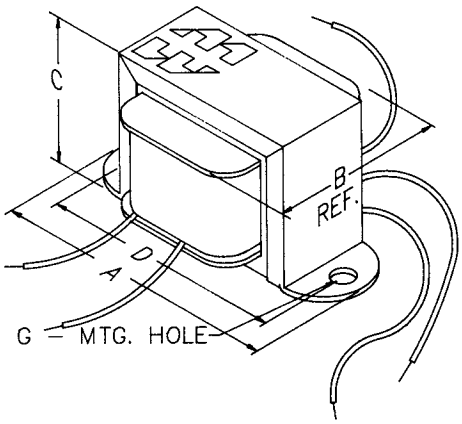
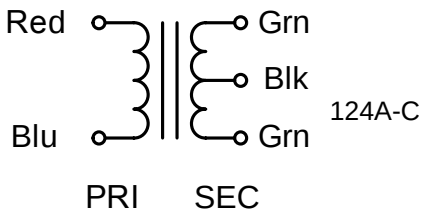


TUBE DRIVER - INTERSTAGE TRANSFORMERS

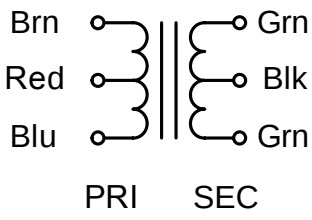
- Designed for general purpose or replacement use in single ended or phase inverter tube driver circuits.
- Open style with minimum 5" long primary leads
- Minimum frequency response 150 Hz. - 15 Khz (+/- 1 db max. ref. 1 Khz.) at full rated power.
- Part number 124B is the same as the 124A except for 49% Nickel laminations for greater fidelity.
- Part number 124C is the COIL ONLY (for those experimenters who want to use their own "iron").

Part No.	Audio Watts	Primary		Secondary		Laminations	Dimensions (Inches)				
		Impedance (Ohms)	D.C. Resistance (Ohms)	Impedance (Ohms)	D.C. Resistance (Ohms)		A	B	C	D	G Mtg. Hole
124A	5	10K	403	90K C.T.	1,524	Grain Oriented Steel	2.38	1.35	1.43	2.00	0.187
124B	5	10K	403	90K C.T.	1,500	49% Nickel	2.38	1.35	1.43	2.00	0.187
124C	5	10K	403	90K C.T.	1,524	None (coil only)	-	-	-	-	-
124D	5	7K C.T.	454	15.8K C.T.	681	Grain Oriented Steel	2.81	1.46	1.68	2.38	0.187
124E	5	15K C.T.	728	33.8K/135K C.T.	3,880	Grain Oriented Steel	2.88	1.74	2.37	2.38	0.187

Schematic & Hook Up Data (124A-D)

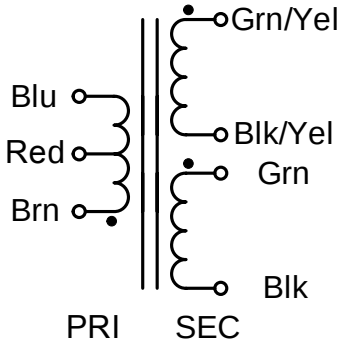


124A-C



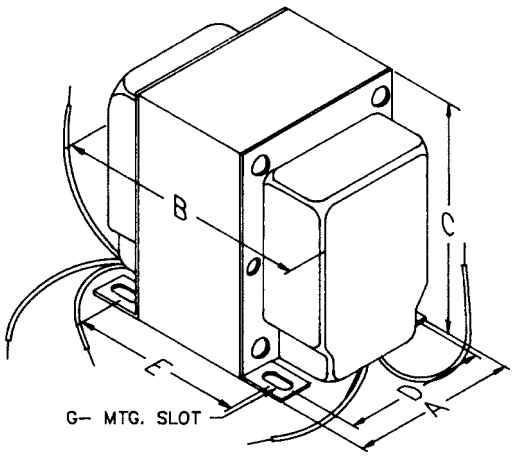
124D

Schematic & Hook Up Data (124E Only)



- For ***Parallel*** connected operation (33.8K Ohm Secondary):
  Connect the GRN/YEL wire to the GRN wire and the BLK/YEL wire to the BLK wire.
- For ***Series*** connected operation (135K Ohm Secondary):
  Connect the BLK/YEL wire to the GRN (this becomes the center tap) GRN/YEL and BLK wires are the output.

Tube Driver - Interstage (126 Series)

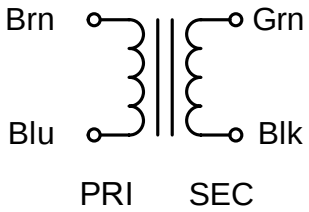


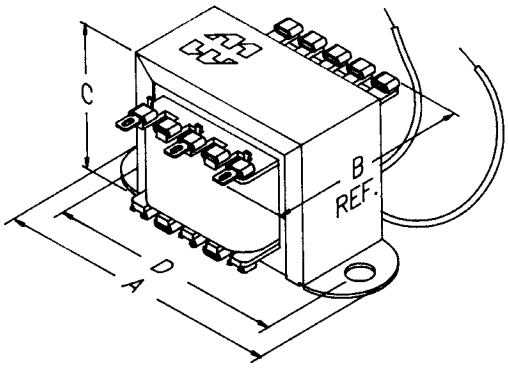
TUBE DRIVER - INTERSTAGE TRANSFORMERS

- Designed for driver use ONLY in single ended tube output amplifiers. These units replace coupling capacitor circuits for improved sound.
- Closed style with minimum 8" long leads.
- All models use bifilar wound windings for exceptional coupling and bandwidth.
- Minimum frequency response 20 Hz. - 20 Khz (+/- 1db max. ref. 1 Khz.).
- The core is gapped to support the specified D.C. bias current.
- Core uses Hi grade silicon laminations (29M6).
- Units weight - 3 lbs. 2 oz.

Part No.	Audio Watts	Primary		Secondary		Inductance	Rated D.C. Bias Current	Dimensions (Inches)					
		Impedance (Ohms)	D.C. Resistance (Ohms)	Impedance (Ohms)	D.C. Resistance (Ohms)			A	B	C	D	E	G Mtg. Slot
126A	4	5K	178	5K	178	59 Henrys	15 ma.	2.50	3.12	3.12	2.00	2.25	.203 x .38
126B	4	5K	178	5K	178	44 Henrys	30 ma.	2.50	3.12	3.12	2.00	2.25	.203 x .38
126C	4	10K	375	10K	375	106 Henrys	15 ma.	2.50	3.12	3.12	2.00	2.25	.203 x .38

Schematic & Hook Up Data



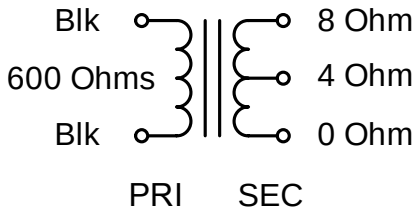


SPEAKER MATCHING TRANSFORMER

- Audio isolation unit (ie...separate primary and secondary)
- Built in response to requests from the "Collins Collectors Association" to match "classic" high impedance audio out puts to modern low impedance speakers.
- Unit can also be used reverse connected to match "classic" high impedance speakers with newer equipment.
- Primary: 600 Ohm (with 6" wire leads)
- Secondary: 8 Ohm with 4 Ohm center tap (with solder lugs)
- Power: Rated at 12 watts
- Excellent frequency response: 30 Hz. - 20 Khz. (+/- 1 db @ Full Power - 1 Khz. Reference)
- Weight: 1 pound, 4 oz.
- Mounting: 2 hole bracket mount - on 2 13/16" mounting hole centers.

