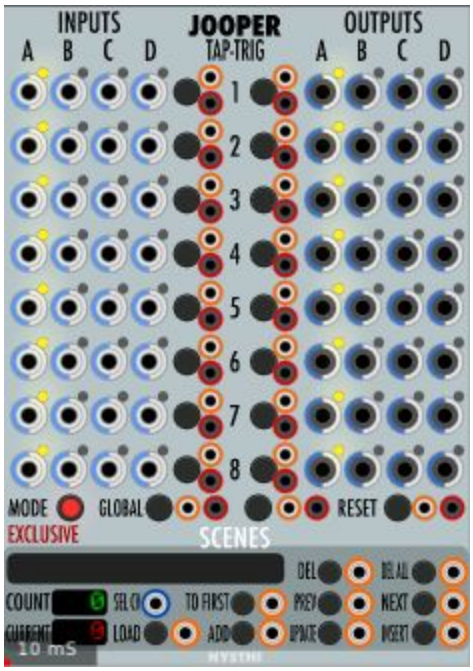
JOOPER is a flexible signal router / matrix switch with scene memory.



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Last Updated: 24 May 2019
Last Patch: v0.6.42/ v1.0.0.alpha2

Type: Complex Switch / Multiplexer / Unity Mixer (Summing)
Size: 18HP x 3U

Note: Jooper has been named, much to his surprise, after Joop van der Linden, who suggested this module to Antonio (although most of the cleverness should be credited to Antonio). Joop is Dutch, so the proper pronounciation would be somewhat like Yoaper.

SWITCHING

Jooper can route various input signals to various outputs. It has eight independent lines (the horizontal lines), each with four inputs and four outputs.

The inputs (cleverly labeled “INPUTS”) are on the left side of the module, and the outputs are on the right. Next to each input and output jack is a lamp, which can be either yellow (lighted) or gray (dark). When a lamp is lighted, the jack is active. When the lamp is dark, the jack is inactive.
There are no internal connections between the lines, but you can obviously patch an output or outputs from any line to the inputs of any other line.

Each line can be switched individually by using its switching button (the one near the middle) or by using the trigger input. There's also a trigger output, that can be used (among others) to chain lines (so you can have different signals be switched simultaneously). There's a switch for the inputs, and for the outputs.

All lines can be switched together using the GLOBAL switch underneath the lines.

MODES

There are three modes:

> EXCLUSIVE (the red one) all lines have 4 inputs and 4 outputs. This can be seen as a sequential switch, but more so, because here you can advance between 4 inputs and/or 4 outputs (per channel, and of course there are 8 channels)
>
> MULTIPLEXER (the green one) Switch between any possible combination of inputs/outputs. It is possible to sum multiple inputs, or send an input to multiple outputs simultaneously. This mode works best with Scenes (set the configuration you want, and save as Scene), or of course when Jooper is used statically (no switching)
> DUAL EXCL A-B (the blue one) turns Jooper into a 16-ch dual A/B switch (that sounds complicated, but it's just 16 standard two input-two output switches).

One thing to remember: in EXCLUSIVE and DUAL EXCL, Jooper is just a switch. In MULTIPEXER mode, you can also sum (combine) signals.

RESET

The reset button and jack (to the right side just above the Scenes section) resets all inputs and outputs so that only the A jacks are active. It will not change the MODE. It will also not affect the SCENES that are in memory.

SCENES

A SCENE can be considered a snapshot of the current state of the switching matrix (the 8 rows). You can store as many SCENES as you like. It will also remember the state of the MODE button.
To the left, the green number will show the amount of stored SCENES, and the red number shows the currently selected SCENE. You can select SCENES by using the SEL CV trigger input, but the scene will not be loaded until you press or trigger LOAD.

ADD will add a scene to memory. There's also a trigger input for this, next to the button. You will notice the green COUNT number will be increased by 1. The red “current” number does not change, although you think it should, and this can be quite confusing. I'll explain that a bit later.

You can delete (DEL) a scene, or. delete all scenes (DEL ALL). If you want a scene to be inserted between two existing scenes, use INSERT. You can navigate between scenes using PREV (Previous), NEXT (Next), TO FIRST (go back to the first scene, this can be considered a reset function, just as when a sequencer is reset to the first step). UPDATE will update a scene with any change you may have made to that scene.

And now for the possibly confusing part:
In initial state, when you just fired up Jooper and have made no changes, there are no SCENES. You can switch all you like, but nothing will be stored. COUNT and CURRENT both are at 0.

