Logic Studio

SECRET SCHOOL OF SOUND

Week 1

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ii - Recommended Reading

Two excellent resources here on mixing and mastering audio. Both books contain a great wealth of technical information, coupled with an appreciation of its artistic applications:

Izhaki, Roey (2008)*Mixing Audio: Concepts, Practices and Tools.* Oxford: Focal Press.

Katz, Bob (2007). *Mastering Audio: The art and the science* (Second Edition). Canada: Focal Press.

1 - Software / Hardware Setup

Overview:

Before you can start recording and playing back audio in Logic, you need to set up your audio Input and Output devices.

Exercise:

- To configure input & output devices**, go to the Logic Pro Menu/ Preferences/Audio** and select the "Devices" tab
- The most important settings to look at for now are the Input and Output Device settings.
- Choose the appropriate options for your system, then close the Audio Preferences window.
- **Switch on the metronome** in the Transport bar at the bottom of the Arrange Window and hit play - you should be able to hear the click track.

2 - Introduction to the Logic Interface

Overview:

Logic is a huge program, and to go through every part of the interface would just be confusing at this point. This section will just take a quick look at the most important elements of the Logic interface that we'll need for the next few exercises.

The Arrange Area

When you create a new Logic project, the default view shows the Arrange Area. Tracks and regions are arranged, or sequenced here.

- The **Add Tracks** button allows you to create new audio, software instrument or external MIDI tracks. The Duplicate track button makes a duplicate copy of the selected track.

- The **Toolbar** at the top of the Arrange Window allows quick access to commonly used functions such as Autozoom, Automation and Flex mode.

- The position of regions and events within a project are aligned with **Bar ruler** positions. The Bar Ruler also displays markers and locators, and reflects time signature changes. The Ruler can be modified to indicate bars, time or both.

- The **Playhead** moves along the bar ruler according to playback position, but can be used for a number of other functions too.

- The **Track List** displays all of the project's instrument tracks, and also includes a number of useful functions that we'll get to in another lesson.

The Transport Bar

- Includes the main transport controls: **Play, Stop and Record**
- The **Click button** toggles the Click Track, or Metronome on and off.
- The **Master Volume slider** controls the master volume, or the level coming out of the speakers.
- The **Cycle [C] button** toggles cycle, or loop mode on and off
- You can **customize the transport bar** by right clicking it and selecting **Customize Transport Bar**

The Inspector displays settings for the currently selected track and its associated routing options in the Arrange Area. The most important setting to look at now is the Track Volume Fader, which can be dragged up or down to increase or decrease the volume of the selected track.

Also in the Inspector:

- Midi-in settings
- Channel Strip inspector
- Output Channel Inspector

3 - Recording Audio

Overview:

This section provides a guide to recording audio through a microphone. All we're going to do is use your computer's built in microphone to record a short sample of clapping.

Exercise:

- **Create a new audio track** by clicking the New Track button at the top left of the Arrange Window.
- Set the track tempo to **91bpm** using the tempo display in the Transport Bar
- **Arm the track** for recording by clicking the track's R button in the Arrange Window.
- Audio data is written to the Hard Disk as it is recorded. You will be prompted to select a location for this data to be recorded. **Name the project "Week 1"** and click Save.
- **Hit the Record Button [R]** in the Transport Bar to begin recording. Try clapping along to the metronome for a few bars.
- **Hit the Stop Button [SPACE BAR]** to finish recording.

- **You can record onto multiple tracks simultaneously**, but you must ensure that your input device is configured for each track. Select the correct input from the Input section of the Track Inspector.

4 - Creating Software Instruments

Overview:

Logic allows you to record instruments and sounds from the real world using microphones and other input devices. However, the software also includes a huge library of *Software Instruments* (or MIDI Instruments) that can be played using an external *MIDI controller*, or using the computer keyboard when CAPS LOCK is turned on.