Part No.	Dimensions (Inches)				
	A	B	C	D	G Mtg. Hole
119DA	3.28	2.35	2.00	2.81	0.187

Schematic & Hook Up Data



Hammond Tube Output Transformers (Overview)

Tube Audio

Audiophile Tube Output Transformers

Whether you are into the clean, free spirited "Single Ended" tube output or high efficiency, high power, "Push-Pull" audio, we have the output transformer for you.

We have been producing tube output transformers continuously for over 75 years, constantly improving and tweaking their performance. The output transformer is one of the most critical components in a audiophile amplifier. These excellent designs have survived the years and have enjoyed a recent resurgence along with the tube industry.

Please note, our specifications are at FULL OUTPUT power. Many "newbies" to the industry use frequency specification data at milliwatt ranges to inflate their claims. Check carefully when comparing manufacturers specs. We use -1db roll off points to ensure a typical HAMMOND conservative rating, again at FULL OUTPUT POWER.

To ensure a long life and maximum versatility these units are built to and tested at a Hi-Pot rating of 2,000 VAC RMS!!!!!

Our transformers are of EI laminated design, we do not offer toroidal designs due to their inability to handle tube imbalance and high manufacturing cost.

More importantly, our designs are "ear tested". After a new design has passed our extensive testing, it's got to sound good too, before we put it on the market! From Bach to rock & three watts to 280 watts, we have your output transformer IN STOCK.

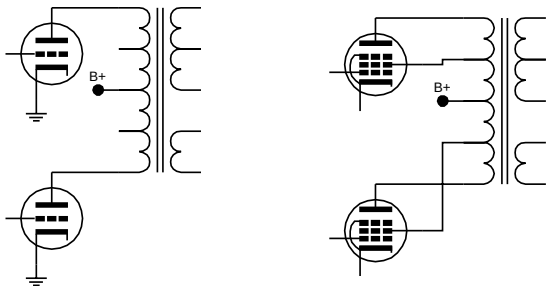
Single Ended Tube Output Transformers

These high quality units are designed for maximum versatility. Designed for both triode or pentode operation - Class A operation. All units include an optional use - 40% screen tap (a proven pentode "sweet spot") for "Ultra-Linear" operation. The ratings shown are at full power and rated plate current. Available in 25-75 watt models (our 1627-1642 series)

The lamination iron used is a high quality (M6) grade, silicon steel, for low loss and the lowest possible distortion at bass frequencies. A factory set core cap ensures against core saturation at full ratings. All single-ended output models include multiple interleaved windings to maximize high frequency response. These windings are machine wound with high quality copper wire.

If you do not need hi-fi ratings or are restoring older equipment using single ended audio output - refer to our economical 125SE series optimized for single ended - universal - general purpose use. Available in 3-25 watt models.

Push Pull Tube Output Transformers



These high quality units are also designed for maximum versatility. All units include an optional use - 40% screen tap (a proven pentode "sweet spot") for "Ultra-Linear" operation. They are designed to be used with most all power output tubes available today. The ratings shown are at full power and rated plate current. We have also added an epoxy potted series to our line for the ultimate in tube output transformers. Available in 10-280 watt models (our 1608-1650 series).

If you do not need hi-fi ratings or are restoring older equipment using push-pull audio output - refer to our economical 125 series optimized for push-pull - universal - general purpose use. Available in 3-15 watt models.

HAMMOND Interleaved Windings

The reason for our sparkling high frequency performance is the use of interleaved windings between the primary and secondary. The number of interleaved windings is optimized to the size (wattage) of the unit. All high fidelity output models (both single ended and push-pull) include multiple interleaved windings to maximize high frequency response. These windings are machine wound with high quality copper wire The multiple interleaved secondaries are wound (series or parallel connecting them) to match to 4, 8 or 16 ohm load impedances. The primaries of each model (including the "single-ended" series) include Ultra-Linear taps at the 40% point.

Tube Output Transformers - Aesthetics

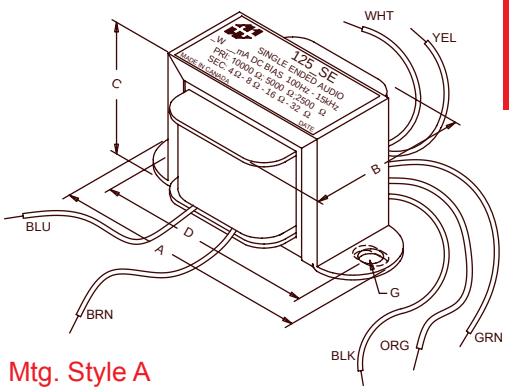
We have also paid close attention to the "look" of our units as they are as much on display in some designs as the tubes themselves. Our high fidelity units are manufactured with high grade laminations (M6) and machine wound with high quality copper wire. The core is varnished and oven baked to ensure quiet operation - even at high ambient temperatures. Then the end bells are bolted on. These end bells are finished in a tough, low gloss, black powder paint finish to resist scratching.

Single Ended Output - General Purpose (125 "SE" Series)

UNIVERSAL - SINGLE ENDED
"CLASSIC" TUBE OUTPUT TRANSFORMERS

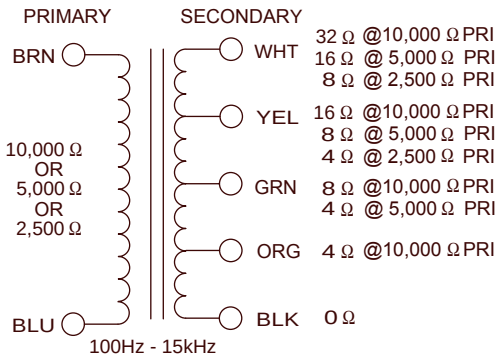
- Designed for general purpose or replacement use (not Hi-Fi) in single ended tube output circuits.
- Frequency response: 100 Hz. - 15 Khz (+/- 1db max. ref. 1 Khz).
- Open style with minimum 12" long primary and secondary leads.
- All sizes use butt stacked cores (using 29M6 steel) with an air gap, to reduce D.C. core saturation.
- Primary impedance range from 2,500 to 10,000 Ohms.
- Secondary impedance range from 4 to 32 Ohms.
- For full frequency response (20 Hz. to 20 Khz.) single ended output transformers - see our 1627-1642 Series.

