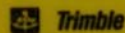


Static Survey Quick Reference



Static Survey Quick Reference

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*For technical support, call 1-408-481-6940 or
1-800-SOS-4TAC.*

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Equipment Checklist

To perform a static survey you need:

- At least two Series 4000 receivers.
- An antenna, tripod, tribrach, and measuring rod for each receiver.
- A power source for each receiver. If you are using batteries, you need **enough fully charged batteries** to last through the survey.
- An antenna cable and power cable for each receiver.

The preferred antenna is the Compact L1/L2 Antenna with groundplane. You may also use the L1/L2 Geodetic Antenna, a predecessor of the Compact L1/L2 Antenna, or the Permanent Reference Station L1/L2 Geodetic Antenna. For single-frequency surveys you may use the L1 Geodetic Antenna.

Static survey results may be postprocessed with the Trimble programs GPSurvey and TRIMVEC Plus.

Setting Parameters

1. If the receiver is not turned on, press **[POWER]** and wait until it displays the *Log Data* menu.

```

QUICK-START NOW! (SINGLE SURVEY) --
START PRE-PLANNED (SINGLE SURVEY) --
START FAST STATIC OR KINEMATIC SURVEY --
MORE --
    
```

2. Press **[CONTROL]**.

```

RECEIVER CONTROL: | LOGGED DATA FILES
(1 of 7)           | RTCM-104 OUTPUT
                   | RTCM-104 INPUT
                   | MORE
    
```

3. For a single-frequency receiver, skip to step 7. For a dual-frequency receiver, proceed.

4. Press MORE until the L1/L2 OPERATION softkey appears; then press that key.

```

RECEIVER CONTROL: | POWER CONTROL
(5 of 7)           | L1/L2 OPERATION
                   | NMEA-183 OUTPUT
                   | MORE
    
```

```

L1/L2 TRACKING: P,C/A-CODE | L1 TRACKING
                  P,E-CODE | L2 TRACKING
                  |
    
```

5. Press the L1 TRACKING and L2 TRACKING softkeys, if necessary, to set L1 TRACKING to P,C/A-CODE and L2 TRACKING to P,E-CODE.

2

3

Setting Parameters (cont.d)

6. Press **[CLEAR]**, returning you to the *Control* menu.

7. Press MORE until the DEFAULT CONTROLS softkey appears; then press that key.

```

RECEIVER CONTROL: | DEFAULT CONTROLS
(7 of 7)           |
                   | MORE
    
```

```

INITIALIZE ALL CONTROLS TO DEFAULT |
SETTINGS AND RESTART RECEIVER      | NO
ARE YOU SURE ? | YES
    
```

8. Wait while the receiver resets itself and displays the *Log Data* menu.

```

QUICK-START NOW! (SINGLE SURVEY) --
START PRE-PLANNED (SINGLE SURVEY) --
START FAST STATIC OR KINEMATIC SURVEY --
MORE --
    
```

9. If you will conduct only preplanned surveys, you may end the parameter setting procedure here.

If you will conduct any quickstart surveys, proceed with this step.

Press MORE until the SETUP SURVEY CONTROLS softkey appears; then press that key.

```

ENABLE AUTO-SURVEY TIMER --
RESULTS FROM PREVIOUS SURVEY --
SETUP SURVEY CONTROLS --
MORE --
    
```

```

MODIFY QUICKSTART CONTROLS --
MODIFY FAST STATIC CONTROLS --
MODIFY KINEMATIC CONTROLS --
    
```

```

QUICKSTART CONTROLS |
STORE POSITION: NORMALLY | CHANGE
ELEVATION MASK: +15° MIN SVs: 03 |
MEAS SYNC TIME: 015.0 SEC | ACCEPT
    
```

10. Set the quickstart controls to appropriate values. The default values shown above are recommended for most applications.

Set all quickstart controls and other parameters to the same values on all receivers used in a survey.

Press ACCEPT, then press **[CLEAR]**.

```

ENABLE AUTO-SURVEY TIMER --
RESULTS FROM PREVIOUS SURVEY --
SETUP SURVEY CONTROLS --
MORE --
    
```

This ends the parameter setting procedure.

4

Quickstart: Starting a Survey

STARTING THE SURVEY

1. Set up the antenna and equipment. Measure and record the antenna's height (for instructions, see page 16).

2. From the *Log Data* menu, press the QUICK-START NOW! softkey.

```

QUICK-START NOW! (SINGLE SURVEY) --  « Press
START PRE-PLANNED (SINGLE SURVEY) --
START FAST STATIC OR KINEMATIC SURVEY
                                     MORE --
  
```

The receiver displays the main status screen. It begins logging data when the required number of satellites become available above the elevation mask.

```

0492-137-0 PRE-SURVEY POSITION IELEV/AZM
APPROX. MEMORY LEFT: 94 HR IPOSITION
SU02,19,06,18 I DATE
PWR2+([####]) 2:05:03 PST/24 I MORE
  
```

3. If you must change the data file's default name, see the instructions on 17.

This ends the procedure for starting a quickstart survey.

