

TPC Desktop Series

Adjustments Learning Guide

1/18

NOTICE

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Typography

We will be using the following typography to distinguish items in the text:

- [Enter] Brackets indicate keys on the keyboard.
- flexibility* Italics are used to highlight words for more emphasis.
- Lot 2** Numbers or text that you enter.

System Requirements

This version of TPC Desktop requires Windows 10 / 8.1 / 8 / 7 / Vista and Internet Explorer Version 6.0 or later. We recommend you have 2 GB of RAM 32-bit OS) 4 GB RAM (64-bit OS) and 60 MB of free hard disk space in which to install the program. **An internet connection is required for program validation.**

Important Licensing Information

Our License Agreement allows you to use TPC on only one computer at a time unless you purchase additional licenses. We do offer one courtesy installation for an additional home or field computer, *but not for a second user* and assuming that the two programs are not being used at the same time. To request a courtesy license contact Traverse PC.

Overview

TPC Desktop uses the Closure View to report the closure of a traverse, edit the closure settings and balance angles, coordinates, apply curvature and refraction, specify precision and apply scale factors.

All of the adjustments re-compute the closure and report it to you right in the Closure View. So this is a great way to try different options and methods of adjusting your data.

►Undoing Adjustments

Any adjustment to apply in the Closure View can be undone. Just choose **Tools | Undo Adjustments**.

►This chapter does not include information on Least Squares adjustments

This chapter does not include information on Least Squares adjustments.

To learn about Least Squares adjustments

1) Refer to the chapter on Least Squares Network Adjustment later in the Learning Guide.

►Getting started

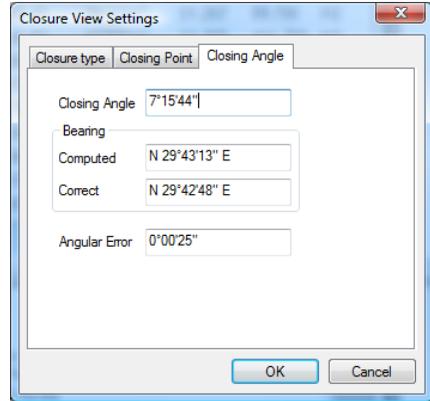
- 1) From the Tasks Manager choose **Sample Surveys**.
- 2) Double-click the **LEARN CLOSURE.TRV** file.
- 3) Choose **File | Save Survey As**.
- 4) Enter the name **Closure** and choose **Save**.
- 5) If prompted to replace the existing file, choose **Yes**.

Setting the Closing Angle

The Closure View tells us that the angular error is None. This is because TPC does not have enough information to calculate the angular error. We still need to tell the program what points we shot for a closing angle and what that angle was.

- 1) Choose **Edit | Closure Settings** and left-click the **Closing Angle** tab.
- 2) Enter **7.1544** in the **Closing Angle** field and hit [Enter] to go to the **Correct** field.
- 3) Enter **100..CP1** in the **Correct** field and choose **OK**.

When we re-occupied the southwest property corner of Lot 2 to close our loop, we turned a sideshot to our original occupied point CP1. We entered the angle we turned for that sideshot in the **Closing Angle** Field. In the **Correct** field, we told TPC to recall the bearing from point 100 to CP1. TPC calculated the bearing that resulted from turning that closing angle in the **Computed** field. The difference between the **Computed** and **Correct** bearings is the **Angular Error**.



► Hints

- TPC relies on the traverse being a true closed loop traverse to adjust angles. This means that you must re-occupy the initial starting point to turn the closing angle.
- We could turn our closing angle to any point by entering the angle we turn and recalling the bearing from our initial occupation of the closing point and the initial position of the point we turned to.

