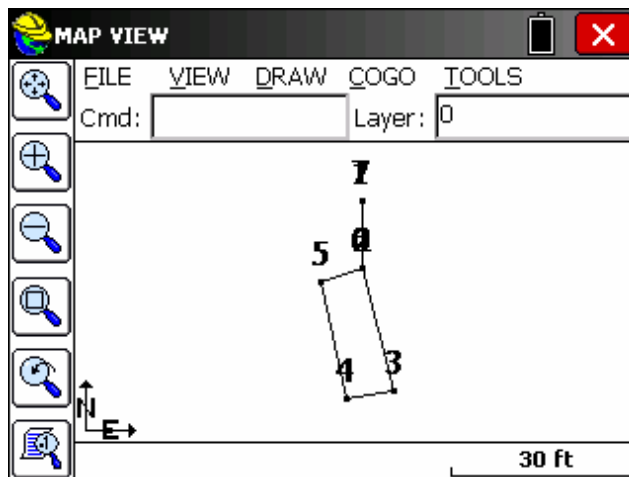
- Successfully process an RW5 file using Compass Rule Adjustment in Leica SurvCE.
- Create an ASCII point file in Leica SurvCE.
- Successfully process an RW5 file using Compass Rule Adjustment in X-Port.
- Create an ASCII point file in X-Port.

2.0 Processing in Leica SurvCE

Objectives

- View the sample data and process it in Leica SurvCE, applying a Compass Rule adjustment.
- Export the data to an ASCII point file.

Defining the project

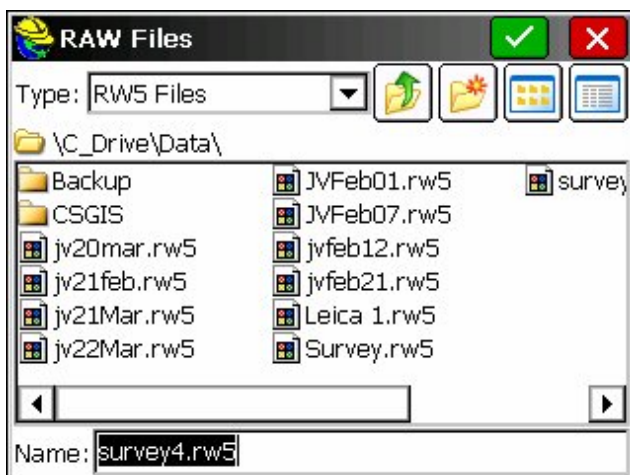


In this example, the traverse was performed by occupying point 2 located at the NE corner of the block. The initial backsight was established by azimuth, measured and stored as point 1 shown along the hanging leg. Angles and distances were measured in a clockwise direction. Point numbers 6 and 2 are at the same location and point numbers 7 and 1 are at the same location. This method allowed for the closing of the angles and the measurement of all traverse legs.

Processing the Data



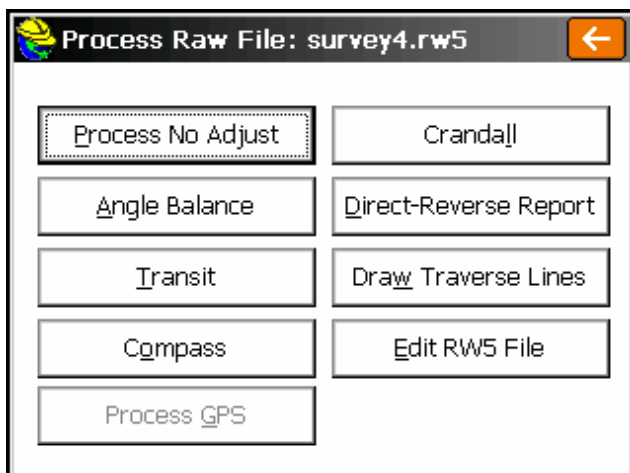
From the File menu tab tap the Raw Data button or press the 4 key on the keyboard.



