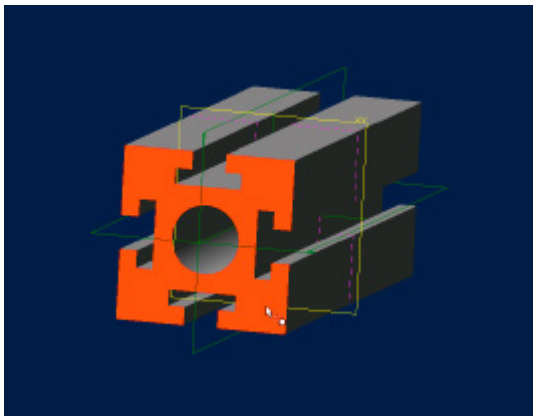
Alibre Design Tutorial - Simple Extrude
Track Channel-1



Part Tutorial

Exercise 3: Track Channel-1

In this Exercise, We will set System Parameters first.
Then, in sketch mode, outline the Track Channel with Rectangles and Straight Lines.
Then we will use the Extrude Feature to create the Track Channel.

Launch Alibre Design.
From the Home window - select File, Work Offline.
Open a New Part workspace. From the Home window - click on the **New Part** icon.
Maximise the Part Workspace Window.

Set Design Properties.
Select File, Properties.

A) Select the Tab Marked "General"
- In Description: insert the information: 'Track Channel 1 '.
- In Curve Smoothness, Select the Radio Button marked 'Automatic'.

B) Select the Tab Marked "Units"
- Check off the Box Show Units for Dimensions.
- On Display Units - confirm Unit: Inches, Format: Decimals and Precision: 4.
- On Angle - Confirm Angle: Degrees and Precision: 4. Adjust if not.
- On Spinner Increment - for Length: enter .1000 " and for Angle: enter 1.0000 degrees. Adjust to these parameters if not. Press 'Tab' to move after editing them.

C) Select the Tab Marked "Physical"
- Change Accuracy: to High. Click on the Calculate Button. Notice the results.

D) Select the Tab Marked "Apply Options"
- On Apply Changes to - Click the Radio Button beside The Current Document.
- Click Apply, then Click Close.

Set Part Options.

From Top Text Menu - Select - Tools > Options >
General Tab > Select or confirm checked off are:
Global - Show popup on errors,
Hints - All
Design
- Prompt for newer versions, - Snap to working plane, - Prompt to edit sketch,
- Prompt on detecting parameters with missing external link, - Reorient on extrude,
- Keep model in View, - Prompt when not sketching on face.
Show as Default - Planes, Annotations, and Sketches.
Grid Tab> Spacing: Make X: 0.1000 " and Y: 0.1000 ", check off Display grid, and Snap to grid.
Color Scheme Tab> For Scheme: - confirm - Dark Background Scheme. Click '**OK**'.

Start the Profile Sketch.

From the Sketch Icons > Click Activate Sketch.
From the Top Text Menu - Select Sketch > Figures > Rectangle > Two Corners.

- Locate the cursor above the X-Axis, and Left of the Y-Axis, click and drag down and Right until below the X-Axis, and right of the Y-Axis, click.
- Notice the lower right hand corner of the workspace - you will see two numbers. Use this as a guide to start at -1.00, 1.00 and to finish at 1.00, -1.00.

From the Sketching Icons > Click Offset.

- Select all Four sides of the Rectangle, Flip direction if lines are outside of selected lines.
- Confirm Distance at .2000 ", Click OK.
- Re-open Offset: Set Distance at .4000 ", Make sure offset lines are inside. Click OK.
- Re-open Offset: Set Distance at .5000 ", Make sure offset lines are inside. Click OK.
- Re-open Offset: Set Distance at .8000 ", Make sure offset lines are inside. Click OK.

From the Sketching Icons > Click Extend Figure.

- Select and click on each of the .8000" offset lines - extending them out to the outside Box.
- Click on them each as many times as it takes to extend them out fully to the edges.
- Select and click on each of the .5000" offset lines, extending them out - short of the outside.

