

Acoustat Ultrasonic Bias Power Supply

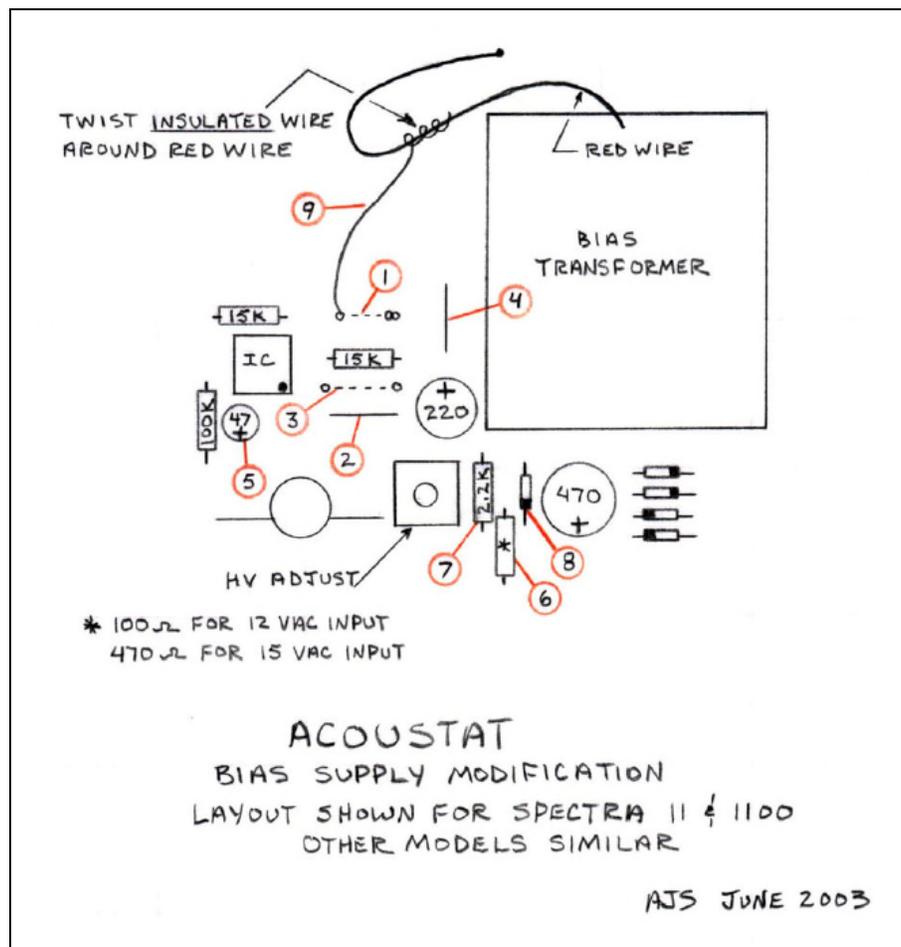
Introduction

Acoustat experienced problems with early versions of the Ultrasonic Bias Power Supply used in the Spectra Series. The oscillator would either not start (resulting in no sound from the speaker), or oscillate at the wrong frequency (resulting in reduced output from the speaker). This modification will convert the circuit to the final design, which always seems to work well.

Note that this modification is NOT a sonic upgrade, and there is no need to apply it to a properly functioning speaker. Always perform the modification for both speakers in a pair.

After performing the modification, the bias voltage must be measured and adjusted. If you do not have the required test equipment and the knowledge to use it, DO NOT attempt this modification. Refer the work to a qualified electronics technician.

A diagram is included, showing the component layout for the Spectra 11 and 1100. For the full range models (Spectra 22/2200, 33/3300, 44/4400, and 66/6600), some interpretation from schematic to physical component location may be required. Anyone able to supply a component layout diagram for these models is urged to do so: the information will be added to these instructions.



Components

Component #1

Originally a 0.001-uF capacitor. For a short time this was changed to a 0.022-uF, and then later a 0.0022-uF capacitor. Remove this component and leave it blank.

Component #2

Originally a 1000-ohm resistor (color code: brown-black-red). For a short time this was changed to a 0.01-uF capacitor. Remove this component and replace it with a wire jumper.

Note: this resistor is still shown on the schematics for the Spectra 1100, 22/2200, 33/3300, 44/4400, and 66/6600. This is incorrect - it should show as a direct connection. Only the Spectra 11 schematic is correct.

Component #3

Originally a 47,000-ohm resistor (color code: yellow-violet-orange). Remove this component and leave it blank.

Component #4

Originally a 1.5-ohm resistor (color code: brown-green-silver). Remove this component and replace it with a wire jumper.

Component #5

Originally a 4.7-uF capacitor. Remove this component and replace it with a 47-uF capacitor. Be sure to observe correct polarity (+/-) when installing the new part.

Component #6

Verify that this resistor is the correct value. If the speaker uses a 12-volt AC wall transformer, this resistor should be 100-ohms (color code: brown-black-brown). If the speaker uses a 15-volt AC wall transformer, this resistor should be 470-ohms (color code: yellow-violet-brown).

Component #7

Originally a 5600-ohm resistor (color code: green-blue-red). Remove this component and replace it with a 2200-ohm resistor (color code: red-red-red). This change may have already been done.

Component #8

Originally a 13-volt zener diode (1N5243). For now, DO NOT alter this component. Later, if the bias voltage is very high, and cannot be adjusted low enough, remove this component and replace it with a 10-volt zener diode (1N5240). Be sure to observe correct polarity (banded end) when installing the new part.

Component #9

Solder one end of a 6-inch (15-cm) stranded wire (22-24 gauge) to the PC board, as shown (previous location of component #1). Wrap 3 or 4 turns of the other end of the wire around the red wire of the bias transformer. Secure the connection with electrical tape. DO NOT strip the insulation from either wire: this is NOT a direct electrical connection. This wire acts as an "antenna" to provide feedback for the oscillator's operation.

IMPORTANT: Reinstall the printed circuit board into the metal chassis. The close proximity of the metal chassis affects the output of the bias circuit, so the board must be installed to obtain an accurate bias measurement.

IMPORTANT: To ensure proper speaker operation, the Bias Voltage must be adjusted. If the bias voltage is very high, and cannot be adjusted low enough, refer again to the instructions for Component #8.

Parts List (for one pair of interfaces)

Be sure to read through the instructions, and examine the interfaces, before buying parts. Depending on the interface, some parts may not be required.

2	10-volt, 500-mW zener diode	1N5240BMSCT-ND
2	47-uF, 25-volt electrolytic capacitor	P5151-ND
2	100-ohm, 1/4-watt resistor	P100BACT-ND (*)
2	470-ohm, 1/4-watt resistor	P470BACT-ND(*)
2	2200-ohm, 1/4-watt resistor	P2.2KBACT-ND (*)

(*) Package of 10 pcs.

All part numbers shown are from www.digikey.com. These parts are also available from many local and mail order distributors. There is no advantage in utilizing "audiophile grade" parts in this application.