Prepare a top-level assembly model for your robot system

Let's create a detailed design of the robot, which will be a 3D model with realistic parts.

A basic kit of parts for *FIRST* programs are available for FTC, in both Tetrix and Matrix, and FRC. The part models have accurate dimensions and mass. In this section we'll use our System Envelope model to guide the placement of parts within subsystems and the placement of subsystems in the top-level assembly.

These instructions set up a top-level assembly file for an FTC robot. The steps are the same for FRC, although the specific components and placements may be different. The detailed design process starts by creating an assembly file to represent the overall robot system and copying our envelope models into the new assembly's skeleton model.

1. From the Home tab, click **New** .

2. Select **Assembly** for Type.

3. Name the new assembly file. The example uses the name "Robot_System". Click **OK**.

*You now have a top-level assembly file, named **robot_system.asm**.*
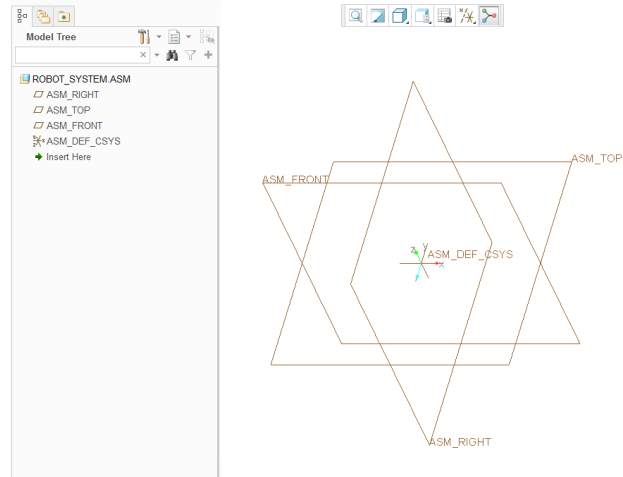
The first part we will add to the new assembly is a skeleton model.

4. From the Model tab, select **Create** .

5. Select **Skeleton Model** for type.

6. A name will be automatically generated. Click **OK**.

7. Leave the default Creation Options. Click **OK**.
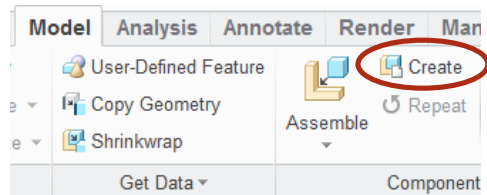
The skeleton model appears in the model tree and a new set of data planes appears in the graphical area.

8. Right-click on the skeleton model in the model tree. Select **Open** .
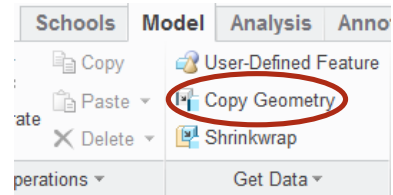
The skeleton model opens in its own window.

*If the data planes are not visible, toggle data on by selecting the **Datum Display Filters** from the in-graphics display menu.*
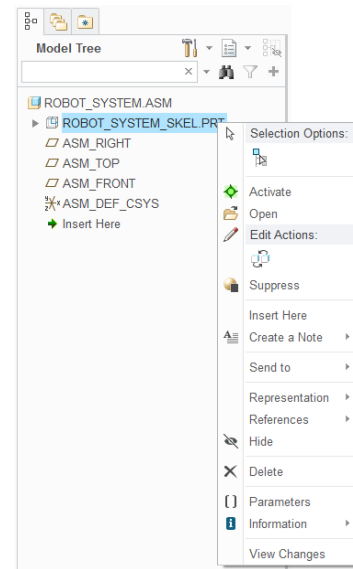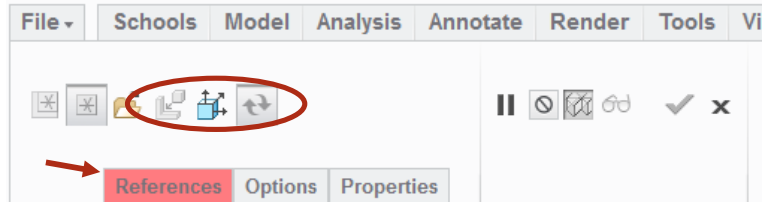
Copy the System Envelope model and the subsystem envelopes into your robot system skeleton model.

