



Aquarius 5000

Pedestrian Kit Option

USER'S MANUAL

DSNP makes no warranty of any kind with regard to this equipment, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. DSNP shall not be liable for errors contained herein or for incidental consequential damages in connection with the furnishing, performance, or use of this equipment

This manual contains proprietary information which is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced or translated into another language without the prior written consent of DSNP.

The information contained in this manual is subject to change without notice.

Table of Contents

1. Description & Requirements.....	1-1
Description	1-1
Unpacking.....	1-1
Mounting the receiver on the metal support	1-5
Hardware and software requirements	1-6
2. Preparing for a field survey	2-1
Assembling the various parts	2-1
Connections	2-3
Getting ready for surveying	2-4
Introduction to the Rover Unit Software Interface	2-5
3. Field Surveying	3-1
Start-up sequence	3-1
Staking out target points.....	3-5
Logging points	3-13
Logging trajectories	3-15
Offset staking-out	3-20
Offset logging	3-22
If the selected project is based on an unknown local grid	3-28

Setting the max. permitted radial and
vertical uncertainties..... 3-31

Initialisation modes and processing modes 3-32

Opening another job file for your project 3-34

Changing project 3-34

Auxiliary displays 3-35

1. Description & Requirements



Description

Unpacking

The Pedestrian Kit Option consists of two distinct containers: one for the accessories, the other for all the parts required to carry the Aquarius receiver on an operator's back.

The accessory container is described below. DSNP reserves the right to make changes to this supply without prior notice.



Accessory container
Part No. 790076562

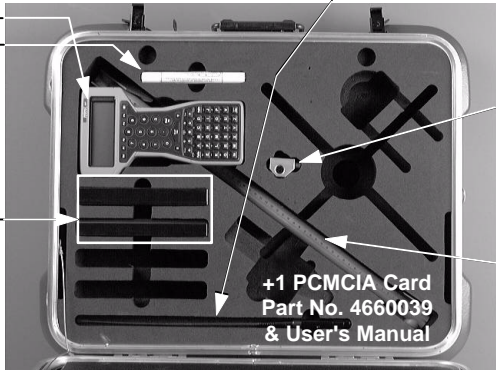


Receiver container
Part No. 790076561

FSP70, 0 dB flexible UHF antenna
3310190 (415/435 MHz)
or 3310196 (430/450 MHz)
or 3310188 (450/470 MHz)

FS/GS
palmtop
computer and
internal battery
Part No.
317076375

2 NiCd
Battery packs
Part No.343088
for rover unit



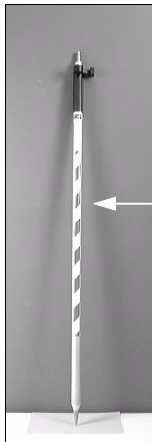
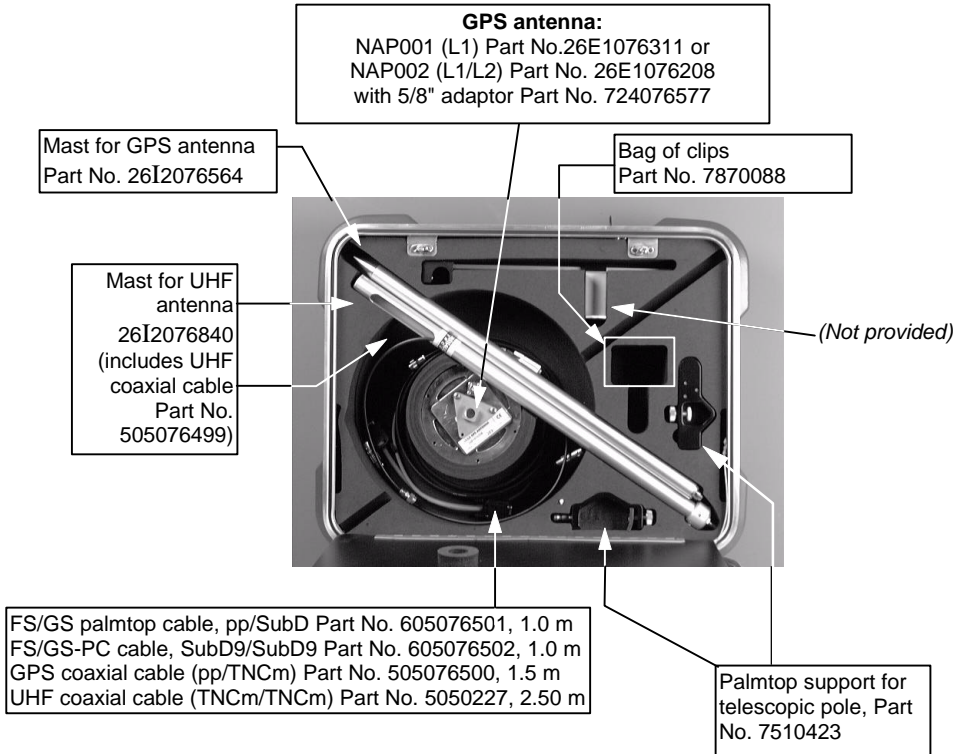
Quick release
adaptor
Part No.
26I2076528

(Not provided)

+1 PCMCIA Card
Part No. 4660039
& User's Manual

Description & Requirements

Description

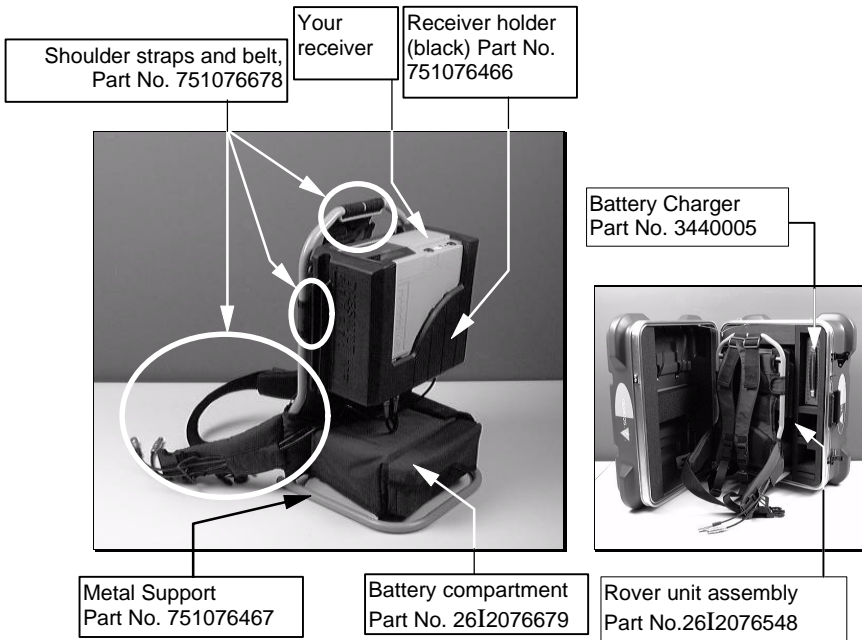


Telescopic Pole 1337-L,
Part No. 3310203
(supplied separately)

1

The content of the other container (the *Receiver* container) is described below. This box contains the battery charger and the rover unit assembly. The photos below show the Aquarius receiver once it has been inserted into the holder and secured on the metal support.

Note that once all the parts have been assembled, the assembly can be directly placed in the container for transportation (see photo on right).



The rover unit assembly (Part No. 26I2076548) consists of the following parts:

- the stand, Part No. 26E1076942, which consists of the receiver holder (Part No. 751076466, black rubber), the Metal support (Part No. 751076467) and small parts (screws, washers, standoffs).
- the battery compartment, Part No. 26I2076679 (which includes 2 battery cables Part No. 605076507)
- Shoulder straps and belt, Part No. 751076678, including a serial line cable (605076509, 0.75 m) and a GPS antenna cable (605076510, 0.75 m, coaxial, 50 Ω).
- Small parts (screws, washers, standoffs)

Note the two cables present in the belt at delivery. Do not remove these cables from the belt as they are precisely required at this location for your field surveys.

Also, they needn't be removed before putting the rover unit assembly back into its container for transportation.

Mounting the receiver on the metal support

1. Insert your Aquarius receiver into the black holder.
2. Insert the standoffs into the 4 holes of the black holder (on rear side)
3. Position the holder/receiver assembly on the metal support
4. From behind the metal support, insert the 4 washers and screws into the holes
5. Secure the receiver and its holder on the metal support by tightening the 4 screws

1

Warning! Do not forget to insert the standoffs (step 2. above), otherwise tightening the screws (step 5) will irreversibly damage the holder.

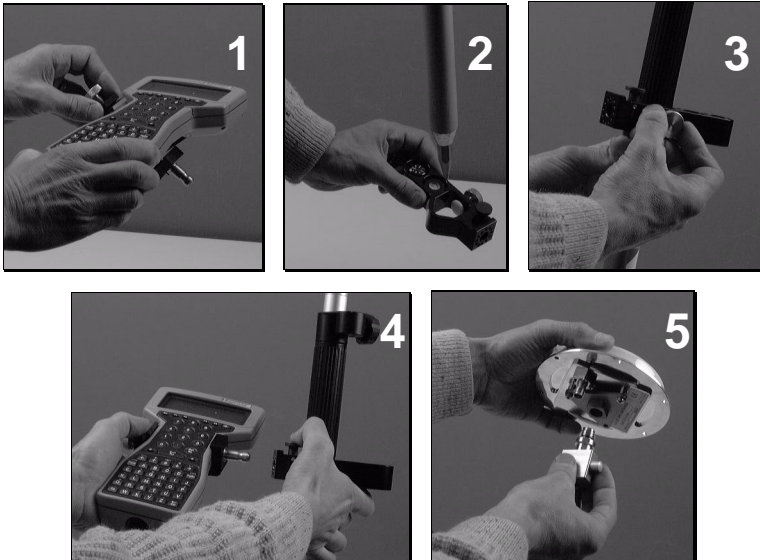
Hardware and software requirements

The following hardware and software elements are required to allow the use of the Pedestrian Kit Option:

- UHF data link option (your Aquarius receiver must be fitted with a built-in UHF receiver for reception of data from a base station)
- KART processing option (if the receiver engine is L1 only) or LRK processing option (if it's L1/L2).

