

# Leica Alignment Tool Kit Technical Reference Manual



Version 1.0  
English

- when it has to be **right**

**Leica**  
Geosystems

## Introduction

### Purchase

Congratulations on the purchase of an Alignment Tool Kit (ATK) application.



This manual contains instructions for setting up the application and operating it. Read carefully through the Technical Reference Manual before using the application.

### Product identification

The type and serial number of your product are indicated on the type plate. Enter the type and serial number in your manual and always refer to this information when you need to contact your agency or Leica Geosystems authorized service workshop.

Type: \_\_\_\_\_

Serial No.: \_\_\_\_\_

Software version: \_\_\_\_\_

### Symbols

The symbols used in this manual have the following meanings:

Type	Description
	Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

### Trademarks

- Windows and Windows CE are a registered trademark of Microsoft Corporation
  - CompactFlash and CF are trademarks of SanDisk Corporation
- All other trademarks are the property of their respective owners.

### Validity of this manual

- This manual applies to the ATK application for GPS1200, TPS1200 and GPS900 instruments. Differences between the various instrument types are marked and described.

## Available documentation

Name	Description	Format
		
Technical Reference Manual	Overall comprehensive guide to the program functions. Included are detailed descriptions of special software settings and software functions intended for technical specialists.	X

### Refer to the following resources for the documentation:

- the SmartWorx DVD
- <http://www.leica-geosystems.com/downloads>

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# 1

## Introduction

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### 1.1

#### Overview

---

#### Description

This manual is an introduction to the application Alignment Tool Kit. Alignment Tool Kit is an "add-on" component to the RoadRunner application. It is only intended for quick and easy modification of existing alignments, or creation of new ones. Alignment Tool Kit is not an on board road planning and design application.

The Alignment Tool Kit application supports these alignment types:

- Horizontal alignments
- Vertical alignments
- X-section templates
- X-section assignments
- Chainage equations

The application is a free application program provided by Leica Geosystems AG. If the application does not appear on your menu or you are otherwise unable to access it, please contact your Leica Geosystems AG representative.

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## 1.2

## Basic Terms

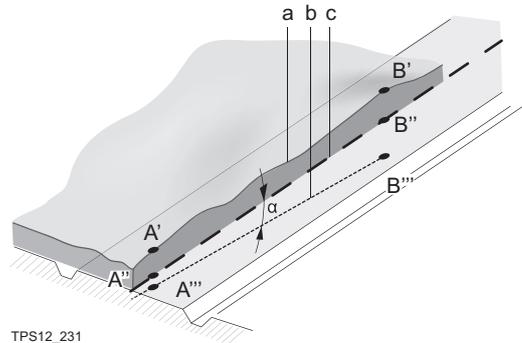
### Description

In order to make the following chapters easier to understand, the basics are introduced in this subchapter.

A road surface can be thought of three different types of design elements:

- the horizontal alignment
- the vertical alignment
- the X-section

### Basic concepts



- a - Natural surface.
- b - The vertical alignment.
- c - The horizontal alignment.
- A''/B'' - Points on horizontal alignment
- A'/B' - Points on real surface
- A'''/B''' - Points on vertical alignment

Any point A in a project has ENh coordinates in a determined coordinate system. Each point has three different positions:

- A'' - Point on horizontal alignment
- A' - Point on real surface
- A''' - Point on vertical alignment

---

By adding a second point B to the project an alignment is defined. The alignment can be thought in three ways:

- Horizontal alignment (A''-B'')
- Projection of the horizontal alignment onto the real surface (A'-B')
- Vertical alignment (A'''-B''')

The angle between the horizontal and the vertical alignment is the grade ( $\alpha$ ).

---

### Geometric elements

A road design is fitted to a base plan or map using the three basic geometric elements:

- Straight
  - Curve
  - Spiral
-

## 1.3

### 1.3.1

#### Description

## Design elements

### The Horizontal Alignment

The horizontal alignment defines the road axis of a project. The constituting elements of a horizontal alignment are:

- straights (tangents)
- curves (arcs)
- spirals (clothoid or cubic parabola).

Each constituting element is defined by individual horizontal design elements such as chainage, easting, northing, radius and parameter A.

#### Design elements for horizontal alignment

Design element	Description
<b>Straight (tangent)</b>	Straight line between two points. It's end point is identical with the beginning of a curve or spiral. The tangent is perpendicular to the radius of the curve.
<b>Curve (arc)</b>	Circular curve with constant radius.
<b>Spiral</b>	Spirals are used to connect straights and curves. A full spiral has an infinite radius at its start or end point whereas a partial has a finite radius at its start and end point.
	<b>In.</b> Radius at the start point is bigger than at the end point.
	<b>Out.</b> Radius at the start point is smaller than at the end point.
<b>Parameter A</b>	$A^2 = R * L$
	R = Radius of the connecting circular curve.

---

Design element	Description
	L = Length of the spiral.

---

### 1.3.2

## The Vertical Alignment

### Description

The vertical alignment gives information about the pattern of heights of the road axis as it is defined in the horizontal alignment.

The constituting elements of a vertical alignment are:

- tangents (straight segments)
- curves
- parabolas.

Each constituting element is defined by individual vertical design elements such as chainage, easting, northing, radius and chainage P.

### Design elements for vertical alignment

Design element	Description
<b>Tangent</b>	Straight line between two points. It's end point is identical with the beginning of a curve or spiral. The tangent is perpendicular to the radius of the curve.
<b>Curve</b>	Circular vertical curve with constant radius.
<b>Parabola</b>	Parabolic vertical curve with constant rate of grade change.

---

**1.3.3****The X-Section Templates**

---

**Description**

A X-Section gives a profile view. It requires vertical alignment or actual elevation on each chainage.

The constituting elements are straight elements. The points are called vertices. You may optionally define slopes at the vertices most left and most right.

Points are defined by:

- $\Delta H$  and  $\Delta V$
  - $\Delta H$  and slope in percentage
  - $\Delta H$  and slope in ratio
-

### 1.3.4

### The X-Section Assignments

---

#### Description

One X-section is valid until a new one is defined at a chainage ahead. X-section definition can be at any chainage. The chainages need not necessarily correspond to chainages where a design element starts or ends.

---

---

**1.3.5****The Chainage equation****Description**

Chainage Equations define adjustments for the chainage values in the horizontal alignment. These adjustments may be necessary when the horizontal alignments has been modified by inserting or removing a constituting element and the chainage in the horizontal alignment were not recomputed. This can be the case when editing manually or with a program which does no automatic recomputation. Simply speaking, chainage equations define leaving a gap or allow an overlap at certain chainages.

The constituting elements in the equations are:

- chainage back
  - chainage ahead.
-



## 2

## Starting Alignment Tool Kit

## 2.1

## Overview

## Access

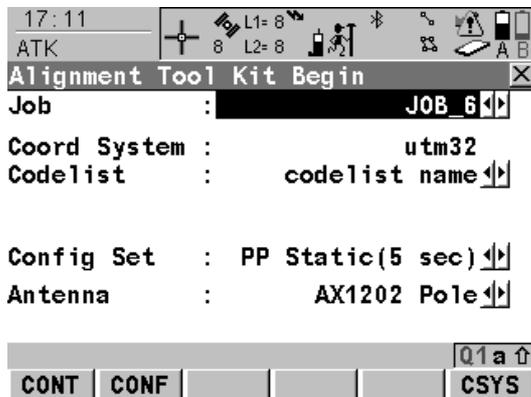
The **Alignment Tool Kit** application can be accessed by:

- Select **Main Menu: Programs... \Alignment Tool Kit** and press **CONT (F1)**.
- Press the **PROG** key. Highlight **Alignment Tool Kit** and press **CONT (F1)**.
- Press a hot key configured to access the screen **ATK Alignment Tool Kit Begin**.
- Press the **USER** key. Highlight **Alignment Tool Kit** in the User menu (which has to be configured) and press **CONT (F1)**.

## ATK, Alignment Tool Kit Begin

Depending on the instrument you are starting ATK with, the **ATK Alignment Tool Kit Begin** screen looks different. Below the begin screens on the different instruments (GPS1200 receiver/TPS1200 instrument/GPS900 receiver) are shown.

## GPS1200

**CONT (F1)**

To accept the screen entries and continue.

**CONF (F2)**

To access ATK Configuration.

**CSYS (F6)**

To select a different coordinate system.

## TPS1200

17:10  
ATK

Alignment Tool Kit Begin

Job : JOB\_6

Coord System : utm32  
Codelist : <None>

Config Set : TCRP

Reflector : Leica Circ Prism  
Add. Constant: 0.0 mm

Q1 a ↑

CONT	CONF	SETUP			CSYS
------	------	-------	--	--	------

**CONT (F1)**

To accept the screen entries and continue.

**SETUP (F3)**

To set up chainage.

## GPS900

17:12

ATK

Alignment Tool Kit Begin

Job : JOB\_6

Coord System : utm32

Codelist : codelist name

Q1 a ↑

CONT	CONF			DATA	CSYS
------	------	--	--	------	------

**CONT (F1)**

To accept the screen entries and continue.

**DATA (F5)**

To view, edit and delete points stored with the job.

