mantis sound diffusion

## general configuration of the diffusion system

idea

- have as many analog outputs as possible
- two motus connected via firewire to laptop
- aggregate device to have motus appear as one interface with 44 outputs (!)
- use two additional motu devices as digital-to-analog-converters
- hook up external gear via ADAT/Analog/SP-Dif
- use max-patch to route / attenuate signals to loudspeakers
- control max-patch via the GLUION / Faderbox

summary of procedure

- turn on: Computer, wait for boot, turn on GLUION, Motu I / II / (III, Motu 2408)
- setup gluion ethernet-connection
- connect motus with each other + mixer (+ x)
- configure motus: clock-source, adat, default-stereo-output-configuration
- create aggregate device
- setup sample rate (motus, max, + x)
- setup max (motu-aggregate-driver, sample rate)
- (configure
- setup mantis-max-patch (inputs/outputs/fader-setup/input-output-matrix/delays/filters/soundfile)
- turn on dsp

detailed procedure

- MUTE ALL SPEAKERS
- GLUION: setup ethernet connection
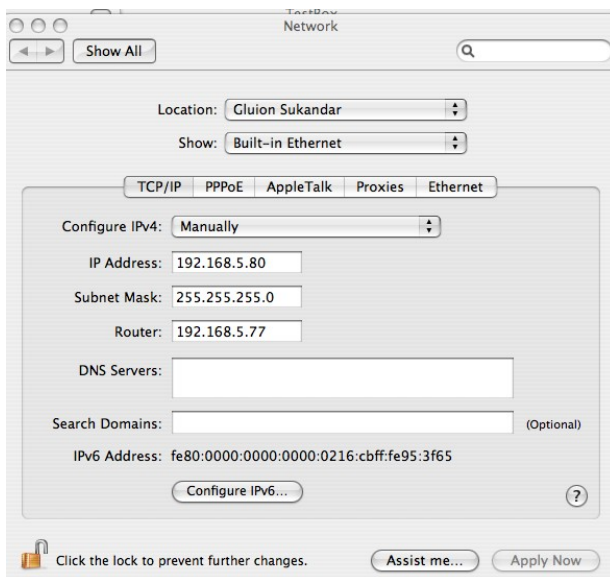
Picture 1: GLUION network settings

Motu: cable configuration

- Motu I
    - FireWire → Diffusion-Computer
    - FireWire → Motu II
    - Out 1..8 → Mixer Line-In 17..25
    - SP-Dif Out → Motu II: SP-Dif In
    - ADAT-Out → Motu 2408: ADAT-A-In
    - In 1/2 → Motu III: Main Out 1/2
    - In 3/4 → loose wire (= external input)
    - In 5/6 → loose wire (= external input)
    - ADAT-In → loose wire (= external input)
    - SP-Dif In → loose wire (red RCA)
- Motu II
    - FireWire → Motu I
    - Out 1..8 → Mixer Line-In 26..32
    - SP-Dif In → Motu I: SP-Dif Out (=clock source)
    - SP-Dif Out → loose wire (black RCA)
    - ADAT-Out → Motu III: ADAT-In
    - ADAT-In → Motu III: ADAT-Out
- Motu III
    - (Firewire → other computer)
    - Main-Out 1/2 → Motu I: In 1/2
    - Out 1..8 → Mixer Line-In 9..16
    - ADAT-Out → Motu II: ADAT-In
    - ADAT-In → Motu II: ADAT-Out (= clock source)
- (external Device)
    - Out 1/2 → loose wire 1/2 (Jack, Motu I, 3/4-In)
    - (ADAT-Out → loose wire (Motu I, ADAT-In)
    - (SP-Dif-In)→ black-RCA (= clock source)
    - (SP-Dif-Out) → red RCA (Motu I, SP-Dif-In)
- (Motu 2408)
    - ADAT-In A → Motu I: ADAT-Out (= clock source)
    - Outs 1..8 → unconnected in the moment
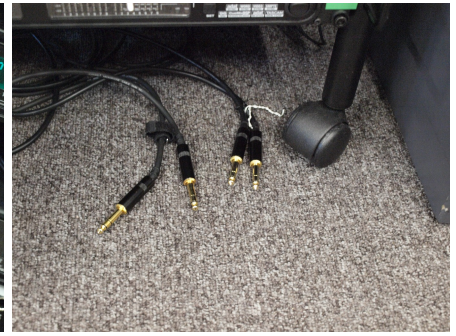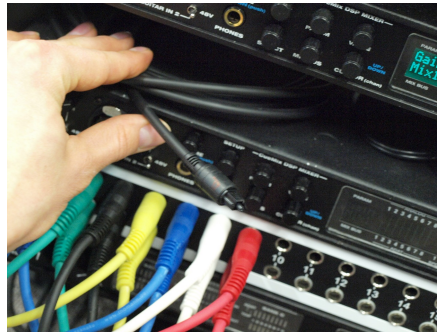
left: red RCA   = Motu I, SP-Dif In, black RCA = Motu II, SP-Dif Out
middle: ADAT-wire   = Motu I Adat In
right: 4 loose jacks = Motu I Analog In 3...6
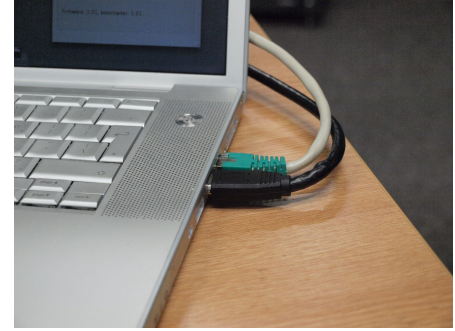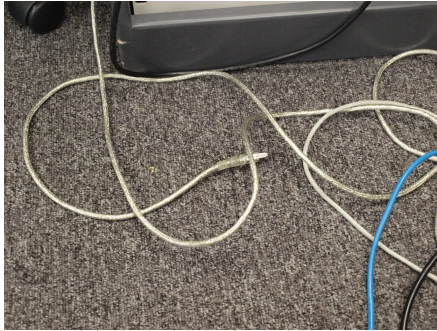
left: loose silver firewire-wire = Motu III, firewire port, to be used be another computer

