

Music Production

- Notes

Notes

- check Chuck - music programming language
- Ideas of setup
 - for session view Launchpad (Quneo) should be enough
 - for arrangement view keyboard and/or pads
 - checkout launchpad95 script
- Arturia
 - seems to make pretty cool devices fairly priced. Most have VC/Gate output.
- Books
 - The Secrets of Dance Music Production
 - Making Music - 74 Creative Strategies for Electronic Music Producers
- Links
 - <http://www.musicradar.com/news/tech/the-best-android-music-making-apps-in-the-world-today-276167>
- Magazines
 - Future Music
 - Computer Music
- Audio Interfaces
 - **Behringer UMC204HD**
 - Novation Audiohub 2x4
 - 4xRCA outputs, 3x USB hub,
 - Focusrite Scarlett 2i4 (2G)
 - ESI UDJ6
- songs to sample
 - Et si tu n'existais pas (Joe Dassin)
 - Black Betty (Tom Jones)

What do you need

- DAW, for example Ableton Live
- MIDI Keyboard
- Studio Headphones or Studio Monitors
- Audio Interface, for example Focusrite (optional)
- Microphone for instruments and/or voice (optional)
 - dynamic microphones used for live gigs, loud sounds, low sensitivity, they don't require power source
 - condenser microphones commonly used in studios, they require power source (48v)
 - phantom power through XLR cables

- Other instruments, for example a Synth (optional)

Controllers

Controllers don't play sounds they only send sound information, usually through MIDI (Musical Instrument Digital Interface), to a device that generates the sounds and an audio interface can play those sounds.

Instruments can play sounds, therefore they can have some or all of the devices: MIDI Controller, Synthesizer, Sequencer, Audio Interface, they are an "Appliance". They do need to be paired with a PC.

Pads and Knobs

There are 2 types of knobs, endless rotary encodes and fixed-position or control knobs. **Encoders** are used to increment or decrement values. Jog wheels are a kind of encoders. **Control knobs** or **Pots** (short for Potentiometers) are used to set absolute values, they can have center detent.

- Quneo
- Arturia BeatStep - <https://www.arturia.com/beatstep/overview>
 - controller and step sequencer
 - 16 pads (2x8) and 16 encoders (2x8)
 - 16-step analog sequencer
 - connectivity: USB, MIDI, CV/Gate
 - price: 100 E
 - Pro version: ~250 E
- Akai LPD8 (Laptop Pad Controller)
 - 8 pads and 8 Q-Link knobs (they look like Control Knobs)
 - price: 50 E
- Akai APC mini (Ableton Performance Controller)
- Akai APC40 (Ableton Performance Controller)
- Midi Fighter Twister
 - 4x4 clickable encoders
 - Center Detent function so it can be used like a potentiometer with middle LED indicator
 - price: 280 E
- Novation Launchpad & LaunchControl

Keyboards

- **Arturia KeyStep**
 - keyboard controller and polyphonic step sequencer
 - each sequence can have 64 steps, each step can have up to 8 notes
 - can be connected to Novation Circuit
 - connectivity: USB, MIDI, CV/Gate
 - price: 120 E
- **Arturia MiniLab Mk II**
 - comes with Analog Lab Lite, Ableton Live Lite, UVI Grand Piano Model D
 - 25 slim keys, 8 RGB pads (x2 banks) and 16 encoders (2 clickable), Pitch Bend and Modulation touch strips
 - keys and pads and encoders, but no step sequencer like with Beat- or KeyStep
 - price: 100 E
- **Akai APC Key 25** (Ableton Performance Controller with Keyboard)
- **Akai MPK mini** (Music Performance Keyboard and Pads)
- **Novation LaunchKey** (mini)

Instruments

Synthesizers

- **Novation Circuit**
 - Hybrid Synth-Drum Machine, Sequencer, Controller
 - allows sample uploading
 - 4 tracks
- **Korg Minilogue**

Drum Machines

Drum machine is used to create drum patterns outside of your DAW sequencer. As a side note, if your drum machine supports sample upload, most don't, then it can basically become any instrument you want, it gets closer to a sampler.

- **Novation Circuit**
 - Hybrid Synth-Drum Machine, Sequencer, Controller
 - allows sample uploading
 - 4 drum tracks
 - price: 290 E
- **Arturia Spark LE**
 - price: 200 E
- **Elektron Analog Rytm**
- **Elektron Digitakt**

- can sequence up to 8 external synths
- allows sample uploading
- Korg Volca Beats
 - entry level
 - can be connected to other Volca synths
 - real analog sound, but not fully analogue (hybrid)
 - only one drum kit, it can be modified in many ways
 - single audio output

 works only with computer

Samplers

Capable of creating long phrases or whole tracks (as opposed to a drum machine which is capable of creating drum patterns or short phrases). NI Maschine MK3 is an example of a notorious modern (as of 2018) sampler (or Groovebox), usually used as a drum machine. It only works connected to a computer.

- Korg Volka Sample
- Novation Circuit
- Elektron Octatrack

Software

To Check

- Mixbus
- EnergyXT
- Qtractor
- Tracktion 5
- Mulab Free
- Ohm Studio
- PreSonus

DAWs

Ableton Live

Reaper

- unlimited evaluation

LMMS

Linux MultiMedia Studio

Plugins

Free

- Synth1
 - Virtual Analog Synthesizer
- TAL Plugins (Togu Audio Line)
 - TAL NoiseMaker
- W1 Limiter
 - simulation of L1 limiter by Waves
- Rough Rider
 - aggressive compressor
- Magical 8bit Plug
- Alchemy Player
- iSpinner
- LoudMax

Popular

- Serum
- Synth1

DJ

VirtualDJ

Use quneo's vertical slider to control LPF of the filter knob:

```
var "$shift" ? nothing : param_multiply 0.5 & param_greater 47% ? deck left eq_low 50% : deck left eq_low
```

Serato DJ

See `serato.md` file.

