STATIC SURVEY QUICK GUIDE

–DAVID(2024.01.08)

STATIC SURVEY QUICK GUIDE

Part A: How to do static survey? Procedures?

Part B: How to use SGO to process static data?

Part A: How to do static survey? Procedures?

1. Design a draft control network (on Google Earth)

2. Make a plan of how to shift receiver

3. Configure same settings for all receivers(static mode, recording interval, Mask Angle)

4. Record static data in field

(**MUST** fill Static Field Record Table)

Part A: How to do static survey? Procedures?

5. Download static data and modify static file name

1) Make backup for downloaded raw data

2) Modify the static data file name according to merged General Static Field Record table(very important)

6. Everyday Import static data to SGO and process it

(To check network shape correct or not, and check baseline qualified or not)

7. Import all static data files to SGO for process after all field record complete

1. Design a draft control network (on Google Earth)

--Open google earth and decide where to put the receiver in field and make a mark on GE
--Manually draw a draft network map(as below) according.
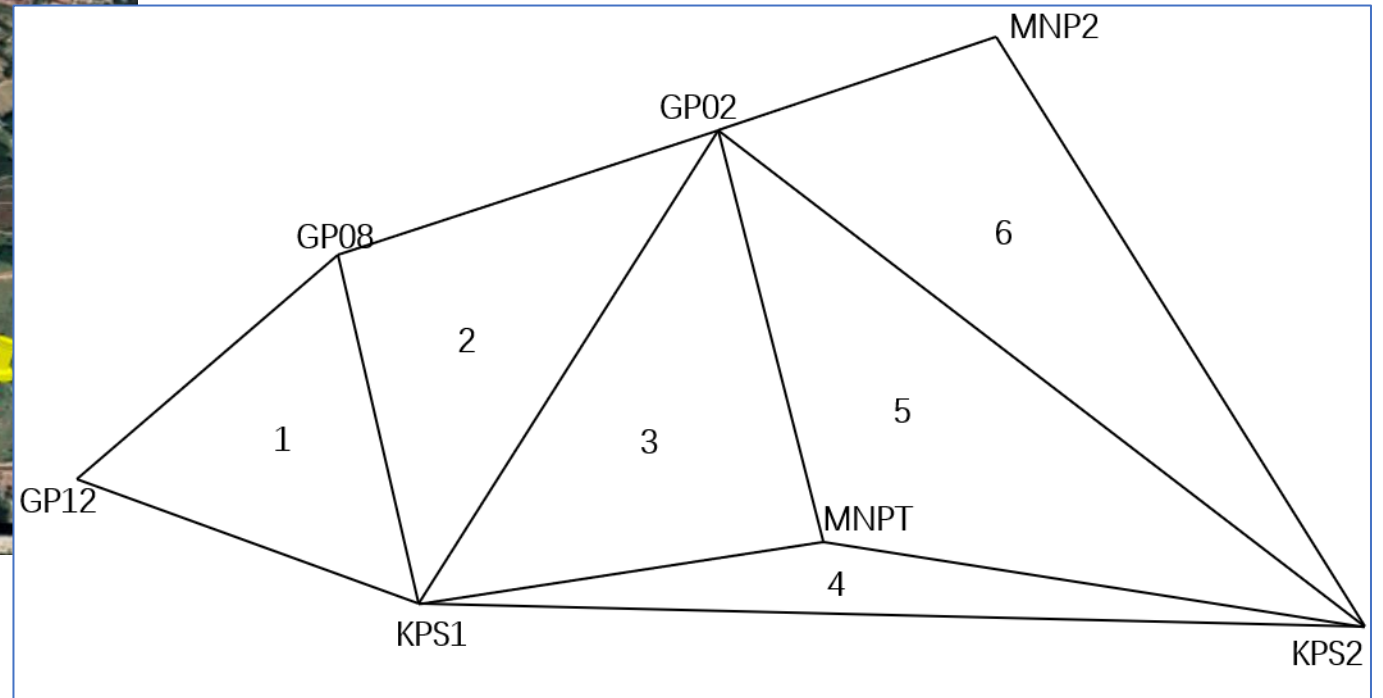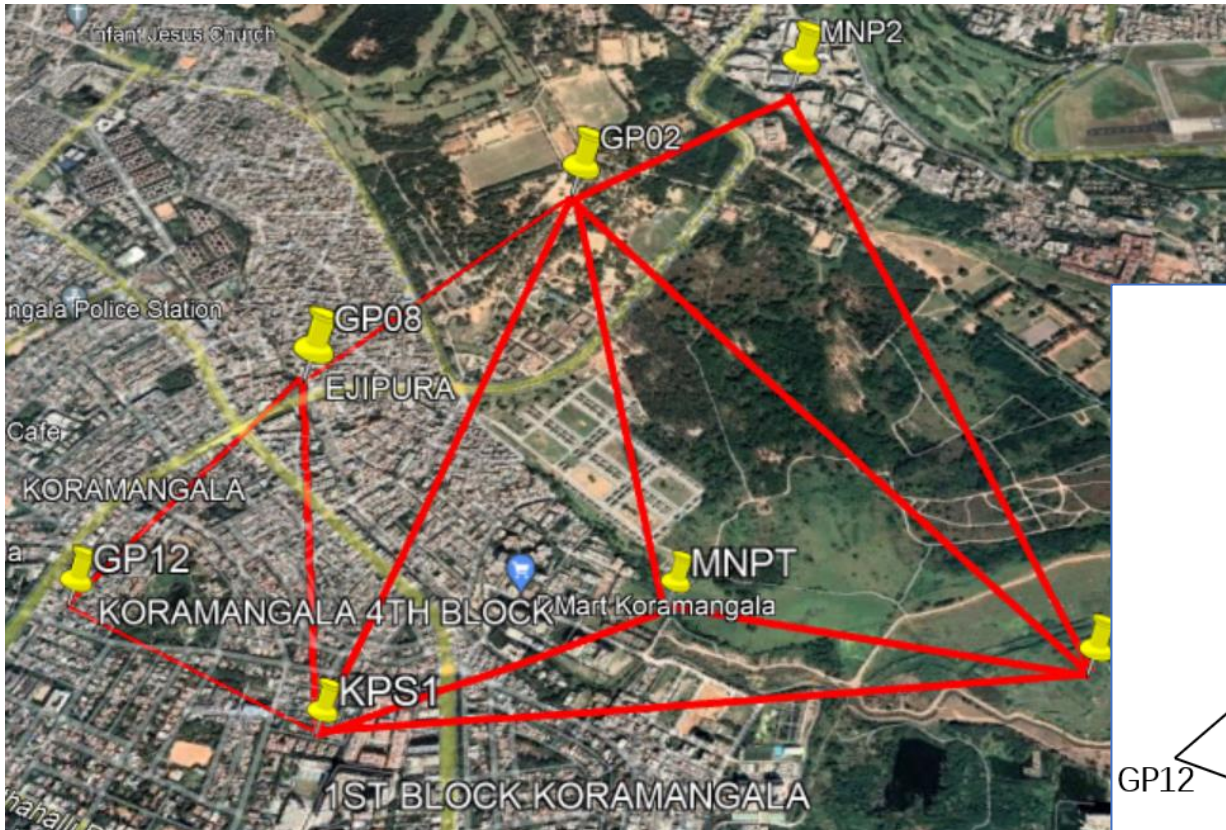
2. Make a plan of how to shift receiver