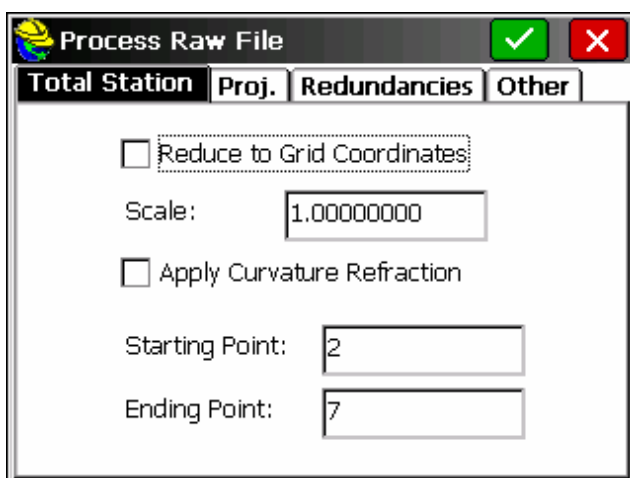
Select survey4.rw5

Press the  key on the RX1250 or tap the  on the screen to accept the selection.

Compass Rule Adjustment



Select Compass from the adjustment options dialog box.



Process Raw File [✓] [✗]

Total Station | **Proj.** | **Redundancies** | **Other**

☐ Reduce to Grid Coordinates

Scale:

☐ Apply Curvature Refraction

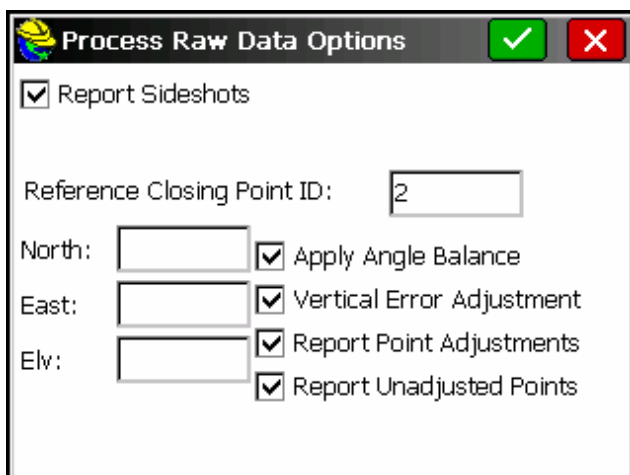
Starting Point:

Ending Point:

Since point 7 was only measured to record the closing angle balance measurement, the traverse is only from points 2 through 6.

2 Starting Point
6 Ending Point

Tap the [✓] on the screen to accept the selection.



Process Raw Data Options [✓] [✗]

☒ Report Sideshots

Reference Closing Point ID:

North: ☒ Apply Angle Balance

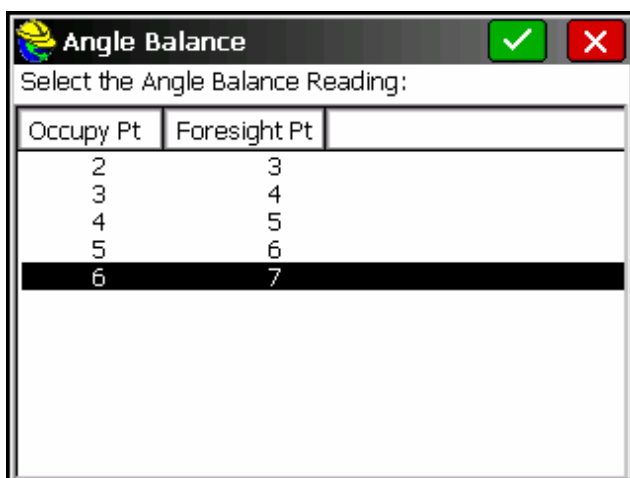
East: ☒ Vertical Error Adjustment

Elv: ☒ Report Point Adjustments

☒ Report Unadjusted Points

The Reference Closing Point is always the initial occupied point number in a closed loop traverse.

Enter the following:
2 Reference Closing Point ID
Apply Angle Balance
Vertical Error Adjustment
Report Points Adjustment
Report Unadjusted Points



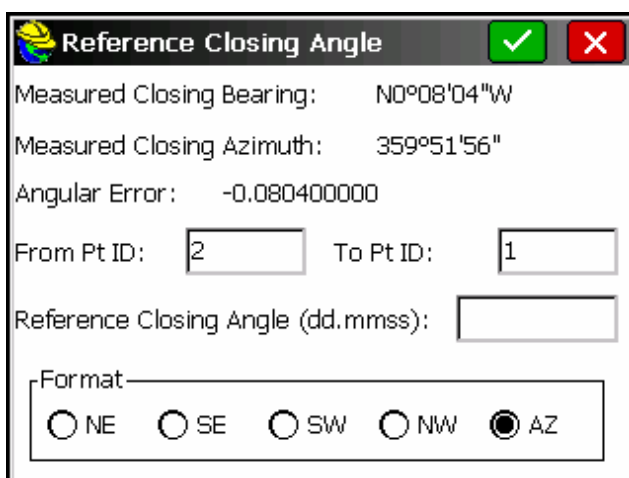
Angle Balance [✓] [✗]

