re-Q

Text and Measurements by **Garry Springgay**

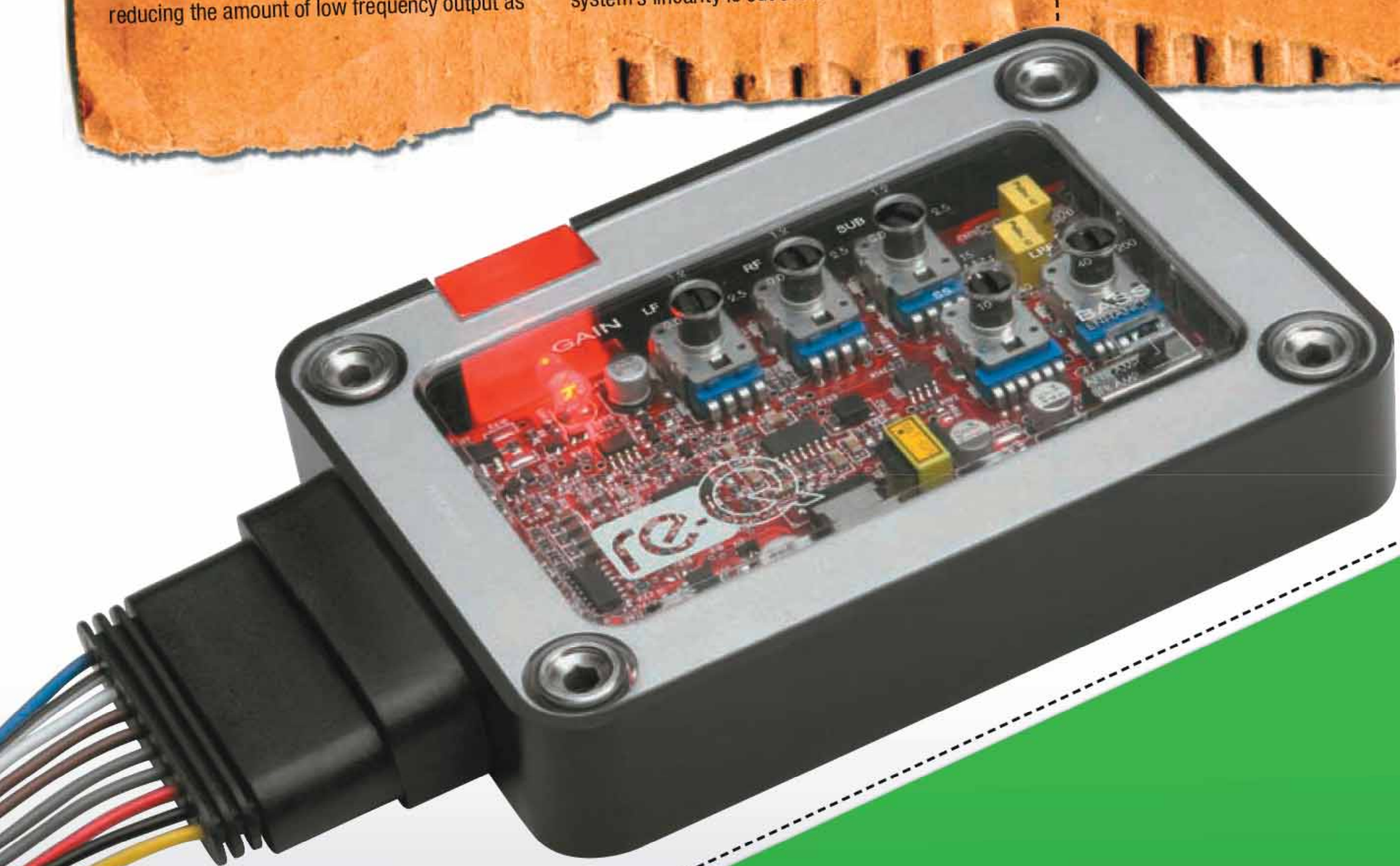
With the head units in new vehicles becoming more and more integrated into the car and often an integral part of another unrelated system, more consumers are choosing to retain the OEM head unit and upgrade the car's system by replacing the factory amp and speakers with much higher performance aftermarket product.

