LARIX ELEKTRO
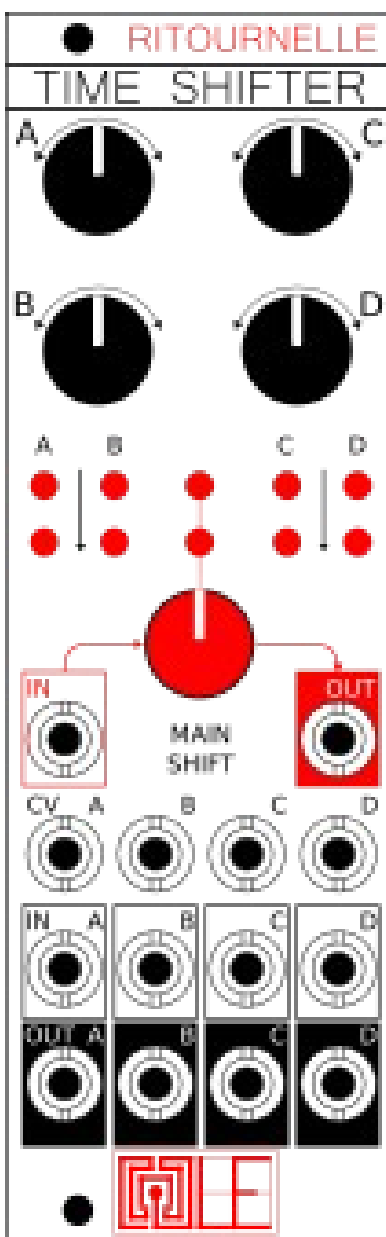
RITOURNELLE Time-Shifter

WHAT'S THAT THING ?

The **Time-Shifter** is a delay for gate or trigger signales.
As all good « time machines » it can delay after and before (!).

KNOBS :
MAIN SHIFT : Time decay between IN and OUT
(red Jacks).
Also the range of time decay for the 4 circuits A B C D.
A, B C and D : Time decay of the corresponding circuit.
The value depend on the MAIN SHIFT value:
When the knob is centered, the time decay is identical the
MAIN SHIFT value.
Left : There is less delay, until zero.
Right : There is more delay, untile twice of the MAIN SHIFT
approximatively.

JACKS I/O :
IN (Red): Input of the MAIN SHIFT circuit.
OUT (Red) : Output of the MAIN SHIFT circuit.
IN (A, B, C, D) : Input of each circuits A B C or C.
OUT (A, B, C, D): Output of each circuits A B C or C.
CV (A, B, C, D): CV in for the delay of the 4 circuits.

LEDs:
The LEDS helps to see the time decay between the input and
the output of each circuits : A B C D and the MAIN SHIFT.

Typical use:
- Groove (or swing, etc.) controlable by CV (!)
- Realignment of gates sequences.
(When using multiple sequencers with different latency)
- Signals sequencing adjustment.
(Be sur that a RST arrives after a CLK signal, for example)

Technical specifications:

+12V : 33mA max.
-12V : 10mA
(5V is not used)
8HP, 35mm deep (Approx.) with PSU connector

Time shifting: 10ms to 1.25sec. (approx.) for Main In
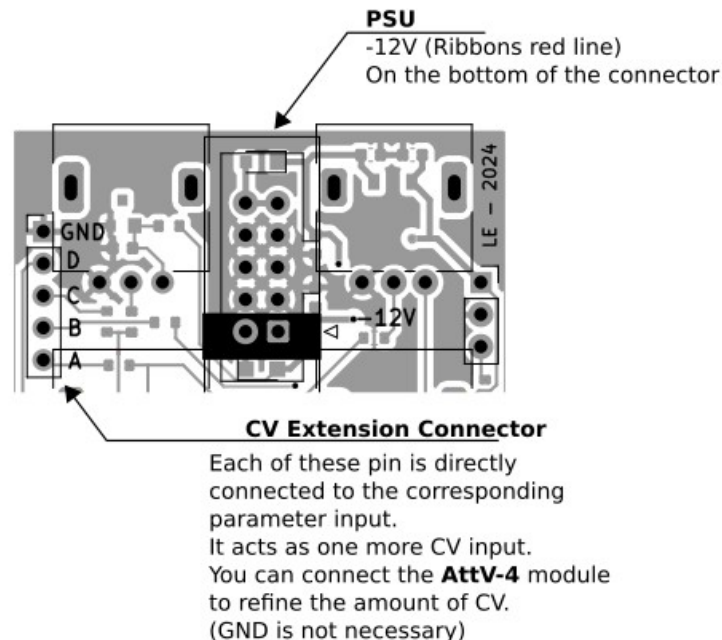0ms to 3sec. (approx.) for ABCD.

Installation:

At first, ensure that there is enough power to supply the module.
Beware of the orientation: the red strip on the ribbon cable should match the white line on the module, and on the PSU board (-12V).

