Contents [hide]

Garbage Ideas

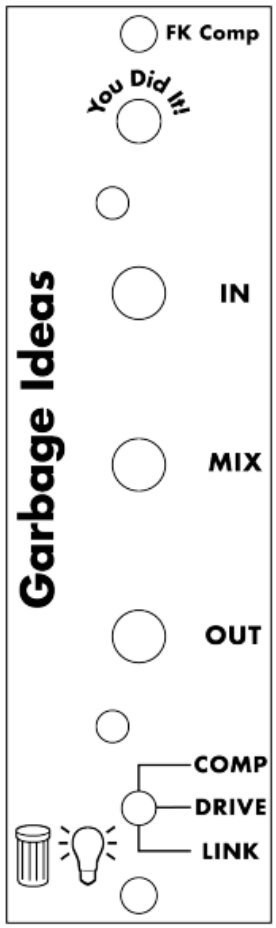
Garbage Ideas 2025 FK Comp Peak Limiter Saturator Module

Specifications

- Product Name: The FK Comp
- Model: Garbage Ideas 2025
- Format: 500 series

Introduction

The FK Comp is an aggressive FET-style peak limiter with an additional saturation effect in the 500 series format. This document will showcase some of the deeper functionality of the unit.



Controls

The FK Comp has three rotary controls.

- Input: Controls the signal level going into the main amplifier of the FET compressor. It does not affect dry signal presented to the mix knob.
- Mix: Blends the signal presented to the output stage. Clockwise is wet, and counterclockwise is dry.
- Output: Controls the amplitude of the signal presented to the mix knob from the main compressor amplifier.

The FK Comp also has a three-way toggle switch.

- Comp: Dynamic control is enabled.
- Drive: Dynamic control is disabled. The main compressor gain stage is allowed to distort.
- Link: Dynamic control is enabled. In 500 series chassis that support pin 6 linking, the gain reduction will be linked between multiple units. Note that both units must be in link mode.

  The gain reduction linking acts as a “greater than” function. If one module begins

limiting, the gain reduction of the linked modules will follow with the same amount of gain reduction. If both modules have their detectors engaged, both units will assume the larger value of gain reduction. The detectors do not sum. This means in a stereo bus application, the gain reduction of a center-panned mono source will not trigger more compression than the same mono source hardpanned to either side.

Theory of Operation

Block Diagram

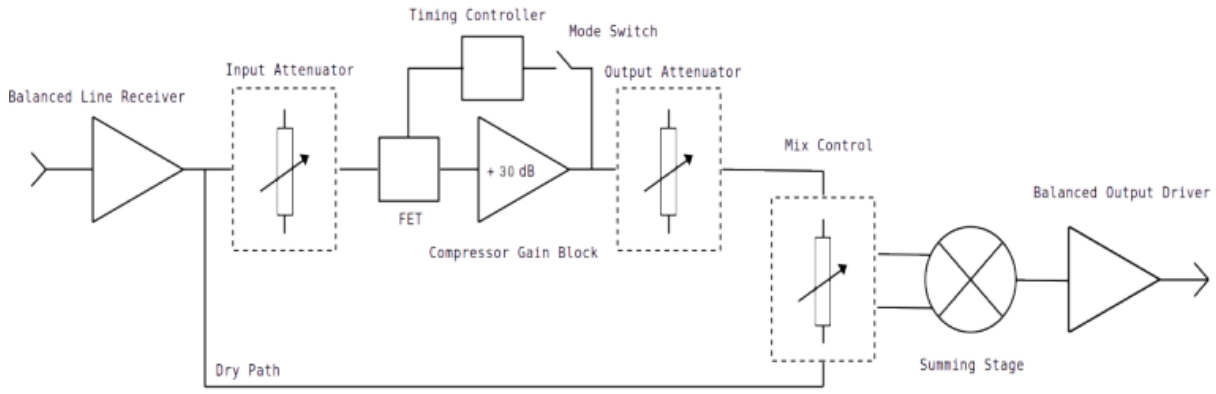


Figure 1: FK Comp Block Diagram

- Figure 1 is a simplified representation of the FK Comp's inner workings.

Balanced Line Receiver

- The input stage of the FK comp consists of a high performance line receiver IC. It takes a balanced line level input and generates a single ended output with terrific fidelity and low noise.

Balanced Output Driver

- The final output stage of the FK comp is a high-performance balanced line driver IC. It can drive single balanced and unbalanced loads.

Gain Reduction Stage

- The gain reduction stage consists of the FET, the Compressor Gain Block, and the Timing Controller in a control loop.

