

# *Muse Coils*

## **OTSE-400NX-05U**

A high level output transformer built with the primary idea of delivering a flow of stunning endless musical emotions.

For SE tube output stages

Nanocrystalline core

OCC magnet wire

Multitap primary

### **A word of warning:**

Please remember you will be installing your new transformers within a potentially hazardous area surrounded by lethal voltages and currents. Respect all safety rules when handling tube amplifiers. Stay safe and have fun!

### **A summary of building philosophy:**

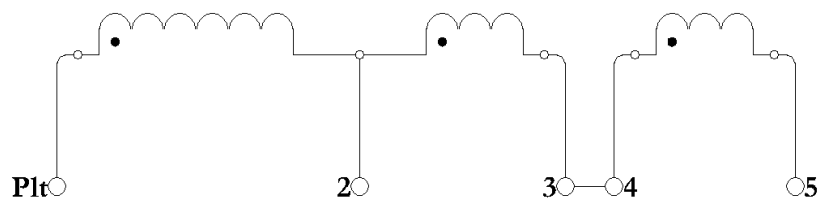
A well performing audio transformer should not be viewed only as an electrical device with coils and a magnetic core. An audio transformer should be built like a musical instrument. Every material plays its significance in the final audible performance. The art of sculpting the best sound possible lies into the hands and mind of the creator to combine the materials into the ultimate synergistic way.

## THE PRIMARY COIL

Multiple primary impedance options are possible thanks to different connections on the primary side of the transformer.

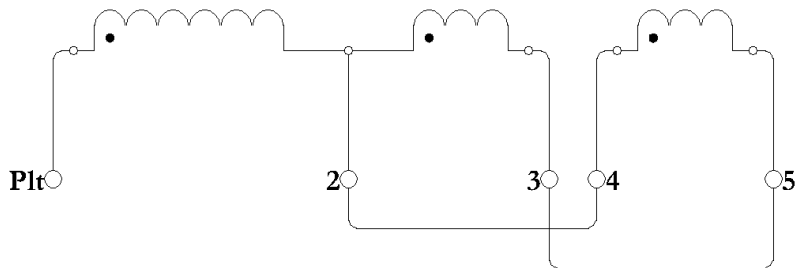
Please respect the following schematics:

### 4.9k



Connect pin 5 to B+ (power supply)

### 4.1k



Connect pin 5 to B+ (power supply)

### 3.4k

To obtain 3.4k primary mode, instead of **pin 5**, connect **pin 2** to B+.

It works with any of the two wiring diagrams depicted above

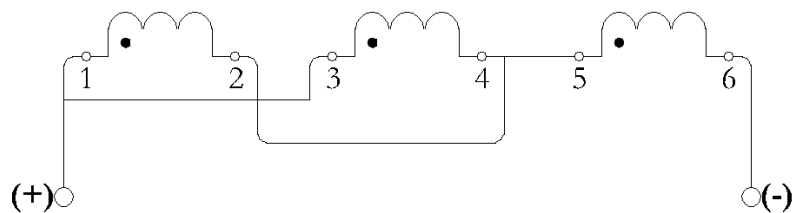
## THE SECONDARY COIL

The whole set of secondaries consists of three equally turned coils. Connecting them in different combinations permits us to use different loads.

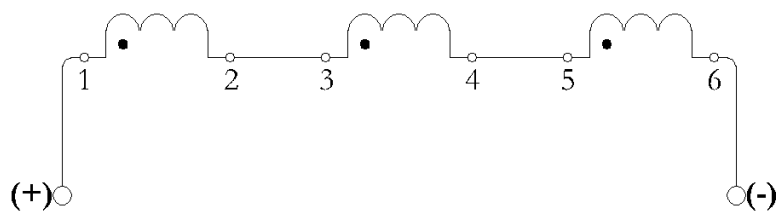
Please respect the following schematics:

Note: The "Easy 4R" is a tap-style connection, letting you easily switch between 4R and 9R, but slightly degrades high-frequency performance.