In many of the newer vehicles, the factory systems use sophisticated DSP and other techno-trickery to try and get the best performance they can out of the limited capabilities of the original speakers. One of the more common tricks employed is to program the DSP to reduce the bass output as the volume setting increases. Yep, you read it right, the louder you crank it up, the less bass you'll get. Why do they do this? Well, for several reasons that are very logical and technically correct, unless you're a car audio enthusiast! The problem is the OEM sound engineer and the typical car audio enthusiast have completely different goals. He is trying to limit distortion and retain maximum reliability of the factory system, and we're trying to get maximum fidelity at sound levels high enough to overcome road noise. By reducing the amount of low frequency output as volume increases, he accomplishes both of those goals. The amp is not being asked to drive the speakers as hard, so it clips later, and the speakers are not pushed to their mechanical excursion limits. In case you forgot, with a constant power level, for every halving of frequency, the speaker cone must quadruple its excursion.

So, by removing the low-frequency information, the engineer only has to be concerned with the thermal power handling of the speakers, and not about mechanical damage. Put yourself in the OEM engineer's boots for a minute, and you'll soon understand his logic.

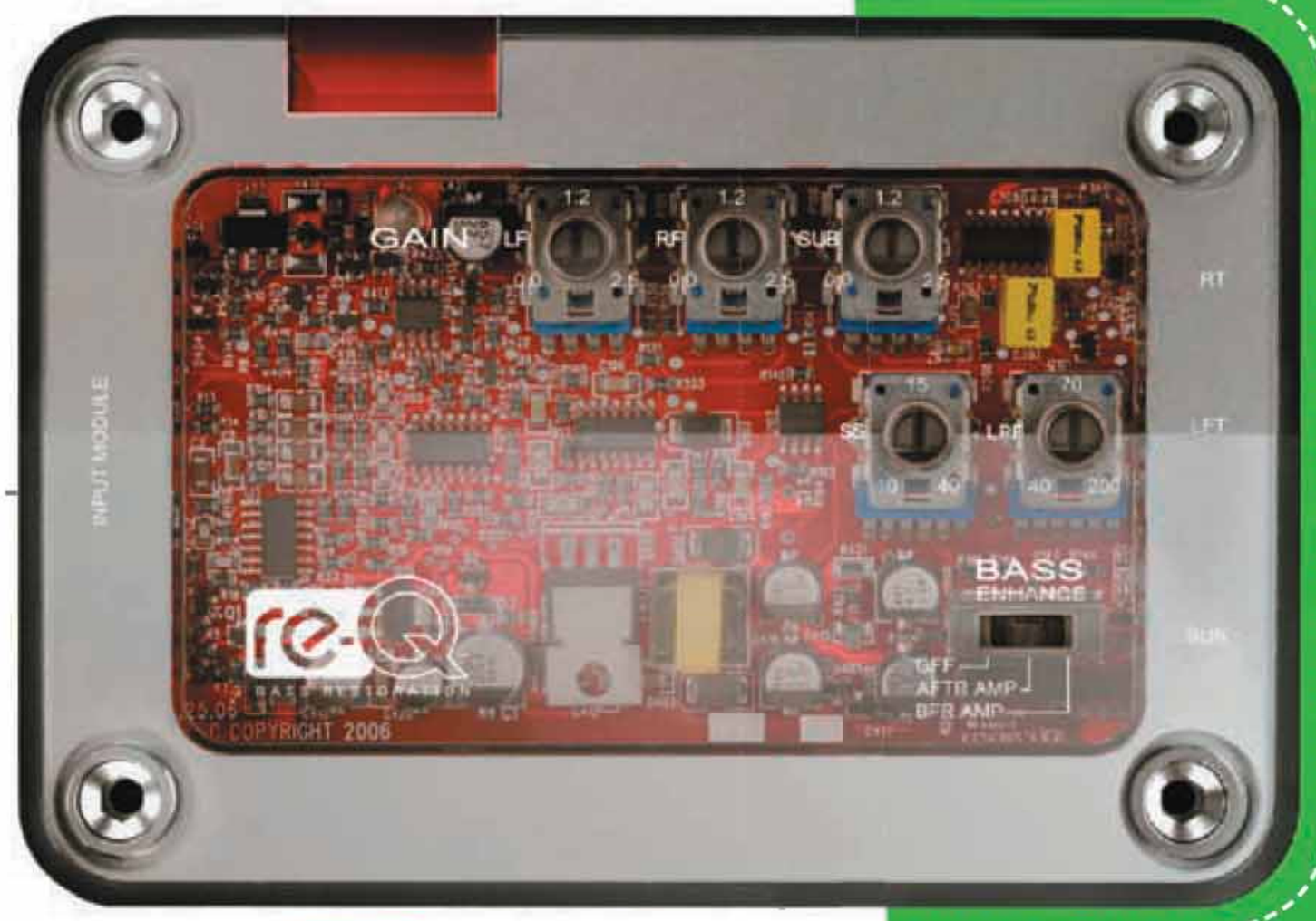
But just adding an EQ or maxing out the gains on a woofer amp won't fix the problem because at lower volumes, the OEM head unit actually has more bass output, so then the bass overcomes the rest of the system, and the whole system's linearity is out the window. »