2. Preparing for a field survey

Assembling the various parts

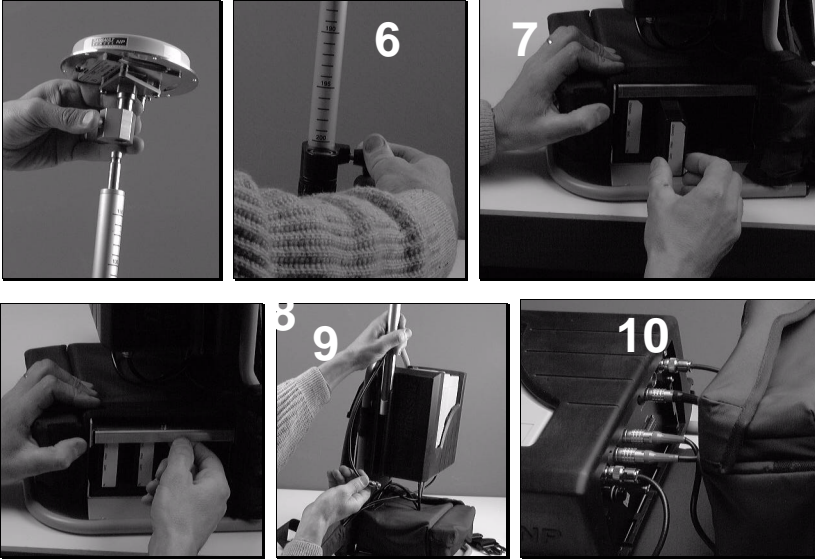


2

After inspecting all the parts provided and after mounting the receiver on the metal support for portable operations (see *section 1*), proceed as shown above:

1. Secure the palmtop on its holder.
2. Insert the pointed end of the telescopic pole into the hole of the palmtop support.
3. Secure the support somewhere on the telescopic pole so that the palmtop be at a proper height (i.e. adapted to your own height).
4. With a thumb, depress the quick release button on the support and insert the tipped end of the palmtop holder into the support. Release the button.

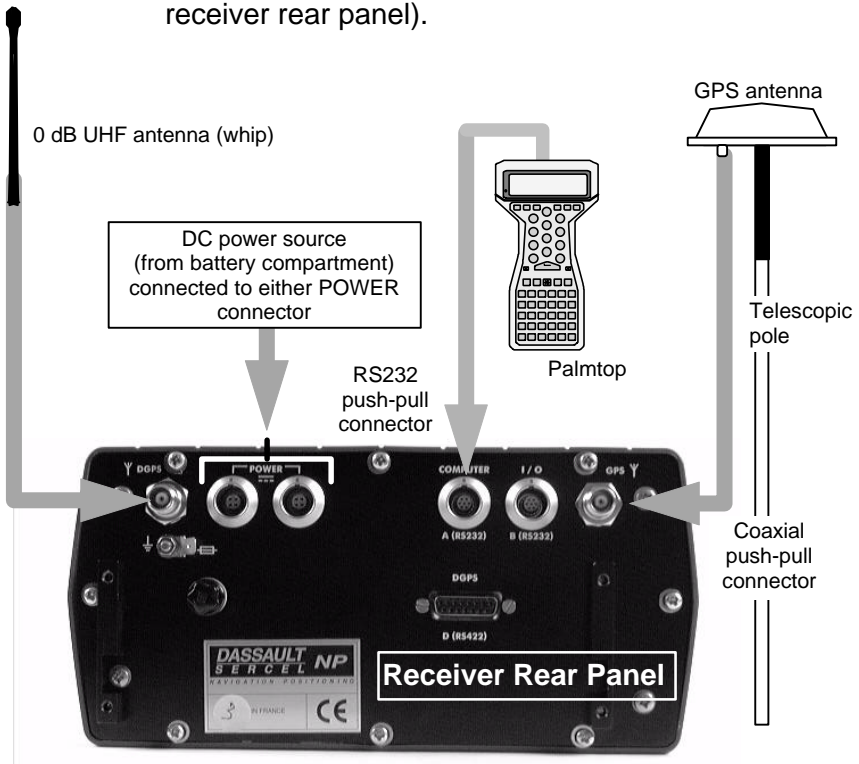
- Secure the quick release adapter in the lower part of the GPS antenna.



- With a thumb, depress the button on the quick release adaptor and insert the top of the pole into the adaptor. Release the button.
- Give the GPS antenna the desired height by adjusting the length of the telescopic pole.
- Insert fresh battery packs into the battery compartment (a single way possible for battery insertion).
- Do not forget to lock the battery compartment.
- Screw the UHF antenna on top of the mast and insert the mast into the dedicated location on the receiver holder.
- Make the necessary connections (described in the next page).

Connections

- Connect the end of the coaxial cable (protruding from the belt) to the GPS antenna.
- Connect the end of the serial line cable (protruding from the belt) to the palmtop.
- Make sure the palmtop is fitted with the NiCd battery pack.
- Connect the end of the coaxial cable protruding from the UHF antenna mast to the DGPS input (on receiver rear panel).



Getting ready for surveying

- Insert the PCMCIA containing the project into the receiver.
- Switch on the GNSS receiver by depressing the ON/OFF pushbutton.
- Put the rover unit assembly on your back
- Switch on the palmtop by depressing the red key (top right).

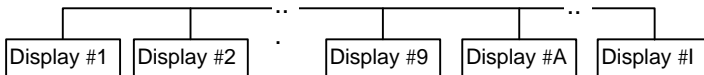


Operator ready for field operations



Introduction to the Rover Unit Software Interface

- The Rover Unit Software Interface will assist you in every step of your field works.
- From any display shown on your palmtop, you can freely access any other display by pressing a single key (except at power-on until you choose a project). Said differently, all displays are arranged "horizontally" at the same level .



- For most of the displays, two viewing modes exist as explained below.
 - The *Read mode*, which is the default mode when accessing the display, just lets you read, not change, the data on the screen
 - The *Edit mode*, which you validate and leave by pressing ↵ (the ENTER or YES key), lets you change the modifiable data on the screen

- A few keys need to be known for best use of the software interface program:
 - Pressing the * key will display the main menu listing all the accessible displays. Use the PgUp/PgDn keys to scroll through the entire main menu.

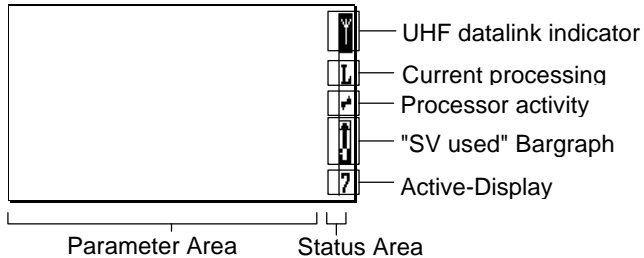
```
0-Welcome
1-Current mobile position
2-Mobile status
3-Kinematic mode
4-Reading files
5-Recording files
6-Guidance selection
7-Guidance
8-Position logging
9-UHF receiver
A-Coord. system
B-Local time
C-GNSS data
D-SV deselection
E-Offset logging
F-Offset stake out
G-Point editor
H-Local grid
I-Data output
```

- From this list, and generally from any display in *Read mode* or from the program menu only (default mode), the keys 0 to 9, A to I, allow you to access the corresponding displays. For example, pressing "2" will cause display #2 to appear on the screen.

- After selecting the desired display, pressing the ↵ (or Yes) key allows you to enter the *Edit mode* for that display. You cannot select another display until you quit the *Edit mode* by pressing ↵ again.
- In *Edit mode*, after modifying parameters on the screen, pressing ↵ will cause the program to validate the new values assigned to these parameters.
- In *Edit mode* only, the "sp" key or the dot" key (.) are used in those fields where only preset values can be entered. In this case, pressing either of these keys repeatedly will let you view all the possible values for the field.
- In *Edit mode* only, the keys ← ↑ → and ↓ allow you to move the cursor within a field and from a field to an adjacent one.
- In *Edit mode* only, the Del/No key allows you to quit this mode without validating the changes you made on that screen.
- The Esc key allows you to quit the program.

2

- All displays are divided into two distinct areas as shown below. The status area is permanently shown whatever the display chosen.



UHF datalink indicator:

 : UHF Datalink okay

 : No UHF Datalink

Current processing mode:

H : Hold (no position solution)


G : GPS


E : EDGPS (metric accuracy)

K : KART (centimetric accuracy)

L : LRK (centimetric accuracy)

"SVs used" bargraph:

 : GPS reception okay

 : Minimum GPS reception required

 : No GPS reception

- Alarm report:
 - Message boxes will appear on the screen together with a specific sound (see below) in case of satellite or battery alarm.

