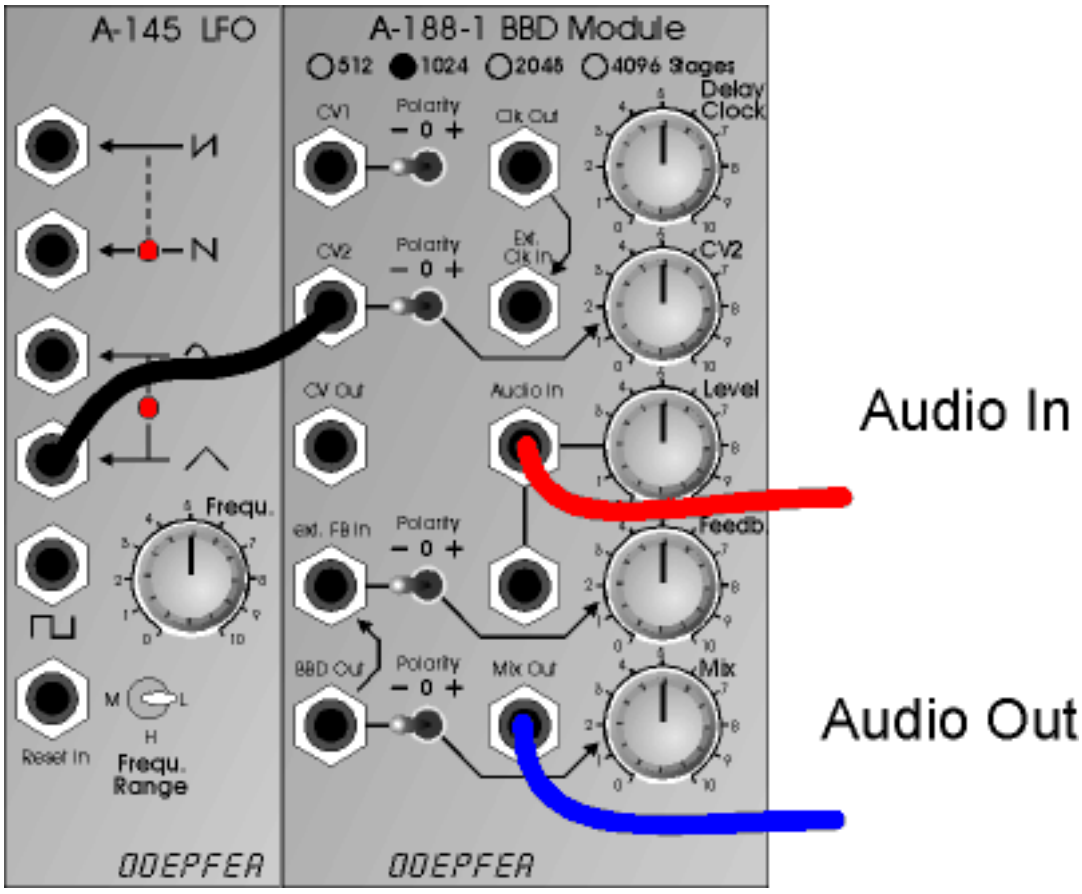
The first section of MP3 examples is made with a 2048 stage BBD device. The maximum clock frequency mentioned in the data sheet of the 2048 stage BBD is 100kHz. This leads to a minimum delay time of about 10ms. But we found that the device is able to operate even a bit beyond this spec (up to ~ 150kHz) causing a minimum delay time of about 7ms.

Two different audio sources are used for the examples:

- BBD_Source_1.mp3: a short sample recorded with the A-112 (original signal #1 without BBD effect for reference)
- BBD_Source_2.mp3: an 8 note sequence made with A-100 modules: A-110 + A-105 + A-140 controlled by a MAQ16/3 (original signal #2 without BBD effect for reference)

For both audio signals a standard flanger appication was made: triangle output of a LFO is used to control the clock CV input of the BBD module, short delay time/high clock rate, medium resonance.



- BBD_Flange_LFO_1.mp3
- BBD_Flange_LFO_2.mp3

For the first audio signal an example with an envelope follower was made. The A-112 output is processed by an A-119. The envelope output of the A-119 is used to control the clock CV input of the BBD module. In addition the manual clock rate is reduced by hand during the example. At the end of the example the sound becomes more and more "destroyed" as the clock rate goes below the value that is specified for the BBD