Adjusting Angles

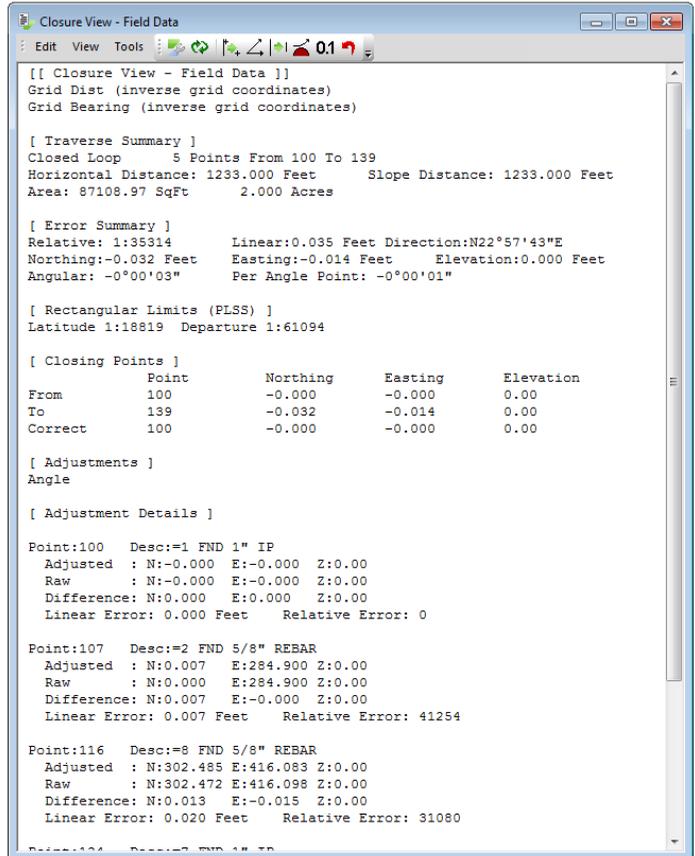
The Closure View now displays the 25 second angular error that resulted from the data on the Closing Angle tab. To balance the angles,

- 1) Choose **Tools | Balance Angles**.

The **Closure View** now shows the results of the angular adjustment. The **Adjustment Details** show exactly what happened to each point in the traverse. If you aren't happy with the results of the adjustment, you can choose **Tools | Undo Adjustments** to put the traverse back to its unadjusted state. We will continue by balancing the coordinates.

 **To learn more about balancing angles**

- 1) Choose **Help | Search For Help On...** and left-click the **Index** tab.
- 2) Scroll down to **Adjusting a traverse**, highlight it and choose **Display**.
- 3) Select **Balance Angles** and choose **Display**.



```

Closure View - Field Data
Edit View Tools
[[ Closure View - Field Data ]]
Grid Dist (inverse grid coordinates)
Grid Bearing (inverse grid coordinates)

[ Traverse Summary ]
Closed Loop      5 Points From 100 To 139
Horizontal Distance: 1233.000 Feet      Slope Distance: 1233.000 Feet
Area: 87108.97 SqFt      2.000 Acres

[ Error Summary ]
Relative: 1:35314      Linear:0.035 Feet Direction:N22°57'43"E
Northing:-0.032 Feet      Easting:-0.014 Feet      Elevation:0.000 Feet
Angular: -0°00'03"      Per Angle Point: -0°00'01"

[ Rectangular Limits (PLSS) ]
Latitude 1:18819      Departure 1:61094

[ Closing Points ]
      Point      Northing      Easting      Elevation
From      100      -0.000      -0.000      0.00
To        139      -0.032      -0.014      0.00
Correct   100      -0.000      -0.000      0.00

[ Adjustments ]
Angle

[ Adjustment Details ]

Point:100 Desc:=1 FND 1" IP
Adjusted : N:-0.000 E:-0.000 Z:0.00
Raw      : N:-0.000 E:-0.000 Z:0.00
Difference: N:0.000 E:0.000 Z:0.00
Linear Error: 0.000 Feet      Relative Error: 0

Point:107 Desc:=2 FND 5/8" REBAR
Adjusted : N:0.007 E:284.900 Z:0.00
Raw      : N:0.000 E:284.900 Z:0.00
Difference: N:0.007 E:-0.000 Z:0.00
Linear Error: 0.007 Feet      Relative Error: 41254

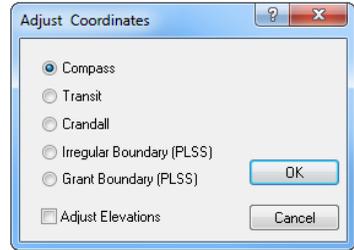
Point:116 Desc:=8 FND 5/8" REBAR
Adjusted : N:302.485 E:416.083 Z:0.00
Raw      : N:302.472 E:416.098 Z:0.00
Difference: N:0.013 E:-0.015 Z:0.00
Linear Error: 0.020 Feet      Relative Error: 31080
  
```

Adjusting Coordinates

- 1) Choose **Tools | Balance Coordinates**.
- 2) Select **Compass** and choose **OK**.

The **Closure View** now shows the results of the adjustment and tells us that we have applied both a compass rule adjustment and adjusted the angles. The **Adjustment Details** shows exactly what happened to each point in the traverse.

Note: Not all options are available in personal and premium editions.