If you add a SCENE, there's 1 SCENE. This SCENE is added to the end of the row. You will now be “tranported” to SCENE1, you will think. But that's not the case.

THE SCENE MEMORY CHANGES FROM AN EMPTY STATE TO AN ACTIVE STATE. So SCENE 0 that you were working in (you thought), disappears. Now you are in SCENE 1, the first SCENE in the row (that, for now, only has 1 SCENE in it). But, in fact, you are not really in SCENE 1.

Any time you ADD a scene, the current settings will be added as a SCENE in the end of the row, but you will not be taken to that SCENE. You will stay in a state that we might call PROGRAMMING STATE (don't you love computers) which is independent of SCENE selection. The CURRENT number says 1, because SCENE 0 (that never really existed) has disappeared, but best way to think of it is that you are still in the SCENE that is no SCENE, the one SCENE that rules them all, the VOID-SCENE.

Only if you start navigating between SCENES, you will actually “be” in a SCENE. Now you can change settings, UPDATE if you like the new settings better, or jump to another SCENE (PREV, NEXT, TO FIRST) and all the changes you made will disappear. If you press ADD, a new SCENE will be added to the end of the line.

So remember : ADD will add a scene to the end of the line of SCENES.

NAMING SCENES

In the black display on the top of the SCENES section you can enter a name for each of the scenes. Do not forget to UPDATE the scene after entering text.

Patching Suggestions.

1. Connect the trig outputs from a drum (trig) sequencer to Jooper, and the outputs from Jooper to drum players. Now you can create buildups, dropdowns, etc.
2. Connect the outputs of a drum sequencer to different drumkits.
3. Connect a sequencer to different VCO's for different bass or lead sounds.
4. Connect different sequencers to a lead or bass sound.
5. Jooper can also be a simple 16ch on/off switch.
6. Connect different outputs of 4 hands, different voltages, to Jooper and route those to the sequence number selection input of a sequencer.
7. Use Jooper to start counters at a certain time.

Well, you get the idea.

Quantization.

It can be useful to quantize the switching to a beat/bar/number of bars. For this, you can use Elsker, or Martin Lueders Trigger Buffer.

JANNEKER

The creation of Jooper, with its SCENES, begged for a companion that would be able to switch between scenes at timed intervals. So we came up with the idea of Janneker (along with Janneker Timed) (Janneke is the name of Joop's wife). Originally it was conceived as part of Jooper, but for various reasons, notably space, it became a separate module. Still Jooper and Janneker can be best explained in how they work together.

JANNEKER is a timed pulse director. You can ask it, so to speak, to "push" a button after counting to 8. Or 4. Or first count to 8, push a button, count to 6, push the button again, etc.
It works very well with Jooper, 4Hands, or Impromptu's sequencers to control settings in a song, and to advance from one section of a song to the next. In fact, with Janneker you have a tool to program the entire song. But it can switch anything else, too, like a sequential switch, a quantizer, etc.

Consider this: You have created sequences. You have created song sections using Jooper. You might have 4Hands send out different values, intended for different sections. Now Janneker will be the "conductor" that will "tell" all the instruments, all the sections, to start or stop playing, and when.

The most important connection is the "END OF PULSES" trigger output. This has to be connected to the "NEXT" scene selector button in Jooper, or the NEXT sequence button in an Impromptu sequencer (you have to right click and set SEQ CV-in to "trig incr".

Quantized to pulse

Now connect a (clock) pulse to the INCR+1 trigger input. This pulse's tempo is the time grid to which we can switch. If you set it to 1 bar, there's a switching possibility at every bar. This is, to me, the most practical setting. But you can also set it to 4 or 8 bars, or whatever.
Now tell Janneker to count 8 bars by changing the red PULSES number. You can use drag, or the numeric keyboard for that (mouse should be over the display).
Press ADD, and a new SCENE is created, which consists of this information: wait 8 bars, then output a pulse at "END OF PULSES".

Start the clock, and see Janneker output a pulse after 8 bars. Add a few more scenes, preferably with different lenghs, and see what happens.

OVERVIEW

ACTIVE: when active, Janneker responds to pulse inputs. When inactive, it ignores those, and will not output a pulse.
LOOP: After the last scene, Janneker will re-start from scene 1.
EOL: End Of Loop. Will output a pulse at the end of the loop, so after the last Scene has played.
REC: record mode. Discussed later. Basically, if you Janneker is active, and a clock is inputting pulses to the incr+1 input, you can program Janneker by adding scenes. Janneker will remember the PULSES setting for each created scene.
END OF PULSES/CURRENT: when the green "CURRENT" display reaches the number in "PULSES" , END OF PULSES outputs a pulse (trigger).

