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Detecting Errors in Survey Data

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Ways to Detect Error?

- GEOPAK's Survey Data Editor (OBS Editor) Preferences.
- Ray Hintz's Electronic Field Book Processor Tools.
- Field Book and Graphical Comparison.




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OBS Editor Preferences

- Check for Errors on File Open, File Save, or both.

- Allows checking of the following:
 - Setups – Instrument Height
 - Observations – Target Height, Horizontal & Vertical Angles, and Slope Distance.
 - XYZ/ASCII Files – Minimum and Maximum values for Northing, Easting, and Elevation.

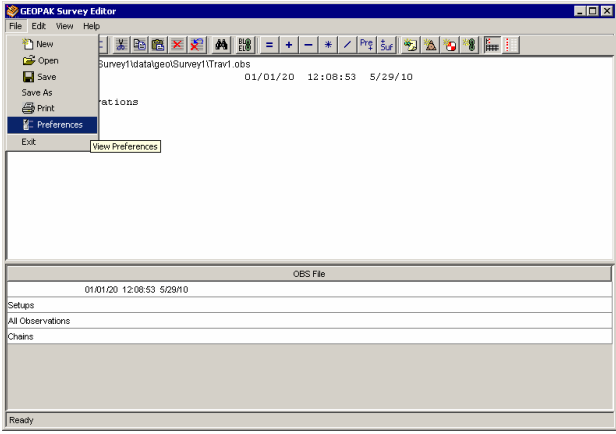




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OBS Editor Preferences

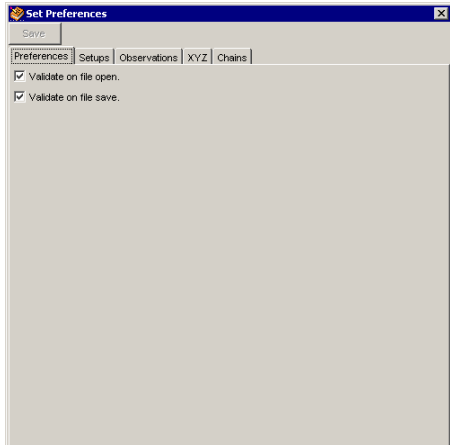
Accessed through File>Preferences in the OBS Editor






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OBS Editor Preferences Tab

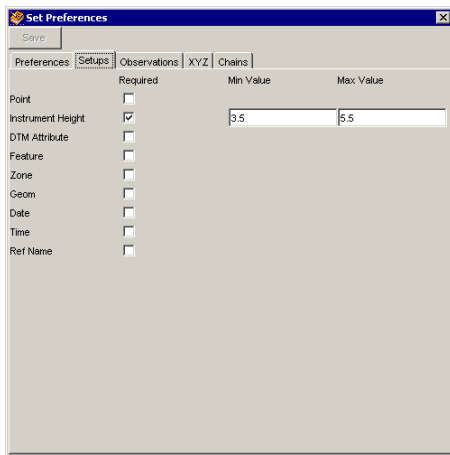
Allows File Validation on File Open, File Save, or both.




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OBS Editor Preferences Setups Tab

Allows checking of Instrument Height and other values.



	Required	Min Value	Max Value
Point	<input type="checkbox"/>		
Instrument Height	<input checked="" type="checkbox"/>	3.5	5.5
DTM Attribute	<input type="checkbox"/>		
Feature	<input type="checkbox"/>		
Zone	<input type="checkbox"/>		
Geom	<input type="checkbox"/>		
Date	<input type="checkbox"/>		
Time	<input type="checkbox"/>		
Ref Name	<input type="checkbox"/>		



OBS Editor Preferences Observations Tab

Allows checking of Horizontal & Vertical angles, Slope Distance, and Rod Height.

The screenshot shows the 'Set Preferences' dialog box with the 'Observations' tab selected. The 'Required' column has checkboxes for 'Point', 'Horizontal Angle', 'Vertical Angle', 'Slope Distance', 'Rod Height', 'Geom Code', 'Feature', 'DTM Attribute', and 'Zone'. The 'Min Value' and 'Max Value' columns contain numerical values for 'Vertical Angle', 'Slope Distance', and 'Rod Height'.

	Required	Min Value	Max Value
Point	<input type="checkbox"/>		
Horizontal Angle	<input type="checkbox"/>		
Vertical Angle	<input type="checkbox"/>	88.2211	91.2211
Slope Distance	<input type="checkbox"/>	5.00	500.00
Rod Height	<input checked="" type="checkbox"/>	0.15	8.50
Geom Code	<input type="checkbox"/>		
Feature	<input type="checkbox"/>		
DTM Attribute	<input type="checkbox"/>		
Zone	<input type="checkbox"/>		





OBS Editor Preferences XYZ Tab

Allows checking for Minimum & Maximum Northing, Easting, and Elevation.

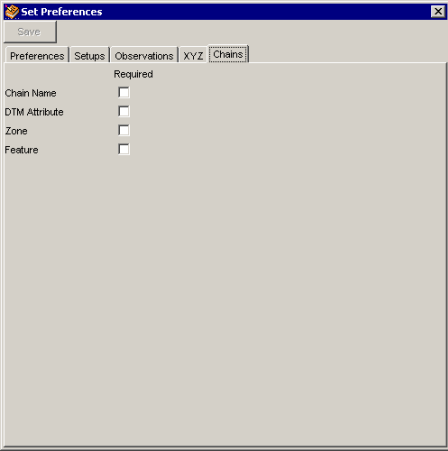
The screenshot shows the 'Set Preferences' dialog box with the 'XYZ' tab selected. The 'Required' column has checkboxes for 'Point', 'X Coordinate', 'Y Coordinate', 'Z Coordinate', 'Geom Code', 'Feature', 'DTM Attribute', and 'Zone'. The 'Min Value' and 'Max Value' columns contain numerical values for 'X Coordinate', 'Y Coordinate', and 'Z Coordinate'.



