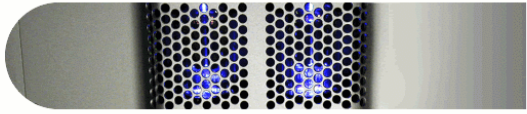




**TUBE
DRIVER**
BLUE



Butler

AUDIO, INC

TUBE DRIVER® BLUE™
2150

OWNER'S INFORMATION

Certification:

BK Butler's original signature below certifies that your new Tube Driver BLUE has been personally checked for proper performance:

TUBE DRIVER® BLUE™ 2150

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TUBE DRIVER® BLUE™ 2150

Congratulations

Thank you for choosing Tube Driver BLUE. This latest *patent pending* creation of BK Butler, promises to become a classic just as his former Tube Driver designs have. With careful attention given to the attainment of "all tube" response characteristics in a mobile environment, Tube Driver BLUE will satisfy even the most critical audiophile. For the first time in the history of tube amplifier design, the original "Edison effect" has been fully utilized to achieve low THD distortion in an *open-ended*, high-powered vacuum tube hybrid amplifier. By carefully balancing the sonic response, load and transfer characteristics of carefully selected triode vacuum tube drivers, BK has achieved astounding results.

Tube Driver BLUE uses *ZERO* global negative feed back which results in greatly improved sound quality with an extremely warm, open and transparent qualities. The design is truly original and sets a new musical standard for mobile audio.

As essential as clean power is for good sound reproduction, natural *DYNAMICS* are equally important. Tube Driver BLUE produces unmatched musical dynamics and the 'punch' of a live concert performance. High current bipolar output sections are servo-driven by dual vacuum tube triodes, which directly reflect the speaker load. This results in authentic high-performance power tube response characteristics of "all tube" designs.

Best of all, this natural vacuum tube response is created without traditional large and heavy output transformers or dangerously high power supply voltages. Tube Driver BLUE sets the new standard for musical vacuum tube reproduction and rivals even the most expensive home audio vacuum tube equipment.

Service

Do not attempt to service Tube Driver BLUE products yourself. Removing the cover and performing unauthorized repairs or modifications will void the warranty. Due to the new and unique circuitry used, installation of non-factory parts may severely damage performance and/or reliability. Please contact the factory regarding warranty and repair information. The best permanent contact is through email as instructed at our website:
www.tubedriver.com

For Your Records

Serial Number _____
Purchase Date _____
Purchased From _____

Caution!

The extended use of a high-powered audio system may result in hearing loss or damage. While Tube Driver BLUE systems are capable of live "Concert level" volumes with incredible sound pressure, they are also designed for you to enjoy at more reasonable levels. Many audiophiles are content with vacuum tube home amplifiers of less than 10 Watts/Channel. Learn to listen to the subtle characteristics created by the musicians that only vacuum tubes can give you. Please observe all local sound ordinances.

Features

- 100% "All Tube" Sound
- Open-ended audiophile circuitry, NO global negative feedback
- Load adaptive Vacuum Tube driven output circuitry
- Massive heat exchanger cooling
- Regulated MosFET power supply
- Regulated DC Tube Heaters with Soft Start
- DC fault / Short Circuit protection circuitry
- Dual color LED: Green = Normal Operation, Red = Fault
- Gold plated connectors
- Mixed Mono/Stereo Operation
- 1-Year Warranty
- Concept & Design by BK Butler with over 25 years of pro music vacuum tube experience

Specifications

Frequency Response:	5 – 100 Khz (+/- 1dB)
Total Harmonic Distortion:	Less than 0.15% at full power, 1Khz
Signal to Noise Ratio:	Greater than 110dB
Channel Crosstalk:	-95dB or better, 1Khz
Input Impedance:	10K Ohms
Input Sensitivity:	450mV – 12 Volts, RMS for full power output
Output Impedance:	2 Ohms or greater (Stereo) 4 Ohms or greater (Bridged, Mono)
Power output:	150 Watts, RMS x 2 @ 4 Ohms per channel 500 Watts, RMS x 1 @ 4 Ohms (Bridged, Mono)
Dimensions L x W x H	17 7/8" x 10 1/4" x 2 3/8"
Weight:	12 Lbs.