You can perform most of the receiver's other functions while a static survey is running. You cannot start another survey of any type or log data for another purpose.

Do not change any receiver parameters while a survey is running, except for the antenna parameters or the *Modify* menu's parameters. Doing so may make the survey data useless.

Quickstart: Ending a Survey

1. Press the **LOG DATA** key to display the SURVEY screen.

```

SURVEY: IUSER INPUT
         I CHANGES
         I
         IEND SURVEY  « Press
  
```

```

STOP THE CURRENT SURVEY ? I YES  « Press
                          I
                          I NO
  
```

```

SURVEY ENDED -- GET READY TO INPUT
                ANTENNA HEIGHT
  
```

The preceding screen appears briefly, then is replaced by the following one.

```

ANT HEIGHT: 0000.0000 INCHES I UNITS
MEAS TYPE: UNCORRECTED I NEXT
ANT TYPE: COMPACT L1/2 W/GRND P I NEXT
ANT SERIAL: 000000 IACCEPT
  
```

2. Measure the antenna height again, using the procedure described on page 16.

The two measurements should agree within 5 mm. *If they do not, the antenna may have shifted during the observation, invalidating the survey results.*

3. Enter the antenna parameters.

You are required to perform the **SHADED STEPS** only for the first survey in a series.

Press **UNITS** to display the type of units you are using to measure antenna height.

Enter the antenna height; press **ENTER**.

Press **MEAS TYPE... NEXT** to display **UNCORRECTED**.

Press **ANT TYPE... NEXT** to display the type of antenna you are using. (Antenna types are listed on page 16.)

Enter the antenna's serial number.

Press **ACCEPT**.

4. The receiver returns to the *Status* screen in positioning mode. This ends the procedure.

Do not end a survey at any station until *all* stations have observed enough simultaneous data to give valid results.

Preplanned: Running a Manual Survey

Before you run a preplanned survey you must define the *station* (the location) where the survey will be conducted and the *session* (the period of time) in which it will be conducted. Defining a station and session is usually an office procedure, and is not described here. See the *Series 4000 Application Guide* for information.

1. Set up the antenna and equipment. Measure and record the antenna's height (see instructions on page 16).

2. Press the **LOG DATA** key, if necessary, to display the first screen of the *Log Data* menu. From the menu, select **START PRE-PLANNED**.

QUICK-START NOW! (SINGLE SURVEY) --
START PRE-PLANNED (SINGLE SURVEY) --
START FAST STATIC OR KINEMATIC SURVEY --
MORE --

« Press

SELECT STATION: 0051 ID:01 INEXT STATION
NAME: WEST END OF BRIDGE IPREV STATION
I
I ACCEPT

3a. To select a station with softkeys: Press **NEXT STATION** or **PREV STATION** until you see the station you want. Press **ENTER** or **ACCEPT**.

3b. To select a station with the keypad: Enter the station ID. When you press the first key, the receiver displays the **SEARCH STATION** screen.

SEARCH STATION: 0000 I ALPHA
I
I
I ACCEPT

Enter the rest of the ID, then press **ENTER**.

If the station ID is found, the receiver displays the station in the **SELECT STATION** screen. Press **ACCEPT** and go on to the next step.

If the station ID is not found, the receiver says "STATION NOT FOUND." Press **CLEAR**; correct the station ID and press **ENTER** again.

4. The receiver displays the antenna parameter screen.

To start the survey quickly, just press **ACCEPT** and go on to the next step. You may set the antenna parameters during the session, or let the receiver prompt you to do so when the session ends.

ANT HEIGHT: 0000.0000 INCHES I UNITS
MEAS TYPE: UNCORRECTED I NEXT
ANT TYPE: COMPACT L1/2 W/GRND P I NEXT
ANT SERIAL: 000000 IACCEPT

You are required to perform the **SHADED STEPS** only for the first survey in a series.

Press **UNITS** to display the type of units you are using to measure antenna height.

Enter the antenna height you measured in step 1; press **ENTER**.

Press **MEAS TYPE... NEXT** to display **UNCORRECTED**.

Preplanned: Running a Manual Survey (cont.d)

Press ANT TYPE... NEXT to display the type of antenna you are using.

Enter the antenna's serial number.

Press ACCEPT.

