Leica Alignment Tool Kit

Technical Reference Manual

Version 3.0
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

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.

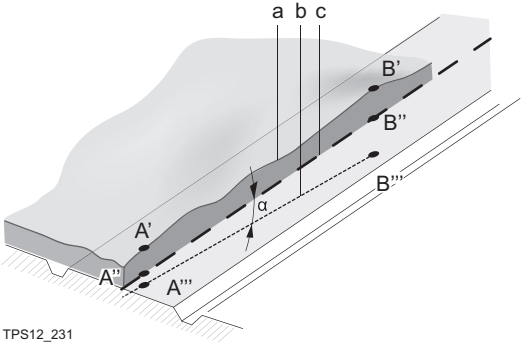
1.2 Basic Terms

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 (α).

Geometric elements

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

- Straight
- Curve
- Spiral

1.3 Design elements

1.3.1 The Horizontal Alignment

Description

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)
- bloss curves (element type used for railway track design)

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
Straight (tangent)	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.
Curve (arc)	Circular curve with constant radius.
Spiral	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.
	In. Radius at the start point is bigger than at the end point.
	Out. Radius at the start point is smaller than at the end point.
Parameter A	$A^2 = R * L$

Design element	Description
	R = Radius of the connecting circular curve.
	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
Tangent	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.
Curve	Circular vertical curve with constant radius.
Parabola	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:

- ΔH and ΔV
- ΔH and slope in percentage
- ΔH 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

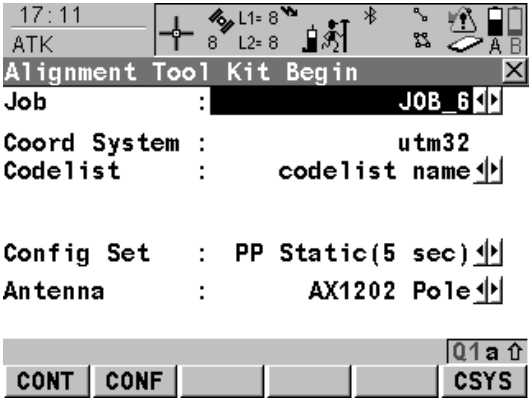
The **Alignment Tool Kit** application can be accessed by:

- 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

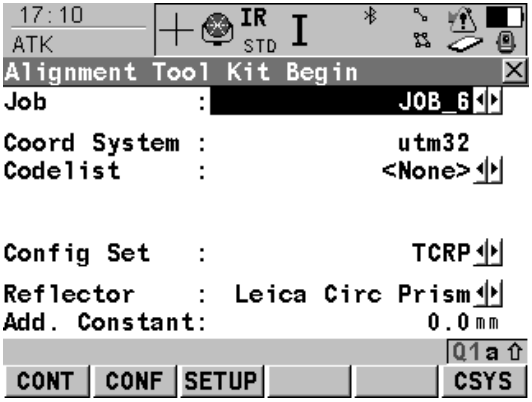


CONT (F1)
To accept the screen entries and continue.

CONF (F2)
To access ATK Configuration.

CSYS (F6)
To select a different coordinate system.

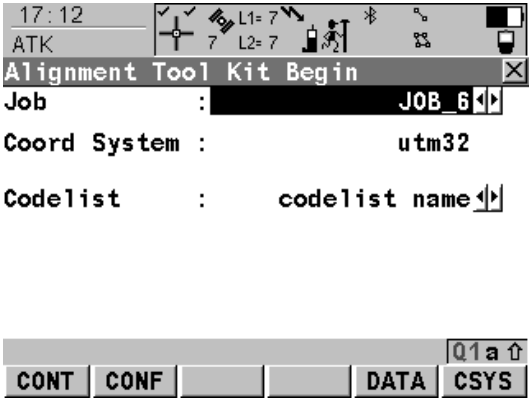
TPS1200+



CONT (F1)
To accept the screen entries and continue.

SETUP (F3)
To set up chainage.

GPS900



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
Job	The active job.
Coord System	The coordinate system currently attached to the selected **Job**.
Codelist	Choicelist. No codes are stored in the selected job. All codelists from **Main Menu: Manage...\Codelists** can be selected.
	Output. Codes have already been stored in the selected **Job**. 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.
Config Set	Choicelist. The active configuration set. All configuration sets from **Main Menu: Manage...\Configuration Sets** can be selected. Only available for **GPS1200** and **TPS1200+**.
Antenna	Choicelist. The antenna currently defined in the selected **Config Set**. All antennas from **Main Menu: Manage...\Antennas** can be selected. Only available for **GPS1200**.
Reflector	Choicelist. The reflector currently defined in the selected **Config Set**. All reflectors from **Main Menu: Manage...\Reflectors** can be selected. Only available for **TPS1200+**.
Add. Constannt	The additive constant stored with the chosen reflector. Only available for **TPS1200+**.

Next step

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

2.2 Selecting the task

Description

Define wether 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

CONT (F1)
To accept the screen entries and continue.

Description of fields

Field	Description
Task	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). • **Create Alignment**. To create a new raw alignment. Refer to "2.2.1 Creating a new raw alignment". • **Modify Alignment**. To modify an existing alignment. Refer to "2.2.2 Modify an existing raw alignment".

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

Next step

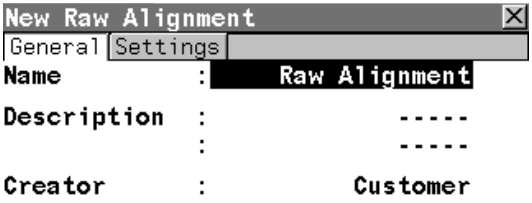
IF an alignment	THEN
is to be created	Select **Create Alignment**. Press **CONT (F1)** and access the **New Raw Alignment** screen. Refer to "2.2.1 Creating a new raw alignment".
is to be modified	Select **Modify Alignment** and access the **Raw Alignments** screen. Refer to "2.2.2 Modify an existing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



CONT (F1)
To accept the screen entries and continue.

