



RK3 ringmod/waveshaper user's manual

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READ THIS, DAMMIT!!!!!!!!!!

RETAIN INSTRUCTIONS: The safety and operating instructions should be retained for future reference.

HEED WARNINGS: All warnings on the RK3 and in the operating instructions should be adhered to.

FOLLOW INSTRUCTIONS: All operating instructions should be followed.

WATER AND MOISTURE: The RK3 should not be used near water (e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, near a swimming pool etc.). Care should be taken so that liquids are not spilled onto or near the enclosure.

VENTILATION AND COOLING: The RK3 normally operates warm to the touch. It **MUST** be situated so that its location or position does not interfere with convective cooling. The RK3 **MUST NOT** be used on a bed, sofa rug or similar surface which may prevent proper cooling. It is **NOT** a toy. If the RK3 is mounted in a synthesizer rack or other built-in installation, space *must* be left around it to allow convection cooling.

HEAT: The RK3 **MUST** be situated away from heat sources such as radiators, heat registers, stoves, or other devices (including power amps) that produce heat.

POWER SOURCE: The RK3 should be connected to a power supply **ONLY** of the type described in the operating manual or as marked on the RK3. It uses +12v at about 400 mA and -12v at 10 mA, and draws about 800 mA when first powered on (dropping to ~400 mA after a few seconds). The power input is a standard Doepfer (tm) 16-pin IDC type, with the -12v pins on the **BOTTOM**. The pins above the +12v pin row are not used and not connected.

CLEANING: The RK3 should only be cleaned with a soft cloth moistened with water. Unplug the power supply before attempting to clean.

NON-USE PERIODS: The RK3 should be shut off when left unused for a long period of time.

DAMAGE OR TUBE REPLACEMENT REQUIRING SERVICE:

The RK3 should be serviced by qualified service personnel when:

--The power supply has been damaged;

--The RK3 has been dropped, physically damaged, or subjected to force;

--Liquid has been spilled onto the RK3 or it has been exposed to rain;

--The RK3 does not appear to operate normally or exhibits a marked change in performance.

SERVICING: The user should not attempt to service the RK3. All servicing should be referred to qualified service personnel.

METASONIX LIMITED WARRANTY and standard legal disclaimer

Thank you for purchasing this Metasonix product. The following terms and conditions apply:

1. Warranty period is for **ONE YEAR** from date of purchase with proof of purchase submitted. Warranty covers electrical failure of vacuum tubes and gas-filled tubes, except in cases explained in 3 below.

2. Operating instructions must be followed. This device was intended **ONLY** for use by **AUDIO AND MUSIC PROFESSIONALS**.

IT IS NOT INTENDED FOR USE BY ORDINARY CONSUMERS!!

Product must not have been damaged as a result of defacement, misuse, abuse, neglect, accident, destruction or alteration of the serial number, improper electrical voltages or currents, repair, alteration or maintenance by any person or party other than our own service facility or an authorized service center, use or installation of non-Metasonix replacement parts in the product, or the use of this product outside of the U.S.A. or Canada (except as a product distributed by an authorized Metasonix dealer), or modification of the product in any way, or incorporation of the product into any other products, or damage to the product caused by accident, fire, floods, lightning, or acts of God, or any use violative of instructions furnished by Metasonix.

3. Obligations of Metasonix shall be limited to repair or replacement with same or similar unit, at our option. To obtain repairs under this warranty, present the product and proof of purchase (e.g. bill or invoice) to the authorized Metasonix service center, transportation charges prepaid. When returning the product for repair, please pack it very carefully, preferably using the original packaging materials. Please also include an explanatory note.

IMPORTANT:

To save yourself unnecessary cost and inconvenience, please check carefully that you have fully read and followed the

instructions in this instruction manual.

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METASONIX shall not be held liable for any incidental, consequential, or direct damages or expenses associated with the use or misuse of its products. The audio output of this product is capable of damaging some types of solid-state audio equipment; such use is entirely at the risk of the user. METASONIX does not guarantee that any of its products are designed for any particular use or purpose. The entire risk of suitability and performance of this product lies with the user. Products manufactured and/or sold by METASONIX are not authorized for use as critical components in devices used in life support and other systems whose failure or performance could result in compromised safety or danger to life or property.

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What it does:

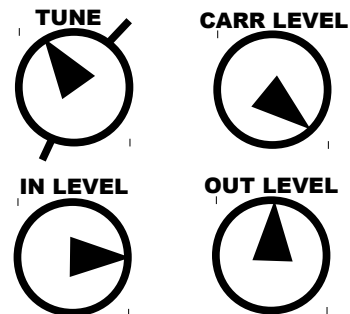
The RK3 is an 8hp Eurorack version of our legendary R-53/TM-1 waveshaper and ring modulator circuit. The entire circuit is based on a single tube, a 14BL11 dual triode plus pentode, and works in the same fashion as the R-53 circuit. It behaves as a primitive pulse generator, adding badly-formed pulses which synchronize to the input waveform erratically. This circuit feeds a simple ring modulator based on the tube's pentode. Main input signal enters the tube via the control grid, and the carrier modulation signal effects the tubes' screen grid. The RK3 is optimized for general use in the *professional* modular synthesizer studio. All panel inputs and outputs are compatible with other synthesizer modules, and cannot damage other modules connected to them.

