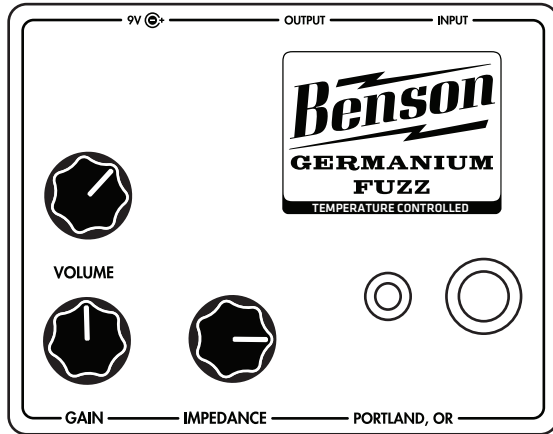
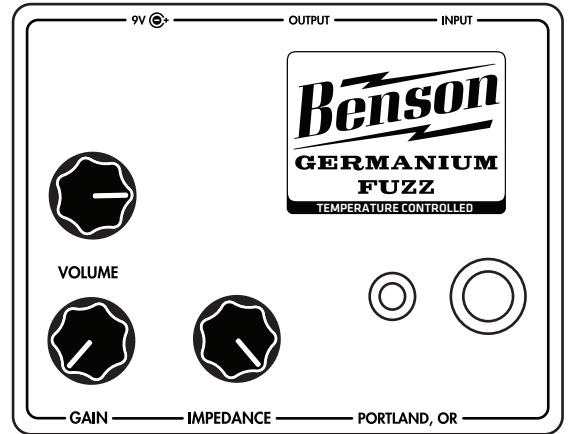