right: green network-wire = GLUION <> diffusion computer, black firewire-wire = Motu I / II <> diffusion computer

Motu : software configuration

- turn on **first motu and wait** for it to show up in the Motu Control Panel
- turn on **second motu and wait** for it to show up in the Motu Control Panel
- Motu Control Panel:
    - Motu I: clock source: master, ADAT IN/OUT: Optical, Default-Stereo-Out: Main 1/2
    - Motu II: clock source: SP-Dif, ADAT IN/OUT: Optical, Default-Stereo-Out: Main 1/2
    - Motu III: clock source: ADAT, ADAT IN/OUT: Optical, Default-Stereo-Out: Main 1/2 (not connected to Mantis-Sound-Dif System via Firewire)
- (Motu 2408: clock source: ADAT-In A)
    - (external device: clock source: SP-Dif (black RCA wire))
- Setup Motu CueMix
    - Motu I / II: remove all input to output connections on ALL Mix-Busses
    - Motu III: route ADAT 1/2 to Mix_Bus 1 (Out 1+2), …
- setup aggregate device in Applications → Utilities → Audio-Midi-Setup
- Motu: Setup Samplerate
    - set the sample rate for ALL motus and digitally connected devices!
    - DO NOT TRUST THE SAMPLE RATE DISPLAY ON THE HARDWARE. it might be WRONG!!!
    - devices (slave) receiving the clock from digital inputs: set the device to the sample rate of the sender (master)
- Mixer-Configuration / Patchbay
    - route direct outs to each loudspeaker
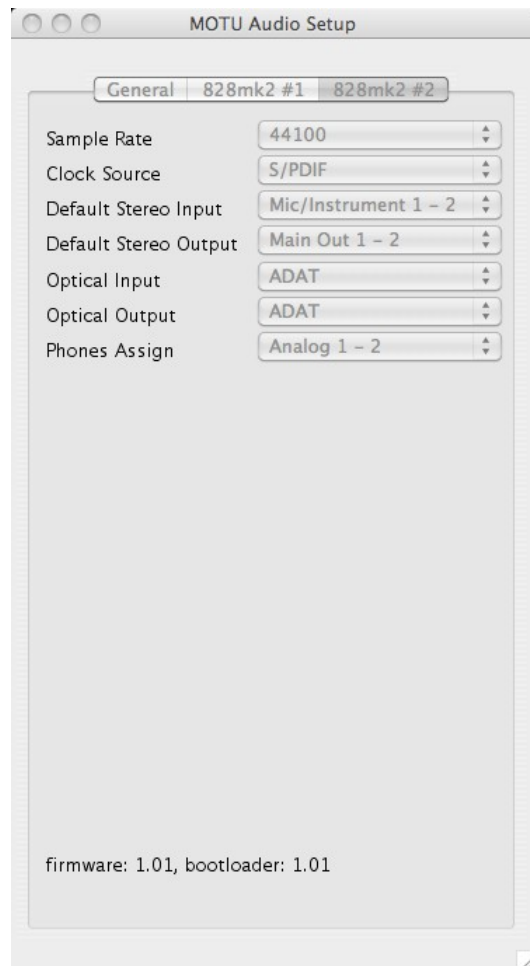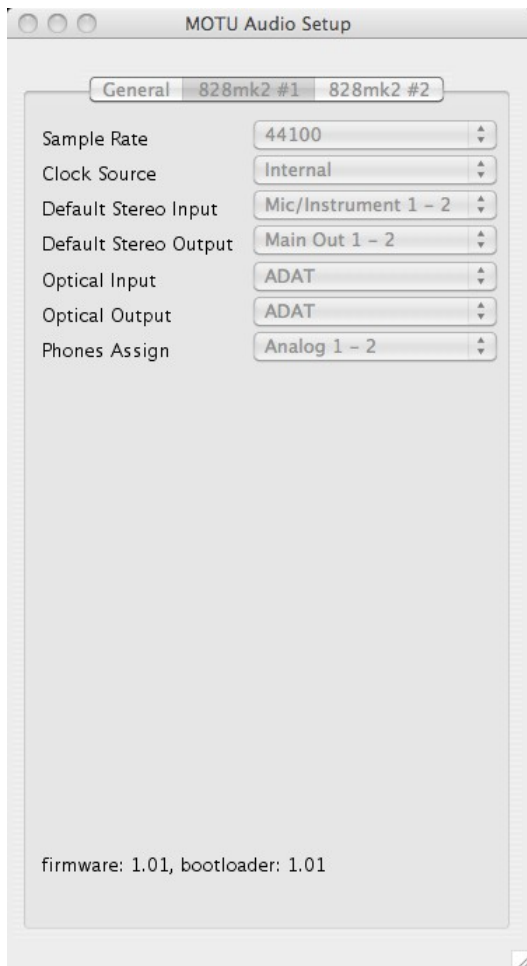
Picture 2: Motu Setup for Motu I (left) and II (right)
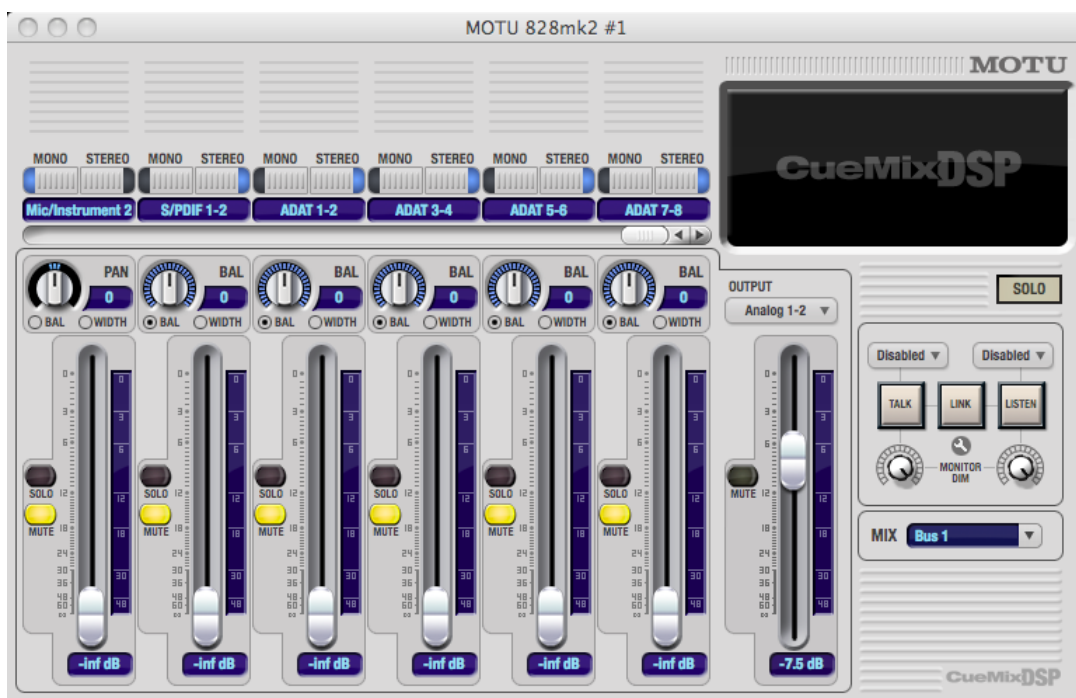
Picture 3: Motu Cuemix: setup adat-inputs to zero on all mix busses (see lower right side corner). for motu III this needs to be different: each adat stereo input needs to be routed to a separate mixbus. the mixbus needs to be routed to a separate hardware output.

