

## MAX PROGRAMMING

“Connect to anything.”

– Cycling ‘74

### Reading

*Max Getting Started*, v4.5 (Cycling 74: Palo Alto, 2005), pp. 3, 9-13, 17-19 & 28-31.

### Terms & Concepts

<p><b>Max Programming</b>  Visual programming language  Patcher, or patch  Object-oriented programming  Objects  - Inlets/outlets  - Assistance text  Patch cords (delete with <i>esc</i>)  Message (m)  Lock/Unlock – Run/Edit  Comment (c)  Self-commenting code  Subpatcher (p)  Encapsulation</p> <p><b>Program Execution</b>  Bang (means “do it”)  Trigger events (bang, <i>trigger</i>)  Triggering by left-most inlet  Message order of execution:  - Right-to-left  - Bottom-to-top  Runtime issues:  - Max Console (<i>print</i>)  - Error messages  - Debugging  - Stack overflow</p> <p><b>Objects</b>  Help on ‘object’ (Option-click)  Copy object (Option-drag)  Inspector (Cmd-i)  Arguments  - Obligatory  - Optional  - Default value  Key commands (x):  - z, n, t, b, c, i, f &amp; m</p> <p><b>Messages</b>  Data types  - Int &amp; Float  - List  - Bang  - Symbol  - Any message</p>	<p>Send/Receive Messages  (w/o patch cords):  <i>send (s)</i>  <i>receive (r)</i></p> <p><b>Working with Data</b>  Number boxes (int. vs. float)  Number box (int)  - Decimal  - Pitch (C4)  - Binary  Variables: <i>int &amp; float</i>  <i>key</i> (ASCII)  <i>pack &amp; unpack</i>  <i>table &amp; coll</i>  <i>text</i></p> <p><b>Math Objects</b>  +, -, *, / and %  <i>expr</i>  <i>random</i></p> <p><b>MIDI Objects</b>  High-level MIDI messages  - <i>notein/noteout</i>  - <i>ctlin/ctkout</i>  - <i>pgmin/pgmout</i>  - <i>bendin/bendout</i>  Note on/off  - <i>makenote &amp; noteout</i>  - <i>stripnote &amp; flush</i>  Low-level MIDI messages  - <i>midin/midiout</i>  - <i>midiparse &amp; midiformat</i></p> <p><b>Routing, Selection &amp; Counting Objects</b>  <i>gate</i>  <i>select (sel)</i>  <i>counter</i></p> <p><b>Timing Objects</b>  <i>metro</i>  <i>tempo</i>  <i>pipe</i></p>	<p><b>User Interface Objects</b>  <i>button (b)</i> – bang  <i>toggle (t)</i> – off (0), or on (1)  <i>sliders</i>  - <i>kslider, nslider, dial, etc.</i>  <i>panel</i> (Arrange &gt; Send to Back)  <i>umenu</i></p> <p><b>Human-Interface Design</b>  Resize an object  Nudge keys (cursor arrows)  Arrange &gt; Align  Distribute  Object &gt;  - Show Fonts  - Color  - Fix Width (Cmd-j)  - Hide/Show on Lock  - Seg. Patch Cords (Cmd-y)  Presentation mode</p> <p><b>Program Initialization</b>  <i>loadbang &amp; loadmess</i></p> <p><b>Environment Settings</b>  Max &gt; Preferences  Options &gt; Overdrive  Options &gt; MIDI Setup...</p> <p><b>Documentation &amp; Tutorials</b>  Max Tutorials, Topics &amp; Guides  Max Reference  Interactive Help files</p> <p><b>File Extensions</b>  .maxpat, .txt, .coll, .mid, etc.</p> <p><b>Application Types</b>  Generative  Parameter mapping  Real-time interactive  Transformative  Sequenced  Standalone</p>
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### Reference

Cycling ‘74. 2021. *Max 8 Documentation*. Palo Alto, CA: Cycling ‘74. Available online at:  
<<https://docs.cycling74.com/max8>>.