Description of fields

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

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

New Raw Alignment, Settings Page

CONT (F1)
To accept the screen entries and continue.

Description of fields

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

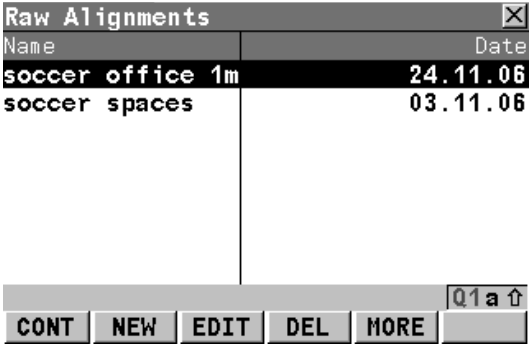
Next step
CONT (F1) accesses the **Aligment Tool Kit Menu** screen. Refer to "2.3 Selecting an option".

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



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
Name	Output. All existing LandXML alignments currently stored in the \Data\XML folder with the file extension *.xml.
Date	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 **NEW (F2)** and access the **New Raw Alignment** screen. Refer to "2.2.1 Creating a new raw alignment".
is to be edited	Press **EDIT (F3)** and access the **Edit Raw Alignment** screen. Edit the alignment and press **CONT (F1)** to return to the **Raw Alignments** screen. **CONT (F1)** again to access **Alignment Tool Kit Menu**.
is to be deleted	Press **DEL (F4)**, confirm or decline the process and return to the **Raw Alignments** screen. **CONT (F1)** again to access **Alignment Tool Kit Menu**.

2.2.3 Importing alignment data

Description

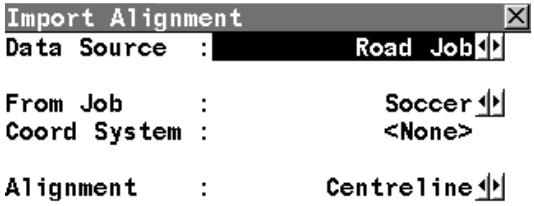
To import alignment data from different sources to an existing alignment.

Importing alignment data from the **Alignment Tool Kit Menu** screen can only be done on empty alignments.

Access

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

Import Alignment



CONT (F1)
To import the selected alignment data to active raw alignment.

Description of fields

Field	Description
Data Source	Choicelist. Data source from where existing alignment data should be imported. **Survey Job**. All jobs from **Main Menu: Manage...\Jobs** can be selected. When in this choicelist press **CFCRD (F6)** or **INTL (F6)** to select a job from a different memory device. **Road Job**.

Field	Description
	Road+ (GSI). Alignment data to be imported from this **Data Source** have to be stored in the \GSI folder on the CF card or on the Internal memory (if fitted).
From Job	Choicelist. Available for **Survey Job** and **Road Job**.
Coord System	Output. The coordinate system currently attached to the selected **Survey Job** or **Road Job**.
Line	Choicelist. Line element from the selected job. Only available for **Survey Job**.
Alignment	Choicelist. RoadRunner alignment. Only available for **Road Job**.
ALN File	Choicelist. Horizontal alignment file in GSI format. Only available for **Road+ (GSI)**.
PRF File	Choicelist. Vertical alignment file in GSI format. Only available for **Road+ (GSI)**.

Next step
CONT (F1) imports the selected alignment data and returns to the **Aligment Tool Kit Menu** screen. Refer to "2.3 Selecting an option".

2.3 Selecting an option

Description

All operations that can be basically performed for aligments 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

CONT (F1)
To accept the screen entries and continue.

IMPRT (F5)
To import alignment data. Refer to "2.2.3 Importing alignment data".

Description of options

Option	Description
Edit Horizontal Alignment	To create, edit and delete elements of a horizontal alignment. Refer to "3 Edit Horizontal Alignments".
Edit Vertical Alignment	To create, edit and delete elements of a vertical alignment. Refer to "4 Edit Vertical Alignments".
Edit X-Section Templates	To create, edit and delete X-Section templates. Refer to "5 Edit X-Section Templates". Only available for **Job Type: Road**.

Option	Description
Edit X-Section Assignments	To create, edit and delete X-Section assignments. Refer to "6 Edit X-Section Assignments". Only available for **Job Type: Road**.
Edit Chainage Equation	To create, edit and delete chainage equations. Refer to "7 Edit Chainage Equation".
Convert to RRunner Job	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 **ATK** method is to be started	Highlight the relevant option and press **CONT (F1)**. Refer to the chapters stated above.
ATK is to be configured	**SHIFT (F2)**. Refer to "2.4 Configuring Alignment Tool Kit".
alignment data is to be imported	**IMPRT (F5)**. Refer to "2.2.3 Importing alignment data".

2.4 Configuring Alignment Tool Kit

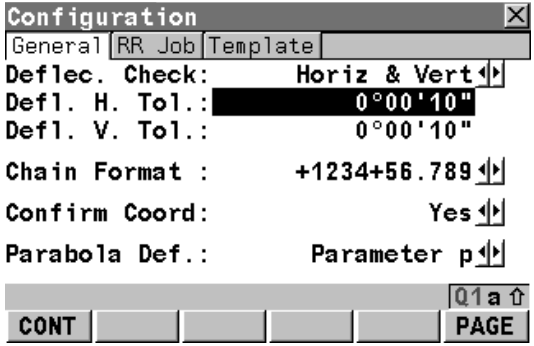
Description

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



CONT (F1)
To accept the screen entries and continue.

