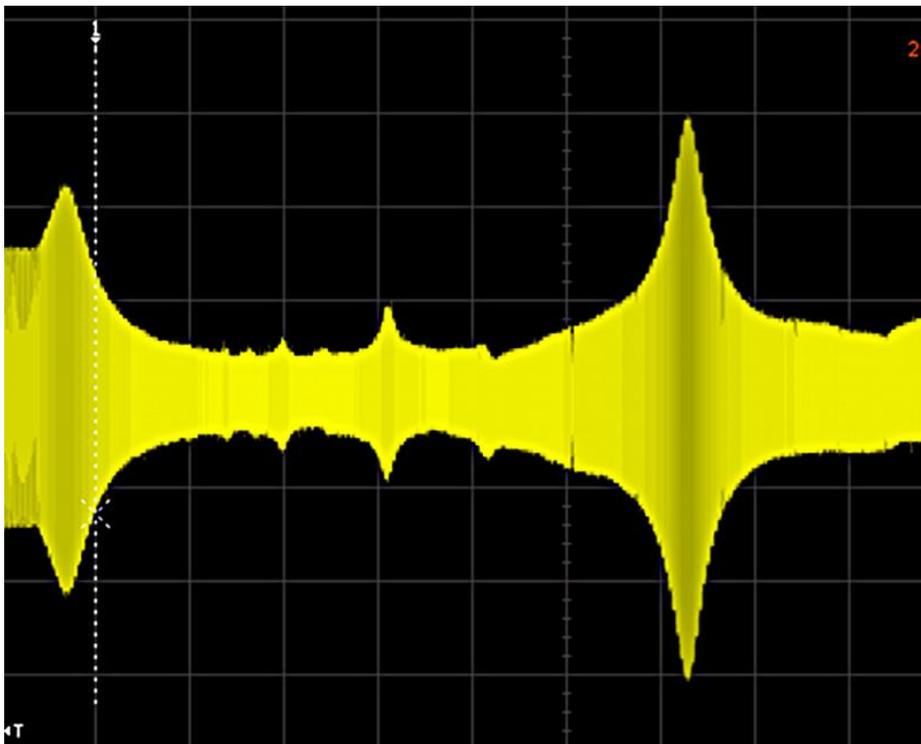


Measurements

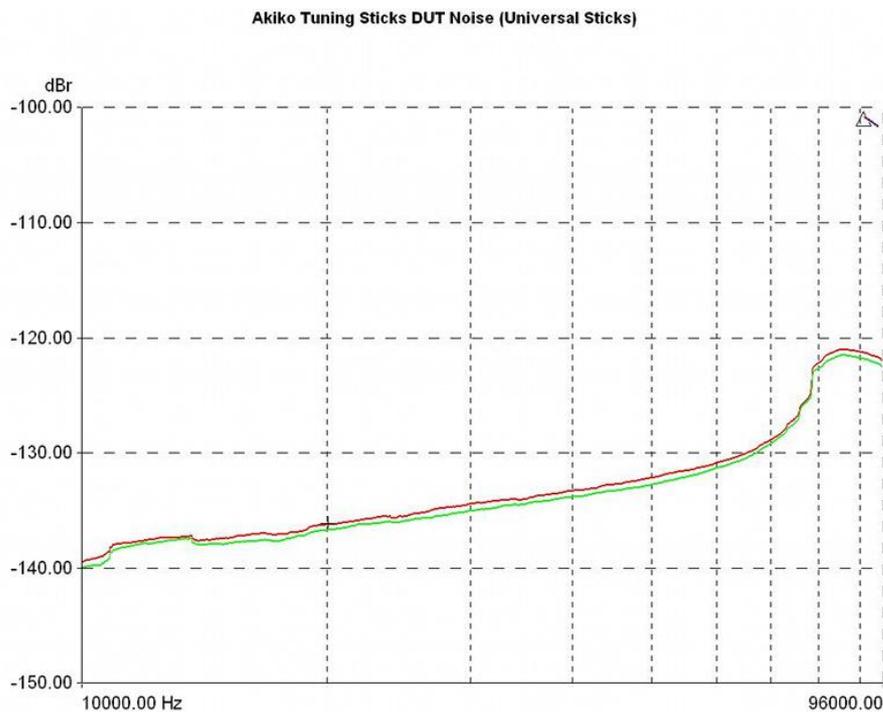
As you may understand, doing lab research on an object which we know almost nothing about, is somewhat difficult. A series of preliminary measurements showed that conventional proximity and/or the electrical connection between a stick and some of the cables does not influence the classical electrical characteristics, such as resistive impedance, inductance, capacitance and impedance. It also showed that the electrical connection is not significant in terms of the characteristics, as the resistance measured between the poles of each probe was found to be more than 5 MW and the capacity in the area of 1 pF (which is probably due to the characteristics of the plugs). These observations suggest that, presumably, the Tuning Sticks' functions are not associated with the characteristics of the same cables, but with their cable environment. These results are supported by two facts. Firstly, the company says the products can be used with a very wide range of cables, operating from low frequencies (power cords) to high frequencies ((digital) audio, video, data and even RF). Secondly, the effect is not observed from contact in either directions, after having received recommended instructions to place the Sticks at least two metres from the system, when making comparisons. Considering this, one would of course expect some potential high frequency management or noise absorption (EMI/RFI), which further complicates the evaluation process, as measuring such signals is not at all possible in a lab environment for audio devices.