	Triangle NO.	Triangle node	REMARKS
Day 1, morning	Triangle 1	GP12-GP08-KPS1	(GP12(Mr.Jason), KPS1(David), GP08(Jack)
Day 1, afternoon	Triangle 2	GP08-KPS1-GP02	Shift receiver from GP12 to GP02
Day 2, morning	Triangle 3	KPS1-GP02-MNPT	Shift receiver from GP08 to MNPT
Day 2, afternoon	Triangle 4	KPS1-MNPT-KPS2	Shift receiver from GP02 to KPS2
Day 3, morning	Triangle 5	MNPT-KPS2-GP02	Shift receiver from KPS1 to GP02
Day 3, afternoon	Triangle 6	KPS2-GP02-MNP2	Shift receiver from MNPT to MNP2
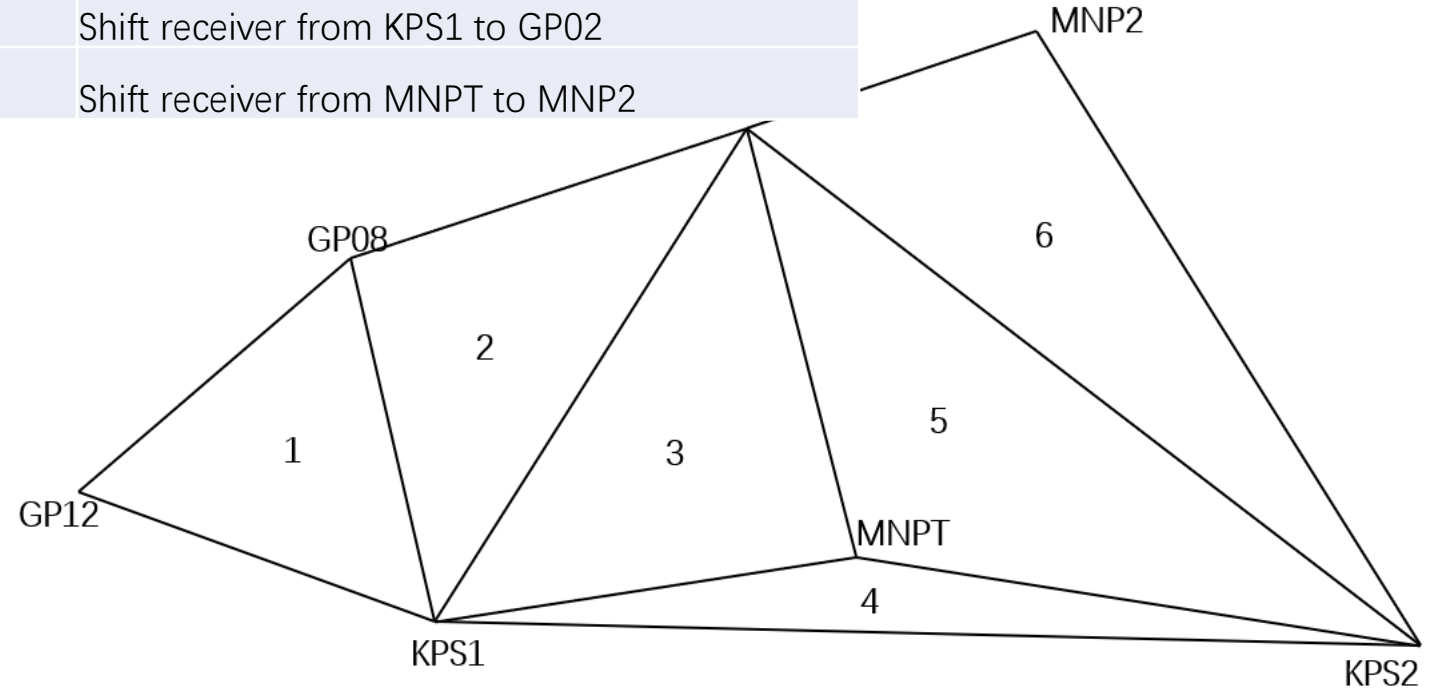
3. Before go field, need to do:

1) Make same setting for all receivers (Set it to static mode, recording interval (5" or 10", Mask angle(keep default 10 degree)

2) Print the designed draft network(or just draw it manfully) and Field Record Table for every surveyor

In field, what a surveyor need to do:

--Power on receiver.
--Measure antenna height
--Fill the Static Survey_Field Record Table.
--Power off receiver
--Shift receiver to another locationaccording the plan.

4. Record static data in field.

Fill the Static survey_Field Record Table (Very Important)

1) Every surveyor Must fill this table for every time field recording
2) Below is record for Triangle 1 (3 surveyors made 3 Field recording tables)

STATIC SURVEY_FIELD RECORD TABLE

Recorder: Mr.Jason	Date: 2022-05-24			
Point Name (Control Point)	Receiver Serail No.	Ant H(m)	Start Time	End Time
GP12	SG11A6133352942	1.565	11:28	12:31

STATIC SURVEY_FIELD RECORD TABLE

Recorder: Mr.David	Date: 2022-05-24			
Point Name (Control Point)	Receiver Serail No.	Ant H(m)	Start Time	End Time
KPS1	SG11A6133436301	1.472	11:27	12:33

STATIC SURVEY_FIELD RECORD TABLE

Recorder: Mr. Jack	Date: 2022-05-24			
Point Name (Control Point)	Receiver Serail No.	Ant H(m)	Start Time	End Time
GP08	SG11A6133352800	1.469	11:30	12:32
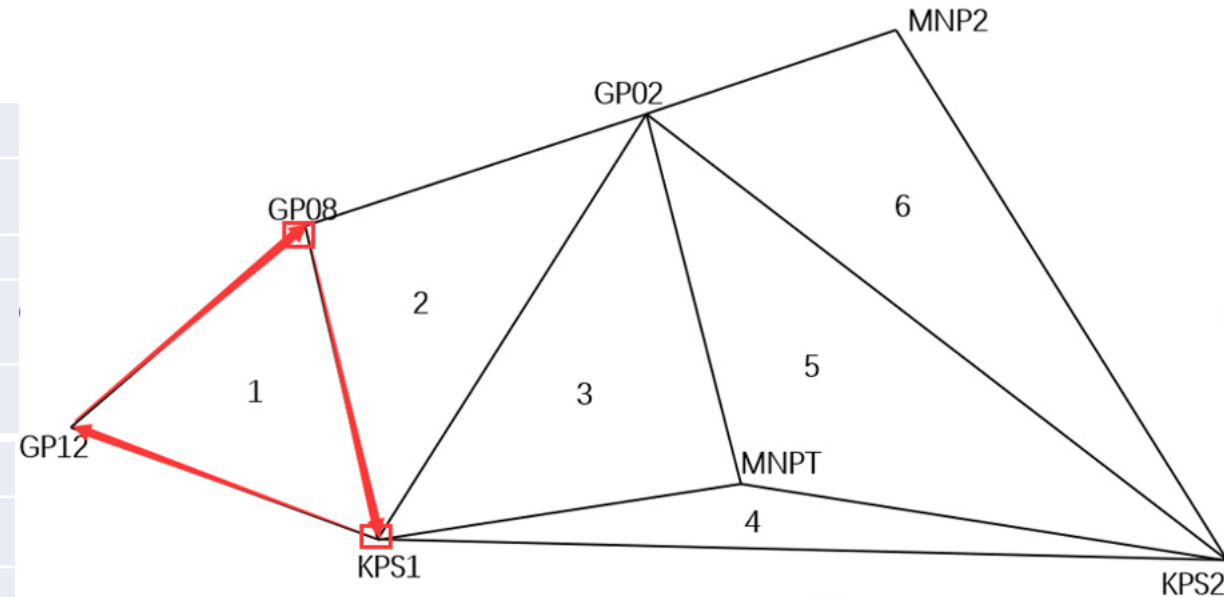
5. Download static data file and modify the file name

