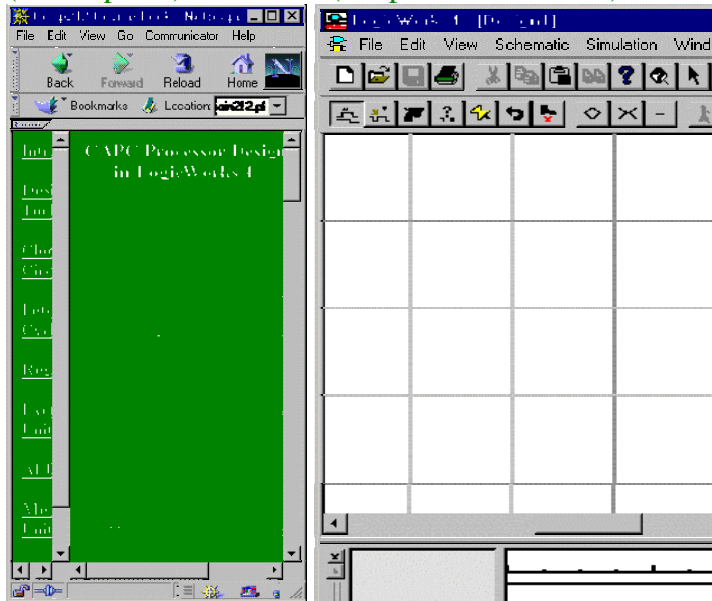


Creating your own devices in LogicWorks4

In this session, we are going to learn how to create our own device symbols. Once stored properly, they could be used like any other devices in the Library.

(1) Start LogicWorks

Start the LogicWorks program by double-clicking on the LW4 icon. Place this page (Netscape/IE) on the left (1/3 part of the screen) and LW4 on the right.



(2)

(2a) Selecting a device

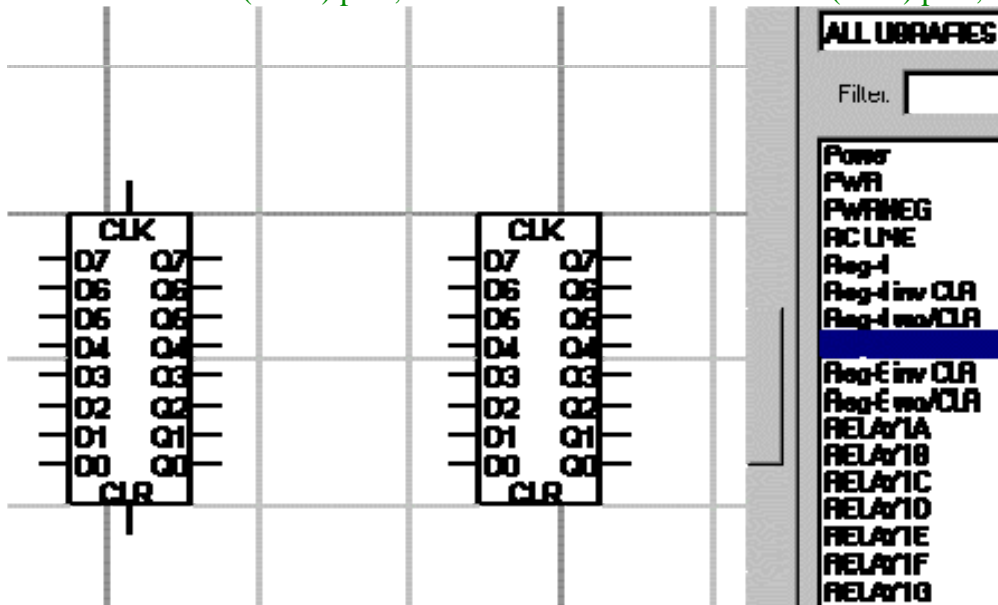
Locate the **Reg-8** chip (8 D-type flip-flop with common Clock and Clear) in the **parts list** (pull-down menu on the right) and double-click on it. Now move the cursor back into the circuit window. The cursor will be replaced by a moving image of the selected symbol, in this case, Reg-8 chip.