Measuring high frequencies by scanning with a speaker cable showed minimal changes in the strongly coordinated frequencies, but some reductions in the width of perceived coordination near the boundary of the scan (10 MHz). These results show, firstly, that the behaviour of the speaker cable is not influenced by the addition of a (Universal) Stick (based on what we know at least) and secondly, that "something" can occur at very high frequencies, outside the boundary of the scan.

In an effort to find indirect evidence for the operation of the sticks, we used a small, low-cost USB DAC and focused on the output noise. The noise diagram, showing only general trends due to the large smoothing, shows some familiar behaviour: the noise level rises up to the limit of the measurements, 96 kHz, but the measurements with the Universal Sticks (in the output interconnects) are systematically lower, close to 0.5 dB.



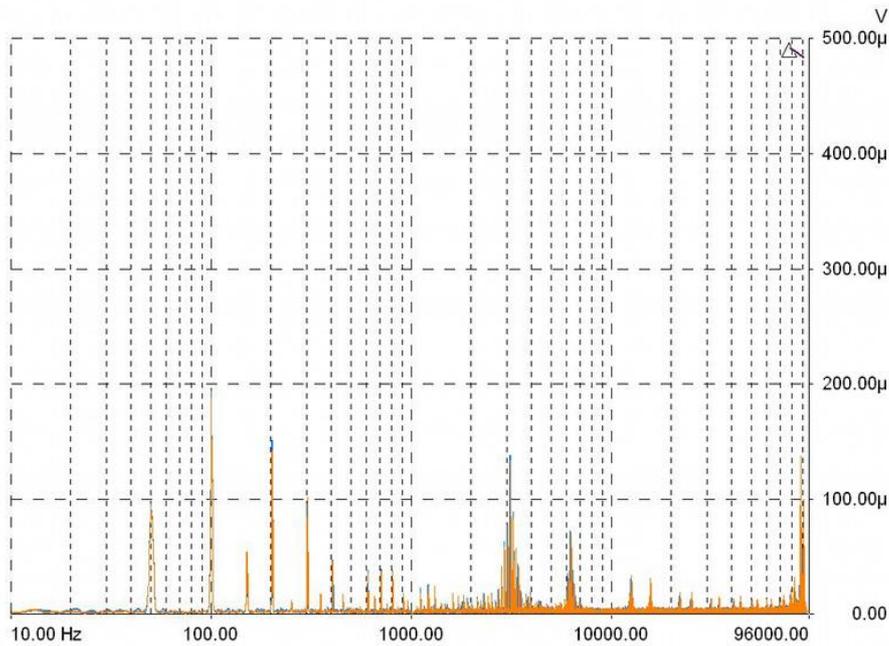
High scanning frequencies (100 kHz-10 MHz). Speaker cable with Universal Tuning Stick. Load 0.047 mF/5 h, input impedance 0.20 Oh, signal 50mVrms width. Horizontal resolution 2mS/DIV.



Range noise at output d/a converter. Sample rate 24/96. With two Universal Tuning Sticks on line outputs (green curve), without Tuning Sticks (red).