1. Everyday merge 3 surveyor's Field Record Table into a **General Field Record Table**
2. Download static data file to computer and modify the static data file name according to **General Field Record Table** and the designed draft network.
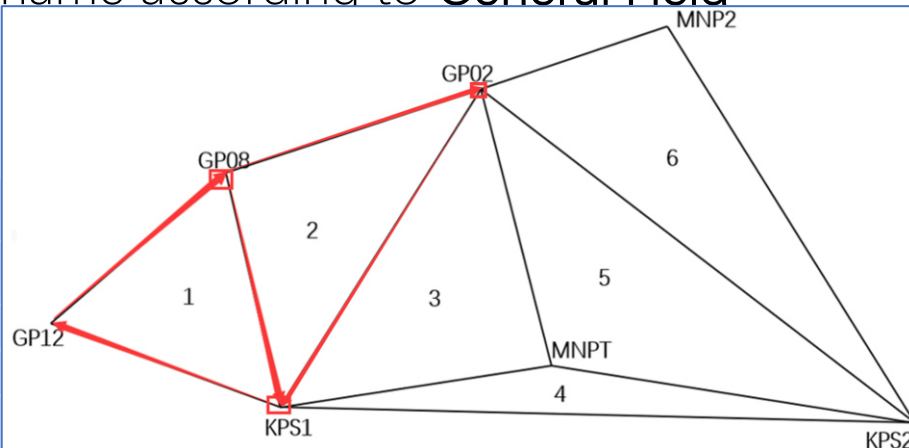
STATIC SURVEY_FIELD RECORD TABLE

1 Triangle 1 (GP12-GP08-KPS1), 2022-05-24, morning time

Point Name (Control Point)	Receiver Serail No.	Ant H(m)	Start Time	End Time	Default static file name	Modify static file name as
GP12	SG11A6133352942	1.565	11:28	12:31	2942***.sth	GP12***.sth
GP08	SG11A6133352800	1.469	11:30	12:32	2800***.sth	GP08***.sth
KPS1	SG11A6133436301	1.472	11:27	12:33	6301***.sth	KPS1***.sth

2 Triangle 2 (GP08-KPS1-GP02), 2022-05-24, afternoon time

Point Name (Control Point)	Receiver Serail No.	Ant H(m)	Start Time	End Time	Default static file name	Modify static file name as
GP08	SG11A6133352800	1.423	14:30	15:31	2800***.sth	GP08***.sth
KPS1	SG11A6133436301	1.454	14:32	15:35	6301***.sth	KPS1***.sth
GP02	SG11A6133352942	1.523	14:29	15:01	2942***.sth	GP02***.sth

6. Everyday Import static data to SGO and process it (Very necessary)

1) Import Day 1 static data (triangle 1 and 2) to SGO when day 1 field work complete.

Why need to do this everyday ?

1) Find real network shape is same as designed draft or not
and check point name correct or not

2) Process it to find out if all baselines qualified or not.

If some baseline not qualified(in red) and not possible to make
it qualified by changing software setting, need to Re-record
the static data of the affected triangle(like triangle 2)
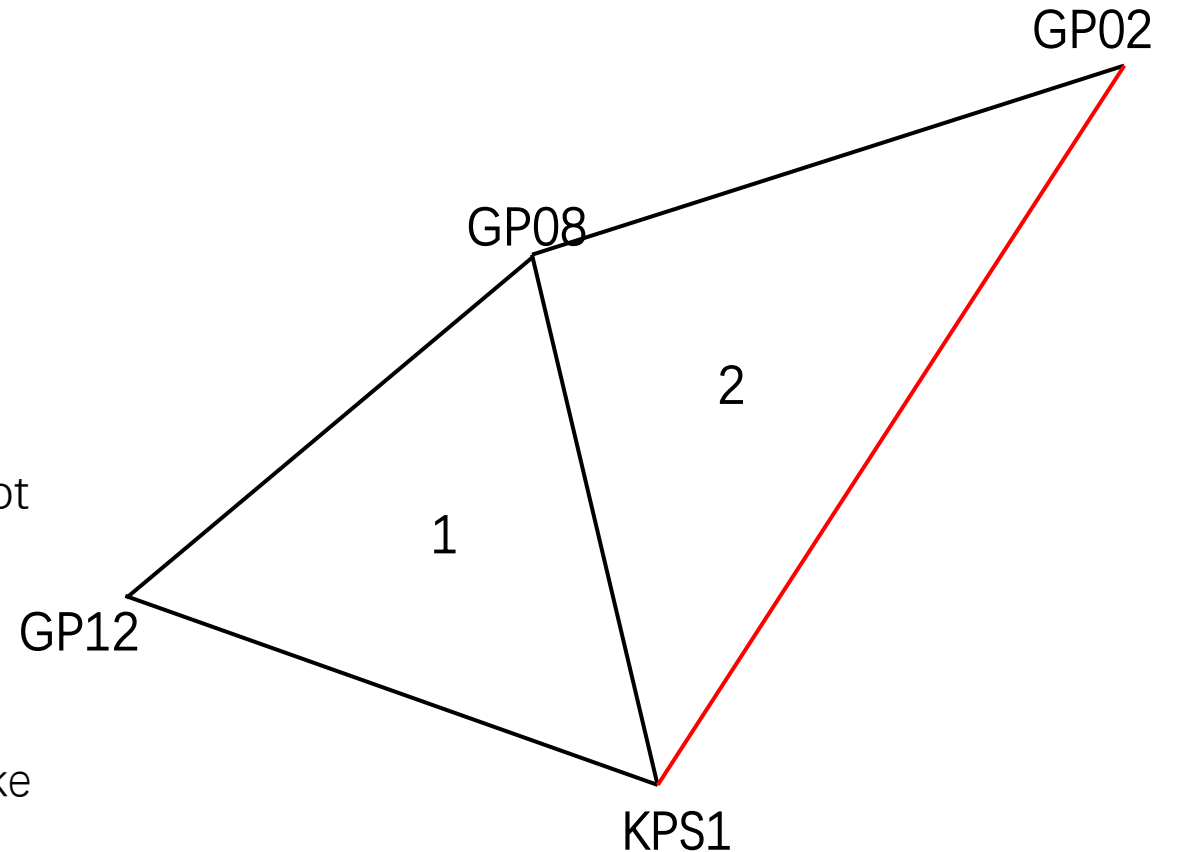
Everyday Import static data to SGO and process it (Very necessary)

