



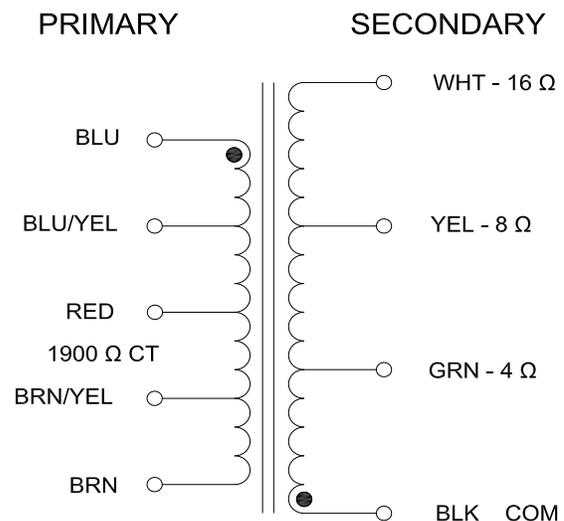
# 1650WA

## HI-FI AUDIO OUTPUT MULTIPLE SECONDARY TRANSFORMER

- NEW & improved version of our 1608-1650 Series multiple secondary output transformers (Re-designed secondaries for easy hook-up of secondary loads).
- Designed for push-pull tube output circuits.
- Units are designed to provide ample "headroom" at bass frequencies (Note the weight of each transformer).
- Enclosed (shielded), 4 slot, above chassis Type "X" mounting.
- Manufactured with plastic coil forms for coil support and insulation.
- Frequency response 30Hz. to 30Khz. at full rated power (+/- 1db max. - ref. 1Khz) minimum.
- Insulated flexible leads 8" min.
- Included 40% screen taps for Ultra-Linear operation (if desired).
- Typical applications - Push-Pull: triode, Ultra-Linear pentode, pentode and tetrode connected audio output.
- Suggested tube types: 6L6GC, 5881, EL34, 6550B, KT88

ELECTRICAL SPECIFICATIONS	
Characteristic	Typical
Input Impedance	1900 Ohms
Output Impedance	4, 8 & 16 Ohms
Output Power	280 Watts
<b>DCR</b>	
Primary Blue-Red	15.65 Ohms
Primary Red-Brown	17.19 Ohms
Secondary Black-Green	0.135 Ohm
Secondary Black-Yellow	0.176 Ohm
Secondary Black-White	0.203 Ohm
<b>Inductance   Impedance</b>	
	@ 60Hz, 10.0V OC
Primary Brown-Red	156H   76KOhm
<b>Leakage Inductance</b>	
	@ 60Hz, 10.0V SC
Primary Brown-Red	3.66mH
<b>Dielectric Strength</b>	
	3535VDC
<b>Temperature Range</b>	
	-40 To 105°C