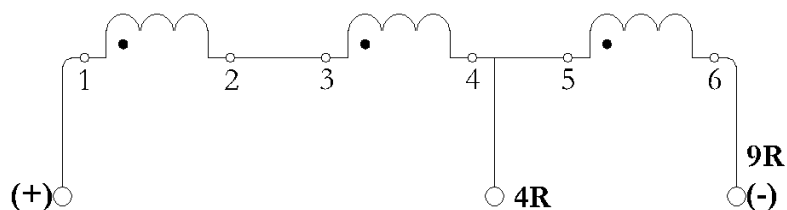
### 4R



### 9R



### "Easy 4R"



# MAIN TRANSFORMER

## PARAMETERS

### Output tube recommendations:

Tube Rp ranging from 400R to 1k, 300B, 2A3, triode strapped KT88, KT120, PL36, EL509, GU50

**Weight:** 5.5 kg  
**Dimensions (mm):** 130\*125\*112

**Primary impedance** 4,9k ; 4,1k ; 3,4k

### Primary inductance:

-4,9k: 33H  
 -4,1k: 28H  
 -3,4k: 23H

### Nominal primary DC current at:

-4,9k: 72mA  
 -4,1k: 78mA  
 -3,4k: 85mA

### Nominal primary Vrms for max power :

-4,9k: 240  
 -4,1k: 220  
 -3,4k: 200

### Active primary losses:

-4,9k: 99,1R  
 -4,1k: 84,8R  
 -3,4k: 80,1R

**Active secondary losses 4R:** 0,128R

**Active secondary losses 9R:** 0,256R

**Active secondary losses "Easy" 4R:** 0,17R

**DC flux density at nominal Idc:** 0,55T

**AC flux density at nominal primary Vrms:** 0,50T

**Maximum power at 25Hz\*:** 12 W

*\*Theoretical maximum power output with no active losses accounted.*

*\*\*The voltage swing related to the maximum power output.*

**Overall parasitic capacitance (Cp+Cs):**

-4,9k:	1.6nF
-4,1k:	1.5nF
-3,4k:	1.3nF

**Leakage inductance (Ls):** 3,9mH

**Resonant frequency (Cs + Ls):** 64kHz

**Low-signal frequency response (loaded and grounded secondary) ; 800R generator impedance:**

**4R Secondary load**

<b>4.9kHz</b>	-	3,7 Hz – 58 kHz* <b>(-3dB)</b>
<b>4.1kHz</b>	-	3,4 Hz – 110 kHz <b>(-3dB)</b>
<b>3.4kHz</b>	-	5,0 Hz – 107 kHz <b>(-3dB)</b>

\*dip due to resonance

**9R Secondary load**

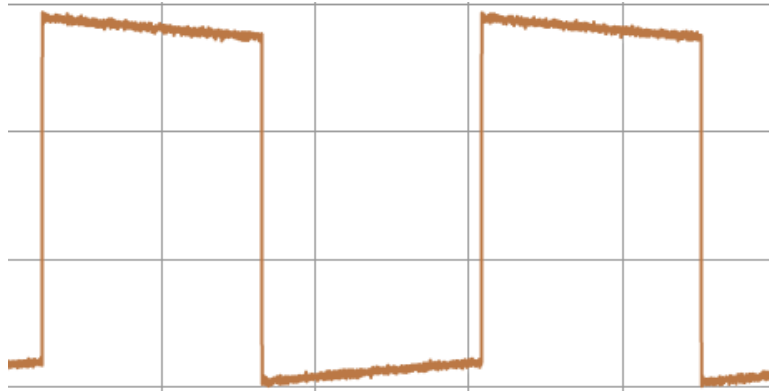
<b>4.9kHz</b>	-	3,7 Hz – 90 kHz <b>(-3dB)</b>
<b>4.1kHz</b>	-	3,4 Hz – 88 kHz <b>(-3dB)</b>
<b>3.4kHz</b>	-	5,0 Hz – 90 kHz <b>(-3dB)</b>

**"Easy 4R" Secondary load**

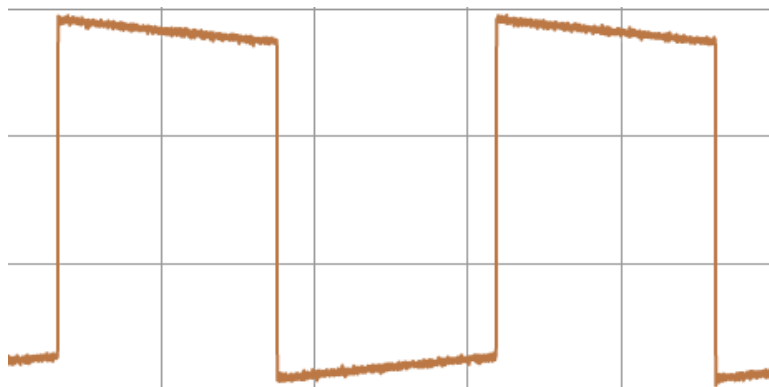
<b>4.9kHz</b>	-	3,7 Hz – 52 kHz <b>(-3dB)</b>
<b>4.1kHz</b>	-	3,4 Hz – 47 kHz <b>(-3dB)</b>
<b>3.4kHz</b>	-	5,0 Hz – 42 kHz <b>(-3dB)</b>