DECR-1: CURRENT is decreased by 1. You can do all kinds of nice stuff with this input. Discussed later.
INCR+1: CURRENT is increased by 1. This is the main clock input.

SCENES: the amount of created Scenes.
CURRENT: the currently active Scene.

(See the Jooper section for some thoughts about Scene creation, in the SCENES section.)

RESET: reset Janneker to Scene 1. Same as resetting your sequencer to beat 1.
PREV: go to previous Scene.
NEXT: go to next scene.
ADD: create a Scene.
Load: Load the current Scene immediately.
Update: update curent Scene.
DELETE: delete current Scene.
DEL ALL: delete all Scenes.

MANUALLY ENTERING VALUES

Change the PULSES value by dragging the mouse, or with the numeric keyboard (mouse should be over Janneker). Right click resets to zero.

For NUMPAD and KEYBOARD commands, your mouse must be over Janneker!

Num keyboard:

0 1 2 3 4 5 6 7 8 9 are used to entering data
"DECIMAL POINT (keypad)" reset current pulse count entering value to 1
"+" adds 1 to the current pulses value
"-" subtract 1 to the current pulses value
"*ENTER* (keypad)" adds a stage with current values at the end of the sequence

Other keyboard controls:

"PAGE DOWN" go to the next scene
"PAGE UP" go to previous scene
"ESCAPE" reload current scene removing current alterations
"OPTION/WINDOWKEY P" will reset current scene, all scenes will be deleted
"OPTION/WINDOWKEY A" will add current scene to the scenes list
"RETURN" (or "OPTION/WINDOWKEY-*ENTER* (keypad)") update current stage with current onscreen values
"I" insert a stage with current values before the current stage of the sequence
"OPTION/WINDOWKEY −" will delete current scene, and remove it from list
"OPTION/WINDOWKEY +" add a stage with current values at the end of the scenes (same as "*ENTER* (keypad)")

values for modes are:
PULSECOUNT mode from 1 to 9999

RECORD MODE

When Janneker enters record mode, it will remember the amount of pulses between entering record mode and ADDing the first Scene, and between subsequent ADD actions.
It will create a new Scene on the next incoming clock pulse in INCR+1. So, Scene creation is quantized to the incoming clock.

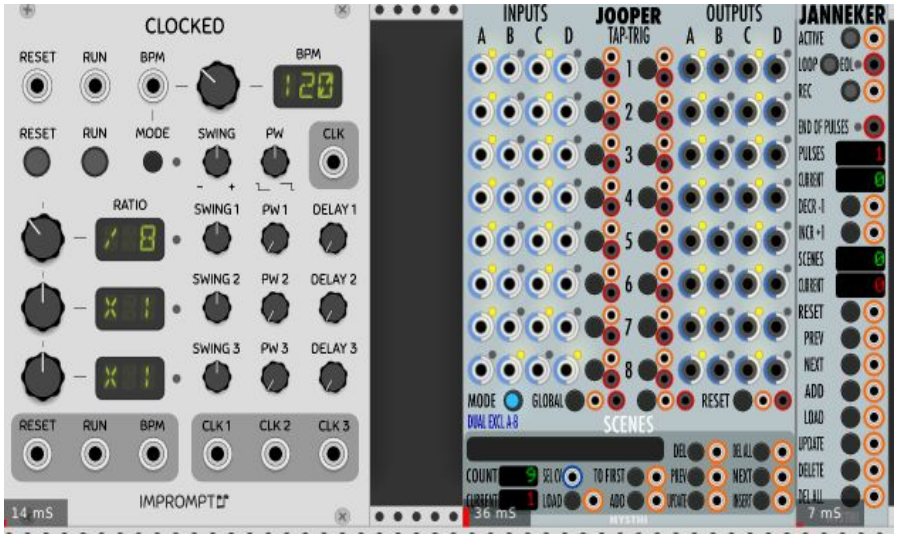
One thing to remember is that a scene is created AFTER the musical event that you want to record. This means it's easy to forget to ADD a scene for the final state of the song, which usually will be when all is silent again. Just count four pulses, press ADD one more time, switch off RECORD and you'll be ok.

