Schlappi Engineering — Angle Grinder

- Manual PDF

Angle Grinder Manual PDF

Schläppi Engineering Angle Grinder — melodic use analysis

The attached manual is for **one module**: **Schläppi Engineering Angle Grinder**.
So rather than "how these modules can be used together," the useful framing here is:

- how the **internal sections** of Angle Grinder work together
- how to patch it with the rest of a Eurorack system to create **melodic material**
- what kinds of **pitched roles** it can play in a musical patch

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What Angle Grinder is, musically

Angle Grinder is not just a weird distortion/filter. It is really **three melodic-capable tools in one**:

1. **Quadrature sine VCO / LFO**
2. **State-variable-ish filter**
3. **Voltage-controlled waveshaper / nonlinear feedback processor**

That makes it useful for melody in several different ways:

- as a **primary oscillator** with 1V/oct tracking

- as a **companion oscillator** for phase-related voices
- as a **harmonic animation source** for otherwise plain waveforms
- as a **filter voice** that can be “played” by resonance/feedback behavior
- as a **subtle or aggressive timbral layer** that follows melodic pitch

The big concept of the module is the interaction between:

- **SPIN** = the oscillator/filter core
- **GRIND** = comparator + VCA + subtractive waveshaping/feedback network

This interaction is what turns a simple pitched tone into something alive and musically rich.

Key manual takeaways for melodic patching

From the manual:

- **Tracks 4+ octaves at the V/OCT input**
- **High range:** about **10 Hz to over 20 kHz**
- **Low range:** about **0.3 Hz to over 600 Hz**
- **Four phase-related outputs**:
- in oscillator mode: **0°, 90°, 180°, 270°**
- in filter mode: **Low Pass, Band Pass, High Pass, Inverted Band Pass**
- **Sine outputs** are **5 Vpp**
- **GRIND/filter outputs can get much hotter**, up to around **22 Vpp**
- **FM1** can be linear or exponential via rear jumper
- **FM2** is additional exponential pitch CV
- **INJECT** can feed SPIN directly, bypassing GRIND
- **FM1 is normalled to GRIND OUT**, which matters a lot for tuning

That last point is especially important for melodic use:
if you want clean pitch tracking, **turn FM1 down unless you intentionally want self-modulated chaos**.

How the two sections work together for melody

1. SPIN as the pitch source

SPIN is a **quadrature sine oscillator**, which means it produces four sine waves at the same frequency but shifted by 90° relative to each other.

For melody, this gives you:

- a **clean fundamental tone**
- four related outputs that can be:
- mixed for different timbres
- sent to different VCAs/filters
- used as phase-offset modulation sources
- treated as separate “voices” that still feel unified

Because it tracks 1V/oct over several octaves, SPIN can absolutely serve as a **pitched melodic oscillator**.

Strong melodic use cases

- lead voice
- bass voice
- tuned FM source
- chord-ish layered sine stack through further processing
- quadrature modulation source for animated stereo melodic patches

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2. GRIND as harmonic sculptor

GRIND compares the SPIN phases against an input, creates square-ish control shapes, and subtracts them from the input. In plain musical terms:

- it can turn simple tones into **edgy, metallic, vocal, pyramidal, stepped, or tearing waveforms**

- it can create **harmonic complexity that still follows pitch**
- it can act like a **voltage-controlled timbre engine**

This is exactly the kind of thing that makes a melody feel expressive rather than static.

For melodic composition, GRIND is especially good at:

- adding controllable overtone motion to a pitched oscillator
- creating brighter transients on note attacks
- evolving a bassline from sine to snarling shape
- producing unstable but repeatable timbres when under CV control

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3. GRIND→SPIN as “playable instability”

The **GRIND -> SPIN** control feeds the GRIND output back into the oscillator/filter core.

This is the musical magic zone.

At low amounts: - subtle enrichment - dynamic asymmetry - controlled growl

At medium amounts: - animated harmonic movement - unstable but still pitch-centered tones - pseudo-resonant behavior

At high amounts: - the oscillator can be overwhelmed and shift toward **filter-like behavior** - tones can become noisy, percussive, or semi-chaotic - pitch may become less stable, but this can be musically great for accents and transitions

For melody, this means you can treat GRIND->SPIN as a **timbre-performance control**: - lower for stable notes - higher for choruses, fills, or dramatic phrases

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Best melodic roles for Angle Grinder

A. Primary melodic oscillator

This is the most straightforward use.

Patch idea

- Sequencer 1V/oct → **V/OCT**
- Envelope → VCA controlling audio level downstream
- Take **0° output** or **GRIND OUT** as main audio
- Keep **FM1 down**
- Tune with **SPIN** and **FINE**
- Use **GRIND sliders** for timbre shaping

Musical result

- Clean sine-based melodies if you use SPIN outputs directly
- Rich, animated leads or basses if you use GRIND OUT

Why it works

You get pitch stability from SPIN and character from GRIND.

B. Melodic oscillator with animated timbre

Because each GRIND lane has its own slider and CV input, you can move the harmonic structure over time.

