Did you know that about a BF-3 ?

by **thealien666** » 02 Sep 2012, 00:55

Having had a look at the schematics of both the BF-2 and the HF-2, I've come to realize that the BF-3 when switched to the "Ultra" position, reproduces the HF-2's behavior. Resonance is doubled and delay times are half as long.

The BF-2 has 1024 BBD stages (providing 1ms to 13ms delay times), where as the HF-2 has only 512 BBD stages (providing 0.5ms to 6.5ms only). Also, the "Res" can go higher on the HF-2 because one resistor is lower in value, allowing a higher feedback signal.

The only differences between an HF-2 and a BF-2 are R10 is 22K Ohms instead of 39k Ohms, IC 3 is MN3207 instead of MN3204, and R40 and R41 are gone. That's it.

They even have the exact same parts number around the whole PCB.

Not only that, but when you use the Bass Guitar input on a BF-3, the pedal switches to the behavior and sound of a BF-2B, which also used the shorter delay times of the MN3207 but without the higher resonance allowed by R10 being lower value.

In other words, with a BF-3 you've got all the sounds and behavior of 3 other Boss pedals: BF-2, BF-2B, and HF-2. And, even though it's digital in nature, the sound is quasi indistinguishable in a blind test, and much quieter, too !

I'm very critical of sound quality, but I have to give credit to Roland's engineers for an excellent job on the BF-3. And all that accomplished without the need for relying on the gimmicky COSM ? Bravo.

thealien666

Re: Did you know that about a BF-3 ?

by **DB Cooper** » 02 Sep 2012, 04:03

You lost me at "hello"...

But, I'll take your word for it!

(probably an indication that I should just stay out of the **Technical Questions/Discussions** board altogether!

DB Cooper

Re: Did you know that about a BF-3 ?

by **Pepe** » 02 Sep 2012, 13:08

Cool info! Thanks! Now I need an HF-2 and a BF-2B for comparison. The BF-3 blows the BF-2 out of the water - at least for me. I did never regret that I have sold my near mint BF-2 a few years ago.

Pepe

Re: Did you know that about a BF-3 ?

by **thealien666** » 02 Sep 2012, 16:30

Of course, as you know already Pepe, the BF-3 has a slightly wider range for "depth". But, contrary to an HF-2, the BF-3 cannot go into self-oscillation, when the internal trimpot for resonnance calibration is set to maximum (VR-5), and the "res" knob is at max.

There is no internal resonnance offset trimpot in a BF-3.

thealien666

Re: Did you know that about a BF-3 ?

by **lmendo** » 02 Sep 2012, 18:01

Great info, thanks!

I own a BF-2 and it is rather noisy. Besides, it usually sounds too "wild" for me. I think this is because it does not have an "effect level" pot, and the effect is probably mixed with the dry signal at equal levels. I just got a GT-100 and its flanging is much better: less noisy and with effect/dry mixing levels. Reducing the effect level as compared with the dry signal gives a lot of control and achieves nicer sounds.

Does the BF-3 have an effect/dry mix level?

lmendo

Re: Did you know that about a BF-3 ?

by **thealien666** » 02 Sep 2012, 21:38

No, the BF-3 does not have an E-Level knob. Both dry and effect signals are mixed at equal levels, as per BF-2, HF-2, BF-2B.

But, by definition, a "flanger effect" is two signals mixed together at equal levels, with one signal slightly out of phase (delayed) relative to the other. It dates back to the days of recoding tapes in studios, where they would

playback 2 identical parts of a track simultaneously and rub a finger against the flange of the magnetic tape spool to slow down one, and the the second in alternance. Resulting in a Thru Zero Phasing effect.

As a matter of fact, a "Flanger" is in reality should be called a "Phaser". The difference is the added possibility of resonance or feedback (which was not possible with tapes). And what is called a "Phaser" by Boss and other companies, is in reality a "comb filter" (because of the way the resulting audio spectrum looks like on a spectrum analyzer), with either 4 or more "stages" (notch frequency bandpass filter or "comb teeth"). Think of it as a graphic equalizer, that you would move multiple sliders frequencies (each one being a notch bandpass filter/booster) in waves. the audible effect is similar, but different. But there is no delayed signal at all in a "Phaser". It is just a series of filtered out frequencies from the incoming signal, which are being move slightly up and down from a central point. Some Phaser also provide a resonance of those multiple filters to enhance the effect.

A "Chorus" is nothing more than a "Flanger" without any resonance or feedback (one single delayed signal), and a somewhat narrower delay times band.