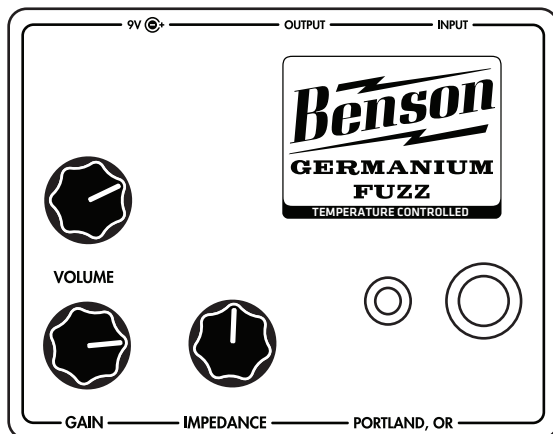
# OVERDRIVE



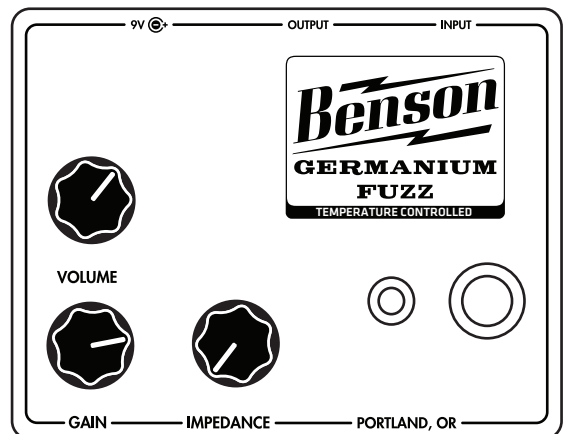
# CLEAN BOOST



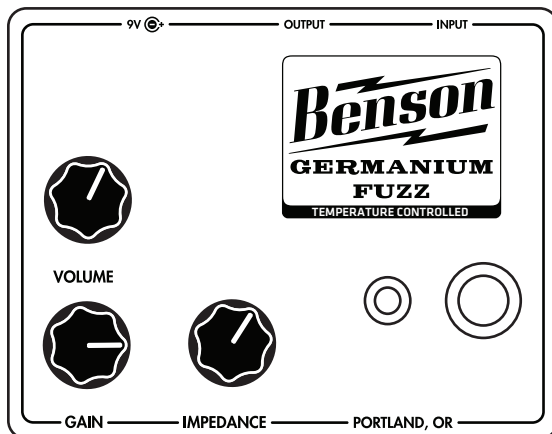
# BRIGHT FUZZ



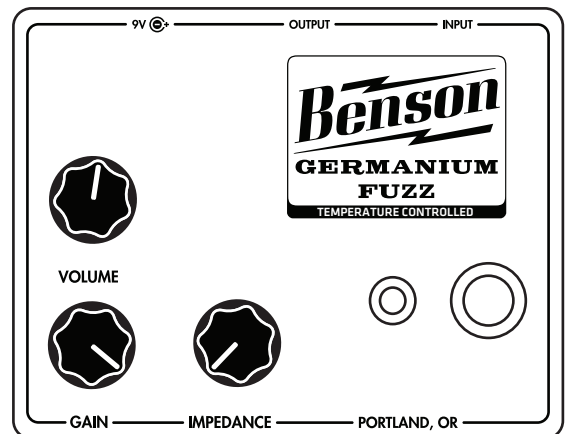
# DARK FUZZ



# DISTORTION



# FULL ON





# GERMANIUM FUZZ USER MANUAL

## THE BASICS

The Germanium Fuzz is a fuzz pedal. The knobs change the sounds. **IMPORTANT:** after plugging it into power (9vdc only), it will take 2-3 minutes on average to sound correct. Good time to tune your guitar and grab a beverage. The color of the LED indicator light might change. Don't turn the internal trimmer. **THAT'S IT.** Read on only if you want some excellent primary source material for an online fuzz thesis.

## SUMMARY

This pedal is designed around two germanium 2N527 OR 2N404 Germanium Transistors. They have been graded for gain and leakage and carefully matched to sound their best. They are set up in the ubiquitous 60's circular fuzz topology, and tuned for good sound, and include some additional oddities aimed at solving the issues that prevent more widespread use of Germanium devices....detailed below.

## THE FIRST FUZZ PEDAL WITH AUTOMATIC THERMAL BIAS TECHNOLOGY

The bias of the transistors in this pedal is automatically regulated by a circuit that GENTLY warms the transistors to a preset operating point using analog components, and ensures a consistent sound, no matter the external temperature. When the LED is orange, the transistors are warming up to increase their hFE (transistor gain) and to shift the bias point to the correct voltage. When the LED turns green, the warmer is off because the correct bias and hFE have been set. Expect the LED to toggle back and forth every so often while the pedal is on...that is how you know its working. The heaters will warm the transistors enough to still be effective on a sunny stage, but far cooler than anything that would harm the transistors. This pedal is designed to operate between freezing and 100°F but might still sound fine outside this range. There are two colors: Studio Black is not meant for direct sunlight, Solar White is fine with it. We have found there is a 20°F difference between a black pedal and a white pedal in direct sunlight.

## INPUT IMPEDANCE

The low input impedance of the classic two transistor germanium fuzz circuit is both a blessing and a curse....a blessing because it can yield a tight sparkly clean tone when guitar volume is rolled down, and a curse because it sounds nasty (in a bad way) if there are buffers or pedals before it in a signal chain. We went to some extremes to keep the blessing and lose the curse.

We installed a class A buffer in the very input of the Germanium Fuzz. This buffer feeds a pickup simulator circuit (an audio transformer set up as an inductor, a resistor, and a capacitor). These two additions make compatibility with other pedals possible without losing the desired sound. After the pickup simulator circuit, we have added an "Impedance" control, which simulates rolling down the guitar volume to get that tight sparkly sound...without adjusting your guitar volume....which you can still do and still sounds great.

## GAIN RANGE

The circuit has been tuned to be used as a rich sounding clean boost, an overdrive, all the way up to an aggressive fuzz with some octave overtones. There are many colors of tone available with the impedance and gain controls...they are very interactive. This is meant as a "pretty" fuzz a la 60's-70's classic rock/psychedeli rock. It is not a spitty, harsh experimental fuzz and more often sounds like an overdrive or distortion (unless it's turned all the way up). We call it a fuzz because it has a fuzzy character but it is so much more.

## INTERNAL TRIMMER

Don't turn the internal trimmer. It is precisely set at our factory. Turning the trimmer voids the warranty. The correct trimmer position is marked in case you get one used where someone turned it. V

## POWER SUPPLY

This pedal is for use only with a 9vdc Boss style center negative power supply...There is no battery. Please do not subject this pedal to more than 9vdc or the pedal or power supply could be destroyed. This pedal only draws 70ma when the heater is engaged, and far less than that when it is off. It will pull those 70ma instantaneously, which most power supplies have no issue with. With substandard or non standard power supplies it is possible the pedal will start oscillating madly at the heater threshold, where the LED changes.

## WARRANTY INFORMATION:

2 years excluding abuse. Visit [www.bensonamps.com](http://www.bensonamps.com) for more information.