Tools Needed for Typical Installation (not supplied)

- Phillips screwdriver (#2 or medium sized)
- Wire cutters
- Wire strippers
- Mounting / Ground connection screws
- Ring connectors (Large enough to accommodate your method of grounding and power connection)
- Speaker wire – 16 gauge or larger
- Connector crimper tool
- Grommets (sized to work with the power wire you plan to use in your installation)
- Tube of silicon Sealant

Current Supply

The information below is a basic formula you can use to determine approximate maximum current draw. A 50% amplifier efficiency rating is used as an average. This formula is only a guideline. Using wire of a larger gauge improves the current transfer of your system, so if in doubt, always use larger cables. Do NOT use smaller gauge wire.

Total 4-Ohm rated RMS output x 2 = Total Input Wattage
Total Input Wattage/Supply Voltage = Current Draw (in Amps)

Example: Your TD BLUE has 2 channels at 150 watts per channel RMS into 4-Ohms (150 x 2 = 300W). You would use the formula below:

$$300W \times 2 = 600W / 12.5V = 48 \text{ Amps Total Current Draw}$$

The chart on the next page will help you to determine the gauge of power / ground cables necessary for proper operation of your Tube Driver.

Power / Ground Wire Gauge Calculator

Recommended MINIMUM Power Cable Gauge

Current Draw (Amps)	Length of Wire to Run (in Feet)							
	<3	4-7	7-10	10-13	13-16	16-19	19-22	22-28
0-20	14	12	12	10	10	8	8	8
20-35 (One 275)	12	10	8	8	6	6	4	4
35-50	10	8	8	6	6	4	4	4
50-65	8	8	6	6	4	4	4	2
65-85	6	6	4	4	2	2	2	0
85-105	6	6	4	4	2	2	0	0
105-125	4	4	4	2	2	0	0	0
125-150	2	2	2	2	0	0	0	0

Warning! **Amplifiers Generate Heat!**

You can install the Tube Driver BLUE in any position, even upside-down. However, you must maintain proper airflow. Do Not install your Tube Driver BLUE under carpets or enclose it behind airtight panels. In trunk-mounted applications, be sure to provide venting for air circulation. Let the amplifier breathe! Without adequate air circulation, your Tube Driver Blue will generate needless heat and under severe conditions will engage protective shutdown circuitry.

Mounting

Your Tube Driver BLUE should be mounted securely in your vehicle to prevent damage. You may mount the system right side up, on its side, or upside-down provided adequate ventilation is maintained.

POWER / GROUND

Warning!

To prevent a short to ground, disconnect the negative (-) terminal of the system battery before you begin. If the power cable shorts to ground, current will continue to flow until the short is opened, the main fuses blow, the battery explodes or the wire melts apart.

Reconnect the negative terminal only after you make ALL connections.

Your Tube Driver BLUE is designed to operate from a typical automobile 12 Volt, negative ground electrical system. The ground wire should be the same gauge as the power wire indicated in the previous gauge chart.

The main power cable should run from the amplifier location, through or under the vehicle, to the battery. You must use a grommet wherever the cable passes through a steel panel to prevent an eventual short to ground.

The power and ground connections are the most important part of any installation. If the connections are poor and/or the resistance is high, the resulting voltage drops will rob you of amplifier power and may allow noise to enter your system. Your new Tube Driver BLUE features a regulated power supply. However it is designed to produce maximum power only when adequate voltage and current is supplied. High resistance caused either by poor connections or inadequate wiring will degrade performance overall. Using a digital multimeter (DMM), try to get cable resistance as low as possible. If resistance is too high, use a larger gauge wire. Try to ground your system to a single point in the vehicle to reduce the potential of noise induced by "ground loops." In larger systems, use distribution blocks and run both power and ground cables directly to the system battery.

Remote Turn-On

IMPORTANT!