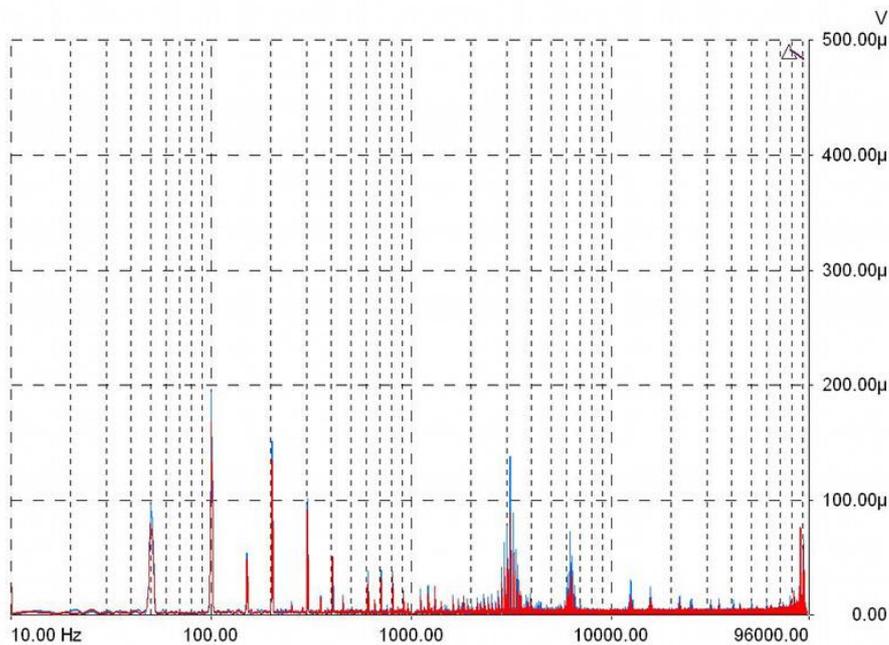
The analysis of this noise spectrum gives indications that this particular stick indeed acts in many places, ranging from low to high frequencies, though only in a small rate. The diagrams are calibrated with μV to give a sense of scale sizes involved. A spectrum analysis, this time with the E-Gold Tuning mkII placed on the power cable, shows even better results, giving the impression that this "big" Stick is clearly more effective when compared to the Universal (or more probable: that this serious problem in the converter found a bit of power and noise rejection).

Akiko Tuning Sticks DUT Wideband Noise Voltage (W/o Vs Universal)



Noise analysis (wideband) in d/a converter output. input signal 1 kHz (24/96, filter rejection band measurement). Noise without Tuning Sticks (blue graph) and Universal (orange).

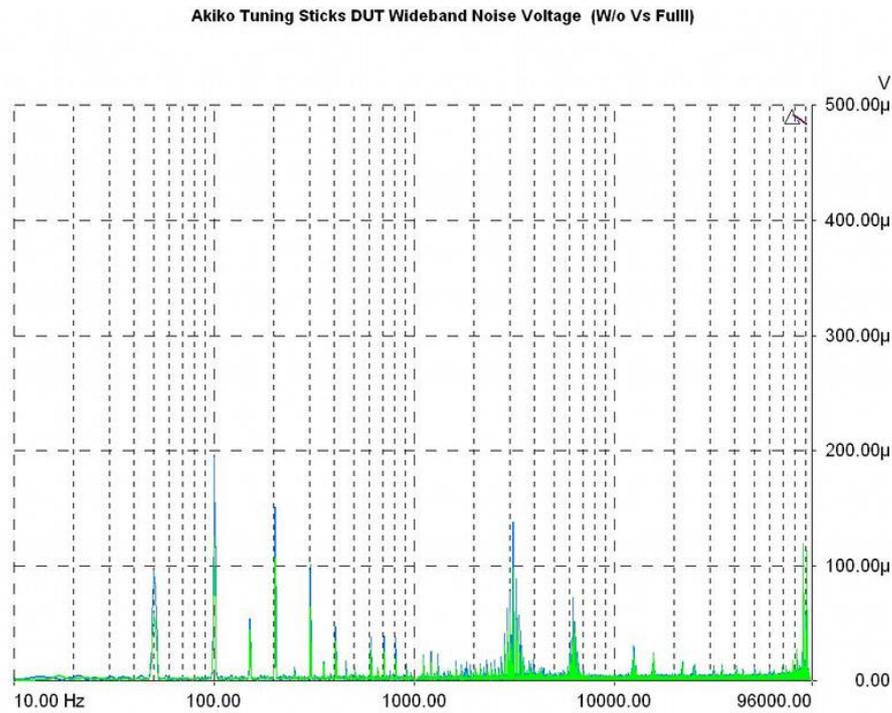
Akiko Tuning Sticks DUT Wideband Noise Voltage (W/o Vs E-Tuning Gold MkII)



