TRAILER CONSULTATION
Kauppatori 2
FIN - 67100 Kokkola Finland
WWW.TRAILERWIN.COM

Tel +358 10 337 2530

E-mail: info@trailerwin.com

CornerWIN

Advanced simulation software for Turning Calculations

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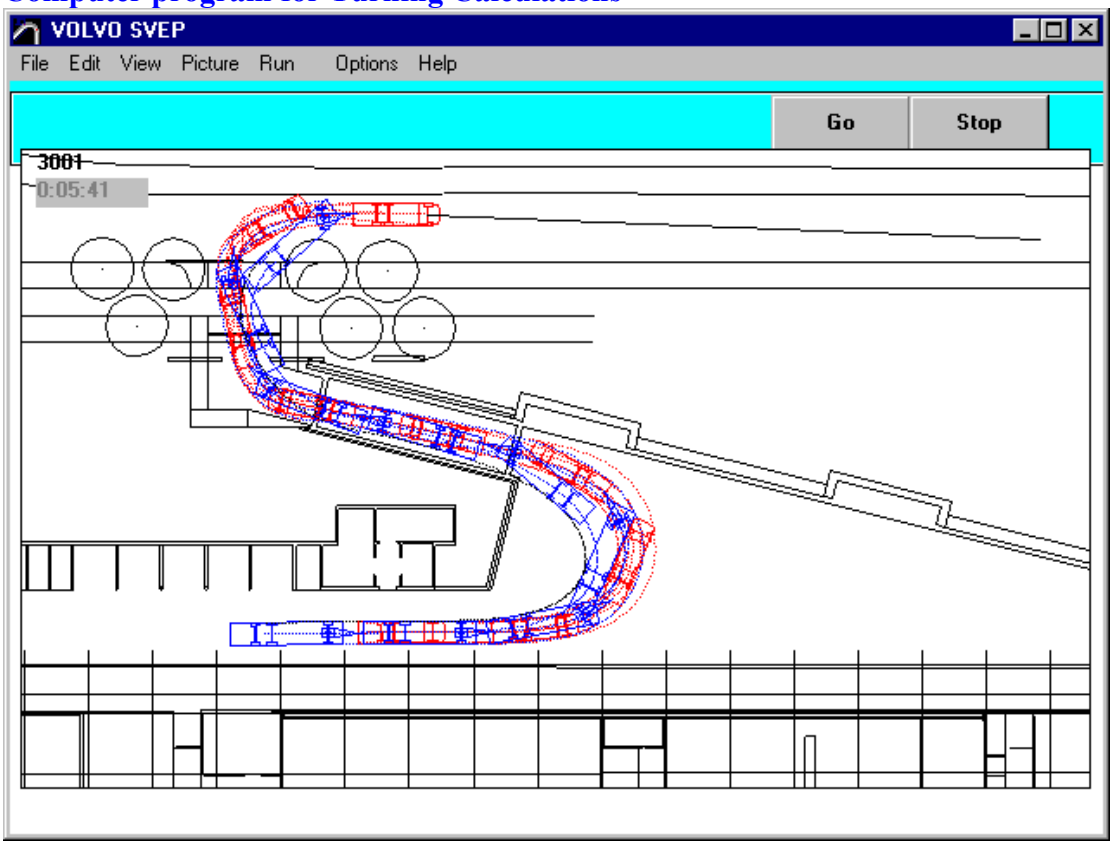
CornerWIN

CornerWIN 2.0

Computer program for Turning Calculations



The alternatives are as follows:

Circle 12.5 m (EU-Circle) Outer Radius 12.5m , inner Radius 5.3m
90 Degrees Swedish Standard Drive round 90º corner
90 Degrees Arc Drive in 90º sector
120 Degrees Arc Drive in 120º sector
360 Degrees Circle Direct to circle , drive trough the circle and direct out.
Arc Drive in sector. You choose Radius and sector angle.
Circle Continuous drive in a circle
Pull Steering the vehicle by pulling with mouse

Easy way to begin; show examples:
Example 1 (Vehicle from TrailerWIN)

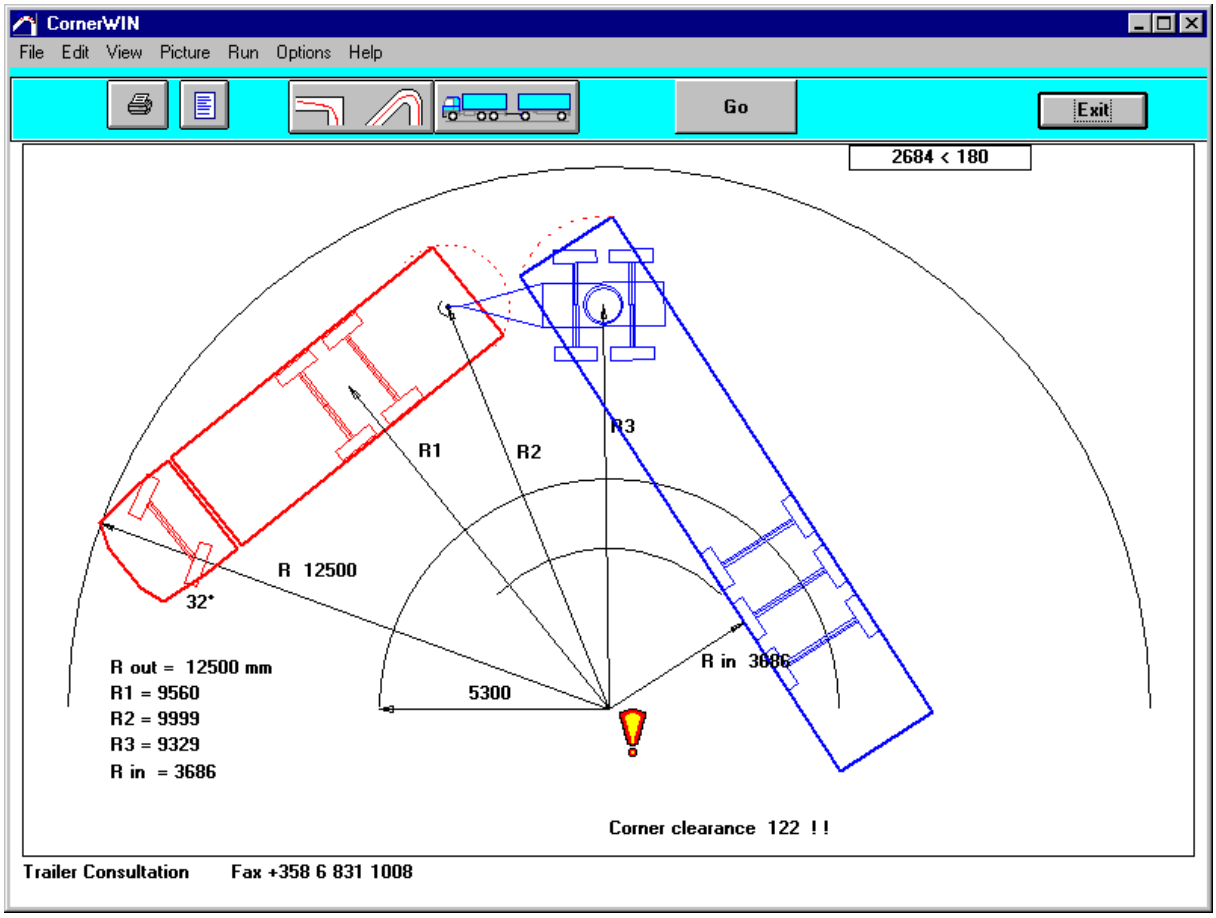
Contact Data Trailer Consultation and Importers

Example 1 (Vehicle from TrailerWIN)
Starting CornerWIN

You can start the CornerWIN Program from TrailerWIN or using Windows Taskbar button **Start** - Programs - TrailerWIN - CornerWIN.

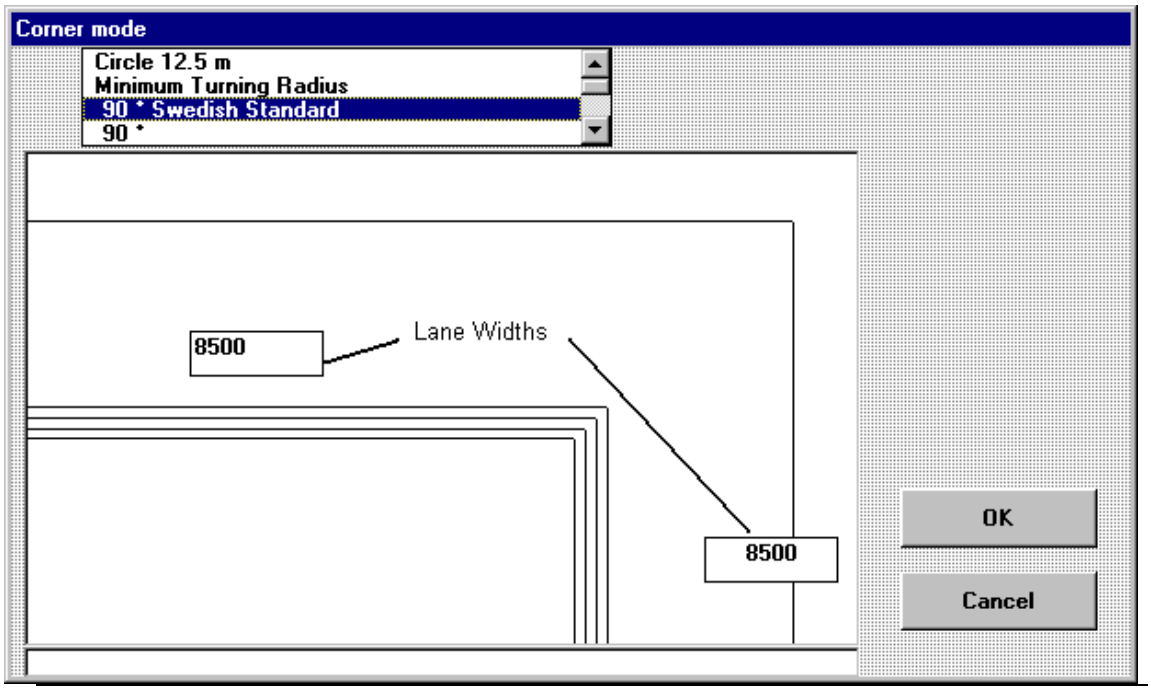
When You are at first modifying combination in TrailerWIN, then go to CornerWIN using Menu: Special – CornerWIN (also menu in TrailerWIN program).

When You start CornerWIN program, you will get at first an EU-Circle turning calculation whit this vehicle, which you have handled at last time, when you started CornerWIN from TrailerWIN.



Choosing type of turning calculation

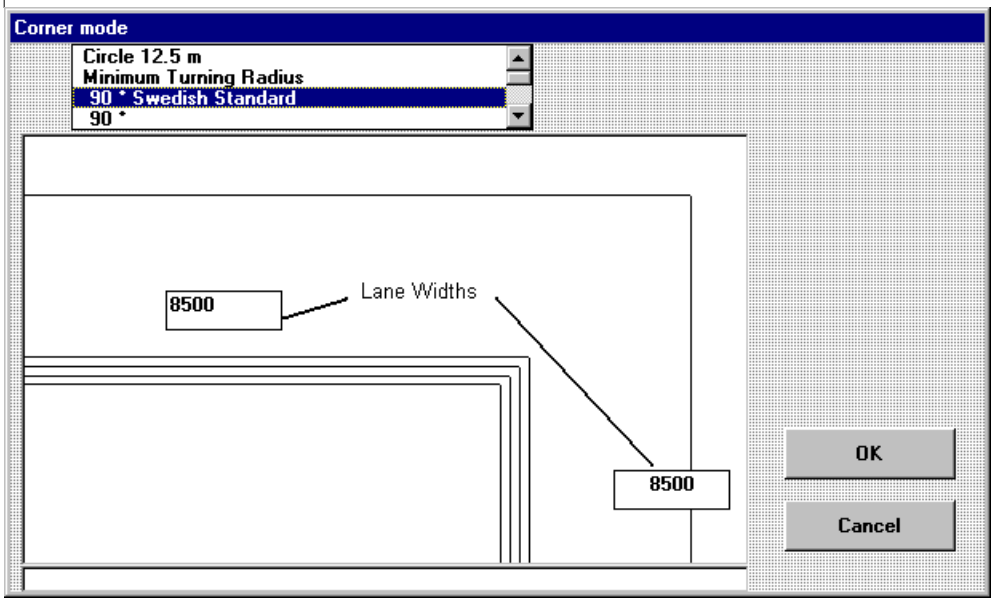
Click CornerMode button
or use menu Edit - CornerMode



The alternatives are as follows:

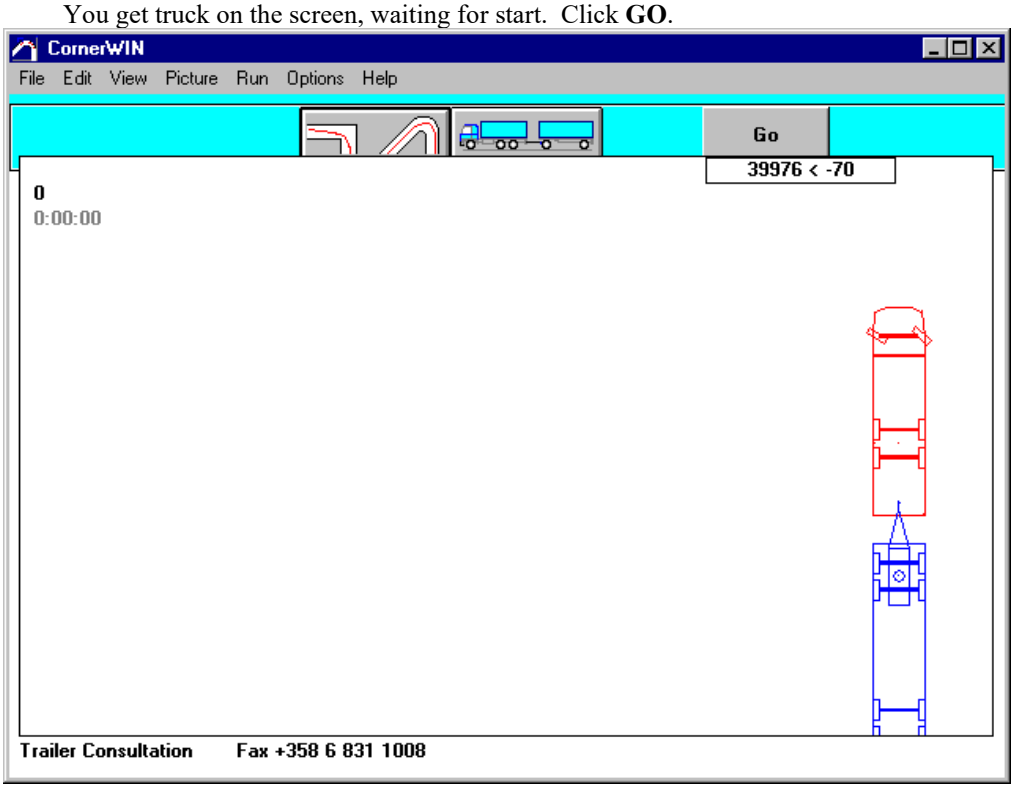
Circle 12.5 m (EU-Circle)	Outer Radius 12.5m , inner Radius 5.3m
90 Degrees Swedish Standard	Drive round 90º corner
90 Degrees Arc	Drive in 90º sector
120 Degrees Arc	Drive in 120º sector
360 Degrees Circle	Direct to circle , drive trough the circle and direct out.
Arc	Drive in sector. You choose Radius and sector angle.
Circle	Continuous drive in a circle
Pull	Steering the vehicle by pulling
120° Special transport	Turning simulation for special transport vehicles
120° Finland	Turning regulation for HCT combinations in Finland
NZ Low Speed Swept Path (LSSP)	Turning regulation for NZ
180° Sweden	Turning regulation for Modul combinations in Sweden

90 Degrees Swedish Standard

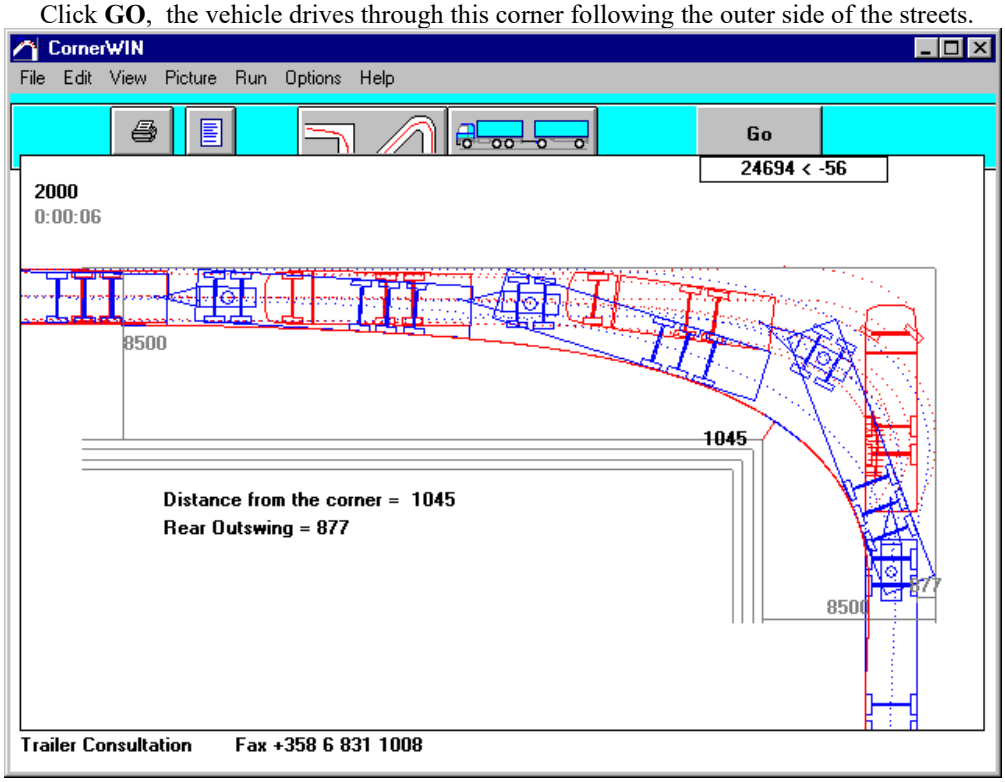


If needed you can change Lane Widths by writing new value. Default is 8500 mm for both. Click then OK.

You get truck on the screen, waiting for start. Click **GO**.



Click **GO**, the vehicle drives through this corner following the outer side of the streets.

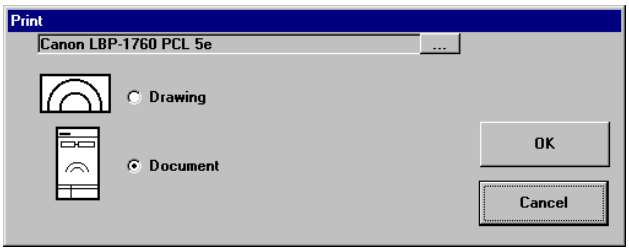


The picture is in scale, you will see directly on the picture, was the lane width enough or not.
You see also how much free space you had to the inside street corner and the outswing of the rear end.

Printing

Printing the turning picture

Click the **button Print** or use **menu File – Print**
Print Window appears:

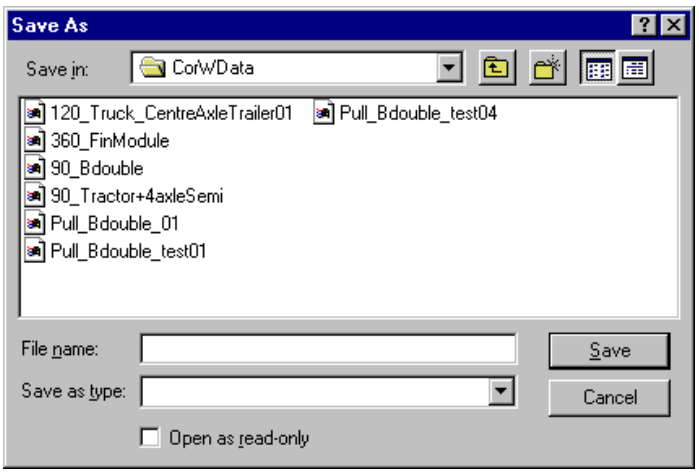


You can choose from two printing modes:
- Print Drawing : Print only turning picture using whole page for this.
- Print Document : Print vehicle drawing and turning picture on the same page.
- Button … will open Printer Setup Window. You can choose printer.

You are able to choose Printer line width changing options on the picture from menu Options - Picture.

Save Calculation

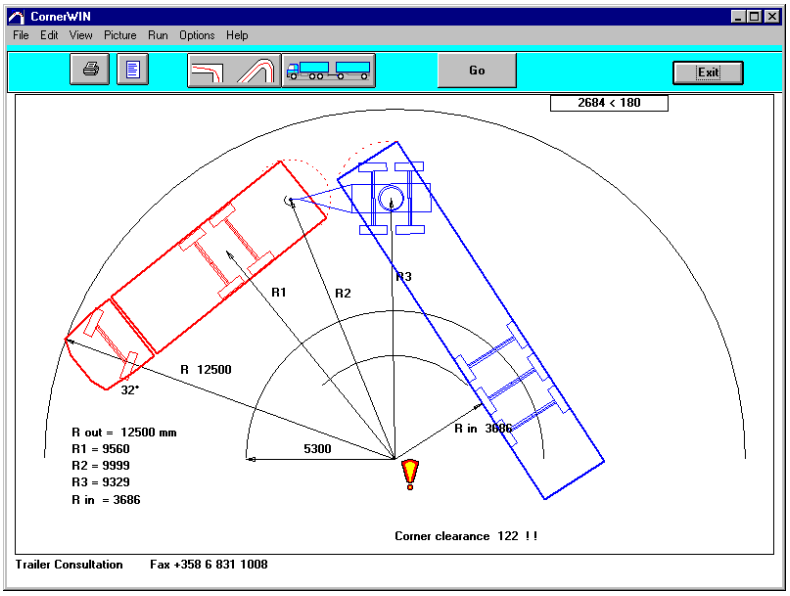
If you need this calculation later, you have to save it now.
Choose menu File – Save Calculation:



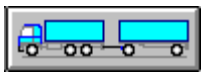
Write file name into File name textbox and click OK.

Example 2 (Using model vehicles)
Starting CornerWIN

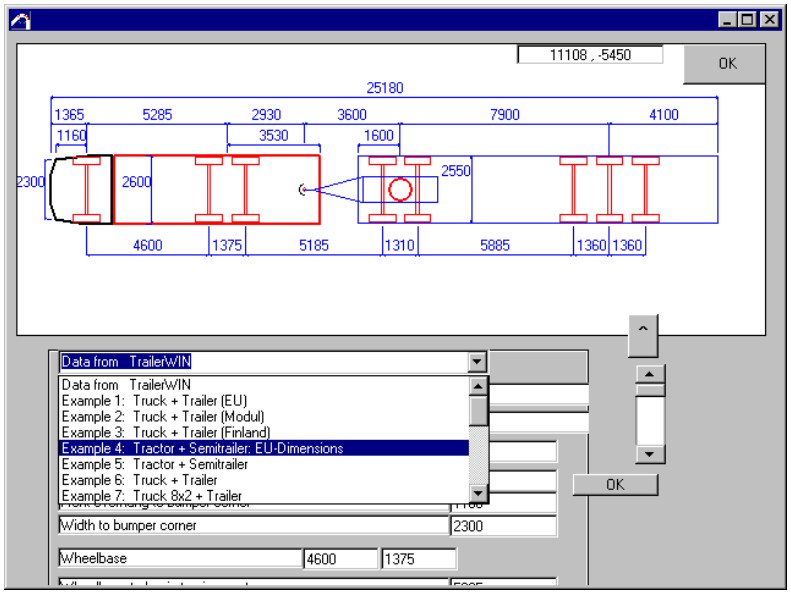
You can start the CornerWIN Program from TrailerWIN or using Windows Taskbar button **Start** - Programs - TrailerWIN - CornerWIN. You will get at first an EU-Circle turning calculation whit this vehicle, which you have handled at last time, when you started CornerWIN from TrailerWIN.



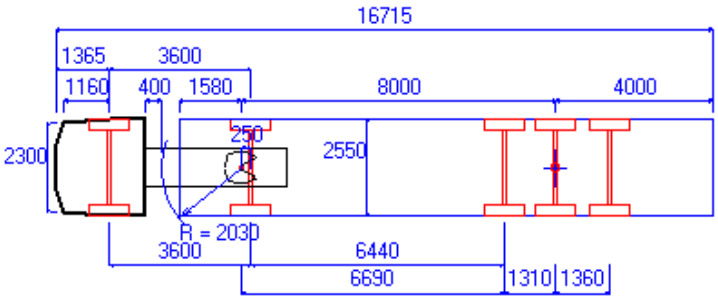
Choosing model vehicle

Click Vehicle data button  or use Menu Edit – Vehicle Data.
Vehicle data windows appears

Under the picture you see Combo box. Open this combo (click arrow button) And choose suitable model vehicle, for example: Tractor + Semitrailer: EU-Dimensions.
You will a new vehicle on the screen



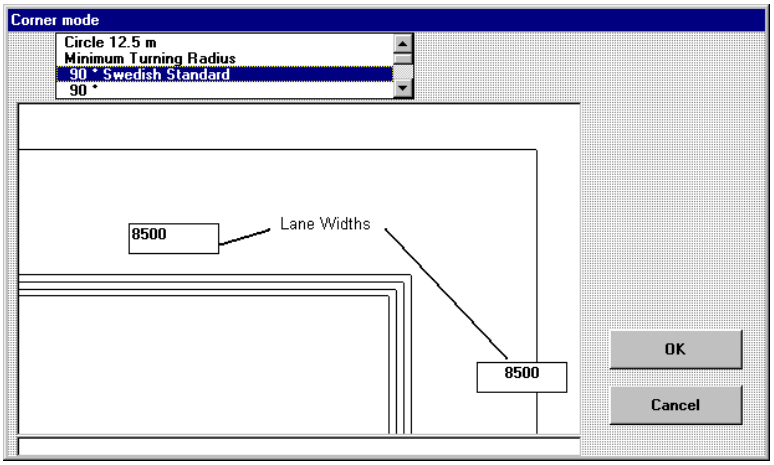
If needed, you can change dimensions; type new dimensions on textboxes,
When you are ready, click small OK, and the picture will be updated.
When you are ready with all modifications, click big OK button, on the right side of the picture.
So you get this vehicle into the turning window.