## Description of fields

Field	Description
<b>Job</b>	The active job.
<b>Coord System</b>	The coordinate system currently attached to the selected <b>Job</b> .
<b>Codelist</b>	Choicelist. No codes are stored in the selected job. All codelists from <b>Main Menu: Manage...\Codelists</b> can be selected.
	Output. Codes have already been stored in the selected <b>Job</b> . If codes had been copied from a System RAM codelist, then the name of the codelist is displayed. If codes have not been copied from a System RAM codelist but typed in manually, then the name of the active job is displayed.
<b>Config Set</b>	Choicelist. The active configuration set. All configuration sets from <b>Main Menu: Manage...\Configuration Sets</b> can be selected. Only available for <b>GPS1200</b> and <b>TPS1200</b> .
<b>Antenna</b>	Choicelist. The antenna currently defined in the selected <b>Config Set</b> . All antennas from <b>Main Menu: Manage...\Antennas</b> can be selected. Only available for <b>GPS1200</b> .
<b>Reflector</b>	Choicelist. The reflector currently defined in the selected <b>Config Set</b> . All reflectors from <b>Main Menu: Manage...\Reflectors</b> can be selected. Only available for <b>TPS1200</b> .
<b>Add. Constant</b>	The additive constant stored with the chosen reflector. Only available for <b>TPS1200</b> .

### Next step

IF	THEN
<b>ATK</b> is to be continued.	Press <b>CONT (F1)</b> to access the <b>Task Selection</b> screen. Refer to "2.2 Selecting the task".
<b>ATK</b> is to be configured	<b>CONF (F2)</b> . Refer to "2.4 Configuring Alignment Tool Kit".

## 2.2

## Selecting the task

## Description

Define whether a new alignment is to be created or an existing alignment is to be modified.

## Access

Refer to "2.1 Overview" to access **ATK Alignment Tool Kit Begin**. Press **CONT (F1)** to access the **Task Selection** screen.

## Task selection



Task Selection

Task : Modify Alignment

Raw Alignment: soccer spaces



CONT Q1a

CONT (F1)

To accept the screen entries and continue.

## Description of fields

Field	Description
Task	<p>Choicelist. Defines the task used in the ATK application. Alignments will be saved as LandXML files in the \Data\XML folder on the CF card or on the Internal memory (if fitted).</p> <ul style="list-style-type: none"> <li>• <b>Create Alignment.</b> To create a new raw alignment. Refer to "2.2.1 Creating a new raw alignment".</li> <li>• <b>Modify Alignment.</b> To modify an existing alignment. Refer to "2.2.2 Modify an existing raw alignment".</li> </ul>

Field	Description
<b>Raw Alignment</b>	The alignment to be modified. All alignments in the \Data\XML folder can be selected. Only available for <b>Modify Alignment</b> .

### Next step

IF an alignment	THEN
is to be created	Select <b>Create Alignment</b> . Press <b>CONT (F1)</b> and access the <b>New Raw Alignment</b> screen. Refer to "2.2.1 Creating a new raw alignment".
is to be modified	Select <b>Modify Alignment</b> and access the <b>Raw Alignments</b> screen. Refer to "2.2.2 Modify an existing raw alignment".

## 2.2.1

## Creating a new raw alignment

## Access

Refer to "2.2 Selecting the task" to access the **Task Selection** screen. Select **Create alignment** and press **CONT (F1)** to access the **New Raw Alignment** screen.

New Raw Alignment,  
General Page

**New Raw Alignment** [X]

General Settings

**Name** : **Raw Alignment**

**Description** : -----

                  : -----

**Creator** : **Customer**

CONT [ ] [ ] [ ] [ ] Q1 a ↑ PAGE

**CONT (F1)**

To accept the screen entries and continue.

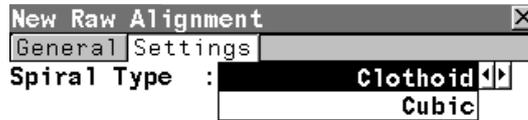
## Description of fields

Field	Description
<b>Name</b>	Input. The name of the new raw alignment.
<b>Description</b>	Input. Optional description of the new raw alignment.
<b>Creator</b>	Input. Optional description of the Creator of this alignment.

## Next step

**PAGE (F6)** to change to the **Settings** page.

## New Raw Alignment, Settings Page



## Description of fields



**CONT (F1)**

To accept the screen entries and continue.

Field	Description
Spiral Type	Choicelist. The type of spirals to be used in the alignment definition.
	<b>Clothoid.</b> Uses clothoid as transition curve type.
	<b>Cubic.</b> Uses cubic parabola as transition curve type.

## Next step

**CONT (F1)** accesses the **Alignment Tool Kit Menu** screen. Refer to "2.3 Selecting an option".

## 2.2.2

## Modify an existing raw alignment

## Access

Refer to "2.2 Selecting the task" to access the **Task Selection** screen. Select **Modify Alignment**, move the focus to **Raw Alignment** and press enter to access the **Raw Alignments** screen.

## Raw Alignments

Raw Alignments	
Name	Date
soccer office 1m	24.11.06
soccer spaces	03.11.06

CONT	NEW	EDIT	DEL	MORE	Q1 a ↑
------	-----	------	-----	------	--------

**CONT (F1)**

To accept the screen entries and continue.

**NEW (F2)**

To create a new raw alignment. Refer to "2.2.1 Creating a new raw alignment".

**EDIT (F3)**

To edit an existing alignment.

**DEL (F4)**

To delete an existing alignment.

**MORE (F5)**

To switch the last column between **Date**, **Time** and **Size**.

**SHIFT BCKUP (F5)**

To restore a LandXML alignment file with the extension \*.xmb currently stored in the \Data\XML folder.

## Description of fields

Field	Description
<b>Name</b>	Output. All existing LandXML alignments currently stored in the \Data\XML folder with the file extension *.xml.
<b>Date</b>	Output. Date of creation of the alignment file.

Field	Description
Time	Output. Time of creation of the alignment file.
Size	Output. Size of the LandXML file.

### Next step

IF an alignment	THEN
is to be newly created	Press <b>NEW (F2)</b> and access the <b>New Raw Alignment</b> screen. Refer to "2.2.1 Creating a new raw alignment".
is to be edited	Press <b>EDIT (F3)</b> and access the <b>Edit Raw Alignment</b> screen. Edit the alignment and press <b>CONT (F1)</b> to return to the <b>Raw Alignments</b> screen. <b>CONT (F1)</b> again to access <b>Alignment Tool Kit Menu</b> .
is to be deleted	Press <b>DEL (F4)</b> , confirm or decline the process and return to the <b>Raw Alignments</b> screen. <b>CONT (F1)</b> again to access <b>Alignment Tool Kit Menu</b> .

## 2.3 Selecting an option

### Description

All operations that can be basically performed for alignments by the ATK application.

### Access

Refer to "2.2 Selecting the task" to access the **Task Selection** screen. Press **CONT (F1)** to access the **Alignment Tool Kit Menu** screen.

### Alignment Tool Kit Menu

```
Alignment Tool Kit Menu [X]
1 Edit Horizontal Alignment
2 Edit Vertical Alignment
3 Edit X-Section Templates
4 Edit X-Section Assignments
5 Edit Chainage Equation
6 Convert to RRunner Job
```

**CONT** **Q1a** **CONT (F1)**

To accept the screen entries and continue.

### Description of options

Option	Description
<b>Edit Horizontal Alignment</b>	To create, edit and delete elements of a horizontal alignment. Refer to "3 Edit Horizontal Alignments".
<b>Edit Vertical Alignment</b>	To create, edit and delete elements of a vertical alignment. Refer to "4 Edit Vertical Alignments".
<b>Edit X-Section Templates</b>	To create, edit and delete X-Section templates. Refer to "5 Edit X-Section Templates".
<b>Edit X-Section Assignments</b>	To create, edit and delete X-Section assignments. Refer to "6 Edit X-Section Assignments".

Option	Description
<b>Edit Chainage Equation</b>	To create, edit and delete chainage equations. Refer to "7 Edit Chainage Equation".
<b>Convert to RRunner Job</b>	To convert existing LandXML alignments to a RoadRunner job. Refer to "8 Convert to RoadRunner Job".

The available options can be performed individual or in special combinations. Possible combinations:

- 1 + 6
- 1 + 2 + 6
- 1 + 3 + 4 + 6
- 1 + 2 + 3 + 4 + 6

All listed combinations can also contain additionally the option 5 (Chainage Equation).

### Next step

IF	THEN
an <b>ATK</b> method is to be started	Highlight the relevant option and press <b>CONT (F1)</b> . Refer to the chapters stated above.
<b>ATK</b> is to be configured	<b>SHIFT (F2)</b> . Refer to "2.4 Configuring Alignment Tool Kit".

## 2.4 Configuring Alignment Tool Kit

### Description

The ATK configuration defines the settings to be used in the different parts of the ATK application.

### Access

Refer to "2.1 Overview" to start the ATK application. Press **CONF (F2)** to access **ATK Configuration**.

### ATK Configuration, General Page

Configuration

General | RR Job | Template

Deflec. Check: Yes

Deflec. Tol. : 0.0031 g

Chain Format : +1234+56.789

Confirm Coord: Yes

### CONT (F1)

To accept the screen entries and continue.

### PAGE (F6)

To change to another page on this screen.