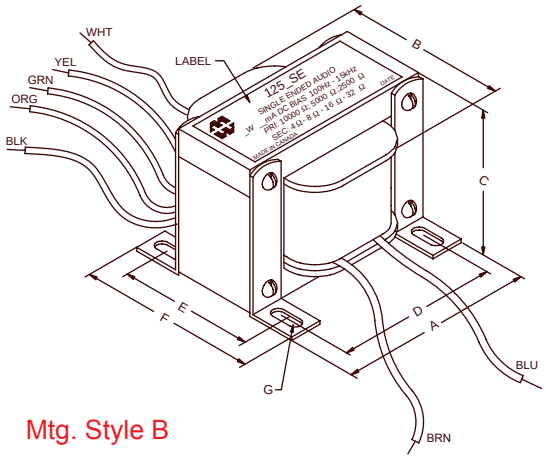
Part No.	Audio Watts	Max D.C. Bias (ma)	Mtg. Style	Dimensions (Inches)						Wt. Lbs.
				A	B	C	D	E	G Mtg. Hole	
125ASE	3	25	A	2.81	1.35	1.69	2.38	-	0.187	0.5
125BSE	5	45	A	3.25	1.63	2.00	2.81	-	0.187	1.1
125CSE	8	60	A	3.69	1.86	2.31	3.13	-	0.187	1.3
125DSE	10	70	A	4.00	2.10	2.63	3.56	-	0.187	2
125ESE	15	80	A	4.50	2.36	2.94	4.00	-	0.187	3
125FSE	20	90	B	3.76	2.52	3.15	3.13	2.25	0.2 x 0.38	4.5
125GSE	25	100	B	4.15	2.88	3.46	3.45	2.50	0.2 x 0.38	6



Mtg. Style A

Schematic & Hook Up Data

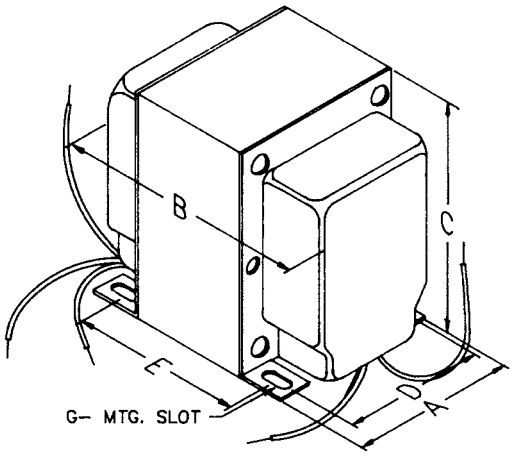




Mtg. Style B

Tube Audio

Single Ended Audiophile - Tube Output (1627-1642 Series)



SINGLE-ENDED
"CLASSIC" TUBE OUTPUT - ULTRA-LINEAR

- "Over designed" for high-fidelity, single ended, Class-A, tube output circuits (triode, tetrode or pentode tubes).
- Enclosed (shielded), four slot, chassis Type "X" mounting.
- Frequency response at least 20 Hz. to 20 KHz. at full rated power (+/- 1 db max., ref. 1 Khz.)
- Units are designed to provide ample "headroom" at bass frequencies (note the weight of each transformer).
- All models have a secondary tapped for 4, 8 or 16 ohm outputs.
- Insulated flexible leads 8" min.
- For maximum versatility, all units (except the 1642SE & 1638SEA) include a 40% screen tap for Ultra-Linear, tetrode/pentode operation (if desired).
- The 1642SE & 1638SEA do NOT include a screen tap as they were designed principally for high impedance triode tubes.
- High quality laminations, (M6) grain oriented silicon steel.
- Core is gapped to reduce core saturation in Class-A, tube amplifier circuits.
- For general purpose or replacement use in single ended, tube output circuits see our 125 "SE" series.

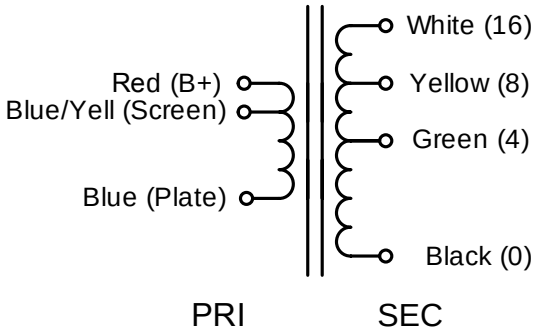
Part Number	Audio Watts	Primary			Ultra-Linear 40% Primary Tap	Hipot Test (VRMS)	Dimensions (Inches)						Wt. Lbs.
		Impedance	Max. DC Bias	Inductance Henrys			A	B	C	D	E	G Slot	
1640SEA	30	1,250	200 ma.	14	Yes	2,000	3.75	4.95	4.56	3.00	3.90	.203 x .375	11
1627SEA	30	2,500	160 ma.	20	Yes	2,000	3.75	4.50	4.56	3.00	3.13	.203 x .375	11
1630SEA	30	3,500	135 ma.	42	Yes	2,000	3.75	4.98	4.65	3.00	3.90	.203 x .375	11
1628SEA	30	5,000	120 ma.	48	Yes	2,000	3.75	4.50	4.56	3.00	3.13	.203 x .375	11
1642SE	75	5,000	300 ma.	53	No	3,500	4.38	7.50	5.25	3.50	5.88	.203 x .375	28
1629SEA	30	6,500	100 ma.	55	Yes	2,000	3.75	4.50	4.56	3.00	3.88	.203 x .375	11
1638SEA	30	10,000	90 ma.	88	No	2,000	3.75	4.50	4.56	3.00	3.13	.203 x .375	11

Suggested Tube Types

Part No.	Triodes	Pentodes
1640SEA	Parallel - 2A3, 6A3, 6B4G, 300B, 572B, 811A	Parallel - 6550, 6CA7
1627SEA	2A3, 6A3, 6B4G, 300B	6CA7, 6L6, 807, 5881, 6550, Parallel - 6AQ5, 6V6, EL84
1630SEA	2A3, 6A3, 6B4G, 300B	6CA7, 6L6, 807, 5881, 6550, Parallel - 6AQ5, 6V6, EL84
1628SEA	211, 300B, 572B, 811A	6AQ5, 6V6, 6L6, 807, 5881, 6550, EL84
1642SE	Parallel - 211, 572, 811A, 845	-
1629SEA	211, 811A, 572B, 845	6AQ5, 6V6, 6L6, 807, 5881, 6550, EL84
1638SEA	211, 845	-

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 (ultra-linear, bias, plate voltage, operating points etc.) will change optimum plate load impedance. Only a few of the most popular tubes are shown. A tube manual or tube manufacturer's technical data sheets should be consulted first, before making a decision on a proper output transformer.

