

Musician's Manual: Mu-FX Boostron 3

FET Boost - Compressor - Distortion
W/ FX Loop



Mu-FX is proud to introduce our first “new” product: the Boostron 3. The Boostron 3 is based on three classic vintage effects creatively improved and combined into a versatile and synergistic package.

Mike Beigel, inventor of Mu-Tron III and founder of the original Musitronics Corp (1972), has teamed up with **Rand Anderson**, a brilliant working guitarist and computer science pro to produce a “Swiss army knife” signal processor focused on CONVENIENCE and TONE, TONE, TONE.

We also credit Benjamin Harrison of Synaptic Groove for the SLACKJAW architecture on which the SLACKER distortion module is based

We are confident that working musicians “with the ears to hear” will find the Boostron 3 to be the

“One pedal to rule them all.”

Functions:

The Boostrotron 3 combines *3 separate signal processes in one compact housing:*

BLASTER (FET gain boost): based on the Alembic Stratoblaster ® *

SQUEEZER (compressor): based on the Musitronics/Dan Armstrong Orange Squeezer® *

SLACKER (versatile LM308 distortion): based on the Slackjaw™ version of the ProCo RAT®

In addition, an **FX LOOP** is placed between the *BLASTER output* and the *SQUEEZER input*. Any effects in the FX LOOP can be bypassed with their own foot switches, and the SQUEEZER and SLACKER can be bypassed with their two separate foot switches on the Boostrotron 3 main unit footswitch platform.

Each process is based on a “classic” product (each one *vintage analog*) but “**as good and better**” than the vintage products that preceded them, reflecting the Mu-FX philosophy of un-compromised “*Modern Vintage Analog*” design.

Power Supply: The Boostrotron 3 works with a 9.0 or 9.6 volt DC supply voltage. Either a single wall-wart supply or an ISOLATED 9V DC supply from a power block will work. While some FX box configurations work with “daisy-chained” 9V supplies, this can cause ground loop hum problems, noise, and even short circuit of an FX box which uses a different barrel jack configuration than the “de-facto standard” 2.1 mm x 5.5mm supply connection of the Boostrotron 3.

* See addendum: “Power Supply Best Practices”

Diagrams:



Boostron 3 - Back Panel Diagram



Boostron 3 - Top Panel Diagram

Controls:

(1) MAIN INPUT JACK

Accepts Standard ¼ inch plug, single conductor shielded cable from electric guitar signal level. The input impedance is a constant 1 meg-ohm, with ESD (surge) protection.

The input jack connects to the **BLASTER** circuit, which is controlled by a *true bypass* toggle switch on the Boostrom 3 top panel, and/or subsequently the **SQUEEZER** circuit and/or the **SLACKER** circuit, which are controlled by true bypass footswitches. Each effect can be engaged separately or in combination with one another (routing moves right to left).

BLASTER

Based on the Alembic Stratoblaster ®* design. The Boostrom **BLASTER** has added function while preserving low noise level: FET clean gain at low gain settings all the way up to FET distortion at high gain settings.

Inside the FET Preamp: A buffer amp (unity gain) provides a constant 1 Meg-Ohm input impedance (won't load guitar pickups) with gain and treble boost panel controls. FET's, while providing low noise amplification and "round" distortion at high gain, have varying characteristics unit to unit. The circuitry in the (Op-amp) buffer stage provides high input impedance at the input and low-impedance drive to the FET (the variable FET parameters are the main reason why individual "Blaster" products have inconsistent product-to-product sound quality).

(2) BOOST

The **BOOST** (preamp gain) control boosts the guitar signal from *unity gain* (at 1 on the dial) to FET distortion at higher gain settings. Due to the difference in the *guitar pickup output levels* and *guitar volume control* on the instrument, different instruments may require different gain settings to achieve the output signal level you want.

(3) BLASTER BYPASS SWITCH

This true bypass toggle switch determines whether the **BLASTER** effect is engaged or bypassed.

