20231127A Schlappi Engineering Nibbler User Guide

SCHLAPPI ENGINEERING

QUICKSTART GUIDE – NIBBLER
MANUAL ONLINE AT SCHLAPPIENGINEERING.COM

Contents

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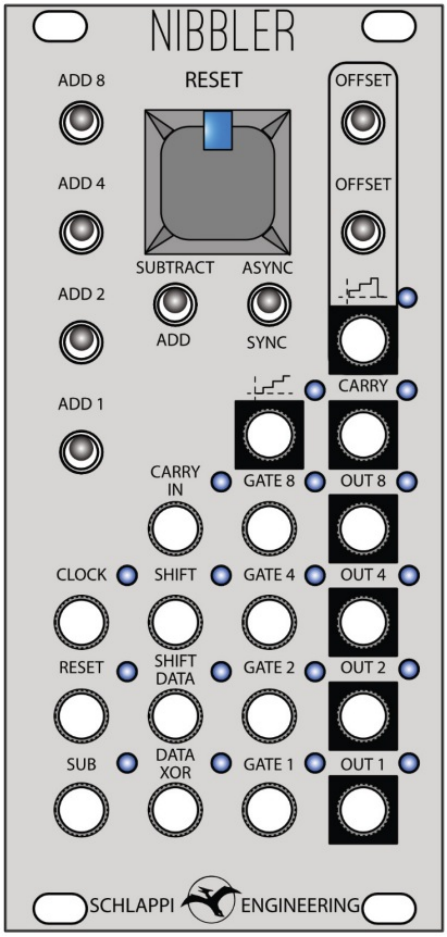
The Nibbler is a four bit digital accumulator based on CMOS logic. This means that it counts in binary from zero to fifteen, with inputs and outputs for individual bits as well as stepped voltage outputs (digital to analog converters). It does this with individual logic chips instead of a CPU.
The concept here is that counting in binary (and its expression in bits) is inherently musical, and with slow clock speeds we can use it to create both rhythms and modulation voltages (or melodies). At audio rate we can generate subharmonics and modem-like sounds (or noise).



ADD SWITCHES
These four switches form a binary word, adding the indicated amount to the output register at each clock pulse.
RESET BUTTON
Clears the output register, holding all outputs at zero while the button is held if in SYNC mode and at the value indicated by the switches if in ASYNC MODE
SUBTRACT ADD SWITCH
Determines if the binary word is added or subtracted to the output register
ASYNC SYNC SWITCH
Determines if the output is updated only on a clock pulse (sync), or every time an input is received (async)
CLOCK INPUT
Input for any gate or trig signal, generally necessary for operation
RESET INPUT
Resets the register to zero whenever a signal is received.
Acts as a sync input at audio rates
SUB INPUT
Reverses the direction of the counter, XORs with the related switch.
DATA XOR INPUT
The input will be XOR'ed with whatever is present at the input to the shift register. Only active when using the SHIFT input.
SHIFT INPUT
If in SYNC mode then when the SHIFT is high then on clock pulses the register shifts up instead of adding, in ASYNC mode the register will shift on each pulse.
SHIFT DATA
Replaces the input of the shift register With no input the top bit (OUT 8) cycles around and enters from the bottom.
OFFSET SWITCHES
These two switches set a phase offset for the related stepped voltage.

Lower offset switch	Upper offset switch	Degree offset	Numerical offset
down	down	0	0
up	down	45	2
down	up	90	4
up	up	180	8

STEPPED OUTPUTS
Stepped voltages made by adding the 4 gate outputs together with binary weights
CARRY OUTPUT
Gate output that goes high for one clock pulse when the accumulator overflows. Can be used to chain multiple nibblers or as a clock divider output.
GATE OUTPUTS
OUT1, OUT2, OUT4, OUT8 combined form a binary word and are thecurrent contents of the output register. They can be used as clock dividers or to create rhythms.
GATE INPUTS
GATE 1, GATE 2, GATE 4 , GATE 8 add to their respective switches then are added to the output register. Can be used without a clock.

PRO TIPS :
*Black square around a jack indicates output, all others are inputs
*A clock input is generally required
*Check that at least one ADD switch is up

PATCHES TO START WITH

CLOCK DIVIDER
SWITCH POSITIONS

SUBTRACT ADD	ADD
ASYNC SYNC	SYNC
ADD 1	UP
OTHER SWITCHES	DOWN

- LOCK signal at CLOCK input
- Take divider output from CARRY
- With only ADD1 up you will have divide by 16
- Only ADD2 will give you divide by 8, ADD 4 will divider by 4
- Push the switches down and raise only ADD 8 for divider by 2
- In generally the ADD switches form the numerator of a divide by 16 calculation
- Try the GATE OUTPUTS to get other divisions