### SCHEMATIC



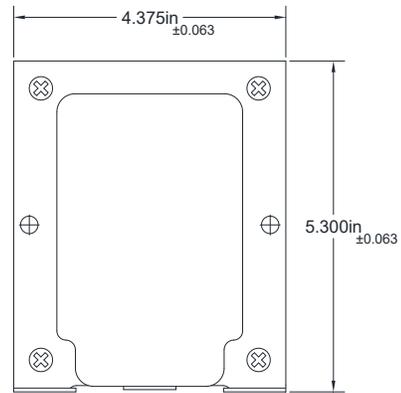
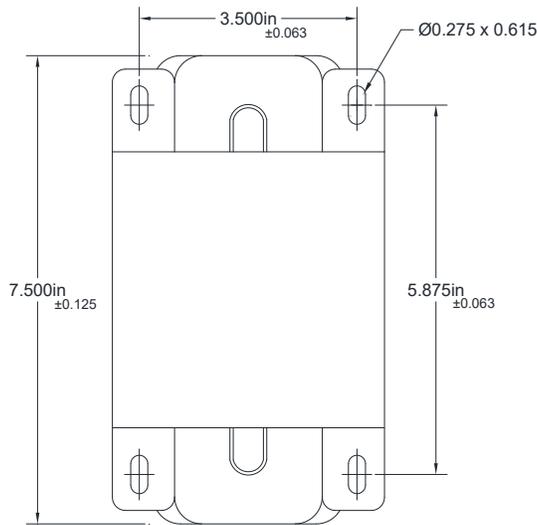
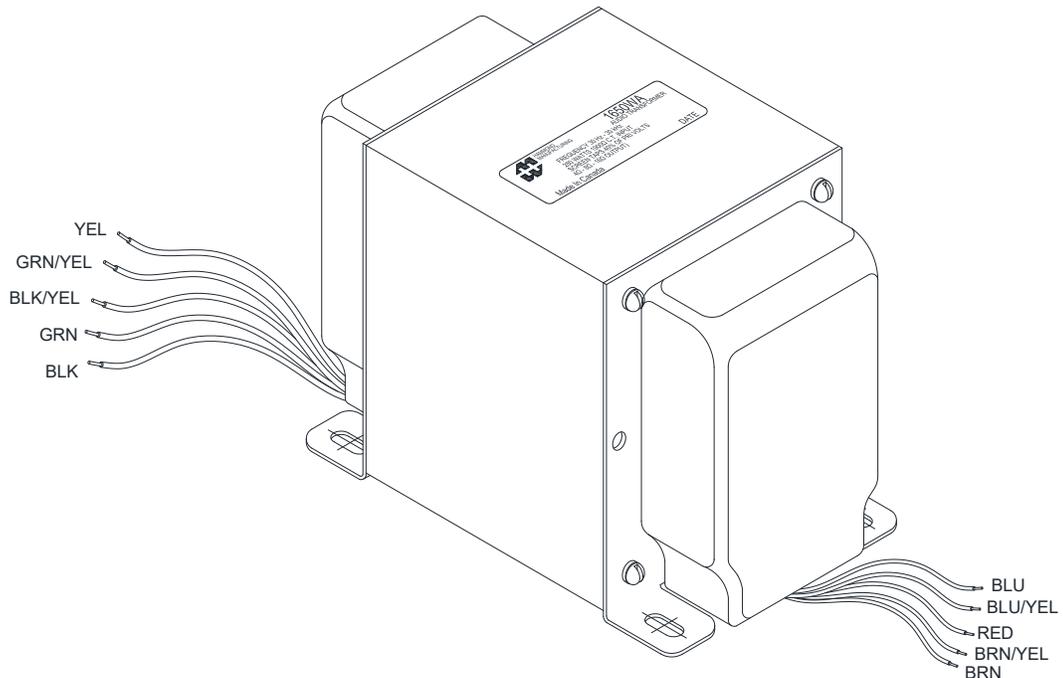

**HAMMOND  
MANUFACTURING**™
 1650WA

BLK - GRN - YEL - WHT; COM - 4Ω - 8Ω - 16Ω  
 BLU - RED - BRN : 1900Ω CT  
 280 WATTS 30Hz - 30KHz  
 BRN/YEL & BLU/YEL SCREEN TAPS 40% OF PRI VOLTS

Made In Canada DATE

Note: The above examples of possible combinations are to help you narrow down the choices of transformers for your favorite tube types. How you operate the tubes (push-pull, push-pull parallel, ultra-linear, class, B+, bias, operating points, etc.) will change optimum plate to plate load impedance. Only a few of the most popular tubes are shown. As more tubes become available we will add them to the list. A tube manual or tube manufacturer's technical data sheets should be consulted first, before making a decision on a proper output transformer.