2) Import Day 1 and Day 2 static data to SGO when day 2 field work complete

(Triangle 1, 2, 3, 4)
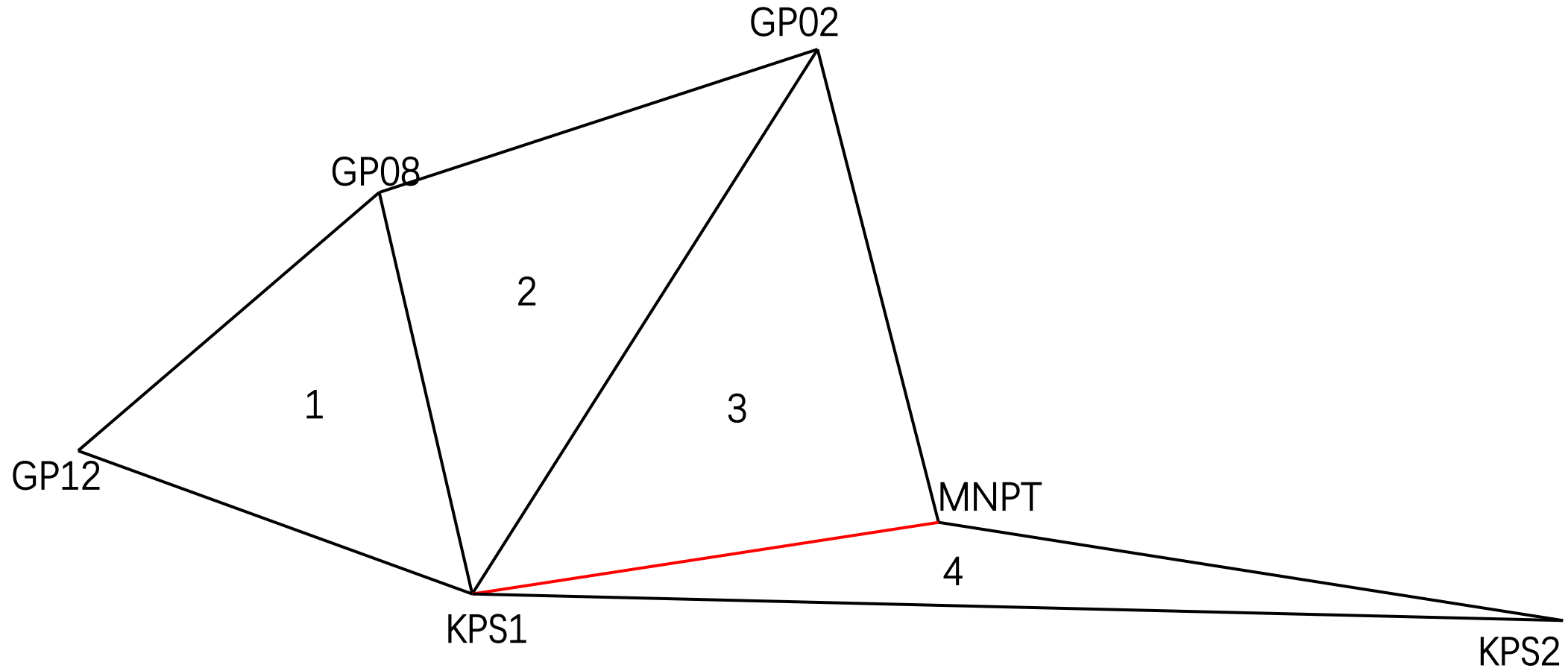
7. Import all static data to SGO and process it

Import all static data (Day 1, Day 2, Day 3) to SGO when day 3 field work complete

（all triangles, 1-6)
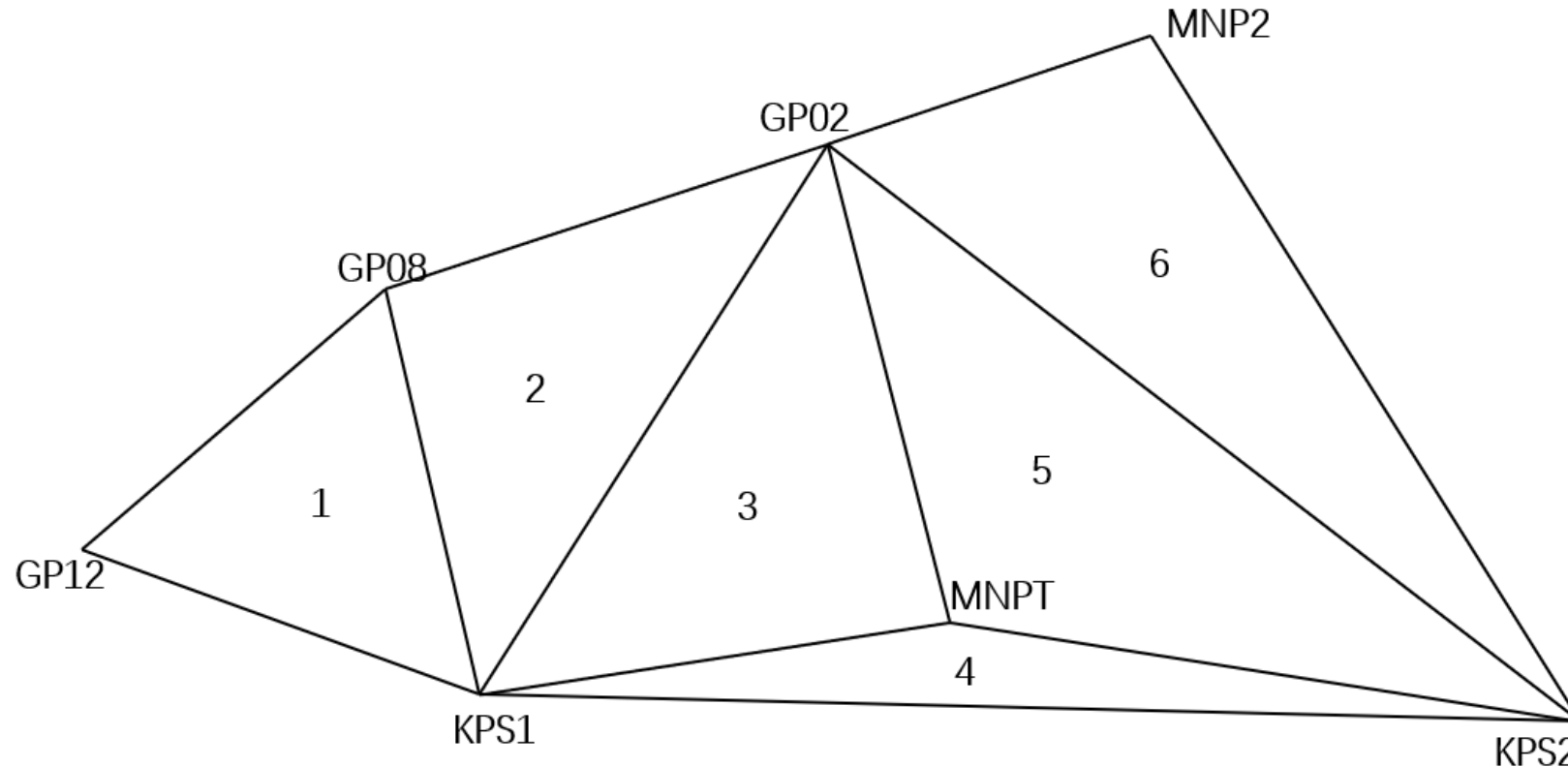
Part B: How to use SGO to process static data_1

1. New a project and set coordinate system parameters(Ellipsoid, Projection)

2. Import static data files to SGO.

3. Check station name (it shall be the same as the modified static file name(first 4 digits) and input antenna height

(Input antenna height one by one manually according to the merged General Field Record Table).