HOW (RECORD MODE)

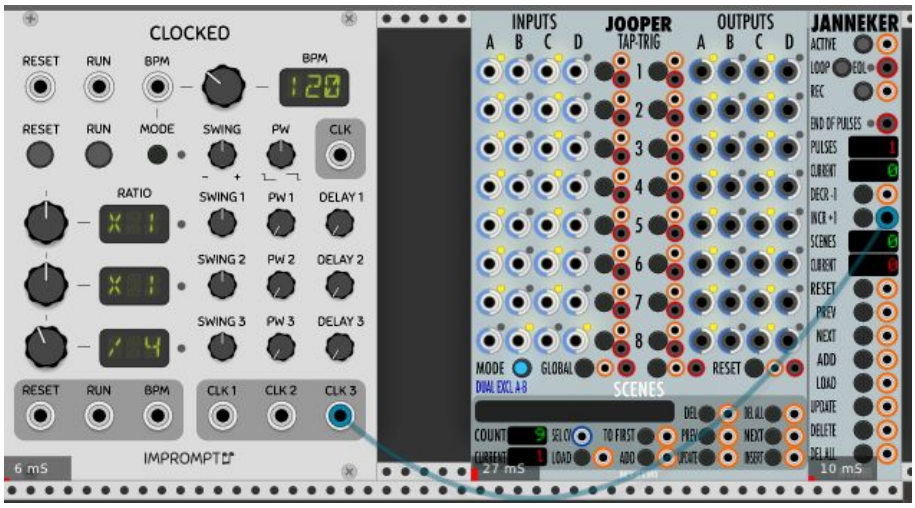
Now, how to use this?
For this description, I assume you have one Jooper and one Janneker connected to each other. But you can connect as many Joopers as necessary, or 4Hands, or sequencers, or whatever you can think of.

For clarity, I have not connected anything to the Jooper switching rows. But you can route sequencer trigger outputs, clock signals, anything through it. I will give one example at the end.

Of course, we also need a clock.

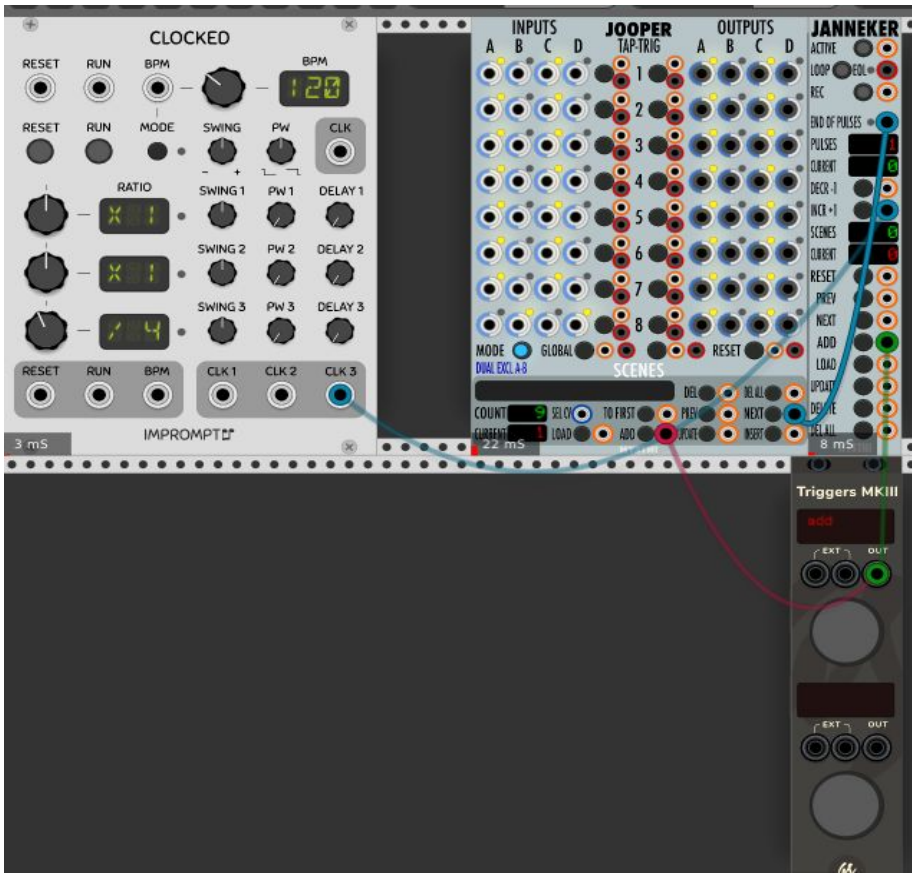


We need a clock signal that will create our grid. Here, the grid is set to one bar (bmp /4). So there will be a pulse incoming to Janneker every bar, and therefore every pulse in Janneker represents one bar.