(2b) Drawing a device

Point the cursor in the center of the window and click the mouse button. A permanent image of the device will now stay in this location and the image will continue to follow your cursor. Make another copy with ample space in between the two. Press **spacebar** to release this operation.

(2c) Combine two Reg-8 chips

Connect two CLK(clock) pins, call it as *load*. Connect two CLR(clear) pins, call it as *clear*.



(3)Port In Connector

Repeat (2a)-(2b) by selecting a Port In Connector. Connect Port In connectors with *load*, *clear* lines, and two sets of D0 to D7 lines.

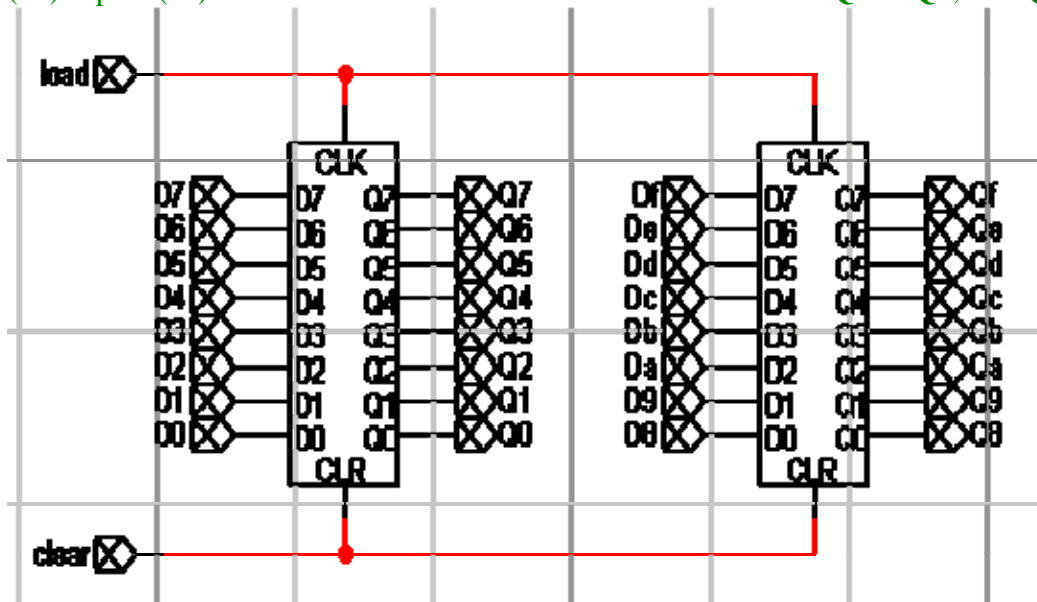
(4)Port Out Connector

Repeat (2a)-(2b) by selecting a Port Out Connector. Connect Port Out connectors to two sets of Q0 to Q7 lines.

(5)Naming connectors

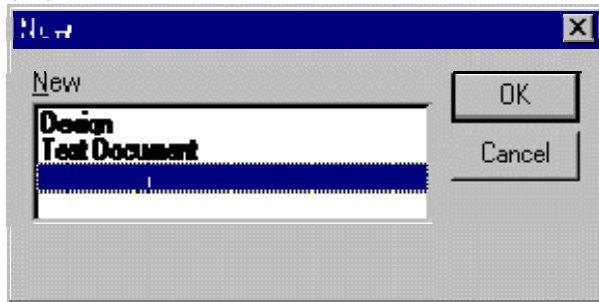
(5a)Right-click each one of the Port In connectors and select Name operation. Assign a name such as "load", *clear*, D0 to D7 and D8 to D15.

(5b)Repeat (5a) to the Port Out connectors with names such as "Q0 to Q7, and Q8 to Q15".

