

Welcome to the Ring Stinger™

**THIS MANUAL CONTAINS
IMPORTANT SAFETY
INSTRUCTIONS -
PLEASE READ BEFORE USE!!**

The Ring Stinger™ is in essence a ring modulator based on the original transformer matrix (and not the ubiquitous modulator chip) for that distinctive vintage ring mod sound and 60s germanium distortion. This is not your average stomp box, however, and uses concepts that are more akin to modular synths than effects pedals. To get the most out of it and appreciate its hidden depths it is absolutely essential to read and understand the manual which we have taken great care to write! All enquiries arising out of laziness will be politely (?) referred to the manual (on a good day).

The extended features of the Ring Stinger™ give it such numerous sound possibilities that it would be foolish to attempt to do them all justice here. We are therefore NOT providing sample settings (so please don't bother to ask) but relying instead on an understanding of the principles involved allied to some pant-curdling experimentation. There are nevertheless some hints and tips provided at the end. If you want to busk it that's fine (the pedal is fairly idiot-proof and you'd be hard pushed not to get a sound) but just don't expect us to explain what's going on.

BASIC PRINCIPLES

A ring modulator is a device that combines two inputs (A and B) into one output, transforming them into new sounds not originally heard at the inputs. These are in fact the sum and difference of the frequencies of the input signals (A+B and A-B). The original input signals are suppressed, leaving the sum and difference signals to be heard together as the output. Many harmonics can be produced by this process yielding very complex waveforms. This results in the atonal and "bell-like" effects that are commonly associated with ring modulation (unless A and B are harmonically related which has less atonal results). A special case (which the Ring Stinger™ exploits) is when A and B are the same thus giving an octave above (A+B). Low-pass filtering (i.e. removing harmonics from) one or both inputs can greatly increase the purity of the output signal.

Most simple ring mod units have only one external input and produce a tone (or "carrier") to modulate it with. The carrier remains static (unless manually tweaked) which greatly limits the effects possible. Modulating the carrier frequency (i.e. moving it around a bit) hugely increases the potential. The Ring Stinger™ allows various ways of doing this (by footpedal, light, external control voltage and not least the built in LFO - short for Low Frequency Oscillator). The carrier (or "VCO" - short for Voltage Controlled Oscillator)

on the Ring Stinger™ also has an insert point allowing the carrier to be overridden by a second external source as well as access to the carrier itself which can be used as a sound source in its own right. It is important to understand that a ring mod will produce a sound only if BOTH inputs have sufficient signal going into them (the resulting output level being a factor of both input levels). You can also use the insert point to treat the carrier itself (e.g. with low-pass filtering as mentioned above, gating, amplitude modulation etc.)

All ring modulators suffer from carrier breakthrough and distort and degrade the original signal, especially those using a transformer/diode matrix as in the Ring Stinger™. However, by good design and time consuming selection and matching of components the carrier rejection achieved in other designs by using modulator chips has been equalled and in most cases surpassed but with two distinct advantages; mega sex tone and no periodical adjustment required. Please note that use of compression or distortion (after the Ring Stinger™) will greatly exacerbate carrier breakthrough.

HOUSING (BENEFIT)

Opening up the Ring Stinger™ and accessing the battery compartment is so simple it can stump the most highly developed musician's brain. There are no screws - you just lift the front panel up by the middle footswitch while holding on to the outer casing and voila - as they say! Keep case closed when in use for maximum signal screening and minimum hum pick-up. This also prevents ambient light from disrupting the optical workings.

WARNING!! The circuit board and components can be sharp - PLEASE DO NOT TOUCH!

BATTERY HOLDER

The clip on the back of the battery holder (opposite the contacts) is designed to latch onto the back of the battery. The ideal way to remove the battery is with a pen by lifting the back of the battery and sliding the pen underneath, between the battery and the holder, thus releasing the battery from the clip. Alternatively you can lever it out using a suitable blunt instrument (e.g. medium to large screwdriver) but make sure you lever against the battery holder and not the pedal casing.

WARNING!! Never attempt to remove the battery by pulling on it with excessive force! Avoid placing your hand near the circuit board.

CHROME KNOBS

For that extra spangle carefully remove the plastic covering the chrome - you'll be amazed at the difference!