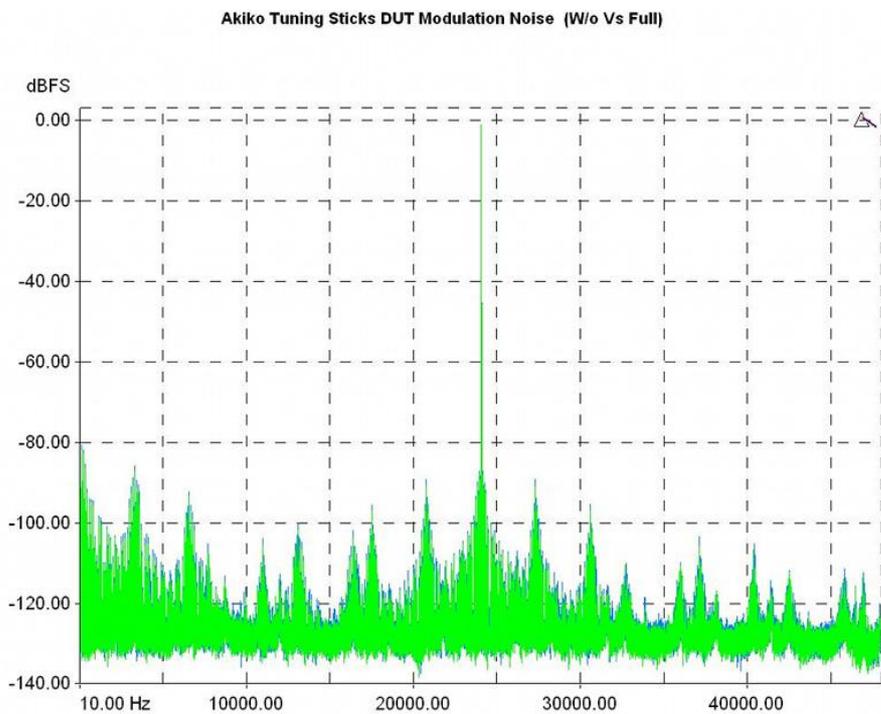
Noise analysis (wideband) in d/a converter output. input signal 1 kHz (24/96, filter rejection band measurement). Noise without Tuning Sticks (blue graph) and with E-Gold Tuning mkII (red).

This trend continues when using more and more of the complete Akiko set. The relevant figure comes from placing a Universal Stick on the S/PDIF, two RCA Sticks on the line outputs and an E-Gold Tuning mkII on the power cable and appears to confirm Akiko Audio's claim that the Sticks have a

cumulative effect. The standard configuration of the measurement signal for (wideband) noise that each DAC makes, also shows the rendering improving with each Stick.

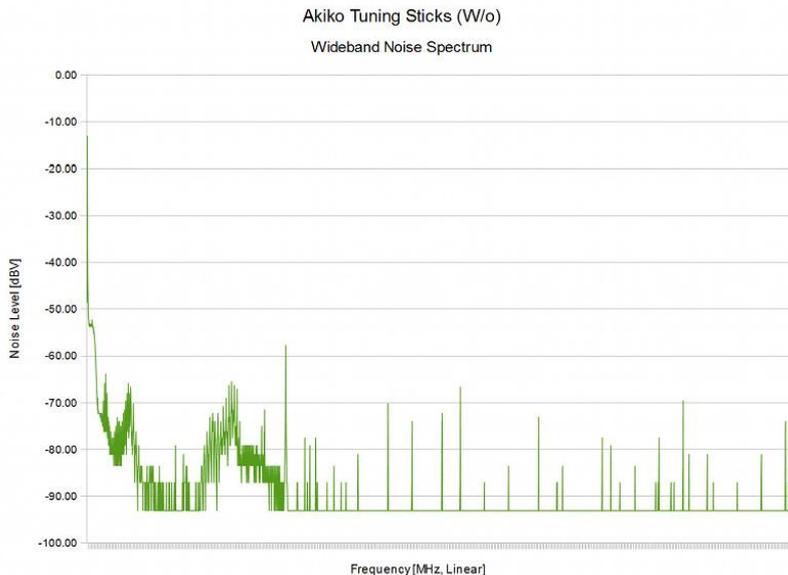


Noise analysis (wideband) in d/a converter output. input signal 1 kHz (24/96, filter rejection band measurement). Noise without Tuning Sticks (blue graph) and with full Tuning Pack Sticks (Universal, RCA and E-Tuning Gold mkII, green).