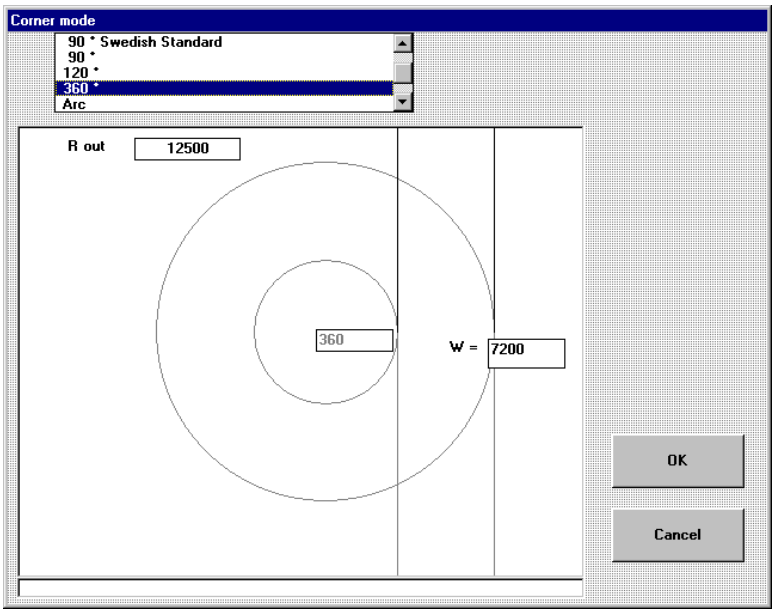
Choosing type of turning calculation (360°)

Click CornerMode button
or use menu Edit - CornerMode

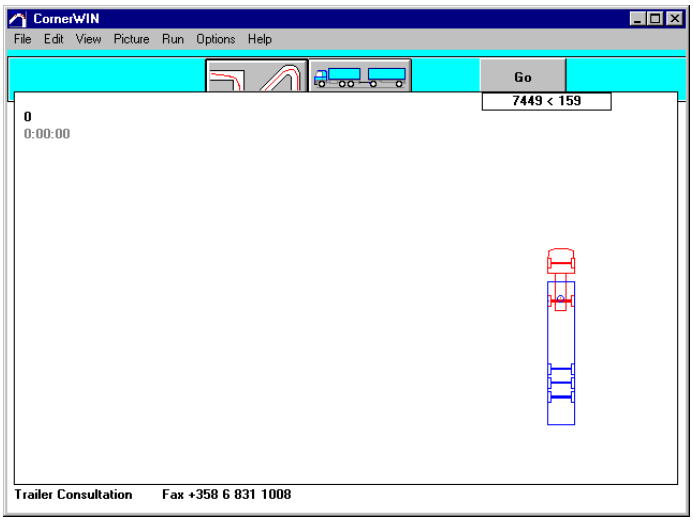
Choose then " **360°** " (360 degrees circle):

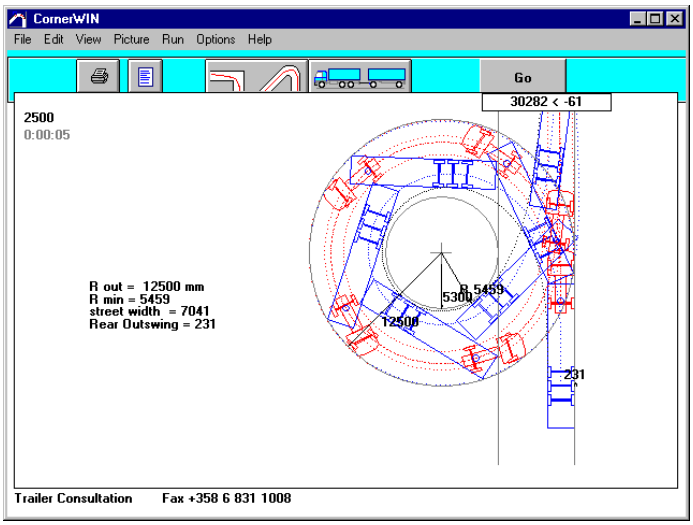


Click then OK.



You get truck on the screen, waiting for start. Click **GO**.
The vehicle comes to the circle, drives 360 degrees so that the front corner follows the circle, and then continues straight out from the circle to the original direction.
Notices that with the long vehicle combinations this is not the same thing as the EU-circle.

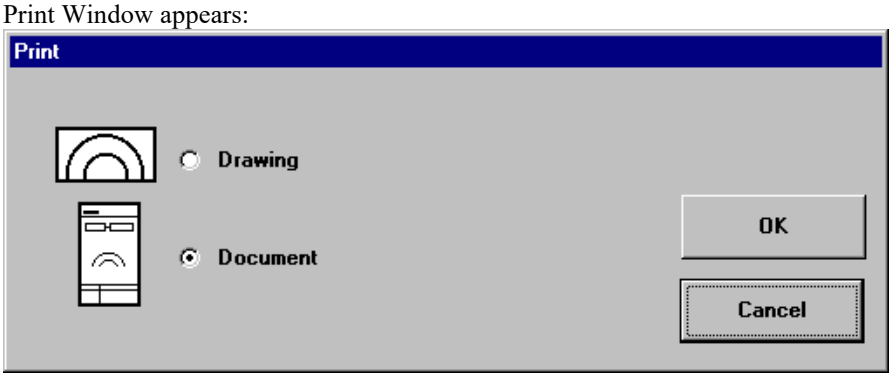




Printing

Printing the turning picture

Click the **button Print** or use **menu File – Print**
Print Window appears:

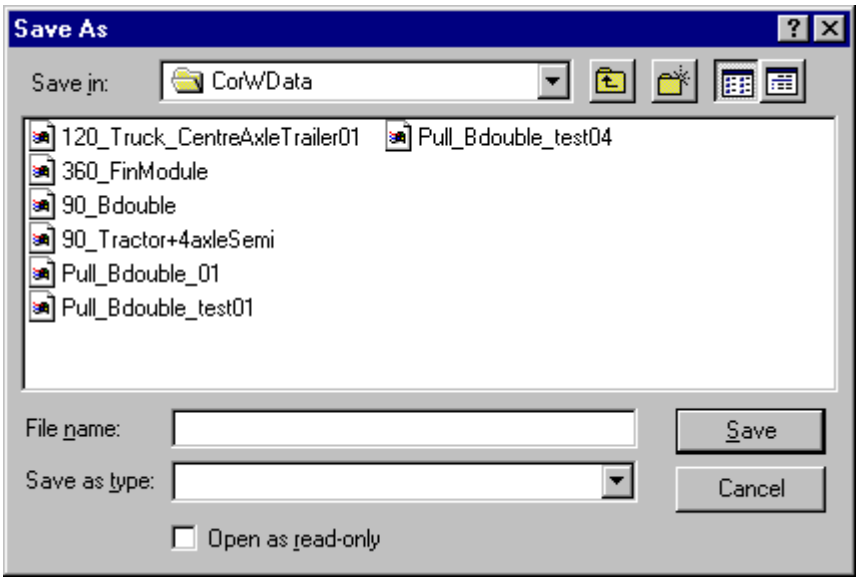


You can choose from two printing modes:
- Print Drawing : Print only turning picture using whole page for this.
- Print Document : Print vehicle drawing and turning picture on the same page.

You are able to choose Printer line width changing options on the picture from menu Options - Picture.

Save Calculation

If you need this calculation later, you have to save it now.
Choose menu File – Save Calculation:

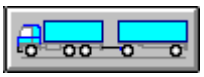


Write file name into File name textbox and click OK.

CornerWIN Toolbar

Computer program for Turning Calculations

Corner Mode

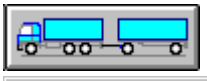


Vehicle Data

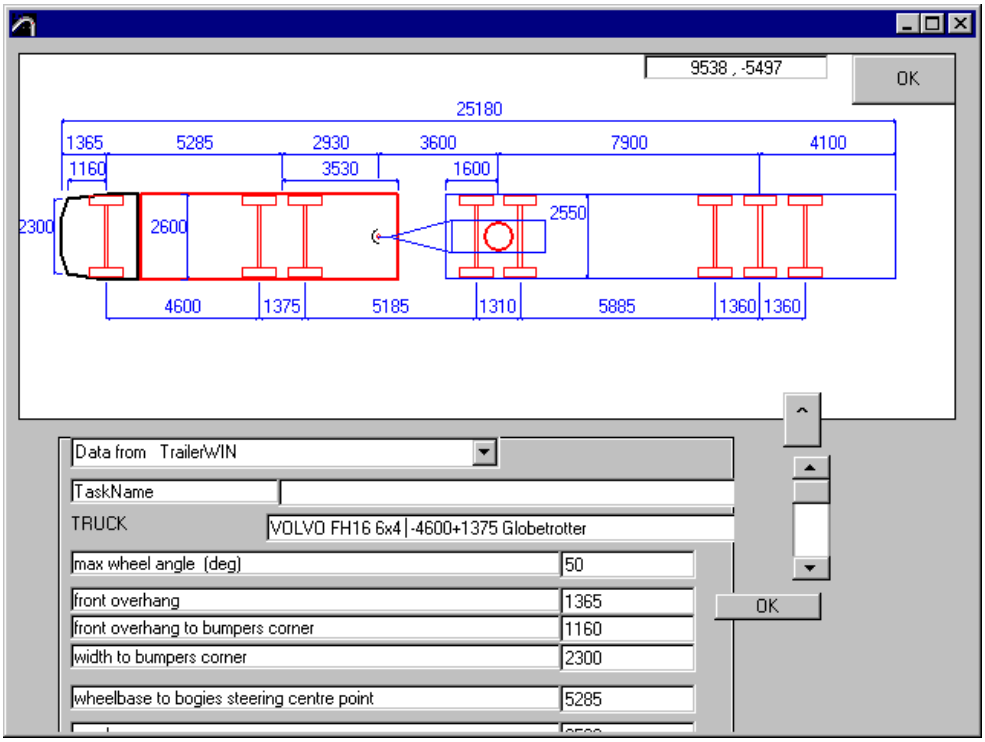
Print

Text Data

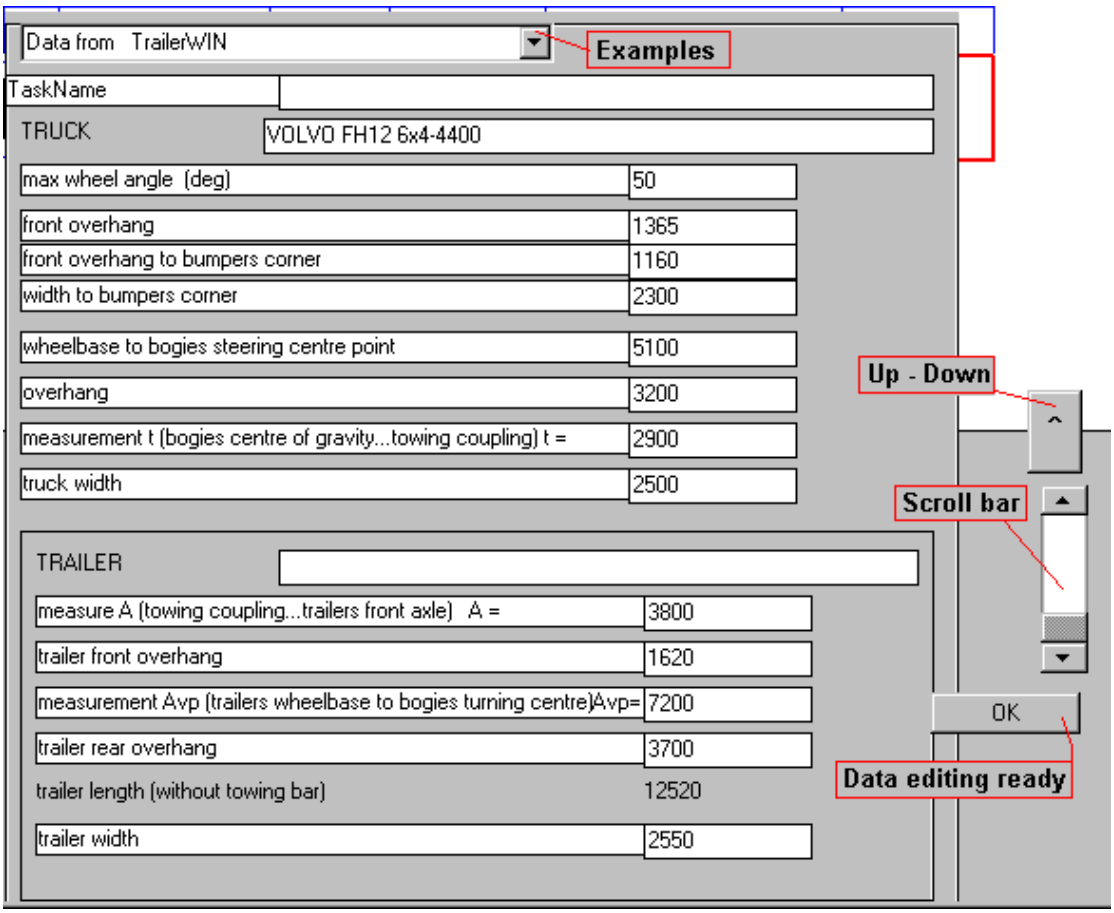
Vehicle Data



Vehicle Data



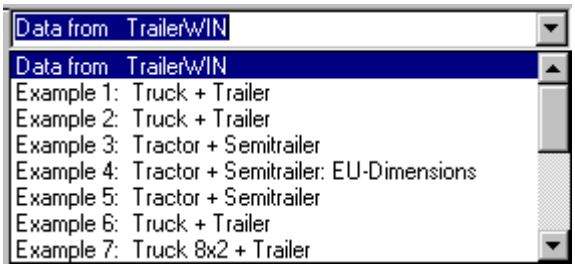
On this windows you can see or edit vehicle data.



Using scroll bar and Up-Down button you can see all data.

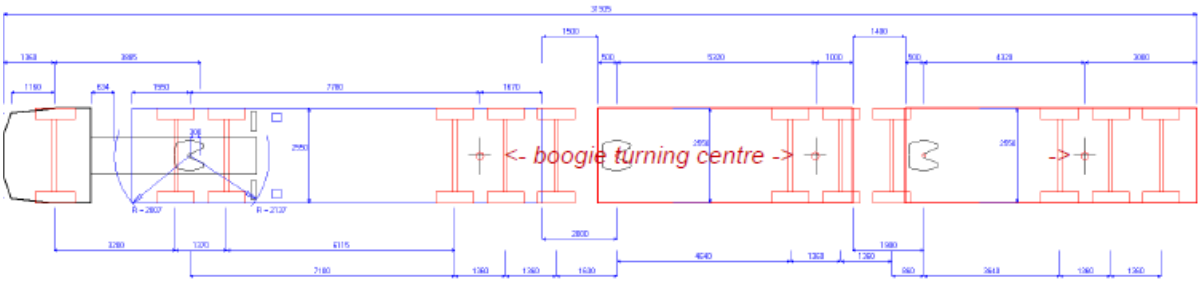
When you have edited data click on **OK** beside data. First after that you will take new data in use and you will see refreshed picture with new dimensions.

Most up on the data edit area is a listbox including example vehicles.



