

GPS STATION OCCUPATION DESCRIPTION

Project / GPS Session Information			
Project:	GPS station location:	GPS operator:	
GPS station ID:	Station name/number:	GPS session ID/no.:	
Type of GPS Session conducted (static, kinematic, etc.):		Total no. of receivers used:	
Location of the other GPS receivers used in same session:			
Session date (YYYY-MM-DD):	Julian day:	Data file number:	
Session Start Time	Local:	UTC:	
Session Stop Time	Local:	UTC:	
Fixed Control Monument Information			
Trigonometric Station monument number:		Year measured:	
Vertical Benchmark Station number:		Year measured:	
Other Station number (GPS, Doppler, etc.):		Year measured:	
Type of Control Monument:			
WGS 84 Coordinates of Occupied Fixed Control Monument			
Latitude (N/S):		Year measured:	
Longitude (E/W):		Year measured:	
Elevation above ellipsoid:		Year measured:	
Orthometric height:		Year measured:	
Geoid height:		Year measured:	
Hardware / Software Configuration Used			
GPS receiver type: 4000 SSI Geod. Surveyor		Receiver serial number:	
Receiver software - version installed: Nav. / Sig. / Boot		GPSurvey software version:	
Data sampling rate: 1 second		Elevation mask (cut-off angle): 15° (default)	
Minimum no. of satellites: 4 SVs		Other information:	
Antenna Information			
Type of antenna:		Ant. serial No.:	
Antenna cable number:	Antenna cable length:	Tripod/tribrach:	
Type of antenna measurement (True Vertical / Uncorrected):			
True Vertical ant. meas. (+ phase center correction factor of 6.25 cm = Compact L1/L2 / 6.92 cm = Ext. L1/L2)			
True Vertical ant. meas. at > Start of Session:		End of Session:	
Start of Session antenna heights (HI) - 3 slant heights / only for <i>Uncorrected ant. measurements</i>	at notch #	at notch #	at notch #
Average ant. height:			
End of Session antenna heights (HI) - 3 slant heights / only for <i>Uncorrected ant. measurements</i>	at notch #	at notch #	at notch #
Average ant. height:			
Final Antenna Height (HI):	Antenna problems:		
Meteorological Data (Optional)			
Barometer serial number:		Pressure value units:	

Time UTC		Pressure values				Temperature - degrees C				
						Dry		Wet		
GPS Calculated Coordinates										
Preliminary WGS 84 Coordinates - for the point occupied at Start of GPS Session						Final Adjusted Network Coordinates - after Data Processing and Network Adjustment				
Latitude (N/S):						Latitude (N/S):				
Longitude (E/W):						Longitude (E/W):				
Elevation above ellipsoid:						Elevation above ellipsoid:				
Orthometric heights:						Orthometric heights:				
Geoid height:						Geoid height:				
Raw Field Data - at End of GPS Session										
Satellites tracked (SV's)	SV #:	SV #:	SV #:	SV #:	SV #:	SV #:	SV #:	SV #:	SV #:	SV #:
Continuous # of L1 meas.										
Continuous # of L2 meas.										
Total L1 meas.										
Problems encountered during survey / Equipment failures listed:										
Sketches / Additional Information										
Sketch of GPS station - for newly established points; Re-check existing sketches of established control points. If possible, take a photo.						Additional info / sketches (ant. set-up, map of area, etc.).				
GPS operator's signature:						Date (YYYY-MM-DD):				

GPS FIELD PROCEDURE CHECKLIST Trimble 4000

- 1) **To START a GPS Survey Session:** Connect the external battery (or other power source) and turn the Trimble receiver **"ON"** by pressing lightly on the **Power** key. Note that you use the **Enter** or **Accept** keys to enter the contents of any displayed field or screen into the receiver memory. You use the **Clear** key to "erase" any changes keyed into a displayed field and to return to its previous value. Remember, that the **Clear** key will always take you one menu back. Press **Status** to return to the Status display screen.
- 2) **Enter all relevant PARAMETERS** into the GPS receivers (*insure that all receivers on the survey use the same parameters*):
 - a) Press **Log Data**, then **More**, then **Set Up Survey Controls**, followed by **Modify Quickstart Controls**
 - b) CHECK the **Elevation mask: 15 degrees**
 - c) CHECK the **Minimum number of satellites: 4 SV's**
 - d) CHECK the sampling rate, **Meas sync time: 15.0 seconds**
 - e) If correct, press **Accept**, followed by **More**, and **QuickStart Now! (Single Survey)**.
 - f) Now, you should **Enter** a **Data File Name**. You do this by pressing **Log Data**, then **Changes**, followed by **File Name**. It is important that each and every Data File Name be unique, so you know where to find your GPS Data when processing the baselines. Press **Accept**, to enter the new data **File Name**. Select **Status** to return to the Status display screen.
 - g) Next, you should **Enter Antenna Information** (see # 6 below); To do this, press **Log Data**, **Changes**, **Antenna Height** and then enter the antenna height (in *either* centimeters or meters). Then select the **Type of Antenna Measurement: used, True Vertical** or **Uncorrected**, and the **Type of Antenna** used. Finally, **Enter** the **Antenna Serial Number** and press **Accept**. Press **Status** to return to the Status display screen again.
- 3) **Stay away from the antenna during the session;** avoid unnecessary cycle slips; **Note any problems observed during the session, and when they occurred.** This helps troubleshooting later.
- 4) **Measure / Re-check the Antenna Height** at the **End of Session**. **Confirm that you have, in fact, entered the correct antenna height at the start of the session.** This is especially important to do, if you have left the antenna during the session, or if the antenna set-up is unstable, because of strong winds, or any other factors beyond your control.
- 5) **To STOP a GPS Survey Session:** Press **Log Data**, then **End Survey**, followed by **Yes** to stop data recording. Turn the receiver **"OFF"** by pressing on the **Power** key for 3 seconds; this feature prevents accidental turn-offs, if you accidentally press the **Power** key.
- 6) **Remember to Measure and Enter the Antenna Height (HI) 2 times, both at the start of the session and at the end of the session.** Incorrectly measured and/or entered antenna heights are

