**The lecture 13**

**Working with subcharts**

Stateflow allows you to create charts within charts. A chart that is embedded in another chart is called a *subchart*. The subchart can contain anything a top-level chart can, including other subcharts. In fact, you can nest subcharts to any level. A subchart appears as a labeled block in the chart that contains it. A subchart is itself a superstate of the states and charts that it contains. You can define actions and default transitions for subcharts just as you can for superstates.

You can also create transitions to and from subcharts just as you can create transitions to and from superstates. Further, you can create transitions from states residing outside a subchart to any state within a subchart, and vice versa. The term *super transition* refers to a transition that crosses subchart boundaries in this way. Subcharts enable you to reduce a complex chart to a set of simpler, hierarchically organized diagrams. This makes the chart easier to understand and maintain. Nor do you have to worry about changing the semantics of the chart in any way. Stateflow ignores subchart boundaries when simulating and generating code from Stateflow models. Subcharts define a containment hierarchy within a top-level chart. A subchart or top-level chart is said to be the *parent* of the charts it immediately contains. A subchart or a top-level chart is said to be an *ancestor* of all the subcharts contained by its children and their descendents.

**Creating a Subchart**

You create a subchart by converting an existing state, box, or graphicalfunction into the subchart. The object to be converted can be one that you havecreated expressly for the purpose of making a subchart or it can be an existingobject whose content you want to turn into a subchart.

To convert a new or existing state, box, or graphical function to a subchart:

1. Select the object and click your mouse’s right button to display the Stateflow shortcut menu.



1. Select **Subcharted** from the **Make Contents** menu. Stateflow converts the selected state, graphical function, or box to a subchart.



**Manipulating Subcharts as Objects**

Subcharts are first-class objects in Stateflow. You can use the same techniques to drag, copy, cut, paste, relabel, and resize subcharts as you use to perform similar objects on states and boxes. You can also draw transitions to and from a subchart and any other state or subchart at the same or different levels in the chart hierarchy.

**Opening a Subchart**

Opening a subchart allows you to view and change its contents. To open a subchart, double-click your mouse anywhere in the block that represents the subchart. Stateflow replaces the current contents of the editor window with the contents of the subchart.



**Navigating Subcharts**

The Stateflow toolbar contains a set of buttons for navigating a chart’s subchart hierarchy.



**•**Up

If the Stateflow editor is displaying a subchart, this button replaces the subchart with the subchart’s parent. If the editor is displaying a top-level chart, this button raises the Simulink model window containing the chart. The next two buttons allow you to retrace your steps as you navigate up and down a subchart hierarchy.

**•**Back

Returns to the chart that you visited before the current chart.

**•**Forward

Returns to the chart that you visited after visiting the current chart.