RC tutorial 000 - AutoCAD for dummies - Starting RailCOMPLETE

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- This tutorial was prepared without RailCOMPLETE.
- Assumed skills: Any level
- Time to spend here: Newbie: 1 week / Intermediate: 1 day / Proficient: 1 hour / Expert: 5 minutes just checking that you know everything already.
- Further reading: Search for 'acad [topic]' on the internet to know more.

1. This tutorial's goal is to ensure that

(a) you have installed RailCOMPLETE correctly, and

(b) you have gained sufficient proficiency with ordinary AutoCAD commands.

(c) you know where to locate commands and how get Help in RailCOMPLETE.

2. We assume that you have one of the regular AutoCAD or add-on versions (Map 3D, Civil 3D etc) from 2016 or more recent installed. You do not need any of the Civil 3D, Map or other add-on packages in order to use RailCOMPLETE (*), but you cannot use the Lite version with RailCOPMLETE since the Lite versions do not have real support for the Z coordinate.

(*) Exporting RailCOMPLETE data to IFC requires Civil 3D.

3. If you have trouble installing RailCOMPLETE; be sure that you first close all AutoCAD sessions on your computer, then run the RailCOMPLETE installation program (to be found on the RC download site or by sending an email to license@railcomplete.no and ask for a trial license), then re-start AutoCAD.

4. If you cannot see the RailCOMPLETE ribbon in the windows' top line (with icons / buttons), then type command name 'RC-LoadRibbon' and hit ENTER.

5. If you still cannot see the large RC icons, try clicking on the small square with an arrow in it in the top row of the AutoCAD window. This toggles or modifies what AutoCAD will show in its top row / in its top rows.

6. If you have closed the lid on your portable PC and re-opened it with another configuration of connected screens or projectors, then the RC ribbon may appear as garbled. Run command 'RC-ReorganizeRibbonToDefault' to fix the problem.

7. Make sure that the Windows Screen size setting (one of 100%, 125%, 150% or 175%) is the *same* for all of your computer screens used for AutoCAD windows. If not, AutoCAD will get confused and may not display your windows correctly - they may be shown partially outside the screen, they may dock outside your screen, or they may appear as partially garbled. To check or to change settings, right-click somewhere on your computer desktop and launch the Windows Screen Settings tool. Click on each of the rectangles representing your connected computer displays (screens) in turn and check / modify settings as needed.

8. Use the AutoCAD command OPTIONS (OP) and check 'Display File Tabs' in the Options\Display menu in order to show file names for your currently opened drawings as clickable tabs just below the icon row.

9. Press F2 in AutoCAD to toggle the AutoCAD text window on/off

10. Press Ctrl+9 in AutoCAD to toggle the command line window on/off. When OFF, the F2 button will show the Text window as a pop-up window, when ON, the F2 button will toggle an enlarged command line view to show or hide the latest log text lines. Try it.

11. Use F12 to toggle the AutoCAD ToolTip in order to see what you type directly on the computer screen (called 'modelspace').

12. Before you continue, make sure to try out the AutoCAD commands SAVE and SAVEAS to make a safe copy of this tutorial. Use QSAVE (or Ctrl+S) to save using your current file settings. With SAVEAS, you can change the file format, e.g. into 'DWG 2013', 'DWG 2018' or the plain text format 'DXF'.

13. Consider using the AutoCAD command OPTIONS and 'Files\Automatic save' in order to turn on or off auto-saving of your drawings.

14. In order to see a nice pop-up window and not just a command-line prompt when opening a drawing file, make sure that the AutoCAD FILEDIA system variable is set to 1. Check your setting by entering OPEN (or Ctrl+O) to open a file.

15. Many AutoCAD (and some RailCOMPLETE) commands can be run in script-friendly mode instead of the more human-friendly pop-up window mode. Set the AutoCAD system variable CMDDIA to 1 to ensure that pop-up windows are used when available.