(4) BLASTER LED

The **BLASTER** signal level LED responds to the output level of the preamp, showing a brightening yellow indication of signal strength, which turns to red when the output signal reaches distortion. It's like a little "VU" meter. (With *no signal input*, it doesn't light up, either in the **BLASTER** or the **TRUE BYPASS** switch settings).

(5) BRIGHT

While a FET preamp seems to intrinsically provide a clean, "open" sound quality at un-distorted gain settings, the **BRIGHT** control (treble boost) can compensate for high-impedance guitar pickups losing treble response when run through long signal cables, or "high capacitance" small diameter cable. The **BRIGHT** control provides compensation for this loss of signal quality and in addition, can "brighten up" an otherwise dull guitar signal.

FX LOOP

(6) FX SEND / BLASTER OUT JACK

The FX SEND (by itself) provides a low-impedance signal output set by the BOOST and the BRIGHT controls of the BLASTER section. This output can be routed to parallel signal processors or direct to an amplifier, without interrupting the functionality of the Boosttron. As the BOOST control is turned up, the output signal level can increase to the point where it might overdrive the inputs of subsequent signal processors or the amplifier. The FX SEND jack has another important function, which is to drive other effects inserted into the FX LOOP, which then returns to the next sections of the Boosttron 3 for signal processing by the SQUEEZER and/or SLACKER sections.

(7) FX RETURN / SQUEEZER IN JACK

The FX RETURN (by itself) provides a direct input into the SQUEEZER and/or BLASTER circuits, bypassing the BLASTER circuit entirely. The primary purpose of the FX RETURN jack is *to provide a FX LOOP* between the SLACKER (preamp) and the subsequent SQUEEZER (compression) and SLACKER (distortion) processes. You can put any kind of signal processors you want into the FX LOOP:

Our favorite example is to have the Mu-FX Octave Divider and Tru-Tron 3X (in that order) in the Boosttron 3's FX LOOP. In this way, the BLASTER preamp drives the OD to track notes more smoothly and the TT3X to become more touch sensitive and dynamic. Upon return to the Boosttron 3, the SQUEEZER's compression evens out the volume spikes that envelope filters are prone to and allows the user to add varied distortion options on top of it all.

SQUEEZER

Based on the Musitronics/Dan Armstrong Orange Squeezer®* compressor. The Boosttron 3 SQUEEZER provides the same great "squash" that the original unit was known for but has added input and output signal level controls for improved functionality.

(8) JUICE

JUICE controls the incoming signal level to the compressor's input (from the BLASTER or FX LOOP) from a gain of 1-11.

(9) OUTPUT

OUTPUT controls the signal level of the SQUEEZER output to either the MAIN OUTPUT JACK (if only SQUEEZER effect is engaged) or to the SLACKER circuit (if SLACKER effect is engaged).

(10) SQUEEZER FOOTSWITCH & LED

The SQUEEZER footswitch determines whether the effect is engaged or true-bypassed (doesn't effect the incoming signal from BLASTER or FX LOOP). When the effect is bypassed the LED is *RED* and when the effect is engaged the LED is *BLUE*.

SLACKER

Based on the Slackjaw™ version of the ProCo RAT®* - a versatile high-gain LM308 based boost-distortion with our modifications and added controls.

(11) GAIN

From unity gain (at 1) to VERY VERY high gain (at 11). The low gain settings give “sizzle” to your sound, the higher gain settings FUZZ at almost every level of dynamics.

(12) BASS SWITCH (Low Frequency Response)

Controls the low-frequency cut-off of (guitar) signals into the distortion section. By varying the switch positions and distortion GAIN control, very different distortion response from the instrument can be obtained.