Select the Angle Balance Reading:

Occupy Pt	Foresight Pt
2	3
3	4
4	5
5	6
6	7

Select the foresight shot from the last occupied point to the original backsight location. In this example we would select the leg measured from point 6 to point 7, since point 7 was our foresight angle balance shot to point 1.

Tap the [✓] on the screen to accept the selection.



Reference Closing Angle [Green Checkmark] [Red X]

Measured Closing Bearing: N0°08'04"W
 Measured Closing Azimuth: 359°51'56"
 Angular Error: -0.080400000

From Pt ID: To Pt ID:

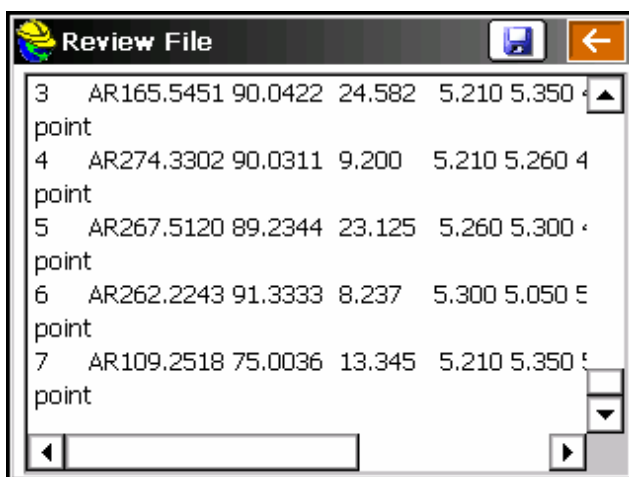
Reference Closing Angle (dd.mmss):

Format:
☐ NE ☐ SE ☐ SW ☐ NW ☒ AZ

The reference closing angle is the original backsight azimuth. Key in point 2 and point 1, or key in the known azimuth or bearing.

Tap the  on the screen to accept the selection.

Viewing the results

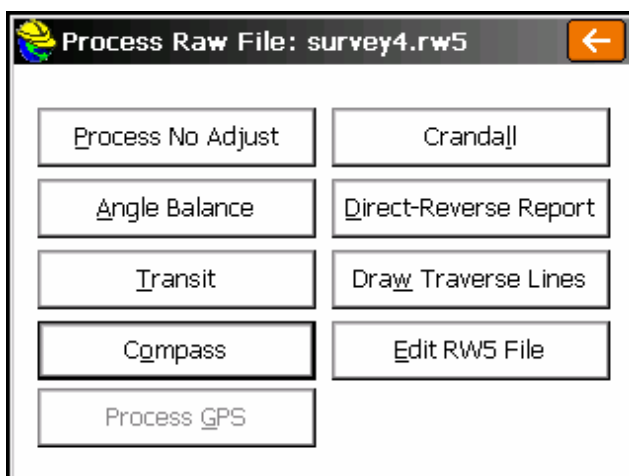


Review File [Save icon] [Back arrow]

3	AR165.5451	90.0422	24.582	5.210	5.350	point
4	AR274.3302	90.0311	9.200	5.210	5.260	point
5	AR267.5120	89.2344	23.125	5.260	5.300	point
6	AR262.2243	91.3333	8.237	5.300	5.050	point
7	AR109.2518	75.0036	13.345	5.210	5.350	point

The file will be presented for your review.

Tap the  to exit the report viewer.