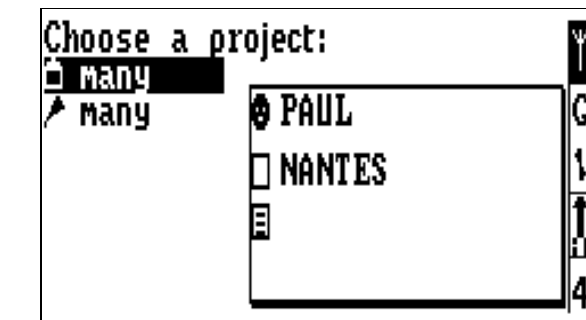
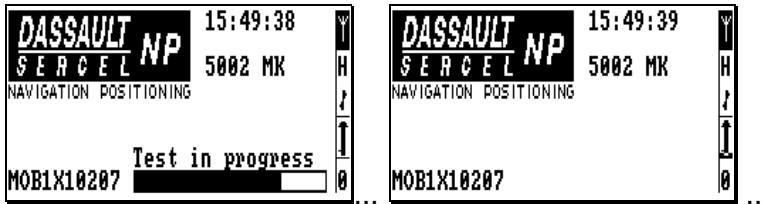
- The buzzer will sound in the following cases:
 - At the end of the initialization phase, not an alarm (beeps three times)
 - Satellite alarm (brief 3-tone "down" sound every 6 seconds approx.)
 - Battery alarm (brief 3-tone "up" sound every 6 seconds approx.)
 - Invalid display request (brief 2-tone sound)
 - Invalid data entry (brief 2-tone sound)
 - Other errors (brief 2-tone sound)

3. Field Surveying

Start-up sequence

Assuming the rover unit is now ready and you have the palmtop in hand, do the following:

- From the DOS prompt, type in "M" (not case-sensitive) and press ↵. The following screens appear in sequence:





- **Choosing a project**

(Continued from preceding page)

This unconditional start-up sequence leads you to choose a project among those stored on the PCMCIA (and implicitly to select the coordinate system required for the project).

- Use the ↑ and ↓ keys to move the cursor within the list. The first project in the list is selected by default.

Note that each project appears twice in the list. Choose one of the two knowing that:

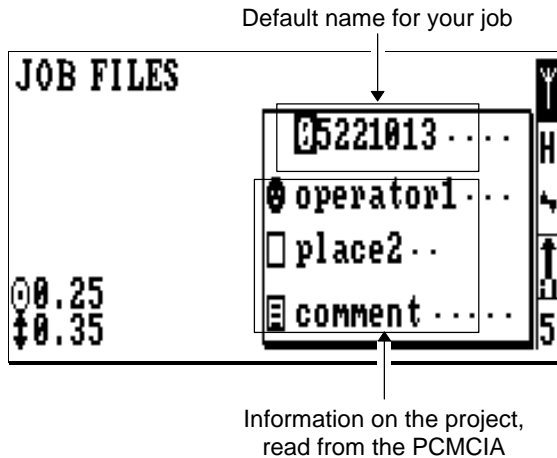
- the selection preceded by  just contains the reference points of the project.
- the selection preceded by  just contains the target points of the project.

NOTE: In fact, when you create a project with KISS, two files are generated: one containing the reference points of the project (*project.ref*), the other the target points of the project (*project.tar*). Because these files are expected to let the rover unit know which coordinate system should be used for the project, they are systematically created by KISS, even if they do not contain a single point.

- After choosing the item containing the target points (typical choice), press ↵. After a few seconds, a new display (Display #5) appears on the screen (*see next page*).

- Opening a job file

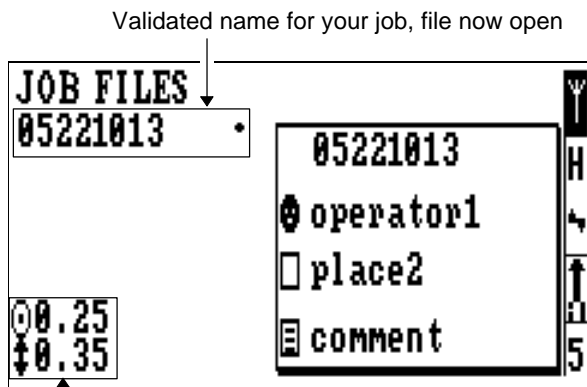
(Continued from preceding page)



The default name prompted for your job file is in the form “mddhmm” (month, day, time). Note the position of the cursor on the leftmost figure.

- If required, change the job file name and also the next parameters. Use the arrow keys to move the cursor within the framed area.

- Press ↵. Display #5 should now look like this if you have not made any changes to the previous screen:



Described in page 3-31

The symbol (■) appearing to the right of the validated file name indicates that the file is now open and ready to receive the field data.

You have now reached the end of the unconditional start-up sequence, which means that you can now have free access to any of the displays available on your palmtop.

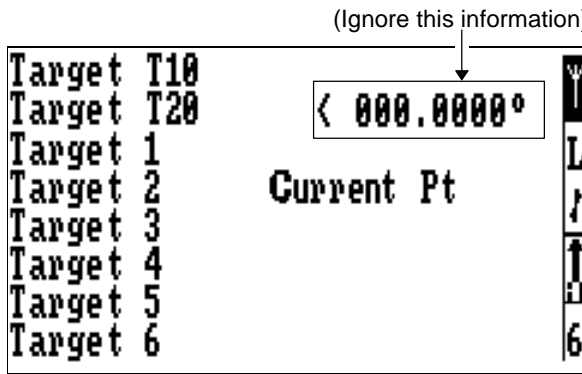
Unless the **L** (or **K**) processing mode is now displayed in the status area, wait for this letter to appear before proceeding with your work. When displayed, this letter denotes successful LRK (or KART) initialisation and the ability for the rover unit to start your work.

NOTE: OTF initialisation is the default initialisation mode run by the unit.

Staking out target points

Now that your rover unit is initialised, do the following:

- Press “6”. A new screen appears listing all the target points of the selected project (display #6).

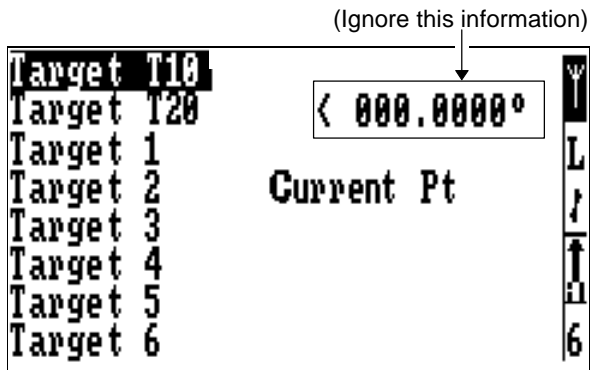


- Press ↵: the cursor now appears on the target point the closest to your current position, prompting you to survey this point first.

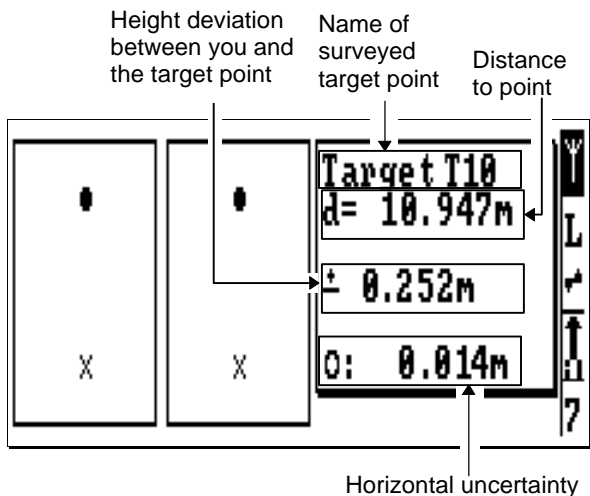
NOTE: Later, in this particular context, you can ask the system to search for the closest point — because in the meantime another point was selected or you moved to another location — by simply pressing the “N” key. Somewhere within the list, the closest point will be marked with a ■.

If you cannot access display #6 (“Disabled screen, Coord. system invalid” message displayed), please refer to page 3-28, *If the selected project is based on an unknown local grid*.

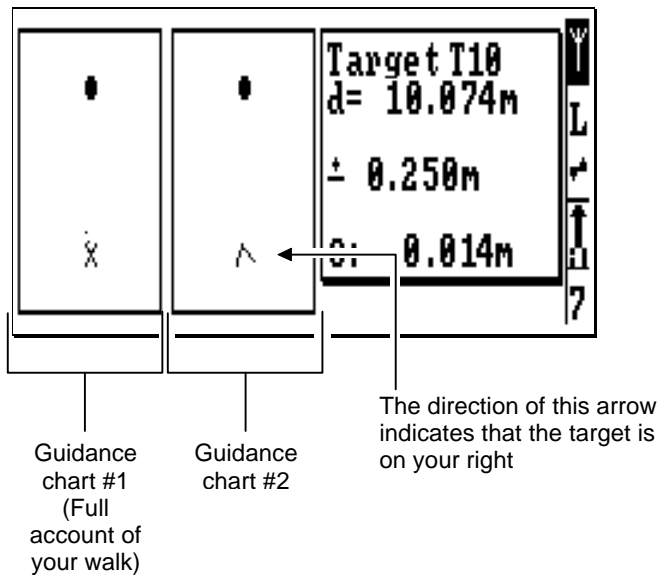
- To choose another point, move the cursor using the ↑ and ↓ keys.



- Press ↓ again to validate the selected point. A new screen appears providing guidance to help you walk to this point (display #7).





- Move straight ahead by about 1 metre toward the presumed direction of the target point and then observe the two charts in the left-hand part of the screen.




3

Guidance chart #1 will trace your walk to the target point, starting from the position where you were (start position) when you selected that point, up to the moment when you are at about 0.50 m from the point. On this chart:

- the target point is represented by a  (immobile throughout the procedure)
- the start position is represented by a  (also immobile throughout the procedure)
- your successive positions as you walk toward the point are represented by a dotted line starting from the start position.