Connect the PSU ribbon into the PSU connector, the small connector (2x5 pin) into the module, and the large one (2x8 pin) into the PSU Board.
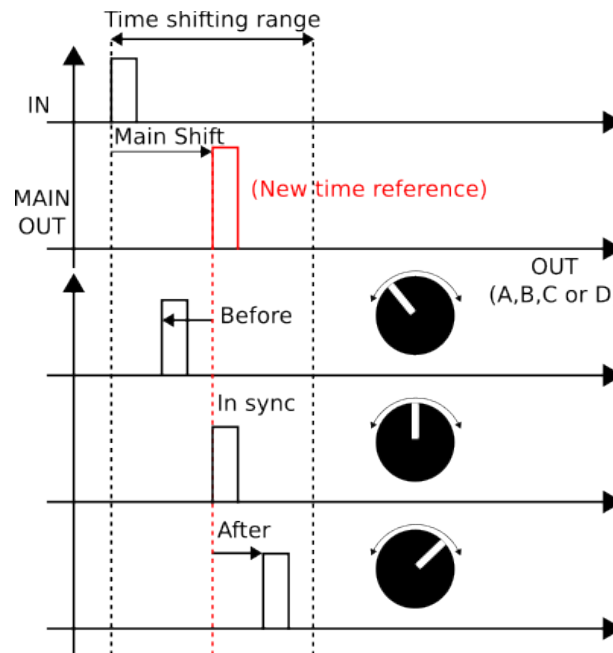
It is better to have a **well-insulated box** because parasites can be added to the signal of the modules. If you are not familiar with electronics, prefer commercial boxes. This is especially true for power supplies: a poorly designed power supply can damage the modules.

To avoid various problems, electromagnetic, but not only, **complete the empty spaces with blind front panels** (Blank panels).

PSU
-12V (Ribbons red line)
On the bottom of the connector

CV Extension Connector
Each of these pin is directly connected to the corresponding parameter input.
It acts as one more CV input.
You can connect the **AttV-4** module to refine the amount of CV.
(GND is not necessary)

For more informations about the CV Extension Connector: see below.

Technical explanation

The first idea was to **find a way to build a swing or a groove**. So to decide which steps of which track is decayed, and how much. To go further than what the sequencers offer (One knob most of the time, with hidden algorithm)

To do this, it is necessary to be able to shift the events after and before.
  After, it's easy : a simple delay !
  But before, we can't predict when an event will appear...

The solution is to decay everything, and then, decaying less than the others events.
So comparing to the new decaying events, it will sounds like it appear before !
And that's it !

The **MAIN SHIFT** defines this new reference. So if you enter the main CLK signal into the input, the output of this circuit can be used as the new CLK reference.
The four circuits A B C and D works according to the value of the MAIN SHIFT reference :
When the knob is centered, the time decay is the same as for the MAIN SHIFT.
Left, means less time decay, so the event will appear before.
Right, means more time, so the event will appear after.

Also, the **MAIN SHIFT** value defines the **maximum** of time-shifting, and the **precision** of the knobs.

Even if you don't use the MAIN SHIFT circuit,
the RED knobs controles the time shifting of all the circuits.