the single greatest source of problems/inaccuracies on GPS surveys. Remember to **Enter both** the type of antenna measurement that you make, either **True Vertical** or **Uncorrected**, **as well as** the **Antenna Type**, that you are using. Check also the *correction factor* (for the phase center height) for the antenna type, that you have set-up. This varies for *each* antenna type; **Ext L1/L2 Geodetic = 6.92 cm and Compact L1/L2 with Groundplane = 6.25 cm**. If you use **True Vertical** as the measurement type, you must first measure the **True Vertical** height from the exact center of the survey point to the very bottom of "the black base on the underside of the antenna, and then *add the phase center correction factor (either 6.92 cm or 6.25 cm) to this distance.* *By using a True Vertical antenna measurement, you are finding the total distance from the center of the survey point up to the phase center of the antenna. Then Enter this total distance as your True Vertical antenna height.* If, however, you use **Uncorrected** as the measurement type, you measure the slope distance from the exact center of the survey point to the bottom edge of the notches on the antenna groundplane. By using an **Uncorrected** antenna measurement, you are in fact entering an antenna height into GPSurvey that must be corrected into a vertical measurement, by the postprocessing software program. For this reason, you *do not add the phase center correction factors to Uncorrected antenna heights before you enter them*, since this is automatically done in data processing by GPSurvey, based upon the type of antenna that you have specified you are using. It is therefore essential that you specify the *correct* antenna type, because the phase center correction factors vary for each antenna type. *Uncorrected* antenna heights should be *measured 3 times* around the antenna groundplane, with each measurement being (to a notch) *120° apart* from each other. All 3 measurements should be within 1 millimeter of each other, or better. If so, this confirms that the antenna set-up is more or less "on the level". If not, level the antenna again.

Trimble 5700

Konfigurering af Trimble 5700:

Configuration Toolbox

1. Tilslut modtageren via seriel kablet til port 2 (den i midten) på modtageren.
2. Tænd modtageren.
3. I menuen vælges: Communication -> Get file
Vælg:
 - o stat15s: for stationær måling med 15 sek data
 - o stat1hz: for stationær måling med 1 Hz data
 - o kin1hz: for kinematisk måling med 1 Hz dataklik Get file
4. Vælg Contents: -> File
Afkryds Stored in receiver og vælg As auto power up file
(Du kan også gå ind og ændre i de forskellige parametre, så opsætningen passer til de aktuelle målinger)
5. Klik Transmit
6. Klik Close
7. Sluk modtageren ved at holde tænd/sluk knappen inde i 2 sek.

Modtageren er nu konfigureret og trin 1 til 7 kan gentages for evt. andre modtagere

Download af data fra Trimble 5700:

Data Transfer

1. Tilslut modtageren via seriel kablet til port 2 (den i midten) på modtageren, eller via USB (bag klap i bunden af modtageren).
2. Tænd modtageren.
3. I Device menuen vælges:
 - o Trimble 5700: COM1
 - o Trimble 5700: USB (Anbefales til store datamængder)
4. Klik Add...
5. Vælg en folder til download af data i Destination:
6. Dobbeltklik på modtagerikonet i det store filvindue.
7. Vælg filer og klik Open.
8. Klik Transfer All
9. Klik på Disconnect ikonet i Device menuen
10. Klik Close
11. Sluk modtageren ved at holde tænd/sluk knappen inde i 2 sek.

Trin 1 til 11 kan gentages for evt. andre modtagere

GPS Databehandling i Trimble Total Control

1. Start Trimble Total Control. Klik new Project og Ok.

2. I menuen vælges: Project -> Import -> Receiver Raw data.
Vælg filer og klik Add to Project.
3. Kontroller om antenntype og højde er korrekt, samt hvorledes højden er målt.
Ret evt. i oplysningerne og klik Ok. Hvis alle filer er indlæst skal vinduet lukkes.
Herunder er nævnt de sædvanlige parametre for GA's GPS instrumenter.
 - o Trimble 4000:
Antenntype: Compact L1/L2 w/Ground Plane.
Antennehøjde: bottom of notch on ground plane.
 - o Trimble 5700:
Antenntype: Zephyr Geodetic.
Antennehøjde: bottom of notch.
4. I menuen vælges: Process -> Settings...
Under fanen Parameter sættes GPS Cutoff til 15° og Processing Interval til 15 sec.
Under fanen Processor sættes Processing model til Static og Generate Residual Data (static only) markeres.
Under fanen Tropo vælges Tropospheric model: Saastamoinen.
Klik Ok
5. Klik + ud for points i oversigten til venstre, der vises en oversigt over punkter med GPS observationen. Højreklik på reference stationen og sørg for at Fix er markeret, på de andre stationer skal Fix ikke være markeret.
Højreklik på reference stationen og vælg properties. Under fanen Geo indtastes reference stationes position og højde. Klik assign og luk vinduet.
6. I menuen vælges: Process -> Generate Ephemeris.
7. I menuen vælges: Process -> Process Project og klik Ok.
8. I menuen vælges: Adjust -> Adjust (Free)
9. I menuen vælges: Adjust -> Adjust (Biaised)
10. I menuen vælges: Adjust -> Report... Klik Biased Adjustment Report og Run.
I vinduet kan punkternes position og fejlskøn ses.

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