Part B: How to use SGO to process static data_1

4. Process baseline.

5. Input known point.

6. Network adjustment.

7. Output result.

1. New a project
Set coordinate system parameters
(Ellipsoid, Projection)

2. Import static data file to SGO

[Common operation]-[Import]

3. Check station name and antenna height

1) If not, change station name manually from here
2) Input antenna height one by one manually
----According to the merged General Field Record Table

From where we can modify station name and antenna height

Another method to change station name and antenna height

Firstly import static data to SGO , later modify station name and input antenna height
(This method is not recommended, but also works)
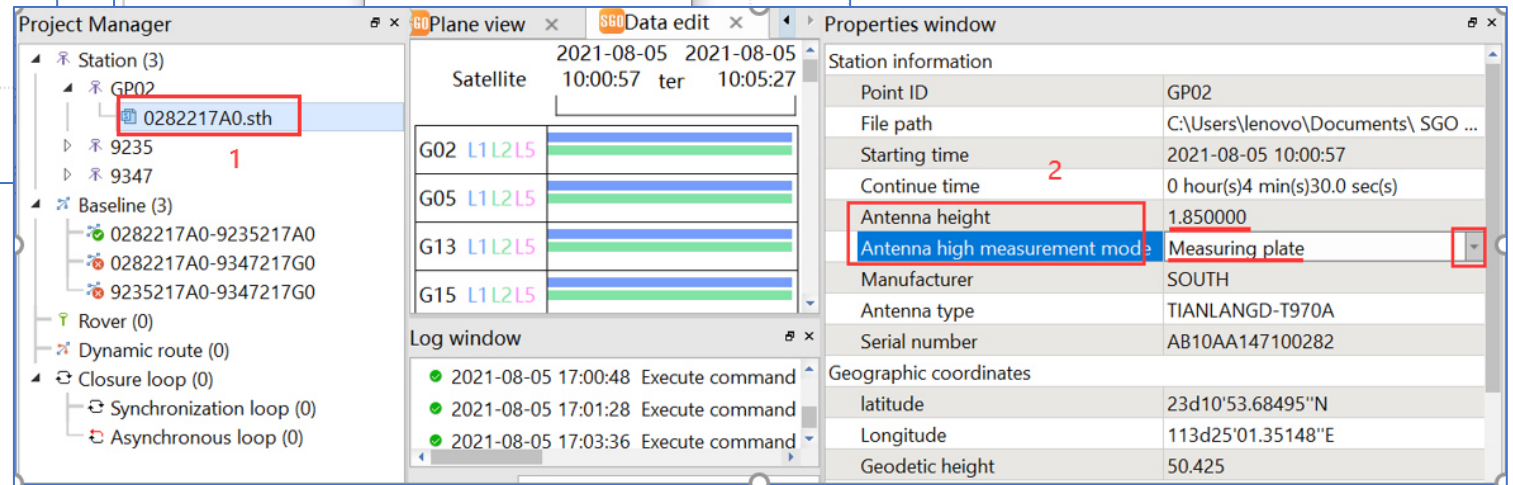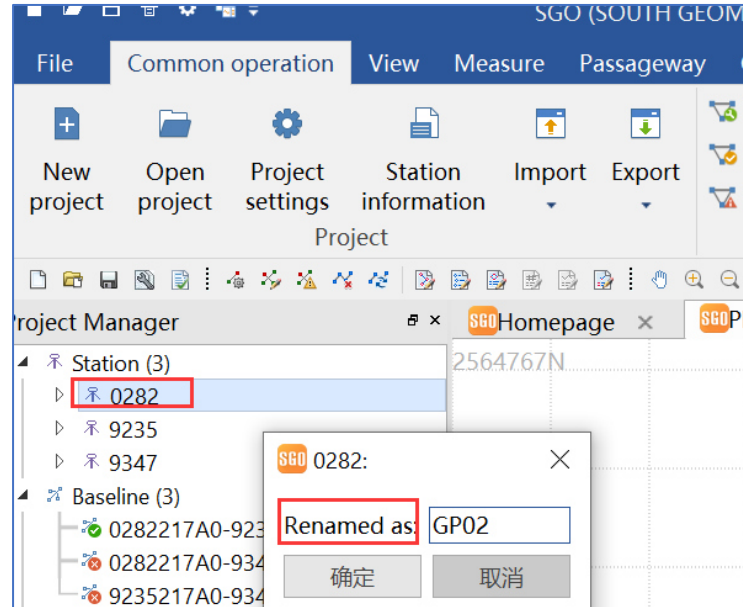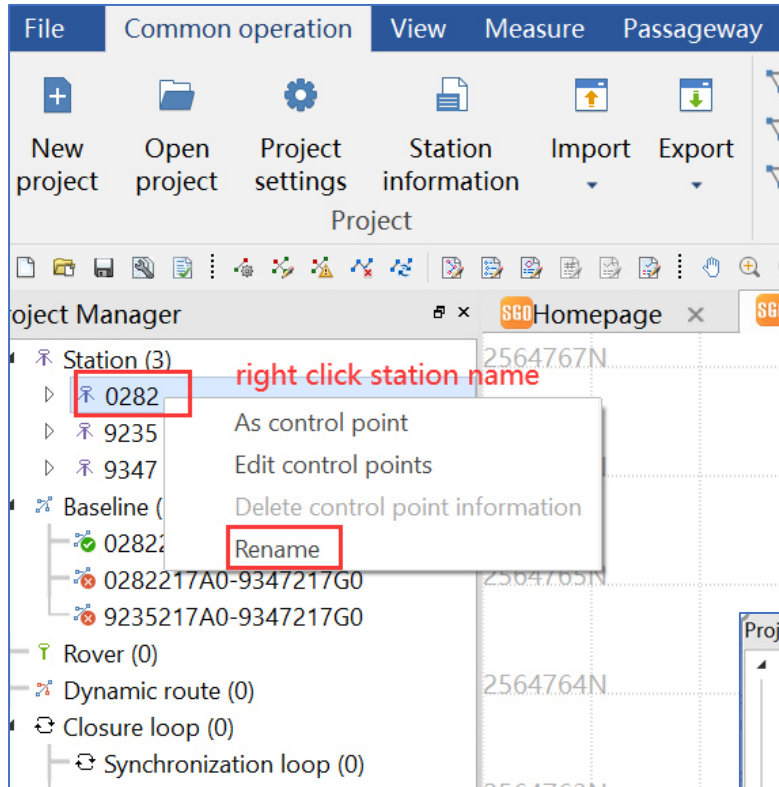
4. Process baseline

If a baseline is **qualified, it turns green color.**
If **unqualified, it is grey color**(as below)

If Baseline not qualified, what need to do?

