Border Patrol

SE 300B

INSTALLATION AND BIASING MANUAL

Thank you for purchasing the BorderPatrol SE300B. We are sure you will greatly appreciate it's sound quality and, correctly installed and maintained, the amplifier will provide many hours of listening pleasure.

Please read the following to ensure that the amplifier is installed correctly and kept in optimum operating condition.

1. If you are using 300B valves supplied by BorderPatrol follow the installation instructions.

2. If you are supplying your own 300B valves or installing a new pair please follow the Biasing Instructions on page 3. We recommend either Western Electric or JJ 300B's.

Manufacturers quote between 3000 and 5000 hours as the life expectancy of the valves but keen audiophiles may prefer to change them more often to keep the amplifier sounding at its best.

Design features.

All triode, single-ended, zero negative feedback circuit.
Inter-stage driver transformers.
Fully hard-wired.
External power supply.
3 independent valve rectified choke input filter power supplies.
Fixed bias output stage.
High performance output transformers.
Hovland polypropylene film and foil coupling capacitors.
Cerafine electrolytic power supply capacitors.

Specifications

Power output: 9W /channel.
Input sensitivity: 200mV RMS to full output.
or 1.2V RMS to full output (6S45pi version)
Frequency response: +/-3dB 8Hz-55kHz.
Input voltages: 0-220-230-240V selectable internally or
0-110-115-120V selectable internally.

Dimensions

Audio chassis 430 x 330 x 220mm.
Power supply 345 x 220 x145mm.

Weight

Audio Chassis 17kg.
Power Supply 16kg.

Valve Complement

Audio Circuit: 2 x 300B, 1x E182CC, 1 x 13D3/CV4068.
or 2 x 300B, 2 x Reflektor 6S45pi
Power Supply: 1 x GZ37, 2 X EZ80

Biasing

Recommended Bias Current for each 300B: 70mA for WE
75mA for JJ.
Maximum Current for each 300B: 85mA

Fuse Ratings

FS1: T1.6A Anti Surge with 220/230/240V units/
T3.15A Anti Surge with 110/115/120V units.

FS2: T315mA Anti Surge

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249 Swindon Rd Cheltenham Gloucestershire GL51 9HZ Tel/fax 00 44 1242 717171 bp@borderpatrol.co.uk www.borderpatrol.co.uk