CONNECTIONS (TOP PANEL RIGHT TO LEFT)

In/On

Connecting a jack to this will power up the unit (whether switched on or off). This will use battery power (if power jack is not connected). You can connect a mic, instrument, mixer send or the output of another effect. Please note that the input level has a marked effect on the sound (see Drive(I)).

To attain a sufficient level a mic should be 200-600 ohm and connected via a suitable impedance matching transformer for high impedance 50kohm output (the inexpensive in-line balanced XLR to 1/4" jack type is ideal). The Ring Stinger™ is optimised for instrument level (-20dBm to -15dBm) which gives the best Drive range and Blend balance. Higher levels can be used but may require adjustment of control settings.

POWER JACK

This is a commonly available type of jack for connecting a power supply (a.k.a. psu, AC adapter, wall wart)

WARNING!! If you wish to use a power supply you must remove the battery first. Never have a battery and a power supply connected at the same time (see below).

BATTERY OR POWER SUPPLY? (or "How To Get Your Money's Worth!")

Even though the Ring Stinger™ will run on a suitable battery (e.g. 9 volt PP3, 6F22 or MN1604 type) and a battery holder is provided, we strongly recommend that this is only as a last resort as the performance of the pedal will be seriously compromised! The inherent voltage decrease (esp. over time) and the relatively high internal resistance of batteries (compared to the low impedance of a good quality regulated power supply) will not be flattering to the potential sound and will affect the VCO purity.

IMPORTANT: The purity of the VCO waveform depends on the supply voltage (see "Calibrating the VCO"). An impure VCO waveform, especially if modulated with a complex input signal, will drastically increase the harmonics flying around at the output. This will not generally give the most musical results, but can of course be used if desired.

The maximum current consumption is approx. 30mA, but even with no signal it will be relatively high. This means that even an alkaline battery will not last very long. In the long term it makes absolutely no financial (or ecological) sense to keep replacing them when you can buy a power supply for literally the price of a few disposable batteries.

The Ring Stinger™ is calibrated for 9 volt operation. 12 volts will work fine, but it will be necessary to re-calibrate the pedal in order to obtain a pure VCO waveform. This may be necessary even on a 9 volt supply as no two supplies produce exactly the same output voltage. **NEVER RUN THIS PEDAL ON MORE THAN 12 VOLTS!!** Please note also that a single power supply can be made to run a number of pedals (easily done with a more than fashionable Lovetone pedal board!)

POWER SUPPLY SPECIFICATIONS:

The power supply should have a Japanese-style, tip (centre) negative, "barrel" type connector. This type of connector is used widely in many devices and should be readily available from music or electronics outlets. (We do not currently sell power supplies.)

IMPORTANT!! Even though it is widely used, it is a nonstandard part and comes in many size variations not

all of which will work reliably. The connector has a dual function; to supply power to the pedal and also switch out the battery supply if a battery is fitted. The ideal dimensions for the connector are 2.1mm internal diameter and 5.4mm external diameter. Lovetone cannot guarantee that the correct connector will be used at all times by all customers and we therefore stress that when using a power supply you remove the battery first. Do not connect a power supply without checking to see if a battery is fitted.

For safety reasons we recommend using a power supply with double insulation as opposed to earthing/grounding - in addition this will help prevent hum loops. It should be well smoothed, otherwise you can also get hum problems (from "ripple" on the dc output). The power supply should also be of the regulated type, which means that its output voltage should not vary significantly with load.

Voltage: the output should be 9v or 12v d.c. (or either if it has a selector switch).


WARNING!! Never use more than 12v as this can result in permanent damage.

Current: the current rating should be a minimum of 200mA (0.2A) up to 1.5A. Higher current (more expensive) supplies will generally have a stiffer, smoother output resulting in a cleaner sound. Anything higher than 1.5A, however, would be a waste of money for running a set of pedals.

PLEASE NOTE: THE CURRENT RATING OF THE POWER SUPPLY IS ITS MAXIMUM CAPACITY - THE PEDAL WILL ONLY DRAW THE CURRENT IT REQUIRES.

CALIBRATING THE VCO

WARNING!! The VCO output is much higher than instrument level, so turn down your amp or monitoring volume first.