	Required	Min Value	Max Value
Point	<input type="checkbox"/>		
X Coordinate	<input checked="" type="checkbox"/>	9000	14000
Y Coordinate	<input checked="" type="checkbox"/>	19000	24000
Z Coordinate	<input checked="" type="checkbox"/>	50.000	75.000
Geom Code	<input type="checkbox"/>		
Feature	<input type="checkbox"/>		
DTM Attribute	<input type="checkbox"/>		
Zone	<input type="checkbox"/>		

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OBS Editor Preferences Chain Tab

Allows checking for required Chain attributes.




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Ray Hintz's EFBP Tools

➤ Older DOS Based Tools


- EFBP.EXE – DOS Processing program. “Robust” option allows re-weighting of error estimates.
- CHK.EXE – Allows user to hold specific control points & provides the ability to calculate user defined traverse closures.
- LCHK.EXE – Same as above, except for elevations instead of N/E.
- FIXIT.EXE – Allows the user to apply a variety of adjustments to the OBS file.

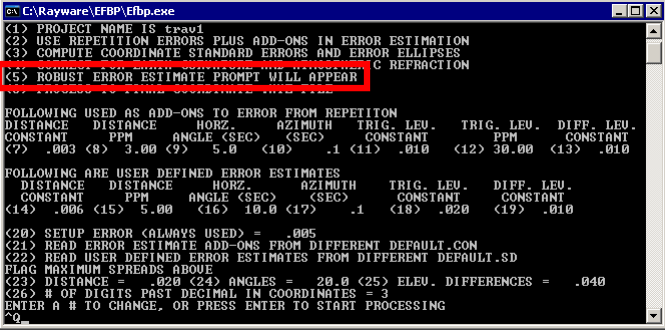



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EFBP.EXE Tool

DOS Processing program. "Robust" option allows reweighting of error estimates.






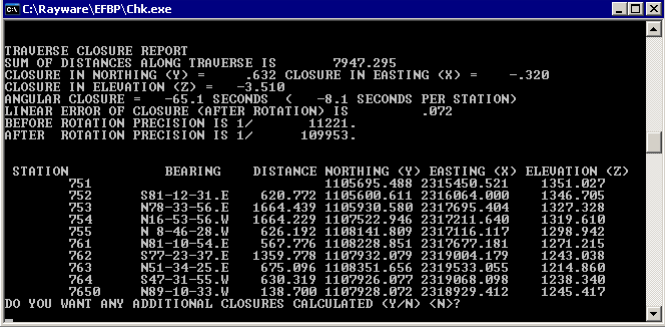


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CHK.EXE Tool

Allows user to hold specific control points & provides the ability to calculate user defined traverse closures.







LCHK.EXE Tool

Same as CHK.EXE, except for elevations instead of N/E.

```

C:\Rayware\EFBP\Lchk.exe
ELEVATION CLOSURE REPORT
SUM OF DISTANCES ALONG SURVEY IS      57803.045
CLOSURE IN ELEVATION (Z) = 3.714
CLOSURE PER STATION = .109
PRECISION = 1 / 15564
STATION      ELEVATION (Z)
7650          1245.417
764           1238.340
763           1214.860
762           1243.838
761           1271.215
755           1298.942
754           1319.610
753           1327.328
752           1346.705
751           1351.027
745           1266.375
744           1386.438
743           1402.470
742           1381.171
741           1426.050
734           1485.537
733           1401.087
732           1411.229
731           1421.676
    
```




FIXIT.EXE Tool


Allows the user to apply adjustments to the OBS file.

```

C:\Rayware\EFBP\Fixit.exe
Error!
INPUT SLOPE DISTANCE SCALE FACTOR <1=NO CHANGE, - IS DIVIDE > <1.00>
INPUT SLOPE DISTANCE CONSTANT <0.00 IS NO CHANGE> <0.00>
INPUT HGT OF INSTRUMENT SCALE FACTOR <1=NO CHANGE, - IS DIVIDE> <1.00>
INPUT HGT OF INSTRUMENT CONSTANT <0.00 IS NO CHANGE> <0.00>
INPUT HGT OF TARGET SCALE FACTOR <1=NO CHANGE, - IS DIVIDE> <1.00>
INPUT HGT OF TARGET CONSTANT <0.00 IS NO CHANGE> <0.00>
INPUT STATION SCALE FACTOR <1=NO CHANGE, - IS DIVIDE> <1.00>
INPUT STATION CONSTANT <0.00 IS NO CHANGE> <0.00>
INPUT OFFSET SCALE FACTOR <1=NO CHANGE, - IS DIVIDE> <1.00>
INPUT OFFSET CONSTANT <0.00 IS NO CHANGE> <0.00>
INPUT LEVEL ROD SCALE FACTOR <1=NO CHANGE, - IS DIVIDE> <1.00>
INPUT LEVEL ROD CONSTANT <0.00 IS NO CHANGE> <0.00>
    
```





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Field Book and Graphical Comparison

- Keep simple sketches in a Field Book of each Setup.
 - Setup Point
 - Instrument Height
 - Point Ranges
 - Chains Created
- Import Information into MicroStation/GEOPAK and Check with Measure Tools.
 - Measure Distance Between Points
 - Measure Angle Between Elements





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Questions?

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