You can deduce the way to go from the indication provided by guidance chart #2 after your 1-metre move. On this chart:

- the target point is represented by a  (like on guidance chart #1)
- your current position is now represented by an arrow pointing in the direction deduced from your 1-metre move. You will precisely head for the target point when this arrow is oriented upward, in the vertical direction:

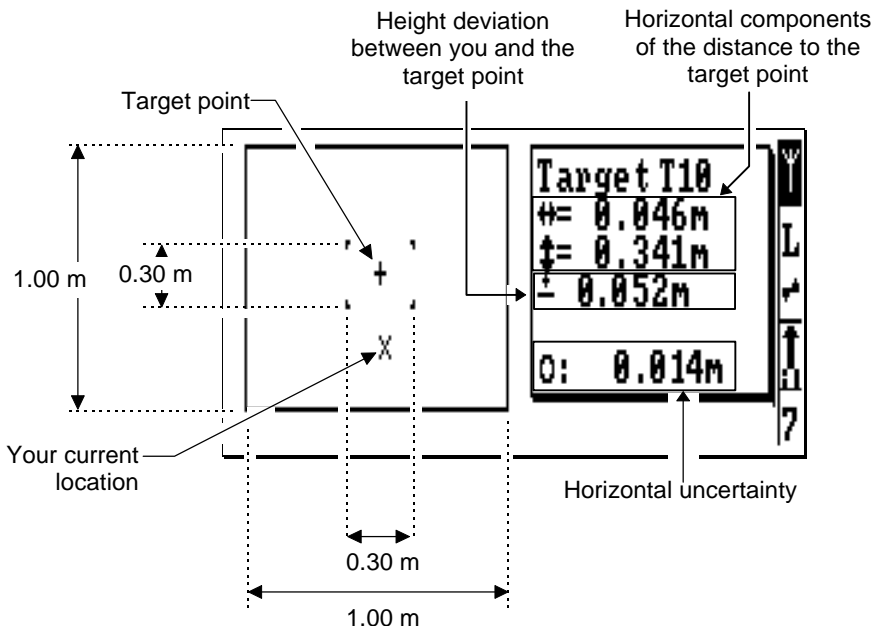


NOTE: These two charts do not give visual information of the distance to the target point (this information is provided in a numerical form on the right-hand part of the screen).

- Correct your direction of walk according to this indication and then walk while continuing to read this indication for auto-correction of the path followed.

For example, from the indication on the screen of page 3-7, you should change your direction by about 15 degrees to the right.

- When the distance to the target point is only 0.50 metre, display #7 is changed as follows:



(Central square: $\pm 15\text{ cm}$ around the target)

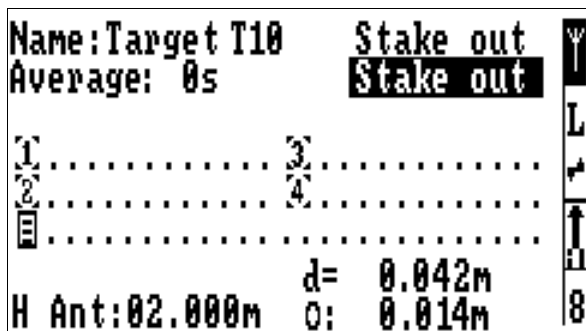
(Larger square: $\pm 50\text{ cm}$ around the target)


- While reading the components of the distance to the target, adjust the location of the telescopic pole (while maintaining it vertical) so as to cancel these values.

If the target cannot be reached, because of natural obstacles for example, you should offset the staking out of this point (refer to page 3-20 to run this particular procedure).

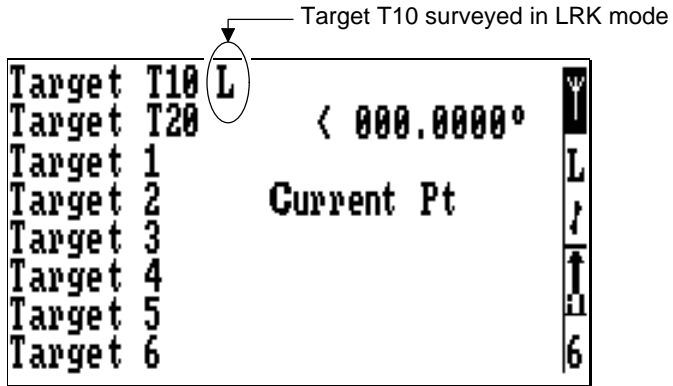
You can still zoom in on the target by pressing the PgeDn key. The target is then shown at the centre of a square, 30 cm in side. You can come back to the previous screen by pressing the PgeUp key.

- When the antenna accurately coincides with the target point, mark the location of this point on the ground.
- Keep the antenna immobile on this point and press ↵. Display #8 appears through which you can record the position of the point. From this time, the antenna verticality is no longer required.



- Before recording the point, you can fill in the following fields:
 - Stake Out** : Leave this field unchanged (see **NOTES** below).
 - Average** : Position averaging time before effective recording, in seconds (default: 0 seconds)
 - ① to ④ : Geocodes (optional)
 -  : Comments (optional)
 - H Ant** : Current height of the GPS antenna (which may be different at that particular moment)
- Put the antenna back in vertical position
- Press ↵ again to start recording the position of the target point. Stay as immobile as possible during the recording (while the “Please Wait” message is displayed).

The buzzer sounds to indicate the end of recording and Display #6 re-appears, this time with a letter after the selected target point, meaning that this target point has now been staked-out in the corresponding processing mode (see **NOTES** below).



- To select a new point, press \downarrow and move the cursor to that point using the vertical-arrow keys. Resume the procedure above to survey that point.

NOTES: “?” appearing after a point name, on display #6, after surveying the point means that the rover unit was not initialised properly when you recorded the point.

If you need to resume the staking-out of a target point, select display #6, press \downarrow , move the cursor to that point and press the Clr key. This deletes the letter (L for LRK, K for KART, E for EDGPS, G for GPS ... or “?” for incorrect recording) which follows the name of the target point, meaning that this point can now be surveyed for a second time.

When display #8 appears before you can record the point, "Stake Out" is selected in the first field, which is the right option if the project executes exactly as planned. If however, before reaching the target point, you wish to log an unplanned point, select "logging" in this field (using the "dot" or "sp" key) name and log this point. Do not forget however that in any case you will have to perform a stake-out operation for the currently selected target point before being allowed to select another target point.



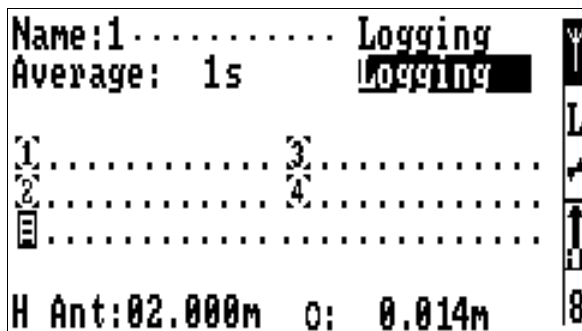
Logging points


After running the start-up sequence (see description of this sequence, from page 3-1 to page 3-4), do the following:

- Walk to the desired location and stop there.

If the interesting point cannot be reached, because of natural obstacles for example, you should offset the logging of this point (refer to page 3-22 to run this particular procedure).

- Press "8". Display #8 appears which should look like this.



- Before recording the point, you can fill in the following fields:
 - Logging** : Leave this field unchanged.
 - Average** : Position averaging time before effective recording, in seconds (default: 0 seconds)
 - ① to ④ : Geocodes (optional)
 -  : Comments (optional)
 - H Ant** : Current height of the GPS antenna (which may be different at that particular moment)
- Put the antenna back in vertical position.
- Press ↵ again to start recording the position of the point. Stay as immobile as possible during the recording (while the “Please Wait” message is displayed).

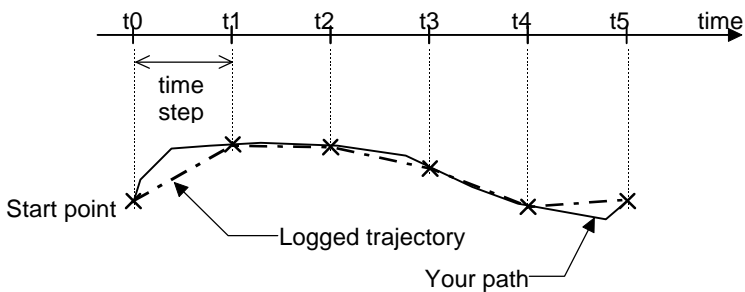
The buzzer sounds to indicate the end of recording and Display #8 re-appears with all the fields blank, except for the “Name” field, which the system has incremented by one to anticipate the next position logging.

Logging trajectories

- Introduction

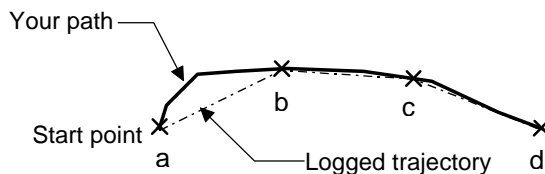
There are two different ways of logging a trajectory:

- points are automatically recorded *on a time basis* as you walk along the trajectory, i.e. a new point will be recorded every x seconds, regardless of the distance walked between this point and the preceding one.



