



Headway Pickups

Snake 3 acoustic guitar model Snake 2 mandolin system

“If one snake don’t get you, the other one will...”
Headway Music Audio may now make amplifiers as well, but they made their reputation with acoustic instrument pickups.

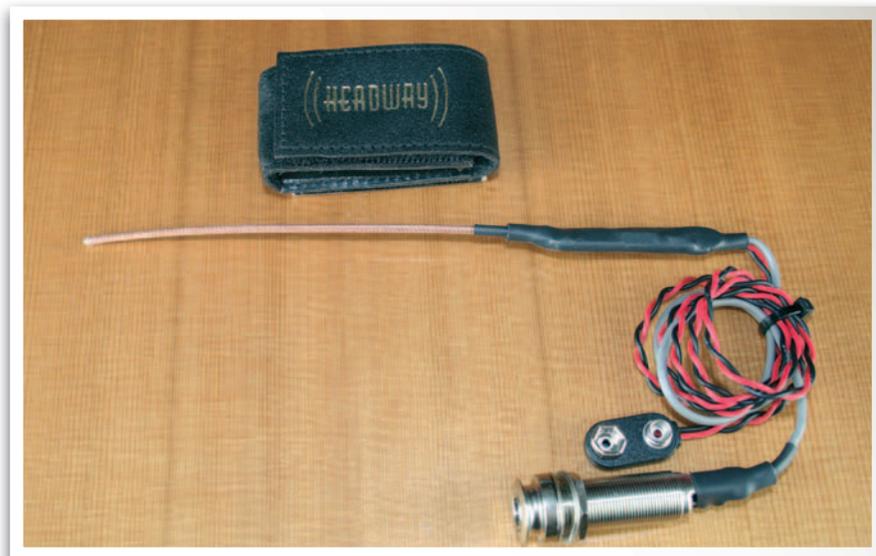
There’s a quasi-Zen aphorism that goes something along the lines of: “What is the difference between a duck? Neither of its legs are both the same...” It gets a bit like that with acoustic guitar pickups — there isn’t a definitive technology or construction that is the ultimate answer. I’ve tried many, bought a good few, scrapped several and am still looking for the pickup that will give me what I want — the sound of my guitar, but louder.

Undersaddle piezo-electric pickups are nowadays the dominant force in acoustic guitar pickups — and it isn’t difficult to see why. They are relatively easy to manufacture, relatively easy to install, have an attractive immediacy to the sound and are less susceptible to feedback than many other

types of piezo acoustic guitar pickup. This all means that there is a plethora of these pickups on the market at all kinds of price points from multiple manufacturers. It will possibly come as a surprise to many of you to realise that there are UK manufacturers out there and competing quite successfully against the established American brands. One of these plucky Brits is England’s very own Headway Music Audio (formerly Headway Electronics), whose pickups have established a strong following amongst many discerning acoustic

instrumentalists.

Headway, like most of their competitors, make pickups for a range of stringed instruments, in their case even including a specialist oud (rather like a fretless lute) pickup system, but, unlike the vast majority of their competitors, they utilise a 360° sensing, co-axial piezo-electric cable pickup in many of their products, including the oud and the two active systems under review here. The pickup is constructed from a piezo element that runs down the centre of a tube formed by an



Review by Bob Thomas

insulated core, which is electrically shielded by a braided-wire outer layer, that is itself covered by an outer seal. The result is a robust pickup with a flat frequency response.

However, as a friend sagely remarked when I first tried an early FRAP (Flat Response Acoustic Pickup) back in the 1970's,"there's no such thing as a guitar with a flat response" and that truism has been reflected in the number of preamplifiers for piezo pickups that have been developed over the last 30-odd years. Headway, in the Snake 3 and Snake 2 pickup systems, have tackled the dichotomy at source by tailoring their outputs to compensate for the fact that they are essentially picking up the sound of vibrating, resonant, wooden boxes.