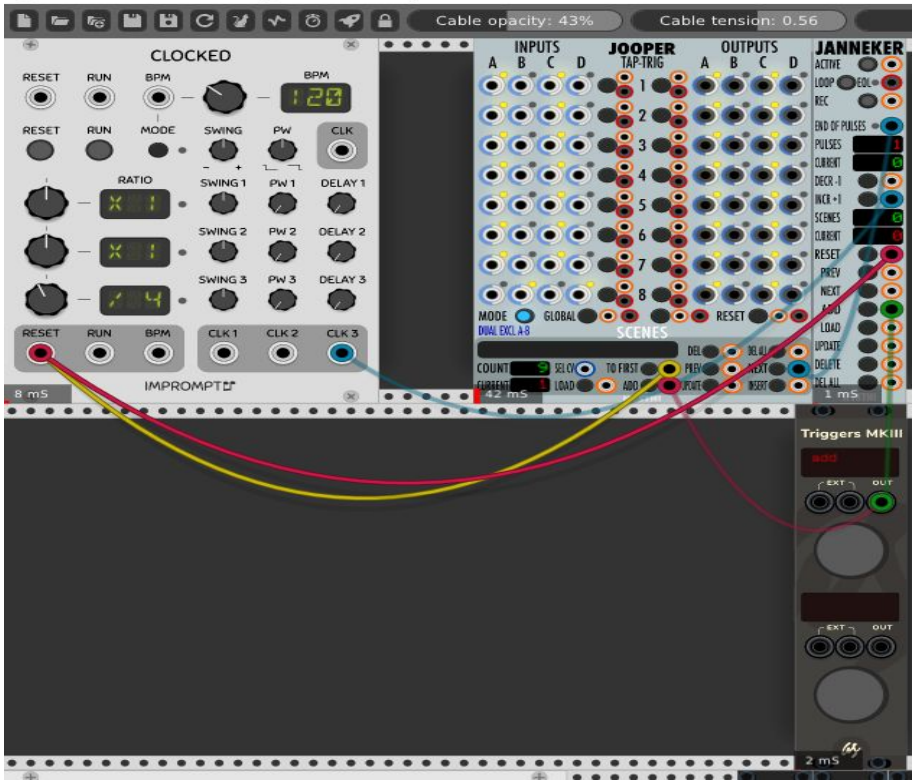


Then, it's necessary to synchronise those. For that reason, we need to add Trigger Buttons to, at least, the ADD inputs on both Jooper and Janneker.

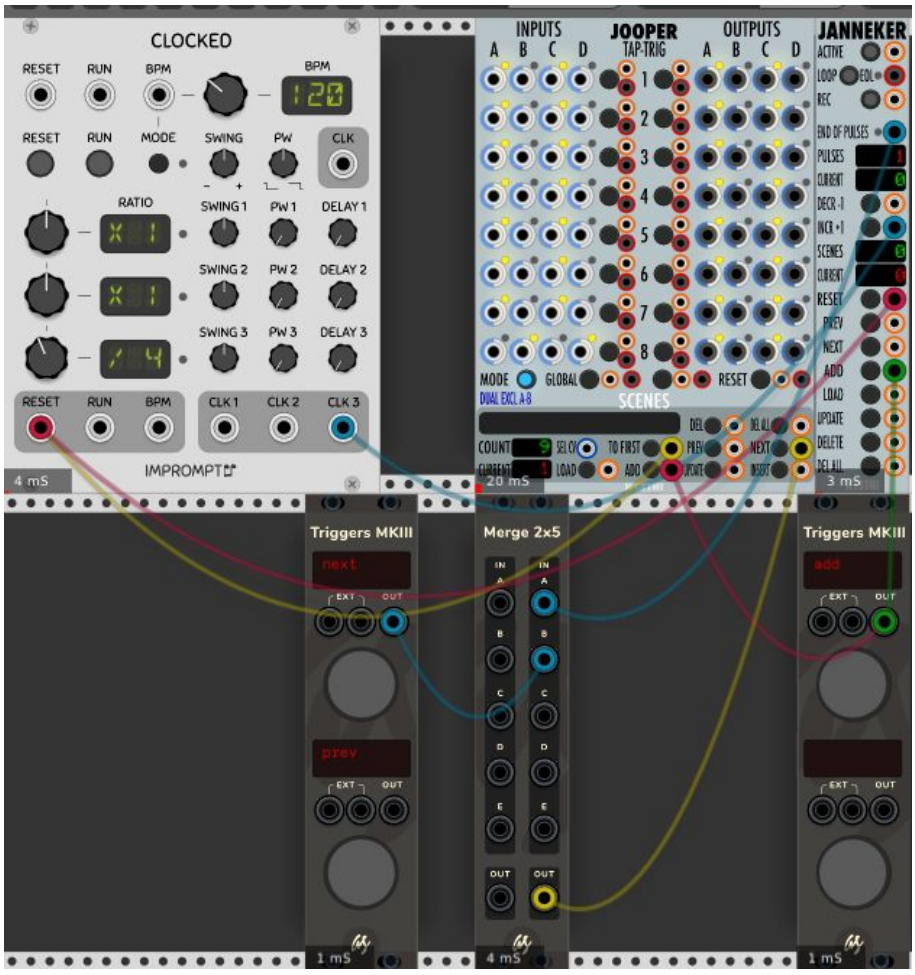
END OF PULSES of Janneker should be connected to the NEXT input of Jooper.