PAGE (F6)
To change to another page on this screen.

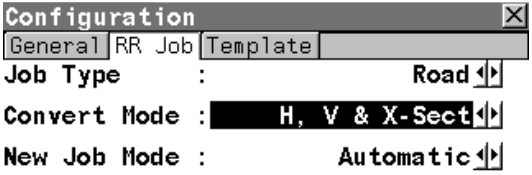
Description of fields

Field	Description
Deflec. Check	Choicelist. Possibility to do a deflection check for horizontal and/or vertical alignments.
	• **Horiz & Vert**. The deflection check will be done for horizontal and vertical alignments.
	• **Horizontal Only**. The deflection check will only be done for horizontal alignments.

Field	Description
	• **Vertical Only**. The deflection check will only be done for vertical alignments.
	• **None**. No deflection check will be done.
Deflec. H. Tol.	Input. The deflection tolerance for horizontal alignments. 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.
Deflec. V. Tol.	Input. The deflection tolerance for vertical alignments.
Chain Format	Choicelist. Selects display format for all chainage information fields.
	• **+123456.789**. Default chainage display format.
	• **+123.4+56.789**. Seperator between tens and hundreds with additional thousand separator.
	• **+123+456.789**. Seperator between hundreds and thousands.
	• **+1234+56.789**. Seperator between tens and hundreds.
Confirm Coord	Choicelist. If set to **YES**, each time a new alignment element has been entered, a confirmation message displays the end coordinates for confirmation.
For Parabola	Choicelist. Parameter defining the curve.
	Use Parameter p.
	Use K factor. K factor = Parameter p/100.

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

ATK Configuration, RR Job 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
Job Type	Choicelist. Define the job type to be used for the conversion. Currently supported job types are **Road** and **Rail**.
Convert Mode	Choicelist. The mode used for the conversion. Refer to "8 Convert to RoadRunner Job" for more detailed information.
New Job Mode	Choicelist. The job mode to be used for the conversion.
	Manual. The conversion has to be done manually. Refer to "8 Convert to RoadRunner Job" for more detailed information.
	Automatic. The conversion will be done automatically with the options defined for **Convert Mode**.

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
Layer	Choicelist. Possibility to define multiple layers per X-Section within the creation of X-Sections. This setting can not be changed for existing alignments.
	Single. A single layer can be defined per X-Section.
	Multiple. Multiple layers can be defined per X-Section.
Height Mode	Choicelist. Define the mode for heights used in X-Section Templates.
	Relative Only. Heights entered for the X-Section Templates are relative to the height of the vertical alignment.
	Relative & Abs.. 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:

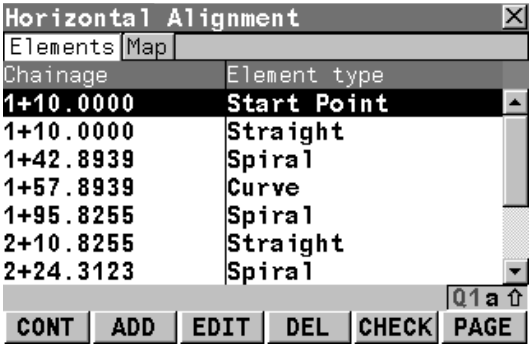
- Start Point
- Straight (Tangent)
- Curve
- Spiral
- Partial Spiral
- Bloss
- Partial Bloss

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 **EDIT (F3)**. Refer to "3.2 Editing the start point".

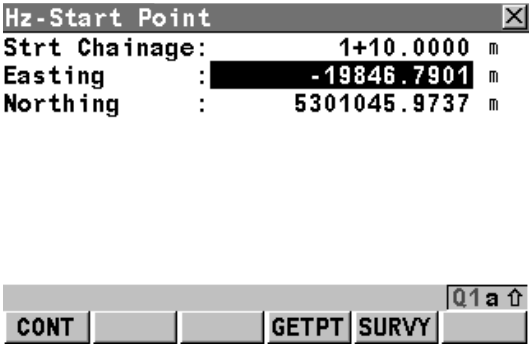
IF	THEN
an element is to be created	Press **ADD (F2)** and access the **Hz-Add Element** screen. Refer to "3.3 Inserting/Editing an element to/in a horziontal alignment".
an element is to be edited	Press **EDIT (F3)**. Refer to "3.3 Inserting/Editing an element to/in a horziontal alignment".
an element is to be deleted	Press **DEL (F4)** 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 **CHECK (F5)**. The horizontal alignment will be checked. **OK (F4)** confirms the checking and returns to the **Horizontal Alignment** 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



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.

Description of fields

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

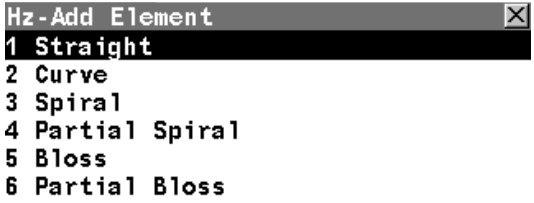
3.3 Inserting/Editing an element to/in a horziontal alignment

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
Straight	To insert/edit a straight to/in a horizontal alignment.
Curve	To insert/edit a curve to/in a horizontal alignment.
Spiral	To insert/edit a spiral to/in a horizontal alignment.
Partial Spiral	To insert/edit a partial spiral to/in a horizontal alignment.
Bloss	To insert/edit a bloss curve to/in a horizontal alignment. Only available for **Job Type: Rail**. Refer to "2.4 Configuring Alignment Tool Kit".