# SQUARE WAVE FREQUENCY MEASUREMENTS part 1

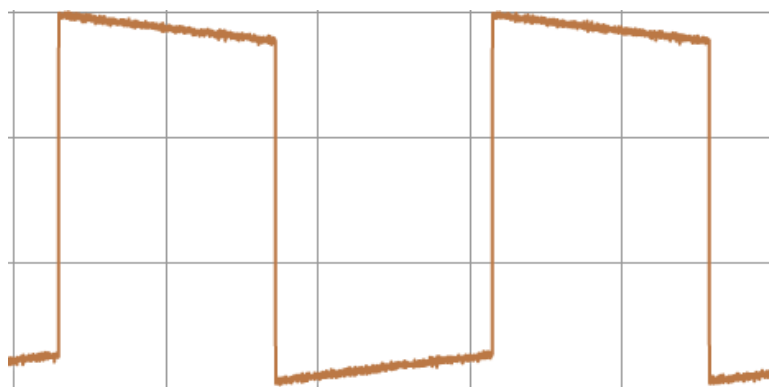
**100Hz** square waves, 800R generator impedance;  
grounded secondary, 9R load



**Fig. 1:** 4.9k Primary impedance



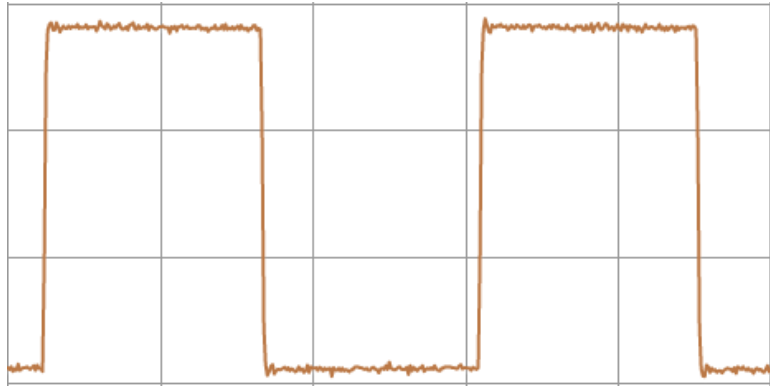
**Fig. 2:** 4.1k Primary impedance



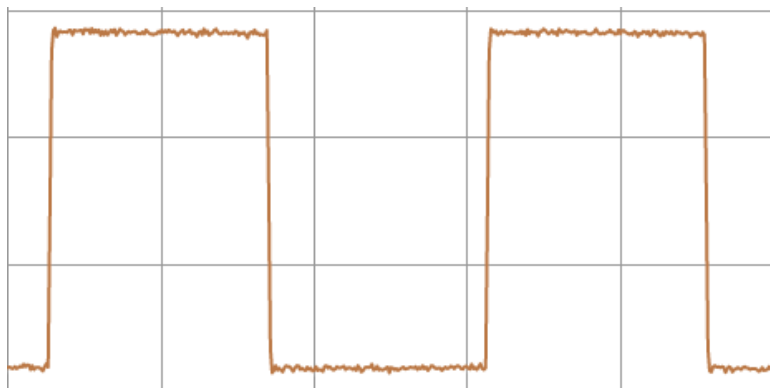
**Fig. 3:** 3.4k Primary impedance

## SQUARE WAVE FREQUENCY MEASUREMENTS part 2

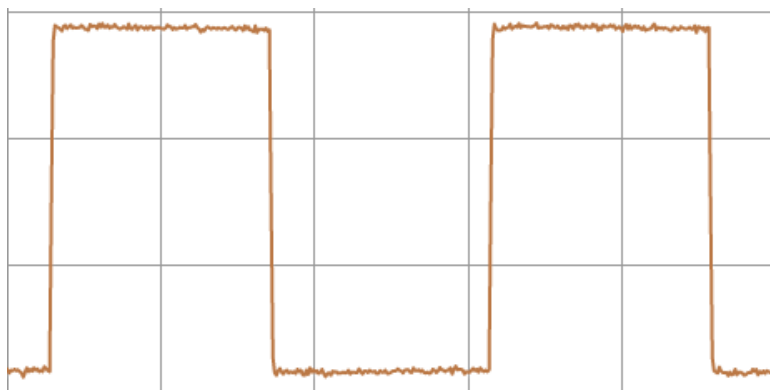
1kHz square waves, 800R generator impedance;  
grounded secondary, 9R load



