

CHC Navigation Ltd

CGO2 Work Flow – Adjustment

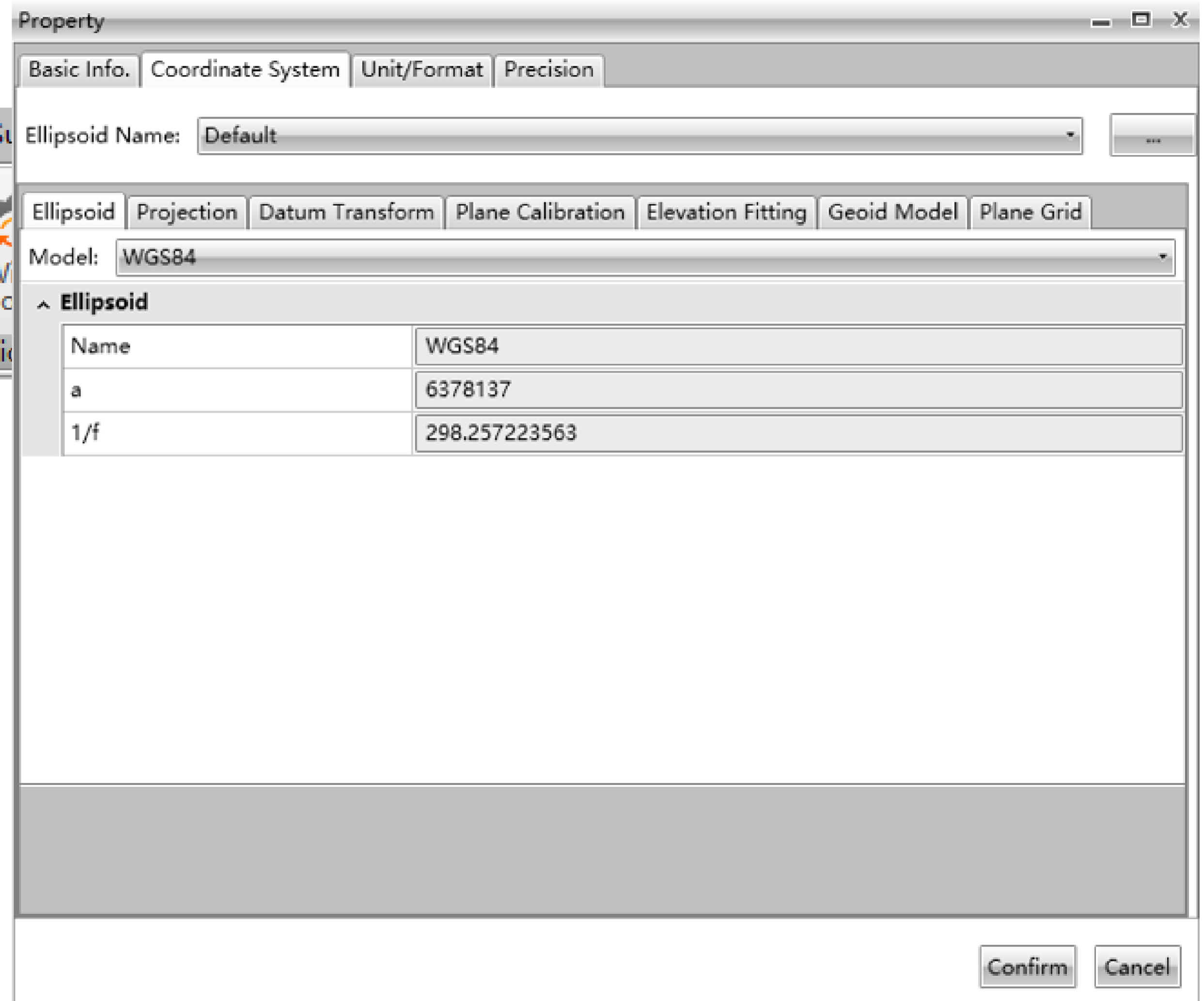
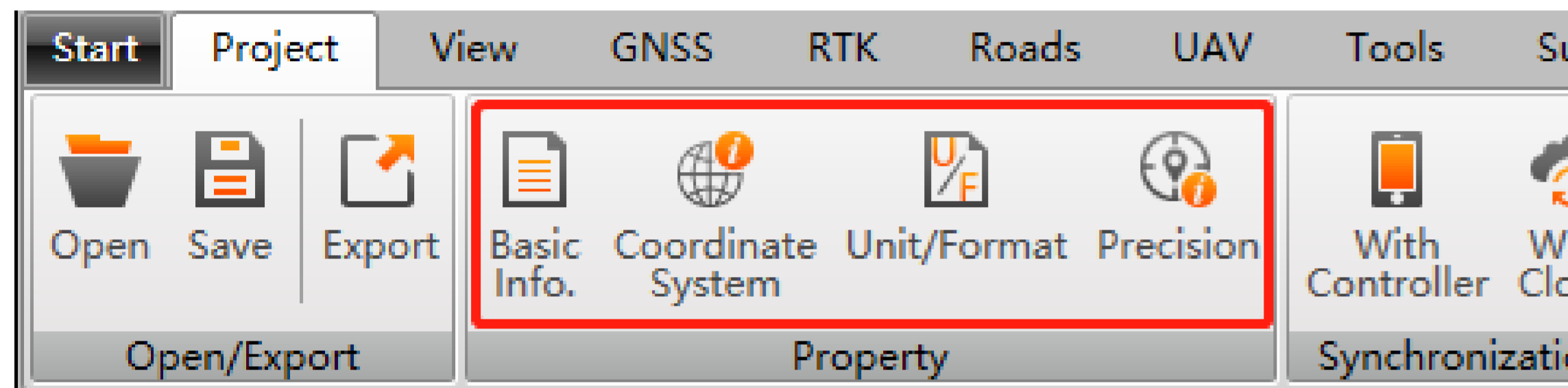
Step1: Import raw data, process baseline