Information on drawing

You can find measures on the drawings as well as cross-marks showing boogie turning centers. With this it´s easier to check that the data given is correct.



Explanation for models in CornerWIN

In the list You can find for example following model: “AB-Triple Combination 6x2 fff+ffs+ffs+ffs” where:

- “AB-Triple Combination” = type of combination
- “6x2” = axle configuration for truck
- “fff+ffs+ffs+ffs” = axle type configurationo for trailer axles per group of axles where:
  - “f” = fixed axle (non-steered)
  - “s” = steered axle
  - “+”= separator for next group of axles (on trailers the first boogie and second boogie also separated)

B-Triple, AB-Triple, C-Train combinations

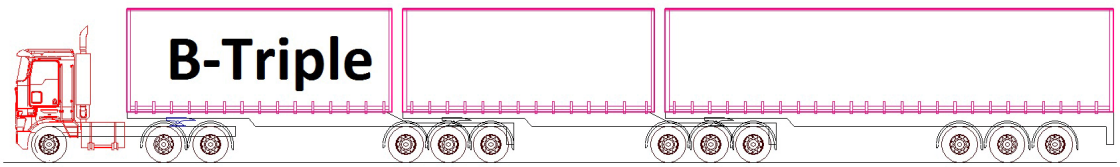


Figure 1 B-Triple

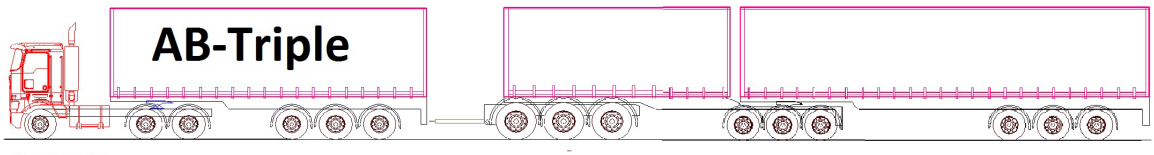


Figure 2 AB-Triple

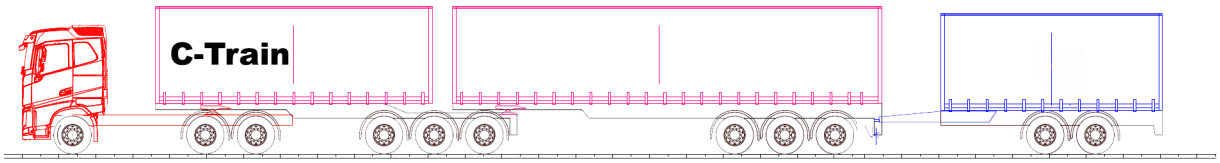
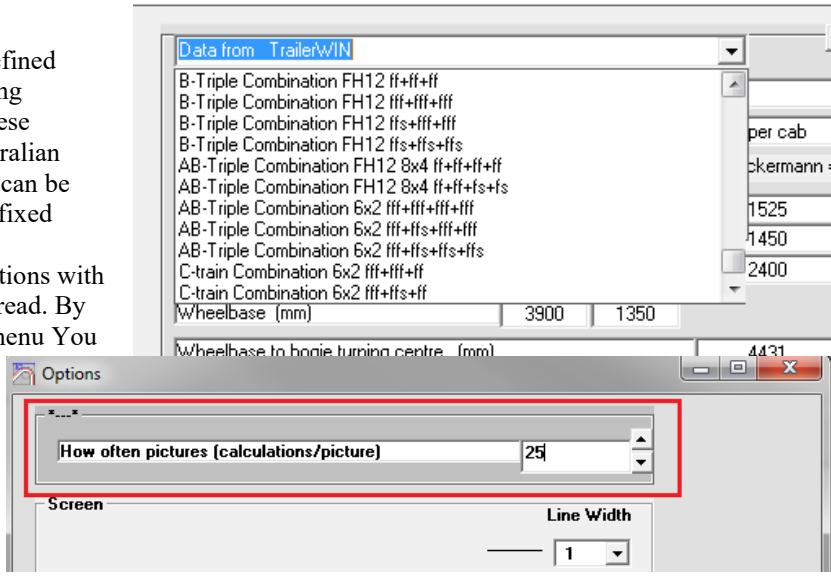


Figure 3 C-Train

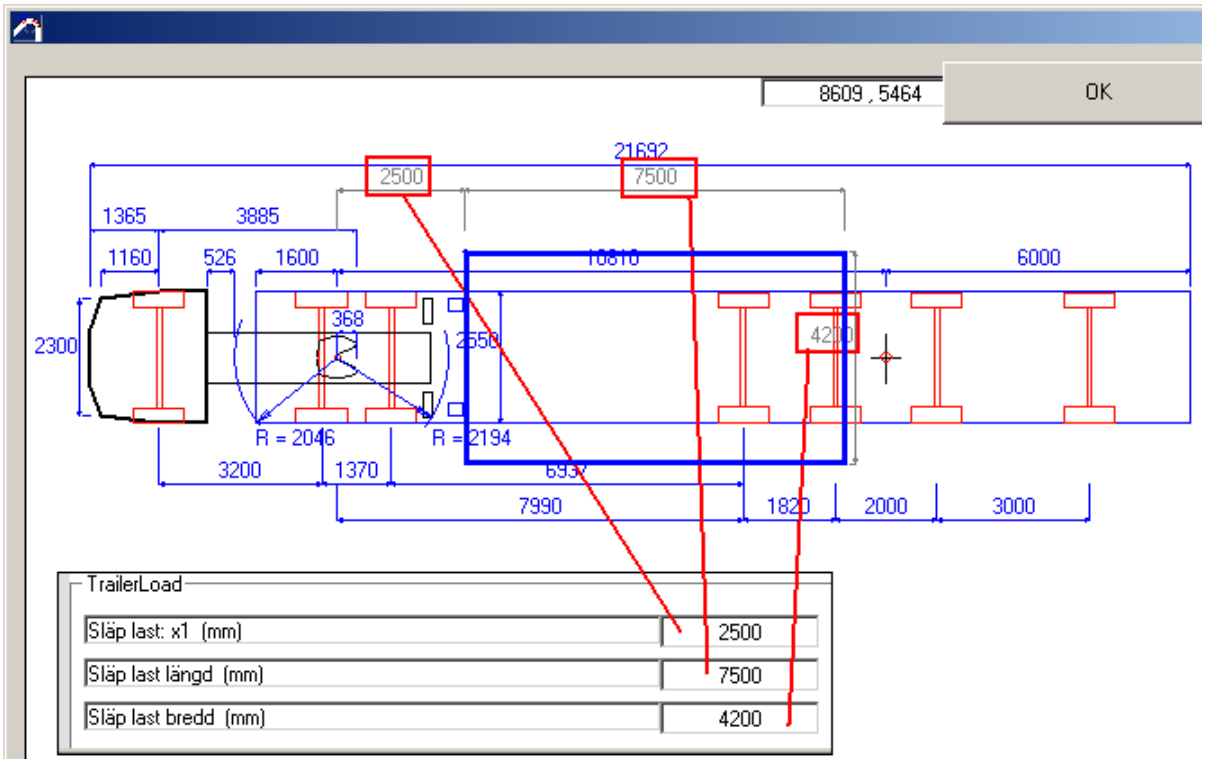
In CornerWIN you can find new pre-defined HCT-combination, you can do all turning calculations and simulations with all these combinations (static turning, 180° Australian Swepth Path etc). These combinations can be found with different options of steered/fixed axles.

When running simulations for combinations with 3 trailers the picture can be difficult to read. By increasing the redraw-rate in Options-menu You can adjust how often the combination will be drawn on the turning picture. For 3 trailer combinations a good redraw rate is 20-25, when default value is 15.



Trailer Load

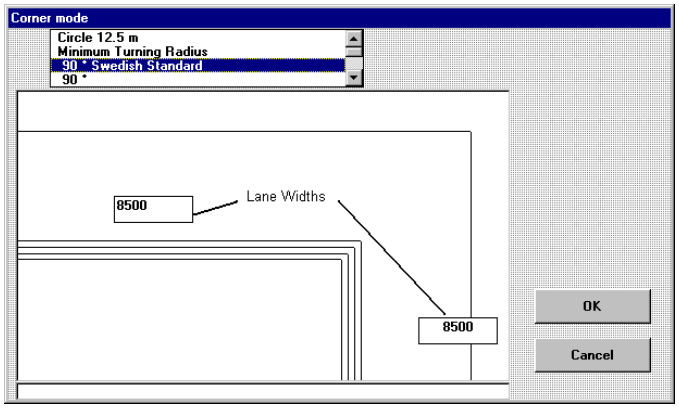
With Trailer Load data it is possible to get some load on the trailer.
Meaning of dimensions you see in the following picture



Corner Mode

or from Menu - **Corner mode**

From this menu you can choose the type of the turning calculation.



The alternatives are as follows:

Circle 12.5 m (EU-Circle)
Outer Radius 12.5m , inner Radius 5.3m

90 Degrees Swedish StandardDrive round 90º corner

90 Degrees Arc Drive in 90º sector

120 Degrees Arc Drive in 120º sector

360 Degrees Circle
Direct to circle , drive trough the circle and direct out.

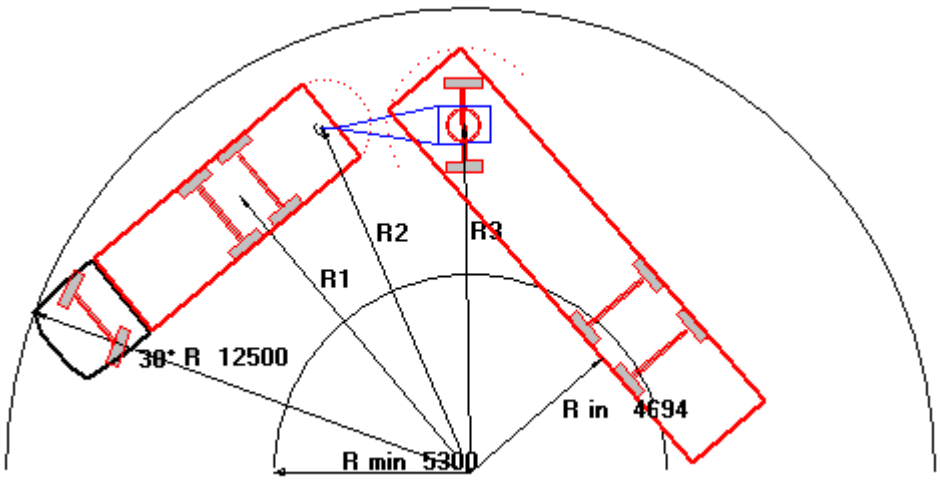
Arc Drive in sector. You choose Radius and sector angle.

Circle Continuous drive in a circle

Pull Steering the vehicle by pulling

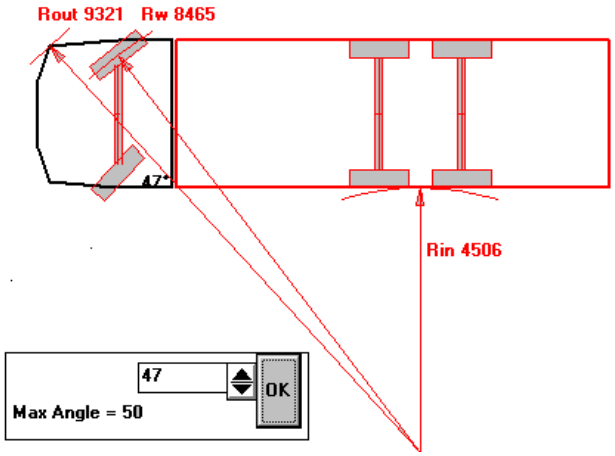
EU Circle

Calculating turning in EU circle.
Outer radius in circle is 12.5 m and inside circle is 5.3 m.
The vehicle runs so that the front corner is on the outer circle. All parts of vehicle must be between these two circles.



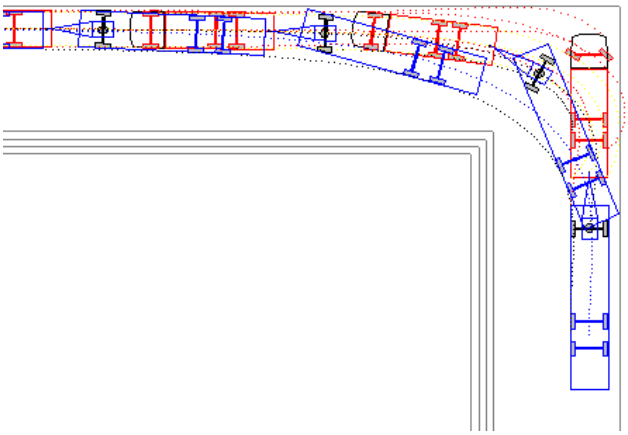
Turning Radius Kerb Radius

Calculating Rout (Radius to the front corner of the vehicle) and Rw (Radius to the front wheel) with chosen steering angle.



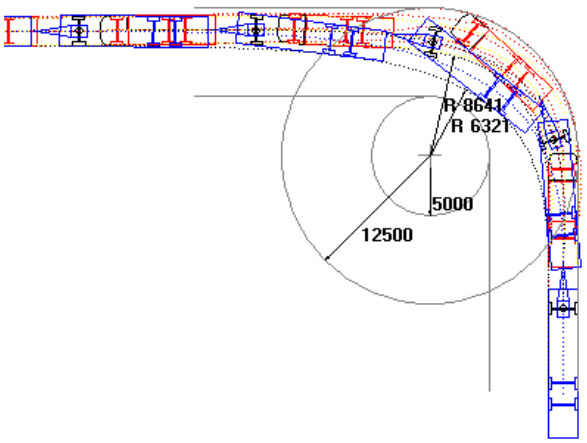
90 Deg. Corner

Calculating 90 deg rectangular corner.
(Swedish rule).
The vehicle is driving on right side of the street, makes turning using maximum steering angle, and then follows the right side of the street. Default Street width is 8.5meter.
The Program calculates the minimum distance to the inner corner.