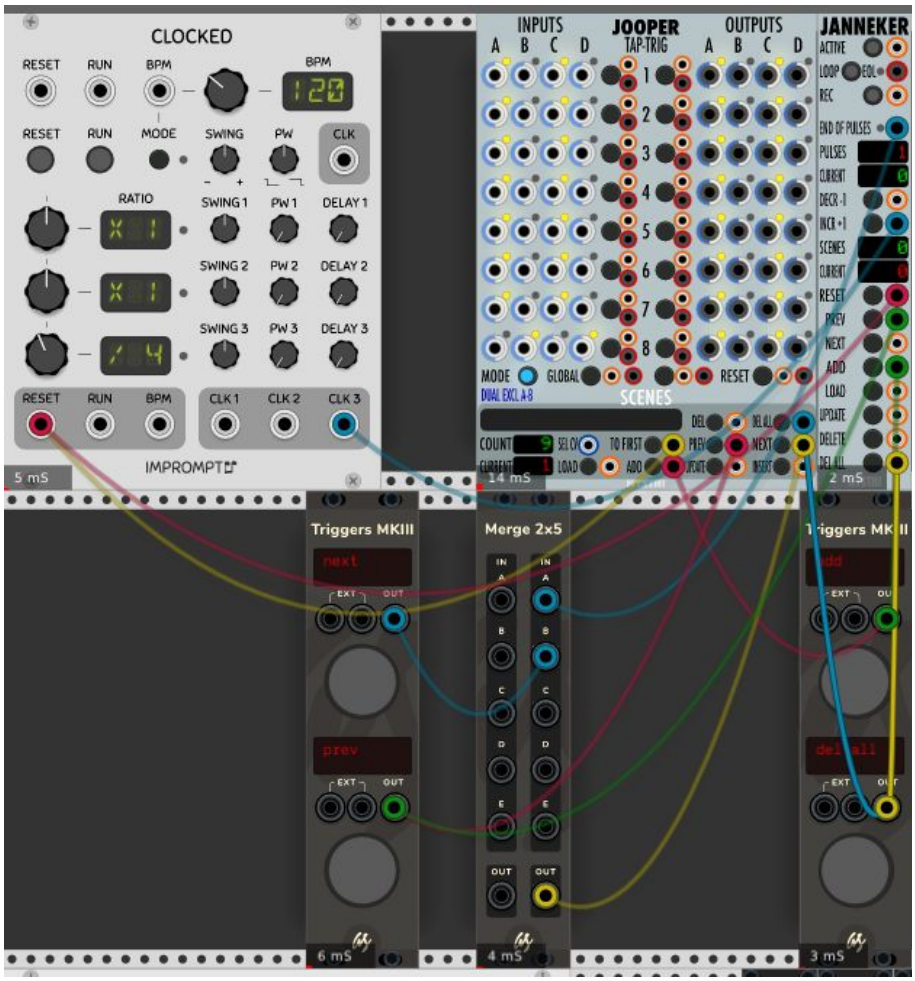
Also, we need a trigger button connected to the RESET input of Janneker, and the TO FIRST input of Jooper. This is probably connected to the button that resets the entire song to its initial state.