The Logic software instruments include Drum Machines (Ultrabeat), a variety of synthesizers (subtractive, modeling and frequency modulated), an organ (EVB3), an electric clav (EVD6), a vocoder (EVOC 20 PS), electric pianos (EVP 88) and a sampler (EXS24) which includes a huge range of sampled instruments.

Exercise:

We're going to create a software instrument, try it out and then learn how to edit the settings of any software instrument.

- MIDI Tracks are created in the same way as Audio Tracks.
- Click the **Add New Tracks** button at the top left of the Arrange Window.
- Select **Software Instrument** and click Create.
- **The Library Tab** should appear on the right of the screen, allowing you to select an instrument from Logic's extensive collection.
- Alternatively, you can select instruments from the **Input section of the Track Inspector**.
- You can call up the Library window at any time by clicking the media button in the tool bar at the top of the Arrange Window, then selecting the Library Tab.
- Select **Keyboards/Electric Pianos/Classic Wurlitzer 200A.**
- You can use your computer keyboard to input MIDI data in Logic. **Hit the CAPS LOCK key** to enable this function.

- You can **edit the Instrument Settings** by double clicking on the instrument name in the Inspector (or the mixer)

5 - Recording MIDI

Overview:

When you hit a key on the keyboard, you are simply *sending an instruction* to the software instrument, which responds by audibly producing the note you have instructed it to play.

When you record audio with a microphone, Logic stores the data as an *audio file*. Audio files take up a huge amount of hard disk space, and furthermore, they do not offer much room for editing.

MIDI instruments are recorded in a different way. Instead of recording the sound that is produced by the software instrument, *Logic simply records the instruction* that is sent to it. These recorded instructions can be manipulated after the fact, meaning you can correct mistakes or change chords, melodies and patterns at any time without having to perform the passage again. These instructions are stored as *MIDI Files*, which appear as *MIDI Regions* in the Arrange Window.

Exercise:

• The steps for recording MIDI Data are the same as recording audio:
  • **Arm the track** using the track's R button
  • **Hit Record** in the transport bar [R]
  • **Play a short melody** using your controller or computer keyboard with MIDI Typing turned on [CAPS LOCK]
  • **Hit Stop** [Space bar] to finish recording.

6 - Music Theory Basics

Overview:

You don't need music theory to make music. However, we're going to be covering some concepts and terms that will be much easier to understand if you have even a very basic grasp of music theory.

Don't worry about trying to remember everything from this lesson. We'll only cover the very basics, just so you can get a better understanding of what some of the elements of the Logic interface refer to and how to use them.

- The musical notes/pitches used in Western music are: ABCDEF and G
- There are no notes after G (so there's no H, I or J in music), so if you keep on going up past G you get to A again.
- The distance, or interval, between A and G is seven notes.
- If you go up one more note to A, you are now eight notes up. This interval is known as an Octave, which is sometimes written as 8ve for short.
- So the distance between C and the C above it, or as another example, D and the D below that (counting backwards), is an 8ve.
- When people talk about "Middle C" they mean the C key right in the middle of a piano keyboard.
- In Logic and other MIDI applications, each octave has a number, i.e. C1, C2, C3, C4, C5, C6.
- Middle C in Logic is called C3.
- With the Computer MIDI Keyboard turned on, the notes A to G correspond to the A-L keys on the computer keyboard.
- There are also 'half' notes, or semitones, between each note from A-G. They are played on the black keys on the piano and are represented by the sharp symbol, which looks like the hash symbol.
- There are 12 semitones in each octave: A-A#-B-C-C#-D-D#-E-F-F#-G-G#
- On the Computer MIDI Keyboard, the black keys are W, E, T, Y, U and O.
- Just to confuse you, the sharps can also be written as flats, so that A# can also be written as B flat.

- Notes that are neither sharps nor flats are called Naturals.