The audio input and carrier/CV input are both 500k ohms impedance. The audio output is able to drive a 600-ohm load. The audio input can accept any signal and cannot be damaged by overvoltage. The CV input can accept changing CVs (such as LFOs) or audio signals, and is limited to +-10v range.

USAGE

To begin experimentation, adjust the RK3 controls approximately as shown:

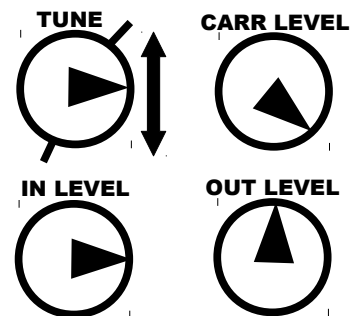
Drive the input with a strong signal and adjust input and output volumes as needed. Simple tube distortion can be obtained without using the pulser, which will usually be disabled when TUNE is fully clockwise or counterclockwise. Note that the output level may not be as "hot" as most conventional Euro modules, but it should be enough to be usable with them.



The pulser circuit works best with waveforms having sharp transitions, such as square or sawtooth waves or digitized audio. (Acoustic instrument or electric guitar usually do NOT work well with the pulser.)

To explore the pulser, adjust the controls as shown:

Twiddle the TUNE knob while feeding signal to the input, and observe how the pulser tries to "track" the input pitch. The markings on the TUNE knob show roughly where the pulser starts to work. Some find the best setting to be at the point where the pulser just begins to be noticeable – turning it further clockwise will cause the pulser to break into oscillation, which may or may not be useful, depending on personal preference and the nature of the input signal. It will also interact with input level settings.



You may try feeding the CV/carrier IN a strong audio signal. It modulates the input signal via the pentode VCA, giving a unique ring modulation effect. You can also feed a CV here. It interacts with the pulser circuit somewhat so a CV fed to this input can also be useful for sound effects.

To experiment with the ring-modulator function, run a strong audio signal into the CV/carrier INPUT and set the controls as above. Turn CARR LEVEL *clockwise* until you hear the carrier input effecting the main signal. Changing the pitch of the carrier signal will cause a noticeable sum-difference cancellation effect. You will hear heterodyne "beating" when the carrier pitch is close to the pitch of the input signal. (Note: the RK3 ringmod function is not like other ring modulators -- it DOES NOT completely suppress the carrier signal, you will always hear some carrier mixed into

the output. This is NORMAL and an unavoidable characteristic of this kind of primitive circuit design. Learn to use this effect, it will not sound like conventional ringmods.)

The ringmod and pulser may be used simultaneously. The ability to combine audio signals via the regular input and the CV/ carrier input allows for a vast range of unique and very complex tonal effects.

Note that the RK3 controls have considerable "extra range" beyond what they absolutely need. This is made necessary by variations in tube samples and to allow for tube aging. Do not assume these settings are written in stone, and if a different setting gives optimum results for your RK3, this is normal. Because the RK3 is totally different from any other synthesizer module you have ever used, you may be surprised by some of its quirks. Learn to exploit them, and you'll make sounds that other modular synthesists can only dream of.

MAINTENANCE

Powering the RK3 requires a power supply producing +12 volts DC, at 400 milliamps (when first powered on, the RK3 briefly draws about 2-3 times greater current, so be aware of this when using a power supply to run it plus other modules.) Plus -12 volts DC at 10 mA. You MUST assure the power supply is able to handle the RK3 load plus the load of other modules. Doepfer's A-100PSU2 or A-100PSU3 are both adequate to run up to five Metasonix RK-modules with no other loads. If the power supply shuts down, your have overloaded it. (It will not be damaged but you will be forced to wait until it cools off.) The Metasonix RK-P power supply is also available, especially if your existing cabinet has limited power capacity. Many low-cost switching supplies, like the ones offered by Tip-Top Audio or other firms, will have difficulty powering the RK3.

The tube in the RK3 is being run VERY conservatively. It should last for tens of thousands of hours of normal use. Still, the RK3 produces a lot of waste heat, so we recommend shutting it off when not in use.

UNLESS YOU KNOW EXACTLY WHAT YOU ARE DOING, DO NOT REPLACE OR SUBSTITUTE THE TUBE YOURSELF!

Please note: not all tubes have easily visible heaters. If you can't see a heater glowing, DO NOT assume that tube is "bad". We get many foolish complaints of this type!

TUBE REPLACEMENT: despite its expected long lifetime, the tube might be damaged or develop faulty internal wiring connections, requiring replacement. This particular RK3 was shipped, and wired for, a 14BL11 and no other type.

NOTE: Most of the switching-type Euro power supplies currently on the market will have trouble powering the RK3. Because tube heaters draw much more than rated current when powered on cold, a power supply should be chosen to have excess current capacity—250 to 300% of the operating current draw is recommended, especially if a switching power supply is used to power tube heaters.

PLEASE CONSULT WITH METASONIX BEFORE PERFORMING ANY MODIFICATIONS. Such changes can damage the module or the power supply if the wrong tube type is installed. Don't experiment blindly!

It is possible to operate Metasonix RK modules on +-15v power supplies. This is NOT a trivial modification. It requires a proper power connector and a power dropping resistor in the +15v line, to prevent applying excess voltage to the tube heater. Contact Metasonix before attempting it.

If you are confused or have ANY technical questions, feel free to contact us. Please DO NOT ASSUME and *if you are not an experienced technician*, DO NOT TRY RANDOM TUBES OR MODIFY THE CIRCUIT IN ANY WAY!

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