Q1 a ↑

CONT PAGE

### Description of fields

Field	Description
<b>Deflec. Check</b>	Choicelist. If set to <b>YES</b> , a deflection check will be done.
<b>Deflec. Tol.</b>	Input. The deflection tolerance is the tolerance value used for determining deflection errors. A deflection error occurs when the beginning curve tangent of an element does not match the ending tangent of the previous element. If the actual error in deflection is greater than this value, the error will be reported.
<b>Chain Format</b>	Choicelist. Selects display format for all chainage information fields.

Field	Description
	<ul style="list-style-type: none"> <li>• <b>+123456.789</b>. Default chainage display format.</li> <li>• <b>+123.4+56.789</b>. Separator between tens and hundreds with additional thousand separator.</li> <li>• <b>+123+456.789</b>. Separator between hundreds and thousands.</li> <li>• <b>+1234+56.789</b>. Separator between tens and hundreds.</li> </ul>
<b>Confirm Coord</b>	Choicelist. If set to <b>YES</b> , each time a new alignment element has been entered, a confirmation message displays the end coordinates for confirmation.

### Next step

**PAGE (F6)** changes to the **RR Job** page.

### ATK Configuration, RR Job Page

Configuration [X]

General | RR Job | Template

Job Type : Road

Convert Mode : H, V & X-Sect

New Job Mode : Automatic

### CONT (F1)

To accept the screen entries and continue.

### PAGE (F6)

To change to another page on this screen.

Q1 a ↑

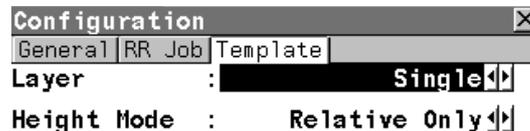
CONT [ ] [ ] [ ] PAGE

## Description of fields

Field	Description
<b>Job Type</b>	Output. Define the job type to be used for the conversion. <b>Road</b> is currently the only supported <b>Job Type</b> .
<b>Convert Mode</b>	Choicelist. The mode used for the conversion. Refer to "8 Convert to RoadRunner Job" for more detailed information.
<b>New Job Mode</b>	Choicelist. The job mode to be used for the conversion.
	<b>Manual</b> . The conversion has to be done manually. Refer to "8 Convert to RoadRunner Job" for more detailed information.
	<b>Automatic</b> . The conversion will be done automatically with the options defined for <b>Convert Mode</b> .

## Next step

**PAGE (F6)** changes to the **Template** page.

ATK Configuration,  
Template Page**CONT (F1)**

To accept the screen entries and continue.

**PAGE (F6)**

To change to another page on this screen.



## Description of fields

Field	Description
<b>Layer</b>	Choicelist. Possibility to define multiple layers per X-Section within the creation of X-Sections. This setting can not be changed for existing alignments.
	<b>Single.</b> A single layer can be defined per X-Section.
	<b>Multiple.</b> Multiple layers can be defined per X-Section.
<b>Height Mode</b>	Choicelist. Define the mode for heights used in X-Section Templates.
	<b>Relative Only.</b> Heights entered for the X-Section Templates are relative to the height of the vertical alignment.
	<b>Relative &amp; Abs..</b> Within the X-Section Templates definition a height can be set for the centreline.

### Next step

**CONT (F1)** accepts the entries and returns to the screen where the **Configuration** screen was entered from.

---

---

## 3

## Edit Horizontal Alignments

---

### 3.1

### Overview

---

#### Description

Allows creating, editing and deleting of the following elements:

- Start Point
- Straight (Tangent)
- Curve
- Spiral
- Partial Spiral

as well as checking the horizontal alignment.

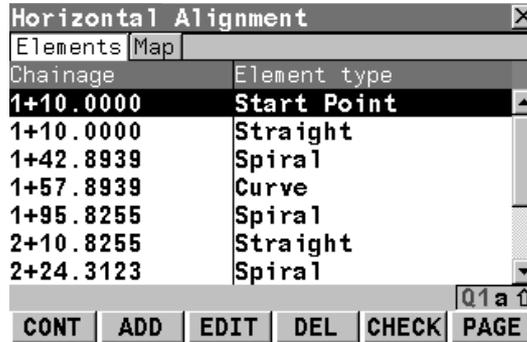
---

#### Access

Refer to "2.3 Selecting an option" to access the **Alignment Tool Kit Menu** screen. Highlight **Edit Horizontal Alignments** and press **CONT (F1)** to access the **Horizontal Alignment** screen.

---

## Horizontal Alignment



### **CONT (F1)**

To accept the screen entries and continue.

### **ADD (F2)**

To add a new element to the horizontal alignment.

### **EDIT (F3)**

To edit the highlighted element of the horizontal alignment.

### **DEL (F4)**

To delete the highlighted element of the horizontal alignment.

### **CHECK (F5)**

To check the horizontal alignment.

### **PAGE (F6)**

To change to another page on this screen.

### **SHIFT HOME (F2)**

To move the focus to the Start Point of the horizontal alignment.

### **SHIFT END (F3)**

To move the focus to the End Point of the horizontal alignment.

## Next step

IF	THEN
the start point is to be edited	Highlight the Start Point and press <b>EDIT (F3)</b> . Refer to "3.2 Editing the start point".

---

<b>IF</b>	<b>THEN</b>
an element is to be created	Press <b>ADD (F2)</b> and access the <b>HZ-Add Element</b> screen. Refer to "3.3 Inserting/Editing an element to/in a horizontal alignment".
an element is to be edited	Press <b>EDIT (F3)</b> . Refer to "3.3 Inserting/Editing an element to/in a horizontal alignment".
an element is to be deleted	Press <b>DEL (F4)</b> and confirm or abort deleting. Refer to "3.4 Deleting an existing element in a horizontal alignment"
the horizontal alignment is to be checked	Press <b>CHECK (F5)</b> . The horizontal alignment will be checked. <b>OK (F4)</b> confirms the checking and returns to the <b>Horizontal Alignment</b> screen.

---

## 3.2

## Editing the start point

### Access

Refer to "3.1 Overview" to access **Horizontal Alignment**. Highlight the **Start Point** and press **EDIT (F3)** to access the **HZ-Start Point** screen.

### HZ-Start Point

```
HZ-Start Point [X]
Strt Chainage: 1+10.0000 m
Easting      : -19846.7901 m
Northing     : 5301045.9737 m
```

#### **CONT (F1)**

To accept the screen entries and continue.

#### **GETPT (F4)**

To apply coordinates or heights from an existing point in the active job.

#### **SURVY (F5)**

To manually occupy a point.

#### **SHIFT CONF (F2)**

To access ATK Configuration.

#### **SHIFT RESET (F4)**

To reset all screen entries.

```
[CONT] [ ] [ ] [GETPT] [SURVY] [Q1a ↑]
```

### Description of fields

Field	Description
<b>Strt Chainage</b>	Input. Start chainage of the horizontal alignment.
<b>Easting</b>	Input. Easting of the start point of the horizontal alignment.
<b>Northing</b>	Input. Northing of the start point of the horizontal alignment.

### 3.3 Inserting/Editing an element to/in a horizontal alignment

**Access**

Refer to "3.1 Overview" to access **Horizontal Alignment**. Highlight an alignment element and press **ADD (F2)/EDIT (F3)** to create/edit a new/existing alignment element.



Creating and editing an alignment element is similar. For simplicity, only the creating of an alignment element is explained and differences are clearly outlined.

**Hz-Add Element**



**CONT (F1)**

To accept the screen entries and continue.

**Description of options**

Option	Description
<b>Straight</b>	To insert/edit a straight to/in a horizontal alignment.
<b>Curve</b>	To insert/edit a curve to/in a horizontal alignment.
<b>Spiral</b>	To insert/edit a spiral to/in a horizontal alignment.
<b>Partial Spiral</b>	To insert/edit a partial spiral to/in a horizontal alignment.

### 3.3.1

## Creating/Editing a straight

### Access

Refer to "3.3 Inserting/Editing an element to/in a horizontal alignment" to access the **Hz-Add Element** screen. Highlight **Straight** and press **CONT (F1)** to access the **Hz-Straight** screen.

### HZ-Straight

The screenshot shows a terminal window titled "Hz-Straight" with a close button (X) in the top right. Below the title bar are three tabs: "Input", "Details", and "Map". The main area contains the following text:

```
Method      :      Azimuth/Length |>
Strt Chainage:      1+42.8939 m
Azimuth     :      374.7362 g
Length      :      10.5000 m
```

The screenshot shows a row of function key buttons: **CONT**, **INV**, **LAST**, **GETPT**, **SURVY**, and **PAGE**. To the right of these buttons is a small box containing "Q1 a ↑".

### CONT (F1)

To accept the screen entries and continue.

### INV (F2)

To calculate the inverse between two existing points in the active job.

### LAST (F3)

To select values from the last inverse calculations.

### GETPT (F4)

To apply coordinates or heights from an existing point in the active job.

### SURVY (F5)

To manually occupy a point.

### PAGE (F6)

To change to another page on this screen.

### SHIFT CONF (F2)

To access the ATK Configuration.

### SHIFT RESET (F4)

To reset all screen entries.

