Synth Lab Manual

Scope of this manual

This manual has been created to provide generalized documentation on using the equipment contained in the Synth Lab. It focuses on how the equipment has been configured to provide a variety of ways to utilize the studio. This document serves as a starting point for learning the gear and how the different devices can work together.

Each device has updated manuals that can be accessed online. Many of these manuals have also been saved on the Synth Lab computer, which you can access on the desktop. Additionally, we recommend searching for video tutorials online to help you understand how others use the devices.

Synth Lab

About the Synth Lab

The Synth Lab is a self-serve electronic music recording studio available to WSU students, staff and faculty, located in the Dimensions Lab on Holland 1st floor. In Fall of 2024, the Digital Audio Collective RSO was awarded Student Technology Fee funding to create a space offering hardware electronic music instruments. Funding was received in July 2025, the studio was assembled the following semester, and the Synth Lab opened to the WSU community in January 2026.

Background

The Synth Lab contains a curated set of hardware electronic music instruments developed and used throughout the last 50 years that have been essential to the history of electronic music, specifically hip hop, EDM and experimental music. This equipment is either newly manufactured clones of older gear, or new and improved designs that take sound making to new levels.

The Digital Audio Collective began in 2023. Its members have been primarily interested and engaged in creating electronic music including hip hop, EDM and experimental music. The Synth Lab has been designed to support these interests.

Equipment

Synth Lab Computer

- Hardware
    - CPU: AMD Ryzen 5950X 16-Core, 32-Thread 4.9GHz Turbo
    - RAM: 64GB DDR4 RAM
    - Video Card: Nvidia RTX 3080 10GB
    - 27" 4K UHD BenQ Monitor (model PD2705)
- Windows 11

Electronic Music Instruments

- Synthesizers
    - Moog Muse – 8 voice analog poly synth
    - Groove Synthesis 3rd Wave – 24 voice wavetable synth
    - Komodo Essence FM MKII – 300 voice digital FM synth
- Sampler/Sequencer
    - Akai Professional MPC Key 37 – sequencer/sampler workstation
    - Electron Digitakt II – sequencer/sampler

- Drum Machines
    - Behringer RD-8 MKII – drum machine, Roland TR-808 clone
    - Behringer RD-9 – drum machine, Roland TR-909 clone

Turntable

- Technics SL-1200MK7 – turntable/record player

Studio Equipment

- RME Fireface 802 Audio Interface
- iConnectivity MIO XL MIDI interface
- 1x Shure SM7dB
- 2x JBL 305P 5" monitors, 1x JBL LSR310S 10" subwoofer
- 2x Patchbays
- 2x Line Mixers

Software

- Ableton Live 12 Suite
- FL studio
- Auracle X (for use with iConnectivity MIO XL MIDI interface)
- Reaper
- Ni Komplete 12
- SuperCollider
- Adobe Creative Cloud
- DaVinci Resolve
- Blender
- VLC
- Microsoft Office
- Google Chrome
- Firefox
- QGIS

Synth Lab: Powering Up

This procedure describes how to safely power up music devices in the lab.

Step 1: Turn Down Control Room Volume

Turn down the Control Room Volume knob (knob with green sticker) all the way down on the rackmount mixer labelled L1 (line mixer 1). This is found within the rack on the left built into the desk with the computer monitor. Reducing the volume will prevent loud pops and clicks when music devices are powered up. This also prevents damage to the speakers.

Step 2: Turn on Music Devices

Turn on the music devices that plan to use. Device Power On/Off guides for each device are posted near the equipment.

Step 3: Set Desired Volume

Set the control room volume knob to desired volume (L1 or line mixer 1), then ensure the mixer channels connected to the desired music device is also turned up.

Synth Lab: Choosing a Computer

Option 1: Synth Lab Computer

The Synth Lab's computer is connected to the music devices by default. This provides a selection of DAWs including Reaper, Ableton Live, Adobe Audition, FL Studio and Audacity. It also includes Native Instruments Komplete 12, a suite of virtual instruments and effects that can be accessed in most DAWs.

Option 2: User Device or Laptop

The Synth Lab also allows users to bring their own laptop computer to connect to the built-in hardware. This enables one to access their own hardware, software, preferences, configurations, and operating system. The user must install the associated drivers/software on their own device and connect that device to the USB 2.0 cables and then switch the USB switches to Input 2 by pressing the center button. There are two of these switches, one connects to the RME Fireface 802 Audio Interface, the other connects to the IConnectivity MIO XL MIDI Interface. Additionally, you can connect the computer monitor with a USB C cable if desired.