"IF YOU HAVE A VEHICLE WHERE YOU'D PREFER TO HANG ON TO THE OEM RADIO, AND WOULD PREFER A GOOD-SOUNDING, WELL-ENGINEERED, ECONOMICAL, HIGH-PERFORMANCE INTERFACE THAT WILL IMPROVE THE OVERALL SOUND OF YOUR SYSTEM, CHECK OUT THE re-Q, AND RECLAIM YOUR BASS."



re-Q

The re-Q is not only a simple and effective way to interface many OEM systems to aftermarket amps; it's also designed specifically to restore the lost bass when adding aftermarket amps and speakers to an OEM system. But don't misunderstand, the re-Q is not simply a bass EQ or gain control – what makes this piece different is it actually varies the amount of bass boost applied, depending on the level of the input signal.



So, what can we do to get the bass back in the system at higher volume settings, if it never is part of the signal feeding our aftermarket amps and high performance speakers? Enter the cool new product: re-Q.

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This way, at lower volumes when the head unit is not cutting the low frequency output, the re-Q doesn't add anything and the system sounds correct. As volume increases and the head unit's bass output falls off, the re-Q is there to add it back in, maintaining good linearity at any volume.

> "IF THIS ALL SOUNDS VERY TECHNICAL AND COMPLICATED, DON'T WORRY, BECAUSE IT'S ALL PRETTY AUTOMATIC FROM THE USER'S POINT OF VIEW. EVEN BETTER, THE re-Q IS A SIMPLE AND VERY STRAIGHTFORWARD PRODUCT TO INSTALL."

If this all sounds very technical and complicated, don't worry, because it's all pretty automatic from the user's point of view. Even better, the re-Q is a simple and very straightforward product to install. At only 5.25 by 4 by 1 inches, the device itself is small enough to easily hide in the dash or under a seat. An included wiring harness allows connections to the OEM front speakers as well as the OEM subwoofer if one exists. After that, the usual power and ground connections, and the re-Q also can provide the amp turn-on trigger for the aftermarket amps. The unit can be also configured to turn on with either a dedicated 12V wire or by using the "Smart Engage" signal sensing. Included on the re-Q are gain controls for the left and right front channels and sub-woofer channel. Outputs are RCAs with a left, right and a pair of subwoofer outs. There is a 10-40Hz adjustable subsonic filter, as well as a 40-200Hz low-pass filter for the subwoofer outputs. A switch allows you to select the amount of bass you'd like the unit to add, which is handy for vehicles with different amounts of factory "compensation."

In under an hour I accomplished the simple installation into a Grand Cherokee test vehicle, and using the Smart Engage feature to turn the unit and the amps on, after a bit of re-tuning including removing any existing EQ, I did some listening. The re-Q pretty much performed just as advertised. The car's low frequency response was much more linear, without the need to drastically increase the gain on the sub amp when I got on the volume. Just as smoothly, when the volume was reduced, the overall tonal balance of the sound remained quite linear, just as it would be with an aftermarket head unit with a flat response regardless of level. »