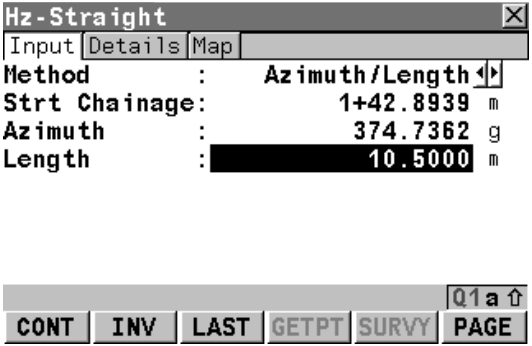
Option	Description
Partial Bloss	To insert/edit a partial bloss curve to/in a horizontal alignment. Only available for **Job Type: Rail**. Refer to "2.4 Configuring Alignment Tool Kit".

3.3.1 Creating/Editing a straight

Access

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

Hz-Straight



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.
	Azimuth/Length. Using the azimuth and the length of the straight.

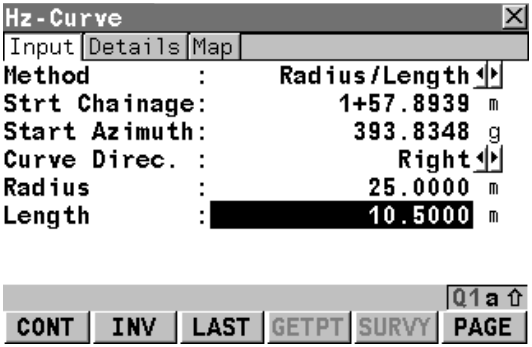
Field	Description
	Azimuth/ E Chain. Using the azimuth and the end chainage of the straight.
	End Coords. Using the end coordinates of the straight.
Strt Chainage	Output. The end chainage of the previous element is automatically used and cannot be edited.
Azimuth	Input. The azimuth displayed is from the previous element. Another value can be entered manually.
Length	Input. Length of the straight element.
End Chainage	Input. Chainage at the end of the element.
End East	Input. Easting for the end chainage.
End North	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 horziontal alignment" to access the **Hz-Add Element** screen. Highlight **Curve** and press **CONT (F1)** to access the **Hz-Curve** screen.

Hz-Curve



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.
	Radius/Length. Using the radius of the curve and its length.
	Radius/Delta. Using the radius and the delta angle of the curve.

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

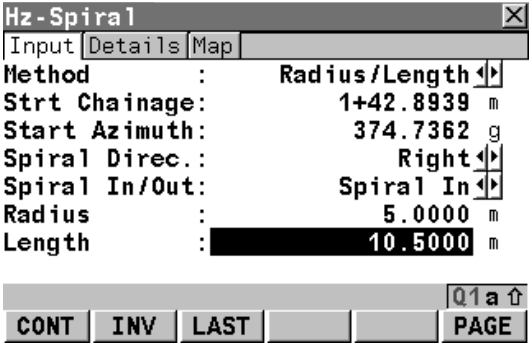
Field	Description
End East	Input. Easting for the end chainage. Available for **Radius/E Coords** and **Center/E Coords**.
End North	Input. Northing for the end chainage. Available for **Radius/E Coords** and **Center/E Coords**.

3.3.3 Creating/Editing a spiral

Access

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

Hz-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 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.
	Radius/Length. Using the radius of the connecting curve and its length.

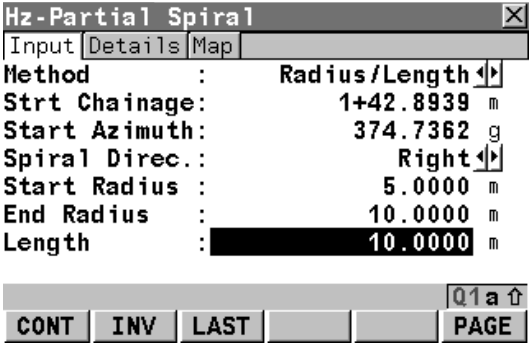
Field	Description
	Radius/E Chain. Using the radius of the connecting curve and its end chainage.
	Param/Length. Using the parameter A and the length of the connecting curve.
	Param/E Chain. Using the parameter A and the end chainage of the spiral.
Strt Chainage	Output. The end chainage of the previous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

3.3.4 Creating/Editing a partial spiral

Access

Refer to "3.3 Inserting/Editing an element to/in a horziontal 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.
	Radius/Length. Using the radius and the length of the spiral.
	Radius/E Chain. Using the radius and the end chainage of the spiral.

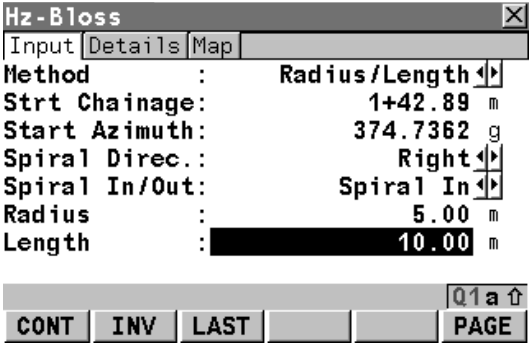
Field	Description
Strt Chainage	Output. The end chainage of the previous element is automatically used and cannot be edited.
Start Azimuth	Input. The azimuth of the tangent in the start point. This is used from the previous element. The value can be edited.
Spiral Direc.	Choicelist. Looking in the direction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

3.3.5 Creating/Editing a bloss curve

Access

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

Hz-Straight



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 the ATK Configuration.

SHIFT RESET (F4)
To reset all screen entries.

