



#### SOME DESIGN NOTES, ABOUT THE ONE TUBE AMPLIFIER (OTA)

This is really possible to build a complete amplifier with just one tube! The simplicity of this circuit diagram is amazing. It does however needs the right components, otherwise you get stuck with insufficient frequency range, too low input impedance, and distortion.

**THE TUBE:** Linear curves are needed for output tubes by definition, because you sweep through the entire curve chart. Yet with tube design, linearity is always in conflict with high gain, which tends to produce tubes with not so nice curves. 20B however really has it both: Good gain, and such excellent curves, you will find with no other tube at a gain of 20x.

**THE OUTPUT TRANSFORMER:** High gain tubes do not like transformer capacitance. The requirements to the transformer are very high. Most output tubes have a gain of only 4x, but 20B has an unloaded gain of 20x. So that is a remarkable difference. The output transformer LL1935B was designed by Per Lundahl with great care, especially for such high Gain output tubes as the EML20B, 10Y or 801A.

**THE INPUT TRANSFORMER:** Such devices are inevitable with an OTA. A step up factor of 4x transfers the transformer resistive load to the input with a factor 16x. This is low, but reasonable. Yet it is important to use a low capacitance transformer for this, such as LL1922 indeed. This has been tested, and used in some OEM produced OTA's.

**The INPUT:** Take the opportunity to create a balanced input!

**HUM AND NOISE:** The input transformer works free of hum and noise, and a driver tube is not needed. So all in all an OTA is the most quiet design without feedback.

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Here is an excerpt from the LUNDAHL data sheet:

"... the transformer is a dual coil transformer where coils are wound using our high internal isolation technique with isolation foil between each layer of copper wire. Each coil consist of one primary and two secondary sections. The isolation between primary and secondary sections are gradually increased closer to the tube anode connection in order to minimize capacitive energy storage..."

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Document Title:	20B-V4 One Tube Amplifier (OTA)				
Date created:	1.9.2014	Last Revision:	2	Date:	21.9.2020
Pages:	1	of	1		
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