16. You select objects (RC objects and regular AutoCAD objects such as "dumb" circles and texts) by clicking on them in modelspace. It is hereby adviced that you should take care to set the AutoCAD PICKADD system variable to 0. This has the effect that whenever you select a new object, all your currently selected objects will be de-selected first. In order to add to your selection set, you must hold down the Shift button when selecting more objects. If PICKADD is set to 1, then Shift-Select has the opposite meaning, i.e. de-selecting the object you click on. Press ESCAPE to deselect the current selection set at any time. The Pickadd sysvar can be toggled simply by first pressing Ctrl+1 to bring up the AutoCAD property tool, and then click on the 'toggle PICKADD' icon located close to the window's top right corner.

17. Use AutoCAD command SYSVARMONITOR to see which settings AutoCAD currently has and learn about their usage.

18. RailCOMPLETE (abbreviated as 'RC') models are best viewed against a black background. Use AutoCAD command OPTIONS (OP) to change color settings, select Colors and then 'Black'. The 'Color scheme' setting will change the appearance of your window borders and menus.

19. Use F3 to toggle AutoCAD object snapping on/off and use AutoCAD command OSNAP to define your favorite snap settings. Be sure to enable 'Nearest' snapping before you start working with alignments, it enables you to snap to the point in alignment where the current cursor posistion is projected (in the XY plane) onto the alignment.

20. When you are drawing objects, F8 toggles between freehand and orthogonal drawing modes.

21. When you are drawing objects, F9 toggles between freehand and 'snap-to-grid' mode.
22. Ctrl+G toggles the grid on/off (or use GRID on/off)
23. Change grid snapping settings using the AutoCAD SNAP and GRID commands.
24. Use F12 to toggle on/off AutoCAD Dynamic Input. When ON, all your typing will be shown directly on the computer screen at your CAD cursor.
25. Use Ctrl+W to toggle on/off AutoCAD Selection Cycling. When ON, you will see a special cursor symbol whenever your CAD cursor hovers over multiple items (where one can hide the underlying item(s)). You will be prompted to select between the candidates, instead of just getting the topmost item if Selection Cycling is OFF.
26. To view and edit AutoCAD element properties, use the PROPERTY (Ctrl+1) command.
27. To view and edit AutoCAD layers, use the LAYER command.
28. AutoCAD elements (objects) always belong to a layer. Layers can be FROZEN (the snow crystal icon), which makes their object 'disappear from most tools'. It can also be turned OFF (the light bulb) in order to hide from view your objects' graphical elements drawn on that layer.
29. Before you start, set UNITS to meters [m] with precision 0.000, and angular measurements to decimal degrees [DD] with precision 0.000.

NOTE: RailCOMPLETE usually has these settings in its DNA file, executed when you open a RailCOMPLETE document or when you load DNA into a plain DWG file - there's more about that further down.

30. Experiment with AutoCAD LINE, CIRCLE, RECTANGLE, POLYGON, POLYLINE in 2D.
31. Continue with reading about and experimenting the AutoCAD COPY, COPYBASE, COPYCLIP, PASTECLIP commands. You must use COPYBASE (or Ctrl+Shift+C) to copy an object with a basepoint, otherwise you cannot paste into another drawing (which may use another coordinate system).
32. Try out the AutoCAD MOVE and MIRROR commands.
33. Then draw two intersecting lines and try out the AutoCAD FILLET and CHAMFER commands on them.
34. Draw one line and then draw another line further away such that an extension of the first line would cross the second line. Then experiment with the AutoCAD TRIM command to extend a line till it hits another drawing element.
35. Also experiment with the EXTEND command, which lets you extend a line up to the next obstacle, e.g. another line, circle or rectangle etc.
36. Experiment with the SCALE and ROTATE commands.
37. Use the AutoCAD UCS (user Coordinate System) command to define which way the X-axis and Y-axis should point. The Z-axis follows automatically, as a right-handed, right-angled (cartesian) coordinate system. Then use the AutoCAD PLAN or EXPLAN command to re-orient your drawing on the computer screen, such that Y is up and X is to the right.