All closely related, but all different in their implementation and resulting sound effect.

thealien666

Re: Did you know that about a BF-3 ?

by **nathanscribe** » 02 Sep 2012, 21:49

Some flangers do not use any dry signal in the output mix - the Yamaha FL-01 is one. Other interesting variants include inversion of feedback, which gives a different tone. I have a Tantek flanger that uses twin BBDs to generate two delayed signals that can be modulated individually, and centred separately, and combined in different amounts with the dry signal. It's interesting, but hard to get used to. It also has CV in for modulation, which is handy for synth-heads like me.

Personally I like the roughness of a proper BBD flanger, though I do like what my humble Digitech RDS delays do in that field. I tried a BF-3 once but wasn't convinced. I kind of miss my BF-2 now, though I've no real need to pick up another... or so I tell myself. I'm trying to trim down the flangers, but I haven't found one unit yet that does all I want. Even two between them, I'd be hard pushed to choose. So I've still got about eight. Sigh.

nathanscribe

Re: Did you know that about a BF-3 ?

by **thealien666** » 02 Sep 2012, 21:58

Eight ???

That's a little overkill... You wouldn't be suffering from GAS, would you ? (I do, but it's kept under control... for now...)

In the case of a flanger that doesn't mix the input signal with the delayed one, that's not really a flanger but rather simply a "resonant delay". Anyone can produce that effect with a delay pedal, just by cranking up the resonance and manually sweeping the delay time from extremely short to about 15ms.

thealien666

Re: Did you know that about a BF-3 ?

by **lmendo** » 02 Sep 2012, 22:09

Even if a "flanger" with an adjustable effect level does not quality for that name, I still like it better Besides, chorus effects do have an effect level, and are still called "chorus"

lmendo

Re: Did you know that about a BF-3 ?

by **lmendo** » 02 Sep 2012, 22:15

> *thealien666 wrote:*
> *...there is no delayed signal at all in a "Phaser". It is just a series of filtered out frequencies from the incoming signal...*

Actually, a comb filter is a delayed signal mixed with a dry signal. The level of the delayed signal relative to the dry signal determines the depth of the spectrum notches, and the delay value controls the width of the comb teeth.

lmendo

Re: Did you know that about a BF-3 ?

by **nathanscribe** » 02 Sep 2012, 22:20

> *thealien666 wrote:*
> *Eight ???*

I know.

> *In the case of a flanger that doesn't mix the input signal with the delayed one, that's not really a flanger but rather simply a "resonant delay". Anyone can produce that effect with a delay pedal, just by cranking up the resonance and manually sweeping the delay time from extremely short to about 15ms.*

Perhaps, but many (most?) delays don't allow the shorter end of such times. Getting a delay to provide that tight, punchy sound of a flanger at the short end of its sweep is often not possible, though the longer end tends to be OK I find.

nathanscribe

Re: Did you know that about a BF-3 ?

by **thealien666** » 02 Sep 2012, 23:15

I should have said: " there is no delayed signal by a BBD chip at all in a "Phaser"."

There is an out-of-phase signal, however. So, technically, you're right. It is a delayed signal, although very slightly.

Flanging uses a delay applied equally to the entire signal which is similar in principle to phasing except that the delay (and hence phase shift) is uniform across the entire sound. The result is a comb filter with peaks and troughs that are in a linear harmonic series. Typically, the comb filter created by flanging's uniform delay will have many uniformly spaced "teeth" whilst a phaser (depending on the design of the circuitry) will have fewer teeth — maybe even just one — and/or they will be unevenly spaced and the spacing will depend on the whim of the designer.

Phasing however, because its frequency response has fewer "teeth", having just one band-pass filter gives a subdued phase-shifting sound. But by adding extra "stages" (in other words, extra band-pass filters), you can add extra degrees of phase shift, which is why you might see some phasers with an option to select 90, 180, 270 and 360 degrees of phase shift — each one switches in another filter, thereby potentially introducing more "teeth".

@nathanscribe: you're right, most delays do not have short enough times. But the DD-7 does. 1-50 ms on shortest range. But manually turning the delay knob, or using an expression pedal to do so, is not very practical anyway.

thealien666

Re: Did you know that about a BF-3 ?

by **Pepe** » 03 Sep 2012, 07:38

The DD-7 has a "modulate" mode, though. I thought it could work as a flanger and tried it out a while ago. It does *not*. Sad thing. Had been a nice hidden feature.