Please check:

[CGO2 Work Flow - Import](#)

[CGO2 Work Flow – GNSS baseline processing](#)

Step2: Check the Coordinate System



Step3: Designate known point - Conversation

Map GNSS x

Index	Contrc	Station	North(m)	East(m)	Height(m)	Longitude(Local)	Latitude(Local)	Ellipsoid H
1		ASHD	9041038.977	-7752604.45172	48.5602	034°37'32.8214686"E	031°45'59.5021202"N	48.5602
2		HEFE	8968399.655	-7666976.97351	119.3063	034°56'58.6133874"E	031°59'59.3511402"N	119.3063
3		KSHO	8957816.408	-7664411.00328	62.9916	034°46'44.7823679"E	032°03'45.6348826"N	62.9916
4		NETA	9013308.640	-7619922.70308	104.7129	034°54'54.5613662"E	032°11'46.2497319"N	104.7129
5		RISH	9018837.95701	-7683910.84848	73.4157	034°46'26.7766257"E	031°59'16.1991680"N	73.4157
6		SHOA	8981318.41595	-7666976.97351	119.3063	034°56'58.6133874"E	031°59'59.3511402"N	119.3063
7		TELV	9021188.21809	-7664411.00328	62.9916	034°46'44.7823679"E	032°03'45.6348826"N	62.9916
8		ZOFI	8997886.64656	-7619922.70308	104.7129	034°54'54.5613662"E	032°11'46.2497319"N	104.7129

Context menu for row 1:

- Convert To Control Point
- Delete related Control Point
- Remove



Map GNSS x

Index	Station	North(m)	East(m)	Height(m)	Longitude(Local)	Latitude(Local)	Ellipsoid Height(m)
1	ASHD	9041038.97705	-7752604.45172	48.5602	034°37'32.8214686"E	031°45'59.5021202"N	48.5602

Left sidebar menu:

- Station
- Control Point**
- Baselines
- Repeat Baselines
- Loop Closure

Step3: Designate known point – Import/Add

Map GNSS x

Index	Station	North(m)	East(m)	Height(m)	Longitude(Local)	Latitude(Local)	Ellipsoid Height(m)
1	ASHD	9041038.97705	-7752604.45172	48.5602	034°37'32.8214686"E	031°45'59.5021202"N	48.5602