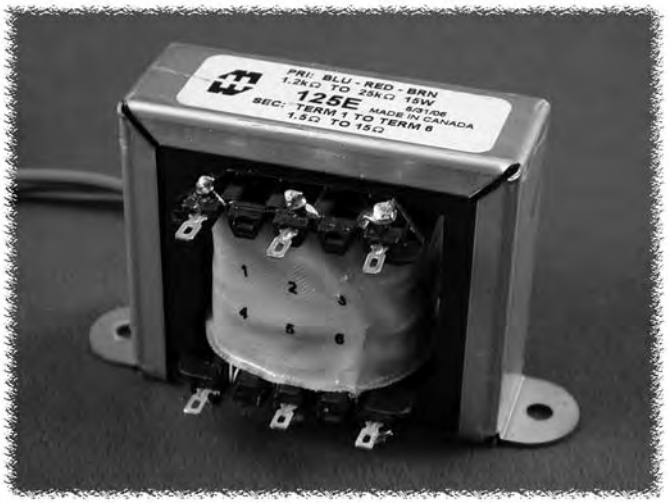
Transformer Schematic

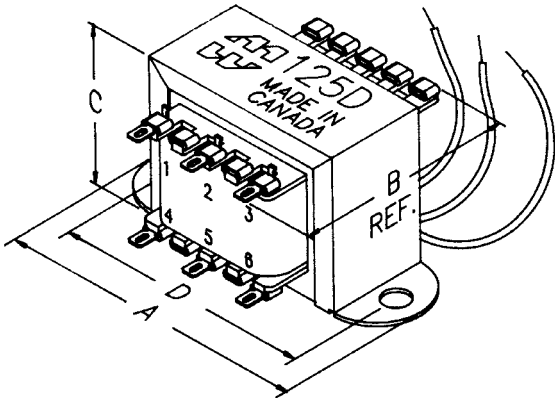


Notes:

- The 1642SE and 1638SEA do not include a primary screen tap (as they are designed for triode applications).
- Red wire connects to B+
- Blue/Yell wire connects to screen (optional use)
- Blue wire connects to tube plate

Push-Pull Output - General Purpose (125A-E Series)



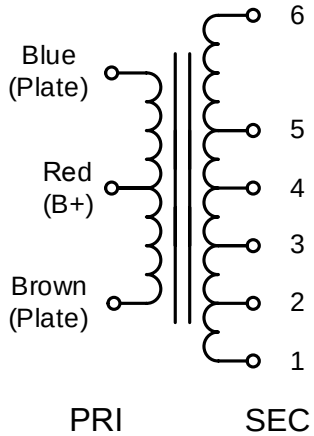


UNIVERSAL PUSH-PULL
"CLASSIC" TUBE OUTPUT TRANSFORMERS

- Designed for general purpose or replacement use in push-pull tube output circuits.
- For single ended use, see our 125 SE series - optimized for single ended tube output circuits.
- Frequency response: 150 Hz. - 15 Khz (+/- 1db max. ref. 1 Khz)
- Open style with minimum 5" long primary leads, secondary solder lugs for convenient secondary connections.
- Tables provided with each transformer listing 90 pre-calculated impedance ratios.
- Primary impedances from 1,200 to 25,000 Ohms and secondary impedances from 1.5 to 15 Ohms (see chart below).

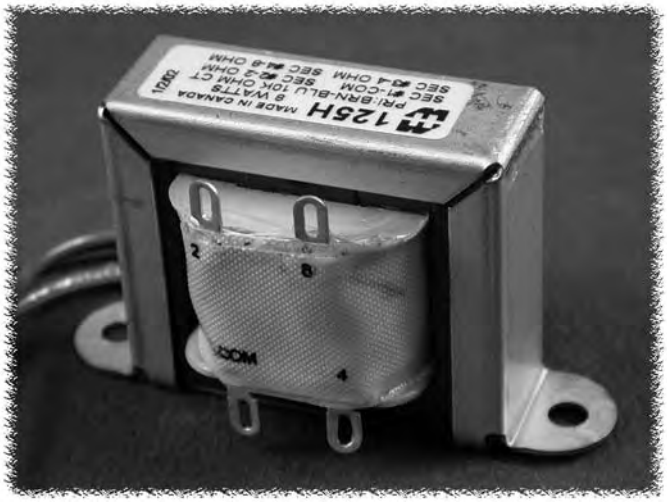
Part No.	Audio Watts	Max D.C. Bias (ma)	Primary Inductance Henrys	Dimensions (Inches)					Wt. Lbs.
				A	B	C	D	G Mtg. Hole	
125A	3	25	14.94	2.06	1.25	1.19	1.75	0.187	0.19
125B	5	45	8.97	2.38	1.38	1.38	2.00	0.187	0.3
125C	8	60	5.60	2.81	1.50	1.69	2.38	0.187	0.5
125D	10	70	4.48	3.25	1.75	2.00	2.81	0.187	1
125E	15	80	2.99	3.69	2.00	2.31	3.13	0.187	1.5

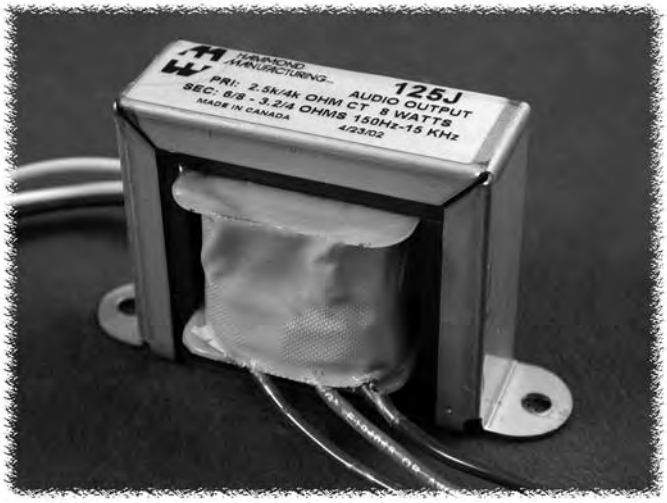
Schematic & Hook Up Data



Connect Speaker to (Sec. Lugs)	Voice Coil Impedance (Ohms)							
	1.5	2	3.2	4	6	8	12	15
	Resulting Total Primary Impedance (Blue Wire to Brown Wire)							
1 & 2	27K	-	-	-	-	-	-	-
2 & 3	18K	24K	-	-	-	-	-	-
3 & 4	16.5K	22K	-	-	-	-	-	-
4 & 5	10K	13.5K	21.6K	27K	-	-	-	-
5 & 6	8.5K	11K	18K	22K	-	-	-	-
1 & 3	5.4K	7.2K	11.5K	15K	21.6K	-	-	-
2 & 4	4.2K	5.6K	9K	11.2K	16.8K	22.5K	-	-
3 & 5	3.3K	4.4K	7K	8.8K	13.2K	17.6K	26.4K	-
4 & 6	2.4K	3.2K	5.1K	6.4K	9.6K	12.8K	19.2K	24K
1 & 4	2.15K	2.9K	4.6K	5.8K	8.7K	11.6K	17.4K	21.5K
2 & 5	1.55K	2.05K	3.3K	4.1K	6.15K	8.2K	12.3K	15.5K
3 & 6	1.3K	1.7K	2.7K	3.4K	5.1K	6.8K	10.2K	12.8K
1 & 5	-	1.4K	2.2K	2.8K	4.2K	5.6K	8.4K	10.2K
2 & 6	-	-	1.7K	2.1K	3.15K	4.2K	6.3K	8K
1 & 6	-	-	1.2K	1.5K	2.3K	3.0K	4.5K	5.6K