- points are automatically recorded *on a travelled distance basis* as you walk along the trajectory, i.e. a new point will be recorded every x metres, regardless of the time elapsed between this point and the preceding one.

$$ab(\text{path})=bc(\text{path})=cd(\text{path})$$

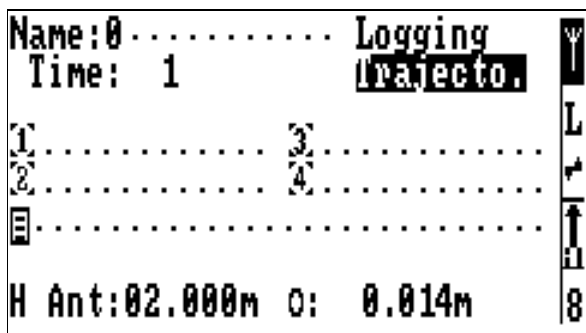


- **Starting the survey of a trajectory**

After running the start-up sequence (see description of this sequence, from page 3-1 to page 3-4), do the following:

- Walk to the beginning of the trajectory and stop there.
- Press “8”. Display #8 appears.
- Press ↵. The cursor appears on the first field.

Press the “dot” or “sp” key to select “Trajecto.” in this field. Display #8 should now look like this.



- Press ← to access the “Name” field and type in a number as the name of the trajectory.
- Press ↓ twice to move the cursor to the “Time/Dist” field and, using the “dot” or “sp” key, choose on which basis (time or distance) you want to log the trajectory.
- Press ↓ and type in the *log step* (respectively in seconds or metres).

- Access the other fields, fill them in if required (geocodes ① to ④ and comments) and correct the height of GPS antenna if necessary.
- Press ↵ to start recording the trajectory.
- Walk along the trajectory. Do not forget to adjust your walking pace to the log step chosen.

The buzzer will sound every time a new point is being recorded (you do not have to stop walking at this moment).

3

NOTES: Default names for trajectories are deduced from an automatic numbering of the points recorded while surveying trajectories.

No name is assigned to the points making up a trajectory.

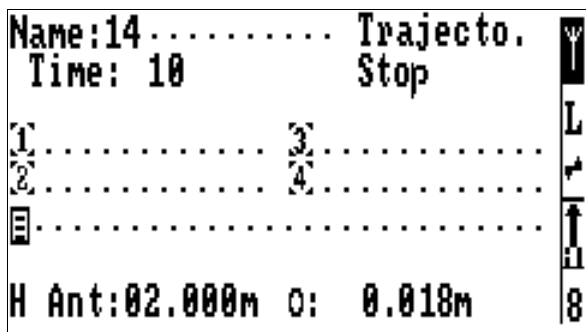
No offset logging can be performed on a point of a trajectory.

To start a trajectory job and there is a staking-out job in progress, you must first complete the staking-out of the selected target point.

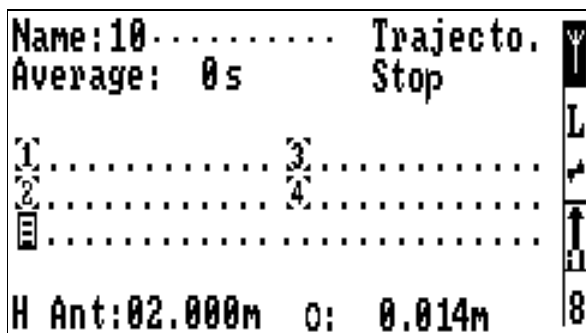
- **Suspending/resuming the survey of a trajectory**

You may want to suspend a trajectory, for example to perform position logging.

While recording a trajectory, screen #8 looks like this.



- Press ↵. This causes the cursor to appear on “Stop”.
- Press the “dot” or “sp” key to select “Pause”.
- Press ↵ again.
- Confirm your choice by pressing ↵ again. This suspends the survey of the trajectory. Display #8 then looks like this.



From this display, you can do the following:

- Press again. The cursor appears on “Stop”.
- Press the “dot” or “sp” key to select either “Resume” (to continue the survey of the trajectory”) or “Logging” (to proceed with the logging of a point). If you choose “Logging”, then you are in the Position Logging context, as described in page 3-13, except that “Trajecto.” (instead of “Logging”) is displayed on top of the screen to recall you that a trajectory has been suspended.
- Whatever your choice, then press ↵ to validate your choice.

3

NOTE: You cannot end the survey of a trajectory if it is currently suspended (“Stop” option in this case is inactive). You have first to resume the survey before being allowed to end it.

- **Ending the survey of a trajectory**

As mentioned earlier, you cannot end a trajectory if it is currently suspended. The first thing you have to do in this case is to “resume” the survey of this trajectory. Then do the following:

- Press ↵
- Press ↵ again to validate the “Stop” selection
- Press ↵ again to confirm your choice. This completes the survey of the trajectory.

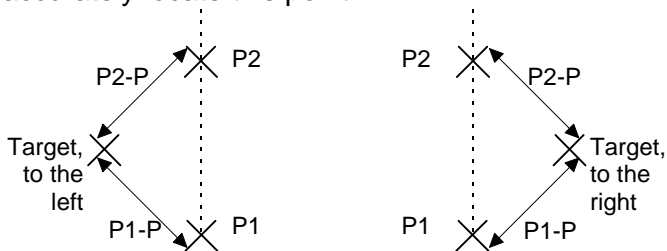
Offset staking-out

• Introduction

This chapter comes as a continuation of the staking-out procedure, from page 3-10, in the event of a physical impossibility for you to reach the target. Two different techniques are then available for you to survey the inaccessible point:

- **Lateral offset:** Through this technique, the accurate location of the target will be deduced from two points (P1 and P2) located nearby, properly logged, and forming a triangle (ideally an equilateral one) with the target.

From the distances P1-P and P2-P provided by the rover unit and by way of external means (a simple meter for example), you will then have to measure the distances from P1 and P2 to the target to accurately locate this point.



Back at the office, when reading the results of the project with KISS, this target point will be described through its dX, dY components, projected onto the grid, in reference to P1.

- **Linear offset:** Through this technique, the accurate location of the target will be deduced from two points (P1 and P2) located nearby, properly logged and both aligned with the target (not operational yet).

- **Procedure** (Continued from page 3-10)
 - Go to a point near the target where reception conditions are good. This point is going to be logged as P1.
 - From display #7, press “F”. Display #F appears.
 - In the selected field, press the “dot” or “sp” key to select “Lateral”.
 - Press → to move the cursor to the next field and choose “Logging P1” within this field.
 - Press ↵ to log this point. Stay as immobile as possible during the recording (while the “Please Wait” message is displayed). Display #F now prompts you to log P2.
 - Move to another point offering the same conditions of reception, situated at a few metres from P1, and keeping in mind that these two points should form a “regular” triangle with the presumed location of the target. This point is going to be logged as P2.
 - Press ↵ to log P2. Stay as immobile as possible during the recording (while the “Please Wait” message is displayed). Display #F now should look like this.

Location of the target in reference to P1-to-P2 segment (Left or Right), reckoned by the system

Target name recalled here

OFFSET STAKE OUT		
Lateral	Right	Compute
P1-P:+	12.828m	P1:OK
P2-P:+	14.467m	P2:OK
Nm:Far2		
3	3	
4	4	

- Press ↵. The “Validate Offset?” message appears.
- Press ↵ again to confirm the offset and complete the procedure. Display #6 then appears. The offset target point is marked with a ♂.

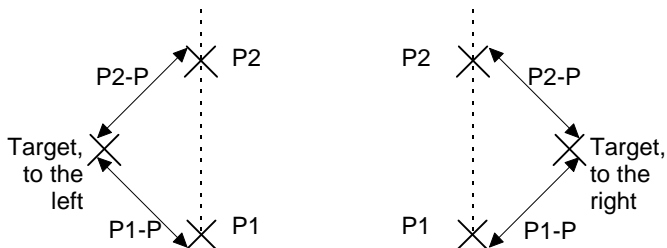
Offset logging

• Introduction

This chapter comes as a continuation of the logging procedure, from page 3-13, in the event of a physical impossibility for you to reach the desired point. Two different techniques are then available for you to survey the inaccessible point:

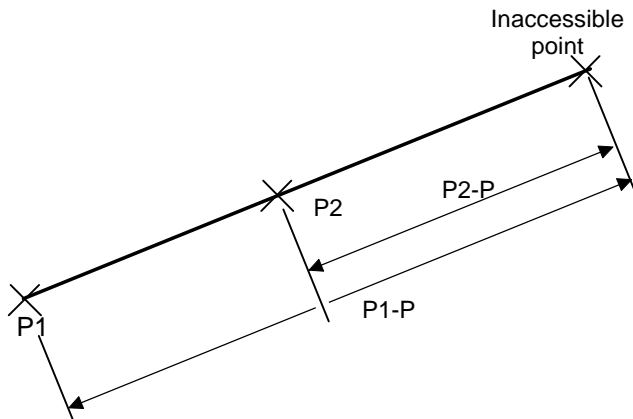
- **Lateral offset:** Through this technique, the accurate location of the point will be deduced from two points (P1 and P2) located nearby, properly logged, and forming a triangle (ideally an equilateral one) with the desired point.

By way of external means (a simple meter for example), you will then have to measure the distances from P1 and P2 to the point and enter the two measurements in the unit through the palmtop keyboard.



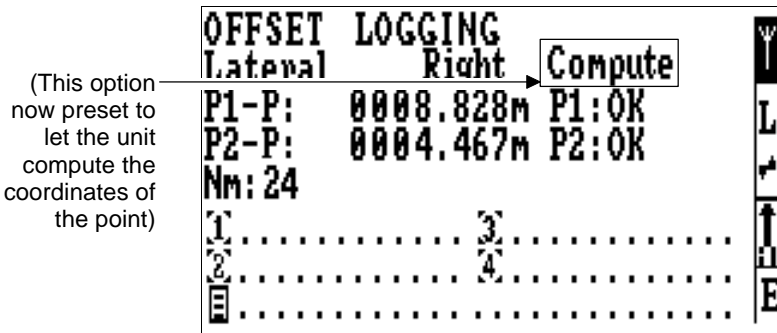
Back at the office, when reading the results of the project with KISS, this point will be described through its dX , dY components, projected onto the grid, in reference to P_1 .