Open up the pedal as described previously and connect your power supply. Plug an amp or other suitable monitoring into the VCO out jack. Set VCO freq. to approx. 12 o'clock, Depth/Manual to zero (fully anti-clockwise) and the VCO selector switch to  (sine wave). The trim pot is near the middle of the main pcb (as you look from underneath) and labelled PW trim. Using a trim tool or small screwdriver slowly turn the trim pot to find the "null point" (the setting which gives the mellowest sound). Provided you use the same (regulated) supply with this pedal no further adjustment should be necessary. (This calibration also affects the triangle and square waves, but is best done on sine as described above.)

VCO Out

Together with Carrier In, this acts as the insert point for the VCO (or "carrier") thus providing access to the VCO (regardless of whether there is anything connected to the Carrier In).

WARNING: Turn down your amp or monitoring volume before you plug into this socket.

PLEASE NOTE: If you have a signal connected to In/On at the same time as accessing the VCO there may be some

crosstalk. If so, turn down the Drive(I) control or mute the incoming signal.

Carrier In

This acts as a second input if you want to ring mod two external signals. Connecting a jack will break the path of the VCO. When nothing is connected the VCO out is “normalised” to the Carrier In (i.e. no jack cable needs to be connected for basic operation). This input has a 20K input impedance so when using a guitar (or other similarly high impedance source) some preamplification or signal buffering will be desirable. Buffering can easily be achieved by connecting a FET switching pedal (e.g. Boss, DOD, Ibanez) in bypass between the guitar and this input. If instability is experienced using a wah pedal, the same would be beneficial (between the wah and this input).

IMPORTANT: Because in basic operation the break jack set-up described above may be sitting idle for very long periods of time, it may be necessary every now and again to “exercise” the contacts by inserting a jack a few times. If you experience any signal loss this is the first thing to try.

VCO CV In/Pedal

This is a STEREO jack socket that accepts 3 different types of controllers for the VCO frequency:

1. Volume Pedal (see **WARNING!!** in LFO Depth Pedal)

a) Using a MONO cable:

Connect the output of a passive (i.e. non battery-using) volume pedal (e.g. Boss FV50 or FV60) to the socket. Use the VCO Freq. control to offset the range of pedal operation.

b) Using a STEREO cable (this provides a better sweep):

This requires making a special cable consisting of one stereo (TIP-RING-SLEEVE) jack “A” (which plugs into the Ring Stinger™) and two mono jacks “B” + “C” (which plug into a passive volume pedal, B to the output and C to the input).

Wire the following connections: A TIP to C TIP, A RING to B TIP, A SLEEVE to B+C SLEEVES.

Moving your foot forward will decrease the VCO frequency for both a) and b).

2. Light Jack

Insert the jack (which is provided) into the socket. It will respond to ambient light changes and, more directly, hand movements (which can create, with a bit of practice, very theremin-like effects). The brighter the ambient light, the greater the available range will be. Maximum darkness will give the highest VCO frequency (which will approach, but never quite reach, that set on the VCO Freq. control if the jack was not plugged in).

3. CV (Control Voltage)

Connect a mono jack with CV feed all the way into the socket. Please note that the VCO is scaled at slightly less than 1V/octave so that a potentiometer, series resistance or volume pedal can be placed in line with the control voltage to scale it to 1V/octave (over a moderate range).

LFO Depth Pedal

This is a STEREO jack socket that accepts 2 different types of controllers for the LFO depth:

1. Volume Pedal (See **WARNING!!** at end of this section)

Use the same (stereo cable) set-up as for 1.b) above. The LFO Depth/Manual control will scale the action of the pedal. Maximum setting will give maximum available modulation (which will in most cases be approximately half that available without the volume pedal). Moving your foot forward will increase modulation depth. Please note a mono cable set-up will not work in this socket.

WARNING!! The sleeve connection to this socket must NOT come into contact with other cable sleeves or ground, as it is at a different voltage.

2. Light Jack

Insert the jack into the socket. Bright light gives maximum available modulation (which will approach, but never quite reach, that set on the Depth/Manual control if the jack was not plugged in).