Description of fields

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

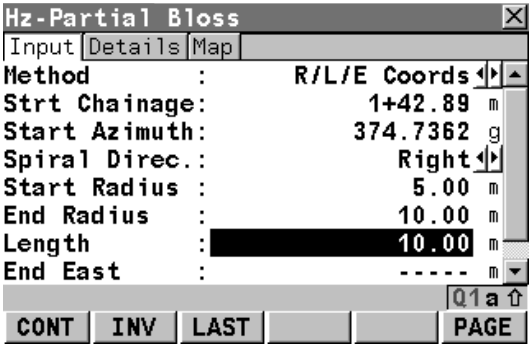
Field	Description
	Radius/E Chain. Using the radius of the connecting curve and its end chainage.
Strt Chainage	Output. The end chainage of the previous element is automatically used and cannot be edited.
Azimuth	Input. The azimuth displayed is from the previous element. Another value can be entered manually.
Length	Input. Length of the bloss curve element.
End Chainage	Input. Chainage at the end of the element.
End East	Input. Easting for the end chainage.
End North	Input. Northing for the end chainage.

3.3.6 Creating/Editing a partial bloss curve

Access

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

Hz-Straight



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 the ATK Configuration.

SHIFT RESET (F4)
To reset all screen entries.

Description of fields

Field	Description
Method	**R/L/E Coords**. The method used to define the partial bloss curve.
Strt Chainage	Output. The end chainage of the previous element is automatically used and cannot be edited.

Field	Description
Start Azimuth	Input. The azimuth of the tangent in the start point. This is used from the previous element. The value can be edited.
Spiral Direc.	Choicelist. Looking in the direction of increasing chainage, the direction of the bloss curve can be **RIGHT** or **LEFT**.
Start Radius	Input. The entry radius of the bloss curve. The signs are set by the system depending on the bloss curve direction defined in **Spiral Direc.**.
End Radius	Input. The exit radius of the bloss curve. The signs are set by the system depending on the bloss curve direction defined in **Spiral Direc.**.
Length	Input. Length of the bloss curve element.
End East	Input. Easting for the end chainage.
End North	Input. Northing for the end chainage.

3.4 Deleting an existing element in a horizontal alignment

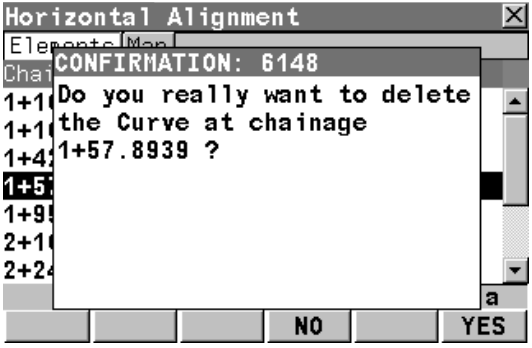
Access

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

Deleting an existing element step-by-step

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

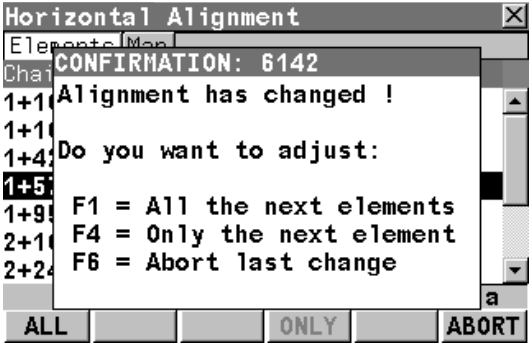
Step 3



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:

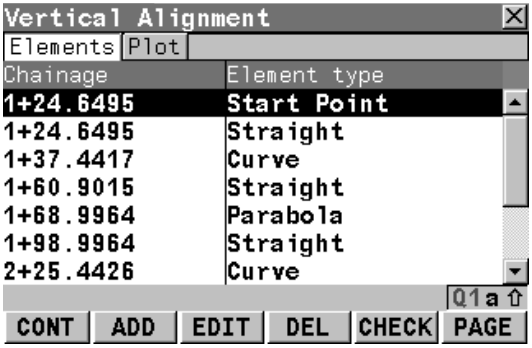
- Start Point
- Straight (Tangent)
- Parabola
- Curve

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 **EDIT (F3)**. Refer to "4.2 Editing the start point".
an element is to be created	Press **ADD (F2)** and access the **Vert-Add Element** screen. Refer to "4.3 Inserting/Editing an element to/in a vertical alignment".

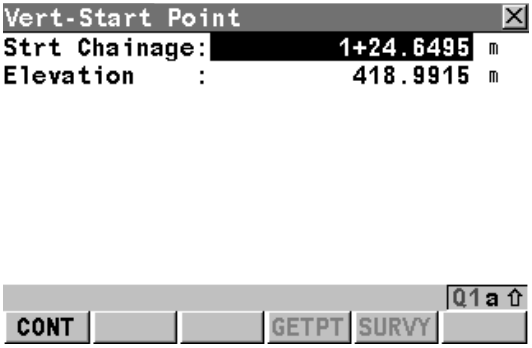
IF an element	THEN
an element is to be edited	Press **EDIT (F3)**. Refer to "4.3 Inserting/Editing an element to/in a vertical alignment".
an element is to be deleted	Press **DEL (F4)** and confirm or abort deleting. Refer to "4.4 Deleting an existing element in a vertical alignment"
the vertical alignment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



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.