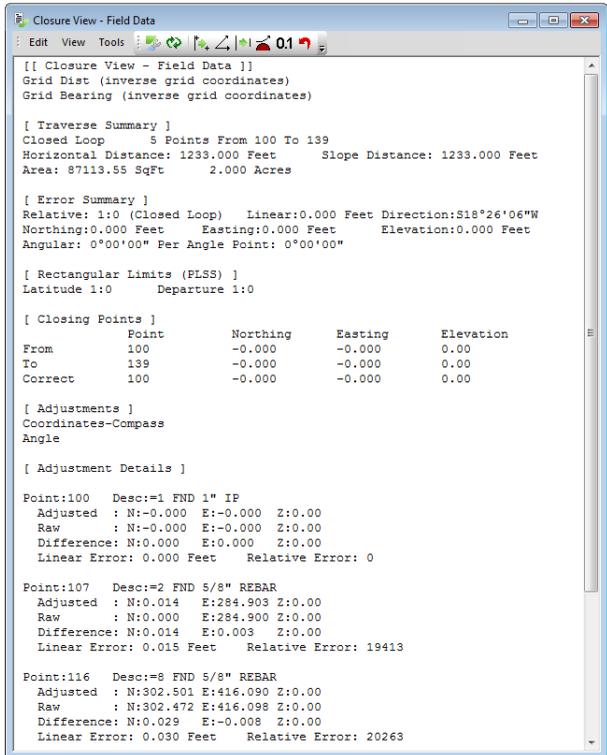


► Hints

We don't have space to get into an in-depth discussion of the pros and cons of each adjustment routine. It is important that each surveyor become familiar with both the strengths and weaknesses of these adjustment methods before putting any of them to use.

[🔗](#) To learn more about balancing coordinates

- 1) Choose **Help | Search For Help On...** and left-click the **Index** tab.
- 2) Scroll down to **Adjusting a traverse**, highlight it and choose **Display**.
- 3) Select **Balancing Coordinates** and choose **Display**.



Traverse View & Closure View Synchronization

The Traverse View and Closure View are always synchronized, because they share the same traverse and its data. This is helpful as you adjust a traverse because you get to see what happens with the adjustment.

Here is a typical sequence and what to look for.

► Raw Data

As you enter data in a Traverse View, you are looking at what you could call *Raw Data* or *Raw Coordinates*. The inverses of the coordinates exactly matches the data you entered because they were created by the raw data.

► Raw Closure

If you open the Closure View for this traverse, the Closure View displays the *Raw Closure* of the traverse. The closure information displayed here exactly matches the *Raw Data* in the traverse because they are based on the same traverse.

► Correcting Mistakes

If the Raw Closure indicates that you may have made a mistake in entering the *Raw Data*, just go back to the Traverse View and correct it. The Closure View will automatically reflect the changes in the *Raw Closure* it displays.

The top screenshot shows the 'Traverse View - Field Data' window with the following table:

Point	Type	Grid Bearing	Slope Dist	Horiz Angle	Northing	Easting	Description
CP1					188.642	107.658	H&N
CP2	BS	S48°43'16"E	227.00	0°00'00"			H&N
100		S29°42'48"W	217.20	78°26'04"	-0.000	-0.000	=1 FND 1" IP
101	SS	N40°38'32"E	162.50	10°55'44"	123.304	105.842	H2
102	SS	N41°59'00"E	154.00	12°16'12"	114.474	103.013	H2
103	SS	N44°03'14"E	148.10	14°20'26"	106.437	102.979	H2
104	SS	N49°54'15"E	117.40	20°11'27"	75.614	89.807	H2
105	SS	N60°16'35"E	103.40	30°33'47"	51.267	89.795	H2
106	SS	N71°46'59"E	164.00	42°04'11"	51.269	155.780	H2
107		N89°59'50"E	284.90	60°17'02"	0.014	284.903	=2 FND 5/8" REBAF
108	SS	N75°16'19"W	201.70	14°43'51"	51.292	89.830	=105 H2
109	SS	N68°19'52"W	138.90	21°40'18"	51.302	155.819	=106 H2
110	SS	N54°43'49"W	158.10	35°16'21"	91.305	155.823	H2
111	SS	N48°01'51"W	184.30	41°58'19"	123.261	147.875	H2
112	CO	N08°55'02"W	224.50	08°55'02"	224.500	400.433	H2