WARNING!! The two pedal input jacks are to be used only in the manner described. DO NOT CONNECT ANYTHING ELSE TO THESE (E.G. INSTRUMENTS, AMPS ETC.) AS THIS COULD RESULT IN PERMANENT DAMAGE.

Out

Main pedal output.

CONTROL PANEL

LFO Depth/Manual

The action of this control depends on the status of the LFO/Unlock footswitch (i.e. whether the LFO is activated or not) and the Oct./Ring footswitch (i.e. whether you're in octave or ring mod mode)

Ring Mod Mode:

1. When the LFO (and yellow LED) is on it determines the depth (or “amount”) of modulation of the VCO by the LFO. Depending on the position of the LFO 4-way switch this can mean modulation of the VCO frequency or pulsewidth “PW”. PLEASE NOTE: In certain circumstances a high depth setting can push the VCO square wave pulsewidth “off the scale” resulting in a momentary silence. Please also note that use of the LFO in Ring Mod mode may cause additional carrier breakthrough to occur.

2. When the LFO (and yellow LED) is off it acts as a fine tune for the VCO Freq. (maximum shift being on average 1.5 octaves) or VCO PW (whichever the LFO selector switch is set to) but only on square waves - not triangle. (See also LFO/Unlock footswitch.) This feature can be used to effectively extend the available range of VCO Freq. (in both directions).

Octave Mode:

This control has no effect.

LFO Rate

Determines the speed of the LFO. The LFO has a range

from very slow up to low audio frequencies (which allows FM effects to be heard at the VCO output, as well as driving the ring mod bananas. The action (rate) of the LFO is shown by the yellow LED. (In Octave Mode it is also shown by the green LED.)

VCO Freq.

Determines the frequency of the VCO. The VCO has an extremely large range. At the slow end it can be used to create gating/repeater effects. This is because, as mentioned previously, the ring mod needs both inputs to be active to produce an output so on sub-sonic VCO frequencies the output will follow the pulsing of the VCO. (This also means that if you have a jack connected to Carrier In with no signal on it you'll get nothing - however at least it'll be a big fat analogue nothing!) The most pronounced gating effect will obviously happen when the VCO is set to square wave - see VCO selector switch.

PLEASE NOTE: In Octave mode the VCO is switched off to prevent cross talk.

Drive(I)

Ring Mod Mode:

Determines the drive to the ring mod. More drive means more distortion and thus a more atonal effect. For purer more bell-like tones keep the drive low (and select sine wave on the VCO). **IMPORTANT: Too low a drive level may result in no sound at all.** The input level at In/On will also determine the amount of drive.

Octave Mode:

Determines the octave drive. The drive levels in Octave Mode are somewhat higher than in ring mod mode producing a full-on germanium octave "fuzz" effect. (If you're using a guitar the best way to hear this is on the neck pickup with the tone rolled off.)

Timbre

A glorified name for a tone pot - but this is no ordinary tone control. Clockwise it goes from a low pass, through fizzy and scooped, to a poky mid boost. At either extreme it will roll off high end harmonics - useful for creating purer bell-like tones.

Blend

Mixes straight signal with effect, giving 100% effect when fully clockwise and vice-versa. Adding some straight is useful for preserving bottom end on bass sounds for instance, as well as some semblance of the original key.

LFO selector switch

Ring Mod Mode:

Selects triangle or squarewave on either pulsewidth ("PW") or frequency modulation of the VCO.

Octave Mode:

This switch has no effect. The modulation of the octave drive always comes off the LFO square wave (and always at a fixed level i.e. it is not affected by the LFO Depth/Manual control). The depth of modulation is, however, affected

by the Drive(I) control. Maximum Drive(I) setting will give maximum depth.

VCO selector switch

Selects sine, triangle, sawtooth or square waveforms on the VCO. The purest ring mod sounds will be obtained using the sine wave (see Power Jack section on how to calibrate sine wave purity). The VCO sine output is not 100% pure, however. For the best bell tones you can use an external dedicated sine wave generator - or indeed the sine wave on your sampler. These should be connected to Carrier In. All the VCO waveforms change shape when PW modulated by the LFO, EXCEPT sawtooth (where subtle amplitude modulation will result instead).

PLEASE NOTE: The triangle waveform is lower in level thus enabling lower overall output levels.