Patch idea

- Sequencer → **V/OCT**

- Slow envelope/LFO/sequence rows → one or more **GRIND CV inputs**
- Main audio from **OUT**
- Optionally use a separate envelope to control final VCA

Musical result

Each note can have: - different brightness - different edge - different attack contour - timbral movement across a phrase

This is ideal for: - acid-adjacent leads - morphing basslines - synthetic plucks with internal animation

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C. Dual-role melody + modulation source

Since SPIN has four phase outputs, you can use one as audio and others as modulation tied to the same pitch.

Patch idea

- 1V/oct → V/OCT
- **0° output** → audio path
- **90° / 180° / 270° outputs** → modulate:
- panning
- wavefolder symmetry
- filter cutoff
- VCA level on parallel voice

Musical result

The melody itself drives its own movement.
This creates very coherent patches where: - every note has internal motion - stereo shifts feel locked to the pitch - supporting modulation feels musically related rather than arbitrary

This is one of the most special melodic uses of Angle Grinder.

D. Melodic filtering / pingable timbre voice

When SPIN is damped or sufficiently disrupted by GRIND feedback/input, it behaves more like a filter core.

With the right external oscillator, Angle Grinder becomes a very unusual **melodic filter voice**.

Patch idea

- Send a tuned VCO or harmonically rich source into **IN**
- Turn **GRIND -> SPIN** clockwise
- Add some **DAMPING**
- Use the SPIN outputs as:
- low pass
- band pass
- high pass
- inverted band pass

Musical result

- moving resonant tones
- formant-like melodic filtering
- unstable but expressive spectral shifts
- pseudo-physical or vocal textures

This works great when the melody is carried by another oscillator and Angle Grinder becomes the **character voice**.

E. Soft-sync melodic voice with INJECT

The **INJECT** jack directly hits the SPIN core and can be AC- or DC-coupled. The manual says AC mode is default and acts like a **soft sync-like effect**, especially with square or saw input.

Patch idea

- Sequencer → V/OCT on Angle Grinder
- Another oscillator's saw or square → **INJECT**
- Main audio from SPIN output or GRIND OUT

Musical result

- stable pitch with reset-like articulation
- animated sync-ish harmonics
- sharper melodic presence without standard hard-sync harshness

This is excellent for: - leads - sync bass - aggressive arpeggios

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Practical melodic patch recipes

1. Clean sine lead

Goal: pure, stable melodic line

Patch - Sequencer → V/OCT - 0° output → VCA → mixer - Envelope → VCA CV - FM1 fully down - GRIND sliders down or unused - DAMPING low / oscillator mode active

Result - very pure sine lead or bass - good for sub lines, FM carrier duty, or minimal melodies

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2. Animated bass voice

Goal: bassline that moves harmonically while staying pitch-centered

Patch - Sequencer → V/OCT - OUT → lowpass filter or LPG → VCA - One envelope or sequencer lane → GRIND CV 1 - Another modulation source → GRIND CV 2 - Keep GRIND->SPIN low to medium - Use one or two sliders up

Result - bass with evolving edge - can move from rounded to biting across a phrase - especially good for techno, EBM, industrial, electro

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3. Phase-based stereo melody

Goal: wide melodic voice from one oscillator

Patch - Sequencer → V/OCT - 0° output → left voice chain - 180° output → right voice chain - Or 90° and 270° to two VCAs/panners - Use same envelope for both, or offset them slightly

Result - natural stereo spread - strong mono relationship but lively width - beautiful for drones, ambient melodies, and glassy tuned textures

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4. Four-note articulated patch from one pitch source

Goal: one melodic line driving a complex ensemble feel

Patch - Sequencer → V/OCT - Send 0°, 90°, 180°, 270° to four different destinations: - four VCAs - four filters - four wavefolders - Modulate each destination differently - Mix them back together

Result - one pitch source, but layered motion - pseudo-ensemble or rotating timbre cloud - excellent for melodic ostinatos

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5. Harmonic melody processor

Goal: use Angle Grinder to transform another melodic oscillator

Patch - External oscillator carrying the melody → IN - Set SPIN to LFO or audio rate depending desired effect - Listen to OUT - Modulate GRIND sliders/CV - Keep GRIND->SPIN low for processing, higher for feedback complexity

Result - supersaw-like shimmer at low internal rates - metallic sidebands and tearing overtones at audio rates - melody remains recognizable but gets a distinct synthetic personality

This is especially powerful when you already have a favorite VCO but want a more original melodic timbre.

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6. Filtered melody with nonlinear resonance

Goal: melodic line with unstable resonant animation

Patch - External VCO → IN - Use GRIND->SPIN at medium-high setting - Add DAMPING to move away from pure oscillation - Take LP/BP/HP outputs from SPIN - Sequence/filter the external VCO as normal

Result - animated filtering that feels halfway between a filter, resonator, and feedback network - great for leads that need movement without adding many extra modules

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7. Self-voicing chaotic melody

Goal: unstable but tunable lead voice

Patch - Sequencer → V/OCT - No input patched, or experiment with IN turned up as manual suggests - Use OUT as audio - Raise one or more GRIND sliders - Explore GRIND->SPIN and DAMPING carefully - FM1 down unless intentionally using self-feedback FM

Result - highly characterful, almost broken-waveform tones - can sound like sync, folding, PWM, and comparator distortion all at once - great for aggressive hooks and industrial melody lines

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How to keep it melodic instead of chaotic

Angle Grinder can go wild quickly. If your goal is melody, these practices help a lot.