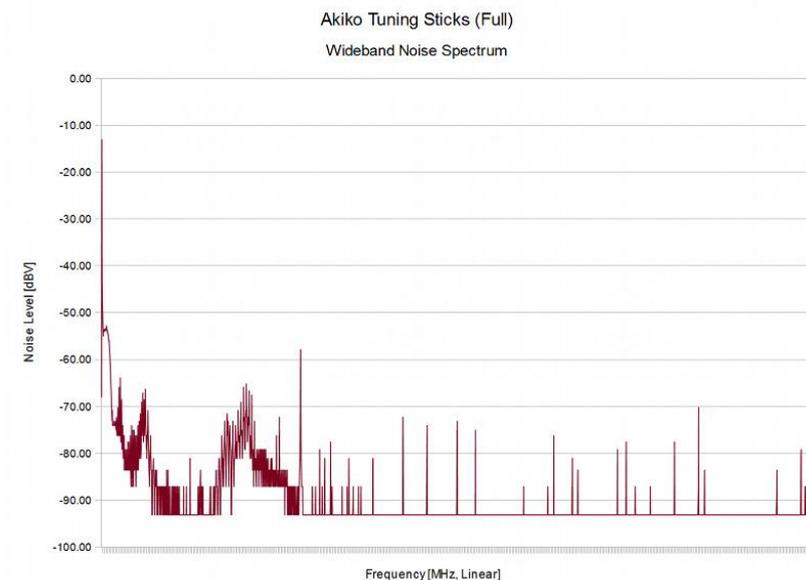


Signal from noise modulation (wideband) in d/a converter badge 24 kHz, without Tuning Sticks (blue graph) and with full Pack (green).

After all that, one can indeed argue there is a measurable impact the Sticks have on the noise of a system in the high frequency areas (even in the acoustics range). An even better approach, rather than looking at the effect itself in the images we've seen up to this point, is to look at the results of the actual impact of the Sticks themselves in the much higher frequency range (in the order of tens of MHz) and indeed, an analysis of the spectrum in this region shows this effect. When studying the relevant diagrams (derived from data domain acquisition by Cadence in 100MSa mixed with 512x averaging, for those who like the details) one should keep in mind that we are dealing with the, for this report, unusual 0-50 MHz range, which means the usual area of interest (up to about 100 kHz for digital systems) is cramped into the part on the left and thus almost unseen. The cutting edge that once distinguished the 24 kHz signal is applied to the converter. According to both the existence of a smaller number of components and also the comparison between components that exist in both cases, the system generally displays less noise with Sticks in place. This comparison most often results in favour of the version including the Sticks. Also quite interesting is the fact that the noise components seem to decline in frequency, at least up to the limit of 50 MHz, in the case with Sticks. This probably shows how Akiko's effect is more important in the higher frequency range (although, alternatively, it could be that the range is digressive in general and in two cases or even be periodic; we cannot know for sure). How important these findings are, or to what extent we can associate the best behaviour of EMI/RFI issues that the system with Stick seems to have with any sonic differences, is not certain. This because in addition to and in compliance with standard specifications there doesn't seem to have been any study (which associates sound quality with EMI/RFI noise levels) and, of course, the measurement of a component and usage scenario doesn't provide enough evidence in any case. In the first instance, however, the fact that the use of Sticks leads to smaller noise levels outside of the measurable impact band and less noise within, should suffice. The whole experiment does need to be investigated wider though.



Noise spectrum analysis (0-50 MHz) without Tuning Sticks. Sampling, averaging 100MSa 512 x.



Noise spectrum analysis (0-50 MHz) with full Tuning Pack Sticks. Sampling, averaging 100MSa 512 x.