--Change settings in [Baseline process settings]
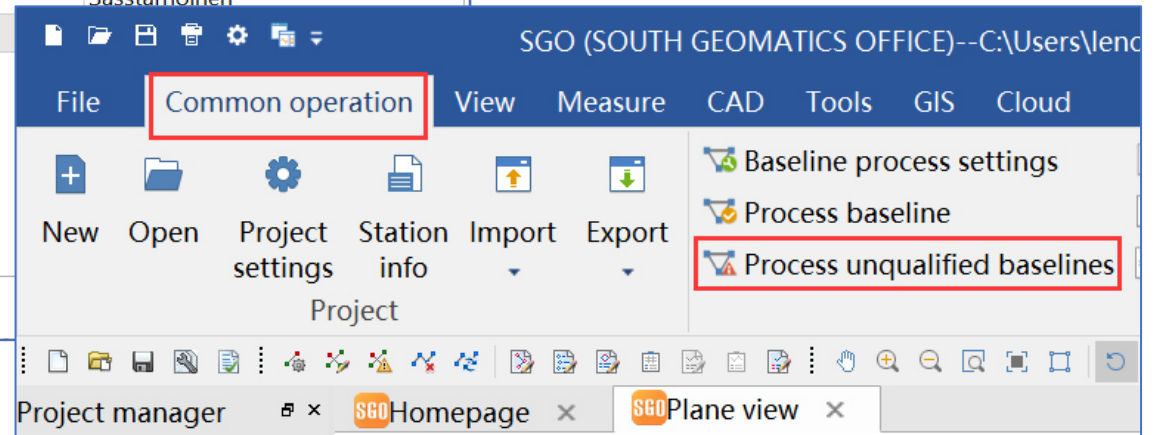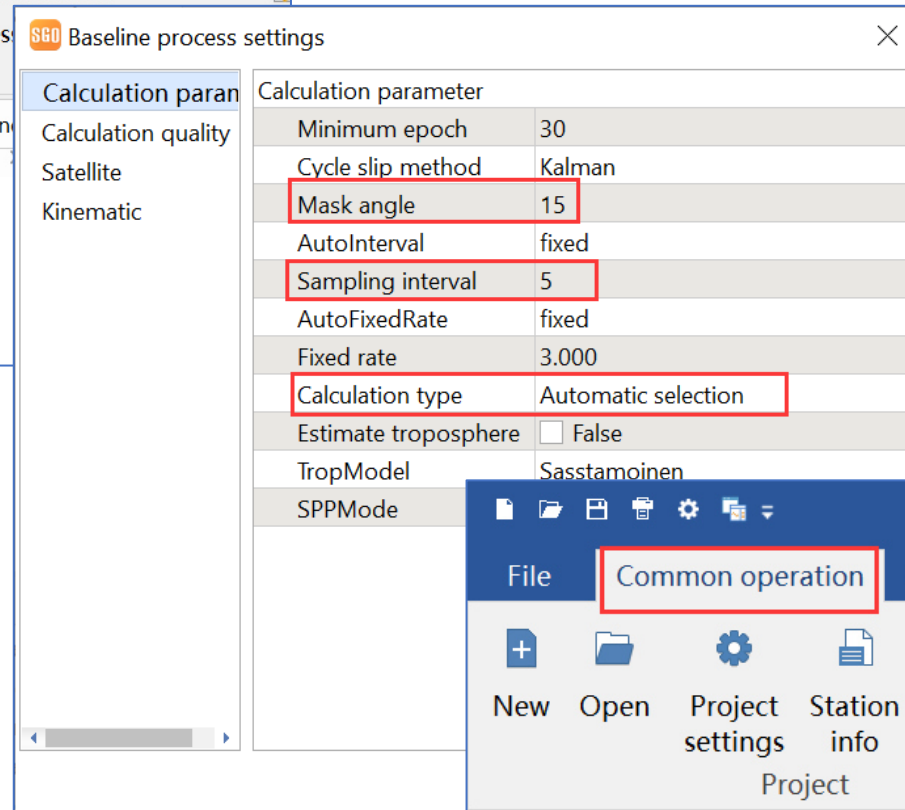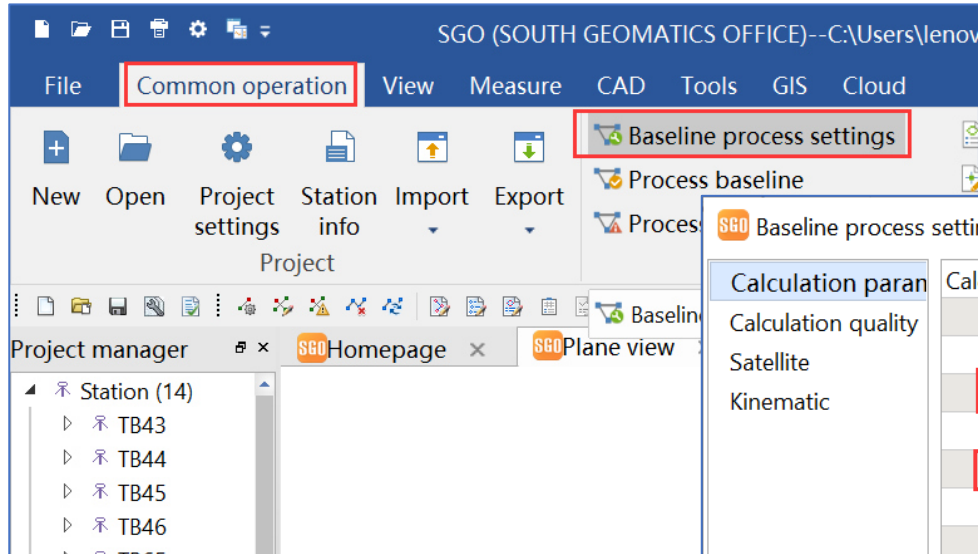
After changing settings in [Baseline process settings] and try to process unqualified baseline again. It becomes qualified !

This image shows baseline(KPS1-MNPT) qualified(green color) after changing settings and being processed again
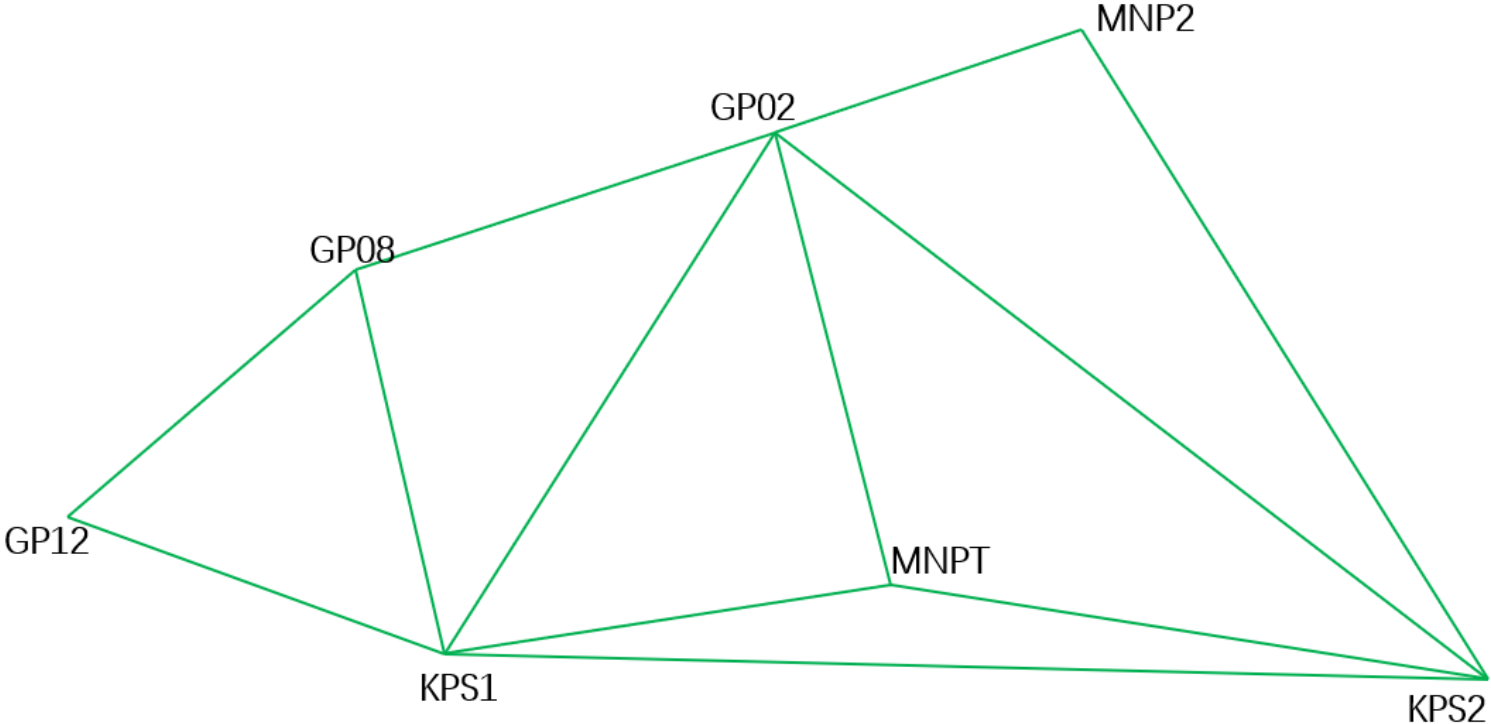
5. Input known point