### Description of fields

Field	Description
Method	Choicelist. The method used to define the straight.
	<b>Azimuth/Length</b> . Using the azimuth and the length of the straight.

---

Field	Description
	<b>Azimuth/ E Chain.</b> Using the azimuth and the end chainage of the straight.
	<b>End Coords.</b> Using the end coordinates of the straight.
<b>Strt Chainage</b>	Output. The end chainage of the previous element is automatically used and cannot be edited.
<b>Azimuth</b>	Input. The azimuth displayed is from the previous element. Another value can be entered manually.
<b>Length</b>	Input. Length of the straight element.
<b>End Chainage</b>	Input. Chainage at the end of the element.
<b>End East</b>	Input. Easting for the end chainage.
<b>End North</b>	Input. Northing for the end chainage.

---

### 3.3.2

## Creating/Editing a curve

### Access

Refer to "3.3 Inserting/Editing an element to/in a horizontal alignment" to access the **HZ-Add Element** screen. Highlight **Curve** and press **CONT (F1)** to access the **HZ-Curve** screen.

### HZ-Curve

Hz - Curve	
Input	Details
Method	: Radius/Length
Strt Chainage:	1+57.8939 m
Start Azimuth:	393.8348 g
Curve Direc. :	Right
Radius	: 25.0000 m
Length	: 10.5000 m

CONT	INV	LAST	GETPT	SURVY	PAGE
------	-----	------	-------	-------	------

#### CONT (F1)

To accept the screen entries and continue.

#### INV (F2)

To calculate the inverse between two existing points in the active job.

#### LAST (F3)

To select values from the last inverse calculations.

#### GETPT (F4)

To apply coordinates or heights from an existing point in the active job.

#### SURVY (F5)

To manually occupy a point.

#### PAGE (F6)

To change to another page on this screen.

#### SHIFT CONF (F2)

To access ATK Configuration.

#### SHIFT RESET (F4)

To reset all screen entries.

### Description of fields

Field	Description
Method	The method used to define the curve.
	<b>Radius/Length.</b> Using the radius of the curve and its length.
	<b>Radius/Delta.</b> Using the radius and the delta angle of the curve.

Field	Description
	<b>Radius/E Chain.</b> Using the radius of the curve and the end chainage.
	<b>Radius/E Coords.</b> Using the radius and the end coordinates of the curve.
	<b>Center/E Coords.</b> Using the coordinates of the center point and the end point of the curve.
	<b>3 Points.</b> Using three points.
<b>Strt Chainage</b>	Output. The end chainage of the previous element is automatically used and cannot be edited.
<b>Start Azimuth</b>	Input. The azimuth of the tangent in the start point. This is used from the previous element. The value can be edited.
<b>Curve Direc.</b>	Choicelist. Looking in the direction of increasing chainage, the direction of the curve can be <b>RIGHT</b> or <b>LEFT</b> .
<b>Radius</b>	Input. Radius of the curve. The signs are set by the system depending on the curve direction defined in <b>Curve Direc..</b>
<b>CP East</b>	Input. Easting of the center point of the curve.
<b>CP North</b>	Input. Northing of the center point of the curve.
<b>Int. East</b>	Input. Easting of the intermediate point of the 3-pt-arc.
<b>Int. North</b>	Input. Northing of the intermediate point of the 3-pt-arc.
<b>Length</b>	Input. Length from the start to the end point of the curve.
<b>Delta</b>	Input. The deflection angle. Only available for <b>Radius/Delta</b> .
<b>End Chainage</b>	Input. The end chainage of the curve element can be typed in. Available for <b>Radius/E Chain</b> and <b>Radius/Delta</b> .

<b>Field</b>	<b>Description</b>
<b>End East</b>	Input. Easting for the end chainage. Available for <b>Radius/E Coords</b> and <b>Center/E Coords</b> .
<b>End North</b>	Input. Northing for the end chainage. Available for <b>Radius/E Coords</b> and <b>Center/E Coords</b> .

---

3.3.3

Creating/Editing a spiral

Access

Refer to "3.3 Inserting/Editing an element to/in a horizontal alignment" to access the **HZ-Add Element** screen. Highlight **Spiral** and press **CONT (F1)** to access the **HZ-Spiral** screen.

HZ-Spiral

The screenshot shows a terminal-style window titled "Hz-Spiral" with a close button (X). It has three tabs: "Input", "Details", and "Map". The "Input" tab is active, displaying the following fields:

- Method : Radius/Length
- Strt Chainage: 1+42.8939 m
- Start Azimuth: 374.7362 g
- Spiral Direc.: Right
- Spiral In/Out: Spiral In
- Radius : 5.0000 m
- Length : 10.5000 m

At the bottom of the screen, there is a control bar with several buttons: "CONT", "INV", "LAST", a blank button, another blank button, and "PAGE". A cursor "Q1 a ↑" is positioned above the "PAGE" button.

**CONT (F1)**

To accept the screen entries and continue.

**INV (F2)**

To calculate the inverse between two existing points in the active job.

**LAST (F3)**

To select values from the last inverse calculations.

**PAGE (F6)**

To change to another page on this screen.

**SHIFT CONF (F2)**

To access ATK Configuration.

**SHIFT RESET (F4)**

To reset all screen entries.

Description of fields

Field	Description
Method	Choicelist. The method used to define the spiral.
	<b>Radius/Length.</b> Using the radius of the connecting curve and its length.

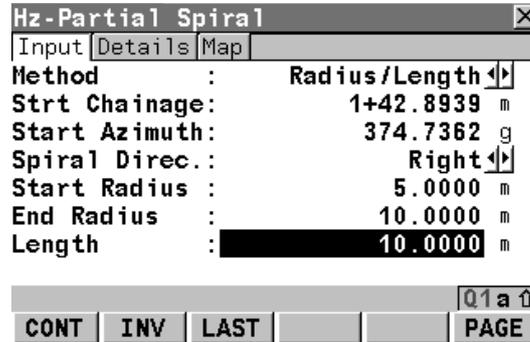
Field	Description
	<p><b>Radius/E Chain.</b> Using the radius of the connecting curve and its end chainage.</p> <p><b>Param/Length.</b> Using the parameter A and the length of the connecting curve.</p> <p><b>Param/E Chain.</b> Using the parameter A and the end chainage of the spiral.</p>
<b>Strt Chainage</b>	Output. The end chainage of the previous element is automatically used and cannot be edited.
<b>Start Azimuth</b>	Input. The azimuth of the tangent in the start point. This is used from the previous element. The value can be edited.
<b>Spiral Direc.</b>	Choicelist. Looking in the direction of increasing chainage, the direction of the spiral can be <b>RIGHT</b> or <b>LEFT</b> .
<b>Spiral In/Out</b>	Choicelist. For a spiral transition from tangent to curve select <b>IN</b> , for a spiral transition from curve to tangent select <b>OUT</b> .
<b>Radius</b>	Input. Radius of the spiral. Available for <b>Radius/Length</b> and <b>Radius/E Chain</b> .
<b>Parameter A</b>	Input. The parameter A defining the spiral. Available for <b>Param/Length</b> and <b>Param/E Chain</b> .
<b>Length</b>	Input. Length of the spiral element.
<b>End Chainage</b>	Input. The end chainage of the curve element can be typed in. Available for <b>Radius/E Chain</b> and <b>Param/E Chain</b> .

3.3.4 Creating/Editing a partial spiral

Access

Refer to "3.3 Inserting/Editing an element to/in a horizontal alignment" to access the **Hz-Add Element** screen. Highlight **Partial Spiral** and press **CONT (F1)** to access the **Hz-Partial Spiral** screen.

HZ-Partial Spiral



- CONT (F1)**  
To accept the screen entries and continue.
- INV (F2)**  
To calculate the inverse between two existing points in the active job.
- LAST (F3)**  
To select the values from the last inverse calculations.
- PAGE (F6)**  
To change to another page on this screen.
- SHIFT CONF (F2)**  
To access ATK Configuration.
- SHIFT RESET (F4)**  
To reset all screen entries.

Description of fields

Field	Description
Method	Choicelist. The method used to define the partial spiral.
	<b>Radius/Length.</b> Using the radius and the length of the spiral.
	<b>Radius/E Chain.</b> Using the radius and the end chainage of the spiral.

Field	Description
<b>Strt Chainage</b>	Output. The end chainage of the previous element is automatically used and cannot be edited.
<b>Start Azimuth</b>	Input. The azimuth of the tangent in the start point. This is used from the previous element. The value can be edited.
<b>Spiral Direc.</b>	Choicelist. Looking in the direction of increasing chainage, the direction of the spiral can be <b>RIGHT</b> or <b>LEFT</b> .
<b>Start Radius</b>	Input. The entry radius of the spiral. The signs are set by the system depending on the spiral direction defined in <b>Spiral Direc..</b>
<b>End Radius</b>	Input. The exit radius of the spiral. The signs are set by the system depending on the spiral direction defined in <b>Spiral Direc..</b>
<b>Length</b>	Input. Length of the spiral element.
<b>End Chainage</b>	Input. The end chainage of the curve element can be typed in. Only available for <b>Radius/E Chain</b> .