External links to download software/drivers

RME Fireface 802 Audio Interface driver
RME Fireface 802 downloads link

Iconnectivity MIO XL MIDI Interface
Iconnectivity Windows drivers link
Iconnectivity control software link

Set the Synth Lab to its Default State prior to departure

If you choose to use your own device, please make sure you allow enough time to set the Synth Lab back to its default state. The computer monitors input must be set to the Synth Lab computer and the switches must also be set to Synth Lab computer. Failure to do this may cause difficulties for the next user.

Synth Lab: General Instructions

Device

The individual devices in the Synth Lab may take time to learn and understand. The best learning resources are the device manuals and videos and guides created by device users that can be found online.

Audio Routing

The Synth Lab audio routing has been configured to allow for different approaches to using the equipment. Here are three examples:

- Learn and play the music devices: synthesizers, drum machines, samplers/sequencers
- Utilize a DAW-based approach, using Reaper, FL Studio, Ableton Live or other software on the computer to sequence and record music.
- Sequence and Record music with a Sampler/Sequencer device such as the Digitakt or MPC

The Synth Lab's default configuration is optimized for learning and playing the Synth Lab's music devices. This simply mixes the outputs of all the instruments through rackmount line mixers and then outputs the mixed signals to the speakers. Keep in mind that individual devices also have their own main output volume.

All music device outputs and inputs are terminated at the two patchbays prior to the mixer. This means that all audio connections, both inputs and outputs can be accessed and routed at one or both patchbays.

Patchbay Overview

- The patchbays top row of jacks are audio outputs from the equipment.
- The patchbays bottom row of jacks are audio inputs from the equipment.
- Each top row jack is connected to its corresponding bottom row jack. This connection is a half-normalled configuration, which also allows the user to split the signal to a separate destination with a patch cable.

Patchbay to Mixer Notes

- Most device outputs are normalled to the rackmount line mixers L1 and L2 through the patchbay.
    - Signals from patchbay P2 output into the line mixer L2

    - The output of line mixer L2 outputs into the patchbay P1.
    - Patchbay P1 outputs to line mixer L1.
- The Moog Muse is first routed through patchbay P1 to patchbay P2. This allows the outputs to be available at both patchbays. After patchbay 2, the outputs show up at line mixer L2.
- The final Control Room Volume output is labelled, and the knob is marked with a green sticker on line mixer L1.
    - The line mixer L1 outputs to the patchbay P1, which is normalled to the subwoofer.
    - The subwoofer outputs to P1 where it is normalled to the left & right speakers.

Record

To record or sample the sound, the user must use a ¼" patch cable to route the instrument output to the desired input of the audio interface, MPC, Digitakt or 3rd Wave keyboard synth.

MIDI Routing

Most of the instruments in the Synth Lab can be controlled by any other instrument or the computer via MIDI. MIDI, which stands for Musical Instrument Digital Interface, is a protocol that allows electronic music instruments to communicate with each other, such as note pitch, timing, sync and other control messages. MIDI contains 16 channels of data, meaning instruments need to be set to send/receive appropriate channels.

All the Synth Lab's instruments are connected via USB to the iConnectivity mioXL MIDI patchbay and communicate over USB-MIDI protocol. To view the MIDI data information being sent/received, press the touch panel on the mioXL. USB-MIDI should show activity lights on MIDI channels sending/receiving data.

Routing can be configured through an application on the computer called Auracle X. Open the application, verify the mioXL is connected, select MIDI Routing. Select a source or device sending MIDI, then select destination(s) to determine the device that is to receive the MIDI signal.

- The ports listed under USB Device represent physical devices and are labelled. They show up as HST 1-7.
- Ports listed under DAW are ports available to the DAW software on the computer such as Reaper, Ableton Live or FL Studio. These ports must be activated in the DAW software settings. This allows you to sequence MIDI notes and data from the

software to the various hardware device. The reverse is also possible, using hardware devices to record MIDI data in the software.

Synth Lab Manual, a work-in-progress

Send us your feedback on the Synth Lab Manual so that we can make it more useful. We will do our best to create documentation or incorporate useful things you may discover.

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