# Chapter 12. Meeting 12, Approaching a Mix

## 12.1. Announcements

- Audio materials for Processing Report 2 (due Friday 23 March):

  audioProcReport02.zip

- Mix Report 1 Due Monday 9 April

## 12.2. Quiz 3

- ?

## 12.3. Static, Dynamic, Non-Linear Mixes, and Automation

- A static mix means that fader and panning positions are relatively fixed

- A dynamic mix alters fader and panning positions (and other parameters) during the mix

- Hardware mixers developed ways of recording the movement of faders or knobs: became known as automation

- In DAWs, automation is dynamic parameter data

- Non-linear mixing changes the temporal arrangement of components

## 12.4. Destructive and Non-Destructive Audio Editors and Editing

- Destructive: what you see is what you get

- Destructive: Examples: Peak, Audacity

- Non-Destructive: what you see is one representation of what you have

- Non-Destructive systems are general Digital Audio Workstations (DAWs)

- Non-Destructive: Examples: Pro Tools, Digital Performer, Audacity, Sonar, Cubase

- Non-destructive non-linear editing in Live

- Adjusting the grid in Live

## 12.5. Importing Audio

- Non-Destructive editors provide representations of associated sound files and regions

- Source audio files may or may not be in the project

- Linking versus copying: always copy if possible

## 12.6. DAW Projects

- Projects are a folder that contain many components

- The project file is small: it only contains control and parameter information

- The project contains subdirectories for audio files and other data

- It is critical to keep all project components together

## 12.7. File Management in Live

- Audio files in Live are not copied to the project unless explicitly forced to be

- The File / Manage Files menu item shows a dialog to Collect Into Project
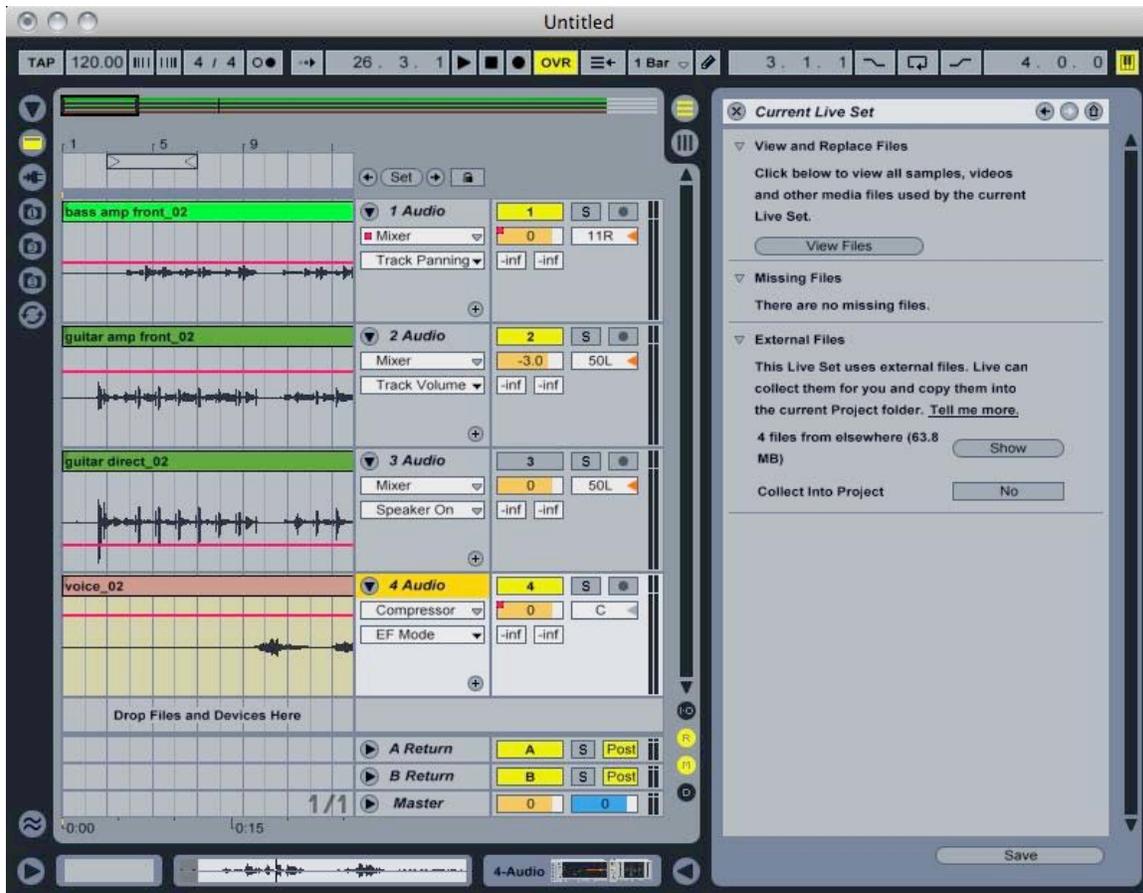
Courtesy of Ableton AG. Used with permission.