1. Turn FM1 down for pitch tracking

The manual explicitly warns that **FM1 is normalled to GRIND OUT**.
So if nothing is plugged in and FM1 is up, the oscillator is self-modulating.

That is fun, but not ideal if you want: - precise tuning - consistent intervals - stable bass

So for melodic work: - **start with FM1 fully CCW**

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2. Start from SPIN outputs, then add GRIND

If you need a reliable melodic basis:

1. get the pitch right on 0° output
2. confirm tracking
3. then bring in GRIND OUT or feedback

This prevents losing the musical center too early.

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3. Use fewer sliders first

The manual's oscilloscope examples show that each slider introduces a distinct shaping contribution, and combinations get more complex.

For melody: - begin with **one slider** - then try **two adjacent sliders** - only then go to all four

This keeps the overtone structure more readable.

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4. Use GRIND->SPIN like a macro performance control

Instead of setting it high all the time, automate or perform it.

Best use: - lower during verse - rise during fill - spike for transitions - pull back for pitch clarity

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5. Separate “pitch CV” from “timbre CV”

Use: - **V/OCT / FM2** for pitch-related control - **GRIND CV inputs** for timbre-related control

This makes the module much easier to compose with.

Where Angle Grinder shines in melodic genres

Excellent for

- industrial techno
- EBM
- electro
- dark ambient
- experimental pop
- IDM
- cinematic tension music
- acid-adjacent bass and lead work
- noise-informed but tonal music

Less naturally suited for

- very pristine traditional subtractive lead patches

- ultra-precise tonal polyphony
- delicate, perfectly repeatable analog sweet-spot patching

It can still do subtler work, but its personality is in **animated nonlinearity**.

Best musical pairings in a wider Eurorack system

Even though only one module manual was attached, Angle Grinder pairs especially well with:

Sequencers

For obvious melodic use: - 1V/oct lines - sequenced timbre CV to GRIND lanes - transposition and accent tracks

VCAs / LPGs

Essential to shape notes dynamically after the often-hot outputs.

Envelopes

Very useful for: - note articulation - per-note grind animation - feedback depth changes

Filters

If using GRIND OUT as a main oscillator, a downstream filter can tame or spotlight specific overtones.

Wavefolders / distortion

Angle Grinder already shapes heavily, but subtle extra processing can create very rich leads.

Delays / reverbs

The phase outputs into stereo effects can sound huge and highly musical.

Precision adder / quantizer

Helpful if you want to keep complex Angle Grinder patches locked into tonal material.

Most musically useful outputs for melody

0° output

- best starting point for pitch
- cleanest reference
- ideal for tuning and stable melodic work

90° / 180° / 270°

- alternate voices
- stereo companions
- modulation tied to pitch
- parallel processing

OUT / GRIND OUT

- most characterful melodic audio output
- best for aggressive basses and leads
- can get very hot; attenuate if needed

Filter outputs when in filter behavior

- best for spectral melodies
- unusual formants
- feedback-rich tonal coloration

Three high-value melodic workflows

Workflow 1: Stable melody, unstable timbre

- Pitch from V/OCT
- Audio from GRIND OUT
- FM1 off
- Moderate slider use
- GRIND CV animated by envelopes/LFOs

This is probably the most generally useful mode.

Workflow 2: One oscillator, many related voices

- Use multiple SPIN outputs in parallel
- Different processing per phase
- Common pitch sequence

This is excellent for stereo and layered arrangements.

Workflow 3: External melody into Angle Grinder processor

- Use another VCO for the main melody
- Feed it to IN
- Use Angle Grinder as wave-transformer/filter-feedback network

This is the best option if you want Angle Grinder's character without relying on it as the only pitch source.

Bottom line

Angle Grinder is absolutely capable of creating melodic components, but it is most rewarding when treated as a **performance-oriented timbral oscillator/filter hybrid** rather than a plain voice.

Its strongest melodic uses are:

- **quadrature sine VCO** for tuned melodic lines
- **animated waveshaper** for expressive bass and lead timbres
- **phase-related multi-output source** for stereo or layered melodic structures
- **soft-sync / injected oscillator** for sharper harmonic articulation
- **nonlinear filter/resonator** for spectral melodic processing

If you want clean melody, start simple: - V/OCT in - FM1 down - monitor 0° output - add GRIND gradually

If you want memorable melody, lean into what makes Angle Grinder special: - CV the GRIND lanes - exploit the four phases - perform GRIND->SPIN - use INJECT and feedback as compositional tools

It is a module that can make a sequence sound less like "notes from an oscillator" and more like a **living mechanical voice**.