Tube Driver BLUE is equipped with a special vacuum tube warm up circuit. Whenever your system is turned on, there will be an approximate 10 – 15 second delay before any sound will be heard. During this warm-up time, voltage is gently being applied to the vacuum tube heaters for proper start-up and to insure long life.

You must connect a wire to the remote (REM) terminal located in the center of the power connector to turn on your Tube Driver BLUE. Your FM Radio/CD/Tape source unit normally provides a remote amplifier turn-on or power antenna lead that provides +12 Volts when you turn it on.

- Run a wire from the turn-on lead to the REM connection
Tighten the connection

Speaker Connections

Follow these simple instructions to make your speaker connections:

- Using at least 16 Gauge wire, run wire from the speakers to the amplifier(s) using the same precautions that you followed for running the power, ground and remote wires.
- Cut off excess wire.
- Use wire strippers to strip approx. ¼ inch of insulation at the end of the wires
- Attach a proper sized U connector to each wire.
- Securely tighten each wire to the proper speaker output terminal using a Phillips screwdriver.

Speaker Bridging

Your Tube Driver BLUE is capable of being bridged into a 4-Ohm (minimum) mono output without switches or bridging modules.

You can achieve this mono channel by using the left negative (-) speaker connection and the right positive (+) speaker connection.

Being certain you do not operate your Tube Driver BLUE at less than the minimum recommended speaker impedances will produce better sound and musical dynamics.

Important Note: Total bridged impedance of less than 4 Ohms may trigger protection circuitry engagement and may eventually damage your amplifier.

Mixed Mono Output

You can operate the 2 channels in both stereo and bridged mono at the same time (3 channel or tri-mode) by using highpass filters (bass blockers) and bandpass (midrange only) on the higher frequency stereo channels. A lowpass filter (coil) is used on the mono connection to the sub woofers. The frequencies of the chosen highpass and lowpass filters must not overlap (allow the mids and the highs to play the same frequencies of music as the subs) or the impedance the amplifier 'sees' at those frequencies will be cut in half. This could cause the amplifier to engage protection circuitry.

Input Gain Control

There is an Input Gain Control located on the end panel between the RCA input jacks and the Speaker output terminals. This is NOT a volume control! This control is designed to match the output signal of the source unit to the amplifier inputs.

By turning the control clockwise (to the right), the inputs of the amplifier become more sensitive and will allow a weak signal as low as 450 mV to drive the amplifier to full power. It is advisable, however to use the LOWEST possible setting of the input gain control by driving the amplifier with the HIGHEST level from the FM Radio/CD/Tape source unit. This will reduce the potential for the amplifier to reproduce *pops* from brake light and accessory switches and *alternator whine* or *ignition tick*.

In order to achieve the best Signal to Noise ratio possible, you must carefully experiment by making a few practical listening tests to adjust the 'headroom' of your system correctly. The basic rule to remember is that best S/N ratio is achieved by using the highest undistorted level from the source unit and the lowest undistorted input level setting on the amplifier.

Summary

1. Set the Input Gain Control to just above the lowest setting.
2. Turn the master volume or output volume of the source unit or pre-amp to almost full-undistorted volume.
3. With music playing, slowly increase the input Gain Control until you hear distortion. Turn down the Gain Control until the distortion stops.

This will set the approximate proper 'headroom' level to operate the source unit/preamp with your Tube Driver BLUE. Further minor adjustments may be made at any time if desired.