Remove
Import Control Point
 Add Control Point

Observation File
 Check
 Station
Control Point
 Baselines
 Repeat Baselines
 Loop Closure

Import Control Point

WGS84 (Point,LAT,LONG,HEIGHT) Format (*.csv; *.txt)
 Format of latitude and longitude: Degree°Minute'Second"

WGS84 (Point,X,Y,Z) Format (*.csv; *.txt)

Local (Point,LAT,LONG,HEIGHT) Format (*.csv; *.txt)

Local (Point,North,East,h) Format (*.csv; *.txt)

Confirm Cancel

Control Point Attribute

Name

WGS84
 X(m) 0.00000 Y(m) 0.00000 Z(m) 0.00000
 Lon. 000°00'0.0000000"E Lat. 000°00'0.0000000"N Ellipsoid(m) 0.0000
 Constraints

Local
 North(m) 0.00000 East(m) 0.00000 Include Zone
 Zone Height(m) 0.0000
 Lon. 000°00'0.0000000"E Lat. 000°00'0.0000000"N Ellipsoid(m) 0.0000
 Constraints

Confirm Cancel

Step4: Set Known Point

- Observation File
- Check
- Station
- Control Point
- Baselines
- Repeat Baselines
- Loop Closure

Index	Station	North(m)	East(m)	Height(m)	Longitude(Local)	Latitude(Local)	Ellipsoid Height(m)
1	ASHD	9041038.97705	-7752604.45172	48.5602	034°37'32.8214686"E	031°45'59.5021202"N	48.5602

h)	4466410.34392
h)	3084137.49211
h)	3338474.45985
h)	034°37'32.8214686"E
h)	031°45'59.5021201"N
h)	48.5602
h)	XYZ(WGS84)

h)	9041038.97705
h)	-7752604.45172
h)	<input type="checkbox"/> Include Zone
h)	48.5602
h)	034°37'32.8214686"E
h)	031°45'59.5021202"N
h)	48.5602
h)	

XYZ(WGS84)

Lat-Lon-Height(WGS84)

None

NE

NEh

h

Lat-Lon-Height

Lat-Lon

None

Step5: Adjustment

Adjustment Type

Free-net Adjustment
 Constraint Adjustmet Target Coordinate S...
 Two-Dimensional Constraint Adjustment
 Elevation Fitting Best Practice