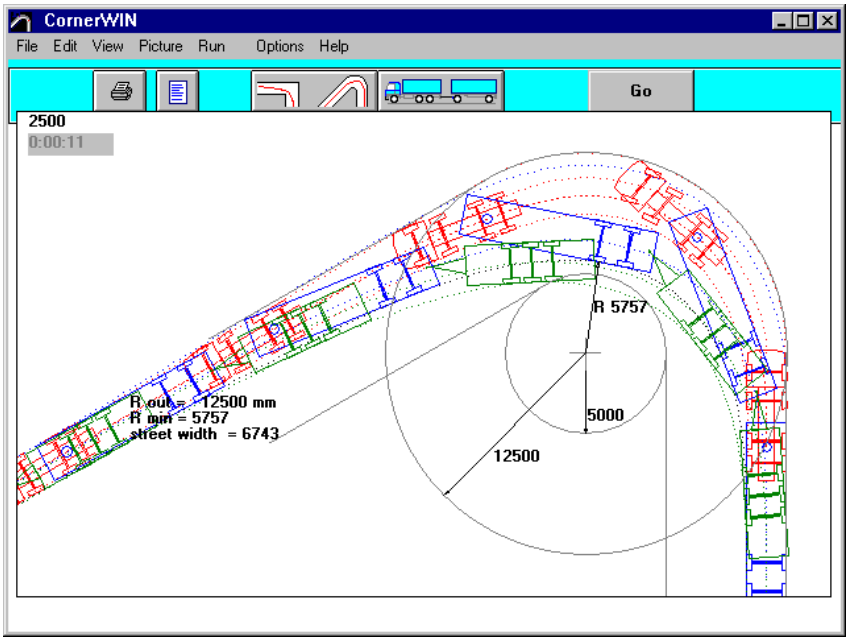
90 Deg Arc

Turning in 90 deg arc. The vehicle comes direct, tangential to the circle, drives 90 degrees, following the outer side of the circle and then drives tangential out.



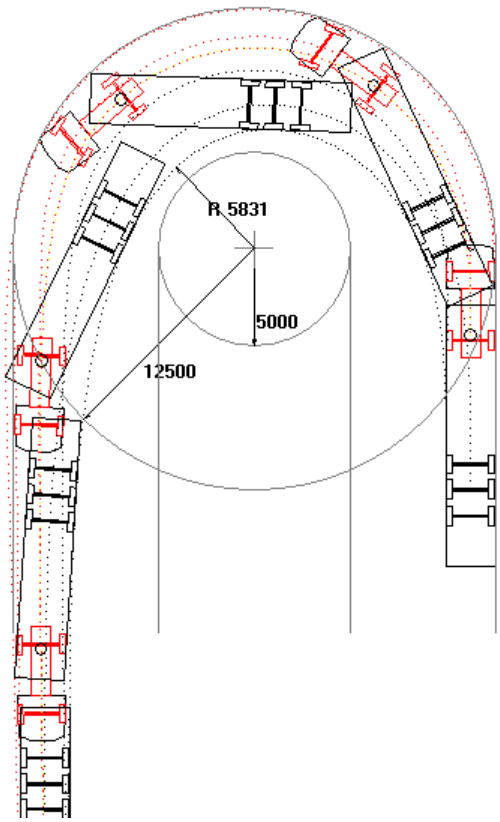
120 Deg. Arc

Turning in 120 deg arc. The vehicle comes direct, tangential to the circle, drives 120 degrees, following the outer side of the circle and then drives tangential out.



180 Deg Arc

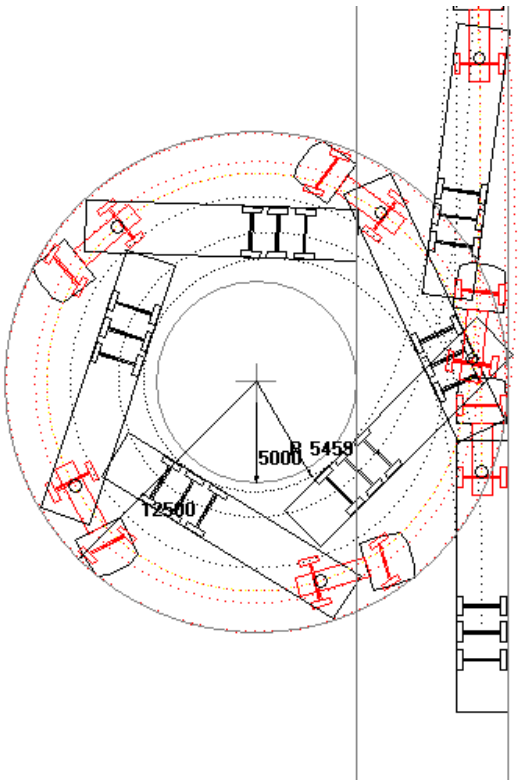
Turning in 180 deg arc. The vehicle comes direct, tangential to the circle, drives 180 degrees, following the outer side of the circle and then drives tangential out.



360 Deg Circle

Turning in 360 deg arc. The vehicle comes direct, tangential to the circle, drives full circle, 360 degrees, following the outer side of the circle and then drives tangential out.
The default radius is 12.5 m.
The Program calculates the minimum radius Rin to the vehicle inside.

The result is not identical with the result in EU-Circle or Circle turning modes. The long vehicle do not get the same position (angles between truck and trailer, etc.) what is the position when the vehicle is running continuous in the circle.

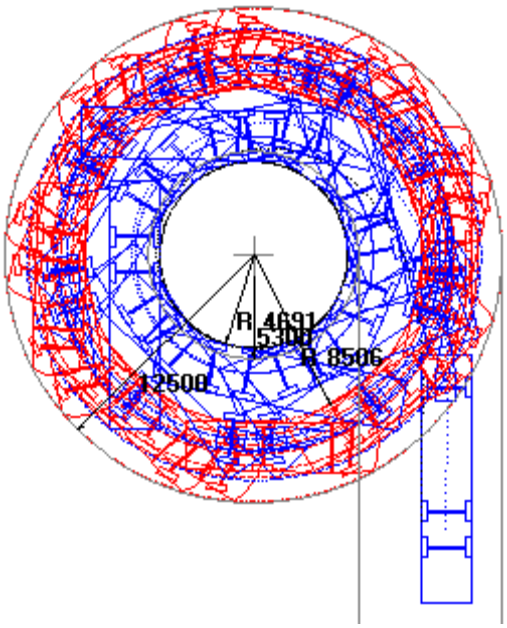


Circle

Driving in circle continuously.
The default radius is 12.5 m.
The Program calculates the minimum radius Rin to the vehicle inside.

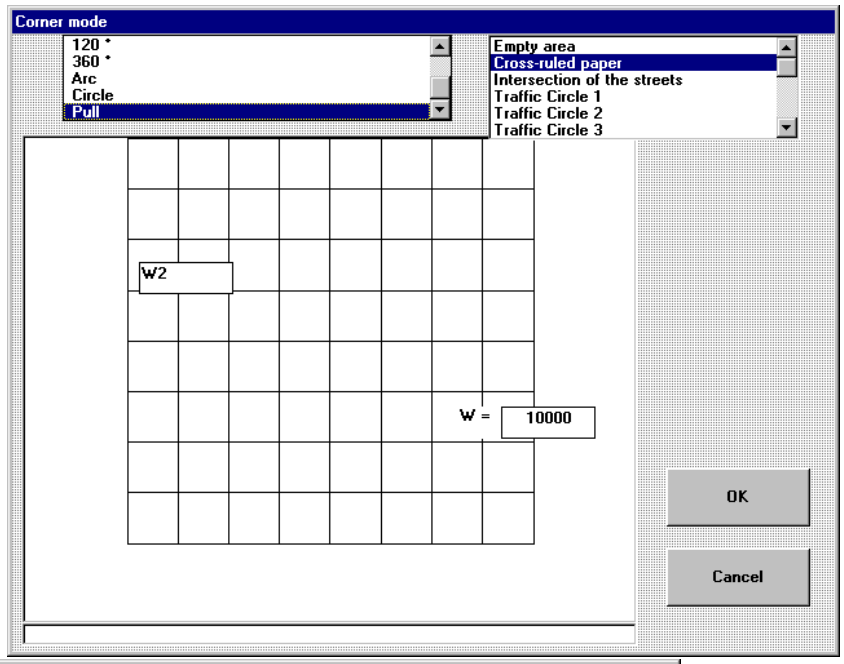
The result should be almost identical with the result in EU-Circle, .

(This is not the same thing as calculating turning in 360 deg arc.)



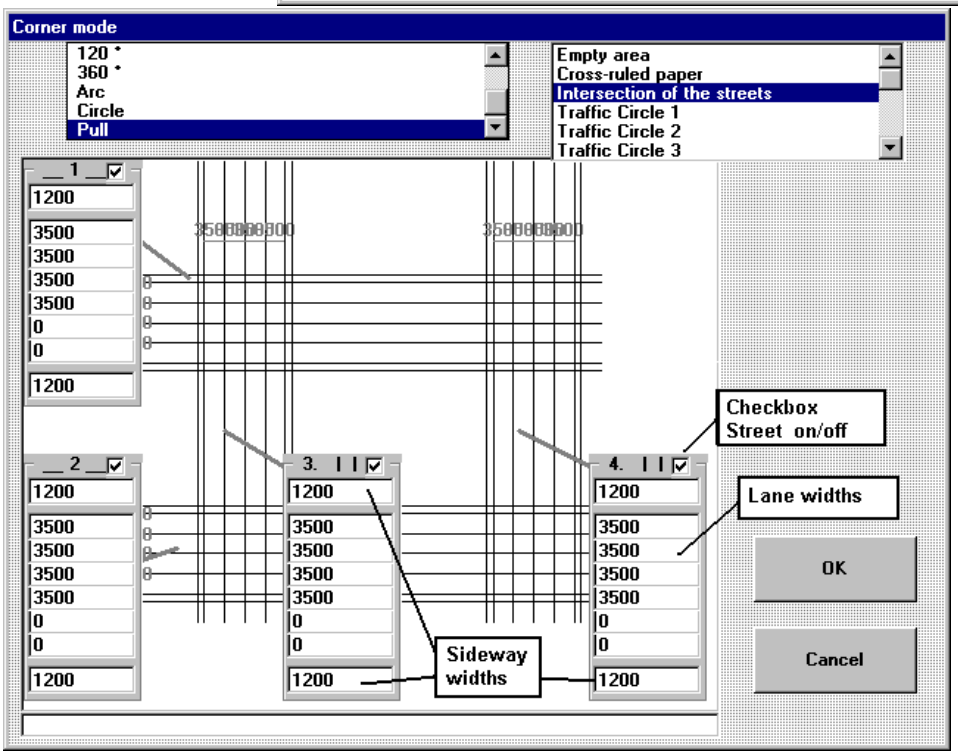
Pull

When you choose "pull", the map listbox appears.
You can choose background "map" from this listbox.



Some of maps are editable:
Editable maps:
Intersection of the streets, Traffic circle 1

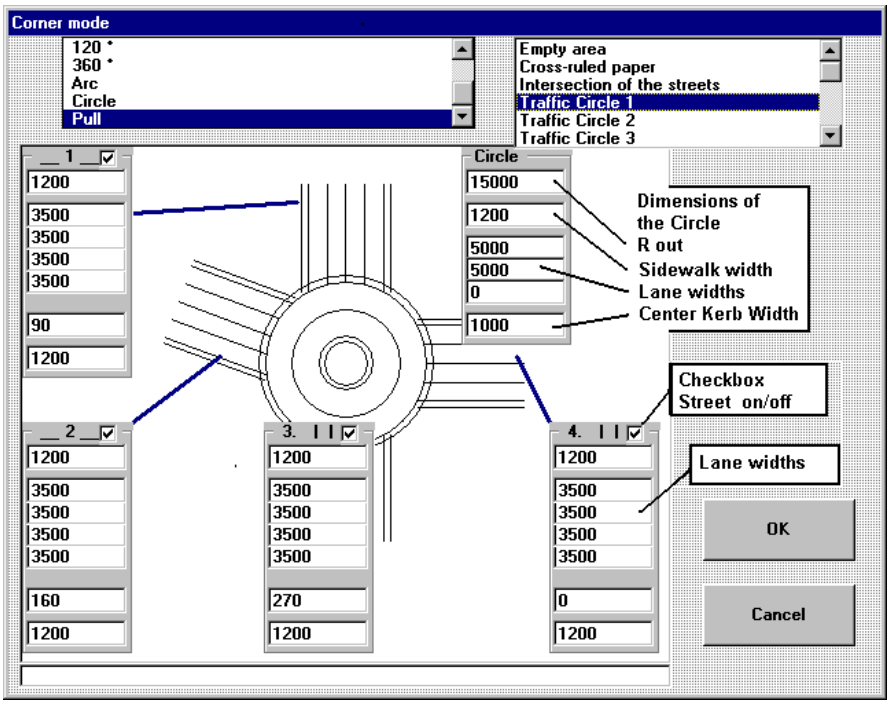
Intersection of the streets



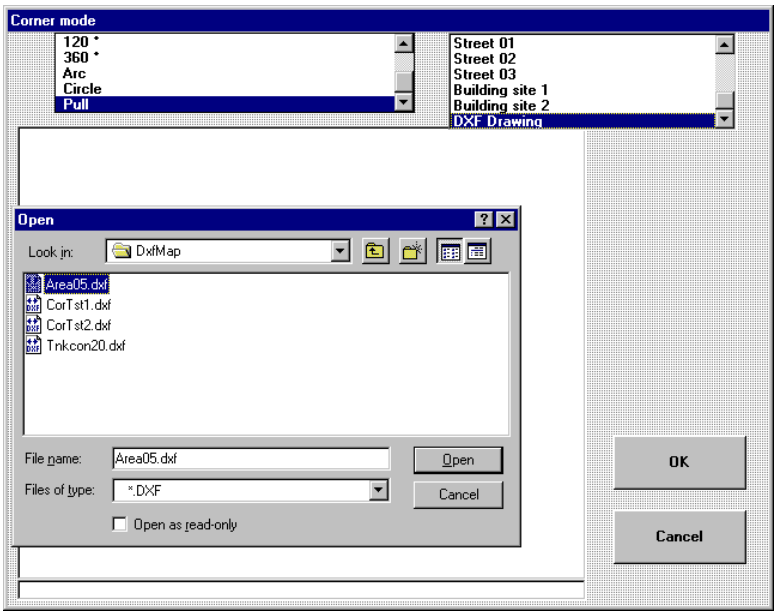
Using Checkboxes : "Street on/off" You can choose if you have all four streets on picture.
You are also able to change lane widths and sidewalk widths.
If you will have two-lane street; give width for two lanes, and type width of other lanes to 0.