(Right click a station , choose Edit control point, then click Add button to input known point)

6. Network adjustment.

[Common operation]-[Net adjustment]

Right click any area of Net Adjustment report
to export report(Html format)
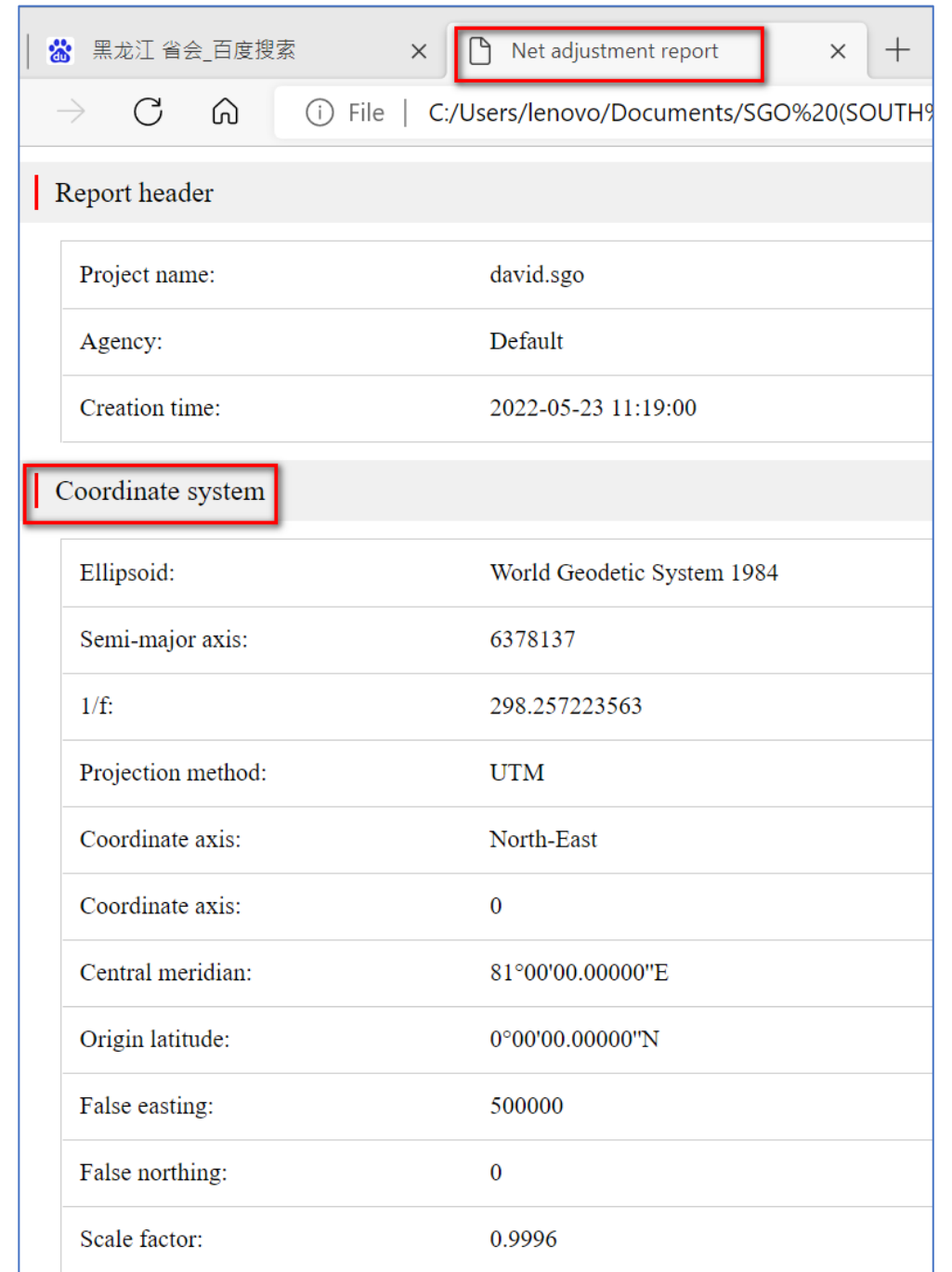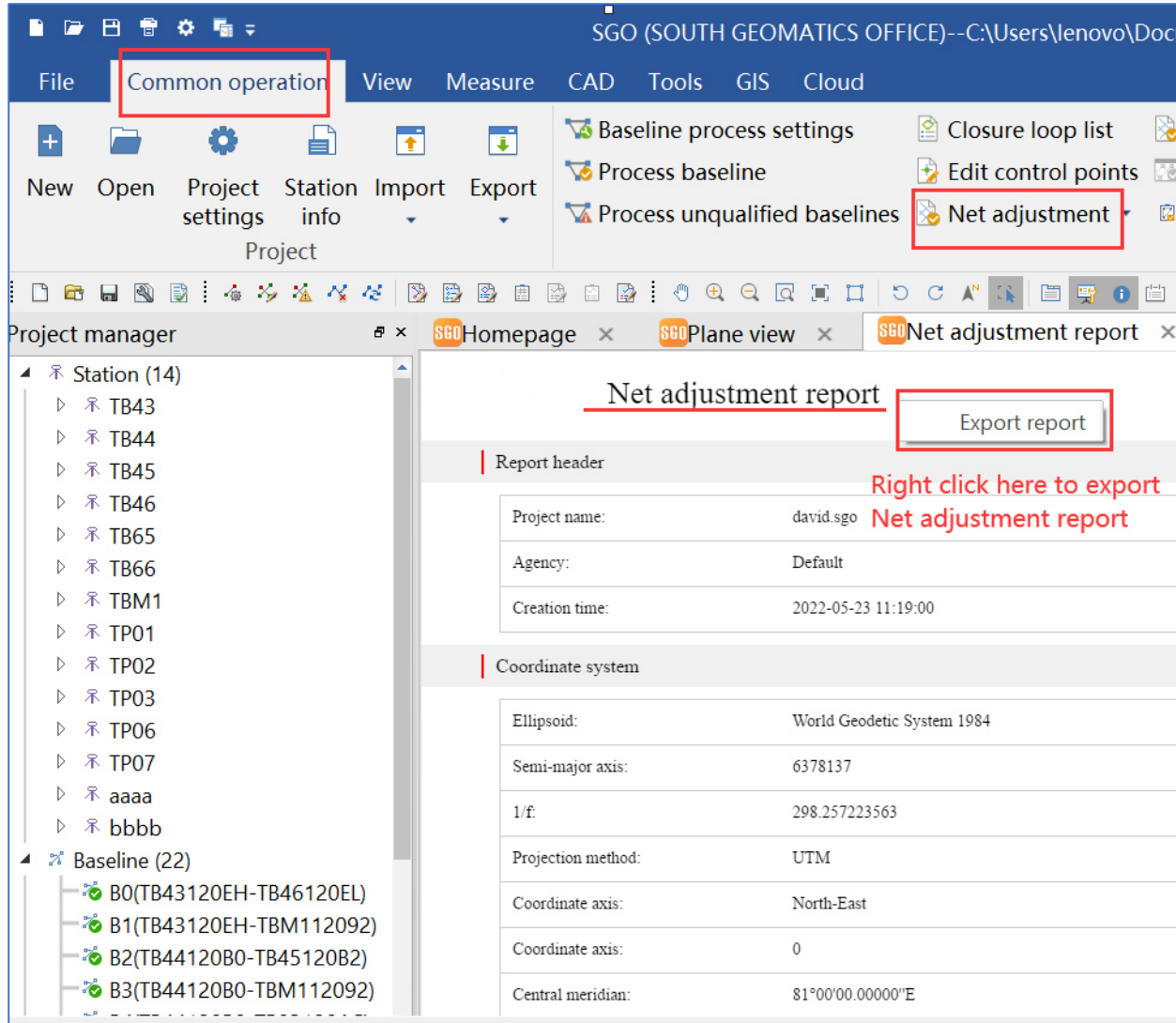
Word format Net adjustment report

[File]-[Project settings]-[Export settings], Export report format, choose Doc format.

