Problem 1

Our analog microwave can be in one of four possible states: Off, Idle, DoorOpen, or Cooking. We group the last three together into a composite state, On, so that we can simplify the transition to Off. We add entry actions to each of the states to guarantee that the light is always in the correct state. The microwave has a timer variable that represents the current position of the timer dial, and this timer dial creates an event, TimerDone, when it hits zero. Changes to the dial while we are in the Cooking state are handled with internal transitions.

Problem 2

Our analog microwave can be in one of four possible states: Off, Idle, DoorOpen, or Cooking. We group the last three together into a composite state, On, so that we can simplify the transition to Off. We add entry actions to each of the states to guarantee that the light is always in the correct state. The microwave has a timer variable that represents the current position of the timer dial, and this timer dial creates an event, TimerDone, when it hits zero. Changes to the dial while we are in the Cooking state are handled with internal transitions.
Problem 3

Assuming that the popcorn button just turns the dial to a set amount, then adding the popcorn button to our statechart diagram is as simple as adding an event to the transition to cooking.
Problem 4

Note: I have assumed that we always want to start in the Light Active state.
Problem 4 (alternate approach)

Note: I have assumed that we always want to start in the Light Active state.
Problem 5

After a good discussion in class, we have decided that it is appropriate to model the simple concurrent behavior of the volume and bass knobs as internal transitions. We list only two of the controls here, but all of the different volume and balance controls could be modeled in the same fashion.

You might also notice that this state diagram doesn’t show any way to get back into radio mode after being in tape mode, except for turning to power off and on again. Even though it is probably incorrect, this is the behavior described in the owner’s manual.