Process Raw File: survey4.rw5 [Back arrow]

Process No Adjust	Crandall
Angle Balance	Direct-Reverse Report
Transit	Draw Traverse Lines
Compass	Edit RW5 File
Process GPS	

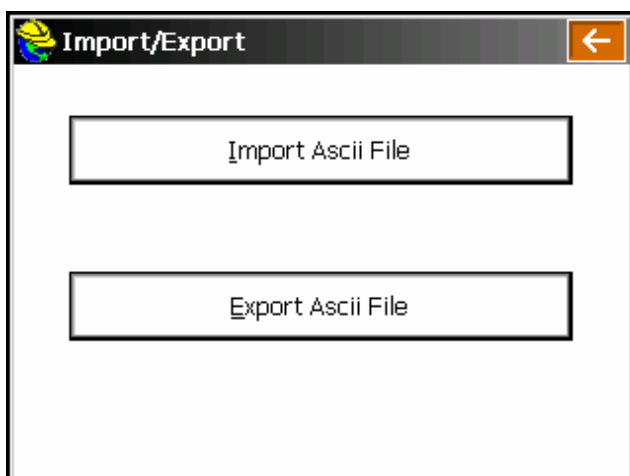
Tap the  to exit the Process Raw File screen.

You have now successfully processed a raw file, applying a Compass Rule adjustment.

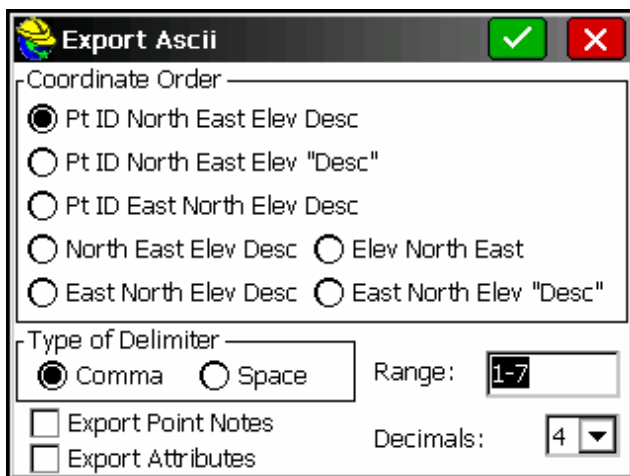
Exporting an ASCII point file



From File menu tab press the 7 on the keyboard or tap the **Import/Export** button.



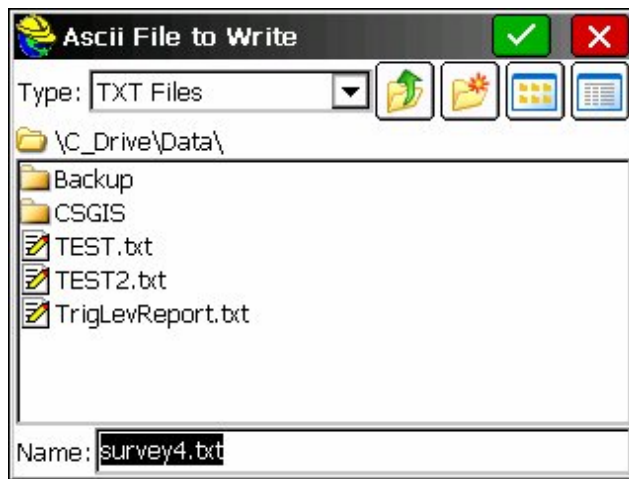
Select Export Ascii File



Apply the following:

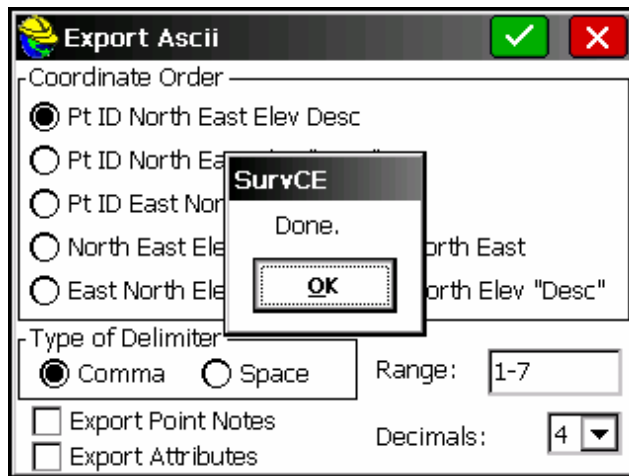
Pt ID North East Elev
Desc Coordinate Order
Comma Type of Delimiter
1-7 Range

Tap the  on the screen to accept the selection.



Accept the name survey4.txt

Tap the  on the screen to accept the selection.



Tap **OK** to finish.