Snake Anatomy

Both the Snake 3 and Snake 2 pickup systems share the same physical layout where the coaxial piezo element is terminated directly onto the preamplifier circuit board. From the preamplifier, which is encased in a layer of black heatshrink tubing, wires run to the PP3 battery clip and a screened cable runs out to the endblock-mounting output jack socket. The overall appearance is perhaps somewhat utilitarian, but in a world where form follows function it all makes perfect sense.

It is obvious that a lot of time and effort has gone into getting the electronics right. On the Snake 3, which utilises the brand new pickup element also to be found in Headway's upcoming high-end HE2 system, the preamp boasts a Class A, all discrete component input stage utilising FET-based 'harmonic optimisation'. The use of an FET (Field Effect Transistor) in the preamp input is important since FET's have an extremely high input impedance. Piezo pickups in general need to 'see' a high input impedance so that there is a minimal load on the pickup, otherwise there is a loss of output level in both bass and treble frequencies. Coaxial piezo pickups in particular really need to see input impedances in the 20MegOhm range.

Obviously, if the input impedance of a piezo pickup preamp is too low, the loss in treble and bass frequencies results in a signal in which the midrange frequencies are excessively prominent. The resulting output is heard as the infamous 'piezo quack' where the midrange imbalance results in an over bright, mizzly sound which becomes even more annoying when the guitar is played hard and the peakiness becomes even more prominent. However, designing the preamp with an FET input stage in the way that Headway have done should ensure that the signal from the pickup exhibits an essentially flat frequency response.

However, getting the pickup to deliver a flat frequency response to the preamplifier is



only part of the story. In order to produce an accurate and believable sound, Headway have also introduced a 3-band, fixed-frequency EQ into the equation. Based round an IC (Integrated Circuit) chip more commonly seen in pro-audio applications than in pickup preamplifiers, the purpose of this EQ is to tailor the sound of the pickup to allow for unwanted side-effects often found when acoustic guitars are amplified. In order to reduce body noise, the EQ cuts frequencies, starting below the low D on the sixth string. The common tendency towards mid-range feedback in amplified acoustic guitars is compensated for by a gentle midrange cut, however this gentle cut leaves plenty of signal for fingerstyle players, who usually want a more even sound, to boost if necessary.

On the Snake 2 mandolin system, the low frequency cut begins below the frequency of

the low G string and is much steeper than on the Snake 3.

The final component in both systems is the extremely neat little leather and Velcro battery bag, which not only is a doddle to fit inside the guitar and to remove for battery changes, but also helps protect the instrument from damage in the unlikely event of it being shaken loose in transit.

Snake Fitting

In order to give of their best, co-axial element pickup systems really need to be fitted by a skilled luthier, and if you're not one of those then you really, really need to find one to do the job for you. Why? First off, these things are round, and, although they do apparently work well in a flat-bottomed slot, they really need to sit in a slot with a rounded bottom. Milling a rounded bottom into your saddle slot is a skilled job that requires a specialist jig, a specialist power tool fitted with a specialist rounded cutter. So, I repeat... get a luthier to do this for you unless you know exactly what you're doing.

On an acoustic guitar, once your luthier has milled out the saddle slot, there is then the question of drilling the access hole in the end of the slot for the pickup to fit into. Unlike most conventional undersaddle pickups, this hole has to be drilled at a 50° or shallower angle. This is fine, except that a hole 50° from the end of the saddle slot can often end up running into a top brace, so great care has to be taken to ensure that the structural integrity of the instrument isn't compromised — another luthier task.

The actual fitting of the pickup is a breeze — simply poke it into the saddle slot, fit the endpin jack, fix the battery bag in place with the supplied Velcro and that's it! Then the fun begins...

First off, you've got to ensure that the bottom of the bridge insert is perfectly flat before refitting it. Then, once the insert is refitted, restring the guitar and tune it up to pitch and then wait for two or three days to let everything bed in, or clamp the bridge down >>

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Headway Snake 3 & Snake 2 Pickup Systems

Snake 3 £99 Snake 2 £89

Key Notes

- 360° sensing co-axial piezo cable pickup
- Sealed-in braid improves string balance achievement and retention
- Preamp design features Class A input stage and Pro Audio IC chips
- 3-band, fixed EQ used to tailor response and reduce susceptibility to feedback.
- Leather/Velcro battery bag as standard.