Adjustment Report

Free-net Adjustment

Auto Adjustment

Single Adjustment

Setting

Create Report

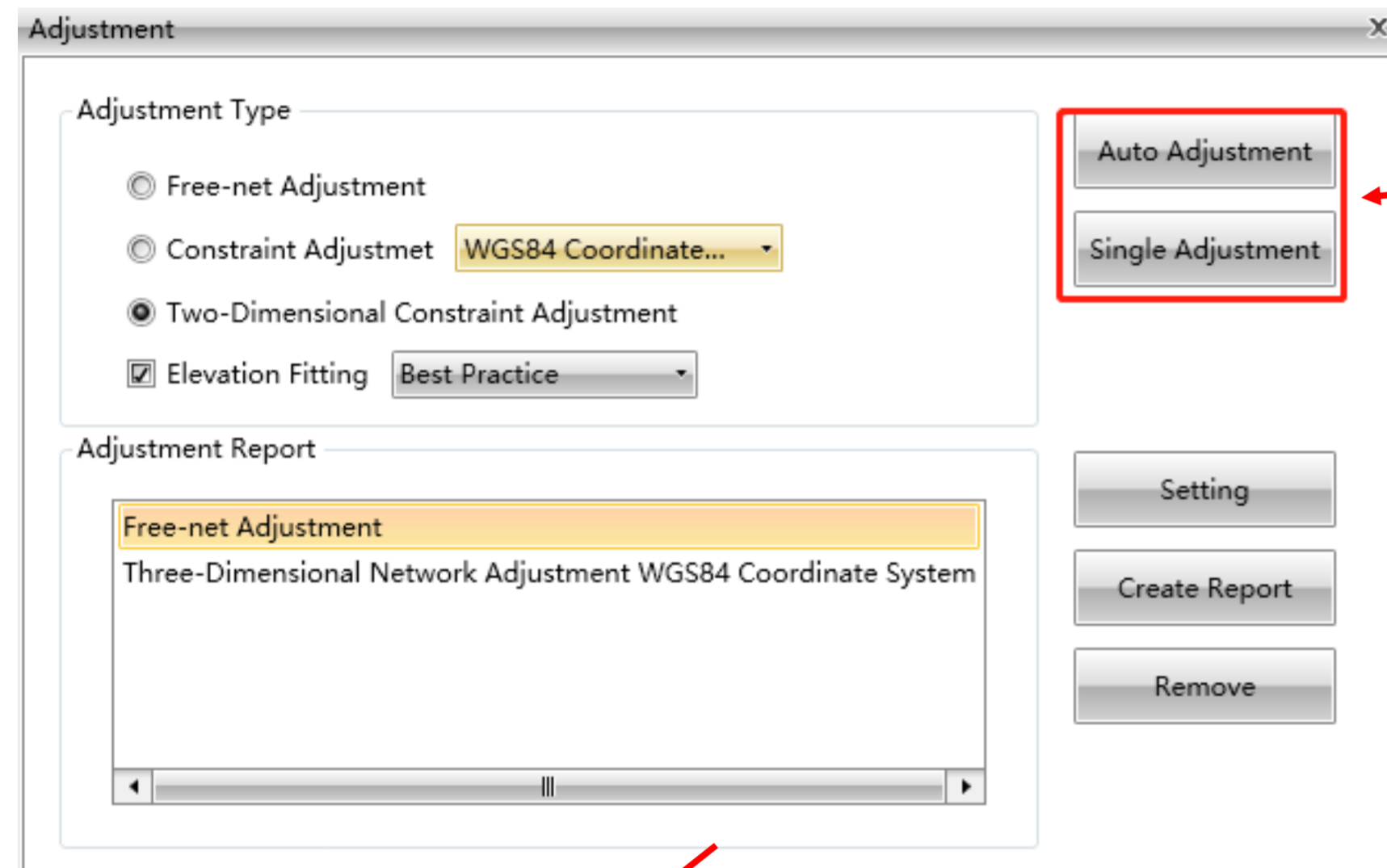
Remove

The adjustment will be based on the control point:

- Free-net Adjustment: No limitation
- WGS84, Three-Dimensional: At least one known WGS84 coordinates.
- Local, Three - Dimensional: At least one Local known coordinates.
- Local, Two-Dimensional: At least one known local coordinates, normally two.