FLAT: Rolls off low-end response about Low E on electric guitar - a balanced response

(-): Rolls off low-end response about 200 Hz - gives a “nasal” response distorting the high fundamentals and overtones

(+): Rolls off about 5 Hz - even the picking of the string comes through the gain section

(13) MODE SWITCH (Distortion Characteristic)

Allows for 3 different kinds of distortion and properly used, can preserve the guitar’s dynamic range AND distortion characteristics.

COMP: Asymmetrical distortion and “soft clipping” limiting of dynamic range. Allows dynamic expression along with lower “high end clipping” of the instrument. Useful for both solo and 2-note distortion more than the other settings. Odd and Even harmonics.

EXP: Asymmetric distortion, but allows full-dynamic range up to “hard clipping” at the LM308 rails. Useful for power chords, “thin” chords and solos. Odd and Even harmonics.

DIST: Symmetrical silicon diode (opposite polarity) distortion for “squashed” distortion signal, varying from “sizzle” to “solo”. Mostly EVEN harmonics.

(14) LEVEL

The LM308 is very high-gain and can put out signals around 8 volts peak-to-peak into “whatever FX (or amp) comes next.” Advise using low to medium output level unless you want your speakers to pop out of the cabinet.

(15) SLACKER FOOTSWITCH & LED

The SLACKER footswitch determines whether the effect is engaged or true-bypassed (doesn’t effect the incoming signal from BLASTER, FX LOOP and/or SQUEEZER). When the effect is bypassed the LED is *RED* and when the effect is engaged the LED will display one of 3 colors:

GREEN = COMP mode

TEAL = EXP mode

BLUE = DIST mode

(16) MAIN OUTPUT JACK

The “end of the line” for the Boostrotron 3 processes. The output can go directly to your amplifier or DI box, or you can add other effects (particularly delay and echo) between Boostrotron and amp or final audio destination.

*[All the processes can be true-bypassed, though we doubt you will want the **BLASTER** bypassed! That's why it has a toggle switch and not a footswitch. Any effects units going through the **FX LOOP** are controlled by their own footswitches.]*

(17) POWER JACK

This Mu-FX unit runs on **9 – 9.6 Volts DC**. The Boostrotron 3 does not have a battery compartment, since it draws enough current to exhaust a battery in a relatively short time.

***** BEWARE CHEAP POWER SUPPLIES!** Especially “switching mode” wall-warts. The high gain and frequency response of the Boostrotron 3 can pass noise pulses from these supplies, producing a whistling and un-intentionally distorted output signal. *******

—————Power Supply Best Practices—————

Take care how you interconnect FX units that have different power supply voltages (AC or DC) and ground-to-case connections!!!

The Boosttron 3 uses an external 9V DC power input (+/- to 5.5mm Barrel and GND to 2.1mm Pin). Other 9V effects might have a +9 to Pin and GND to Barrel.

The **Mu-FX® TruTron 3X™** and **Mu-FX® Octave Divider™** run on **12V AC** external power supplies (12V AC to 2.1mm Pin and GND to 5.5mm Barrel).

We strongly recommend using ISOLATED power supplies to all the effects in your entire signal chain.

The best “brick” power supplies will provide enough isolated DC and AC voltage supplies for all of the signal processing devices in your chain or pedal-board. If you have **MANY** effects units strung together, you might need more than one power supply block.

The many available power supplies, wall-warts, brick supplies and AC-line powered FX devices vary greatly in the quality and stability of their power outputs, as well as **AC HUM FIELDS** from their transformers or **RADIATED RF FIELDS** from switching power supplies. Even the **PHASE** of connection between AC line inputs and power outputs can cause hum and noise in the signal cables or in the effects devices themselves.

With today’s complex signal processing chains, the possibility of power supply hum, noise or incompatibility increases with the number of audio processors.

So-called “Daisy Chaining” some of the 9V products **MIGHT** work, but it could also result in **GROUND LOOPS** or (worst case) **POWER SUPPLY CONFLICT FAULTS** between the power supply cables and the audio cables connecting the effects together...