Traffic circle 1

Using Checkboxes : "Street on/off" You can choose if you have all four streets on picture.
You are also able to change lane widths and sidewalk widths.
If you will have two-lane street; give width for two lanes, and type width of other lanes to 0.
You can also change dimensions of the circle.



DXF Drawing (as map)

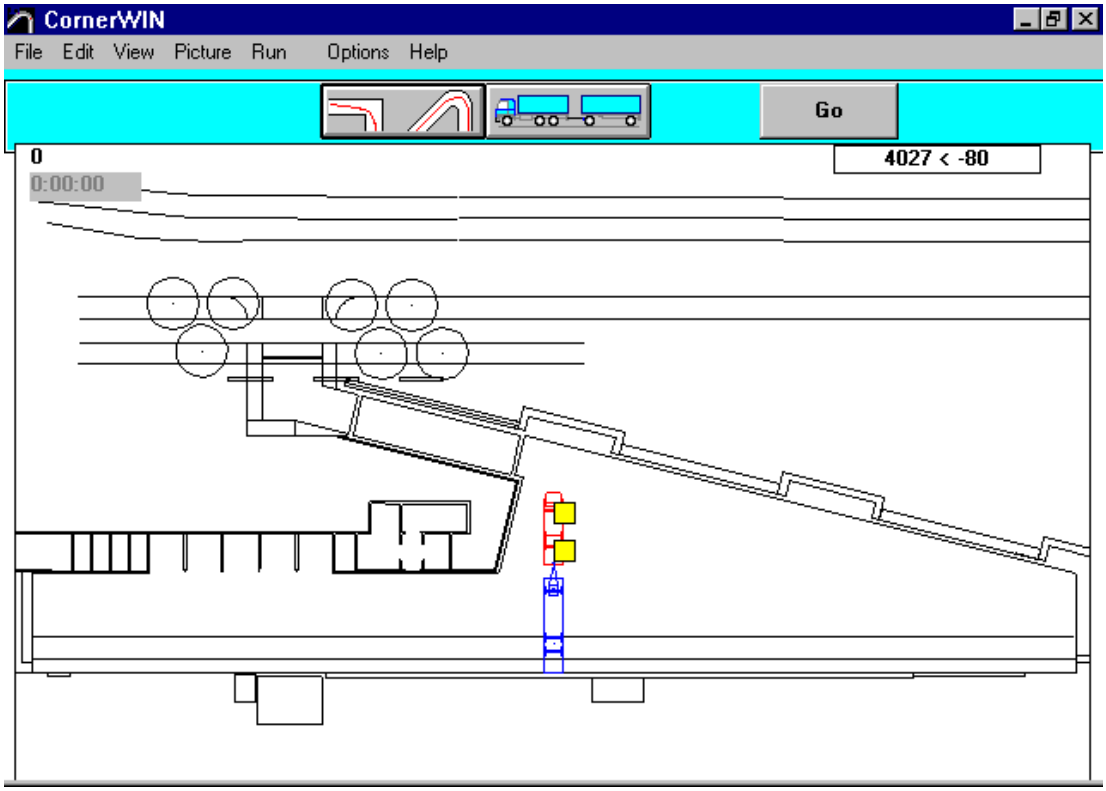


If you choose **DXF Drawing** as map, you will get a file open dialog for choosing a DXF drawing.

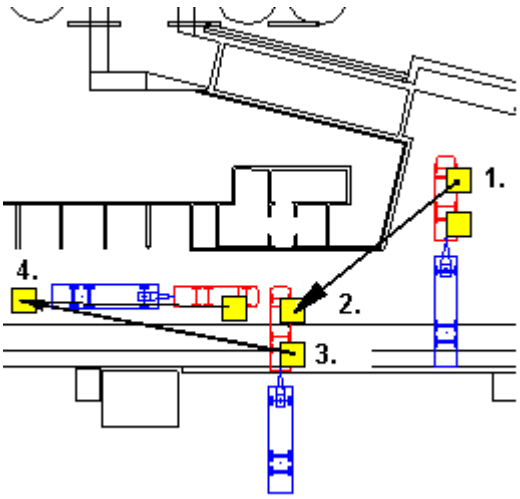
The default directory for map drawings is subdirectory **DXFMAP**, the whole path for example: **C:\TRAILERW\DXFMAP** .
If you will use own DXF drawing as map in CornerWIN, then save DXF files in this directory .
The Drawing must be simple drawing. Use only basic drawing items: lines, circles, arcs.
If your original drawing includes blocks, you have to explode blocks before making DXF-file.

To pull the vehicle

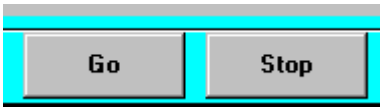
In this example we choose **Building site 2**
When you have chosen the map , you see the following screen.
The vehicle is on default place.



You can drag the vehicle on the correct starting point. Set the cursor on the first yellow square by the front axle of the vehicle. Push mouse left button and keep it down. Drag the cursor with this square on the wanted starting place and release the mouse button. In the picture from point **1.** To point **2.** . The direction of the vehicle you choose dragging the second yellow square fare in this direction where you like to have the rear of the vehicle, in the example picture from point **3.** .to point **4.** .

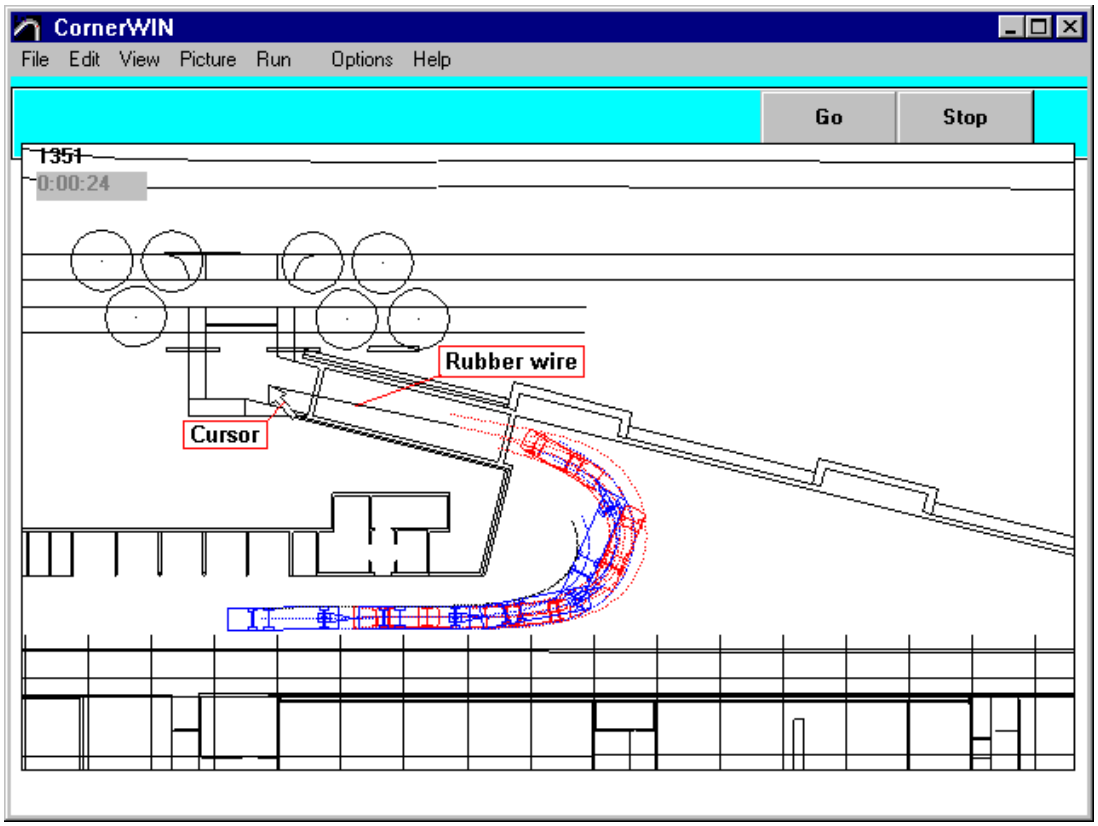


When starting position is OK, you can begin to drive the vehicle on the map.

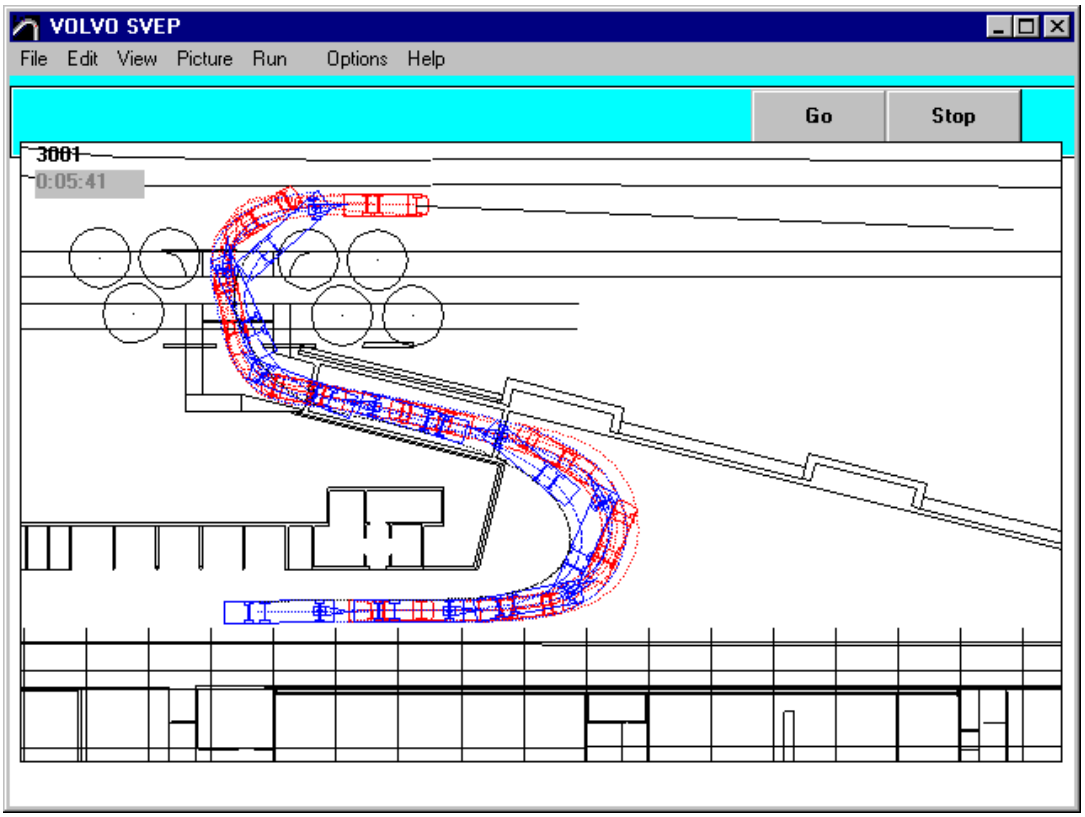


Click button **GO** on the toolbox.
When you now move the mouse, you will see the line from the cursor to the front of the vehicle. Think this line as rubber wire, which is pull the vehicle.

When you now push down the left mouse button (mouse down) , the vehicle begins to move to the direction of this line. The vehicle stops when you release the mouse button (mouse up).



and …



When you want not to drive more, click the STOP button on the toolbox.

How to add own DXF-pictures as map.

Draw a picture in AutoCAD or some other CAD-program. (tested with AutoCAD, recommendation AutoCAD or AutoCAD LT).
Following points are very important:

- The picture should be a **simply drawing**, **no blocks**, no texts with fonts.

- The picture must not be scaled. **The scale must be 1:1** in millimeters.

- **Origin point** (0,0) must locate Origo point (0,0) must be about in the centre of the drawing. In the centre of this area, which you want to see in CornerWIN

1.
2.

If you have already the drawing, but the origin is not on correct place:
Use in this case in AutoCAD the Command MOVE - SELECT ALL - as basic point you will show the left - low corner of the body - as second point you type 0,0 also the coordinates of the origin.

Choose Menu SAVE AS and then choose file format as DXF (choose AutoCAD R12 DXF).
(In older CAD versions you need to use command DXFOUT in AutoCAD)
Give name for this picture.
Choose directory **\DXFMAP** under TrailerWIN-directory, also usually
C:\TRAILERW\DXFMAP.