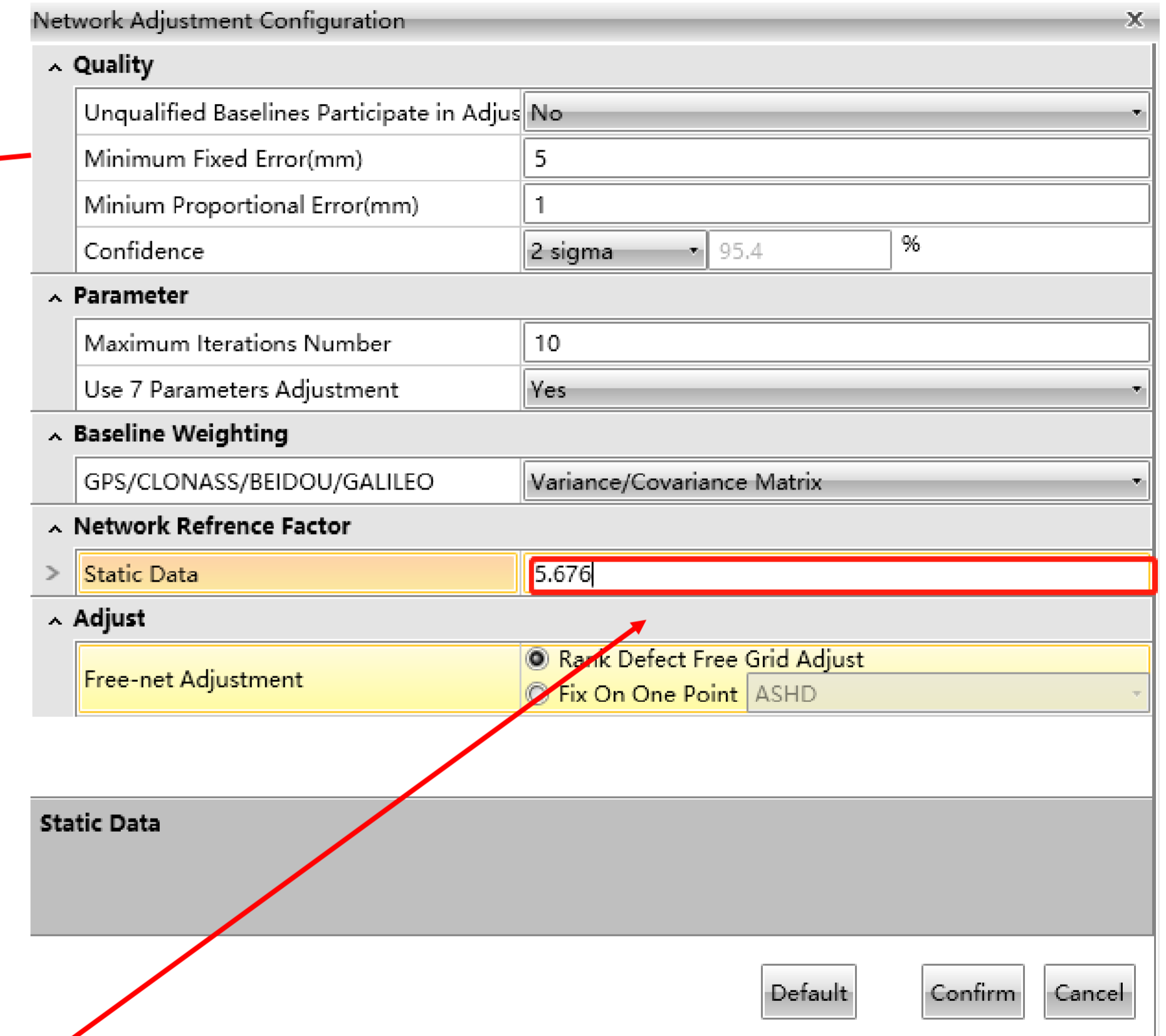
Adjust according to the designated parameters on the left side

Step6: Change NRF, re-adjust



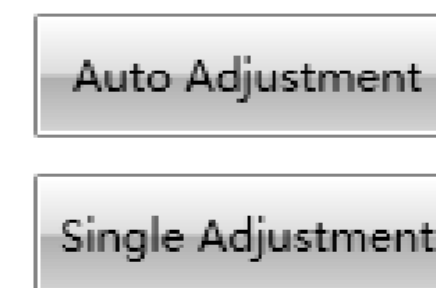
The Adjustment dialog box shows the following configuration:

- Adjustment Type: Free-net Adjustment, Constraint Adjustment (WGS84 Coordinate...), Two-Dimensional Constraint Adjustment, Elevation Fitting (Best Practice)
- Buttons: Auto Adjustment, Single Adjustment, Setting, Create Report, Remove
- Adjustment Report: Free-net Adjustment, Three-Dimensional Network Adjustment WGS84 Coordinate System

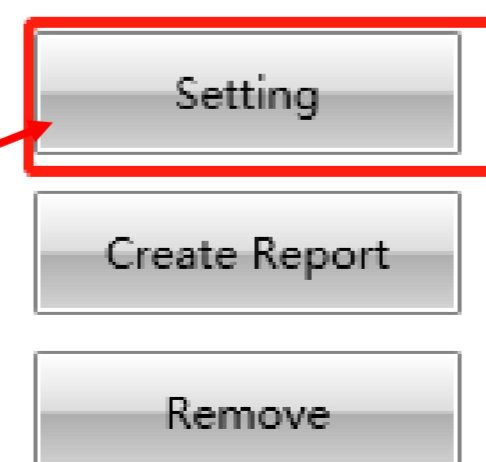


The Network Adjustment Configuration dialog box shows the following configuration:

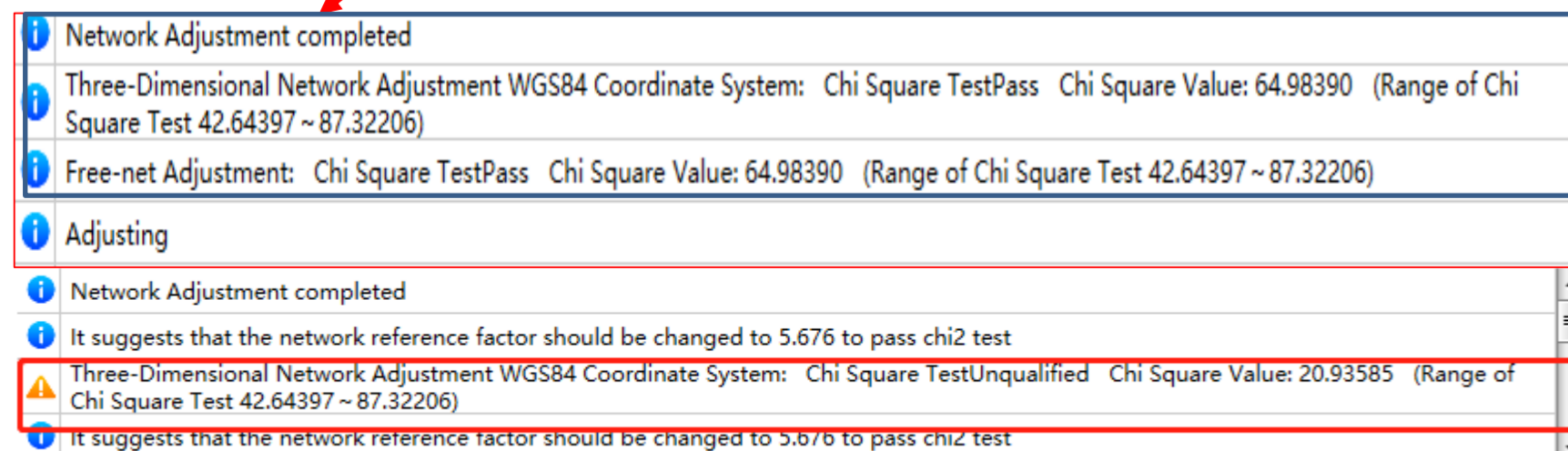
- Quality: Unqualified Baselines Participate in Adjust (No), Minimum Fixed Error(mm) (5), Minimum Proportional Error(mm) (1), Confidence (2 sigma, 95.4 %)
- Parameter: Maximum Iterations Number (10), Use 7 Parameters Adjustment (Yes)
- Baseline Weighting: GPS/CLONASS/BEIDOU/GALILEO, Variance/Covariance Matrix
- Network Reference Factor: Static Data (5.676)
- Adjust: Free-net Adjustment (Rank Defect Free Grid Adjust, Fix On One Point ASHD)
- Buttons: Default, Confirm, Cancel



Auto Adjustment
Single Adjustment

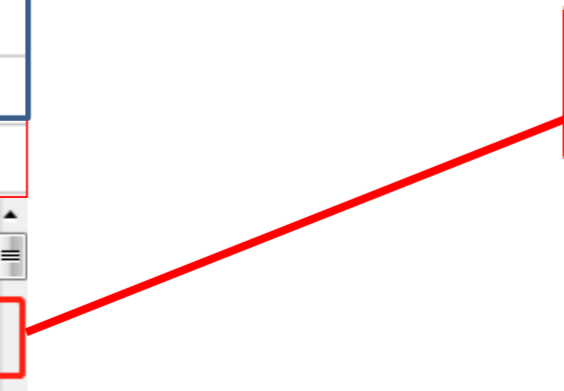
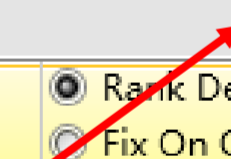