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

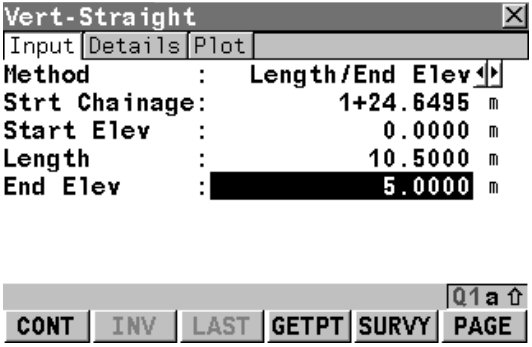
Options	Description
Straight	To insert/edit a straight to/in a vertical alignment.
Parabola	To insert/edit a parabola to/in a vertical alignment.
Curve	To insert/edit a curve to/in a vertical alignment.

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



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.
SHIFT %/H:V/V:H (F5)
To switch between **hv**, **vh** and **%** for the S. Ratio unit.

Description of fields

Field	Description
Method	Choicelist. The method used to define the straight.
	Length/End Elev. Using the length and the end elevation of the straight.
	End Chain & Elev. Using the end chainage and the elevation of the straight.
	Length and Grade. Using the length and the grade of the straight.
	End Chain/Grade. Using the end chainage and the grade of the straight.
Strt Chainage	Output. The end chainage of the previous element is automatically used and cannot be edited.
Start Elev	Output. The end height of the previous element is automatically used and cannot be edited.

Field	Description
Length	Input. Length of the straight element as slope distance.
End Chainage	Input. Chainage at the end of the element.
Grade	Input. The grade of the straight element. Positive inclines have positive values, negative inclines have negative values.
End Elev	Input. Height at the end of the element. Type in manually or, alternatively, press **GETPT (F2)** when the focus is on this line to select the height from an existing point in the active job.

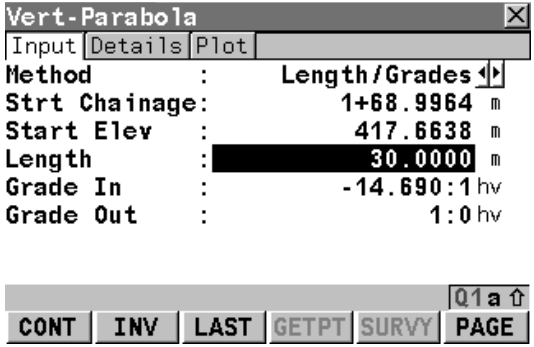
For grade units the system settings are applied. To change the system setting access the **CONFIGURE Units & Formats** screen. Refer to GPS1200, TPS1200+ or GPS900 Technical Reference Manual for more detailed information.

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-Parabola**s-screen.

Vert-Parabola



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.

SHIFT %/H:V/V:H (F5)
To switch between **hv**, **vh** and **%** for the S. Ratio unit.

Description of fields

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

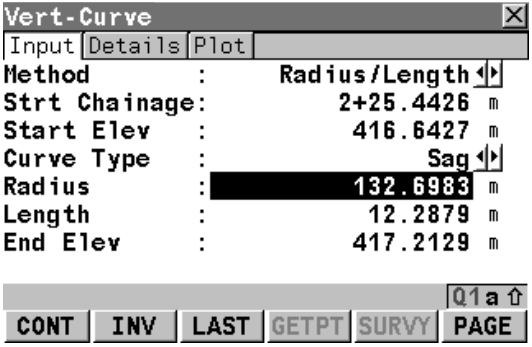
Field	Description
Grade out	Input. The grade at the end of the parabola. Positive inclines have positive values, negative inclines have negative values.
End Elev	Input. Height at the end of the element. Type in manually or press **GETPT (F2)** when the focus is on this line to select the height from 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



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 curve.
	Radius/Length. Using the radius of the curve and its length.
	Radius/E Chain. Using the radius and the end chainage of the curve.
Strt Chainage	Output. The end chainage of the previous element is automatically used and cannot be edited.
Start Elev	Output. The end height of the previous element is automatically used and cannot be edited.
Curve type	Choicelist. **Crest** or **Sag**.
Radius	Input. Radius of the curve.
Length	Input. Length of the curve along the segment.
End Chainage	Input. Chainage at the end of the element.
End Elev	Input. Height at the end of the element. Type in manually or, alternatively, press **GETPT (F2)** 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