### 3.4 Deleting an existing element in a horizontal alignment

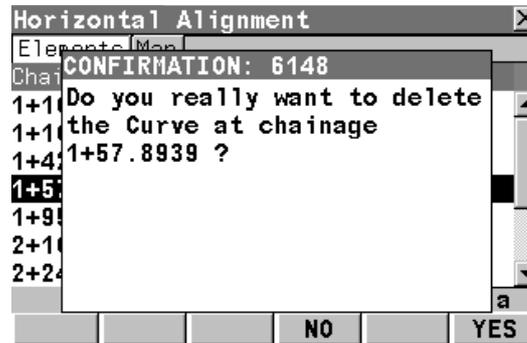
#### Access

Refer to "3.1 Overview" to access the **Horizontal Alignment** screen.

#### Deleting an existing element step-by-step

Step	Description
1.	<b>Horizontal Alignment.</b>
2.	Select the element to be deleted and press <b>DEL (F4)</b> .
3.	Press <b>YES (F6)</b> to confirm deleting or <b>NO (F4)</b> to abort deleting the element.
4.	For <b>YES (F6)</b> , choose which elements have to be adjusted or abort the deleting. It automatically returns to the <b>Horizontal Alignment</b> screen.

#### Step 3



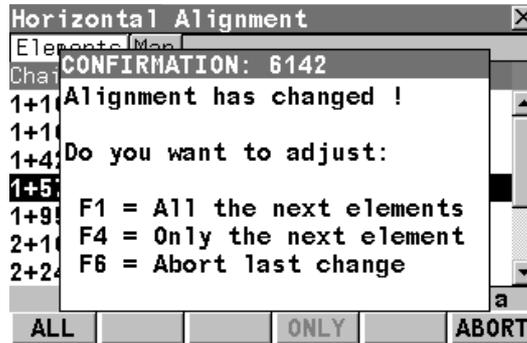
**NO (F4)**

To accept the deleting and continue.

**YES (F6)**

To decline the deleting and return to the last screen.

## Step 4



### **ALL (F1)**

To adjust all following elements.

### **ONLY (F4)**

To adjust only the next element.

### **ABORT (F6)**

To abort the process without deleting an element.

---

## 4

# Edit Vertical Alignments

---

### 4.1

## Overview

---

### Description

Allows creating, editing and deleting of the following elements:

- Start Point
- Straight (Tangent)
- Parabola
- Curve

as well as checking the vertical alignment.

Throughout the whole component height and elevation is used for local orthometric height. If no local orthometric height is available, the local ellipsoidal height is used instead.

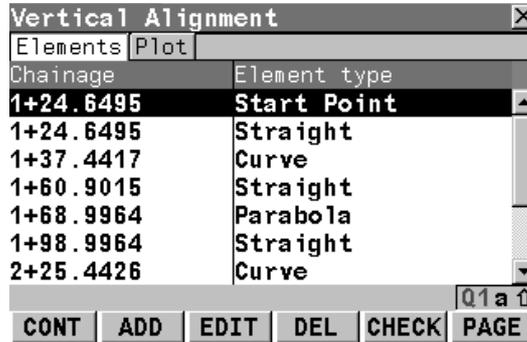
---

### Access

Refer to "2.3 Selecting an option" to access the **Alignment Tool Kit Menu** screen. Highlight **Edit Vertical Alignments** and press **CONT (F1)** to access the **Vertical Alignment** screen.

---

## Vertical Alignment



### CONT (F1)

To accept the screen entries and continue.

### ADD (F2)

To create a new element of the vertical alignment.

### EDIT (F3)

To edit the highlighted element of the vertical alignment.

### DEL (F4)

To delete the highlighted element of the vertical alignment.

### CHECK (F5)

To check the vertical alignment.

### PAGE (F6)

To change to another page on this screen.

### SHIFT HOME (F2)

To move the focus to the start point.

### SHIFT END (F3)

To move the focus to the end point.

### Next step

IF an element	THEN
the start point is to be edited	Highlight the Start Point and press <b>EDIT (F3)</b> . Refer to "4.2 Editing the start point".
an element is to be created	Press <b>ADD (F2)</b> and access the <b>Vert-Add Element</b> screen. Refer to "4.3 Inserting/Editing an element to/in a vertical alignment".

---

<b>IF an element</b>	<b>THEN</b>
an element is to be edited	Press <b>EDIT (F3)</b> . Refer to "4.3 Inserting/Editing an element to/in a vertical alignment".
an element is to be deleted	Press <b>DEL (F4)</b> and confirm or abort deleting. Refer to "4.4 Deleting an existing element in a vertical alignment"
the vertical alignment is to be checked	Press <b>CHECK (F5)</b> . The vertical alignment will be checked. <b>OK (F4)</b> confirms the checking and returns to the <b>Vertical Alignment</b> screen.

---

## 4.2

## Editing the start point

### Access

Refer to "4.1 Overview" to access **Vertical Alignment**. Highlight the **Start Point** and press **EDIT (F3)** to access the **Vert-Start Point** screen.

### Vert-Start Point

```
Vert-Start Point [X]
Strt Chainage: 1+24.6495 m
Elevation : 418.9915 m
```

#### CONT (F1)

To accept the screen entries and continue.

#### GETPT (F4)

To apply coordinates or heights from an existing point in the active job.

#### SURVY (F5)

To manually occupy a point.

```
[CONT] [ ] [ ] [GETPT] [SURVY] [Q1a ↑]
```

### Description of fields

Field	Description
Strt Chainage	Input. Start chainage of the vertical alignment.
Elevation	Input. Elevation at the start chainage of the vertical alignment.

### 4.3 Inserting/Editing an element to/in a vertical alignment

**Access**

Refer to "4.1 Overview" to access **Vertical Alignment**. Highlight an alignment element and press **ADD (F2)/EDIT (F3)** to create/edit a new/existing alignment element.



Creating and editing an alignment element is similar. For simplicity, only the creating of an alignment element is explained and differences are clearly outlined.

**Vert-Add Element**



**CONT (F1)**

To accept the screen entries and continue.

**Description of options**

Options	Description
<b>Straight</b>	To insert/edit a straight to/in a vertical alignment.
<b>Parabola</b>	To insert/edit a parabola to/in a vertical alignment.
<b>Curve</b>	To insert/edit a curve to/in a vertical alignment.

### 4.3.1

### Creating/Editing a straight

#### Access

Refer to "4.3 Inserting/Editing an element to/in a vertical alignment" to access the **Vert-Add Element** screen. Highlight **Straight** and press **CONT (F1)** to access the **Vert-Straight** screen.

#### Vert-Straight

Vert-Straight		✕
Input	Details	Plot
Method	:	Length/End Elev
Strt Chainage:		1+24.6495 m
Start Elev	:	0.0000 m
Length	:	10.5000 m
End Elev	:	5.0000 m

CONT	INV	LAST	GETPT	SURVY	PAGE	Q1 a ↑
------	-----	------	-------	-------	------	--------

#### CONT (F1)

To accept the screen entries and continue.

#### INV (F2)

To calculate the inverse between two existing points in the active job.

#### LAST (F3)

To select the values from the last inverse calculations.

#### GETPT (F4)

To apply coordinates or heights from an existing point in the active job.

#### SURVY (F5)

To manually occupy a point.

#### PAGE (F6)

To change to another page on this screen.

#### SHIFT CONF (F2)

To access ATK Configuration.

#### SHIFT RESET (F4)

To reset all screen entries.

## Description of fields

Field	Description
<b>Method</b>	Choicelist. The method used to define the straight.
	<b>Length/End Elev.</b> Using the length and the end elevation of the straight.
	<b>End Chain &amp; Elev.</b> Using the end chainage and the elevation of the straight.
	<b>Length and Grade.</b> Using the length and the grade of the straight.
	<b>End Chain/Grade.</b> Using the end chainage and the grade of the straight.
<b>Strt Chainage</b>	Output. The end chainage of the previous element is automatically used and cannot be edited.
<b>Start Elev</b>	Output. The end height of the previous element is automatically used and cannot be edited.
<b>Length</b>	Input. Length of the straight element as slope distance.
<b>End Chainage</b>	Input. Chainage at the end of the element.
<b>Grade</b>	Input. The grade of the straight element. Positive inclines have positive values, negative inclines have negative values.
<b>End Elev</b>	Input. Height at the end of the element. Type in manually or, alternatively, press <b>GETPT (F2)</b> when the focus is on this line to select the height from an existing point in the active job.



For grade units the system settings are applied. To change the system setting access the **CONFIGURE Units & Formats** screen. Refer to GPS1200, TPS1200 or GPS900 Technical Reference Manual for more detailed information.

## 4.3.2

### Creating/Editing a parabola

#### Access

Refer to "4.3 Inserting/Editing an element to/in a vertical alignment" to access the **Vert-Add Element** screen. Highlight **Parabola** and press **CONT (F1)** to access the **Vert-Parabolas**-screen.

#### Vert-Parabola

Vert-Parabola	
Input	Details
Method	: Length/Grades
Strt Chainage:	1+68.9964 m
Start Elev	: 417.6638 m
Length	: 30.0000 m
Grade In	: -14.690:1 hv
Grade Out	: 1:0 hv

CONT	INV	LAST	GETPT	SURVY	PAGE
------	-----	------	-------	-------	------

#### CONT (F1)

To accept the screen entries and continue.