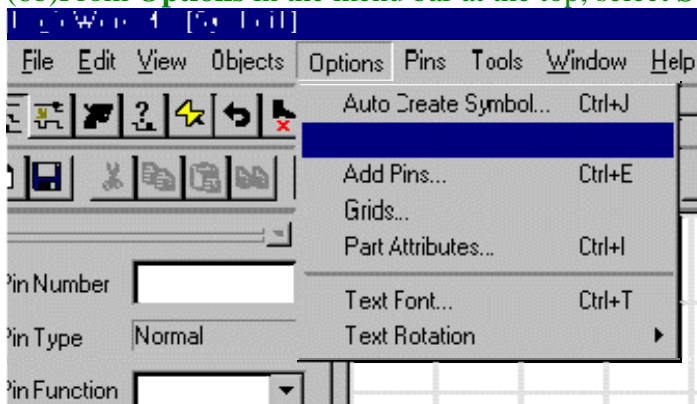


(6) **Open DeviceSymbol Editor**

(6a) Select **New** from **File Tool** and then choose **Device Symbol** option.

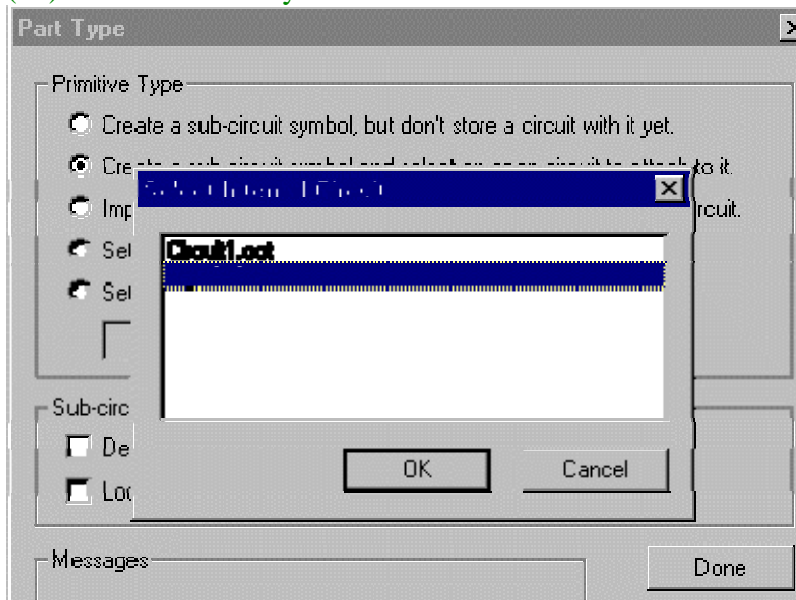


(6b) From **Options** in the menu bar at the top, select **Subcircuit/Part Type** command.



(6c) Choose "**Create a subcircuit symbol and select an open circuit to attach to it**" option.

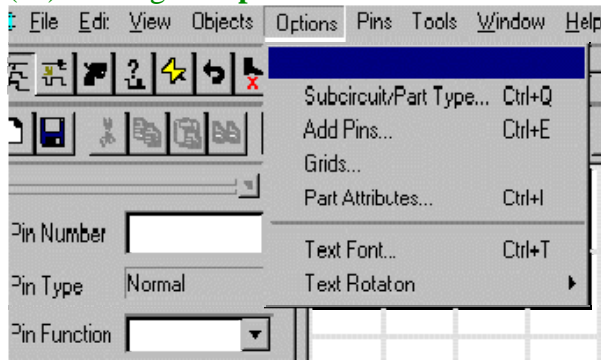
(6d) Select the circuit you have created from the list in the menu.



(6e) Click **done** button. Observe **red input and output symbols** appeared in the pin table.