- **Linear offset:** Through this technique, the accurate location of the desired point will be deduced from two points (P_1 and P_2) located nearby, properly logged and both aligned with the inaccessible point. A single distance (P_1-P or P_2-P) will be required by the unit to deduce the coordinates of the accessible points.



- **Lateral Procedure** (Continued from page 3-13)
 - Find and mark two points on the ground, several metres apart, located near the desired point, and where reception conditions are good. These two points are going to be logged as P1 and P2.
 - Using a meter, measure the distances from P1 and P2 to the desired point.
 - Go to P1. From display #8, press “Del/No” and then “E”. Display #E appears.
 - In the selected field, press the “dot” or “sp” key to select “Lateral”.
 - Move the cursor to the next field and choose “Left” or “Right”, depending on the location of the desired point in reference to the chosen P1-to-P2 segment.
 - Move the cursor to the next field and choose “Logging P1”.
 - Move the cursor to the next two fields and successively type in the values of distances measured from P1 and P2 to the desired point.
 - Move the cursor to the Nm field and give P1 a name (a figure necessarily). Fill in the optional next fields (geocodes and comments), if required.
 - Press ↵ to log P1. Press ↵ again to confirm this choice. Stay as immobile as possible during the recording (while the “Please Wait” message is displayed). Display #E now prompts you to log P2.
 - Go to P2.
 - Move the cursor to the Nm field and give P2 a name (a figure necessarily). Fill in the optional next fields (geocodes and comments), if required.

- Press \downarrow to log P2. Press \downarrow again to confirm this choice. Stay as immobile as possible during the recording (while the “Please Wait” message is displayed). Display #E now should look like this.



- Press \downarrow . The “Compute point?” message appears.
- Press \downarrow again to confirm the logging of the desired point and complete the procedure.

NOTE: The message “IMPOSSIBLE” will be returned if the information entered or chosen on Display #E is inconsistent with your choice of P1 and P2. In this case, press “Del/No” and resume the procedure after finding the reason why the procedure did not work.



- **Linear Procedure (Continued from page 3-13)**

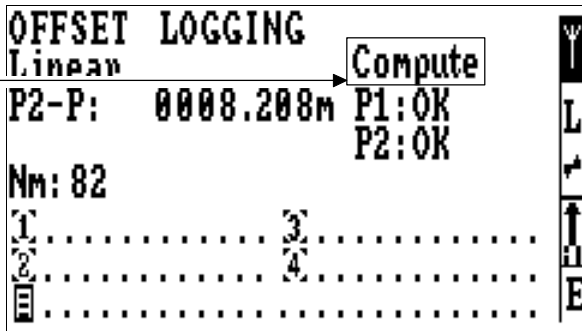
- Find and mark two points on the ground, several metres apart, aligned with the desired point, and where reception conditions are good. These two points are going to be logged as P1 and P2.
- Using a meter, measure the distances from P1 or P2 to the desired point.
- Go to P1. From display #8, press “Del/No” and then “E”. Display #E appears.
- In the selected field, press the “dot” or “sp” key to select “Linear”.
- Move the cursor to the next field and choose “Logging P1”.
- Move the cursor to the “Px-P” field and choose “P2-P” or “P1-P”, depending on your choice about the distance to be used by the unit for the logging of the inaccessible point.

Move the cursor to the next field and type in the value of distance measured from P1 or P2 to the point (depending on the previous choice).

- Move the cursor to the Nm field and give P1 a name (a figure necessarily). Fill in the other optional fields (geocodes and comments) if required.
- Press ↵ to log P1. Press ↵ again to confirm this choice. Stay as immobile as possible during the recording (while the “Please Wait” message is displayed). Display #E now prompts you to log P2.
- Go to P2.

- Move the cursor to the Nm field and give P2 a name (a figure necessarily). Fill in the other optional fields (geocodes and comments), if required.
- Press ↵ to log P2. Press ↵ again to confirm this choice. Stay as immobile as possible during the recording (while the “Please Wait” message is displayed). Display #E now should look like this.

(This option now preset to let the unit compute the coordinates of the point)



- Press ↵. The “Compute point?” message appears.
- Press ↵ again to confirm the logging of the desired point and complete the procedure.

NOTE: The message “IMPOSSIBLE” will be returned if the information entered or chosen on Display #E is inconsistent with your choice of P1 and P2. In this case, press “Del/No” and resume the procedure after finding the reason why the procedure did not work.

If the selected project is based on an unknown local grid

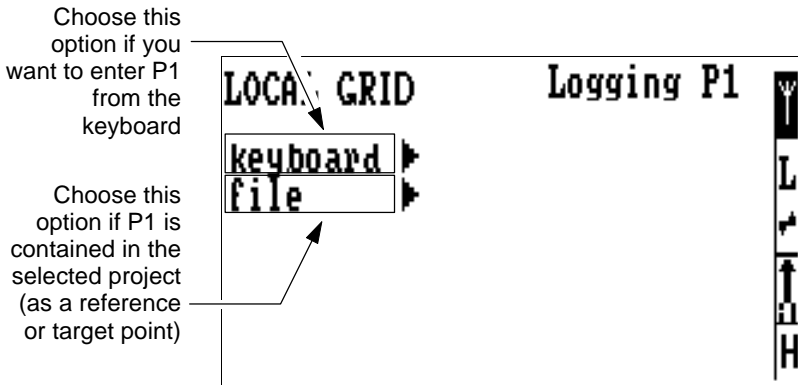
If you cannot access display #6 after selecting a project. (“Disabled screen, Coord. system invalid” message displayed), this means that an unknown local grid was selected for this project.

In this case you first have to go through a particular sequence at the end of which the rover unit will be capable of determining the characteristics of the local grid. In this particular sequence, two known points, P1 and P2 (not to be confused with P1 and P2 in offset operations), have to be logged. The sequence can be outlined as follows:

- At P1, log this point after providing the system with the coordinates of this point expressed in the unknown local grid.
- At P2, resume this operation.
- After which the unit returns the components of the local grid in reference to the standard coordinate system chosen as intermediate system.

• **Procedure** (continued from page 3-5)

- In reply to the message “Disabled screen, Coord. system invalid”, press ↵.
- Press “H”. Display #H appears.



- Press ↵ again. Move the cursor to the desired option and press →:

(From Keyboard:)

Current position with no local grid

- Make changes if necessary

(From File:)

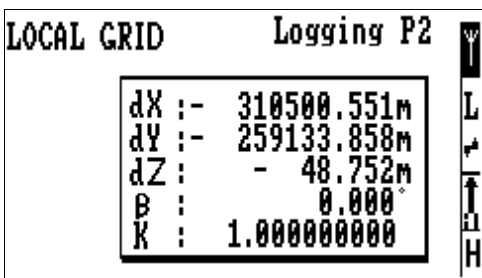
- Choose a point:

- Press →

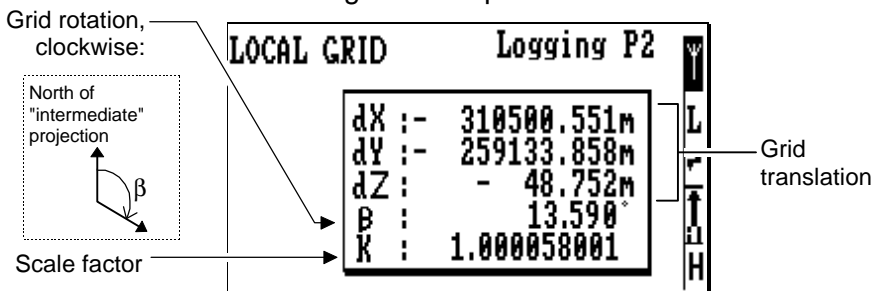
- Make changes if necessary

If the selected project is based on an unknown local grid

- Press \downarrow to log P1. Stay as immobile as possible during the recording (while the "Please Wait" message is displayed).
- Then the unit returns the partial solution to the unknown local grid from the logging of P1. Example:



- Go to P2
- Press \downarrow again and enter the coordinates of P2, also expressed in the unknown local grid, from the keyboard or from the selected project file, as you have just done for P1.
- Press \downarrow to log P2. Stay as immobile as possible during the recording (while the "Please Wait" message is displayed).
- Then the unit returns the complete solution to the now known local grid. Example:



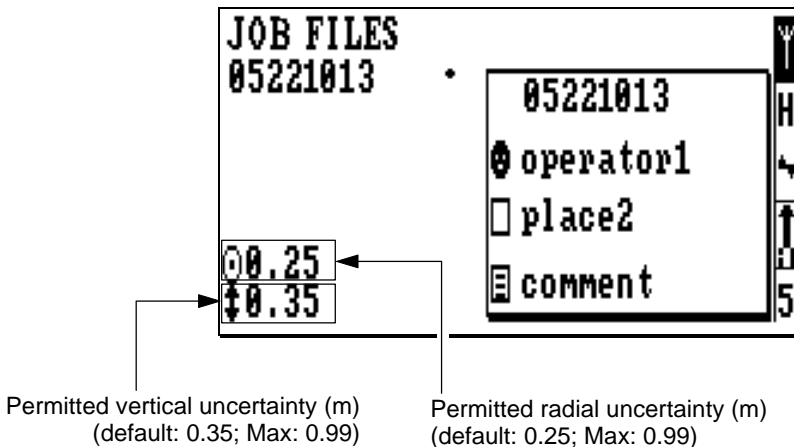
The unit is now ready for the survey of your project.

