

PH 9.0X Details and Explanation of benefit

What the PH 9.0X upgrade includes:

The upgrade to the PH 9.0X involves the **addition of a pair of Lundahl gapped output transformers**, commonly used in SET tube amps. The addition of these transformers also means the **elimination of a pair of chokes and coupling caps**, all in the signal path.

Why this upgrade?:

The circuit change made to the PH 9.0X, make it much closer to the PH 150 in terms of overall circuit design. Various other circuit differences in the PH 9.0 vs. the PH 150 were implemented, to see where the PH 9.0 could be improved. Most either made no difference, or for whatever reason, did not sound as good in the PH 9.0. This circuit change however DOES make a difference. The use of the Lundahl output transformers was one of the cost cutting design changes made to the PH 150 to achieve the PH 9.0. I found that the improvements were simply big enough that it warranted offering the upgrade, as an add cost option for the PH 9.0.

Sonic Benefits:

The sonic benefits of this circuit change are obvious and significant! There is **better bottom end**, more **weight and authority** to the sound as well as **improved resolution, detail and soundstage**.

Technical Explanation:

Eliminating the coupling caps simply cleans up the signal because no coupling cap sounds better than the best coupling cap. This can be done, because the output transformers can absorb the DC voltage present at the outputs that the coupling caps otherwise block.

The chokes are replaced also, as the primary winding of the output transformer serves the same purpose, but does so with a much higher inductance, translating to better bass and performance.

Balanced (XLR) outs and RCA outs – how different than the \$300 XLR upgrade:

Balanced outputs are automatically possible because the output of the transformer is a balanced signal. The RCA outs are also fed from this same transformer however, but obviously not balanced. This means that a toggle switch is needed to toggle from RCA to XLR outs. If you connect RCA outs when the toggle is in the XLR position, it will sound wrong because the grounding is not right for single-ended operation.

Both RCA and XLR outs should both sound the same. It really depends on whether the preamp or integrated amp that you are connected the PH 9.0 to, prefers a balanced or single ended (RCA) connection.

This is different than our \$300 XLR balanced upgrade, which simply adds a pair of 1:1 Edcor transformers to the existing circuit, to provide a balanced output. Only the balanced signal goes through the transformers in this case. ***The 'X' upgrade is a redesign, not just an addition of transformer coupled balanced XLR's.***

Better with RCA or XLR outs?:

Because the **output impedance is VERY low for both RCA or XLR outputs**, driving a preamp or integrated with even as low as **10K to 20K input impedance is fine**. This is another place where the lack of a coupling cap is a good thing. The lower the input impedance of the equipment following the PH 9.0, the larger the coupling cap must be, in order to not limit bass. With no coupling cap, there is no issue here.