**Fig. 4:** 4.9k Primary impedance



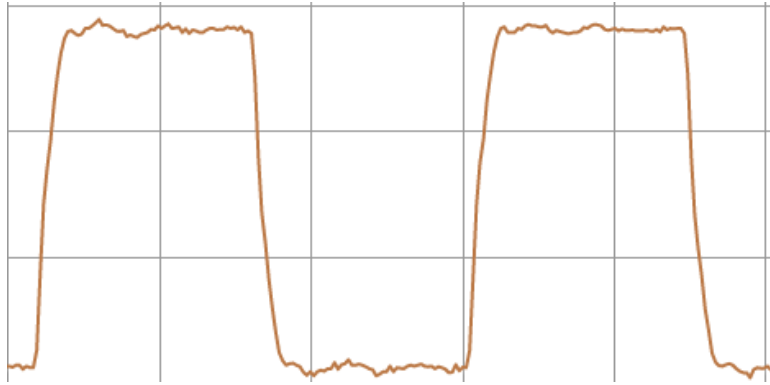
**Fig. 5:** 4.1k Primary impedance



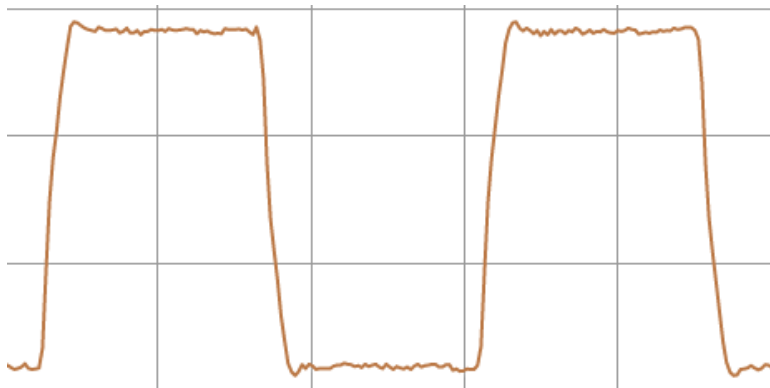
**Fig. 6:** 3.4k Primary impedance

## SQUARE WAVE FREQUENCY MEASUREMENTS part 3

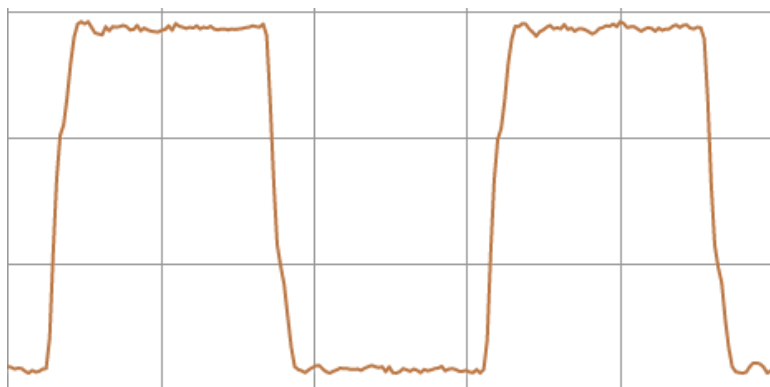
**10kHz** square waves, 800R generator impedance;  
grounded secondary, 9R load



**Fig. 7:** 4.9k Primary impedance



**Fig. 8:** 4.1k Primary impedance

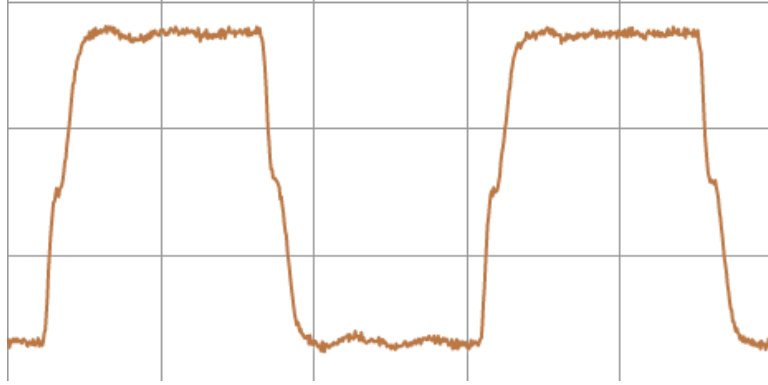


**Fig. 9:** 3.4k Primary impedance



## SQUARE WAVE FREQUENCY MEASUREMENTS part 4

**10kHz** square wave, 800R generator impedance;  
grounded secondary, "**Easy 4R**" tap



**Fig. 10:** at 4.9k Primary impedance