INSTALLATION

1. Spiked feet. Three self-adhesive spiked feet are supplied with the amplifier. Fix them to the base.

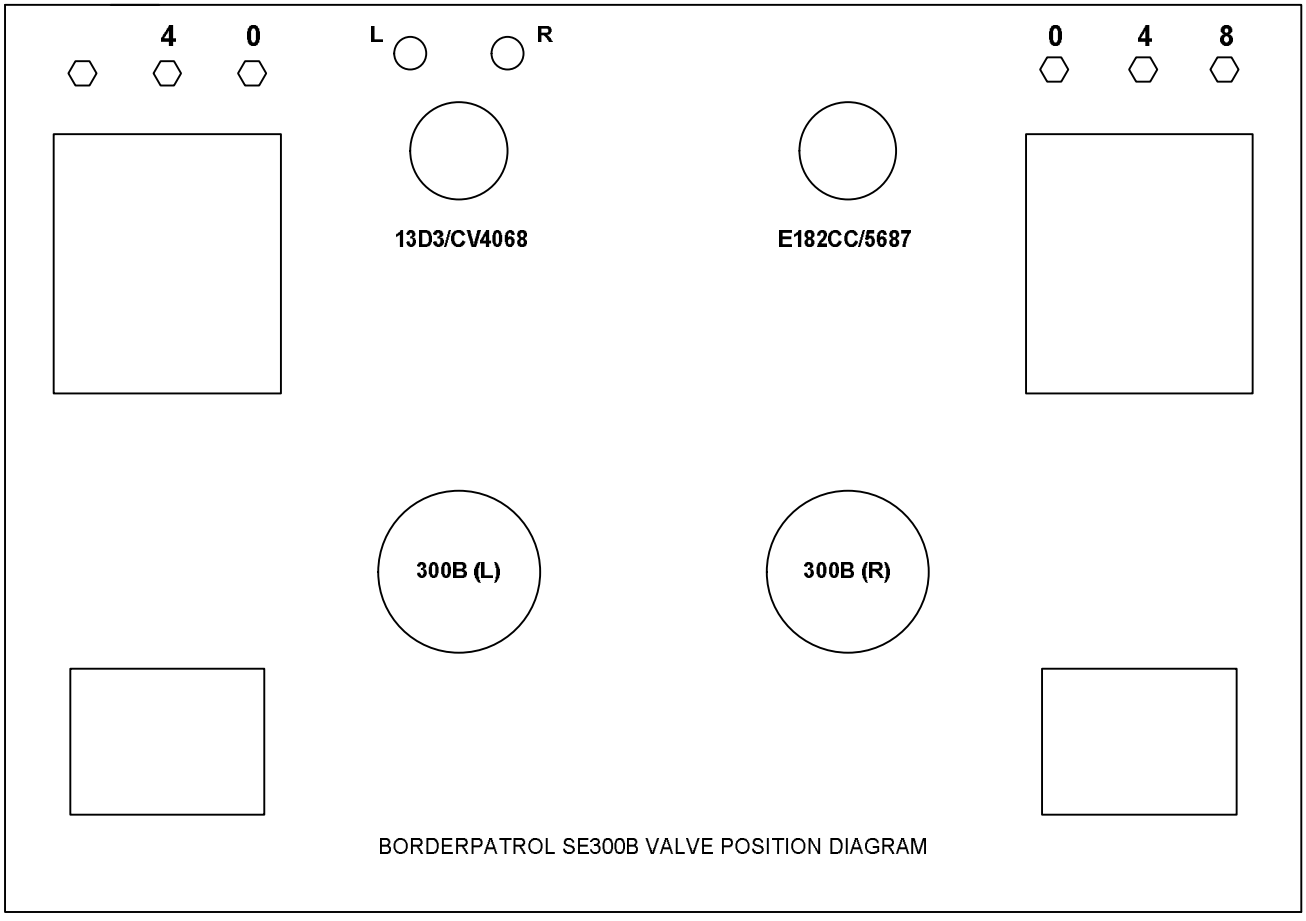
2. Valves. Install the valves according to the Valve Position Diagram below. The 300B's are marked L (left) and R (right) to correspond with the left and right valve base. **CAUTION!** Make sure the 300B's are orientated correctly with respect to the valve base. There are two thick pins and two slim pins: ensure that they go in the correct holes in the valve base. If you need to use excessive force to get the valve in the base you are probably doing it incorrectly and powering up with an incorrectly installed 300B could cause serious damage to the valve and the power supply unit.

3. Power supply unit. Fix the front plate using the 4 Allen bolts supplied. Plug the 10 pin plug from the amplifier into the socket on the rear of the power supply unit making sure the locating pin is secured and tighten the locking screw. Do not use excessive force!
Connect the mains cable and switch on.

4. If a hum occurs when the amplifier is used with an active pre-amplifier switch, the small toggle switch located on the PSU next to the IEC inlet to an upward position.

The BorderPatrol 300B SE uses an adjustable bias output stage so it is necessary to adjust the bias on the output valves every 6-12 months depending on usage and when installing new 300B's. Please refer to the Biasing instructions on page 2.

To keep the amplifier in top visual condition, dust and occasionally polish using a wax polish.