Push-Pull Output - General Purpose (125H-J Series)



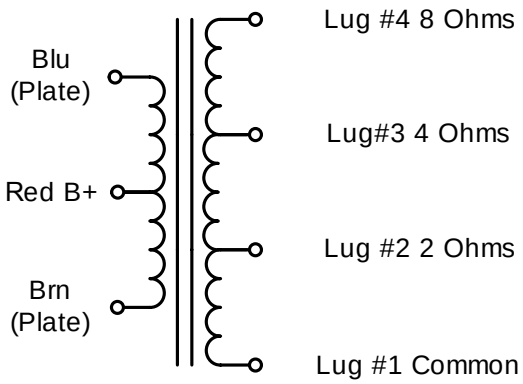


MULTIPLE IMPEDANCE - 8 WATT
"CLASSIC" TUBE OUTPUT TRANSFORMERS

- Designed for general purpose or replacement use in push-pull tube output circuits.
- Frequency response: 150 Hz. - 15 Khz (+/- 1db max.- ref. 1 Khz).
- 125H - open style with minimum 5" long primary leads, secondary solder lugs for convenient secondary connections.
- 125J - open style with minimum 10" long primary & secondary leads.

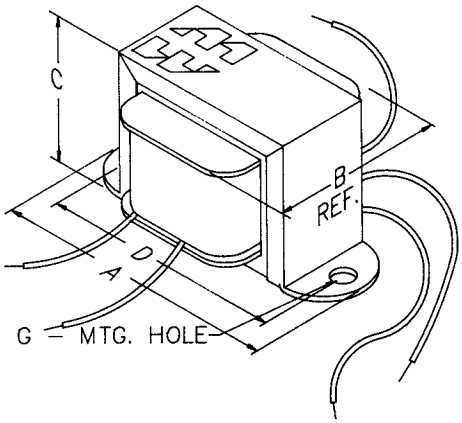
Part No.	Audio Watts	Primary Impedance (Ohms)	Secondary Impedance (Ohms)	Primary Inductance Henrys	Dimensions (Inches)					Wt. Lbs.
					A	B	C	D	G Mtg. Hole	
125H	8	10K	2, 4 or 8	5.6	2.81	1.40	1.63	2.38	0.187	0.55
125J	8	2.5K or 4K	6/8 or 3.2/4	5.6	3.25	1.50	1.94	2.81	0.187	1

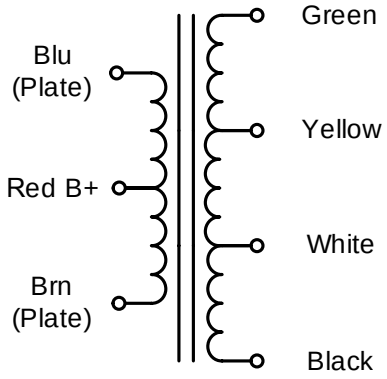
Schematic & Hook Up Data



PRI SEC

125H

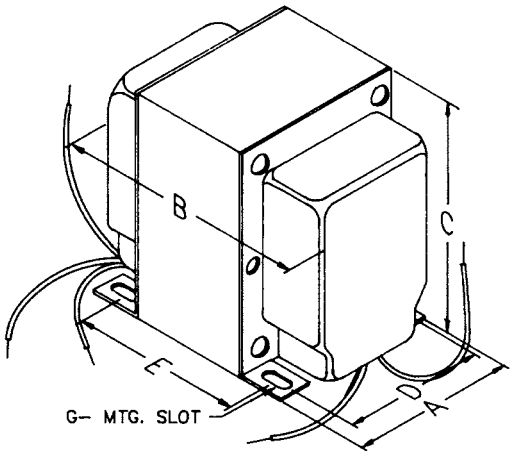




PRI SEC

125J

Pri. Impedance Plate to Plate Brown to Blue (Ohms)	Sec. Impedance (Ohms)	Use Sec. Lead Connections
4,000 C.T.	6/8	WHT - GRN
4,000 C.T.	3.2/4	WHT - YEL
2,500 C.T.	6/8	BLK - GRN
2,500 C.T.	3.2/4	BLK - YEL



PUSH - PULL
"CLASSIC" TUBE TYPE - ULTRA-LINEAR
OUTPUT TRANSFORMERS

- Designed for push-pull tube output circuits.
- Enclosed (shielded), 4 slot, above chassis Type "X" mounting.
- Frequency response 30 Hz. to 30 Khz. at full rated power (+/- 1 db max. - ref. 1 Khz) minimum. Except the 1650E (70 Hz. to 30 Khz. +/- 1 db max. - ref. 1 Khz.)
- Insulated flexible leads 8" min.
- Due to the unique interleaving of the windings BOTH secondary windings must be engaged to meet specifications (see hook-up schematics).
- Negative feedback circuits can be utilized by connecting to the Green & Black wires - 4 Ohm secondary (this winding is always engaged on all load configurations).
- All units include 40% screen taps for Ultra-Linear operation (if desired).
- Typical applications - Push-Pull: triode, Ultra-Linear pentode, and tetrode connected audio output.
- For our NEW improved "easy hook-up" secondary series - see our 1608-1650 "A" series.
- For the "ultimate" in Push-Pull output see our line of epoxy potted output transformers (1650 potted series).

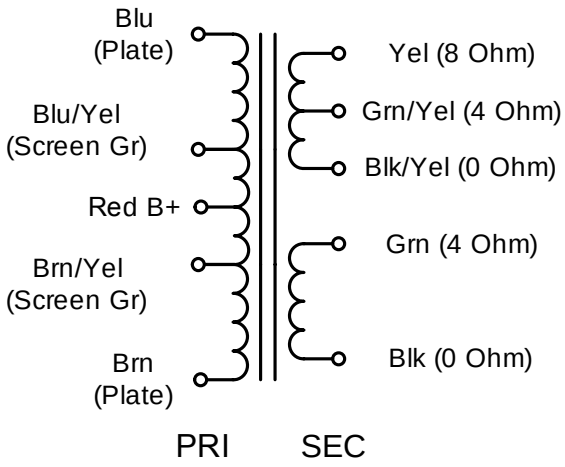
Part Number	Audio Watts (RMS)	Primary Impedance	Max. DC Per Side	Secondary Impedance	Dimensions (Inches)						Wt. Lbs.
					A	B	C	D	E +/- 1/16"	G Slot	
1608	10	8,000 C.T.	100 ma.	4-8-16	2.50	2.75	3.06	2.00	1.69	.203 x .38	2.5
1609	10	10,000 C.T.	100 ma.	4-8-16	2.50	2.75	3.06	2.00	1.69	.203 x .38	2.5
1615	15	5,000 C.T.	100 ma.	4-8-16	2.50	3.25	3.06	2.00	2.19	.203 x .38	3.25
1620	20	6,600 C.T.	158 ma.	4-8-16	2.50	3.50	3.06	2.00	2.44	.203 x .38	3.5
1650F	25	7,600 C.T.	128 ma.	4-8-16	2.50	3.50	3.06	2.00	2.44	.203 x .38	4
1645	30	5,000 C.T.	128 ma.	4-8-16-70 V	2.50	3.75	3.06	2.00	2.69	.203 x .38	4.5
1650H	40	6,600 C.T.	200 ma.	4-8-16	3.13	4.00	3.81	2.50	2.69	.203 x .38	6.5
1650K	50	3,400 C.T.	318 ma.	4-8-16	3.13	4.00	3.81	2.50	2.69	.203 x .38	7
1650N	60	4,300 C.T.	318 ma.	4-8-16	3.13	4.25	3.81	2.50	2.94	.203 x .38	8
1650P	60	6,600 C.T.	200 ma.	4-8-16	3.13	4.25	3.81	2.50	2.94	.203 x .38	8
1650R	100	5,000 C.T.	318 ma.	4-8-16	3.75	4.25	4.56	3.00	3.06	.203 x .38	12
1650T	120	1,900 C.T.	403 ma.	4-8-16	3.75	4.50	4.56	3.00	3.31	.203 x .38	14
1650W	280	1,900 C.T.	806 ma.	4-8-16	4.38	7.50	5.25	3.50	5.88	.203 x .38	28