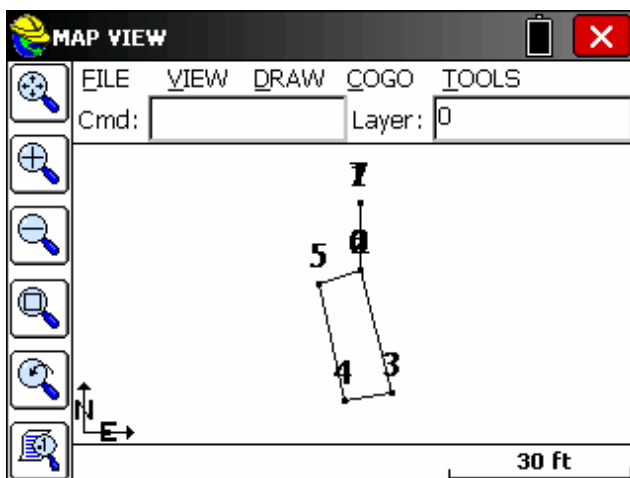
You have now successfully created an ASCII point file. The file can be transferred using X-Port.

3.0 Processing in X-Port

Objectives

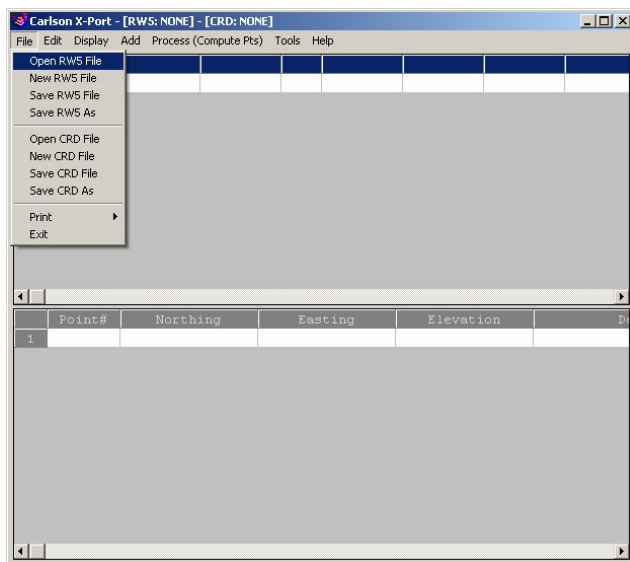
- View the sample data and process it in X-Port, applying a Compass Rule adjustment.
- Export the data to an ASCII point file.

Defining the project

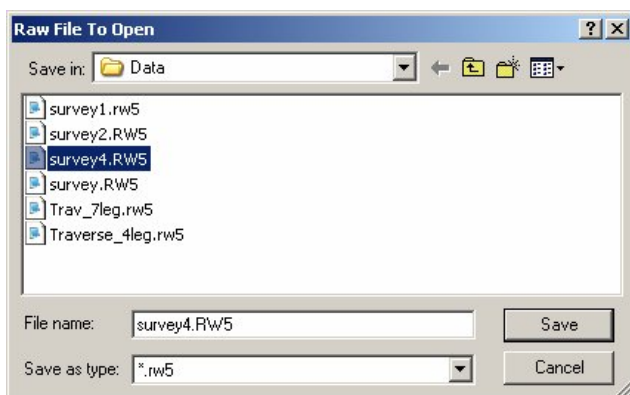


In this example, the traverse was performed by occupying point 2 located at the NE corner of the block. The initial backsight was established by azimuth, measured and stored as point 1 shown along the hanging leg. Angles and distances were measured in a clockwise direction. Point numbers 6 and 2 are at the same location and point numbers 7 and 1 are at the same location. This method allowed for the closing of the angles and the measurement of all traverse legs.

