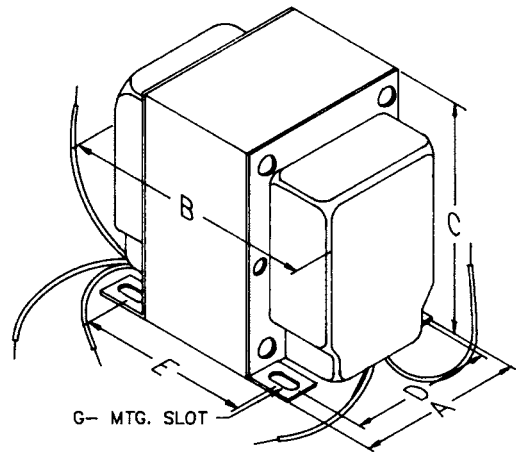


Push - Pull **Audiophile - Output (1608-1650 Series)**



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

Tube Audio

- 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 |



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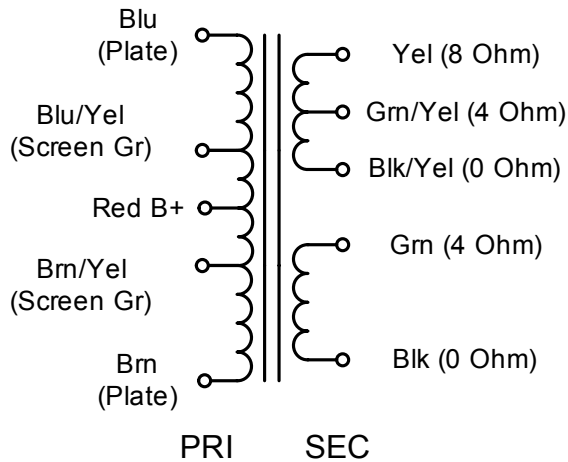
Push - Pull Audiophile - Output (1608-1650 Series)

Suggested Tube Types

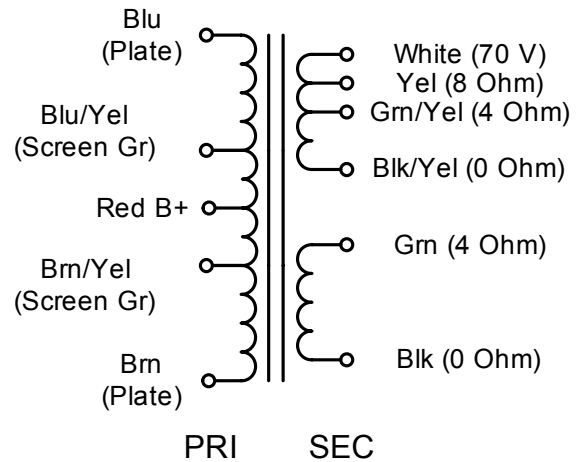
| Part Number | Audio Watts (RMS) | Primary Impedance | Operation | Tube Types |
|-------------|-------------------|-------------------|-------------------------------|--|
| 1608 | 10 | 8,000 C.T. | Push-Pull (2 Tubes) | 6AQ5, 6V6, 6BQ5, EL84, SV83 |
| 1609 | 10 | 10,000 C.T. | Push-Pull (2 Tubes) | 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

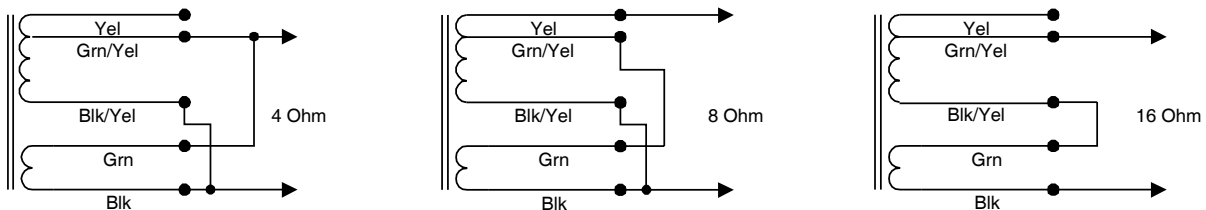


Schematic - 1645 Only



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

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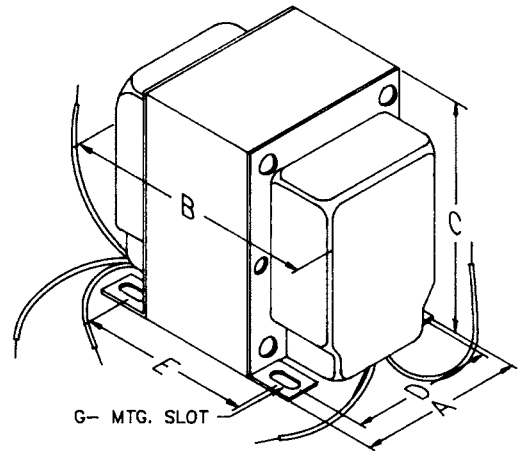
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Push - Pull Audiophile - Output (1608-1650 "A" Series)



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.

