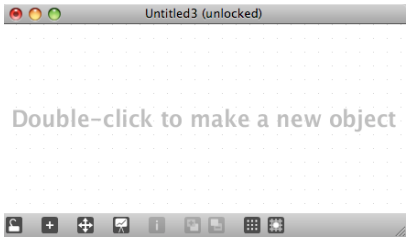
Composition: Electronic Media II
Spring 2009
Building a Patch in Max/MSP

1. Power up the studio and bring up the faders to the Digi and Mac.

2. Launch Max/MSP by clicking on the Max icon in the dock, as shown below:

3. Select **File>New Patcher** to create a new patch. A window like the one below will appear:



4. Double-click in the lower middle area of the window. A target like the one below will appear:

5. In the object palette, click on the **object** icon. An empty **object** object like the one below will appear:

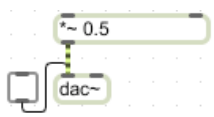
6. Type "dac~", as shown below:

Notice the following:
   1. "dac" stands for digital to analog converter. It converts digital sounds into analog audio sounds.
   2. The ~ (tilde) sign indicates that the object is an audio or MSP object.
   3. The dac~ object has a left audio inlet and a right audio inlet.
   4. You can make the object box longer by grabbing the right side and resizing.

7. Using a similar procedure, insert a **toggle** object and patch it into the left inlet of the **dac~**, as shown below:

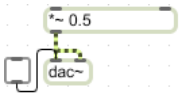
Notice the following:
   1. The **dac~** needs to be turned on and off. The toggle will accomplish this.
   2. This is a segmented patch cord (see the **options** menu).
   3. The patch cord is a plain, black line, which indicate that it is a control signal, not audio.

8. Using a similar procedure, insert an **object** object directly above the **dac~** and patch it into its left inlet of the **dac~**, as shown below:



As shown above, type "*~ 0.5" into the box. This is now called a "signal multiplier" object.

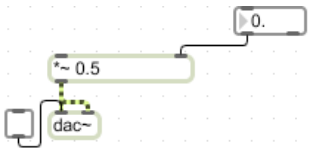
9. Patch the signal multiplier object into the right inlet of the **dac~**, as shown below:



Notice the following:

1. The **Signal Multiplier** will be used to control the volume of the left and right channels of the **dac~**.
2. The patch cords are dashed, yellow and black lines, which indicate that these are audio signals, not control signals.

10. Using a similar procedure, insert a **float number box** above and to the right of the signal multiplier, as shown below:

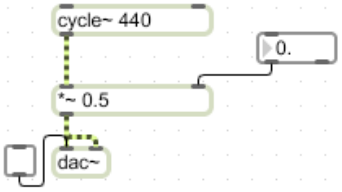


As shown above, patch it into the right inlet of the **signal multiplier**.

Notice the following:

1. The **Float Number Box** will be used to supply a decimal number to the **Signal Multiplier**.
2. This decimal number will function as a volume control for the **dac~**.

11. Using a similar procedure, insert a **message box** directly above the **signal mulitplier** and type "cycle~ 440", as shown below:



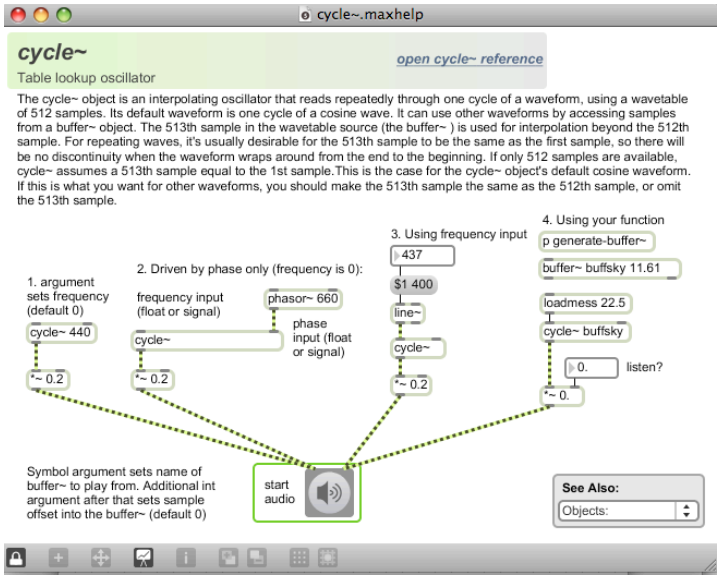
Notice the following:

1. The **cycle~** object is a sine wave.
2. The patch cord is an audio signal.

12. Play the patch as follows:

a) Lock the **Patcher**.
b) Click on the **toggle**.
c) Adjust the volume from the **Float Box**.
d) Press "stop" to stop the sound.

13. To learn more about the cycle~ object, unlock the patcher, highlight **cycle~** and type cmd-shift-h. A window like the one below will appear:



Note the following:

a) Most objects have similar help windows.
b) Items from a help window can be unlocked, copied, and pasted.
c) Each item from a help window also has its own help window, accessed by typing cmd-shift-h as above.
d) Beware of running multiple dac~s.

14. How about controlling the frequency from a number box?

15. Save, name, and store the patch, then quit **Max/MSP**.