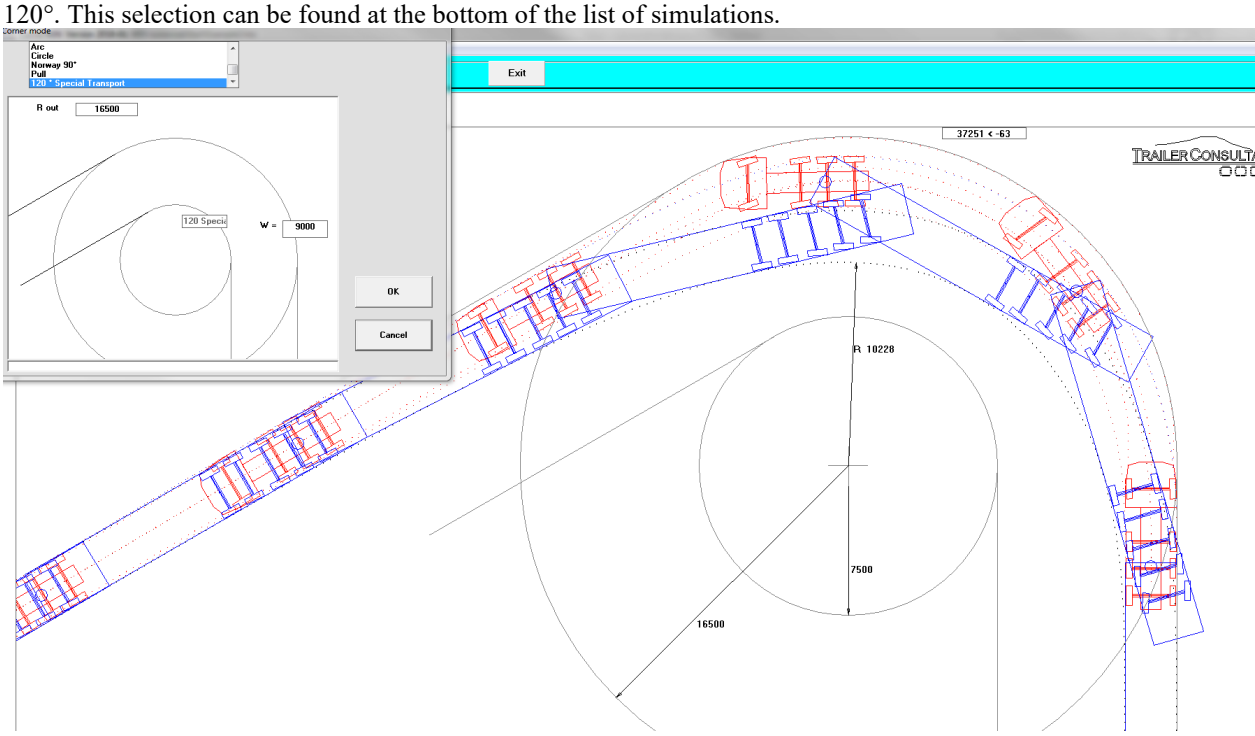
In DXF Options (Tools / Options) choose: "**Enter decimal places ”**.
Choose 0 decimals.
Dxf format choose **ASCII**

Save the file.

When you have this file in DXFMAP directory (folder), you can use it CornerWIN.

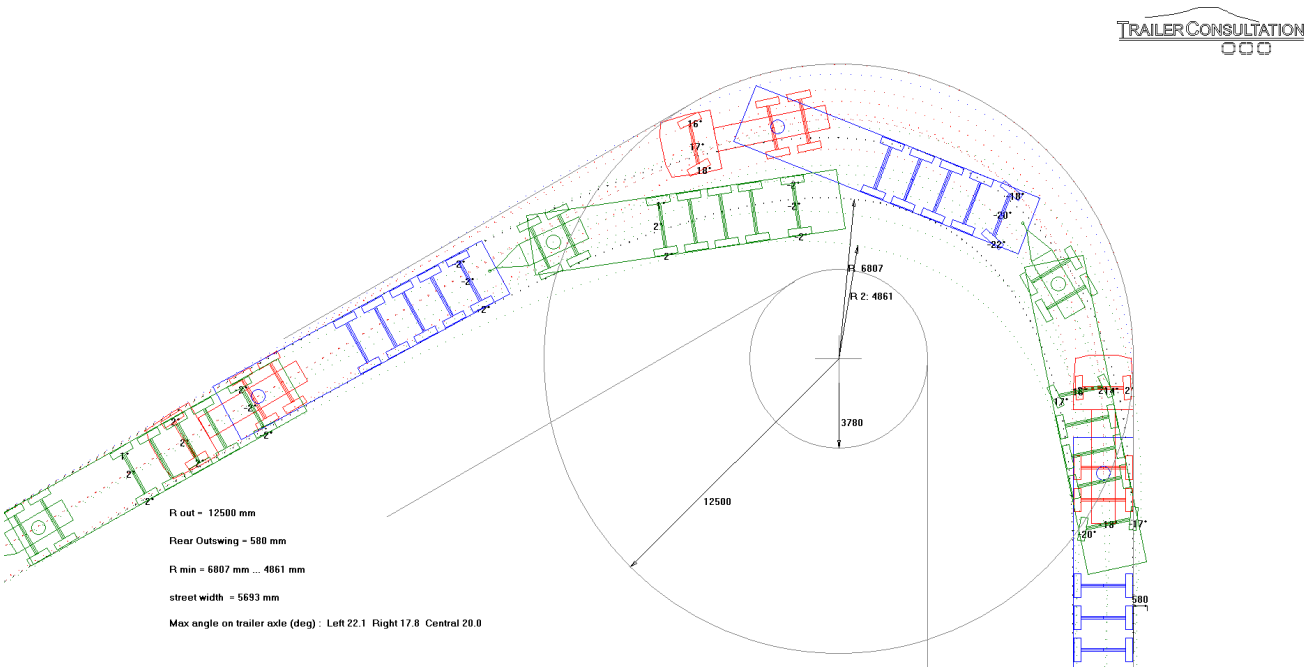
120° Special Transport

In CornerWIN you can find a new simulation for Special transport combinations in 16,5m radius for 120°. This selection can be found at the bottom of the list of simulations.



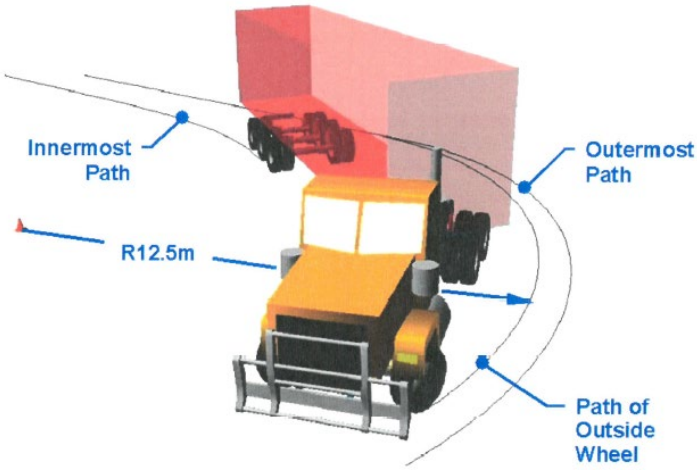
120° Finland

For regulations in Finland we have a simulation mode using preferences from the regulations. This turning mode simulates 120° turning in 12.5m outer radius and the inner radius can be depending on rear corner outswing down to min 3.7m. The inner circle can be less than 4.0m as much as outswing is less than 800mm. CornerWIN calculates this automatically and shows the minimum allowed for the specific combination:

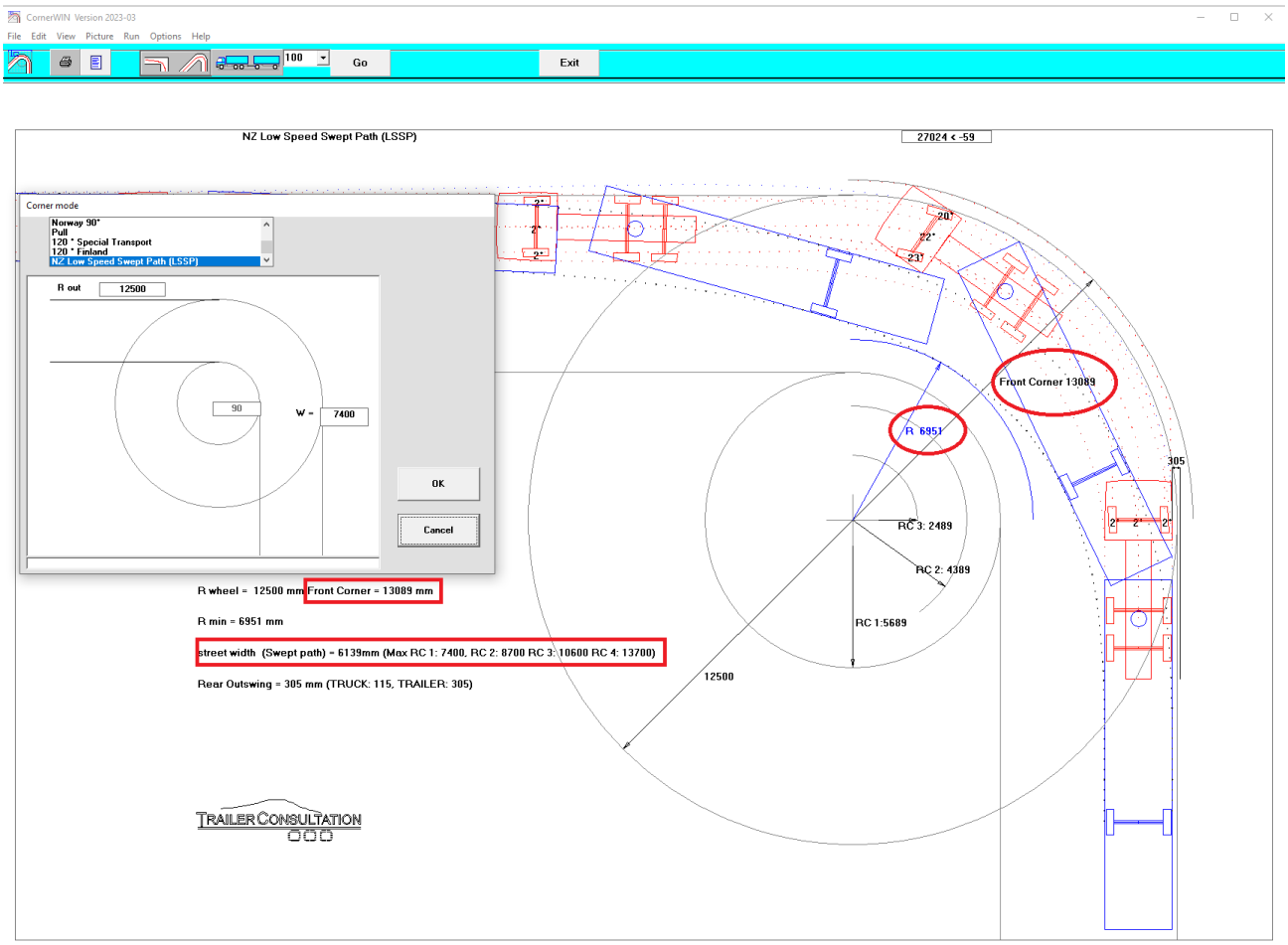


NZ Low Speed Swepth Path (LSSP)

In CornerWIN you can find simulation for NZ LSSP requirement. This simulation drives the truck/combination in a circle where the outer wheel is following a 12,5m circle in 90° turn. During the simulation the software is following the position of the outermost front bumper corner (defined by corner length and corner width) to find the max radius for front corner and at the same time the innermost radius for truck/trailer(s) during the turn making it possible to calculate the swept path. In the output you can also see the minimum radius for the actual vehicle for different road classes shown by shorter arc:s.



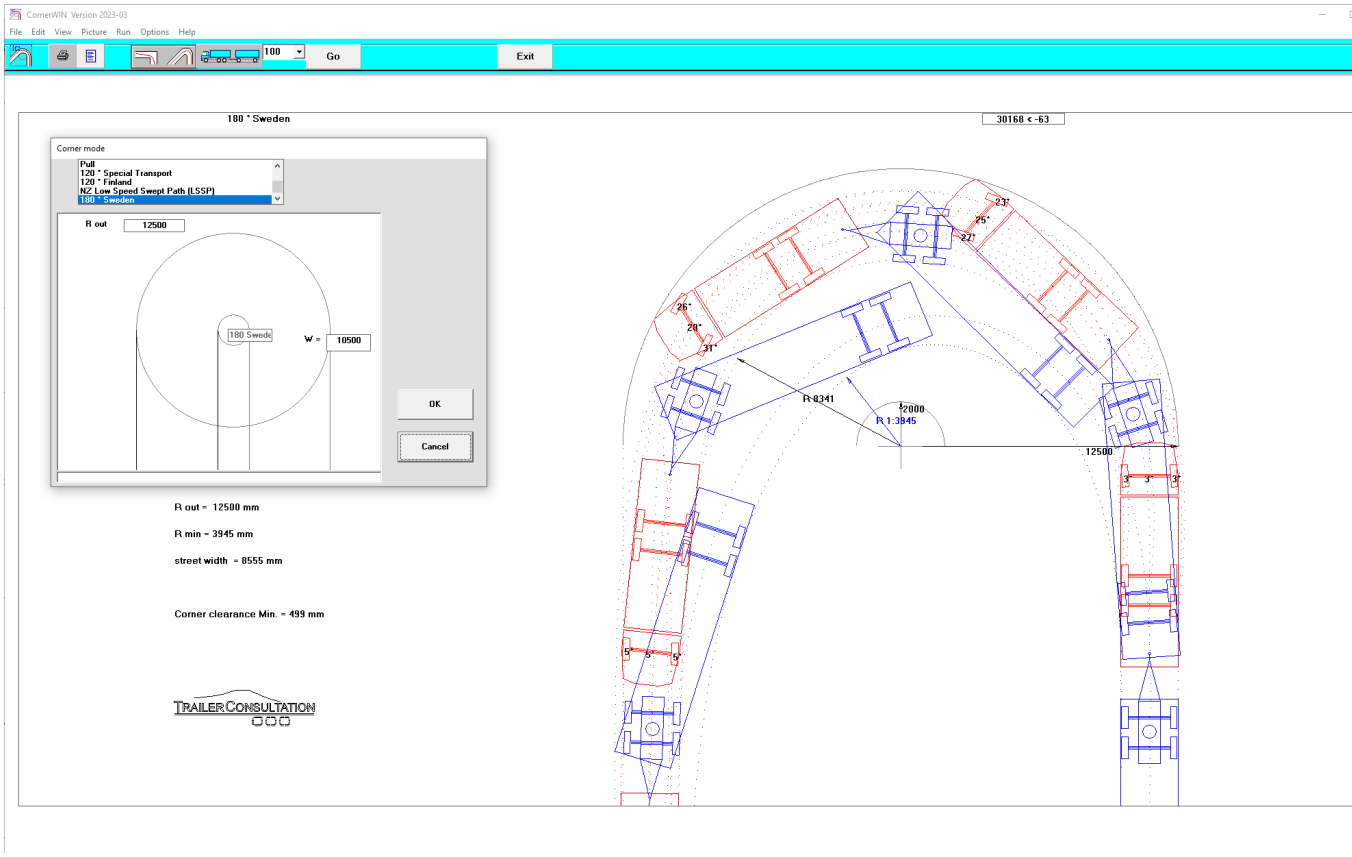
With this simulation it´s easy to find out at design stage if the combination will be able to fulfil the NZ requirements.