9. From the Model tab, select **Copy Geometry** .

10. Click **Published Geometry Only** to disable it.
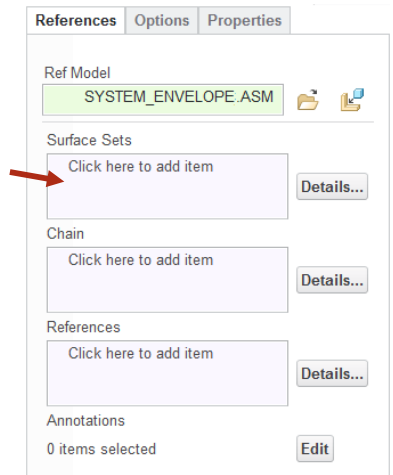
11. Click to open the References tab (appears red).

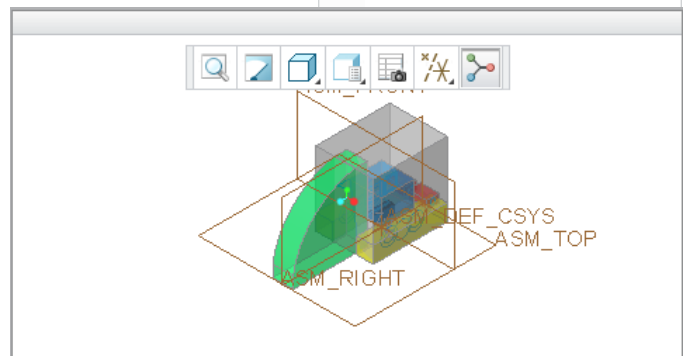12. Click next to the Ref Model field to choose a reference model.

13. Select **system_envelope.asm**. Click **Open**.

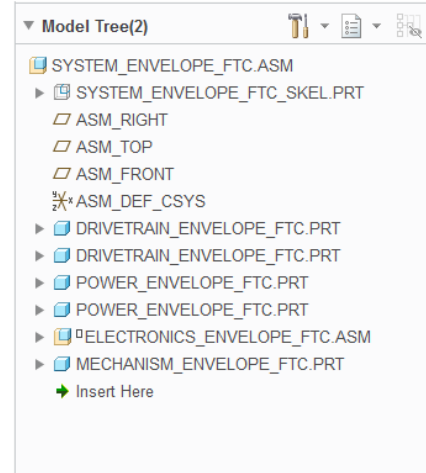14. Keep the default placement option. Click **OK**.

15. Click in the **Surface Sets** field.

A small window with your system_envelope model appears in your graphical area.

A second model tree, Model Tree(2), appears on the left of the Creo window containing the System Envelope model.
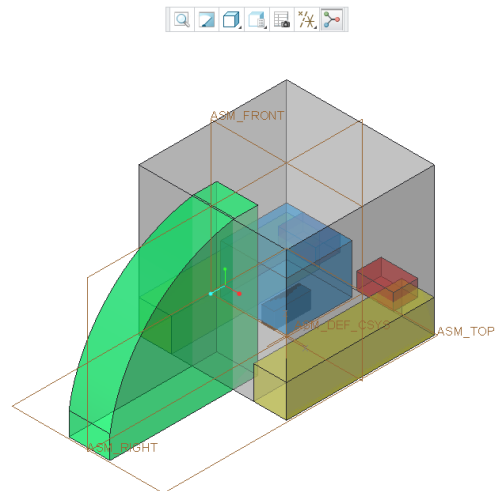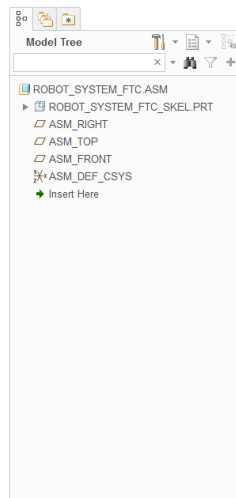

We will copy each of the envelope models into our Robot System skeleton model one-by-one, starting with the System Envelope skeleton model.

16. Select **SYSTEM_ENVELOPE_SKEL.PRT** in Model Tree(2). It will appear highlighted in the graphical window when it is selected. Click ✔ to copy it into the Robot System skeleton model.

17. Use the same procedure to copy each of the subsystem envelopes into the Robot System skeleton model.

Your Robot System skeleton model contains references to the System Envelope and all of the subsystem envelopes. Save it to your working directory and close the Creo window.

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