

# HELIX

Transtronic - recreating the past while preparing for the future.

Guitarists like to distort things - like, REALLY distort things – and all of the devices that we used for this task before the dawn of digital guitar products employed diodes and/or transistors to do the job. Even though they can appear quite small when looking at a circuit board, these components are complex and interactive little blobs of electrical goodness that are intrinsically important to the history of guitar music.

Before diving in I should say that the core of this subject has been covered ad infinitum on the Interwebs, and if anyone reading this wants to get the lowdown on how these things truly work, a quick perusal of the web using your search engine of choice should yield hours of fun reading. For the rest of you, let's consider this to be the Cliff Notes version.

All you need to know about transistors and diodes in guitar pedals is that they're really just used as small amplifiers/gain boosters or clippers in a circuit. Their job is to take a smaller amount of signal and make it much larger, or clip the bejesus out of it so that it sounds to us guitarists like distorted rock and roll.

In doing their jobs in a circuit, transistors and diodes reveal a number of unique attributes, one of which is that they are very sensitive to changes in signal level. A great old fuzz pedal will sound completely different depending on where the guitar's volume knob is set, and how the guitar itself is played. Turn the guitar knob down on some models and the tone cleans up remarkably, turn it down on others and the guitar spits out the notes as if it had just been told it owes you money.

Along with the basic construction of these components, the material that they're made out of affects how they sound and behave as well. Germanium was the first material that transistors were made out of when they came to be at Bell Labs in 1947, and that material was consistently used in transistors until the early seventies when silicon versions replaced it.

Silicon replaced germanium largely because it was a "better" material - more temperature stable, less noisy and more consistent – but it does actually sound and feel different. Germanium designs are often described as "looser and smoother" sounding relative to their silicon counterparts, with germanium designs yielding more touch sensitivity and gooey feel. Both materials have valid uses, and guitarists are split evenly on the subject of which is the best type to use. Incidentally, starting a "silicon vs. germanium" thread on your favorite BBS is a perfect way to start an amusing shouting match, if you're ever sick in bed with access to the Internet but not to 'Top Gear' reruns.

The challenge for an engineer attempting to digitally recreate a pedal design utilizing these parts is that the transistor is much like a tube: it behaves differently with miniscule changes in signal level or voltage and current (the more complex a component's behavior, the harder it is to recreate digitally). This has historically meant that digital recreations of classic distortion and fuzz pedals have only been able to get so far: in order to do it right, you would need a self-governing recreation of a transistor and diode itself, to sit in a virtual circuit and behave like the real thing.

This is precisely what was done for the HX models in Helix, with the creation of Transtronic.

With Transtronic, Helix can recreate the behavior of virtually any type or style of transistor and diode, whether it be made out of germanium or silicon, in any variation of PNP or NPN package type. Transtronic makes it possible to model pedals that were previously thought to be impossible, and it reacts just like the real thing. The Industrial Fuzz can break into full teeth-grinding oscillation at some settings, and it can snit and snat just like the hardware when you roll the volume knob down. The Octave Fuzz effect works exactly like the vintage model, and those that know you have to switch to the neck pickup and dial down the guitar's volume to get the classic Jimi tone will be rewarded with 60's psychedelic authenticity.

Transtronic is just one of the arrows in the HX modeling quiver, so if you're a fan of distortion and fuzz you owe it to yourself to find a Helix and give it a spin. Pick an amp and pedal combination that you're familiar with in the real world, and put it through its paces. We're confident that you'll be surprised at the level of authenticity of these classic effects, because we were too!