#### INV (F2)

To calculate the inverse between two existing points in the active job.

#### LAST (F3)

To select the values from the last inverse calculations.

#### GETPT (F4)

To apply coordinates or heights from an existing point in the active job.

#### SURVY (F5)

To manually occupy a point.

#### PAGE (F6)

To change to another page on this screen.

#### SHIFT CONF (F2)

To access ATK Configuration.

#### SHIFT RESET (F4)

To reset all screen entries.

#### Description of fields

Field	Description
Method	Choicelist. The method used to define the parabola.
	<b>Length/Grades.</b> Using the length and the grades of the parabola.

Field	Description
	<p><b>End Chain &amp; Grades.</b> Using the end chainage and the grades of the parabola.</p> <p><b>Param/End Elev.</b> Using the parameter and the end elevation of the parabola.</p> <p><b>3 Elevations.</b> Using three elevations at defined chainages of the parabola.</p>
<b>Strt Chainage</b>	Output. The end chainage of the previous element is automatically used and cannot be edited.
<b>Start Elev</b>	Output. The end height of the previous element is automatically used and cannot be edited.
<b>Length</b>	Input. Length of the parabola as horizontal distance.
<b>End Chainage</b>	Input. Chainage at the end of the element.
<b>Curve type</b>	Choicelist. <b>Crest</b> or <b>Sag</b> .
<b>Parameter</b>	Input. Parameter of the parabola.
<b>Int. Chainage</b>	Input. Chainage of the second elevation.
<b>Int. Elev</b>	Input. Second elevation. Type in manually or press <b>GETPT (F2)</b> when the focus is on this line to select the height from an existing point in the active job.
<b>Grade in</b>	Input. The grade at the beginning of the parabola. Positive inclines have positive values, negative inclines have negative values.
<b>Grade out</b>	Input. The grade at the end of the parabola. Positive inclines have positive values, negative inclines have negative values.

Field	Description
<b>End Elev</b>	Input. Height at the end of the element. Type in manually or press <b>GETPT (F2)</b> when the focus is on this line to select the height from an existing point in the active job.

---

4.3.3

Creating/Editing a curve

Access

Refer to "4.3 Inserting/Editing an element to/in a vertical alignment" to access the **Vert-Add Element** screen. Highlight **Curve** and press **CONT (F1)** to access the **Vert-Curve** screen.

Vert-Curve

Vert-Curve		Q1 a ↑
Input	Details	Plot
Method	:	Radius/Length
Strt Chainage:	:	2+25.4426 m
Start Elev	:	416.6427 m
Curve Type	:	Sag
Radius	:	132.6983 m
Length	:	12.2879 m
End Elev	:	417.2129 m
		Q1 a ↑
CONT	INV	LAST
GETPT	SURVY	PAGE

**CONT (F1)**

To accept the screen entries and continue.

**INV (F2)**

To calculate the inverse between two existing points in the active job.

**LAST (F3)**

To select the values from the last inverse calculations.

**GETPT (F4)**

To apply coordinates or heights from an existing point in the active job.

**SURVY (F5)**

To manually occupy a point.

**PAGE (F6)**

To change to another page on this screen.

**SHIFT CONF (F2)**

To access ATK Configuration.

**SHIFT RESET (F4)**

To reset all screen entries.

## Description of fields

Field	Description
<b>Method</b>	Choicelist. The method used to define the curve.
	<b>Radius/Length.</b> Using the radius of the curve and its length.
	<b>Radius/E Chain.</b> Using the radius and the end chainage of the curve.
<b>Strt Chainage</b>	Output. The end chainage of the previous element is automatically used and cannot be edited.
<b>Start Elev</b>	Output. The end height of the previous element is automatically used and cannot be edited.
<b>Curve type</b>	Choicelist. <b>Crest</b> or <b>Sag</b> .
<b>Radius</b>	Input. Radius of the curve.
<b>Length</b>	Input. Length of the curve along the segment.
<b>End Chainage</b>	Input. Chainage at the end of the element.
<b>End Elev</b>	Input. Height at the end of the element. Type in manually or, alternatively, press <b>GETPT (F2)</b> when the focus is on this line to select the height from an existing point in the active job.

## 4.4 Deleting an existing element in a vertical alignment

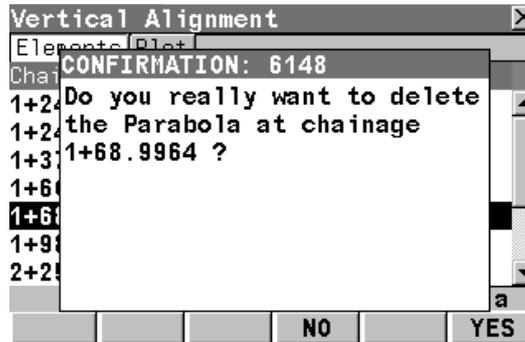
### Access

Refer to "4.1 Overview" to access the **Vertical Alignment** screen. Highlight an alignment element and press **DEL (F4)** to delete the element.

### Deleting an existing element step-by-step

Step	Description
1.	<b>Vertical Alignment.</b>
2.	Select the element to be deleted and press <b>DEL (F4)</b> .
3.	Press <b>YES (F6)</b> to confirm deleting or <b>NO (F4)</b> to abort deleting the element.
4.	For <b>YES (F6)</b> , choose which elements have to be adjusted or abort the deleting. It automatically returns to the <b>Vertical Alignment</b> screen.

### Step 3



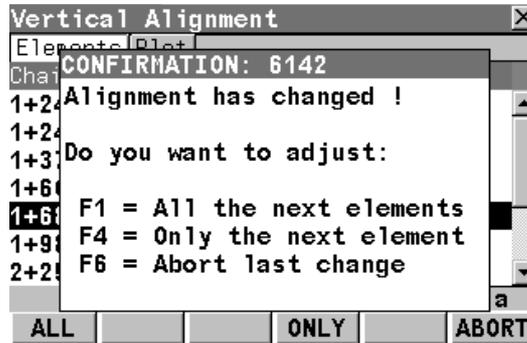
#### NO (F4)

To decline deleting the element and return to the last screen.

#### YES (F6)

To accept deleting the element and continue.

## Step 4



### **ALL (F1)**

To adjust all following elements.

### **ONLY (F4)**

To adjust only the next element.

### **ABORT (F6)**

To abort the process without deleting an element.

## 5 Edit X-Section Templates

### 5.1 Overview

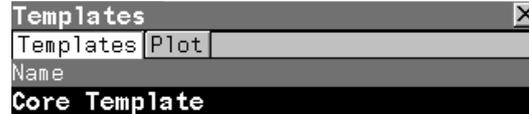
#### Description

Allows creating, editing, deleting and duplicating of X-Section templates.

#### Access

Refer to "2.3 Selecting an option" to access the **Alignment Tool Kit Menu** screen. Highlight **Edit X-Section Templates** and press **CONT (F1)** to access the **Templates** screen.

#### Templates



#### CONT (F1)

To accept the screen entries and continue.

#### NEW (F2)

To create a new X-Section template.

#### EDIT (F3)

To edit the highlighted X-Section template.

#### DEL (F4)

To delete the highlighted X-Section template.

#### DUPLC (F5)

To duplicate the highlighted template.

#### PAGE (F6)

To change to another page on this screen.



### Next step

IF a X-Section template	THEN
is to be created	Press <b>NEW (F2)</b> and access the <b>New Template</b> screen. Refer to "5.2 Creating/editing a X-Section template".
is to be edited	Press <b>EDIT (F3)</b> and access the <b>New Template</b> screen. Refer to "5.2 Creating/editing a X-Section template".
is to be deleted	Press <b>DEL (F4)</b> , confirm or abort deleting. Refer to "5.3 Deleting a X-Section template"
is to be duplicated	Press <b>DUPLC (F5)</b> . Refer to "5.4 Duplicating a X-Section template"

## 5.2 Creating/editing a X-Section template

### Access

Refer to "5.1 Overview" to access the **Templates** screen. Press **NEW (F2)** to access the **New Template: Template Name** screen.



Creating and editing a X-Section template is similar. For simplicity, only the creating of a X-Section template is explained and differences are clearly outlined.

### New Template: Template Name, General Page



### CONT (F1)

To accept the screen entries and continue.



### PAGE (F6)

To change to another page on this screen.

### Description of fields

Field	Description
Template Name	Name of the X-Section template to be created/edited.

### Next step

**PAGE (F6)** changes to the **Segments** page.

**New Template:  
Template Name,  
Segments Page**

New Template: New Template			
General		Segments	
Name	CL H.Offset	CL V.Offset	
CL:Layer 1	0.0000	5.0000	
R1:Layer 1	15.0000	27.5000	
R2:Layer 1	2.5000	8.0000	

Q1 a ↑					
CONT	ADD	EDIT	DEL	MORE	PAGE

**CONT (F1)**

To accept the screen entries and continue.

**ADD (F2)**

To create and add a new segment. Refer to "5.2.1 Add/edit a segment".

**EDIT (F3)**

To edit the highlighted segment.

**DEL (F4)**

To delete the highlighted segment. Refer to "5.2.2 Delete a segment".

**MORE (F5)**

To switch between **CL H. Offset**, **S. Dist**, **H. Dist** in the second column and between **CL H. Offset**, **S. Dist**, **H. Dist** in the third column.