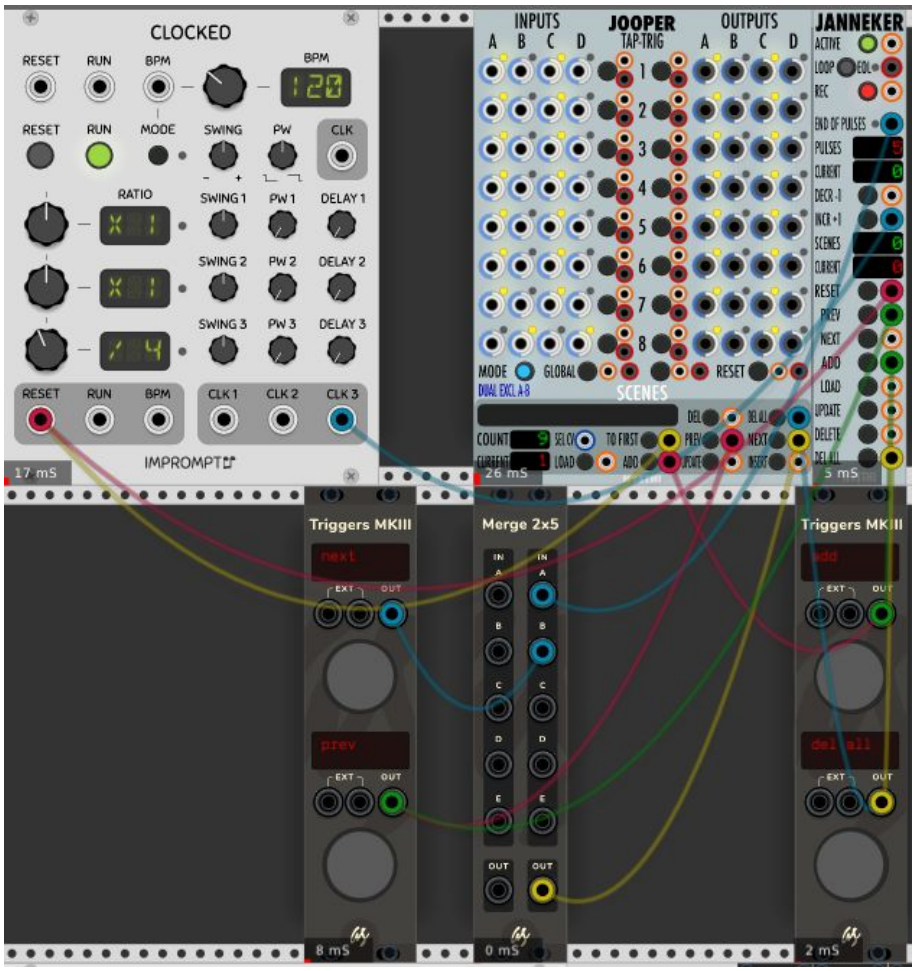
It can be practical to synchronise NEXT and PREV inputs. In this case a merger is needed to combine the END OF PULSES and NEXT of Janneker to Jooper's NEXT.



It can also be practical to connect a trigger to DEL ALL of all modules.