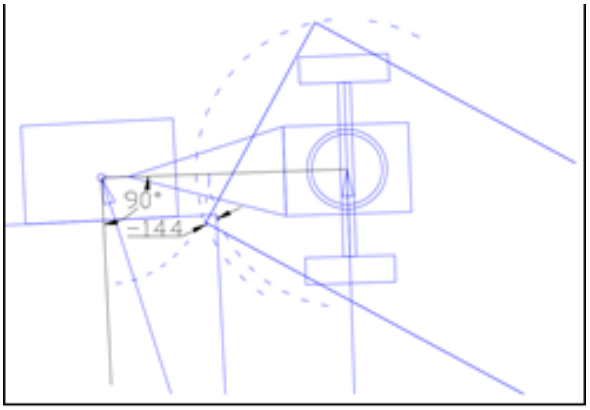
180° Sweden

(turning simulation for combinations 24m-25.25m)

This simulation method is for checking turning against Swedish regulations for combinations over 24m up to 25,25m. In this calculation the complete combination must fit in between the 12,5m and 2m arc's. The simulation gives warnings if the combination length is too short or too long. Note that not all combination types are allowed in this length, verify with Swedish regulations.

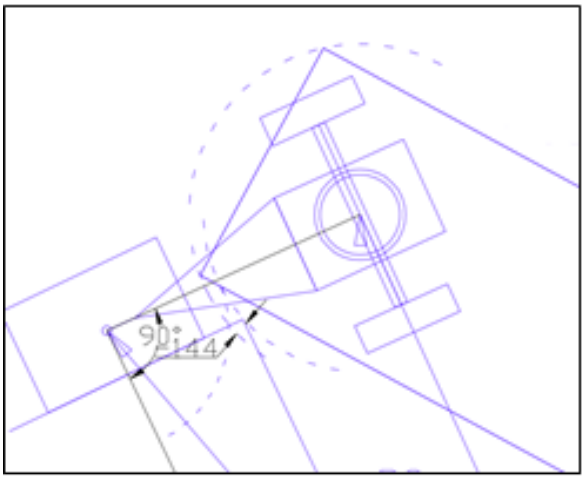


Corner clearance calculation when towing coupling is behind the end of the body



In CornerWIN corner clearance calculation for situations where the trailer coupling is behind the body. This calculation was introduced in TrailerWIN in 2015 and it calculates corner clearance in a situation where the drawbar is in position 90° towards truck.
The pictures have also been improved with more equipments and the calculation have been improved to use width of accessories behind body for rear outswing & corner clearance calculation.

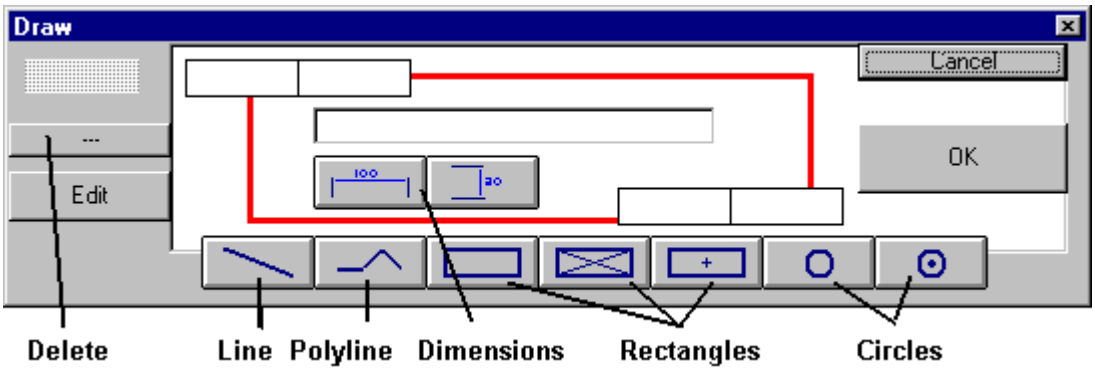
Calculate rear-outswing with rear device or not



You have the possibility to select if You want to calculate with rearmost device for rear-outswing calculation. You will find this new setting in CornerWIN User Options.

Draw lines on the map

Drawing different objects:



Line

Click the Line Button.
Move the mouse cursor on the starting point of the line and push link mouse button down and hold it down.
Move mouse to the endpoint of this line and release the mouse button.

Polyline

Click the Polyline Button.
Move the mouse cursor on the starting point of the polyline and push the link mouse button down and hold it down.
Move mouse to the second point of this line and release the mouse button.
Move mouse to the following point of the polyline and click with left mouse button.

Move mouse to the following point of the polyline and click with left mouse button.
…. continue so, you can have maximum 30 node points on one polyline.
When polyline is ready, then click the Polyline Button again;
it is now End Polyline Button. {bmct buPolyEn.bmp}

Rectangles

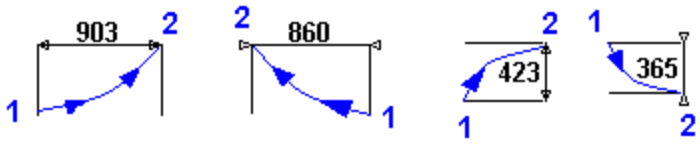
Click on of the Rectangle Buttons.
Move the mouse cursor on the first corner point of the rectangle and push link mouse button down and hold it down.
Move mouse to the opposite corner point of this rectangle and release the mouse button.

Circles

Click on of the Circle Buttons.
Move the mouse cursor on the center point of the circle and push link mouse button down and hold it down.
Move mouse to some point on the circle (radius distance) and release the mouse button.

Dimensions: horizontal and vertical.

Click on the horizontal or vertical dimension button;
When You draw a dimension with mouse, you will get the correct dimension text automatically.
You can anyway change the dimension text; you only write a new text on the dimension editing box , and click the small ok button on the right side of the editing box.
If you later edit this dimension with the mouse, you get again automatically new dimension text.
You can choose arrow position with direction, when you are drawing a dimension with dragging mouse.
The example shows the result and the mouse movement direction, from point 1 to point 2.



Edit Drawing Objects

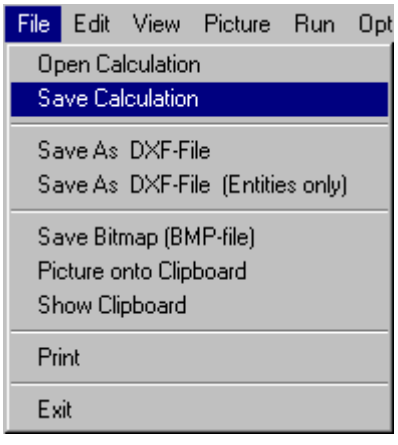
Click Edit Drawing Objects Button
Small rectangles appear on all drawing objects.
You can move these rectangles with mouse, and so change the drawing.

Delete Drawing Objects

Click Delete Drawing Objects Button

Small rectangles appear on all drawing objects.
Click this small rectangle on this object, which you want to delete.
Confirm deleting.

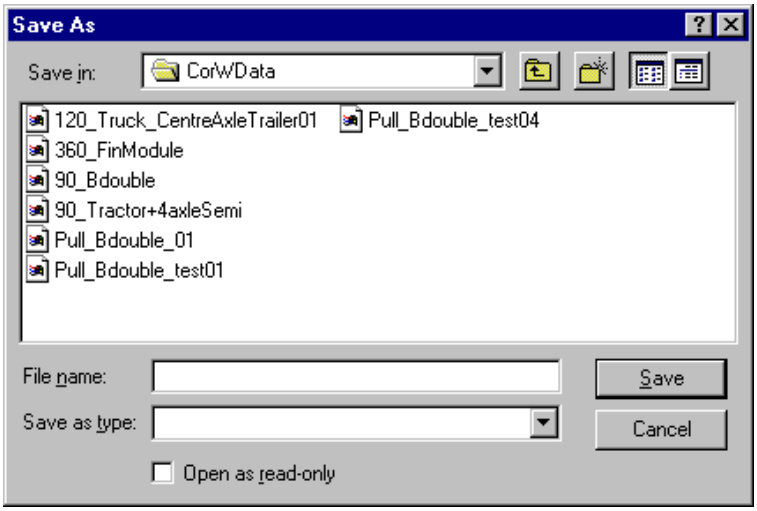
Menu File



Save Calculation

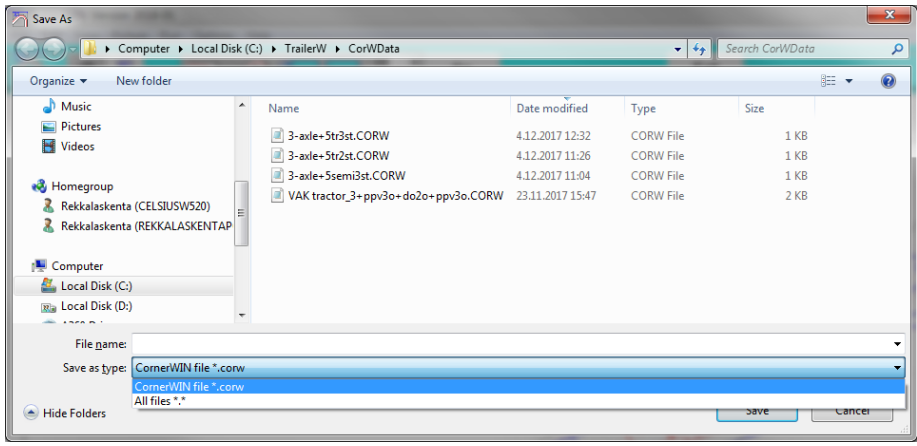
If you need this calculation later, you have to save it now. Choose menu File – Save Calculation:

Write file name into File name textbox and click OK.
The default directory (folder) for CornerWIN calculations is **CornerW\CorWData**



Default file extensions for CornerWIN files *.corw

In CornerWIN the file extension for saving/opening CornerWIN calculations will be ".corw". By opening the dropdown-list you can filter also ".dat" files or select to save/open files with any other file-extensions by selecting option All files *.* . Note that only CornerWIN files can be opened directly from CornerWIN.



Save as DXF-FILE

You can save a picture as DXF-File and later import this file in CAD-programs.
Many text programs as Word for Windows can read DXF-files. It is easier to transport pictures between windows-programs by using clipboard.

Save as DXF-FILE (Entities only)

You can save DXF-files in Entities only format. This format includes in the file only picture-objects (entities) : lines, circles, texts but no information about other drawing parameters; limits, font sizes, layers etc.
If you can't see dimension numbers in CAD-drawing, you have to change dimension textsize (in AutoCAD DIMSCALE / UPDATE)
When running SETUP, a directory "PIC" is made for your Picture-Datafiles.

Save as Bitmap (.BMP-file)

You can save a picture as BMP-File = Windows Bitmap file.
Almost all Windows Text programs and Drawing programs can take pictures in BMP-format.

Print

Printing Calculation. In this Program you can choose from two printing modes:

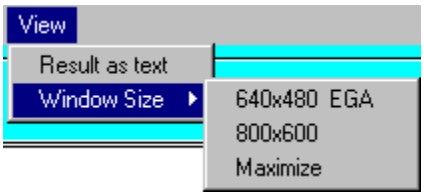
- **Print Drawing :** Print only turning picture using whole page for this.
- **Print Document :** Print vehicle drawing and turning picture on the same page.

You are able to choose Printer line width on the picture from menu Options - Picture.

Exit

Close the program.

Menu View



Result as text

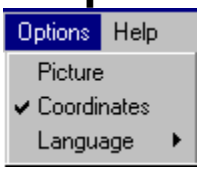
See Calculation values on separate window

Window Size

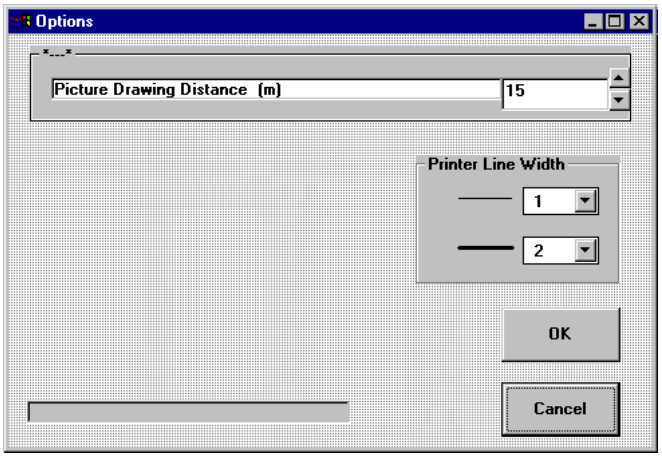
This function is most useful when you want to transfer smaller screen pictures to other programs.
If your monitor has bigger resolution, you can resize program Windows so that Window resolution is 640x480 (EGA Screen) or 800x600 (=VGA Screen) .
Menu Maximize makes program Window to maximum size.
Resize can not use bigger resolution than you have in your monitor.

Resize do not change picture size automatically. When you make new calculation it will be scaled into new Windows size.

Menu Options



Picture



Picture drawing distance

Choosing **picture drawing distance** in meter. So can you choose how often vehicle pictures are drown when vehicle moves on the screen.

Printer line width

Pictures will be drawn using two linetypes, light and heavy lines. You can choose line width in pixels. The result on the paper is depending on printer resolution.

Contact Data

Software development / Sales

TRAILER CONSULTATION
Kauppatori 2
FIN - 67100 Kokkola Finland

Tel +358 – 10 337 2530

WWW.TRAILERWIN.COM

E-mail: info@trailerwin.com

Find your local dealer on our homepage www.trailerwin.com

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