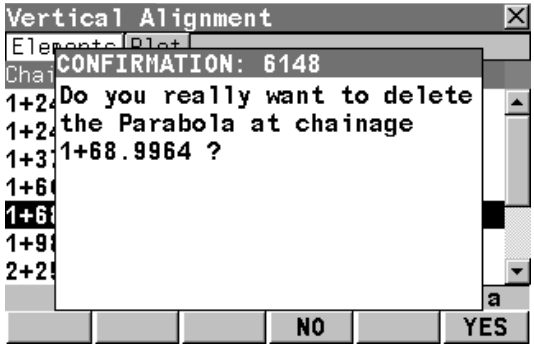
Access

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

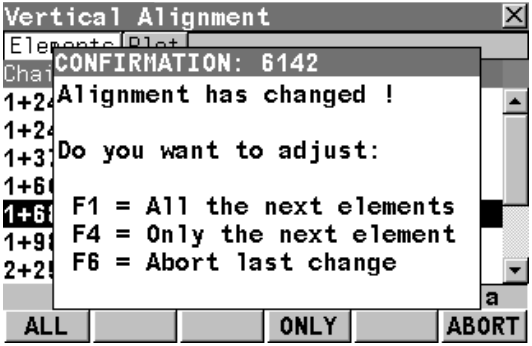
Step 3



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

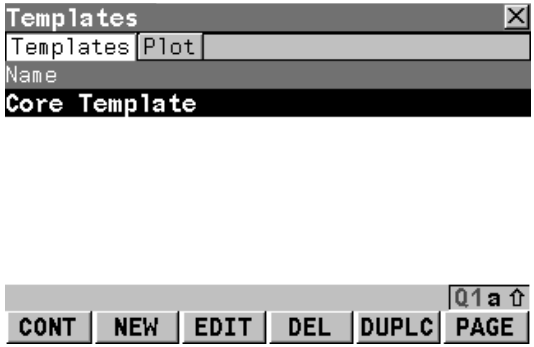
Description

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

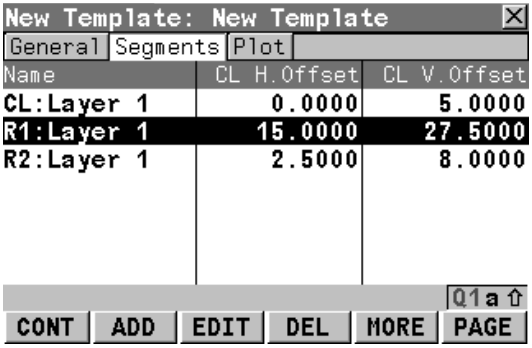
PAGE (F6)
To change to another page on this screen.

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



CONT (F1)
To accept the screen entries and continue.

ADD (F2)
To creat 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 MIROR (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
S. Dist	Slope distance of the segment.
H. Dist	Horizontal distance of the segment.
CL V. Offset	Vertical centreline offset of the segment.
S. Ratio	Slope ratio of the segment.

Next step

IF a segment	THEN
is to be added	Press **ADD (F2)** and access the **Add Segment** screen. Refer to "5.2.1 Add/edit a segment".
is to be edited	Press **EDIT (F3)** and access the **Edit Raw Alignment** screen. Edit the alignment and press **CONT (F1)** to return to the **Raw Alignments** screen. **CONT (F1)** again to access **Alignment Tool Kit Menu**.
is to be deleted	Press **DEL (F4)**, confirm or abort the process and return to the **Raw Alignments** screen. **CONT (F1)** again to access **Alignment Tool Kit Menu**.
is to be mirrored	Press **MIROR SHIFT (F4)** 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.

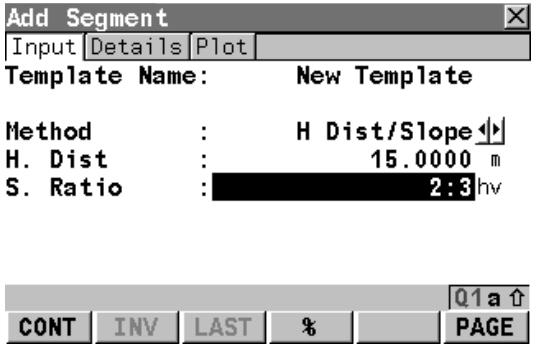
5.2.1 Add/edit a segment

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



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

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

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

5.2.2 Delete a segment

Access

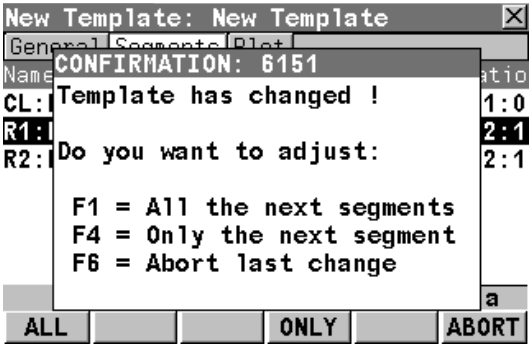
Refer to "5.2 Creating/editing a X-Section template" to access the **New Template : Template Name** screen.

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

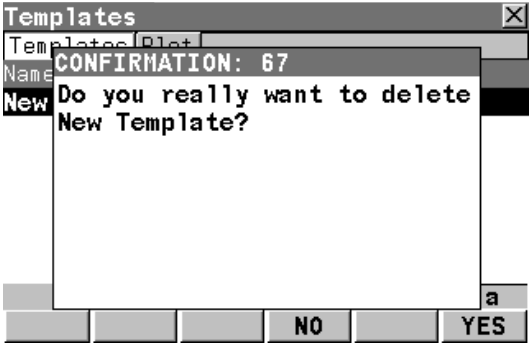
Access

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.	**Templates**.
2.	Highlight the template to be deleted and press **DEL (F4)**.
3.	Press **YES (F6)** to confirm or **NO (F4)** to abort deleting the template.

Confirmation



NO (F4)
To abort deleting the X-Section template.

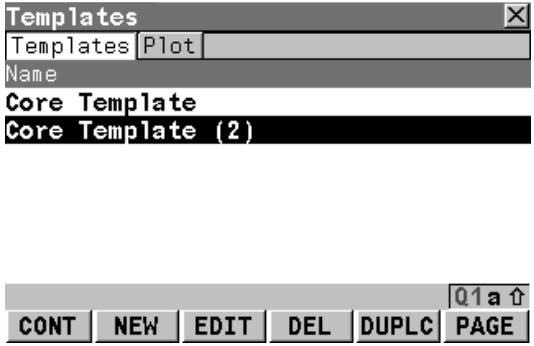
YES (F6)
To confirm deleting the X-Section template.