Impressions and conclusions

Acoustic assessment of the Tuning Sticks' effect consisted of two phases. First of all the effect on the reference system sound using a pair of Universal Sticks, which were placed on the speaker cables to estimate the change caused when compared to a full package (consisting of a pair of Universal (placed similarly), RCA and E-Tuning Gold mkII Sticks (placed on both power lines of the final reference amplifier)). The reference system that was used in almost all of the tests came from avmentor.gr and consisted of a Teac Esoteric D70/P70 (configured for 4 x upsampling dual link cables with the Nirvana AES3 DC-110), the Melos preamp Plus Series Line, Parasound HCA3500 and ATC SCM-50PSL speakers. Using the Tuning Sticks couldn't be simpler: just put them where they need to be and, if mechanical support on the cable is needed, use the accompanying Velcro strips. The initial impression you get when you hear the system with Tuning Sticks in place is that there is, indeed, an audible difference (depending on the type and value of the system in question). Passers-by reached this same conclusion when passing the listening venue and hearing the system with and without Sticks. Because it is not fully understood how these Sticks operate, it was considered important, before applying the usual evaluation process, to precede with an ABX test to confirm that these differences are real and not some psychoacoustic phenomenon unrelated to our test subjects. To test this we used the files at the end of this text and the well-known Foobar2000 plug-in. The score proved to be particularly encouraging, as they gave only a 1.1 % error margin, in other words, the listener achieved a 9 out of 10 score. The test doesn't have any significant statistical meaning. It does, however, give a serious indication. I recommend readers to do the same tests, using the related files and using track 4 as a basis, as it is, in my opinion, the most revealing.



Now for the details. What mostly characterises the audible changes, when the Tuning Sticks are placed, is the significant gain in clarity, the presence and the sense of accuracy. The reference system is commendable for already having these qualities and for the detailed and textured rendering it is able to generate, Akiko however, wins points by moving each mix' particular characteristics with greater comfort and creating the impression that it is more neutral and that they are absent from the site. Furthermore, the Sticks seemed to make it more homogeneous, gave the area more low and better control and gave a commanding sense of when the program included very low frequencies, without standing out and claiming more attention than their fair share. There have been changes in the high frequency area which, although still retaining the basic characteristics, sounded maybe a bit friendlier and more pleasant compared to what I am used to. In terms of the tall area, the system did not show any significant change. Neither did anything seem to change in the tonal balance and neutrality of the system, however there were changes in the dynamic themes. As it stands, the reference system typically manages the dynamic contrast and has the low noise and power margins needed to raise a composition with intense vagaries to realistic levels (these hearings were made at a specific level of listening position with reference to the digital source-20dBFS). Although in my opinion the Tuning Sticks didn't seem to change anything dramatically, there did seem to be a profit in the very low frequency area, as has been mentioned. What did change was the system's capabilities to reproduce micro dynamics (instantaneous dynamic range requirements, which relate mainly to the complexion and the timbre of specific musical instruments and general sound events that may exist on a track and kat'epilogin, such as the sound of keys on horns). Despite the fact that the reference system is very good when it comes to this (I believe the combination of a P70 and D70 is one of the best I've hear so far, even though its old age), the Tuning Sticks showed there is still room for improvement. This cannot be associated with the improvement of the rendering, nor with the increase in the rendering capabilities of the micro dynamics. The bottom line however, is that the system had the ability to transfer more data in this region (or at least transfer it more persuasively and more clearly defined), which in itself is impressive, especially given the cost. Does this effect increase with the amount of Tuning Sticks used? The answer is yes, but certainly not linear. One should not expect similar changes with each stick added, the system simply wins even more with each Stick in place (as described in the beginning). The most important difference however, was between no Sticks and two Sticks. This observations allows for a response that deals with two important questions: One, what Stick should you use? And two, where should you place it? If the Sticks work as assumed then a good place would be the noisy input ports in the system. These may lie in different places, depending on the device and the environment, but are certainly related to the power cables (perhaps it is no coincidence that the biggest improvement in the measurements seemed to come from the E-Gold Tuning mkII). It would also not be a bad idea to cut the noise at the end of the system, at the speaker cables (and so perhaps it is no coincidence that we have heard a big difference when using two Universal Sticks there). As in the case of noise concepts however, inducing "before", "after" and "pluck" is rather too conventional to describe the phenomenon, so tests are required for each case. **Thankfully it are such phenomena that make audio such an interesting area of technology. As simple in construction and use as the Akiko Audio Tuning Sticks are, in proportion to the value of their significant improvement, is a cynic's proof that research on these key issues is still far behind, but also a first class opportunity for more fumbling and upgrading that bleed ones wallet dry. Worth a try, in my opinion, especially as the company refund any unsatisfied customers, though I much doubt that is ever needed...**

Dimitris Stamatakos

avmentor

This is the English translation of the original test report:
http://avmentor.gr/reviews/akiko_tuning_sticks_1.htm