Music Theory

Freq Guide

- 20-50Hz Sub-bass
 - you feel this range rather than hear it
- 50-250Hz Bass
 - here is usually the bass boost in most apps and appliances
- 250-800Hz Muddy
 - between bass and mid-range
- 800-6000Hz Mid
 - human ear is very sensitive to it
 - 4kHz mark - the most sensitive
 - very small adjustments here have a big impact
- 6000-8000Hz Treble
 - control the brightness of the track
 - the magic frequency
 - 50-8000Hz is the most important part of the track
- 8000-20000Hz Ultra-High Treble
 - high hats, the hiss
 - here you get the harshness
 - older people can't really hear this

Tonality and Atonality

Tonal music has a clear tonal center, the "goal note". It's called tonic or the key of the melody. Usually the first and the last note of a melody. It's the first note of the scale used to create the melody.

Atonal music has no clear tonic pitch or goal note.

When we say that a song has a single tonal center or tonic, we also are saying that it is in a single key. It is made from a set of notes that have the tonic pitch as the first note. This set of tones can be arranged in stepwise order as a scale. DO RE MI FA SOL LA SI DO is a scale. As example **C MAJOR** scale means the tonic note is C and the mode is **major**.

Harmonic Function

The most important chord in the key is called the tonic harmony and the tonic pitch is the lowest note of that chord. A chord is multiple notes played together.

Harmony is succession of chords to create a sense of harmony or a story, chords progress to control the creation and resolution of tension. Harmonic function is what the chords "do".

- Tonic = Stable chord (at the beginning and end of the song)
- Predominant = Connecting chord, a chord that prepares the Dominant
- Dominant = Unstable chord (throughout the song and as the second to last chord)

Notation

Chromatic scale: 12 notes, at half step distance.

Middle C = 262 Hz

C4 is called the middle C.

A 7 notes scale has 8 notes, the 8th is same as the 1s up an octave. The interval between the 1st note of a scale and the 5th note is called the **perfect fifth**.

RMS = Root Mean Square

Major Key

- all the white keys in a scale on a piano

Minor Key

- most used in european music, especially dance music
- T, S, T, T, S, T, T
 - T = tone, S = semitone

Measure and Meter Signature

Measure = Bar

Sound Quality

- jitter simulation experiment <http://www.sereneaudio.com/blog/what-does-jitter-sound-like>
- bluetooth quality <http://www.sereneaudio.com/blog/how-good-is-bluetooth-audio-at-its-best>

Online Resources

- <https://www.musictheory.net/>

Music Production

A song has generally sounds in 4 categories:

1. Drums
2. Bass
3. Chords
4. Melodies

Recording

For recording using a microphone you will need microphone (duh), microphone stand, XLR cable, audio interface and a computer with a recording software (DAW or Audacity)

How to Create Chords

- take a note (for example a tonic to get the tonic harmony)
- major chord
 - copy the note 4 positions up
 - copy one more time 3 positions up
- minor chord
 - copy the note first 3 and than 4 positions up
- create a chord progression by copying the chord up on every note of the key
- when creating a loop start with the tonic chord
 - and finish with the 4th or 5th chord
 - use any from 1 to 6 in between

How to Sound musical

Without knowing (too much) musical theory.

Stay in Key

- mark all the notes from a scale in the pianoroll and fold it to see only those notes
 - copy the notes on all octaves

- move the scale notes off grid so you only see them not hear
- draw your melody, you'll be in key

Chord Progressions

- open a chord progression and disable it
- draw on top of it, you'll be in key and it will probably already sound good
- move octaves down and draw your bass line
- use just the base note for the bass line

Harmony

- find a piece of song you like
- convert it to harmony, it will somewhat resemble the original song
- edit the result until you like it
- use the scale plugin to change the key
- add drums or bass line

Use MIDI Effects in Ableton Live

- Scale Plugin
 - use C minor for example
 - change the note and you will be in that key, for example chose F and you'll have F minor
 - combine it with Chord plugin
- Chord Plugin (Chord Sets)

How to use Samplers

- a sample is a piece of audio of any length between, let's say, half a second and a full song
- it is usually a something like a drum hit, snare or kick for example
- sampling typically means to get some audio clips into a sampler, and trigger them using MIDI
- you can buy sample packs, cut some pieces from entire songs and use them as samples, or you can create your own samples
- for example in Ableton drag the Sampler instrument onto a MIDI track and an audio clip onto the sampler. Use your keyboard to trigger the sample at different pitches

How to use Synthesisers

- **Serum** is a very popular and famous synth
- for example to create a bass sound, you start with a squared wave from an oscillator
 - so you need an Oscillator

- filter out the high frequencies using a filter, since the bass has only low frequencies
 - so you need a Filter
- use an envelope to setup the attack and hold, decay and sustain and release when a key is pressed
 - so you need an Envelope
 - attack = the time it takes for the sound to reach its maximum volume or the fade in time
 - hold = TBD
 - decay = the time it takes to get from the maximum volume to the sustain volume
 - sustain = the main volume of the sound (in dB) when the key is held
 - release = the time it takes for the sound to fade out when key is released

Mixing and Mastering

- mixing means to balance out all the elements of your final track
 - balance levels
 - balance frequencies using equalisers
 - take out what clashes
 - control the dynamic range using compression
 - use reverb to make it sound "somewhere" (in a room or in a hall)
- mastering means polishing your final track
 - comes after mixing
 - import back the exported track as audio and polish it further

Music Genres

Kizomba

Sounds and Instruments

- Ableton Live - Muted & Bell Unpitched