STEPPED VOLTAGES

- Start from the CLOCK DIVIDER patch
- Plug the two stepped (sawtooth) voltages into a pitched input

- Try different switch settings for different sequences

AUDIO RATE (FREQUENCY DIVIDER)

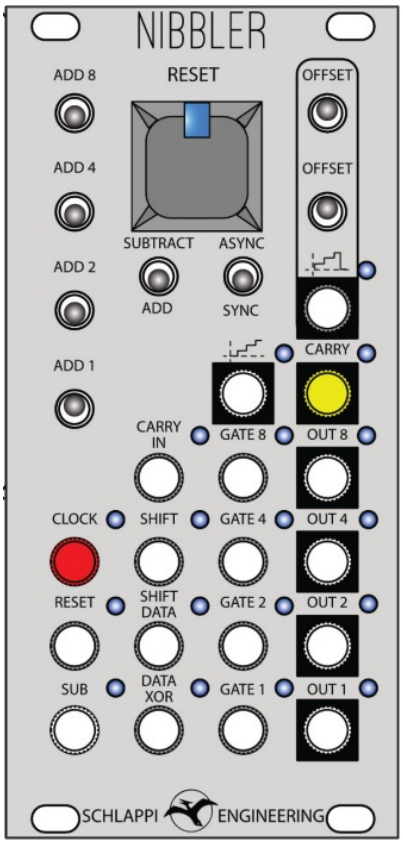
- Start from CLOCK DIVIDER patch
- Input audio at CLOCK input
- Listen to CARRY or GATE outs for pulse waves
- Listen to stepped outputs for saw, triangle, or other waveform outputs

TRIANGLE WAVE

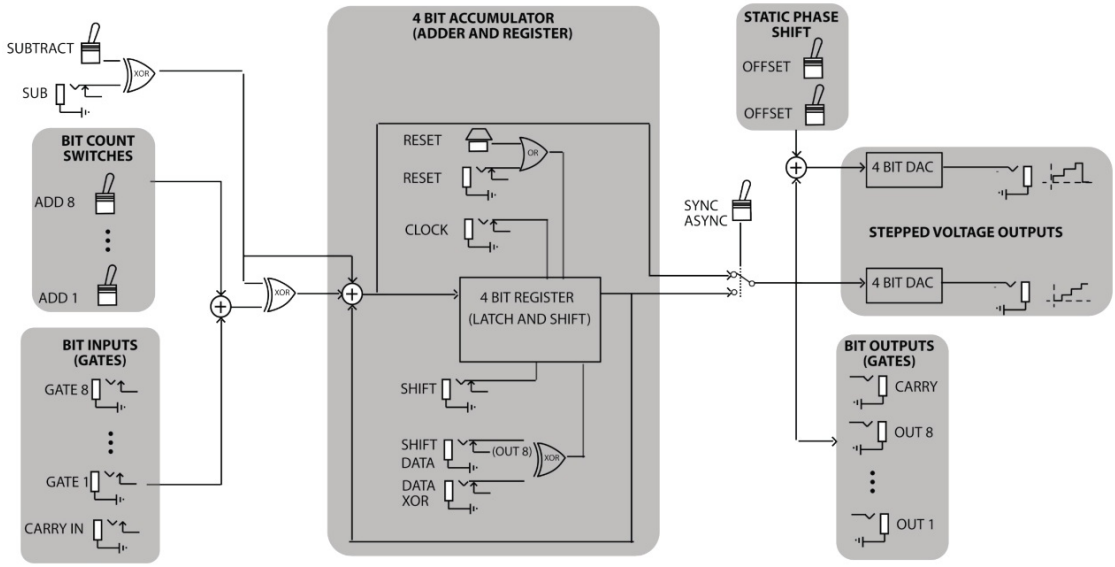
- Start from STEPPED VOLTAGES
- Patch the CARRY out into SUB input
- This will cause the accumulator to alternate counting up and down, resulating in a triangle wave
- Works at LFO or audio rate

SHIFT REGISTER NOISE

- Start from AUDIO RATE patch
- Patch signals into the SHIFT INPUT
- Try all the other inputs as well



A BIT OF THEORY
The Nibbler is at it's core a 4-bit accumulator. That is an adder combined with a register (or memory), this means on each clock pulse the the accumulator word is added to itself (or the existing contents of the register). This is a core component of digital oscillators and filters.



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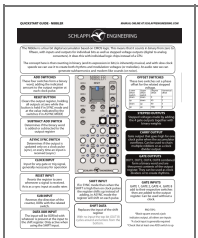
Documents / Resources

	SCHLAPPI ENGINEERING 20231127A Schlappi Engineering Nibbler [pdf] User Guide 20231127A, 20231127A Schlappi Engineering Nibbler, Schlappi Engineering Nibbler, Engineering Nibbler, Nibbler

References

- Schlappi Engineering – schlappiengineering
- User Manual