38. To get back to original "real world" coordinates, use UCS and select World, then use PLAN or EXPLAN to re-orient your drawing.

39. With RailCOMPLETE installed, you would simply use the RC-RotateUcsAndView command, which flips you back into 2D with the horizontal X-axis pointing along the direction you gave.

53. ==========

DON'T DESPAIR...!

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...please keep on reading and studying - you will reap your harvest later! But consider putting this aside and getting back later. Also consider repating this basic stuff - Now you know where to find it.

54. Use AutoCAD command NAVVCUBE to toggle on/off the navigation tool. It offers an easy way to orient and re-orient your drawing, rotating about the Z-axis (which points towards you when our are working in 2D mode). Note: If NAVVCUBE/on doesn't work, try switching NAVVCUBE/off first, then /on again. Don't ask why - but it works :-)

55. In order to 'flip up' a drawing into 3D drawing mode, hold down the Shift button, press down the scrollwheel on your mouse, and move the mouse.

NOTE: If your drawing contains many graphical entities (tens of thosusands of AutoCAD elementary entities), then things get sluggish.

56. In 3D, experiment with setting up your screen with multiple views. You can either navigate to the AutoCAD menu item View\ViewportConfiguration, or you can write on the AutoCAD command line the following LISP expression '(ai_view_dvp 4 nil)' - this splits your screen in four views of your current drawing.

57. NOTE - WARNING - NB: AutoCAD has a challenge when it comes to switching between complex 3D and back to 2D. If you are working with a 3D drawing and then switch to another drawing which is in its 'Top' view (2D), then AutoCAD may crash. To circumvent this problem, be sure to start two or more AutoCAD sessions, using one for plain 2D and another for "tilted" and heavy drawings in 3D mode.

58. In the upper left corner of your AutoCAD drawing window, hovering with the mouse brings up selections for different 3D views. 'Top' means 2D mode, the other ones are various other 3D viewing angles.

59. Just to the right of the hover-view tool, there is a rendering-style tool. Select 'Wireframe' for ordinary and fast working. Select 'Conceptual' or 'Realistic' for more details.

60. NOTE: When you zoom heavily in and out, AutoCAD is pushed to its 'graphics scaling limit', and you might need to use the AutoCAD REGEN (RE) command in order to re-sample the graphics that you see on the screen. Relax, your data are not affected even if the grahpics disappear for a while.

61. The REGEN (RE) command is useful whenever your graphics disappear, it's usually just a need for resampling.

62. The graphical rendering of your selected objects depends on your graphics card's capabilities and current settings. With the AutoCAD command GRAPHICSCONFIG you can toggle graphics acceleration and a number of other issues. With acceleration OFF, your selected lines will usually appear as dashed lines. With acceleration ON, your selected lines will usually appear as 'glowing' and easy to spot in modelspace among all your other non-selected objects. However, with graphics acceleration ON, you risk having memory management issues when dealing with complex models... Nothing is free here...

63. (Advanced info) As far as we know, the EXPORTIFC command found in the AutoCAD Civil 3D add-on is the only command that is needed by RailCOMPLETE in some cases, in order to convert C3D object annotations into IFC annotations when converting 3D exported data from DWG to IFC and include any property sets that were declared in the applicable DNA.

64. (Advanced info:) Note that an object can be an AutoCAD 'BLOCK' element, which in itself is a mini-drawing with many layers, new objects etc, nested. Blocks are edited using the BE (BLOCKEDIT) command, which is closed again using the BC (BLOCKCLOSE) command. There is also a SAVEAS command to the left in the Block Editor, that you can use to make new block definitions from existing ones. Block definitions reside in the internal BlockTable, which can only be inspected through the BE command. Blocks can be renamed using the RENAME (REN) command. The INSERT command lets you create (Insert) instances of a block definition fetched from the BlockTable (or from an external file). Your drawing object instances reside in an internal table called the BlockTableRecord table.