**DIMENSIONAL DETAILS:**

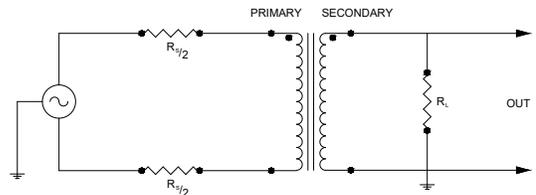


**TEST CONDITIONS**

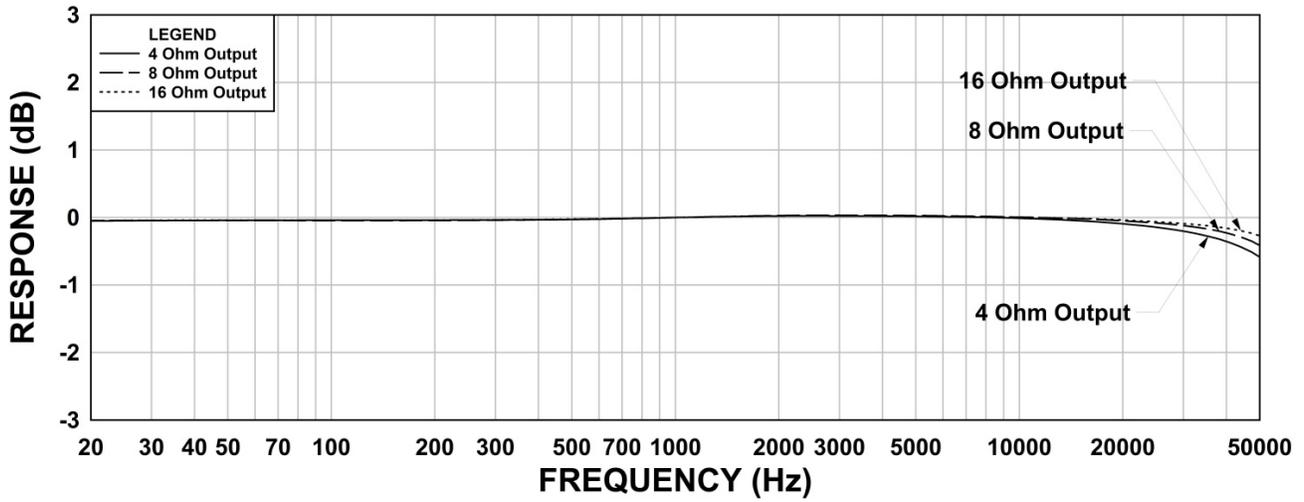
Measurement Instruments:  
 dScope Series III Audio Analyzer  
 Wayne Kerr 3255B with a 3265B Inductance Analyzer  
 HP 4192a LF Impedance Analyzer  
 Keithley 2010 DVM

\* All graphs input level 27dBu @1.0KHz reference.  
 \*\*The results are typical and are subject to normal manufacturing and electrical tolerances.

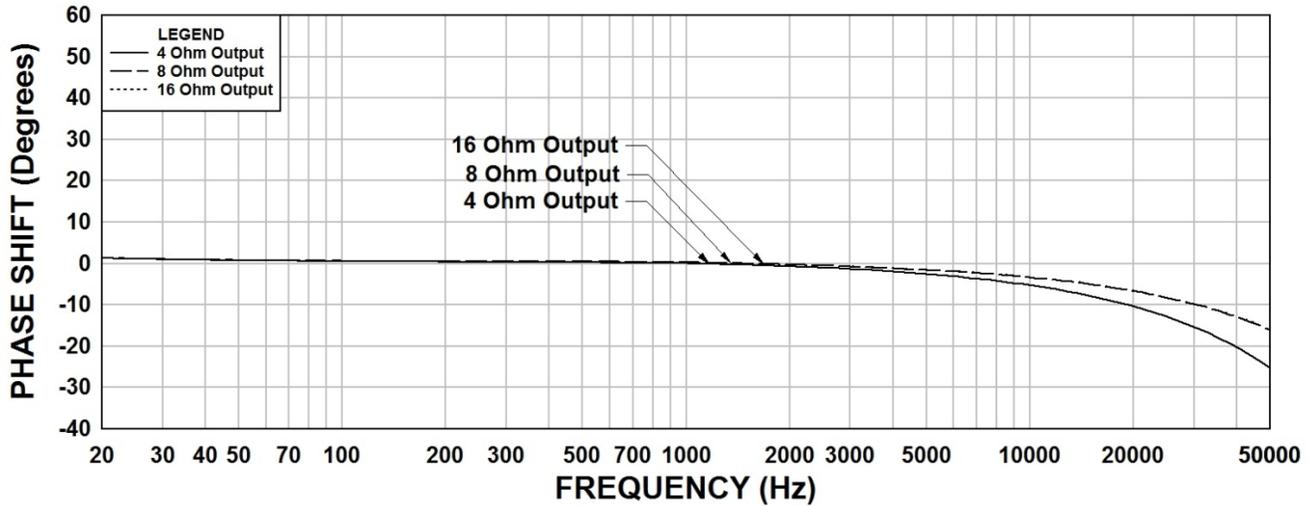
**TYPICAL TEST CIRCUIT**



### 1650WA Frequency Response $R_s = 1.9K$ Ohms



### 1650WA Phase Shift $R_s = 1.9K$ Ohms



### 1650WA THD+N $R_s = 1.9K$ Ohms