**PAGE (F6)**

To change to another page on this screen.

**SHIFT HOME (F2)**

To move the focus to the begin of the list.

**SHIFT END (F3)**

To move the focus to the end of the list.

**SHIFT MIRROR (F4)**

To mirror the entered segments to the other side of the X-Section

**Description of columns**

Column	Description
Name	List of all segments of the X-Section template.
CL H. Offset	Horizontal centreline offset of the segment.

Column	Description
<b>S. Dist</b>	Slope distance of the segment.
<b>H. Dist</b>	Horizontal distance of the segment.
<b>CL V. Offset</b>	Vertical centreline offset of the segment.
<b>S. Ratio</b>	Slope ratio of the segment.

### Next step

IF a segment	THEN
is to be added	Press <b>ADD (F2)</b> and access the <b>Add Segment</b> screen. Refer to "5.2.1 Add/edit a segment".
is to be edited	Press <b>EDIT (F3)</b> and access the <b>Edit Raw Alignment</b> screen. Edit the alignment and press <b>CONT (F1)</b> to return to the <b>Raw Alignments</b> screen. <b>CONT (F1)</b> again to access <b>Alignment Tool Kit Menu</b> .
is to be deleted	Press <b>DEL (F4)</b> , confirm or abort the process and return to the <b>Raw Alignments</b> screen. <b>CONT (F1)</b> again to access <b>Alignment Tool Kit Menu</b> .
is to be mirrored	Press <b>MIRROR SHIFT (F4)</b> to mirror the segments from one side to the other to create a symmetric X-Section. To perform this option the second side must not have any segment.

## 5.2.1

### Add/edit a segment

#### Access

Refer to "5.2 Creating/editing a X-Section template" to access the **New Template : Template Name** screen. **PAGE (F6)** to change to the Segments page and **ADD (F2)** to access the **Add Segment** screen.



Adding and editing a segment of a X-Section template is similar. For simplicity, only the Adding of a segment is explained and differences are clearly outlined.

#### Add Segment

**Add Segment** [X]

Input | Details | Plot

**Template Name:** New Template

**Method** : H Dist/Slope

**H. Dist** : 15.0000 m

**S. Ratio** : 2:3 hv

Q1a

CONT INV LAST % PAGE

#### **CONT (F1)**

To accept the screen entries and continue.

#### **INV (F2)**

To calculate the inverse between two existing points in the active job.

#### **LAST (F3)**

To select values from the last inverse calculations.

#### **%/H:V/V:H (F4)**

To switch between **hv**, **vh** and **%** for the S. Ratio unit.

#### **PAGE (F6)**

To change to another page on this screen.

#### Description of fields

Field	Description
<b>Template Name</b>	Output. Name of the X-Section template to be edited.
<b>Method</b>	Choicelist. Method to be used for defining the segment. <b>H Dist/Slope.</b> Using a horizontal distance and slope to define the segment.

Field	Description
	<b>H Dist/V Dist.</b> Using a horizontal distance and a vertical distance to define the segment.
	<b>CL offsets.</b> Using a horizontal and vertical offsets for the centreline.
	<b>S Dist/Slope.</b> Using a slope distance and slope to define the segment.
<b>CL H. Offset</b>	Input. Horizontal centreline offset of the segment. Only available for <b>Method: CL offsets.</b>
<b>CL V. Offset</b>	Input. Vertical centreline offset of the segment. Only available for <b>Method: CL offsets.</b>
<b>H. Dist</b>	Input. Horizontal distance of the segment. Available for <b>Method: H Dist/Slope</b> and <b>Method: H Dist/V Dist.</b>
<b>S. Dist</b>	Input. Slope distance of the segment. Only available for <b>Method: S Dist/Slope.</b>
<b>S. Ratio</b>	Input. Slope ratio of the segment. Available for <b>Method: H Dist/Slope</b> and <b>Method: S Dist/Slope.</b>

**Next step**

**CONT (F1)** adds segment to the X-Section template and returns to the **Segments** page.

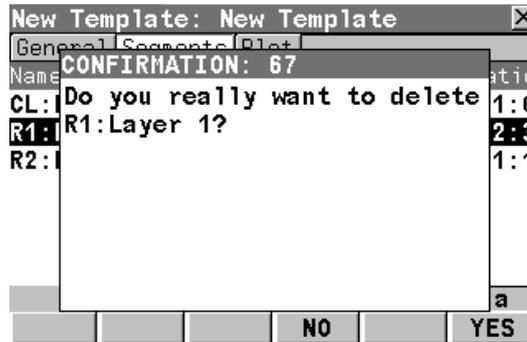
## 5.2.2

## Delete a segment

### Access

Refer to "5.2 Creating/editing a X-Section template" to access the **New Template : Template Name** screen.

### Confirmation



**NO (F4)**

To abort deleting the X-Section segment.

**YES (F6)**

To confirm deleting the X-Section segment.

### Confirmation



**ALL (F1)**

To adjust all following segments.

**ONLY (F4)**

To adjust only the next segment.

**YES (F6)**

To abort deleting.

**Next step**

Depending on the operation to be performed press **ALL (F1)**, **ONLY (F4)** or **ABORT (F6)** and return to **New Template: Template Name, Segments Page** screen.

---

## 5.3

### Deleting a X-Section template

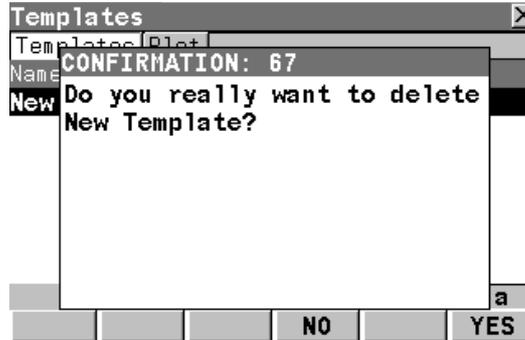
#### Access

Refer to "2.3 Selecting an option" to access the **Alignment Tool Kit Menu** screen. Select **Edit X-Section Templates** and press **CONT (F1)** to access the **Templates** screen.

#### Deleting a X-Section template step-by-step

Step	Description
1.	<b>Templates.</b>
2.	Highlight the template to be deleted and press <b>DEL (F4)</b> .
3.	Press <b>YES (F6)</b> to confirm or <b>NO (F4)</b> to abort deleting the template.

#### Confirmation



**NO (F4)**

To abort deleting the X-Section template.

**YES (F6)**

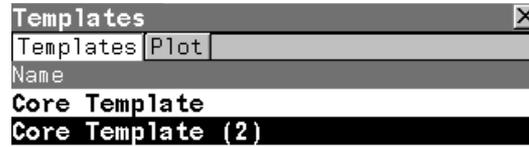
To confirm deleting the X-Section template.

## 5.4 Duplicating a X-Section template

### Access

Refer to "2.3 Selecting an option" to access the **Alignment Tool Kit Menu** screen. Press **CONT (F1)** to access the **Templates** screen.

### Templates



#### **CONT (F1)**

To accept the screen entries and continue.

#### **NEW (F2)**

To create a new X-Section template.

#### **EDIT (F3)**

To edit the highlighted X-Section template.

#### **DEL (F4)**

To delete the highlighted X-Section template.

#### **DUPLC (F5)**

To duplicate the highlighted template.

#### **PAGE (F6)**

To change to another page on this screen.



### Next step

Press **DUPLC (F5)** for duplicating the highlighted X-Section template. The duplicated X-Section template is inserted below the original template.



## 6 Edit X-Section Assignments

### 6.1 Overview

#### Description

Allows the creation, editing and deleting of:

- X-Section assignments

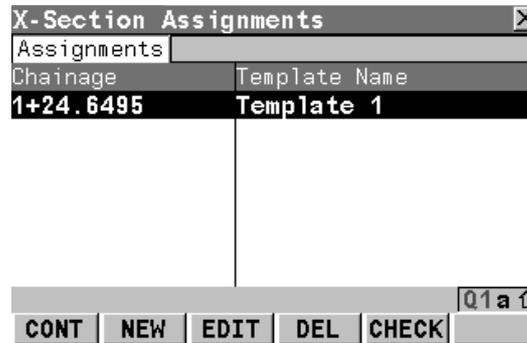
as well as checking the X-Section assignments.

A X-Section assignment defines from which chainage on a X-section is to be used.

#### Access

Refer to "2.3 Selecting an option" to access the **Alignment Tool Kit Menu** screen. Highlight **Edit X-Section Assignments** and press **CONT (F1)** to access the **X-Section Assignments** screen.

#### X-Section Assignments



#### CONT (F1)

To accept the screen entries and continue.

#### NEW (F2)

To create a new X-Section assignment.

#### EDIT (F3)

To edit a X-Section assignment.

#### DEL (F4)

To delete a X-Section assignment.

**CHECK (F5)**

To check the X-Section assignments.

**SHIFT HOME (F2)**

To move the focus to the top of the chainages list.

**SHIFT END (F3)**

To move the focus to the bottom of the chainages list.