Pepe

Re: Did you know that about a BF-3 ?

by **nathanscribe** » 03 Sep 2012, 09:56

1ms isn't *bad*, but a good nice tight flange needs .3 to .5 milliseconds at a minimum, I think. The RBF is good for that, but then its longest time isn't long enough! Can't win!

nathanscribe

Re: Did you know that about a BF-3 ?

by **lmendo** » 03 Sep 2012, 11:02

> *thealien666 wrote:*
> *A phaser (depending on the design of the circuitry) will have fewer teeth — maybe even just one*

Hey, that explains why the phaser can sound a little like a wah (at least much more so than a flanger)

lmendo

Re: Did you know that about a BF-3 ?

by **thealien666** » 03 Sep 2012, 14:02

> *nathanscribe wrote:*
> *1ms isn't bad, but a good nice tight flange needs .3 to .5 milliseconds at a minimum, I think...*

Funny you should say that, which is true, when the BF-2 has only a minimum delay time of... 1 ms.

A real good flanger, that electronically tries to reproduce the tape flanging effect of the sixties and seventies, should ideally have TZF (thru zero flanging), with 0 ms minimum delay time. None of the Boss flangers, or any BBD based ones, offer that.

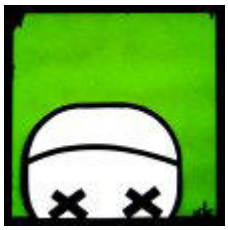
So, the effect at the start of Led Zeppelin's song "Nobody's fault but mine" cannot be faithfully reproduced with an electronic flanger (especially with a steady LFO modulation). But the effect on the Solina keyboard strings of Giorgio Moroder's "Chase" musical piece from the film "midnight express" can, because that's what had been used in the first place.

thealien666

Re: Did you know that about a BF-3 ?

by **natthu** » 03 Sep 2012, 15:45

What about the Jack DeVille Mod Zero? Is it not BBD based? I wouldn't know, I'm just asking... actually, I don't know much about it other than it is a through zero flanger.


natthu

Re: Did you know that about a BF-3 ?

by **thealien666** » 03 Sep 2012, 16:40

I don't know about Jack Deville's Mod Zero. They say it uses BBD technology. But from a technical stand point, using that technology alone does not permit shorter delay times than about 1 ms. Even with the smallest size BBD chip (transistor count wise) and even at the fastest clocking speed possible, there will always be a time delay for the signal to pass thru the chip.

Jack must also use some kind of VCA trick in combination with BBD to produce TZF...

thealien666

Re: Did you know that about a BF-3 ?

by **nathanscribe** » 03 Sep 2012, 17:04

I beg to differ. The Tantek flanger I have and mentioned above is BBD-based, and has thru-zero flanging, as does the EHX Flanger Hoax, which is also BBD-based. It's achieved by running two BBD channels and playing them off each other.

As for BBDs not being able to manage less than 1ms pass-thru, again I beg to differ. I've had at least a couple of units that go down to half a millisecond or so, the HF-2 and RBF-10 being two of them. It depends on the length of the BBD (ie, how many stages) as well as clock speed. BBDs were available in as few as 128 stages. Several flangers used the MN3209, which is (if I recall correctly) 512 stages, others use a 1024-stage. I don't recall any others off the top of my head, those are what I've seen.

nathanscribe

Re: Did you know that about a BF-3 ?

by **thealien666** » 03 Sep 2012, 17:35

I stand corrected as far as using BBD for TZF. I didn't know about using two of them against each other. Neat trick.

But as for obtaining TZF using a single BBD, however small, not possible IMHO. Even if you drive a 128 stages only chip at its maximum operating clock, it will result in a time delay, however short it might be. And if one exceeds the maximum clock frequency recommended, it will result in severe audio distorsion as each capacitor on each cell will not have had enough time to charge fully before passing that incomplete charge to the next cell. Moreover, there's a minimum time period required to transfer all the stored charges from one cell to the next.

thealien666

Re: Did you know that about a BF-3 ?

by **nathanscribe** » 03 Sep 2012, 17:56

I wasn't saying a single BBD could produce TZF, I agree that's not possible - but that a single BBD can provide less than 1ms delay: pick a short one, clock it fast.

It's interesting how the sound of a flanger changes as the delay time moves from very short to very long (comparatively) - some sound phasey, almost vocal. I once had a stupidly cheap Rocktek flanger that had a quirky vocal-like tone to it. The RBF-10 is very good at flanging high tones. The way feedback is implemented, and the filtering used, probably counts for a lot too.

nathanscribe

Re: Did you know that about a BF-3 ?

by **thealien666** » 03 Sep 2012, 18:26

BTW, what didn't you like about the BF-3 compared to the BF-2 ? Can you put it into words, or is it rather at a somewhat subconscious level maybe ? Something not quite right ?

thealien666

Re: Did you know that about a BF-3 ?

by **nathanscribe** » 03 Sep 2012, 18:35

It's a while ago, so I can't really remember. I suspect I'd feel differently about it now. I do sometimes re-buy pedals I've cleared out and end up liking them more.

nathanscribe

Re: Did you know that about a BF-3 ?

by **thealien666** » 03 Sep 2012, 18:51

I remember, when switching from a BF-2 to a BF-3, it took me a little while to get used to the "pristinely clean" sound of it. I was so accustomed to the slightly noisy one of my BF-2. I also had to get used the the wider ranges of its knobs, especially the "depth".