Typical uses :
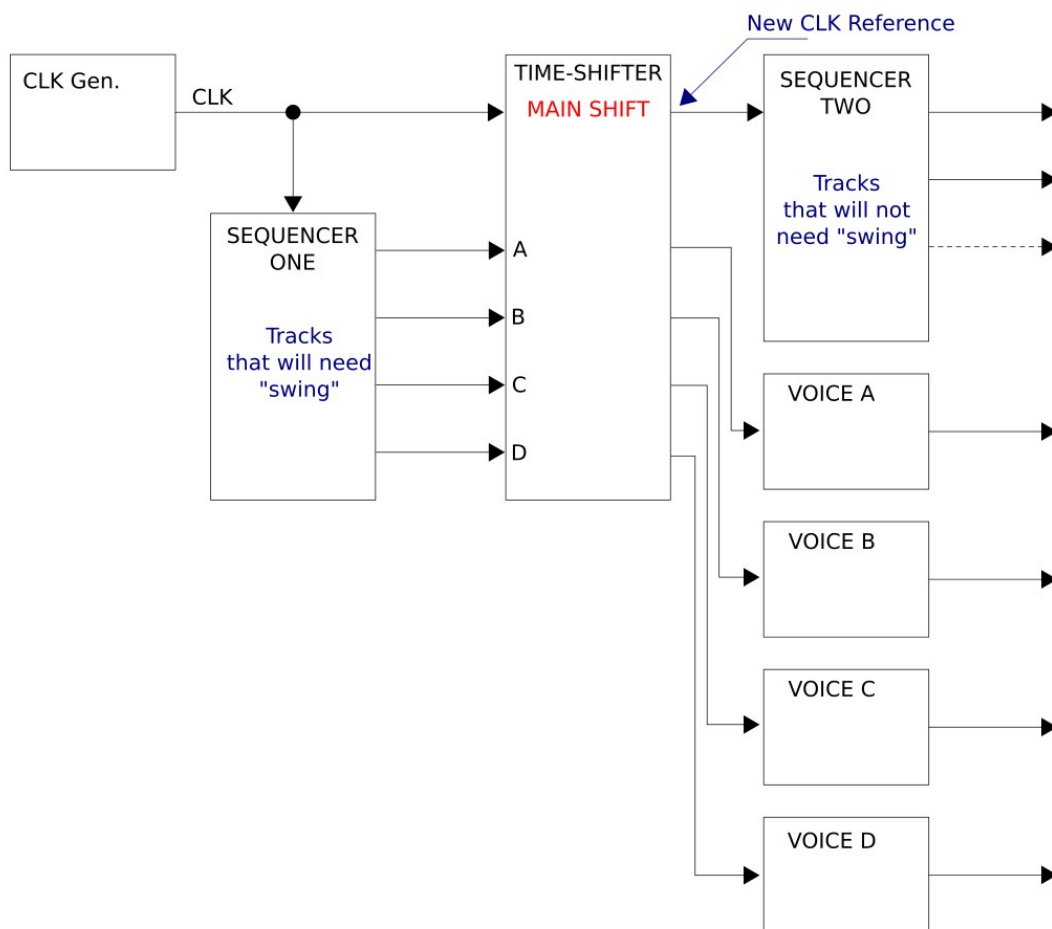
The sequences from the **SEQUENCER ONE** will be decayed by the **TIME-SHIFTER**.

If you need sequences without decays (no swing on them), connect the CLK into the **MAIN SHIFT** circuit, and use the OUT as the CLK for the second sequencer **SEQUENCER TWO**.

The decay of the A B C and D circuits can be longer, or shorter than of the **MAIN SHIFT**, It means that you can decay A B C or D before or after events from the **SEQUENCER TWO**.

Of course, **the module can be used as a simple GATE delay**, with a total of 5 circuits.
Remide that the MAIN SHIFT knobs determines the amount of delay time of all the module.
So if you change the MAIN SHIFT, you change all the A B C D decay too.

As explained quickly at the beginning of the document, this module is also useful for **realigning GATES** sequences from differents sequencer that have a **different latency**.

The module is also made to adjust precisely the **sequencing of critical events :**
The critical case of an RST signal that must arrive before (or after) a CLK event.
Waiting for that a CV is stable before sampling it into a Sample&Hold.

EXTENSIONS:

CV Extension Connector:
This is the 5 PINS connector.
Each of these pin is directly connected to the corresponding parameter input.
It acts as one more CV input.You can connect the AttV-4 module to refine the amount of CV.
The **AttV-4** is a 4 chanels Attenuverters. Each of its outputs are also available at the back of the module.
The wires to connect each together are provided with the **AttV-4**.
The fifth pin is the ground. This pin is not necessary, but in case of,
it means that the ground is available here.
For DIY, if you need to isolate the wires, you can connect the ground here.
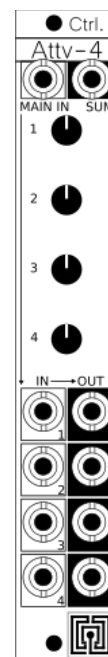
Technical considerations:

All Gate/Trig input: Any signal accepted.
A Gate is generated each time the signal exceeds 0.85V (approx.). And falls down after decreasing under 0.85V too.
It means that you don't need a Clock signal: any will works.
It means that you can plug any signal on it.

Why 0.85V ? It's just to have a bit more than 0V, because it seems that some clock signals don't produce a perfect 0V...
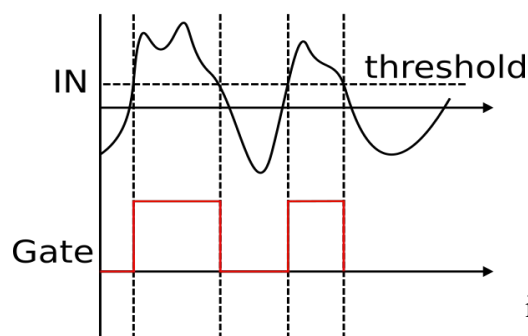
CV IN: 0 to 10V approx. 8bits resolution. (Clipped up and down)
Finaly, this module is a delay for GATE or TRIG. But without a lot of memories, it means that it doesn't works like classical delay :
In fact, only the rising and the falling moments of the inputs are recorded into the memory, to be delayed later.
And due to the small memory, only 8 events (a full GATE, means rise + fall) are recorded.
If the input change too fast, or if the time is too long, the module may « forgets » some Gate signals.

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