Selecting the file

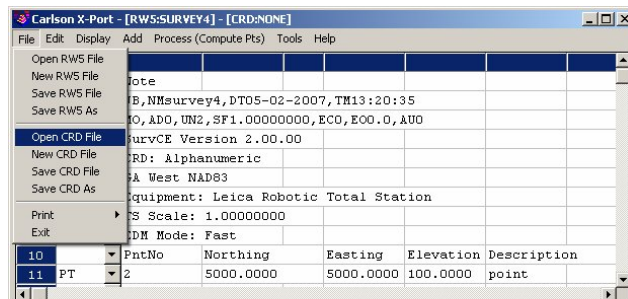


From the menu select **File>Open RW5 File**

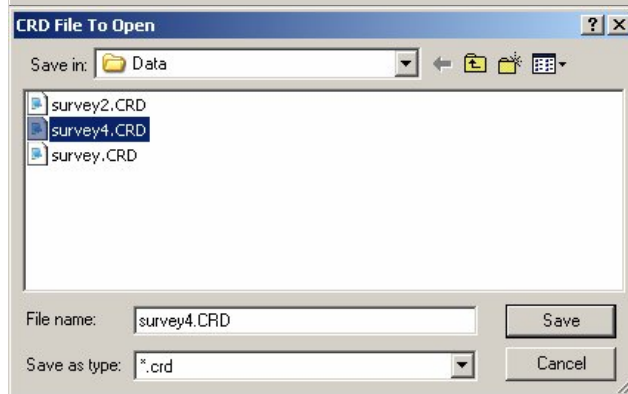


Select survey4.RW5

Click the **Save** button.

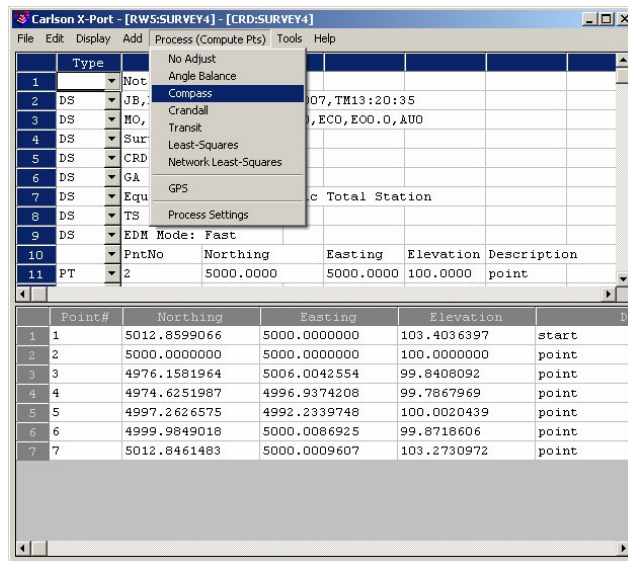


From the menu select
File>Open CRD File

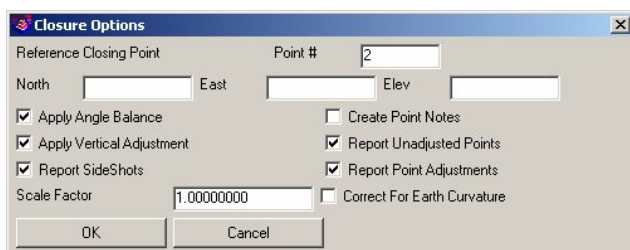


Select survey4.CRD

Click the  button.



From the menu select
Process (Compute
Pts)>Compass



Closure Options

Reference Closing Point Point #

North East Elev

☒ Apply Angle Balance ☐ Create Point Notes

☒ Apply Vertical Adjustment ☒ Report Unadjusted Points

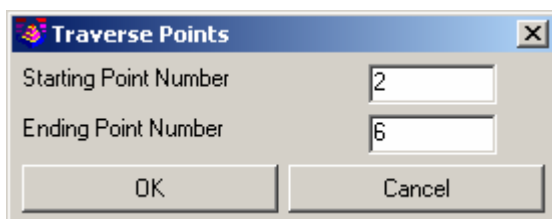
☒ Report SideShots ☒ Report Point Adjustments

Scale Factor ☐ Correct For Earth Curvature

The Reference Closing Point is always the initial occupied point number in a closed loop traverse.

Enter the following:

- 2 Reference Closing Point ID
- Apply Angle Balance
- Apply Vertical Adjustment
- Report SideShots
- Report Points Adjustment
- Report Unadjusted Points



Traverse Points

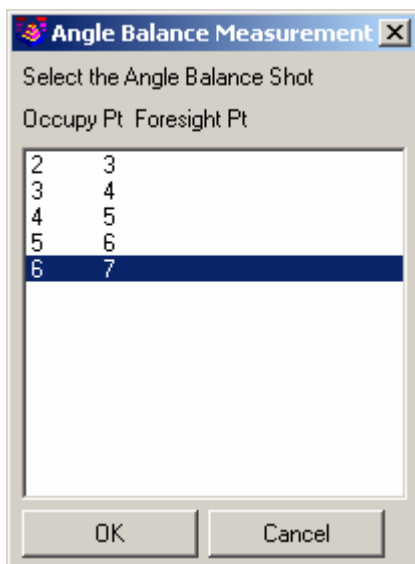
Starting Point Number

Ending Point Number

Since point 7 was only measured to record the closing angle balance measurement, the traverse is only from points 2 through 6.