max 5 configuration

- copy the patch and add the path of the patch to max's file preferences (options > file preferences)
- select aggregate device ("TwoMotus") in DSP-Status
- setup sample-rate to the setting of the motus in DSP-Status
- **DO NOT CHANGE THE SAMPLE RATE WHILE MAX IS RUNNING AND SPEAKERS ARE UNMUTED. MAX WILL CRASH!**
- setup Max-Patch: MANTIS-DIFFUSION-SYSTEM (″~/Documents/MANTIS/MANTIS-DIFFUSION-SYSTEM.maxpat″)
  - recall saved preset
  - (calibrate faders: move them all down, press: faders down, move faders all up, press: faders up, move all faders down again)
  - turn on DSP
  - change main routing matrix if needed
  - adjust the faders / volume
- last step
  - UNMUTE THE LOUDSPEAKERS IF NO DISTURBING SIGNAL IS VISIBLE ON THE MIXER

description of the diffusion max patch

idea

- route inputs to outputs
- attenuate each routing connection via a fader
- filter/delay each output signal independently (or together)
- globally attenuate all signal outputs by a main-level
- globally filter input-signals (tape + hw-input separately)
- internal soundfile-player if needed
- use LESS hardware-inputs in the diffusion-system
- use LESS/EQUAL hardware-outputs in the diffusion-system

playback / diffuse sound

soundfile

- reload corresponding preset !
- drop soundfile in drop-box in the "controls"-window
- route the soundfile-player-outputs to outputs if needed

external input (external soundcard)

- connect external hardware to motus → analog or digital (beware of the clock!)
- check if hardware-input is routed to the main-routing input
- reload corresponding preset !
- route input to output in main matrix if needed

external input (motu III)

- connect silver (!) firewire-wire to own computer
- check motu-settings: clock-source = adat-in

- check connection: main out 1/2 → motu I: in 1/2
- reload corresponding preset !
- route input to output in main matrix if needed

configuration
hardware inputs
- to change the mapping of the hardware inputs to the main-matrix inputs click on:
- "config INs"
- x axis = hardware inputs, y axis = main-matrix inputs
- select a preset or create a new one
- the selected preset is NOT stored within the main-preset to allow using the main-presets on different hardware

hardware outputs
- to change the mapping of the main-matrix outputs to the hardware outputs click on:
- "config OUTs"
- x axis = main-matrix outputs, y axis = hardware outputs
- select a preset or create a new one
- the selected preset is NOT stored within the main-preset to allow using the main-presets on different hardware

fader routing
- open fader-routing window
- assign output-channels to faders
- you can assign one fader to several outputs (= channel grouping)

delay settings
- adjust the delay time for each channel separately, use the numberbox
- press "Dl" to activate / deactivate the delay

filter settings
- select the channels you want to filter by hitting pressing the "E"
- adjust the filter settings in the upper number boxes (3-band-EQ-Settings)
- click on "view" in the filter-settings to see the resulting filtergraph
- press "LS", or "Mid" or "HS" to (de-)activate the desired filter band
- "S" copys the current filter-settings to a channel
- "V" displays the channel's filter-settings in the filter-settings number boxes and filtergraph

save presets
- change settings (main-matrix / filter / delay / fader-routing)
- open "controls"-window
- enter the preset name and hit enter
- **SAVE THE PATCH!!! (and make sure, when you quit max to save the preset-file to the mantis-diffusion-system folder), if you delete presets please save the patch under a different name**