From the Sketching Icons > Click Trim Figure. (Click Zoom to Fit as required)

- Starting from the inside of the line grid, trim out the inside four lines first by selecting them with the cursor, and clicking on them.
- Then move out, trimming the next line segments, so that there is a box inside.
- Then, one line Row inside of the outside edge, at the middle of each side, Trim this line.
- Trim the outside at the same point, halfway along the outside edges, 4 X, making a notch.
- Between the inside First and Second lines - trim the sides of the notches.
- Now at the third line inside, trim out one level to enlarge the Inside Square.
- Trim the corners so as to leave an upside down 'T' channel in the square at 4 sides.
- Trim the remaining short lines at the 4 corners of the Inside Box.

From the Top Text Menu - Select Sketch > Analyse.

- Click **Analyse**. There should be no problems if all trimming work is correct.
- Desired message: No potential problems detected in the sketch for the current check levels.
- If errors appear - click on the listed error and you can observe the errors on the sketch.
- Re-extend or trim the offending lines, and re-analyse.

Create the Extrude Track Channel from the Profile Sketch.

Select - from the Top Text Menu - Feature > Boss > Extrude.
(Alternative: Click Extrude Boss from the Feature Icons)

- Sketch - should already be selected as Sketch<1>, if not - click in the sketch selection area, and on sketch<1> in design explorer, or in the workspace.
- Type - is defaulted at To Depth, - this can be left, or a good alternate would be - Mid Plane. Notice the preview images change to match this selection change.
- Current Depth - is defaulted at 5.0000 " - You may set this at any figure easily by picking up or down selections beside the dimension display. For now, set it at 5.5000 ". Both end images move out to reflect the longer length.
- Leave the Direction as Checked - Along Normal.
- For now - leave the Draft Angle at 0 degrees.
- Edit the Label - Track Channel Extrusion<1>.
- Click **OK**.

Great! You have made the Extrude Track Channel.

Now, to save this file in it's own folder:

- From the main text menu, select **File**, **Save As**
- From the Explorer directory view - select Tutorials folder.
- Click on **New Folder** - create one with the name Track-Channel-1 under Tutorials.
- Select this new folder named: Track-Channel-1
- Edit the name of the part - to Track-Channel-1, and click - **Save**.

Extrude Track Channel - physical practicality view & edit.

Now that you have created the extrusion and saved it, take a close look at it - thinking - how easy would this thing break? You will notice the distances between the adjoining slots, and they would not offer a lot of relative strength. Let's do a fix on this by editing the sketch.

Edit Sketch<1>

- In the **Design Explorer**, Select Sketch<1>, Right Click on this and select **Edit**.
- In the channel slots - click on the out side edge lines on each side, and drag them in .1000"
- Do this to all the slots, so that the slots are narrower by one grid space on each side.
- When this is complete - simply click on the **Select** Icon in the View Tool Bar at the top.

This has updated the Extrusion with the new slot widths, and stronger corners.

- To see what the inside corner to corner distance is we will use the Measurement Tool.
- Select an inside corner edge line on one slot, and another nearest on an adjoining slot.
- You may need to rotate the view of the extrusion around to get both, remember to shift-click.
- Click on the **Measurement Tool** Icon - Besides the Scales Icon (Physical Properties).
- In the popup - Type = Linear, Mode = Pairs, Selected Geometry = Edges <90> and <66>.
- The results are shown in Measurements: Distance: .2828 ", and more. Close.

Modify the Extrusion to have a Hole in the center: Edit Sketch<1>

- In the Design Explorer, Select Sketch<1>, Right Click on this and select **Edit**.
- Select **Circle** from the Sketching Icons, and place the Center on the Origin.
- Drag out the circle until it reads .8000 " Diameter. Click
- When this is complete - simply click on the **Select** Icon in the View Tool Bar at the top.

This has updated the Extrusion with the new Whole in the Center. Now it's lighter!

Now, to Update save this file:

- From the Top Standard Icons - select **Save**. (The Floppy disk Icon.)
- On the Popup - Select **Save**.

Congratulations!
You have completed the Extrude-Track-Channel-1 Tutorial.

(*Text Version*)

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