2 Starting Point Number
6 Ending Point Number

Click



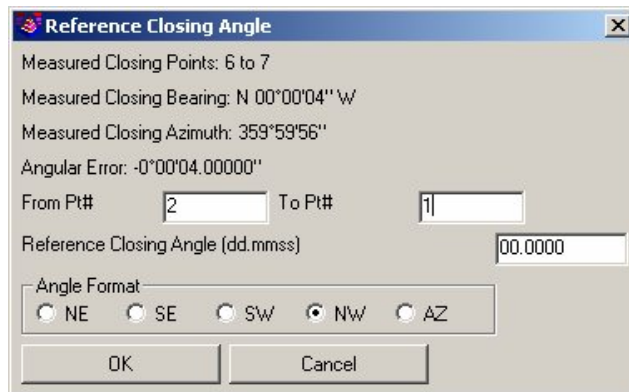
Angle Balance Measurement

Select the Angle Balance Shot

Occupy Pt	Foresight Pt
2	3
3	4
4	5
5	6
6	7

Select the foresight shot from the last occupied point to the original backsight location. In this example we would select the leg measured from point 6 to point 7, since point 7 was our foresight angle balance shot to point 1.

Click



Reference Closing Angle

Measured Closing Points: 6 to 7
 Measured Closing Bearing: N 00°00'04" W
 Measured Closing Azimuth: 359°59'56"
 Angular Error: -0°00'04.00000"

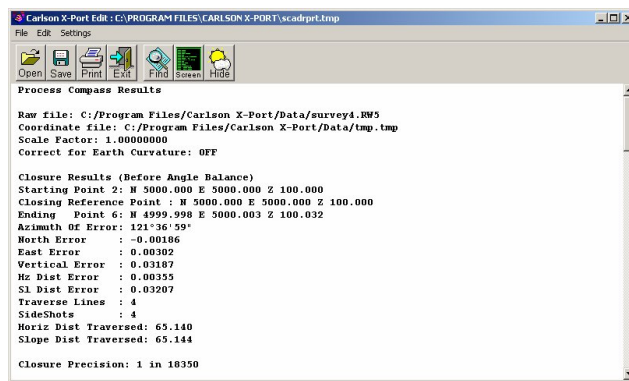
From Pt# To Pt#

Reference Closing Angle (dd.mmss)

Angle Format:
☐ NE ☐ SE ☐ SW ☒ NW ☐ AZ

The reference closing angle is the original backsight azimuth. Key in point 2 and point 1, or key in the known azimuth or bearing.

Click



Carlson X-Port Edit : C:\PROGRAM FILES\CARLSON X-PORT\scadpnt.tmp

File Edit Settings

Open Save Print Exit Find Screen Help

Process Compass Results

Raw file: C:\Program Files\Carlson X-Port\Data\survey4.RW5
 Coordinate file: C:\Program Files\Carlson X-Port\Data\tmp.tmp
 Scale Factor: 1.00000000
 Correct for Earth Curvature: OFF