Setting the max. permitted radial and vertical uncertainties

When choosing a job file or opening a new one (Display #5), you are given the ability to set the maximum values permitted for the radial and vertical uncertainties.

If these limits are exceeded when asking for the recording of a point, a message of the type "Bad Radial Precision, Yes/No?" will appear and you will then be allowed to cancel the recording by pressing the "Del/No" key.

3



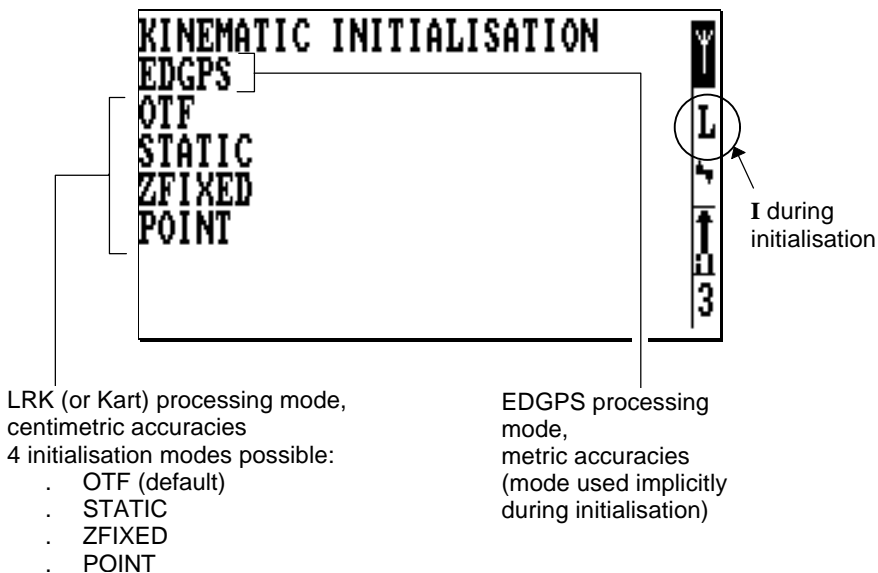
To change these values:

- Select display #5.
Press \downarrow .
- Press \downarrow (repeatedly if the open file is not the last file in the list).
- Make your changes and then press \downarrow again to validate these changes.

Initialisation modes and processing modes

By default, the rover unit is initialised in LRK through OTF. Display #3 can be used to change these settings.

- Select Display #3.



The definitions of the different initialisation modes possible in KART and LRK are recalled below.

OTF : ("On the Fly") Initialization with rover unit in motion, start point unknown

STATIC : Initialization with rover unit at a standstill (to within 1 cm) and point unknown

ZFIXED : Initialization with rover unit in motion, start point unknown, but rover unit altitude remains constant throughout the initialization phase

POINT : Initialization from a known point.

- **Changing the initialisation (and processing) mode**

- After selecting display #3, press ↵.
- Move the cursor to the desired selection and simply press ↵ again. A message of the type "init since x sec" will appear until the end of initialisation.
- If you choose POINT, enter the known start position from the keyboard or from the open project file, in a much similar way as when you have to determine the unknown local grid (see page 3-29):

If you choose "From File":

- press → and select the name of the file containing this point (*project.tar* or *project.ref*)
- press → and select the point name
- press → again to edit the coordinates of this point.
- press ↵ to start the initialisation phase.

3

Opening another job file for your project

- Select display #5.
Press ↵.
- Press →. The cursor then appears in the upper field of the framed area.
- Make changes to this area at your convenience (type in a name for the new file different from those previously created).
- Press ↵ again. A new job file is created and opened. In the same time, the previously open file is closed.

If several job files exist for a project, you can re-open a file that you created and closed earlier:

- Select display #5.
Press ↵.
- Press ↑ to move the cursor to this older file.
- Press ↵ again. The older file is re-opened (■ appears to the right of the file name). In the same time, the previously open file is closed. The field data will be appended to the field data previously stored in that file.

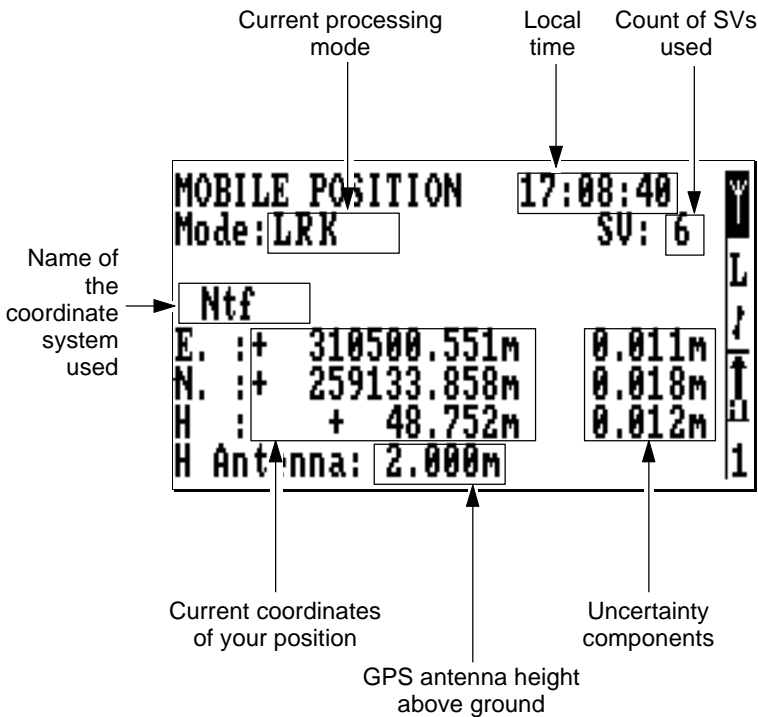
Changing project

- Select display #4.
Press ↵.
- Press ↑ or ↓ to move the cursor to the desired project.
- Press ↵ again. The ■ symbol is moved to the new selection.

Auxiliary displays

- Reading the coordinates of your current position
 - Select display #1.

Display example:

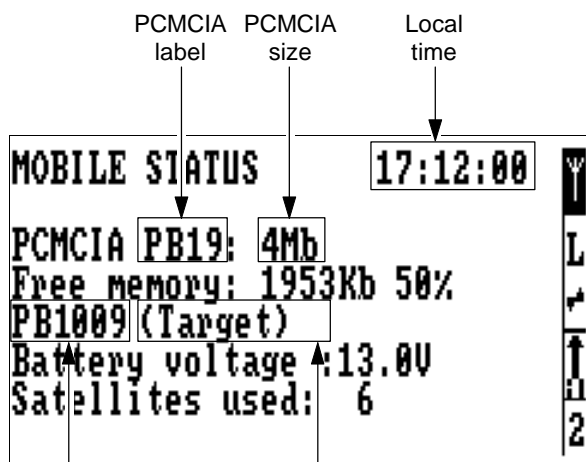


3

- **Reading the mobile status**

- Select display #2.

Display example:

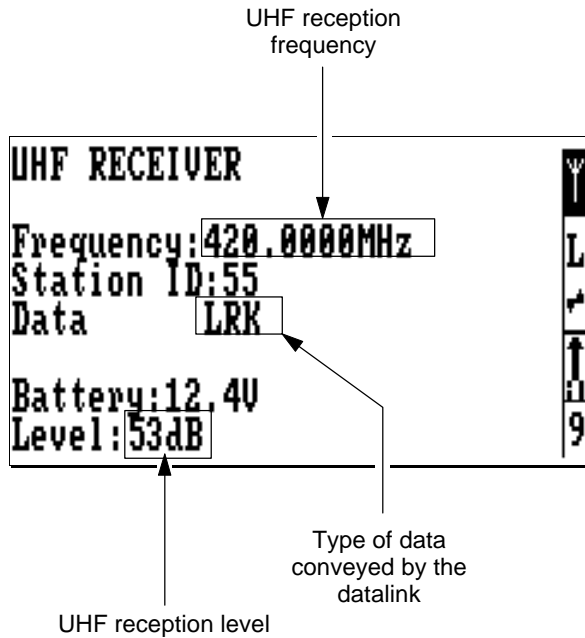


Name of the
open project

Indicates the selected
file in the open project
(Target or Ref)

- Reading the characteristics of the UHF Datalink
 - Select display #9.

Display example:



- Reading the characteristics of the coordinate system used

WARNING! Do not make any changes on this display.

- Select display #A.

Display example:

```
Lambert 2/Ntf Datum
A : 6378249.145m
1/F: 293.46500 S: 1.00000
Dx: -168.000m
Dy: -72.000m
Dz: 318.500m
Ax: 0.00000s Ay: 0.00000s
Az: 0.55400s
```

- Press \downarrow . The cursor appears on the "Datum" field.
- Press the "dot" or "sp" key to select "Projection". The display now shows the characteristics of the projection used.

```
Lambert 2/Ntf Projection
Nori:+ 200000.000m
Eori:+ 600000.000m
Lori: 47°59'59.9920"N
Gori: 2°20'56.8570"E
Ko :0.000000
```

- Press \downarrow again to exit the *edit mode*.

- **Editing the local time**
 - Select display #B.

Display example:

LOCAL TIME	
UTC date	02/03/98
Local time	17:37:14
Local time offset	+02:10
UTC time	15:27:14



Only the "Local time offset" field is editable.

- Viewing the visible GPS constellation

- Select display #C.