**Next step**

<b>IF a X-Section assignment</b>	<b>THEN</b>
is to be created	Press <b>NEW (F2)</b> and access the <b>New X-Section Assignment</b> screen. Refer to "6.2 Creating/Editing a X-Section assignment".
is to be edited	Press <b>EDIT (F3)</b> and access the <b>New X-Section Assignment</b> screen. Refer to "6.2 Creating/Editing a X-Section assignment".
is to be deleted	Press <b>DEL (F4)</b> , confirm or abort deleting. Refer to "6.3 Deleting a X-Section assignment"
is to be checked	Press <b>CHECK (F5)</b> . The X-Section assignments will be checked. <b>OK (F4)</b> confirms the checking and returns to the <b>X-Section Assignments</b> screen.

## 6.2 Creating/Editing a X-Section assignment

### Access

Refer to "6.1 Overview" to access the **X-Section Assignments** screen. Press **NEW (F2)** to access the **New X-Section Assignment** screen.



Creating and editing a X-Section assignment is similar. For simplicity, only the creating of a X-Section assignment is explained and differences are clearly outlined.

### New X-Section Assignment

#### CONT (F1)

To accept the screen entries and continue.

#### STCH (F3)

To take the start point of the vertical alignment for **Chainage**.

#### ENDCH (F4)

To take the end point of the vertical alignment for **Chainage**.

#### SHIFT CONF (F2)

To access ATK configuration.

### Description of fields

Field	Description
<b>Chainage</b>	Input. The chainage to which the X-Section template is assigned to.
<b>Template Name</b>	Choicelist. The X-Section template to be assigned to. All existing X-Section templates currently stored to the alignment can be selected.

### Creating/Editing a X-section assignment step-by-step

Step	Description
1.	<b>New X-Section Assignment.</b>

Step	Description
2.	Type in or edit the value for <b>Chainage</b> . Alternatively press <b>STCH (F3)</b> or <b>ENDCH (F4)</b> to apply the start or end chainage of the vertical alignment.
3.	Select an existing template from the list or create a new one to be assigned to the <b>Chainage</b> .
4.	Press <b>CONT (F1)</b> to create the X-Section assignment.

### 6.3 Deleting a X-Section assignment

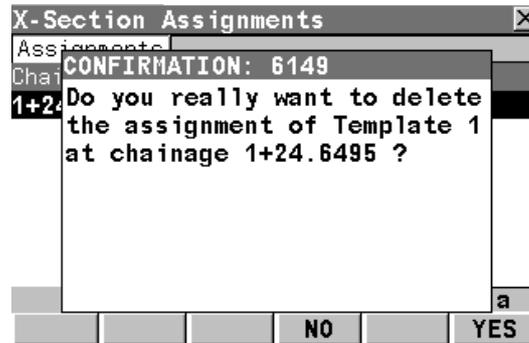
**Access**

Refer to "2.3 Selecting an option" to access the **Alignment Tool Kit Menu** screen. Highlight **Edit X-Section Assignments** and press **CONT (F1)** to access the **X-Section assignments** screen.

**Deleting a X-section assignment step-by-step**

Step	Description
1.	<b>X-Section Assignments.</b>
2.	Press <b>DEL (F4)</b> to delete the X-Section assignment.
3.	Press <b>YES (F6)</b> to confirm deleting or <b>NO (F4)</b> to abort deleting the X-Section assignment. It automatically returns to the <b>X-Section Assignments</b> screen.

**Confirmation**



**NO (F4)**

To abort deleting the X-Section assignment.

**YES (F6)**

To confirm deleting the X-Section assignment.



## 7

## Edit Chainage Equation

## 7.1

## Overview

## Description

Allows creating, editing and deleting of:

- Chainage ahead
- Chainage back

## Access

Refer to "2.3 Selecting an option" to access the **Alignment Tool Kit Menu** screen. Highlight **Edit Chainage Equations** and press **CONT (F1)** to access the **Chainage Equation** screen.

## Chainage Equation

Chainage Equation	
Chainage BACK	Chainage AHEAD
0+05.0000	0+15.0000

				Q1a ↑
CONT	NEW	EDIT	DEL	

**CONT (F1)**

To accept the screen entries and continue.

**NEW (F2)**

To create a new chainage equation.

**EDIT (F3)**

To edit a chainage equation.

**DEL (F4)**

To delete a chainage equation.

**SHIFT HOME (F2)**

To move the focus to the top of the chainage equations list.

**SHIFT END (F3)**

To move the focus to the bottom of the chainage equations list.

### Next step

IF a Chainage equation	THEN
is to be created	Press <b>NEW (F2)</b> and access the <b>Chainage Equation</b> screen. Refer to "7.2 Creating/Editing a chainage equation".
is to be edited	Press <b>EDIT (F3)</b> and access the <b>Chainage Equation</b> screen. Refer to "7.2 Creating/Editing a chainage equation".
is to be deleted	Press <b>DEL (F4)</b> , confirm or abort deleting. Refer to "7.3 Deleting a chainage equation"

## 7.2 Creating/Editing a chainage equation

### Access

Refer to "7.1 Overview" to access the **Chainage Equation** screen. Press **NEW (F2)** to access the **Chainage Equation** screen.



Creating and editing a Chainage equation is similar. For simplicity, only the creating of a Chainage equation is explained and differences are clearly outlined.

### Creating a chainage equation

**Chainage Equation**

Chain. Back : 0+05.0000 m

Chain. Ahead : 0+15.0000 m

**CONT (F1)**

To accept the screen entries and continue.

### Description of fields

Field	Description
Chain. Back	Input. Chainage back.
Chain. Ahead	Input. Chainage ahead.

### Creating/Editing a Chainage equation step-by-step

Step	Description
1.	<b>Chainage Equation.</b>
2.	Press <b>NEW (F2)</b> to create or <b>EDIT (F3)</b> to edit a chainage equation.

Step	Description
3.	Type in or edit the values for <b>Chain. Back</b> and <b>Chain. Ahead</b> .
4.	Press <b>CONT (F1)</b> to create the chainage equation or store the edited chainage equation.

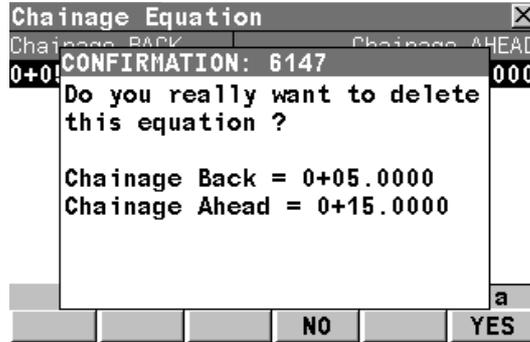
---

### 7.3 Deleting a chainage equation

**Access**

Refer to "2.3 Selecting an option" to access the **Alignment Tool Kit Menu** screen. Highlight **Edit Chainage Equations** and press **CONT (F1)** to access the **Chainage Equation** screen.

**Confirmation**



**NO (F4)**

To abort the deleting.

**YES (F6)**

To accept the deleting and continue.

**Deleting a Chainage equation step-by-step**

Step	Description
1.	<b>Chainage Equation.</b>
2.	Press <b>DEL (F4)</b> to delete a chainage equation.
3.	Press <b>YES (F6)</b> to confirm or <b>NO (F4)</b> to abort deleting the highlighted chainage equation.



# 8 Convert to RoadRunner Job

## 8.1 Overview

### Description

Allows the onboard conversion of existing LandXML alignments including horizontal alignment, vertical alignment, X-sections and chainage equations to a RoadRunner job.

### Access

Refer to "2.3 Selecting an option" to access **ATK Converting to RoadRunner Job**.

### Converting to RoadRunner Job

```

Converting to RoadRunner Job [X]
From
Raw Alignment:  soccer office 1m

To
RRrunner Job  :      Centreline [Tab]
Convert Mode  :  H, V & X-Sect [Tab]
    
```

```

[CONT] [ ] [ ] [ ] [ ] [Q1 a ↑]
    
```

**CONT (F1)**

To accept the screen entries and continue.

### Description of fields

Field	Description
<b>From Raw Alignment</b>	Output. Displays the modified or newly created alignment to be converted.
<b>To RRrunner Job</b>	Choicelist. The RoadRunner job to which the alignment will be converted.
<b>Convert Mode</b>	Defines the mode to be used for the conversion process.

Field	Description
	<p><b>Horiz &amp; Vert.</b> Only horizontal and vertical alignment will be converted.</p> <p><b>Horizontal Only.</b> Only horizontal alignment will be converted.</p> <p><b>H, V &amp; X-Section.</b> Horizontal alignment, vertical alignment and X-Sections will be converted.</p>

## 8.2

## Converting to a RoadRunner Job

### Converting to a Road-Runner job step-by-step

Step	Description
1.	<b>Converting to RoadRunner Job.</b>
	<b>From Raw Alignment</b> displays the created/edited/modified raw alignment to be converted to a RoadRunner Job.
2.	Select an existing job or create a new job for <b>To RRunner Job</b> .
3.	Select the mode to be used for the onboard conversion.
4.	Press <b>CONT (F1)</b> to start the conversion.
	ATK creates a log file during the conversion. The file LandXml2Dbx.log can be found in the \Data\XML folder on the CF Card
5.	After the succesful conversion you have to press <b>OK (F4)</b> for returning to the <b>Main Menu</b> on the instrument/receiver.



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