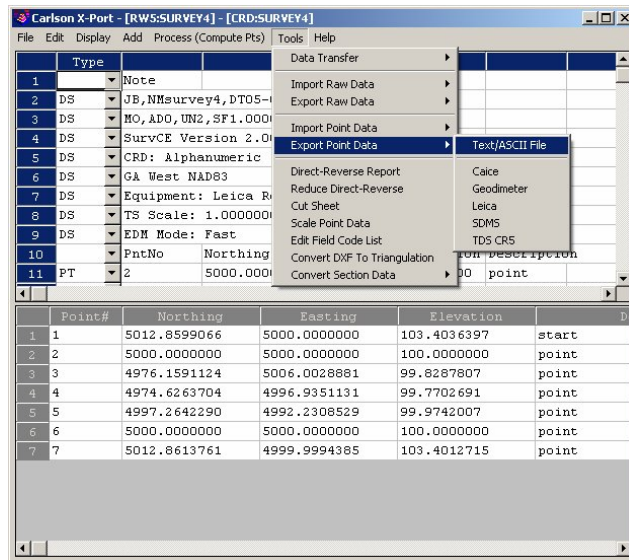
Closure Results (Before Angle Balance)
 Starting Point 2: N 5000.000 E 5000.000 Z 100.000
 Closing Reference Point : N 5000.000 E 5000.000 Z 100.000
 Ending Point 6: N 4999.998 E 5000.003 Z 100.032
 Azimuth of Error: 121°36'59"
 North Error : -0.00186
 East Error : 0.00302
 Vertical Error : 0.03187
 Hz Dist Error : 0.00355
 Sl Dist Error : 0.03207
 Traverse Lines : 4
 Side Shots : 4
 Horiz Dist Traversed: 65.140
 Slope Dist Traversed: 65.144
 Closure Precision: 1 in 18350

The file will be presented for your review.

From here you may print or save the report before closing the window.

Close the window when you have finished reviewing the report.

Exporting an ASCII point file



Carlson X-Port - [RWS:SURVEY4] - [CRD:SURVEY4]

File Edit Display Add Process (Compute Pts) Tools Help

Data Transfer
 Import Raw Data
 Export Raw Data
 Import Point Data
 Export Point Data
 Direct-Reverse Report
 Reduce Direct-Reverse
 Cut Sheet
 Scale Point Data
 Edit Field Code List
 Convert DXF To Triangulation
 Convert Section Data

Text/ASCII File
 Calce
 Geodimeter
 Leica
 SDMS
 TDS CRS
 Point Description
 point

Point#	Northings	Easting	Elevation	Description
1	5012.8599066	5000.0000000	103.4036397	start
2	5000.0000000	5000.0000000	100.0000000	point
3	4976.1591124	5006.0028881	99.8287807	point
4	4974.6263704	4996.9351131	99.7702691	point
5	4997.2642290	4992.2308529	99.9742007	point
6	5000.0000000	5000.0000000	100.0000000	point
7	5012.8613761	4999.9994385	103.4012715	point

From the menu select **Tools>Export Point Data>Text/ASCII File**

Export Point Data

Coordinate Order

☒ Pt# North East Elev Desc

☐ Pt# East North Elev Desc

☐ North East Elev Desc

☐ East North Elev Desc

Type of Delimiter

☒ Comma ☐ Space

Number of Decimals: 5

Range of Points: 1-7

OK Cancel

Apply the following:

- Pt# North East Elev Desc
- Comma Type of Delimiter
- 5 Number of Decimals
- 1-7 Range of Points

Click

OK

Point Text File to Write

Save in: Data

File name: survey4

Save as type: *.txt

Save Cancel

Enter the name survey4

Click

Save

Carlson X-Port Message

File C:\Program Files\Carlson X-Port\Data\survey4.txt successfully written.

OK

Click OK to finish.

You have now successfully created an ASCII point file. The file can be transferred using Data Transfer. From the menu select **File>Exit**

Carlson X-Port - [RWS:SURVEY4] - [CRD:SURVEY4]

File Edit Display Add Process (Compute Pts) Tools Help

Open RWS File

New RWS File

Save RWS File

Save RWS As

Open CRD File

New CRD File

Save CRD File

Save CRD As

Print

Exit

PT Mode: Fast

Scale: 1.00000000

PT No: 2

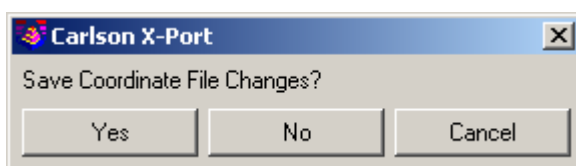
Northings

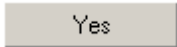
Easting

Elevation

Description

Point#	Northings	Easting	Elevation	Description
1	5012.8599066	5000.0000000	103.4036397	start
2	5000.0000000	5000.0000000	100.0000000	point
3	4976.1591124	5006.0028881	99.8287807	point
4	4974.6263704	4996.9351131	99.7702691	point
5	4997.2642290	4992.2308529	99.9742007	point
6	5000.0000000	5000.0000000	100.0000000	point
7	5012.8613761	4999.9994385	103.4012715	point



Click  to save the changes to the coordinate file.