SV	El	Azi	Orbit	Use	SV	El	Azi	Orbit	Use
17	12	161	↑	U	24	03	42	↑	R
1	16	219	↓	U	6	16	149	↑	U
8	23	148	↓	U	25	55	289	↑	U
29	23	93	↓	U	30	56	83	↓	U
5	23	93	↓	U	22	02	281	↑	S

SV PRN No. [bracketed under SV column]

Elevation angle in degrees [bracketed under El column]

Azimuth angle in degrees [bracketed under Azi column]

SV orbit: ascending (↑) or descending (↓) [bracketed under Orbit column]

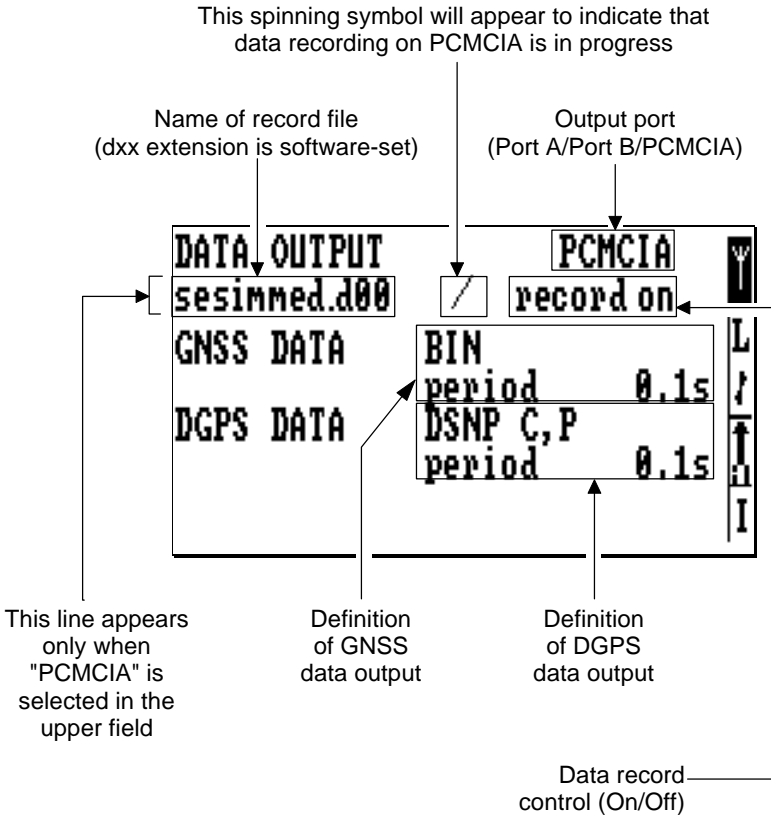
S: Searching
U: Used
R: Received but not used

(Same as opposite) [bracketed under Use column]

- **Setting data outputs**

- Select display #1.

Display example:



- Programming the GNSS data output:
 - Press ↵ and choose the output port
 - Move the cursor to the next field and, using the "sp" or "dot" key, choose the format in which the GNSS data must be output: **BIN** (binary) or **ASC** (ASCII).
 - Move the cursor to the next field and, using the "sp" or "dot" key, choose the output mode:
 - Off** (disables GNSS data output)
 - Period** (data output at regular intervals of time)
 - Trigger** (data output on occurrence of the specified signal)
 - Move the cursor to the next field and, using the "sp" or "dot" key, choose the output rate:
 - x.x sec.** (? to ?) if **Period** mode selected
 - 1PPS** or **EVT1** if **Trigger** mode selected

- Programming the DGPS data output:
 - Move the cursor to the next field and, using the "sp" or "dot" key, choose the format in which the DGPS data must be output:

ASC (ASCII)

RTCM x. A subfield appears (Yes/No) allowing you to choose which of the available RTCM messages (1, 2, 3, 5, 9) you want to output.

LRK

DSNP x. A subfield appears (Yes/No) allowing you to choose which of the available data (C, P or C and P) you want to output

- Move the cursor to the next field and, using the "sp" or "dot" key, choose the output mode:

Off (disables GNSS data output),

Period (data output at regular intervals of time)

Trigger (data output on occurrence of the specified signal)

- Move the cursor to the next field and, using the "sp" or "dot" key, choose the output rate:

x.x seconds if **Period** mode selected

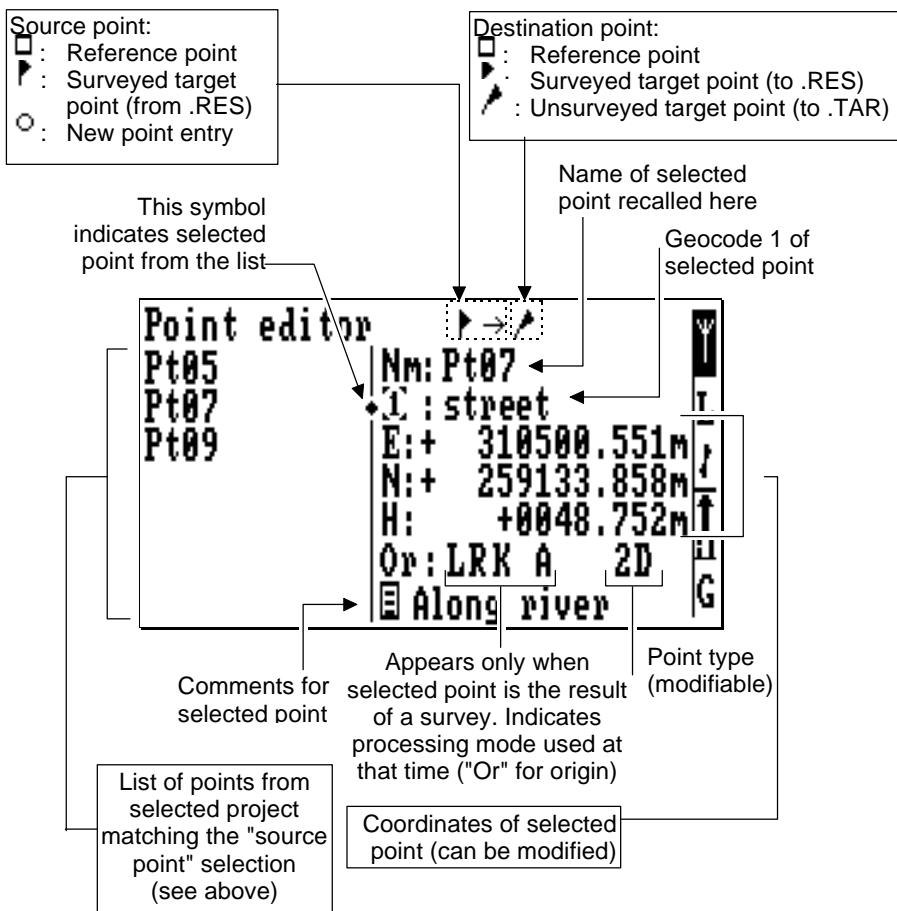
1PPS or **EVT1** if **Trigger** mode selected





• Point Editor







This display allows you to move points from one of the project files (i.e. *.RES, *.TAR and *.REF) to another of these files.





This may be useful when for example you want to transfer a previously staked-out target point (i.e. a point from *.RES) to the .TAR file in order to survey that point again. You can also use this function to create a new target or reference point.

- Select display #G.



- Use the usual keys to enter/quit the *Edit mode*, to edit fields, to change field and to move within a field.
- The allowed "source/destination" combinations are:
 -  →  (new reference point from existing one)
 -  →  (new target point from reference point)

 -  →  (new reference point from surveyed target point)
 -  →  (new target point from surveyed target point)
 -  →  (new surveyed target point from existing one)

 -  →  (new reference point)
 -  →  (new target point)
- To access the four different geocodes, move the cursor to the Geocode No. and then press the "dot" or "sp" key to choose the geocode you want to display
- After setting the Point Editor screen, press ↵. The "Are you sure? " message appears.
- Press ↵ again to confirm your choice. ♣

Index

“?” indication, 3-12

A

Accessory container, 1-1
Alarm report, 2-9
ASC, 3-42, 3-43

B

Bargraph, 2-8
Battery compartment, 1-4
Buzzer, 2-9, 3-11, 3-14, 3-17

C

Coordinate system used, 3-38

Coordinates of current position, 3-35
Current processing mode, 2-8

D

Data link
Reading characteristics, 3-37
Data outputs, 3-41
DGPS data output, 3-43
Direction of walk, 3-8

E

Edit mode, 2-5

G

Geocodes, 3-11, 3-14, 3-24, 3-27
GNSS data output, 3-42
GPS constellation, visible, 3-40
Guidance chart, 3-7, 3-8

I

Initialisation modes and processing modes, 3-32

J

Job file, 3-3, 3-31, 3-34

L

Lateral offset, 3-20, 3-22

Procedure, 3-24

Linear offset, 3-20, 3-23

Procedure, 3-26

Local time, 3-39

O

ON/OFF pushbutton, 2-4

OTF, 3-4, 3-32

P

PgUp/PgDn keys, 2-6

POINT, 3-32, 3-33

Project

Change, 3-34

Choose, 3-2

R

Radial and vertical uncertainties, 3-31

Read mode, 2-5

Rover unit

Preparing for field survey, 2-1

Rover unit assembly, 1-4

Rover Unit container, 1-3

RTCM, 3-43

S

Searching for closest point, 3-5

Shoulder straps, 1-4

Start-up sequence, 3-1

STATIC, 3-32

T

Trajectories, 3-15

U

UHF datalink indicator, 2-8


Unknown local grid, 3-28

Z

ZFIXED, 3-32

DASSAULT SERCEL
Navigation-Positionnement

16 rue de Bel Air B.P. 433
44474 CARQUEFOU Cedex

 +33 (0)2 40 30 59 00. Fax +33 (0)2 40 30 58 92
Télex SERCEL 710 695 F

S.A. à Directoire et Conseil de surveillance
au capital de 75 000 000 F

RCS Nantes B 321 391 237