- Finally, a quick word about frequencies:
- Sound is created by moving air, and travels in waves.
- Each musical note has a corresponding frequency, which is measured in Hertz (Hz) according to the frequency of the sound wave.
- For instance, middle C is 262Hz, and A4 is 440hz.
- Every doubling or halving of these frequencies will deliver the same notes on a different octave: So A3 is 220Hz, A4 is 440Hz and A5 is 880Hz.
- Low E on a six-string guitar is 82Hz, while low E on a bass guitar is 41Hz.

7 - Editing MIDI in the Piano Roll

Overview:

Now that you have recorded some MIDI, you can go back and edit it. There are a few ways to edit MIDI in Logic, and we're going to look at just one of them now.

Exercise:

To edit a MIDI region in the *Piano Roll*:

- **Double click on the region** in the Arrange Window
- OR Select the region and click the **Piano Roll Tab** at the bottom of the Arrange Window
- OR **Open a separate Piano Roll window** from the Window menu [⌘6]

- MIDI note events are **represented by horizontal rectangles**, aligned on a grid of horizontal and vertical lines.
- The **horizontal** placement of note events indicates their **temporal** (bar, beat, and sub-beat) positioning within the region, and project.
- The **vertical** position of note events indicates their **pitch**, with those nearer the top of the Piano Roll grid being higher in pitch.
- **Chords** are displayed as a **vertical stack** of note rectangles. The alignment of notes in chords is not always identical, as not all notes in a chord may be struck, or end, at the same time.
- The **length** of MIDI note events is **directly related to the length of the rectangles**, so notes such as hemidemisemiquavers (1/64th note), quavers (1/8th note), crotchets (1/4 note), minims (1/2 note), whole notes, and so on can be easily recognized.

- If you make any mistakes during recording, **you can correct these mistakes** by dragging the rectangles up and down to correct pitch, or left and right to correct rhythm.

- MIDI notes can by **resized** by dragging their start/end points.

7.1. Editing Regions in the Arrange Area

Overview:

Audio and MIDI files appear in the arrange window as *Regions.* Regions in the Arrange Window can be moved around, resized, looped, chopped up or combined with other regions.

Exercise:

- Chances are there's going to be a little **blank section** at the start and end of your MIDI clip before and after your notes were recorded. It helps keep things tidy if you **remove these sections** either by bringing in the start and end points of the region, or by using the *Split* command..
- You can **resize regions** by dragging the lower half of the region at its start and end points.
- Dragging the end points in **the upper half of the region edits region looping**.

- **You can also split regions:**
    - Select the region you want to split
    - Place the playhead over the point you want to split
    - From the Regions dropdown menu in the Arrange window, select "Split regions by playhead" **[\]**

8 - Drawing MIDI Notes with the Pencil

Overview:

You can also **draw notes manually** instead of recording them in realtime.

Exercise:

- **Create a new MIDI region** in the arrange view: Right click in an empty space of the track's row in the arrange grid and select **Create Empty MIDI Region.**
- Double click on the new region to **view it in the Piano Roll.**
- Choose the **pencil tool** from the top right corner of the Piano Roll window
  - OR hit **[Esc]** then **[2]**
  - OR choose the pencil as the **secondary tool**, and hold the **command key** when you want to draw a note.
- You can **prelisten** notes by clicking them on the keyboard to the left of the editing area
- As you move the mouse around the Piano Roll, the **info display** above the note editing area will display the note name, bar and beat.
- Try drawing the following notes into the grid, and don't worry about note length or rhythm for now: **A3 – C5 – D#4 – F2 – A#6**

9 - Adding More Tracks

- **Add a new software instrument** by clicking the *Add New Track* button at the top left of the arrange window.
- Select **Bass/Electric Bass/Motown Bass**
- **Record a short bassline** to go with your melody

10 - Importing Audio

Overview:

You can also use audio files from outside of Logic. This allows you to import full tracks, recordings from other software, mp3 files, loops from sample packs or any other external audio files.