The bottom screenshot shows the 'Closure View - Field Data' window with the following text:

```

[[ Closure View - Field Data ]]
Grid Dist (inverse grid coordinates)
Grid Bearing (inverse grid coordinates)

[ Traverse Summary ]
Closed Loop      5 Points From 100 To 139
Horizontal Distance: 1233.000 Feet   Slope Distance: 1233.000 Feet
Area: 87116.56 SqFt      2.000 Acres

[ Error Summary ]
Relative: 1:36756      Linear: 0.034 Feet Direction: N80°31'44"E
Northing: -0.006 Feet   Easting: -0.033 Feet   Elevation: 0.000 Feet
Angular: 0°00'25" Per Angle Point: 0°00'05"

[ Rectangular Limits (PLSS) ]
Latitude 1:109592 Departure 1:25152

[ Closing Points ]
From      Point      Northing      Easting      Elevation
To        139      -0.006      -0.033      0.00
Correct   100      -0.000      -0.000      0.00

[ Adjustments ]

[ Adjustment Details ]
Not Adjusted
    
```

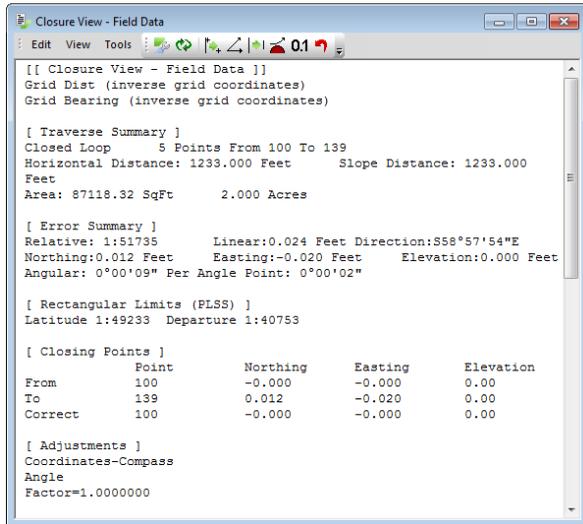
So what happens to this synchronization when you adjust the traverse data?

Traverse View & Closure View Synchronization

► Adjusted Closure

Go ahead and balance angles and or coordinates. Apply any adjustments you want to the traverse in the Closure View and it will display the *Adjusted Closure*.

The Closure View always lists the adjustments that have been applied in the [Adjustments] section. You can close this survey and open it back up any time and the Closure View will remind you of what adjustments have already been applied to a traverse.



► Adjusted Data

At the same time, the Traverse View will display the *Adjusted Data* for the traverse. The *Adjusted Data* is just the inverses between the *Adjusted Coordinates* in the traverse.

Side shots are automatically recomputed from their adjusted control points so their data always stays the same with the exception of the Scale Factor and Curvature and Refraction adjustments.

The screenshot shows the 'Traverse View - Field Data' window with a table of traverse points:

Point	Type	Bearing	Slope Dist	Horiz Angle	Northing	Easting	Descripti...
CP1					188.642	107.658	H&N
CP2	BS	S 48°43'16" E	227.00	0°00'00"	38.884	278.250	H&N
100		S 29°42'48" W	217.20	78°26'04"	-0.000	-0.000	=1 FND 1" IP
101	SS	N 40°38'32" E	162.50	10°55'44"	123.304	105.842	H2
102	SS	N 41°59'00" E	154.00	12°16'12"	114.474	103.013	H2
103	SS	N 44°03'14" E	148.10	14°20'26"	106.437	102.979	H2
104	SS	N 49°54'15" E	117.40	20°11'27"	75.614	89.807	H2
105	SS	N 60°16'35" E	103.40	30°33'47"	51.267	89.795	H2
106	SS	N 71°46'59" E	164.00	42°04'11"	51.269	155.780	H2
107		N 89°59'50" E	284.90	60°17'02"	0.014	284.903	=2 FND 5/8"
108	SS	N 75°16'19" W	201.70	14°43'51"	51.292	89.830	=105 H2

► Displaying Raw Data

You can still see the Raw Data any time by choosing **View | Display Raw Data**. *Computed Data* is blanked out and you see just the data you entered. Choose **Display Raw Data** again to toggle back to the *Adjusted Data*.

The screenshot shows the 'Traverse View - Field Data' window with raw data. The 'Northing' and 'Easting' columns for points CP1, 100, 101, 102, and 104 are blanked out.

Point	Type	Bearing	Slope Dist	Horiz Angle	Northing	Easting	Descripti...
CP1							H&N
CP2	BS	S 48°43'16" E	227.00	0°00'00"			H&N
100			217.20	78°26'04"			=1 FND 1" IP
101	SS		162.50	10°55'44"			H2
102	SS		154.00	12°16'12"			H2
103	SS		148.10	14°20'26"			H2
104	SS		117.40	20°11'27"			H2