FOOTSWITCHES

LFO/Unlock

Stops and starts the LFO, as indicated by the yellow LED (which shows the action of the LFO - but always the triangle wave, irrespective of the position of the LFO selector switch).

IMPORTANT (AND SLIGHTLY WEIRD):

When the LFO is switched off it is effectively frozen or "locked" into one of two states ("UP" or "DOWN").

Ring Mod Mode:

The LFO Depth/Manual control then scales (fine tunes) the (now static) square wave output affecting the VCO Freq. or PW (whichever is selected on the LFO selector switch).

Increasing the LFO Depth/Manual amount in "UP" will push the VCO Freq./PW in one direction, and in "DOWN" in the opposite direction. By observing the yellow LED you can actively select "UP" or "DOWN". This is obviously only possible at low LFO rates - unless you've got the foot-eye co-ordination speed of an insect. You could use this feature to toggle between two discrete VCO Freq. or PW settings. When the LFO Depth/Manual control is at minimum these two settings are virtually identical - the difference between them increases as you turn up the LFO Depth/Manual control.

As mentioned previously all of the above only happens with the LFO square wave and not triangle.

Octave Mode:

The LFO will flash the green LED which will show the status of the LFO square wave and consequently the level of octave drive. The drive is lowest when the green LED is brightest and vice versa. So for maximum drive, lock the LFO when the green LED is "off". As above, you can set up the Ring Stinger™ to toggle between two discrete settings, this time giving two levels of drive (a subtle difference will be heard - most noticeably on guitars).

Middle "**Bypass**" switch

Switches the unit on or off (as indicated by the red LED).

Oct./Ring

Switches between Ring Mod and Octave modes. The green LED indicates ring mod mode, however (as explained above) it may be partially lit or flash in octave mode depending on the status of the LFO. In Ring Mod mode however the green LED will always be brighter than at any time in Octave Mode even when showing minimum octave drive. (Also, the green LED never flashes in ring mod mode.)

HINTS & TIPS:

“Dalek” effects: Feed a mic or voice signal into In/On and dial up a low frequency “jitter” on VCO Freq. with VCO square selected.

Bell tones: Use mid VCO Freq. with VCO sine selected.

Bowed/Plucked effects: Use slow VCO Freq. with VCO sine/triangle/sawtooth selected.

Repeater effects: Use slow VCO Freq. with VCO square selected. Also try blending with straight signal.

Frequency Doubled VCO: Connect VCO Out to In/On and use blend control to mix with original. This enables VCO to be accessed at the pedal output and also brings into play the drive(l) and timbre controls.

WARNING: Keep amp volume/monitoring level down when connecting!

Minimoog owners: Patch unused output or headphone out on your mini into the In/On and the pedal output into the external input. Adjust the external input level so the overload lamp just flashes when the unit is bypassed.

DIY pure ring mod: Plug your input into Carrier In. Connect a jack lead to In/On and touch the loose tip with your finger!

LOVETONE SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT OR CONSEQUENTIAL LOSS, HOWSOEVER CAUSED, RESULTING FROM THE USE OF THIS PRODUCT.

Please ensure that associated equipment e.g. amplifiers (particularly of the valve variety) and any other equipment connected to this product is safely earthed. Always use high quality cables, connectors and power supplies. Lovetone cannot be held responsible for misuse of this product due to associated equipment being faulty, unsafe or poorly maintained.

This product is guaranteed by Lovetone for a period of ONE YEAR from the initial date of shipment by Lovetone to a distributor, dealer or end user. Lovetone will at its discretion repair or exchange for a new one, free of charge, any faulty or defective product returned to it within the above period except where the product:

a/ is deemed by Lovetone to have suffered unreasonable misuse or abuse
b/ has been tampered with or modified either in any way not compatible with normal use as suggested in the manual, or without the express permission of Lovetone.

PLEASE NOTE: If any product is found to be defective or develops a fault please contact us first on +44 1491 571411 or email: info@lovetone.com before sending it back as most problems can be sorted out by phone or email. **IMPORTANT!! If you do have to return the pedal and are outside the United Kingdom you must write: “RETURNED FOR REPAIR UNDER WARRANTY - CUSTOMS VALUE ZERO” clearly on the customs declaration.**

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