## 12.8. DAWs: Tracks

- Many types: audio (mono, stereo, surround), MIDI, auxiliary, master

- Input and output assignments may be busses or physical i/o

- Tracks store information about audio files and how to play them back

- Tracks store multiple parallel parameters that change over time

- Managing automation data in Live

## 12.9. Master Tracks

- Provides a final level control of mix

- Will generally require 3 to 6 dB (or more) gain reduction below unity

- May do 1 to 3 dB (no more) of limiting on master track is sometimes necessary

- Do not compress or do other processing on the master track

- Adding processing to the master track in Live

## 12.10. DAWs: Plugins

- Plugins are serial (insert) processors

- Each plug-in requires hardware processing power

- Always conserve plug-in use as necessary

- Using plug-ins for parallel processing requires an auxiliary track with an insert

## 12.11. Mixing Procedure

- Be sure to time align tracks at beginning

- Can crop tracks at beginning and end

- Listen to each track alone and process

    - Apply channel strip processing

    - Apply fades to remove tacet portions, control start and end positions

    - Set basic pan positions

- Mix groups of instruments organized by microphone capture, ensemble role, or other factors

- Start with loudest instrument and mix downward

## 12.12. Channel Strip Processing

- Optimize each channel or bus-group while maintaining gain staging

- Use filters to isolate necessary frequencies

- Use dynamic effects to remove leakage

- Use moderate to deep compression to raise average level

- Use shallow limiting to control extreme dynamics

## 12.13. Panning Stereo Sources

- If coincident or near coincident, generally pan hard left and hard right

- If not coincident, may explore mixture

- Listen to mono mix to check for phasing distortion

- If combining near and far captures, must pan close microphones to match distant stereo positions

## 12.14. Panning Mono Sources

- Generally avoid 100% hard-panning (95% is a good maximum)

- Low frequencies (bass, kick) are generally toward the center

- Vocals are generally toward the center

- Avoid center build-up with slight offsets out of center (+/- 5%)

- Time keepers (high hat, ride, snare) are often off-center

- Often similar musical roles are balanced left and right (guitars, keyboards)

- Often aim for overall left-right balance

## 12.15. Levels

- Generally 1 dB is the smallest amount of perceivable change

- Always avoid channel, bus, or master clipping

- Amplitudes are relative: find ways to cut rather than boost

- May need to adjust levels by musical sections (boost for a solo)