Suggested Tube Types

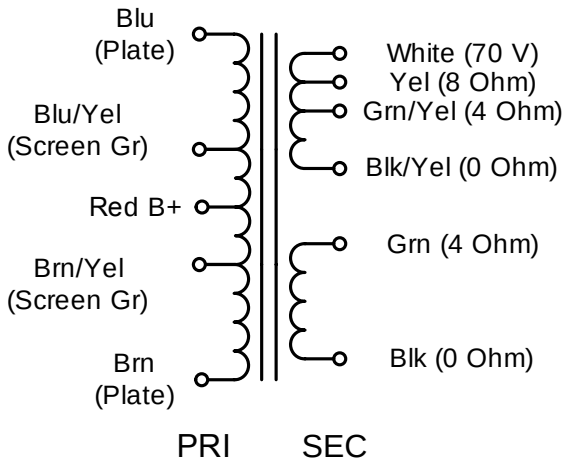
Part Number	Audio Watts (RMS)	Primary Impedance	Operation	Tube Types
1608	10	8,000 C.T.	Push-Pull (2 Tubes)	6AQ5, 6V6, 6BQ5, EL84, SV83
1609	10	10,000 C.T.	Push-Pull (2 Tubes)	6AQ5, 6V6, 6BQ5, EL84, SV83
1615	15	5,000 C.T.	Push-Pull (2 Tubes)	2A3, 6A3, 6AQ5, 6B4G, 6L6, 6V6
1620	20	6,600 C.T.	Push-Pull (2 Tubes)	6AQ5, 6L6, 6V6
1650F	25	7,600 C.T.	Push-Pull (2 Tubes)	6L6GC, 6V6, 807, 5881, EL34
1645	30	5,000 C.T.	Push-Pull (2 Tubes)	6L6GC, 6V6, 807, 5881, EL34
1650H	40	6,600 C.T.	Push-Pull (2 Tubes)	6L6GC, 807, 5881, EL34
1650K	50	3,400 C.T.	Push-Pull Par. (4 Tubes)	6L6GC, 807, 5881, EL34, 6146B, 6550B
1650N	60	4,300 C.T.	Push-Pull Par. (2 or 4 Tubes)	6L6GC, 807, 5881, EL34, 6146B, 6550B, KT88
1650P	60	6,600 C.T.	Push-Pull (2 Tubes)	6L6GC, 807, 5881, EL34, 6146B, 6550B, KT88
1650R	100	5,000 C.T.	Push-Pull Par. (2 or 4 Tubes)	807, 5881, EL34, 6146B, 6550B, KT88
1650T	120	1,900 C.T.	Push-Pull Par. (4 or 6 Tubes)	6L6GC, 5881, EL34, 6550B, KT88
1650W	280	1,900 C.T.	Push-Pull Par. (6 or 8 Tubes)	6L6GC, 5881, EL34, 6550B, KT88

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.

Schematic - All Parts Except 1645

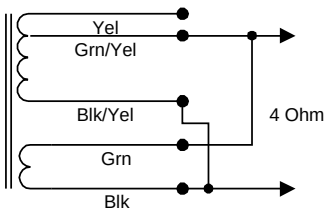


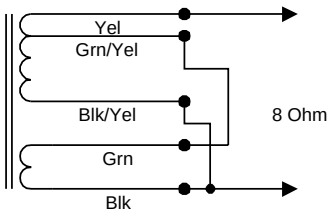
Schematic - 1645 Only

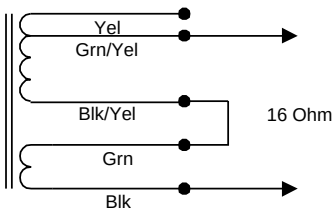


Note: To hook up 4/8/16 ohm secondary loads, see "Secondary Hook-Up Data" below. To hook up secondary to 70V loads, jumper Blk/Yel wire to Grn wire. Connect load to Blk and White wires.

Secondary Hook-Up Data

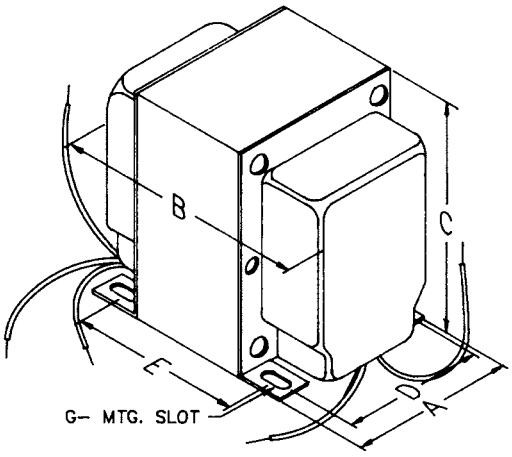






NOTE: Due to the unique interleaving of the windings BOTH secondary windings must be engaged (as shown) to meet specifications

Push - Pull Audiophile - Output (1608-1650 "A" Series)



PUSH - PULL "EASY HOOK-UP"
"CLASSIC" TUBE TYPE - ULTRA-LINEAR
OUTPUT TRANSFORMERS

- NEW & Improved version of our 1608-1650 series output transformers (re-designed secondaries for easy hook-up of secondary loads)
- Designed for push-pull tube output circuits.
- Enclosed (shielded), 4 slot, above chassis Type "X" mounting.
- Frequency response 30 Hz. to 30 Khz. at full rated power (+/- 1 db max. - ref. 1 Khz) minimum. Except the 1650E (70 Hz. to 30 Khz. +/- 1 db max. - ref. 1 Khz.)
- Insulated flexible leads 8" min.
- All units (except the 1650G) include 40% screen taps for Ultra-Linear operation (if desired).
- Typical applications - Push-Pull: triode, Ultra-Linear pentode, and tetrode connected audio output. The 1650G does NOT have primary screen taps and will not support "Ultra-Linear" applications.