End Panel Features

Power End

- Fuse – Uses 2 *identical* 25 AMP automotive fuses
- Power – Note the proper connections for Battery, Remote and Ground
- Do NOT block the air input slots (above) or air exhaust slots (below)
- Large openings on either side may be used to route cables

Input / Control / Speaker Output End

- Inputs. Plug in the RCA outputs from your head unit here
- Gain Control. Use this control to match the output level of the source unit
- Bi-state LED indicator:
Green = Normal operation. Red = Protection mode
- Speaker Out terminals (Connect speakers as indicated)
- Cooling vents. DO NOT BLOCK!
- Largest openings on end panels may be used to route and hide cables

One-Year Limited USA Warranty

This warranty gives you specific legal rights and you may also have other rights that vary from state to state. Butler Audio Inc. warrants its products to be free from defects in materials and workmanship under normal use and service for a period one (1) year from the date of original purchase when the unit is installed according to normally accepted standards of the 12-volt mobile audio industry. Parts and labor are covered under this warranty. The extent and conditions of Limited Warranty are as follows:

1. Butler Audio Inc. will either repair or replace at no charge, to the original purchaser, any unit which upon examination discloses to be defective and under warranty, provided the defect occurs within one (1) year from the date of purchase and the product is returned immediately to Butler Audio Inc. NOTE: Shipping charges are the sole responsibility of the purchaser.
2. The date of purchase must be established by returning the information requested in the "Warranty Activation" section (attached hereto) and a copy of the original sales invoice or receipt, which must accompany the article being returned for warranty work.
3. This warranty shall NOT apply to any Tube Driver BLUE product found to have the original factory serial number removed or defaced. All products received by Butler Audio for in-warranty or out of warranty repair with their original serial numbers removed or defaced will not be repaired and will be returned to sender, freight collect.
4. The provisions of this warranty shall not apply to any Tube Driver BLUE product used for a purpose for which it is not designed, which has been repaired or altered in any way, or which has been connected installed, or adjusted other than in accordance with the instructions furnished in the Tube Driver BLUE's owner's manual.

Nor shall this warranty apply to any part that has been subjected to misuse, negligence, or accident.

5. Butler Audio does not authorize any other person to assume any other liability in connection with its products. THIS WARRANTY IS THE ONLY EXPRESS WARRANTY MADE BY BUTLER AUDIO APPLICABLE TO ITS TUBE DRIVER BLUE PRODUCTS. ANY IMPLIED WARRANTY OR MERCHANTABILITY FOR FITNESS FOR A PARTICULAR PURPOSE APPLICABLE TO BUTLER AUDIO TUBE DRIVER BLUE PRODUCTS IS LIMITED IN DURATION TO THE DURATION OF THIS LIMITED WARRANTY. BUTLER AUDIO INC SHALL NOT BE LIABLE FOR THE INCIDENTAL CONSEQUENTIAL, OR COMMERCIAL DAMAGES RESULTING FROM THE BREACH OF THIS WRITTEN WARRANTY. Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts; so the above limitations or exclusions may not apply to you.

6. Your product will be serviced on an in-warranty basis within the warranty period for the correction of warranted defects. If improper operation of your Tube Driver BLUE product should occur, contact Butler Audio Inc. via the email link provided at **www.tubedriver.com** for assistance with the return and factory repair of your Tube Driver BLUE product. Return unit only **after** obtaining a RMA# (Returned Merchandise Authorization).

Out of Warranty:

Butler Audio Inc. cannot guarantee the repair of Tube Driver products other than those marked "Tube Driver BLUE." For out of warranty repair: Email Butler Audio, Inc. for a RMA#. Only after obtaining an RMA #, return the unit, postage prepaid, in the original protective carton. Please include a description of the problem and if desired, and request for an estimate of repair costs. All repair costs will be prepaid including return shipping before your unit will be returned. Please contact Butler Audio via the email link email at **www.tubedriver.com** with any further questions regarding repairs.

Warranty Activation

In order to activate you warranty, please complete the information on the following page, detach and mail within 10 days to:

Butler Audio, Inc.
PO Box 460572
Aurora, CO 80046-0572

Tube Driver BLUE 2150

Date of Purchase: _____

Serial Number: _____

Purchased from: _____

Price Paid: _____

Your name: _____

Address: _____

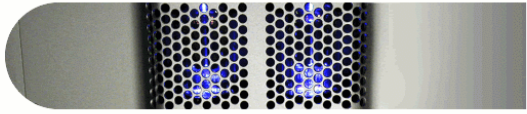
Phone Number: _____

Email: _____

Comments:



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