## 12.16. Timing Offsets

- Measuring distances and calculating millisecond offset

- Use a delay plugin to push back closer microphones

- Listen and adjust: perfect alignment is not required

## 12.17. Double Tracking

- Using two copies of the same audio file panned hard left and hard right

- Hard panning helps removing potential phasing problems

- Delay a second copy by less than 30 ms

- Delay processor must be at 100%

- Alternatively, can use two similar takes of the same material

## 12.18. Bussing: Idiomatic to the DAW

- DAWs can support huge numbes of buses

- Bus design promotes sensible organization of tracks

- Bus design promotes computational efficiency

## 12.19. Bussing: Multiple Captures of the Same Source

- Group multiple microphones of the same source

- Example: drum kits

- Example: pianos

- Example: guitars, amplifiers, direct signals

## 12.20. Bussing: Multiple Instruments Performing Related Roles

- Grouping musical parts or sections

- Example: rhythm sections

- Example: background vocals

- Example: multiple vocal parts

## 12.21. Mixing and Listening

- Listen at multiple output volumes

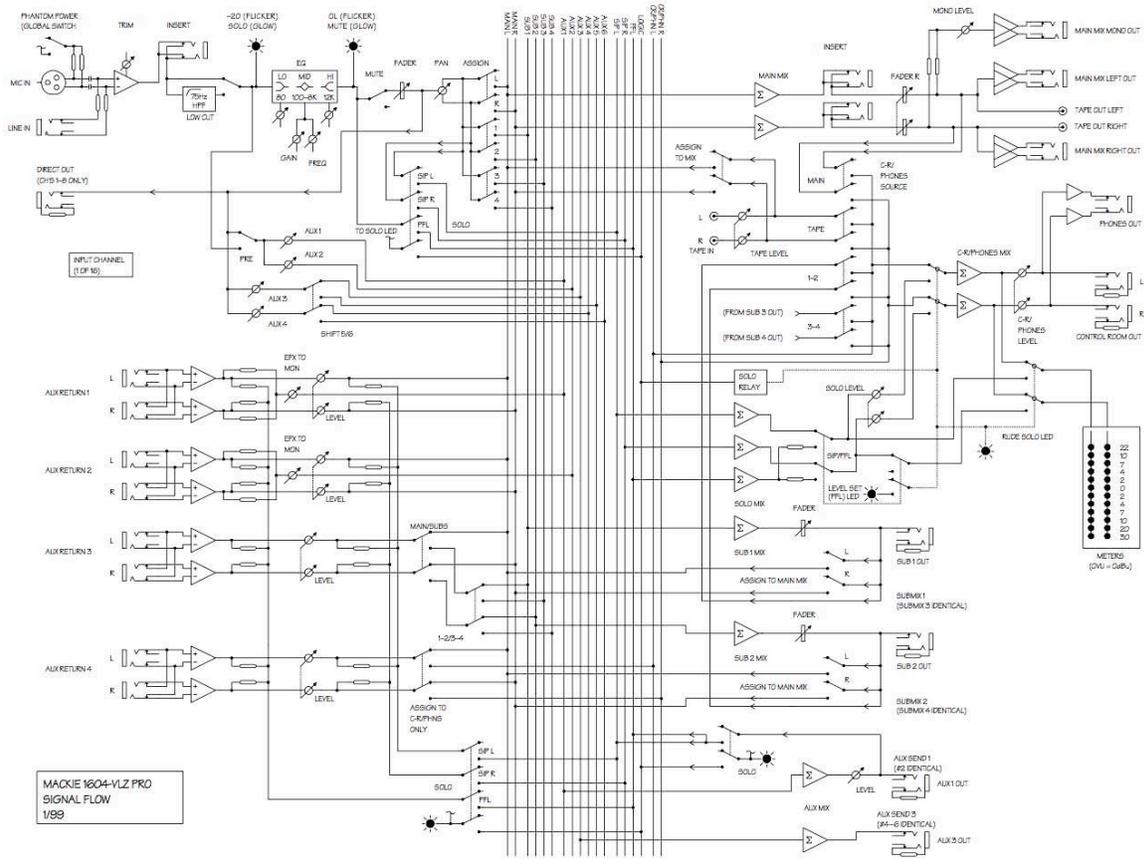- Listen on multiple playback devices and headphones

- Take breaks

## 12.22. Case Study: Mackie 1604 VLZ

- One of the most popular small mixers

- Complete manual in Blackboard course documents

- Small collection of everything you need

MACKIE 1604-VLZ PRO
SIGNAL FLOW
1/99

INPUT CHANNEL
(1 OF 16)

21M.380 Music and Technology: Recording Techniques and Audio Production
Spring 2012