Setting
Create Report
Remove



Log window showing adjustment results:

- Network Adjustment completed
- Three-Dimensional Network Adjustment WGS84 Coordinate System: Chi Square TestPass Chi Square Value: 64.98390 (Range of Chi Square Test 42.64397 ~ 87.32206)
- Free-net Adjustment: Chi Square TestPass Chi Square Value: 64.98390 (Range of Chi Square Test 42.64397 ~ 87.32206)
- Adjusting
- Network Adjustment completed
- It suggests that the network reference factor should be changed to 5.676 to pass chi2 test
- Three-Dimensional Network Adjustment WGS84 Coordinate System: Chi Square TestUnqualified Chi Square Value: 20.93585 (Range of Chi Square Test 42.64397 ~ 87.32206)
- It suggests that the network reference factor should be changed to 5.676 to pass chi2 test

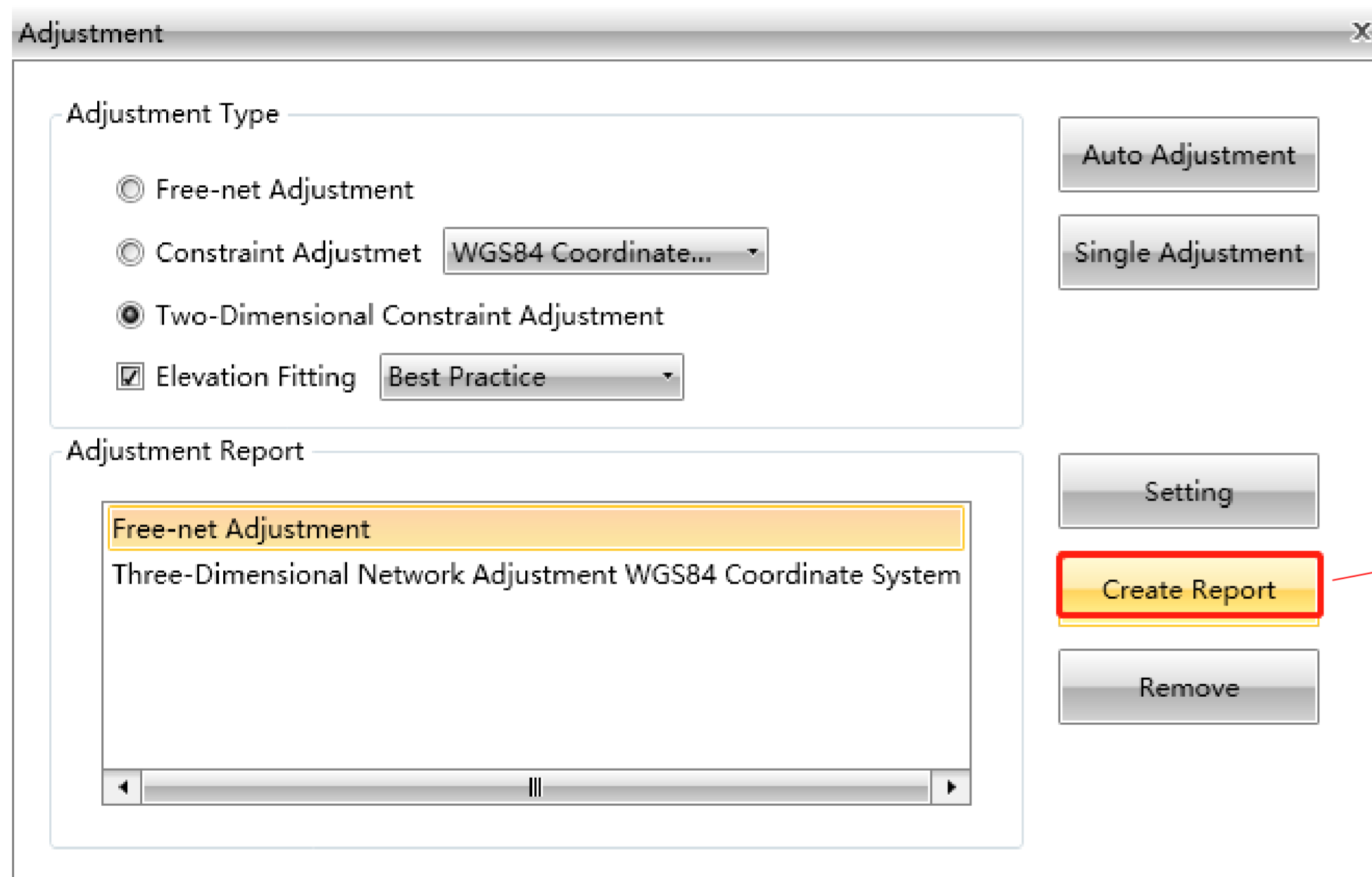


Step7: Check the result - Station

The screenshot displays the CHCNAV software interface. On the left is a vertical toolbar with icons for 'Check', 'Station', 'Control Point', 'Baselines', 'Repeat Baselines', and 'Loop Closure'. The 'Station' icon is highlighted. The main window shows a table with 9 columns: Index, Contrc, Station, North(m), East(m), Height(m), Longitude(Local), Latitude(Local), and Ellipsoid. Row 5 is selected, corresponding to station RISH. To the right, a 'Property' window is open, showing a search bar with 'A-Z', a 'Name' field with 'RISH', and a 'Coordinate System' dropdown menu set to 'Adjustment Of Free Networks'. Below the dropdown, a list of baselines is shown: 'rish2440.17o', 'Baseline solutionB15(shoa2440.hcs->rish2440.hcs)', 'Baseline solutionB20(telv2440.hcs->rish2440.hcs)', and 'Baseline solutionB26(zofi2440.hcs->rish2440.hcs)'. At the bottom of the property window, the text 'WGS84 Coordinate System' is visible, and a 'or.' label is present above a field containing the value '4447783.97447'.