Exercise:

- Click the **media button** in the toolbar at the top of the Arrange Window
  - Select the **Browser Tab**
  - Navigate to the *Logic Week 1/Samples*, then **drag the ZimbaLoop into your project**
  - OR **In the finder**, go to *Logic Week 1/Samples*, then drag the ZimbaLoop into your project

  - **Loop the sample** by dragging the upper half of the region end point

Mixing Techniques 1: Faders & Pan Pots

Overview:

Mixing audio is a fine art and a complex science. Mixing includes not only choosing relative levels for instruments, but also where instruments sit in the stereo field, the relative depth of the instrument, the instrument's timbre, modulation effects, compression, equalization and many more considerations. There are a plethora of tools available for manipulating sound, but we're going to focus on the simplest of these, which are found in the _Mixer Section_ of the Logic interface.

Exercise:

There are several ways to access the mixer:

1) Select the **Mixer Tab** from the bottom left of the Arrange Window
2) Hit **[X]** on the keyboard
3) Open a **separate window** for the mixer from the Window menu **[⌘2]** (useful for multi-screen setups)

In the mixer window, **each vertical column represents a _Channel Strip_**. Each channel strip contains:

- Volume Faders, Level Meters & Peak Display and Reset button
- Pan Pots
- Mute button
- Solo button
- Input monitoring button
- Record Arm button

12 - Audio Effects & Inserts

Overview:

Each channel strip also contains slots for inserting audio effects, or *Plug-ins*. These slots are called inserts. Logic includes a selection of high quality Plug-ins, which are grouped by category (for example Delay, Distortion, Modulation etc.).

Exercise:

- **Click on an empty insert** in the channel containing the Wurlitzer electric piano to open the *Plug-in Menu*.
- Choose ***Delay/Stereo Delay***
- This opens the stereo delay (or echo) settings.
- **Each effect has a selection of presets** to choose from. Choose presets from the list at the top of the effect window or scroll through them one at a time using the forward and back arrows beside the preset list.
- Close the Delay window.
- You can **edit settings** for any insert by double clicking on the effect name.

- **Place another effect on the next insert.**
- Choose **Modulation/Chorus.**
- Select the **Glimmering Chorus preset**
- **Play with the settings** to see what kind of sounds you can create

- **Inserts can be moved** around using the Hand Tool.
- **Choose the Hand Tool from the primary tool menu** in the top right corner of the Mixer Tab
- OR Hit **[Esc] then [2]**
- OR **Choose the Hand Tool from the secondary tool menu** and hold the command key while dragging inserts

- To **Bypass** an insert:
    - Double click on the effect name to open the effect settings window
    - Click **Bypass** in the top left corner
    - OR **Hold [alt]** while clicking on the effect name in the mixer

Homework

- Make sure the correct input and output devices for your system are chosen in the Audio Preferences window.

- Set the track tempo to 100BPM and record at least 4 bars of audio (you could record an instrument you play, or try clapping or drumming on a desk if you don't have an instrument)

- Create a Software Instrument track, and choose a Bass Guitar preset instrument from the library.
- Record at least 4 bars of MIDI to go with the audio track you have recorded. You can use Computer MIDI Typing or an external MIDI keyboard if you have one.

- Recap on the basics of music theory (you can use the Music Theory Basics Presentation or read through the notes). You don't need too much in depth knowledge. You just need to be familiar with the terms so that we can communicate ideas in class.

- Create a Software Instrument synthesizer
- Create an empty MIDI region then double click it to view it in the Piano Roll
- Use the Pencil Tool to draw a melody
- You can edit the melody by moving the note around and resizing them in the Piano Roll

- Change the tempo to 91BPM and drag the ZimbaLoop into a new audio track, then loop the region for as long as you need

- Use the faders, pan pots, track solo and track mute buttons to mix your track

- Add some distortion, reverb and modulation effects to your tracks

- Play around with the settings of each of these effects to see what kind of sounds you can create.