High Notes

- Sounds great.
- No hum.
- Good feedback resistance.
- Great value for money.

Low Notes

- Needs to be professionally fitted to give ultimate performance.

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Behringer Shark — allowed me to produce levels that would have sat happily with a drummer and bass player in an electric band. I don't think that I'd have been able to compete with a guitarist playing through a stack, but the volume that I got would have coped quite happily as an on-stage monitor.

Taking the basic sound of the Snake 3 and applying the built-in 3-band EQ on my amplifier gave me a pretty good sound that I would have been very happy to use on a gig. Getting a bit more involved and creative with my rackmount TC 4-band parametric EQ let me dial in a really great sound from the Snake 3. Mind you, given that the EQ cost me around four times the price of the Snake 3 system, I wouldn't expect everyone to have one in their gigbag, but it does serve to illustrate the fact that the Snake 3 has the potential to sound very, very good indeed.

Of course, with these results, the next stage was to try the Headway system as an alternative to a microphone or two in a recording situation. To put it simply, it was great. The lack of hum and the tweakability of the basic sound meant that it was pretty easy to get a good sound in place and to work with it. Personally I always prefer to use a microphone for recording, but there are occasions — for example, tracking acoustic guitar rhythm parts with drums and bass — where the ability to get a relatively isolated acoustic guitar sound easily really matters. Under these situations I'd be more than happy if guitarists turned up with Snake 3 systems on their guitars.

Performance-wise, everything above also applied to the Snake 2 system fitted to the mandolin. The handling noise from the instrument was a little high, but I think that was due more to the nature of the instrument and the installation, rather than any shortcoming in the Snake 2 pickup system. I get very little handling noise from my own mandolin fitted with a piezo bridge pickup, and I would expect the same if I fitted it with a Snake 2.

Conclusion

Given their level of performance, the Headway Snake 3 Acoustic Guitar and Snake 2 Mandolin pickup systems have to be on your audition list if you're looking for an active system under £100. However, unless you're confident of your own abilities, you will have to factor in the cost of having them professionally installed. Once properly installed they should give you very good results indeed, especially if you need to play at higher volume levels.

Incidentally, if you're looking up the price range a good bit, Headway are just about to release their new HE2 High End range. Given my experiences with the Snake 3 and Snake 2, I'll be taking a very close personal interest in these when they come along. www.headway.com

» fairly tight overnight. If you're lucky, when you plug it in you'll get perfect string-to-string balance straight away. If you're not, then you're into spending some time achieving that. A friend of mine, who uses this kind of pickup in the instruments that he builds, reckons that he can always balance them out in about two hours — but then he has fitted dozens of them. Balancing string outputs is, basically, a trial and error process involving all kinds of packing, shimming, reshaping and the like and, as with other aspects of the fitting process for these pickups, is best left to the experts.

On the mandolin, if it has a moveable, non-adjustable bridge, fitting the Snake 2 pickup is an even more nerve-racking experience as the pickup access hole has to be drilled through the front of the instrument directly under one of the bridge feet in such a way that the hole in the front, the hole in the foot of the bridge and the position of the bridge on the front of the instrument are all in the correct alignment... rather you than me, I'm afraid. Luckily, Headway is now making adjustable

mandolin (and archtop) bridges where the output wire can be run to a side-mounted clamp jack.

Snake Performance

For once, I didn't have to fit pickups to my own instruments as part of the review as Headway very kindly sent along a couple of good quality demo instruments.

Plugging in the Snake 3 reveals that it performs exactly as would be expected given its design philosophy and description. All the characteristics of a good undersaddle piezo pickup are there — the very fast attack and the slightly dry unreality of the basic sound. Completely absent is any trace of 'piezo quack' when played hard and, most importantly, any trace of hum. Also, and this is perhaps the greatest strength of the Headway system, it exhibits a high resistance to feedback and I got surprising volume levels out of it.

This feedback resistance is almost certainly the result of the midrange cut employed in the preamp and that cut, combined with my favourite anti-feedback accessory — the