BORDERPATROL SE300B VALVE POSITION DIAGRAM

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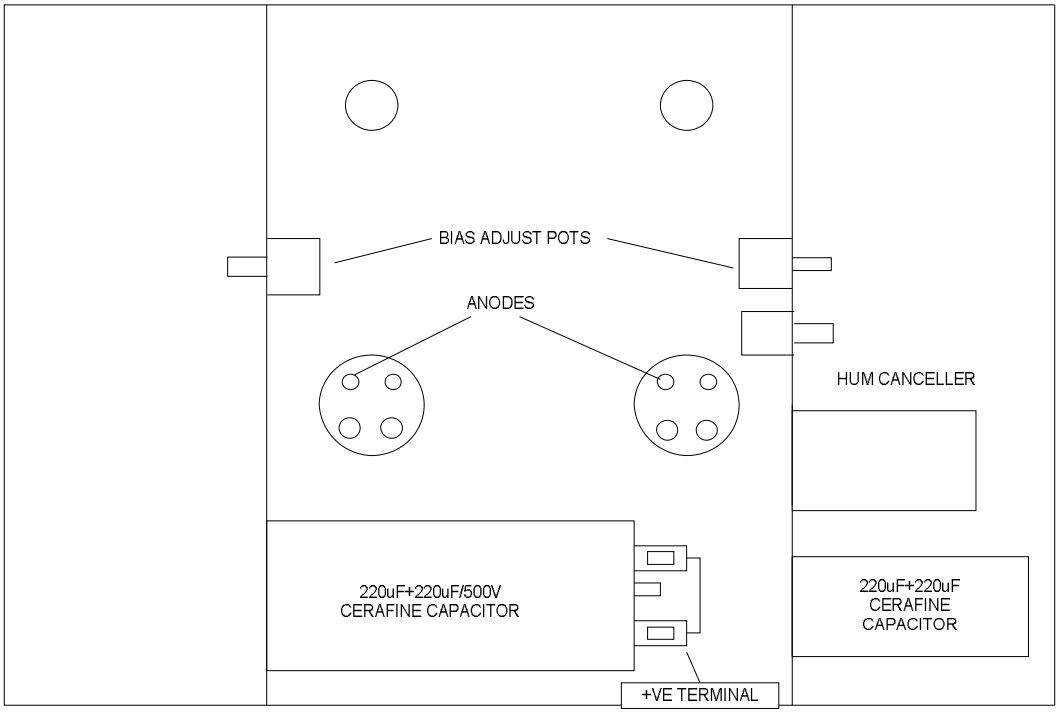
300B SE BIAS ADJUST AND HUM CANCELING (Tools required: DC Voltmeter, screwdriver).

Beware. LETHAL VOLTAGES! If you have any doubt about your ability to safely carry out these operations, please contact BorderPatrol or refer to a service engineer.

VALVE REPLACEMENT. Use a matched pair of 300B's. We recommend JJ, TJ and Western Electric 300B's. Our recommendations are based on reliability and sound quality. New 300B's are regularly released but we have not tested every type and therefore cannot comment on their reliability.
In high sensitivity format, the amplifier will have a CV4068 double triode input valve and Mullard E182CC or Philips 5687 double triode driver valve. Valves that can be substituted for the 13D3/CV4068 are 6158, ECC82, CV4003, 6189, 6072. Possible equivalents for the E182CC and 5687 are 7044, 7199.
In low sensitivity format, a Reflektor 6S45pi high transconductance single triode performs input and driver duties..

HUM-CANCELING See the Diagram. With the 300B's installed, place the amplifier on its side (wedge a support under the output transformer) and remove the base plate. Locate the Grey-bodied cylindrical potentiometer located on the internal bracket. Switch on the amplifier and place your ear close to one of the loudspeakers. Turn the pot backwards and forwards until the audible hum reaches a minimum.

BIASING See the Diagram. The DC resistance of the output transformer primary will be written on one of the internal brackets. Multiply this figure by 0.070 (WE) or 0.075 (JJ) to calculate the DC voltage across the primary of the output transformer when each valve is passing the optimal current of. E.g. Rp=138 therefore 138 x 0.070 = 9.66V for Western Electric or 138 x 0.075 = 10.35V for JJ Electronics.
Turn the amplifier on. **CAUTION! HIGH VOLTAGES PRESENT- Do not touch anything except the adjustment pots.** Set the voltmeter to DC volts, locate the +ve terminal of the 220uF+220uF/500V Cerafine capacitor and place the red probe of the voltmeter on it . Place the black probe on one of the 300B anodes. Measure the DC voltage. Adjust the black bodied pot located on the side bracket nearest to the valve until the measured voltage agrees with the value calculated above. Repeat for the other valve. The two valves feed off a common power supply so the current draw through one will change slightly as the other one is adjusted. The required voltage therefore needs to be approached slowly with regular checks on the other valve. Once the two voltages are within 0.1V of each other, place both voltmeter probes on the two anodes and fine adjust one valve until the measured voltage is as close to zero as possible. The two tubes will then be balanced and biased correctly. The absolute value is less important than ensuring that both tubes pass equal amounts of current.
If you have just fitted new valves, repeat this procedure again after 48hrs and then again after 3 months. The valves should then be sufficiently burned in to not need further adjustment for about one year.



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Border Patrol SE300B Installation and Connection Diagram