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:

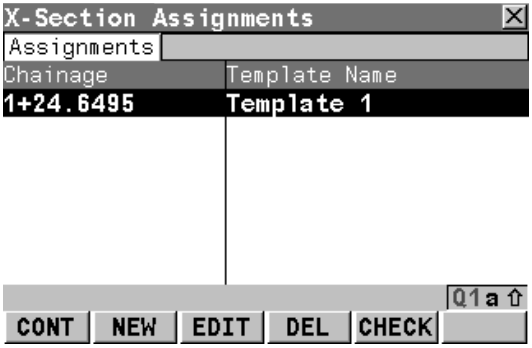
- X-Section assignments

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

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

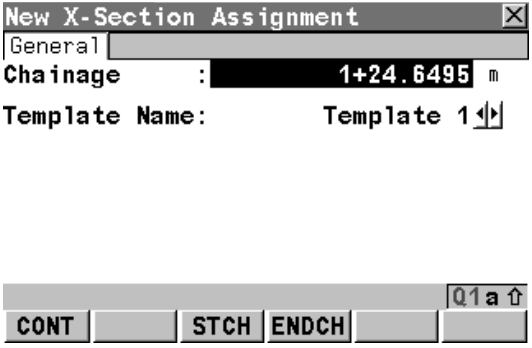
6.2 Creating/Editing a X-Section assignment

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
Chainage	Input. The chainage to which the X-Section template is assigned to.
Template Name	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.	**New X-Section Assignment**.

Step	Description
2.	Type in or edit the value for **Chainage**. Alternatively press **STCH (F3)** or **ENDCH (F4)** 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 **Chainage**.
4.	Press **CONT (F1)** to create the X-Section assignment.

6.3 Deleting a X-Section assignment

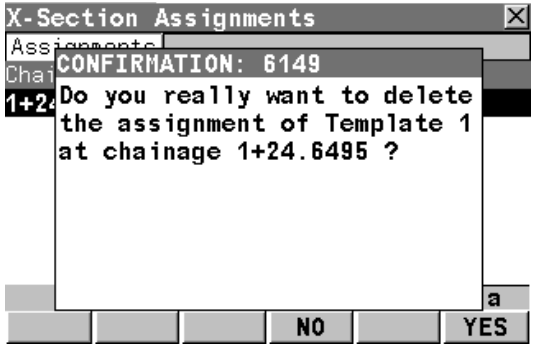
Access

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.	**X-Section Assignments**.
2.	Press **DEL (F4)** to delete the X-Section assignment.
3.	Press **YES (F6)** to confirm deleting or **NO (F4)** to abort deleting the X-Section assignment.
	It automatically returns to the **X-Section Assignments** 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

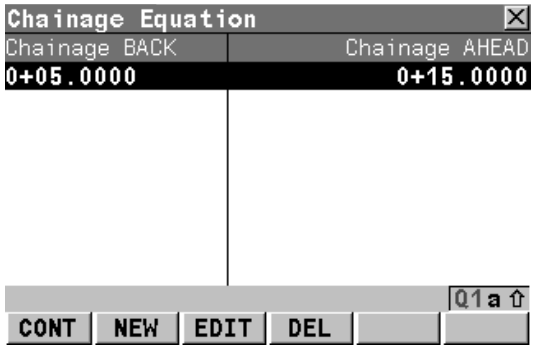
Description

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



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 **NEW (F2)** and access the **Chainage Equation** screen. Refer to "7.2 Creating/Editing a chainage equation".
is to be edited	Press **EDIT (F3)** and access the **Chainage Equation** screen. Refer to "7.2 Creating/Editing a chainage equation".
is to be deleted	Press **DEL (F4)**, 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

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 Chainge equation step-by-step

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

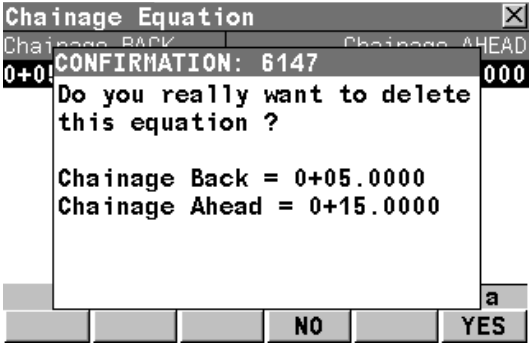
Step	Description
3.	Type in or edit the values for **Chain. Back** and **Chain. Ahead**.
4.	Press **CONT (F1)** to create the chainage equation or store the edited chainage equation.

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.	**Chainage Equation**.
2.	Press **DEL (F4)** to delete a chainage equation.
3.	Press **YES (F6)** to confirm or **NO (F4)** to abort deleting the highlighted chainage equation.

8 Convert to RoadRunner Job

8.1 Overview

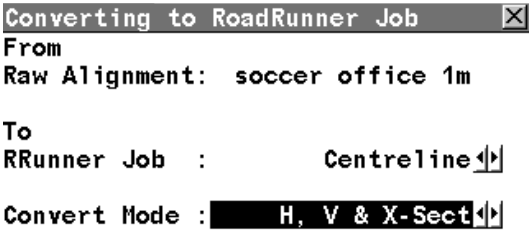
Description

Allows the onboard conversion of existing LandXML aligments 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



CONT (F1)
To accept the screen entries and continue.

Description of fields

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

Field	Description
	Horiz & Vert. Only horizontal and vertical alignment will be converted. **Horizontal Only**. Only horizontal alignment will be converted. **H, V & X-Section**. Horizontal aligment, vertical alignment and X-Sections will be converted. Only available for **Job Type: Road**. Refer to "2.4 Configuring Alignment Tool Kit" for information about supported RoadRunner job types.

8.2 Converting to a RoadRunner Job

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

Step	Description
1.	**Converting to RoadRunner Job**.
	**From Raw Alignment** 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 **To RRunner Job**.
	If an existing job has been selected the alignment will be stored in a new layer.
	If a new job with the same name as an existing job needs to be created then the existing job must be deleted first.
3.	Select the mode to be used for the onboard conversion.
4.	Press **CONT (F1)** 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 **OK (F4)** for returning to the **Main Menu** on the instrument/receiver.

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- when it has to be **right**

Leica Geosystems