

## Assignment #1 Max/MIDI Basics

**Due:** Monday, February 4  
Be prepared to demonstrate your patches in class.

This document assumes you have read the *Max: Getting Started* manual's "Overview: The Max Application." You may assume the following MIDI port assignments:

	Input Device	Output Device
Kurzweil PC88	a	a
Roland JV-2080	b	b

All MIDI output should be directed to the JV-2080 unless otherwise specified.

**Write the following Max programs.** You may store more than one program in a single patcher window. Use Max's Comment object to number each program and to document your work.

1. Write a patch that displays the MIDI note name (Display Style: Note Names C4), key velocity, and MIDI channel in number boxes for any note played on the Kurzweil PC88 controller keyboard.
2. Write a patch that displays *control change*, *aftertouch* and *pitch bend* information for the PC88.<sup>1</sup>
3. Using the **midiparse** object, demonstrate how to construct a "raw" *Note on* message that plays A4 (A above middle C) with velocity 127 on MIDI channel 1. Also construct the corresponding *Note off* message. Test your messages on the JV-2080.
4. Write a program that will map all MIDI data coming from the PC88 keyboard controller to the Roland JV-2080 tone generator, allowing you to play the Roland JV-2080 via the PC88 keyboard.
5. Write a program that will play a randomly selected MIDI pitch between C4 and B4 (inclusive) once a second. The key velocity should be 108 and the duration half a second. Use a number box to display the MIDI pitch number that was randomly selected.<sup>2</sup>
6. Expand the previous program to play octaves rather than single pitches. Add a number box that will allow the user to change the rate of **metro** and constrict the number box's input range to: Min. 10 to Max. 2000. The duration of each note should always be half the metro rate.
7. Write a program that takes data values generated by the PC88's pitch bend wheel (0-127), passes them through a number box and dial object, and plays the corresponding MIDI pitch (0-127) on the JV-2080. Each note should have a key velocity of 90 and a duration of 50 ms.
8. Expand the previous program to allow control of key velocity via the modulation wheel.
9. Write a program that will display music notation on a grand staff for any note you select on a small six-octave monophonic Keyboard Slider (kslider) object. Each note should have a duration of 1.5 sec. Key velocity values should be generated by the Keyboard Slider's right outlet and displayed via a number box.
10. Write a program that will play a minor chord whose root is the key you play on the PC88. For example, if you play MIDI note 60, Max will also play MIDI notes 63 and 67 in real time. Key velocity and duration values should be based on the user's performance.
11. Expand the previous program to play some other interesting sonority based on your PC88 input. Be creative. The sonority must have at least 6 different pitches. Be sure to describe what you have created using a comment object.

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<sup>1</sup> Hint: Use the **midiparse** object and its object help file to accomplish this.

<sup>2</sup> Hint: Objects required: **metro**, **random**, **+**, **makenote** and **noteout**.

BAIN MUSC 336  
*Introduction to Music Technology*

12. Write a program that allows you to use the continuous controller pedal to control the volume and pan of the current MIDI instrument. Use number boxes, sliders and dials to provide visual confirmation of the current volume and pan settings.
12. Write a patch that echoes anything you play on the PC88 two seconds later on the JV-2080. Use Max's **pipe** object to accomplish this.
13. Modify the previous program to echo and transform (e.g., transpose, invert, etc.) what you play on the PC88 on at least four different JV-2080 MIDI channels. Using the JV-2080's GM mode, select different instruments for each channel via program change commands. Use Max's **loadbang** object to automatically send these commands to the JV-2080 when your patch loads. You may set the echo time to anything duration you like. (You could even make it variable, for example, using Max's **borax** object to detect the delta times between note on messages). Be creative.

### Reminders

Be sure to use Max's interactive Object Help feature. Document your programs using Max's Comment object as you complete this assignment. Unless otherwise specified, all sounds should be sent to the Roland JV-2080's MIDI channel 1. Also be sure to:

- Horizontally/vertically align objects
- Use segmented patch cords where appropriate

### Submission guidelines/Grading

Store all of your work in a sub-folder called **Max** in your private folder. Carefully select appropriate names for your files. Followed instructions and ready to present work in class - 60%; Commented code - 15 %; Code is well organized and easy to follow - 25%.

Updated: 1/28/2008