Part Number	Audio Watts (RMS)	Primary Impedance	Max. DC Per Side	Secondary Impedance	Dimensions (Inches)						Wt. Lbs.
					A	B	C	D	E +/- 1/16"	G Slot	
1608A	10	8,000 C.T.	100 ma.	4-8-16	2.50	2.75	3.06	2.00	1.69	.203 x .38	2.5
1609A	10	10,000 C.T.	100 ma.	4-8-16	2.50	2.75	3.06	2.00	1.69	.203 x .38	2.5
1615A	15	5,000 C.T.	100 ma.	4-8-16	2.50	3.25	3.06	2.00	2.19	.203 x .38	3.25
1650E	15	8,000 C.T.	100 ma.	4-8-16	2.50	3.25	3.06	2.00	2.50	.203 x .38	3.5
1620A	20	6,600 C.T.	158 ma.	4-8-16	2.50	3.50	3.06	2.00	2.44	.203 x .38	3.5
1650FA	25	7,600 C.T.	128 ma.	4-8-16	2.50	3.50	3.06	2.00	2.44	.203 x .38	4
1645A	30	5,000 C.T.	128 ma.	4-8-16-70 V	2.50	3.75	3.06	2.00	2.69	.203 x .38	4.5
1650G	35	6,600 C.T.	200 ma.	3.5/8/16/250/500	3.13	3.75	3.81	2.50	2.25	.203 x .38	5
1650HA	40	6,600 C.T.	200 ma.	4-8-16	3.13	4.00	3.81	2.50	2.69	.203 x .38	6.5
1650KA	50	3,400 C.T.	318 ma.	4-8-16	3.13	4.00	3.81	2.50	2.69	.203 x .38	7
1650NA	60	4,300 C.T.	318 ma.	4-8-16	3.13	4.25	3.81	2.50	2.94	.203 x .38	8
1650PA	60	6,600 C.T.	200 ma.	4-8-16	3.13	4.25	3.81	2.50	2.94	.203 x .38	8
1650RA	100	5,000 C.T.	318 ma.	4-8-16	3.75	4.25	4.56	3.00	3.06	.203 x .38	12
1650TA	120	1,900 C.T.	403 ma.	4-8-16	3.75	4.50	4.56	3.00	3.31	.203 x .38	14
1650WA	280	1,900 C.T.	806 ma.	4-8-16	4.38	7.50	5.25	3.50	5.88	.203 x .38	28

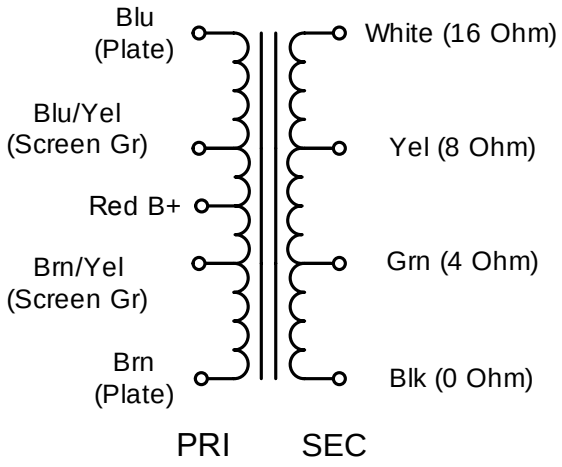
Push - Pull Audiophile - Output (1608-1650 "A" Series)

Suggested Tube Types

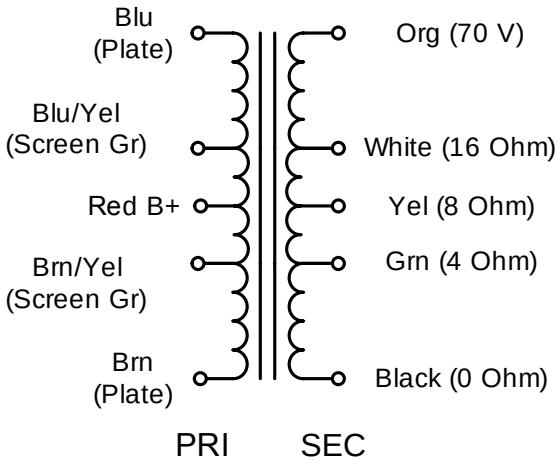
Part Number	Audio Watts (RMS)	Primary Impedance	Operation	Tube Types
1608A	10	8,000 C.T.	Push-Pull (2 Tubes)	6AQ5, 6V6, 6BQ5, EL84, SV83
1609A	10	10,000 C.T.	Push-Pull (2 Tubes)	6AQ5, 6V6, 6BQ5, EL84, SV83
1615A	15	5,000 C.T.	Push-Pull (2 Tubes)	2A3, 6A3, 6AQ5, 6B4G, 6L6, 6V6
1650E	15	8,000 C.T.	Push-Pull (2 Tubes)	6AQ5, 6V6, 6BQ5, EL84, SV83
1620A	20	6,600 C.T.	Push-Pull (2 Tubes)	6AQ5, 6L6, 6V6
1650FA	25	7,600 C.T.	Push-Pull (2 Tubes)	6L6GC, 6V6, 807, 5881, EL34
1645A	30	5,000 C.T.	Push-Pull (2 Tubes)	6L6GC, 6V6, 807, 5881, EL34
1650G	35	6,600 C.T.	Push-Pull (2 Tubes)	6L6GC, 807, 5881, EL34
1650HA	40	6,600 C.T.	Push-Pull (2 Tubes)	6L6GC, 807, 5881, EL34
1650KA	50	3,400 C.T.	Push-Pull Par. (4 Tubes)	6L6GC, 807, 5881, EL34, 6146B, 6550B
1650NA	60	4,300 C.T.	Push-Pull Par. (2 or 4 Tubes)	6L6GC, 807, 5881, EL34, 6146B, 6550B, KT88
1650PA	60	6,600 C.T.	Push-Pull (2 Tubes)	6L6GC, 807, 5881, EL34, 6146B, 6550B, KT88
1650RA	100	5,000 C.T.	Push-Pull Par. (2 or 4 Tubes)	807, 5881, EL34, 6146B, 6550B, KT88
1650TA	120	1,900 C.T.	Push-Pull Par. (4 or 6 Tubes)	6L6GC, 5881, EL34, 6550B, KT88
1650WA	280	1,900 C.T.	Push-Pull Par. (6 or 8 Tubes)	6L6GC, 5881, EL34, 6550B, KT88

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.

