

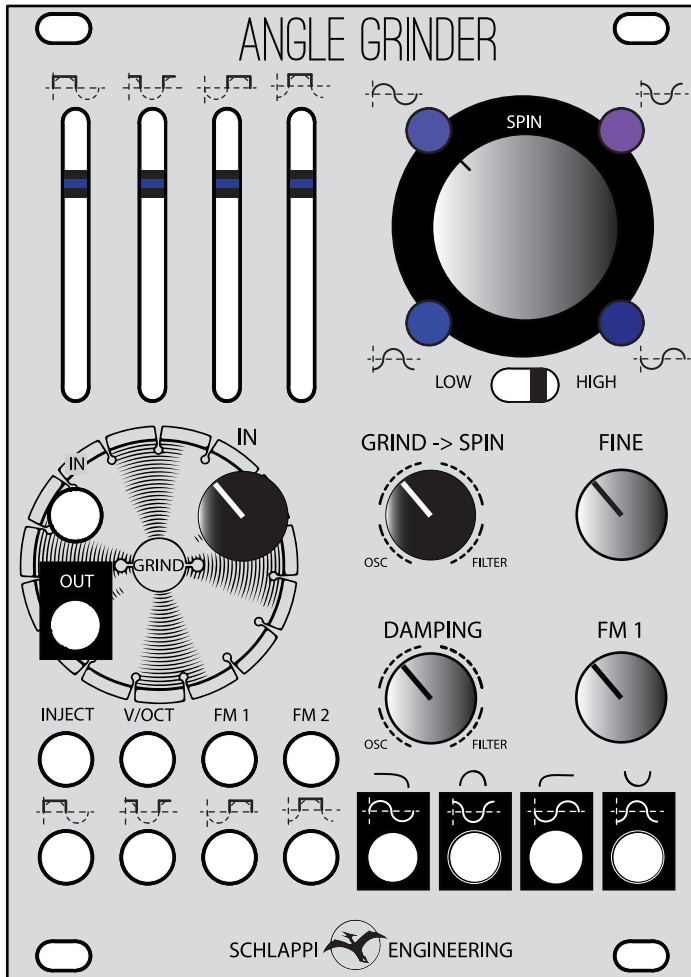
SCHLAPPI ENGINEERING

Angle Grinder is a quadrature sine wave oscillator, filter, and waveshaping effect.

The SPIN section is a quadrature sine wave oscillator.

The GRIND section compares each phase against input signal, then subtracts the result from the input signal.

If the spin section is either damped enough or enough signal is fed into it from the grind section then it will stop oscillating and become a state variable filter (of sorts).



GRIND SLIDERS

Mixes the amount of signal to grind from the associated SPIN output
Feedback playground

IN

Insert audio or cv here

OUT

Output from GRIND

INJECT

Direct input to SPIN
AC coupled on header for soft sync-like effect

V/OCT

Volts per octave cv control over SPIN

FM 2

Exponential CV control over SPIN

GRIND CV

CV control added to associated GRIND SLIDER

SPIN

Coarse tuning control

RANGE SWITCH

LOW 0.1 Hz to 500Hz
HIGH 10 HZ to over 20kHz

GRIND -> SPIN

Feeds the output of GRIND into SPIN (filter/osc)

FINE

Fine tuning control

DAMPING

Counteracts oscillations

FM 1

CV attenuator switchable between linear and exp by header on rear

SPIN OUTPUTS



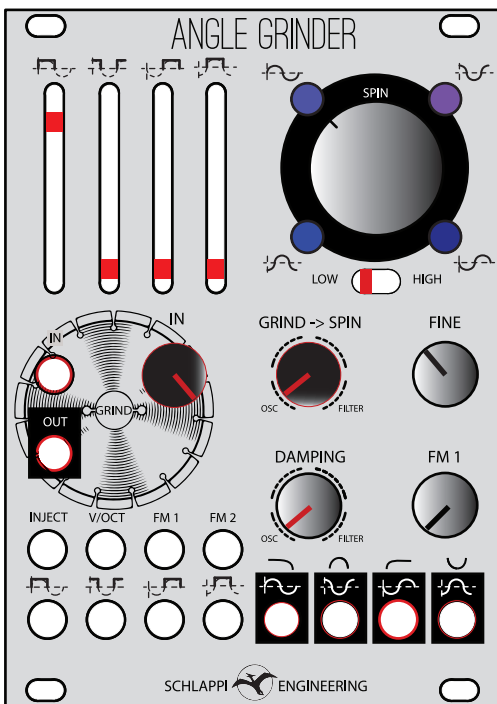
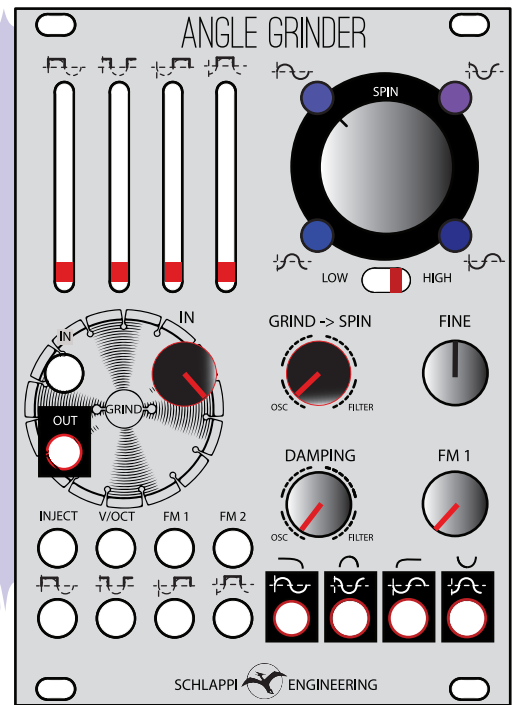
Four phase related output
0°, 90°, 180°, and 270° if oscillating
LOW PASS, BAND PASS, HIGH PASS, and INV BAND PASS if filtering

PATCHES TO START WITH

OSCILLATE

NOB POSITIONS	IN	FULL CW
	GRIND -> SPIN	FULL CCW
	DAMPING	FULL CCW
	FM 1	FULL CCW

- No input. Listen to any of the SPIN outputs for pure sine waves 90° out of phase with each other.
- Listen to the GRIND OUT
- Start with all GRIND SLIDERS down for a sine output
- Experiment with the GRIND SLIDERS and GRIND CV to add harmonics
- Control with V/OCT CV input
- Use RANGE SWITCH to change between LFO and VCO



GRIND

NOB POSITIONS	IN	FULL CW
	GRIND -> SPIN	FULL CCW
	DAMPING	FULL CCW

- Input triangle, sine or saw wave
- start with RANGE SWITCH on LOW
- Listen to the GRIND OUT
- With all GRIND SLIDERS down GRIND OUT will be same as IN
- Bringing up GRIND SLIDERS to introduce wave shaping
- Change RANGE SWITCH to HIGH
- Experiment with GRIND CV and SLIDERS to change timbre

FILTER

NOB POSITIONS	IN	FULL CW
	GRIND -> SPIN	75%
	DAMPING	25%

- Start with the above GRIND patch
- Listen to the 0° output
- Turn GRIND -> SPIN clockwise
- The 0° output will become a LOW PASS output
- Turn DAMPING clockwise to reduce resonance
- SPIN controls filter cutoff frequency
- Try other outputs: BAND PASS, HIGH PASS, INV BAND PASS
- GRIND sliders are now voltage controlled non-linear feedback paths
- Experiment with all controls