65. (Advanced info:) You may launch the AutoCAD Design Centre (ADC) command in order to browse existing folders and files looking for existing AutoCAD definitions - blocks, layers, etc, that you can insert into your current drawing.

66. You can include another drawing as a cross reference to your current drawing. Launch the AutoCAD cross reference editor with AutoCAD command XR. If you do so, ensure first that your current coordinate system is the same as the one in the referenced file, otherwise "XYZ" will mean different things in to two drawings. Tip: Always use AutoCAD command "UCS\World" (User Coordinate System = World) before you save a drawing that shall be use as an Xref, and always set UCS to World before you use the AutoCAD XR command to hook up a new Xref.

67. Cross referenced files - Xrefs - come in two variations: Either OVERLAY or ATTACHMENT. If drawing B has another drawing C as an overlayed cross reference, and if drawing A then cross-references B as either overlay or attachment, then opening A will not lead to opening C. On the other hand, if C is an attachment to B, then opening A will open both B and its attachment C. This process is repeated for each level of cross-referenced drawings - OVERLAY stops the recursion. AutoCAD will detect if there is a loop.

68. ==========

CONGRATULATIONS!

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You have now struggled your way through lots of AutoCAD stuff, and you are officially entitled to click the START button in the upper left corner of your RailCOMPLETE screen. By doing so, you will have to select a railway administration and the one of the available DNA versions. 'DNA' here means 'Definition of Network Assets', and it has many similarities with the human DNA. Go ahead - push that button now! You will se that the ribbon changes, the greyed-down buttons now wake up and become available to you.

69. If you hover over the RailCOMPLETE logo, you'll see what version of RailCOMPLETE you're running. This is useful if you want to report stuff to us.

70. Double-click on the RailCOMPLETE logo. This starts the command 'RC-BrowseCommands', which we speak of as the 'Command Browser'. You will see the list of commands that are currently available to you. This list depends on whether you have started your drawing or not, and it depends on the license level you have been entitled to.

71. The USER license level is the common license level. Within your company there should also be at least one person with the SUPERUSER license level. A superuser can do things like snooping around and looking behind the scenes, fixing possible problems that might be hard for you to find - and also possibly messing up things by changing things in uncontrolled manners... There might also be persons in your company with a TESTER license. They will have access to beta-version routines, i.e. stuff that are still not released to the general public, but we value feedback from users that can tolerate unexpected bahviour from time to time, and in return will have access to the coolest new stuff!

72. Back to the Command Browser. You may search for command names or seach in the explanations that are available for each command. If you double-click on a command name, you will start that command. You can always type the command name in the AutoCAD commmand line window (Ctrl+9 unhides it if you can't see it). You can enlarge the command line window to 5-6 lines height and dock it to the bottom of your screen, which can be practical.

73. Under the RailCOMPLETE logo there is a small arrow. Click on it to see the drop-down menu. Among the choices, you will find access to commands, tutorials, videos, Frequently Asked Questions, useful web links, license issues, the Help system, your own local log file, and an 'about'.

74. The log file contains info about any bugs you might have encountered. Whenever you hear a 'swoooosh' sound and the "swooosh" window appears, this means that RailCOMPLETE has detected unintended behaviour or inconsistent data, and a default and hopefully safe action has been taken - returning control to you instead of just crashing AutoCAD.

75. Under 'About', which you will find in the dropdown menu below the RailCOMPLETE logo, you will have access to the End User License Agreement, which you accepted on behalf of your company when installing the software. There are also copies of third-party licenses. You will find the most recent Release Notes there - look it up to see what's new & cool in whenever you install a new version.

76. If you happen to be an administrator, then you will also see the 'Admin' tab.

77. Have fun!

Please check our website www.railcomplete.com for updates.

Corrections and suggestions are welcome to support@railcomplete.no.

Thank you for using RC Tutorials!