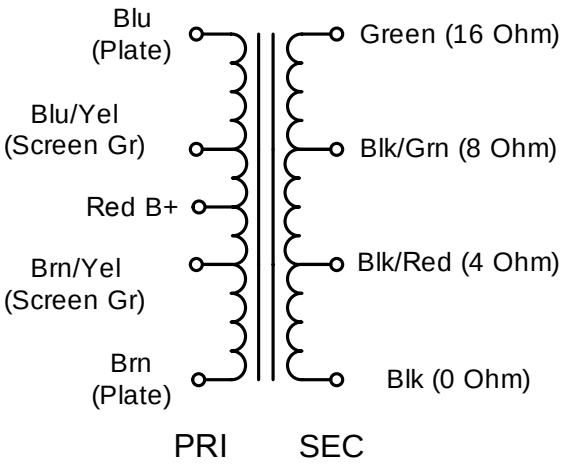
Schematic
All Parts Except 1645A, 1650E & 1650G



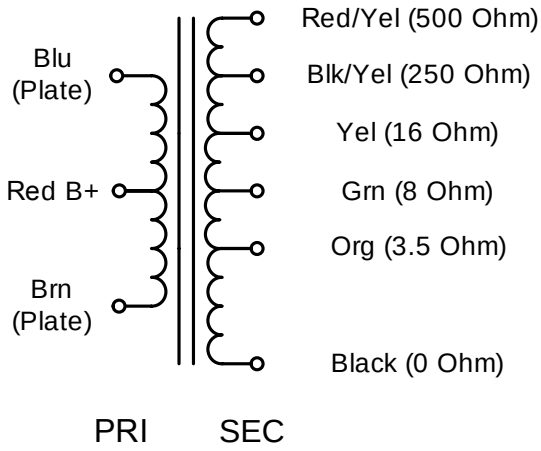
Schematic
1645A Only



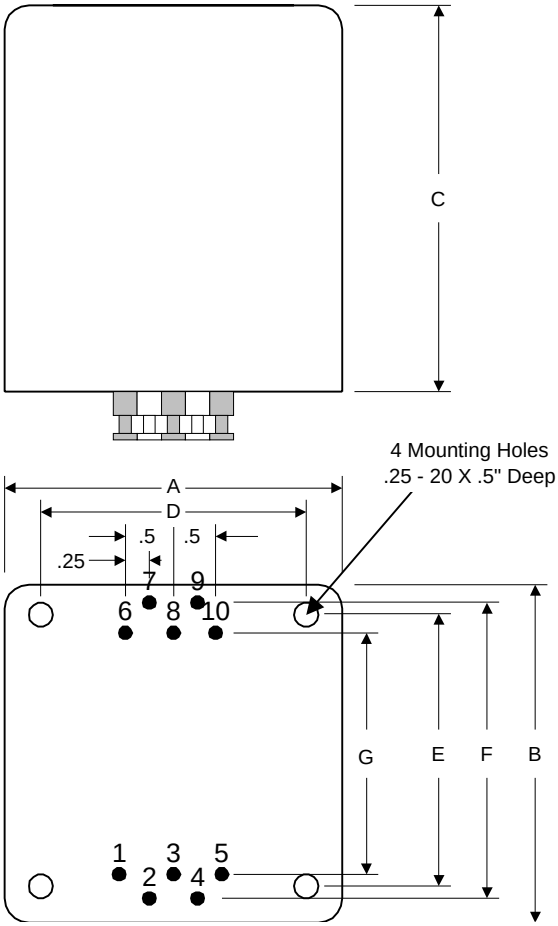
Schematic - 1650E Only



Schematic - 1650G Only



Push - Pull Audiophile - Potted Output (1650 "P" Series)



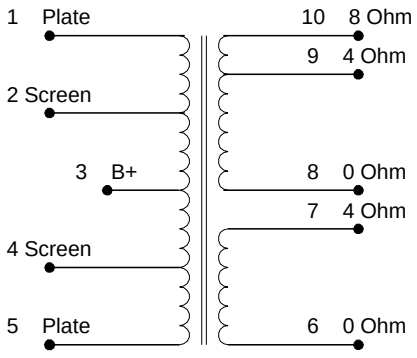
PUSH - PULL
"CLASSIC" TUBE TYPE - ULTRA-LINEAR
POTTED OUTPUT TRANSFORMERS

- Designed for push-pull tube output circuits.
- Enclosed in a drawn steel case, the transformer is completely potted in epoxy and painted in black powder paint to match our potted power transformers & potted chokes.
- Frequency response 30 Hz. to 30 Khz. at full rated power (+/- 1 db max. ref. 1 Khz) minimum.
- Lead connection is via 10 bottom mounted lugs.
- All units include 40% screen taps for Ultra-Linear operation (if desired).
- Typical applications - Push-Pull: triode, Ultra-Linear pentode, and tetrode connected audio output.

Tube Audio

Part No.	Audio Watts	Primary Impedance	Max DC Per Side	Secondary Impedance	Dimensions (Inches)							Wt. Lbs.
					A	B	C	D	E	F	G	
1650KP	50	3,400 C.T.	318 ma.	4/8/16	3.31	3.88	4.25	2.50	3.00	3.31	2.56	9
1650PP	60	6,600 C.T.	200 ma.	4/8/16	3.31	3.88	4.25	2.50	3.00	3.31	2.56	10
1650RP	100	5,000 C.T.	317 ma.	4/8/16	4.25	5.00	4.50	3.38	4.25	4.50	3.75	13

Schematic



Suggested Tube Types

Part No.	Audio Watts	Primary Impedance	Tube Types
1650KP	50	3,400 C.T.	6L6GC, 807, 5881, EL34, 6146B, 6550B
1650PP	60	6,600 C.T.	6L6GC, 807, 5881, EL34, 6146B, 6550B, KT88
1650RP	100	5,000 C.T.	807, 5881, EL34, 6146B, 6550B, KT88

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.

Why the fascination with tube ("valve") designs?

The fast answer?….it's in our company roots!

Amplifiers all distort to some extent. This distortion - which differs between tube & solid state amplifiers, has long been debated by musicians & audiophiles. Many believe that the "warm" tube audio sound is more pleasant to the human ear.

When there was no choice but tube amplification – we were building magnetics (power & filament transformers, filter chokes & matching transformers) for these applications. In fact, we produced a complete radio receiver (the Hammond "Model 12") in 1923 and a line of audio amplifiers (utilizing our transformers throughout) over 80 years ago!

Solid state circuitry became the major design choice by the 1960's. We brought many new magnetic designs out to meet this demand too – but - we continued improving our tube related transformer lines as well. There was always a demand as musicians and "hard core" audiophiles never abandoned the tube designs.

Lately, due to the ready availability of tubes from Eastern European & Chinese companies, a resurgence of tube designs & restoration interest has occurred. We continue to add more products and meet the requirements of these customers.

To celebrate our long history with tube designs & radio we continue to support not only customer product demand but also our fascination with the technology through the Hammond Museum of Radio. The Museum got it's start when museum founder Fred Hammond began collecting early radio and wireless artifacts at the age of 16 (1928). The collection grew over the years to include hundreds of receivers & transmitters dating back to the spark era. It soon became a federally registered museum and is now one of North America's premier wireless museums. For more information please visit the web site listed below.

Hammond
Museum of Radio