5. Start the survey.

```
STATION/SESSION: 2345-093-1|START SURVEY
APPROX. MEMORY LEFT: 8.4 HRI USER INPUT
                                | CHANGES
PWR1+[AAAAA] 2:01:59 PM PST|
```

« Press

6a. If the session description specifies *MANUAL START BY USER*: The receiver will start logging data as soon as the required number of satellites is available above the elevation mask.

6b. If the session description specifies *ONCE AT SPECIFIED DATE AND TIME*: The receiver will start logging data at the specified date and time.

If a session's scheduled start time is already past when you start the session, but its scheduled duration has not expired, the receiver will start logging data immediately and continue until the session would have ended if started on time. For example, if a session scheduled to start at 1500 hours and run for one hour is started at 1545 hours, the receiver will start logging data immediately and continue for 15 minutes.

ENTERING ANTENNA PARAMETERS DURING A SURVEY

To enter or correct antenna parameters while a survey is running:

1. Press **LOG DATA** to display the SURVEY screen.
2. Press the CHANGES softkey.
3. Press the ANTENNA HEIGHT softkey.
4. Enter the parameters as explained above.
5. Press the ACCEPT softkey.
6. You may now press **CLEAR** until you see the main status screen.

ENDING A MANUAL SURVEY

A "Manual Start by User" session must be ended manually. A "Once at Specified Date and Time" session normally ends automatically when its scheduled duration has passed, but may also be ended manually.

To end a preplanned session manually at any time, follow the procedure for ending a quickstart session, described on page 7.

Do not end a survey at any station until *all* stations have observed enough simultaneous data to give valid results.

It is good practice to remeasure antenna height after the end of a survey (not during, as that could interfere with the observation). You cannot put the second measurement in the data file, but you can record it in your field notes for later use.

Preplanned: Auto-Timed Surveys

ENABLING THE TIMER

1. Define the session(s) you want to run. (See the *Series 4000 Application Guide* for instructions.) On the SELECT SCHEDULE screen, select *ONCE AT SPECIFIED DATE AND TIME*.

The auto-survey timer schedules *all* sessions that have been defined to start "Any Day at Specified Time" or "Once at Specified Date and Time." You cannot schedule some sessions and pass over others.

2. Press **LOG DATA**. The receiver displays the Log Data menu.

```
QUICK-START NOW! (SINGLE SURVEY) --
START PRE-PLANNED (SINGLE SURVEY) --
START FAST STATIC OR KINEMATIC SURVEY --
MORE --
```

« Press

```
ENABLE AUTO-SURVEY TIMER --
RESULTS FROM PREVIOUS SURVEY --
SETUP SURVEY CONTROLS --
MORE --
```

« Press

```
AUTO-SURVEY MODE IS OFF | ENABLE
SCHEDULED SESSIONS:    |
1 EVERYDAY SESSION      |
NO ONCE-ONLY SESSIONS  |
```

« Press

```
ENABLE A SLEEP BETWEEN SURVEYS --
ENABLE A STAY AWAKE BETWEEN SURVEYS --
CANCEL --
```


3a. To make the receiver sleep between sessions: Press ENABLE & SLEEP.

3b. To make the receiver stay awake between sessions: Press ENABLE & STAY AWAKE.

In either case, the receiver will sleep until the start of the first session starts and turn itself off after the last session ends.

4. The receiver displays the ANTENNA PARAMETERS screen.

```
ANT HEIGHT: 0000.0000 INCHES  | UNITS
MEAS TYPE: UNCORRECTED        | NEXT
ANT TYPE: COMPACT L1/2 W/GRND P| NEXT
ANT SERIAL: 000000           | ACCEPT
```

Set the parameters as explained in step 4 of "Running a Manual Survey" on page 10; then press ACCEPT.

```
AUTO-SURVEY MODE ENABLED  | CANCEL
                           |
GOING TO SLEEP IN 30 SECONDS |
UNTIL: FRI 12-JUL-91 15:25 PST/24 |
```

The receiver counts down from 30 seconds to zero, then powers off the display and goes to sleep.

While the receiver is asleep, the TIMER light flashes several times a minute to signal that the receiver is not turned off.

Preplanned: Auto-Timed Surveys (cont.d)

DISABLING THE TIMER

Disabling the timer terminates the current surveying session (if any) and deschedules all scheduled sessions. It does not disturb the session definitions, so you can reschedule the sessions simply by enabling the timer again.

1a. If the receiver is awake: Press [LOG DATA].

You can use most functions *without* disabling the timer. You cannot schedule preplanned sessions, though.