But I wouldn't go back today.

thealien666

Re: Did you know that about a BF-3 ?

by **Pepe** » 03 Sep 2012, 18:58

I was lucky: I started with a BF-3 first!

Pepe

Re: Did you know that about a BF-3 ?

by **thealien666** » 03 Sep 2012, 19:10

Oh so, you didn't have to endure the swishy hissing sound of a pedal even though a dummy jack was connected to its input ? I remember vividly my 1984 CE-3 was exhibiting the same thing. (probably from lack of using a compander in their design)
You're lucky, indeed.

thealien666

Re: Did you know that about a BF-3 ?

by **nathanscribe** » 03 Sep 2012, 19:42

Meh, clean is boring. Noise is where the fun starts.
nathanscribe

Re: Did you know that about a BF-3 ?

by **thealien666** » 03 Sep 2012, 20:00

Agreed. Especially if it's a heavily distorted electric guitar solo! In which case, the noise floor wouldn't matter at all.

thealien666

Re: Did you know that about a BF-3 ?

by **visserman** » 14 Sep 2012, 09:44

> *Pepe wrote:*
> *The DD-7 has a "modulate" mode, though. I thought it could work as a flanger and tried it out a while ago. It does not. Sad thing. Had been a nice hidden feature.*

DD7 and hidden features? Quite a few, play with it, let us make this in a quiz before giving away all the sound secrets!!

visserman

Re: Did you know that about a BF-3 ?

by **visserman** » 14 Sep 2012, 09:58

> *thealien666 wrote:*
> *Agreed. Especially if it's a heavily distorted electric guitar solo! In which case, the noise floor wouldn't matter at all.*

Noise floor does not matter in most cases: Hum on amp, cheap transformer, start playing and you will not notice it anymore.
It is good to be precise about noise, and details about what makes a cetain pedal behave the way it does. It is also good to realise that ultraclean does not really exhist, and when it does, it may not be all that inspiring for your playing!

Back to subject now, lots of interesting details here but as most of you will not have the time to read.....

Having tried the BF3---in standard mode---, HF2 and BF2: Even with the BF3 in standard, all three can sound quite similar (had forgotten that you did put it in ULTRA mode for your comparision to HF2).

I still prefer the BF2 out of all of them.
I do also think the BF3 is quite good, certainly useful if you are doing gigs and would like a few more sounds from your Flanger. I am fond of the Gate mode.

Earlier on you made some comments about comb filters, well I have "stumbled" on something of this ilk with any of the DD's and it is quite an eyeopener to say the least. Will post this in the Boss department. Maybe more on the hidden features of the DD7. They will not give them all away in the manual (or anywhere on the net for that matter!!)
Keep 'em coming!!

visserman

Re: Did you know that about a BF-3 ?

by **BearBoy** » 14 Sep 2012, 10:16

Apologies for being a bit late to the party on this one, and possibly misunderstanding, but are you saying that a BF-3 in "ultra" mode sounds like an HF-2 or that it just works in the same sort of way?

BearBoy

Re: Did you know that about a BF-3 ?

by **thealien666** » 15 Sep 2012, 01:39

It was meant to replicate the behavior of an HF-2 in Ultra Mode. Although Boss never claimed it anywhere, the similarity is too striking to be mere coincidence. Of course, being digital, it will not sound exactly the same (probably less noisy).

thealien666

Re: Did you know that about a BF-3 ?

by **charmonder** » 14 Dec 2016, 03:51

This is the thread that officially has me interested in BF-3.

charmonder

Re: Did you know that about a BF-3 ?

by **fuzzbuzzfuzz** » 17 Dec 2016, 08:01

Flangers are definitely a love hate fit me but used in the right place can sound great.

Currently gave two mint BF-2 early version, BF-1 (beautiful), Pearl FG-01 (oscillation/theremin esque) and the last but a Maxin FL-302. The latter was more a completest/price buy but since purchase I've grown to love it. Slightly less dry it out there as the BF-2, more whisky/vintage and if course three knobs for simplicity!

If I pass by again I'll pick up the Big Jam I passed over a while back.

fuzzbuzzfuzz