- The FET acts as a controlled attenuated that is driven by the Timing Controller. The Timing Controller converts the AC output voltage of the Compressor Gain Block into a DC control voltage. It is hand calibrated to the exact FET in
- each FK Comp. The response of the Timing Controller is weighted asymmetrically. Positive swings are more heavily processed than negative swings, leading to the generation of complex harmonics from the compression envelope itself.
- The Compressor Gain Block is a class A gain stage with 30dB of gain. It is responsible for generating distortion in Drive mode.
- The Gain Reduction stage in comp mode has a fixed threshold and a high ratio. The Threshold is set at +8 dBu at the output of the module. In drive mode the Timing Controller sidechain is simply unhooked.

You Did It!

- The You Did It! indicator lights when 15dB of gain reduction is achieved. Keep in mind the FK comp can be applying significant levels of compression without lighting the indicator.

Summing Stage

- The summing stage in the FK Comp is not clean. It has been designed have a level dependent frequency response while simultaneously adding harmonics.
- As signal is driven harder into the summing stage, the output get darker. Both the wet and dry signal are subject to this effect.

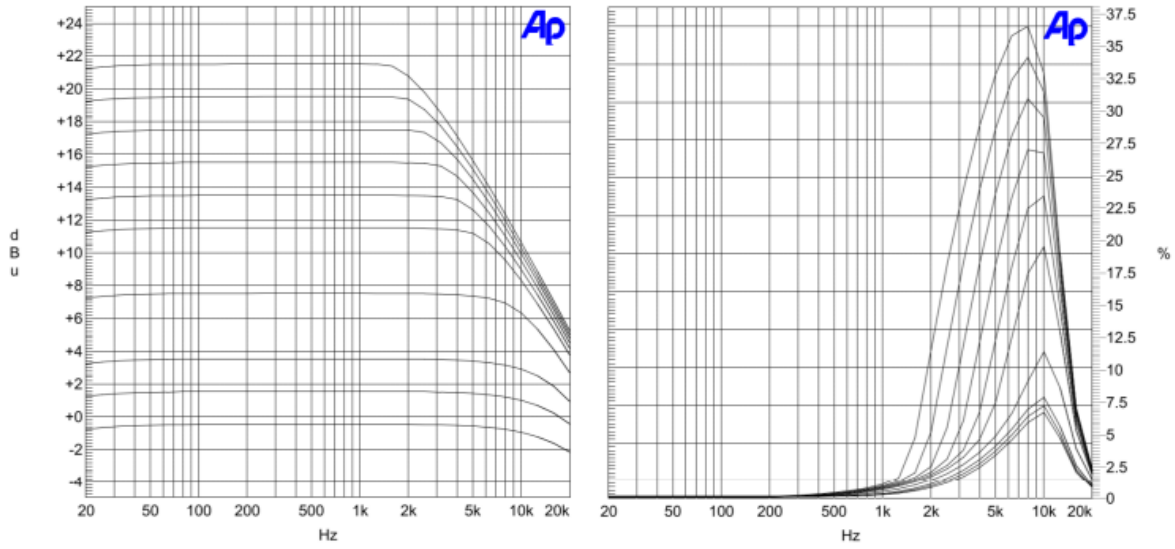


Figure 2: Frequency response and THD plot of an FK Comp fully dry

- Figure 2 is included to demonstrate this effect. The plots were generated from an FK with the mix knob fully counter clockwise.
- This means the signal is only being processed by the summing stage. Sine wave sweeps were performed at operating levels between 0 dBu and 20 dBu with 2dB increments.

  The leftmost plot demonstrates the reduction of the frequency response as the output level goes up.
- The rightmost plot shows the correlated increase in THD as this effect sets in. The summing stage is a class A design; the THD generated is primarily the 2nd harmonic.
- It is worth noting that for the wet signal path, the summing stage is after the output knob. The effect being described can thus be dialed in by adjusting the output knob.
- This adjustment has no bearing on the FET compression in Comp mode, or the saturation generated in Drive mode, and thus is an extra parameter included in the FK Comp.

FAQ

- **Q**: What does the “You Did It!” indicator signify?
- **A:** The “You Did It!” indicator lights up when 15dB of gain reduction is achieved. However, note that significant compression levels can still be applied without triggering the indicator.

Documents / Resources

	Garbage Ideas 2025 FK Comp Peak Limiter Saturator Module [pdf] Instructions 2025, 2025 FK Comp Peak Limiter Saturator Module, FK Comp Peak Limiter Saturator Module, Peak Limiter Saturator Module, Limiter Saturator Module, Saturator Module

References

- User Manual

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