It will open a WORD document automatically named Net Adjustment Report which is Word format Net adjustment report.
(For some computer, due to Microsoft office installation is not perfect, so it might not output WORD format report successfully)

7. Output result.
[View]-[Station list]

(TBM1 is the known point(5000,5000,500)
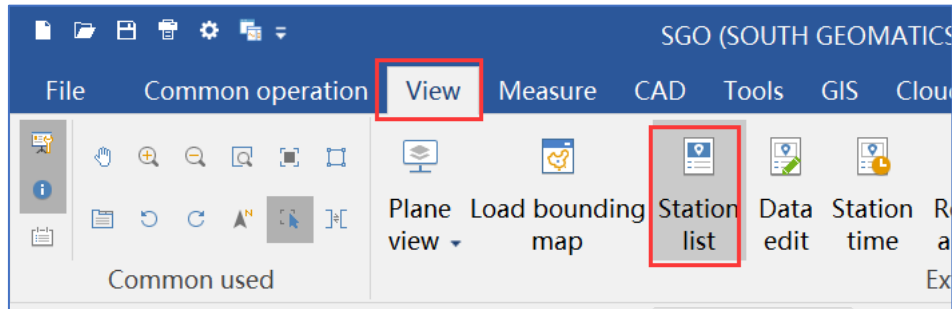
	Station name	Coordinate quality	North(m)	East(m)	h(m)
1	TB43	Adjusted Adjusted	4779.056	5057.048	495.899
2	TB44	Adjusted Adjusted	4625.093	4638.631	418.687
3	TB45	Adjusted Adjusted	4674.735	4621.118	413.844
4	TB46	Adjusted Adjusted	4830.287	5051.775	498.326
5	TB65	Adjusted Adjusted	6086.079	4058.108	482.409
6	TB66	Adjusted Adjusted	6086.264	4078.396	483.028
7	TBM1	Control point Contr.	5000.000	5000.000	500.000
8	TP01	Adjusted Adjusted	4267.359	4755.585	437.762
9	TP02	Adjusted Adjusted	4836.165	5432.770	499.656
10	TP03	Adjusted Adjusted	4688.591	5316.933	495.678
11	TP06	Adjusted Adjusted	4451.080	5037.400	482.182
12	TP07	Unknown Unknown	1640852.334	201823.602	379.194
13	aaaa	Adjusted Adjusted	4161.818	4802.500	443.893
14	bbbb	Adjusted Adjusted	4452.778	4910.430	481.373

Output result, save result file(csv,txt,dat format)
(Right click any area of station list page to export result file)

Open result file(csv, txt, dat format)

Point name	Quality	North	East	Elevation	X(ECEF)	Y(ECEF)	Z(ECEF)	B	L	H
TB43	Static point	4779.056	5057.048	495.899	1258472.379	6037786.359	1621420.603	14°49'27.88839''	78°13'34.50826''	368.997
TB44	Static point	4625.093	4638.632	418.686	1258872.892	6037668.181	1621247.106	14°49'22.71428''	78°13'20.58893''	291.785
TB45	Static point	4674.735	4621.119	413.844	1258887.092	6037647.531	1621293.611	14°49'24.32108''	78°13'19.98305''	286.942
TB46	Static point	4830.287	5051.775	498.326	1258475.968	6037774.644	1621470.652	14°49'29.55184''	78°13'34.31081''	371.424
TB65	Static point	6086.079	4058.108	482.409	1259395.204	6037242.365	1622667.731	14°50'09.97686''	78°13'00.58082''	355.507
TB66	Static point	6086.264	4078.396	483.028	1259375.461	6037246.98	1622668.312	14°50'09.99108''	78°13'01.25877''	356.126
TBM1	Static point	5000	5000	500	1258520.184	6037722.921	1621634.405	14°49'35.04843''	78°13'32.51019''	373.098
TP01	Static point	4267.359	4755.585	437.762	1258776.495	6037800.147	1620907.808	14°49'11.13132''	78°13'24.64571''	310.86
TP02	Static point	4836.165	5432.77	499.656	1258103.035	6037850.91	1621481.23	14°49'29.89639''	78°13'47.04109''	372.754
TP03										
TP06										
TP07										
aaaa										
bbbb										

Result file(csv format)

Result file(txt format)

平差后点坐标(TBM1,5000,5000,500) - Notepad

File Edit Format View Help

```
Point name,Quality,North,East,Elevation,X(ECEF),Y(ECEF),Z(ECEF),B,L,H
TB43,Static point,4779.056,5057.048,495.899,1258472.379,6037786.359,1621420.603,14°49'27.88839''N,78°13'34.50826''E,368.997
TB44,Static point,4625.093,4638.632,418.686,1258872.892,6037668.181,1621247.106,14°49'22.71428''N,78°13'20.58893''E,291.785
TB45,Static point,4674.735,4621.119,413.844,1258887.092,6037647.531,1621293.611,14°49'24.32108''N,78°13'19.98305''E,286.942
TB46,Static point,4830.287,5051.775,498.326,1258475.968,6037774.644,1621470.652,14°49'29.55184''N,78°13'34.31081''E,371.424
TB65,Static point,6086.079,4058.108,482.409,1259395.204,6037242.365,1622667.731,14°50'09.97686''N,78°13'00.58082''E,355.507
TB66,Static point,6086.264,4078.396,483.028,1259375.461,6037246.980,1622668.312,14°50'09.99108''N,78°13'01.25877''E,356.126
TBM1,Static point,5000.000,5000.000,500.000,1258520.184,6037722.921,1621634.405,14°49'35.04843''N,78°13'32.51019''E,373.098
TP01,Static point,4267.359,4755.585,437.762,1258776.495,6037800.147,1620907.808,14°49'11.13132''N,78°13'24.64571''E,310.860
TP02,Static point,4836.165,5432.770,499.656,1258103.035,6037850.910,1621481.230,14°49'29.89639''N,78°13'47.04109''E,372.754
TP03,Static point,4688.591,5316.936,495.678,1258221.552,6037861.201,1621336.267,14°49'25.05202''N,78°13'43.23102''E,368.776
TP06,Static point,4451.080,5037.400,482.183,1258502.038,6037852.344,1621100.027,14°49'17.21782''N,78°13'33.98749''E,355.281
TP07,Static point,4875.984,5424.943,501.760,1258109.518,6037841.262,1621520.141,14°49'31.18778''N,78°13'46.76302''E,374.858
aaaa,Static point,4161.818,4802.500,443.893,1258736.005,6037842.046,1620807.983,14°49'07.71906''N,78°13'26.25729''E,316.991
bbbb,Static point,4452.777,4910.430,481.374,1258626.101,6037825.652,1621099.939,14°49'17.22181''N,78°13'29.74358''E,354.472
```

THANK YOU !