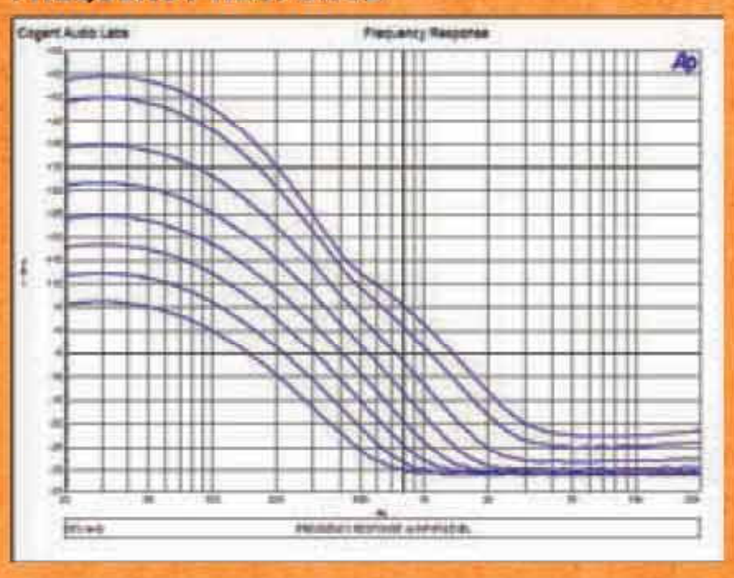
re-Q

> "OVERALL, FROM A SONIC PERSPECTIVE, THE re-Q PERFORMED VERY WELL WITHOUT ADDING ANY NOISE OR CHARACTER OF ITS OWN, EXCEPT FOR THE OBVIOUS ENHANCEMENT OF LOW FREQUENCY OUTPUT WHEN REQUIRED."

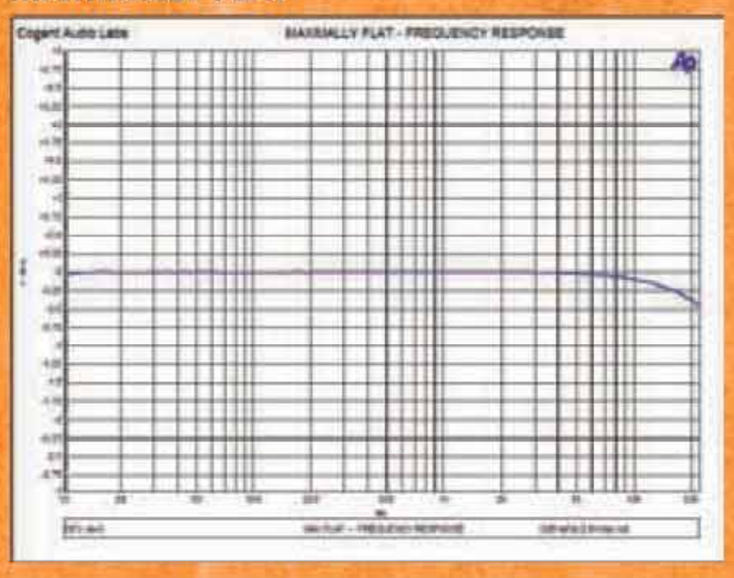
TECHNICAL SPECS	
Frequency Response (+/-1.0dB)	<10Hz–20kHz
Signal to Noise Ratio (ref to 1V out)	-73.1dBA
THD+N (ref 1V out, @ 1kHz)	0.04%
Input signal range	250mV–30.0Vrms
Maximum Output Voltage - Stereo outputs (unclipped)	2.45Vrms
Maximum Output Voltage - Subwoofer outputs (unclipped)	7.6Vrms

Because the OEM head unit's bass reduction is tied in to the actual volume position setting and not the actual output voltage of the player, I did find it possible to occasionally "fool" the re-Q into thinking it needed to add more bass when in fact, it didn't. This was the only real quibble I had when listening to it on very dynamic musical selections (classical music). Where there is a large difference in the minimum and maximum volumes of the track, it would tend to add in a bit too much bass when the track's dynamics got loud. But this was a very small quibble, and only occurred on a couple of the dozens of tracks I listened to. And if I'd been driving on the freeway instead of sitting in a parking lot, I might not have even noticed it.

FREQUENCY RESPONSE



MAXIMALLY FLAT



SUBSONIC FILTER ADJUSTMENT RANGE

CROSSOVER ADJUSTMENT RANGE

CONCLUSION

Overall, from a sonic perspective, the re-Q performed very well without adding any noise or character of its own, except for the obvious enhancement of low frequency output when required. There are a lot of ways to get your OEM head unit connected to aftermarket amps, from cheap, sometimes terrible-sounding high-to-low level signal adaptors, to very fancy high-dollar, DSP-controlled interfaces including some that need expert set-up and a connection to a computer to really get them dialed in… But if you have a vehicle where you'd prefer to hang on to the OEM radio, and would prefer a good-sounding, well-engineered, economical, high-performance interface that will improve the overall sound of your system, check out the re-Q, and re-claim your bass. PAS

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SMART VOLUME SENSING
BASS RESTORATION

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