Tube Audio

| 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 |



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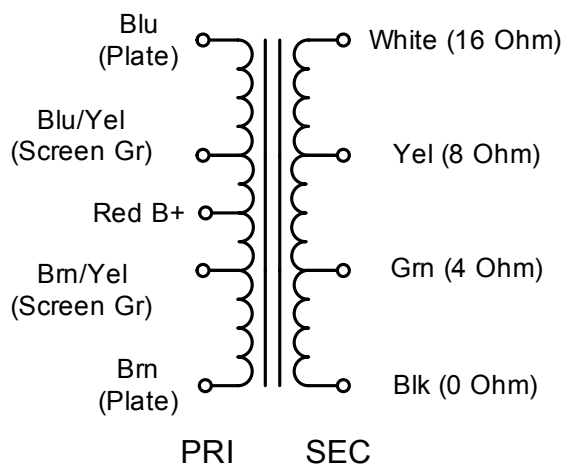
Push - Pull Audiophile - Output (1608-1650 "A" Series)

Suggested Tube Types

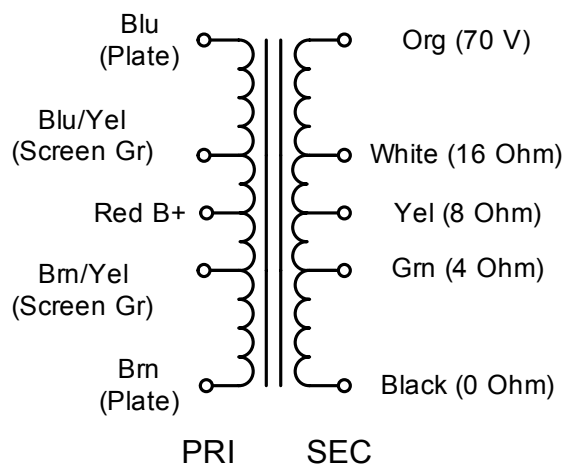
| Part Number | Audio Watts (RMS) | Primary Impedance | Operation | Tube Types |
|---------------|-------------------|-------------------|-------------------------------|--|
| 1608A | 10 | 8,000 C.T. | Push-Pull (2 Tubes) | 6AQ5, 6V6, 6BQ5, EL84, SV83 |
| 1609A | 10 | 10,000 C.T. | Push-Pull (2 Tubes) | 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

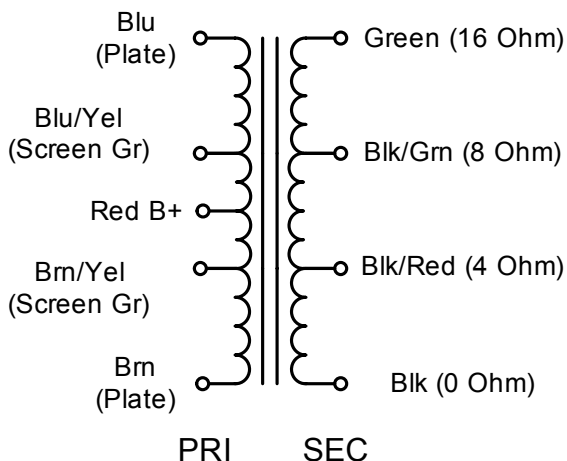


Schematic 1645A Only

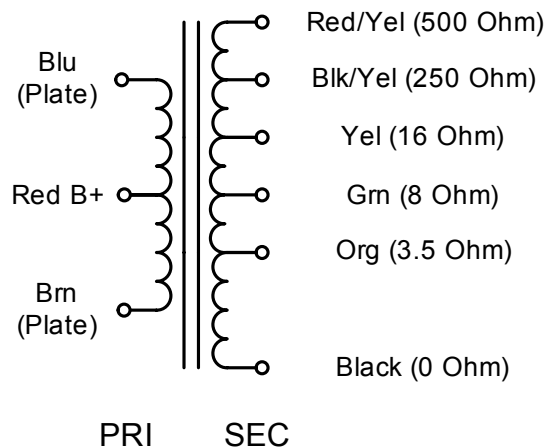


Tube Audio

Schematic - 1650E Only



Schematic - 1650G Only



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