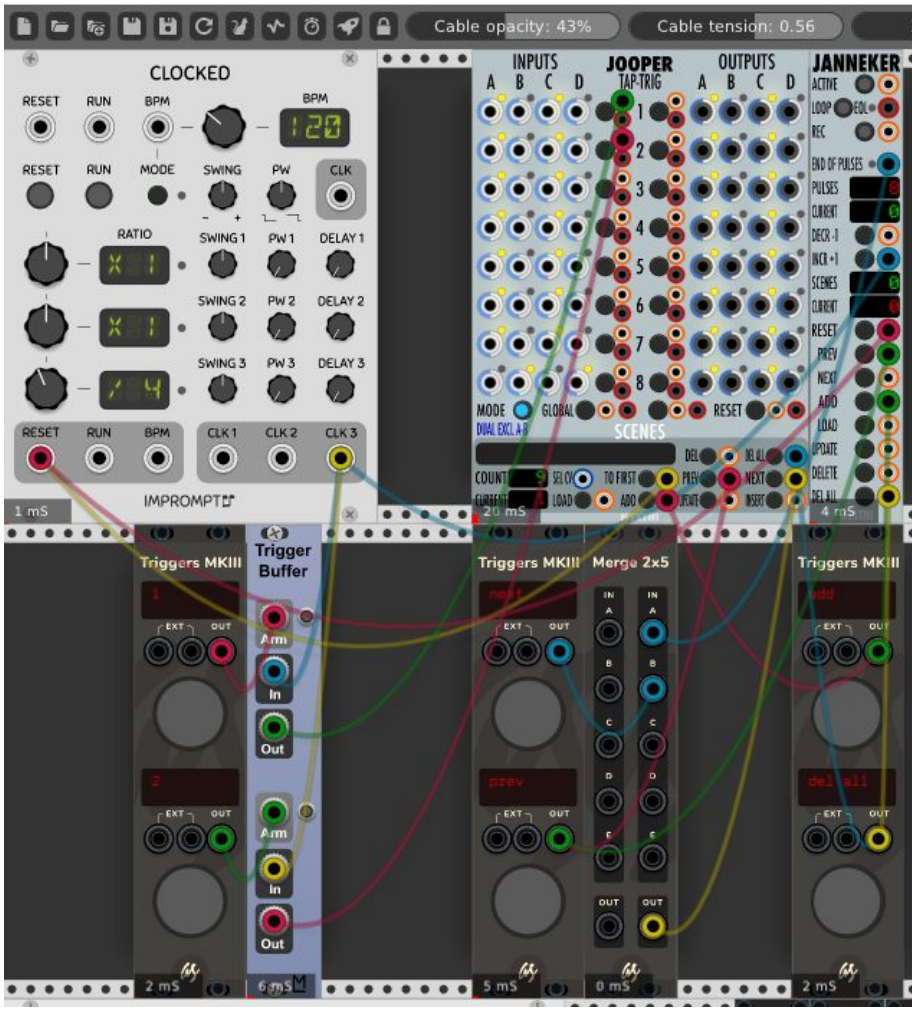
Now, enter REC mode, create scenes on Jooper, and switch between them using Janneker, creating a song on the fly! Make sure to switch Janneker to ACTIVE, and have the clock running. Switch REC on after that, and start counting.



Usually it's better to switch triggers on or off in Jooper, than to route audio through it.

Remember: a scene will be added on the next incoming clock pulse on Janneker. Scenes on Jooper will be added immediately on the ADD trigger, but that's no problem when playing back, so don't worry about that.

But it's musically preferable to hear switches made on Jooper on the next Scene creation, so I use ML's trigger buffer for that. (see Quantization in the Jooper section)



You can of course use hardware triggers to make switching easier, and to trigger that wonderful ADD moment.

MORE PATCHING SUGGESTIONS:

Clock extender. Use Janneker to create irregular clocks, or clocks with varying step lengths.

One final observation:

When Rack will be available as VST plugin, some of this functionality can be done by triggering from the DAW. Still, there are advantages to the JOOPER/JANNEKER team. First, you don't have to use a DAW to create song structure, so you will stay in the modular mindset.
Second, you can enter probability and chance by using, for instance, a bernoulli gate or Nysthi's Bivio or Bridges.
Run the INCR+1 pulse through a bernoulli gate, and your song has a structure with unpredictable lengths. Add some more randomness by connecting a random pulse to the DECR-1 input.

DESCRIPTION

How I see it, using Jooper can come in two stages, especially when used with Janneker.
stage one: creating scenes, creating song structure. Janneker is in record mode.
stage two: playing back the song you created. Janneker record is OFF.

I would not really call the first mode record mode, more like "programming" mode.

But let's make this much easier. Let's keep Jooper the way it is. Because maybe my use is a bit too specialized to make it a special function. I will make a description in the manual (it's partly there, already} and I am trying to explain to Omar how it works, so he can make a video.
The best way I can describe it: Janneker operates on a musical time grid. This grid is the time between Janneker's pulse inputs. That can be one bar, 4 bars, one beat, etc.
When you have Janneker control Jooper, you want Jooper to "snap" to that musical time grid, too.
When you are in the second stage (the playback stage), Janneker will make sure that happens. Because it will send out triggers "quantized" to that musical time grid.
But in the first stage, you will make changes on Jooper. Switch inputs, outputs, etc. If you want those to happen "on the grid" you should push all buttons at once, exactly on the beat. That's not easy, and that's where a trigger buffer helps. You can now push buttons sometime before the change needs to happen.

JANNEKER TIMED

Basically, Janneker Timed has all the functionalities of Janneker, but it will not count pulses, but time. Therefore, on Janneker Timed the E-O-SCENE trig output will output the switching triggers, just like Janneker's END OF PULSES trig output does.

You can set a Time scale

manual input