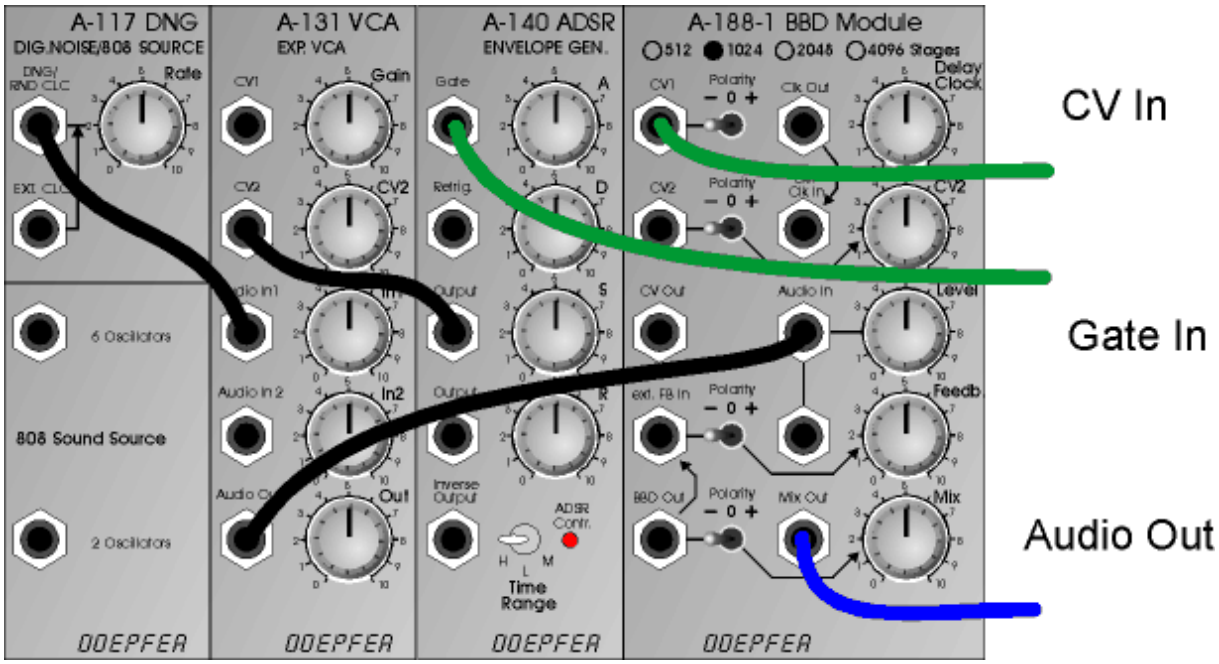
circuit. In addition at the end of the example the clock frequency can be heard as it is now in the audible range (the input signal is scanned with the audible clock rate):

BBD_Envelope_1.mp3

In the last example the second audio source is used and the clock rate is changed manually over the whole range and back again. Additionally the resonance/feedback is lowered a bit by hand during the delay times.

- BBD_Manual_2.mp3

The next mp3's show some examples of the Karplus-Strong synthesis. The patch is the same for all examples:



Karplus-Strong patch

The digital noise signal of the A-117 is processed by a VCA (A-131) that gets it's envelope from an envelope generator (A-140). The output of the VCA is the audio input of the BBD module. A sequencer MAQ16/3 that is used to generate a simple sequence. The gate output of the MAQ16/3 is triggering the gate input of the A-140, the CV output of the MAQ16/3 is controlling the CV clock of the BBD module.

The first three examples show the patch at different settings of the manual clock control of the BBD module (no parameter is changed during the example in question):

- BBD_Karplus_1.mp3
- BBD_Karplus_2.mp3
- BBD_Karplus_3.mp3

In the next example the Resonance (or feedback) control of the BBD module is increased manually (all other parameters remain unchanged):

- BBD_Karplus_Resonance.mp3

In the following example the Decay of the Envelope generator (A-140) is increased manually (all other parameters remain unchanged)::

- BBD_Karplus_Decay.mp3

In the last example the Clock rate of the digital noise (A-117) is increased manually (all other parameters remain unchanged)::

- BBD_Karplus_Source_Clock.mp3

With suitable modules all the manually changed parameters can be voltage controlled too (e.g. external VCA in the feedback loop of the BBD module, A-141 or A-142 instead of A-140, external clock for the A-117, e.g. from an A-110 or A-111). And of course another sound source can be used (e.g. "analog" blue/red noise from A-118, "2 oscillators" or "6 oscillators" signal of A-117, VCO, external signal, looped A-112 sample and so on).

For the second section of examples the module has been modified so that a 1024 stage BBD device could be used. The maximum clock frequency mentioned in the data sheet of the 1024 stage BBD is 200kHz. This leads to a minimum delay time of about 2,5ms. One of the audio sources of the above examples (BBD_Source_1.mp3) is also used for the examples with the 1024 stage BBD module

The first two examples show again kind of a flanger application (triangle output of a LFO is used to control the delay CV input of the BBD module). In the beginning only the original signal appears. Then the delayed signal is added manually without feedback (mix control is changed from 0% to 50%, feedback control = 0). Then the feedback is increased manually. The only difference between the two examples is the feedback polarity:

- BBD_1024_Flange_LFO_Feedback_1.mp3 (feedback switch set to "+")
- BBD_1024_Flange_LFO_Feedback_2.mp3 (feedback switch set to "-")

The next example shows the full delay range of the 1024 stage BBD module that is possible with the internal HSVCO. The delay time is changed manually from minimum to maximum (manual delay control is changed from ccw to cw by hand). Feedback is set to medium.

- BBD_1024_fullrange_manual.mp3

In the last example the delay time is controlled by an analog sequencer (2xA-155 + A-154). Feedback is set to medium. Same audio source as for the other examples.

- BBD_1024_sequenced_flange.mp3