1b. If the receiver is asleep: Press [POWER] to wake it up. It will perform its power-up tests, then display the AUTO-SURVEY MODE screen.

```
AUTO-SURVEY MODE ENABLED  | CANCEL
SLEEP INTERRUPTED         |
GOING TO SLEEP IN 30 SECONDS |
UNTIL: SUN 31-MAR-91  7:15 AM PST |
```

« Press

Press CANCEL before the end of the 30-second countdown, or the receiver will go to sleep again.

2. The receiver displays the Log Data menu.

```
SURVEY:                     | USER INPUT
                           | | CHANGES
                           | |
                           | | END SURVEY
```

« Press

Pressing END SURVEY ends the current survey (if any) and disables the auto-survey timer.

Antenna Parameter Checklist

Parameter	Recommended Value
ANT HEIGHT	Uncorrected antenna height. Measure as described below.
MEAS TYPE	UNCORRECTED
ANT TYPE	See list below.

Measure uncorrected antenna height from the survey mark to the lower inside edge of a groundplane notch. Measure at three equally spaced notches around the rim, and take the average. If the measurements do not agree within 5 mm, recenter and releve the antenna.

Recommended antenna types are:

- Compact L1/L2 with groundplane: select COMPACT L1/2 W/GRND P.
- Compact L1 with groundplane: COMPACT L1 W/GRND P.

You can set the antenna height:

- When you enable the auto-survey timer
- During a survey, by pressing the Log Data key, then the CHANGES softkey
- At end of session, if you did not set it sooner
- In postprocessing

Renaming a Data File

You can change a data file's name at any time during a survey. The preferred time to do so is just after starting the survey.

1. Press the **[LOG DATA]** key to display the *Log Data* menu.

```

SURVEY:                                |USER INPUT
                                         |  CHANGES  « Press
                                         |
                                         |END SURVEY
  
```

```

SURVEY:                                |USER INPUT
                                         |  CHANGES  « Press
                                         |
                                         |END SURVEY
  
```

```

SURVEY CHANGES:                       |ANTENNA HEIGHT
                                         |  FILE NAME  « Press
                                         |
                                         |
  
```

```

CHANGE SURVEY FILE NAME:               | ALPHA
OLD: 1237-034-0                        |
NEW: 1237-034-0                        |
                                         |ACCEPT
  
```

2. Enter the new name and press **ACCEPT**. The receiver displays the *SURVEY CHANGES* screen again.

```

SURVEY CHANGES:                       |ANTENNA HEIGHT
                                         |  FILE NAME
                                         |
                                         |
  
```

3. Press **[CLEAR]** twice to return to the main *Status* screen.

```

0492-137-0  LOGGING FOR 0:01  |ELEU/AZM
APPROX. MEMORY LEFT: 94 HR   |POSITION
SU 02,19[06,18]              |  DATE
PWR2+[*****] 2:05:03 PST/24 |  MORE
  
```

Recovering from a Power Failure

AUTO-SURVEY TIMER ENABLED

1. Restore power to the receiver.
2. The receiver performs its power-up tests, then displays the "Power fail?" screen.

```

          AUTO-SURVEY MODE ENABLED
          POWER FAIL?
STARTING SESSION: 1234-111-0
          IN 30 SECONDS  « Press
  
```

3. The receiver performs a 30-second countdown, then restarts the interrupted session.

AUTO-SURVEY TIMER NOT ENABLED

1. Restore power to the receiver.
2. The receiver performs its power-up tests, then displays the "Survey restarted..." screen.

```

          SURVEY RESTARTED
          AFTER POWER FAIL
          ** PRESS ANY KEY **  « Press
  
```

3. Press any key. The receiver displays the main status screen.

After the receiver recovers from a power failure it logs data to a new file with the same name as the original file, but with a different start time. **Always merge such same-name files after downloading, before postprocessing.**

Avoiding Common Errors

Keep detailed records of your antenna setup in your field notes. Vague or inaccurate records may prevent you from correcting any errors you make in measuring antenna height. This is the single **most common cause of spoiled survey results**.

Set up your antenna where **satellite visibility is not impaired by near-by objects**.

Make simultaneous observations with all receivers so that the postprocessing program can compute a network of baselines. If you cannot synchronize the receivers precisely, extend the observation time to be sure they collect enough simultaneous data for a valid set of observations.

Be sure your receiver has **enough battery power** to last through the survey. You can run a receiver off camcorder batteries indefinitely if you use a dual camcorder battery input cable and replace one battery while the receiver operates from another.

On the session definition's **SPECIAL CONTROLS screen**, be sure POSITION LOGGED is set to NORMALLY, so that the receiver will log the satellite data needed for postprocessing.

Respect the **maximum recommended baselines**. Do not try to measure baselines greater than 15 km in a single-frequency survey, or 30 km in a dual-frequency survey. Poor atmospheric conditions may require shorter baselines or longer observation times to avoid loss of accuracy.