Index	Contrc	Station	North(m)	East(m)	Height(m)	Longitude(Local)	Latitude(Local)	Ellipsoid
1	▲	ASHD	9041115.58620	-7752604.56310	30.4480	034°37'31.6490521"E	031°45'59.8662459"N	30.4480
2		HEFE	8968473.83981	-7585128.35451	193.6147	035°04'18.7969027"E	032°17'10.6509864"N	193.6147
3		KSHO	8957890.81113	-7612150.84117	355.0656	035°05'46.7286062"E	032°10'16.1689495"N	355.0656
4		NETA	9013383.35437	-7602007.54234	39.7422	034°51'40.7238330"E	032°17'0.2092276"N	39.7422
5		RISH	9018913.62730	-7683910.45239	55.2793	034°46'25.6035125"E	031°59'16.5669204"N	55.2793
6		SHOA	8981393.60882	-7666976.70310	101.0923	034°56'57.4426310"E	031°59'59.7206336"N	101.0923
7		TELV	9021263.68910	-7664410.39786	44.8677	034°46'43.6083697"E	032°03'46.0034464"N	44.8677
8		ZOFI	8997961.44281	-7619921.84670	86.5537	034°54'53.3876069"E	032°11'46.6209192"N	86.5537

Step7: Check the result - Report



The screenshot shows the 'Network Adjustment Report' interface. It features the CHCNAV logo at the top. Below the title, there are two sections: 'Basic Information' and '1 Adjustment Settings'. A red arrow from the 'Create Report' button in the previous screenshot points to the 'Basic Information' table.

Basic Information	
Name	Value
Username	DESKTOP-7MVD5J7
Project Datum	Default
Project Name	For_Demo
Distance Units	Meter
Height Units	Meter

1 Adjustment Settings	
Basic Parameters	
Name	Value
Ellipsoid Name	WGS84
Major Axis(m)	6378137.0000

In the United States, contact

iGage Mapping Corporation
+1-801-412-0011

www.igage.com/cgo2

For demos, pricing and additional information.

30-day fully functional demos are available by software code.

THANK YOU

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