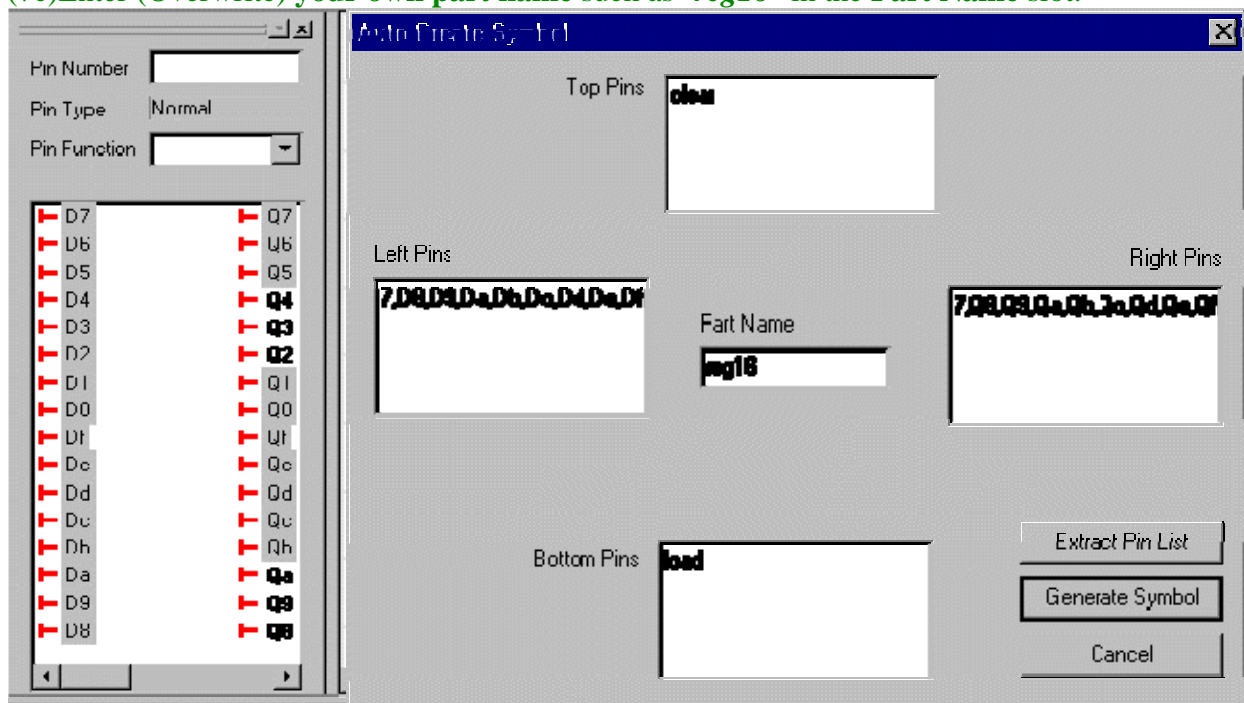
(7) Assign a symbol to the device

(7a) Click again Options and select Auto Create Symbol... at the top menu bar.

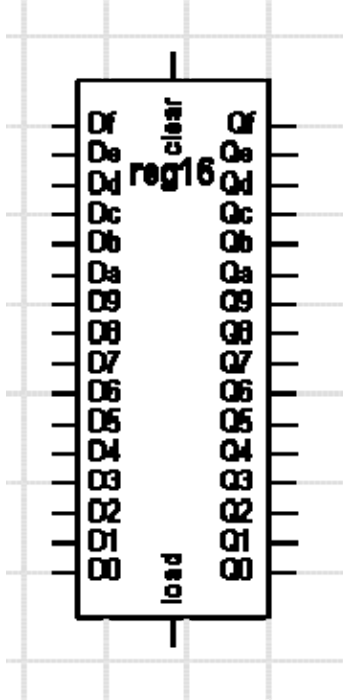


(7b) Enter "D0" to "Df" in the Left Pins slot, "Q0" to "Qf" in the Right Pins slot, "clear" in Top Pins slot, and "load" in the Bottom Pins slot.

(7c) Enter (Overwrite) your own part name such as "reg16" in the Part Name slot.



(7d)Click **Generate Symbol** button. A new rectangular symbol appears on the screen.



(8)Save the symbol in a Library

(8a)Click **File** and select **Save as**. **Save Part As** window will appear on the screen.

(8b)Select a **Destination Library**. You could create your own directory here.

(8c)Click **Save** button. You should be able to use this device, **reg16**, when the directory is active.

