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NATURAL RESOURCES DEFENSE COUNCIL

External Power Supply Documentation from NRDC

April 17, 2006

As a follow-up to NRDC's written comments dated April 10, 2006, we are submitting some additional documentation on external power supplies (EPS) for the Title 20 docket. Our submission consists of two components: a) a series of digital photos of products and their accompanying power supplies, and b) some narrative that describes the images and data that were provided. This information is intended to respond to various claims made by manufacturers at recent CEC workshops about the ability to meet the CEC requirements.

The images, test data, and pricing information were pulled together from a variety of sources including power supply manufacturers and component providers. It should also be noted that the "incremental cost" estimates that are provided refer to the additional outlay the OEM is expected to pay to go from their current inefficient EPS to one that meets the CEC Title 20 standard. The low end of the range is for high volume orders (>500,000/yr) and the higher price is for smaller orders (<50,000/yr).

**Image 1 – Wahl Groomsman Clipper**

The EPS in the upper left corner is the linear EPS that is provided with the current Groomsman model clipper. The guts of a prototype switch mode EPS is provided on the right. The average efficiency of the switcher is more than double that of the currently supplied EPS.

**Image 2 – Wahl Home Pro Clipper**

The EPS in the upper left corner is the linear EPS that is provided with the current Home Pro model clipper. The bottom right is a prototype switch mode EPS that was developed. Again it is dramatically more efficient and also more compact.

**Image 3 – Sharp Cordless Phone**

This is a picture of a cordless phone sold by Sharp in Japan. This product comes with an EPS that already exceeds the CEC requirements.

**Image 4 –** During the last hearing, it was alleged that one can not produce a AC to DC power supply for use with a guitar effects pedal due to the interference it would produce. This image shows a copy of an advertised product in the Musician's Friend Catalogue called the "1 Spot" from Visual Sounds Company. The highlighted text

notes “ No transformer, so forget about the 60 Hz hum”, which is a reference to the unwanted noise distortion that a linear power supply might provide.

While this particular model does not meet the CEC EPS requirements, simple product modifications could quickly bring it into compliance.

#### Image 5 – Philips Norelco Shaver

We provide this as an example of a shaver purchased at retail that already meets the CEC EPS requirements. It is currently shipped with a CEC compliant switch mode EPS.

#### Image 6 – Conair Body Benefits Massaging Back Rest

This image includes the current relatively inefficient linear power supply that is shipped with the product and the guts of a prototype switch mode power supply that could be used instead. It should also be noted that the suggested more efficient 12 V power supply will be dramatically smaller and lighter and will provide the OEM with significant reduced shipping costs.

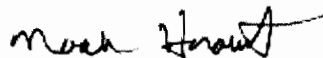
#### Image 7 – Two Linear Power Supplies

This image demonstrates that one can also produce a linear AC to DC power supply that meets the CEC EPS standards. The more efficient one will be slightly larger and heavier as the more efficient one requires a slightly larger core and more copper to attain the required performance levels.

We appreciate the opportunity to add this material to the docket for we believe it responds to the manufacturers challenges raised during recent hearings with some real world examples of how companies can readily achieve the needed efficiency levels required by the CEC at nominal incremental cost. Our prior submittal included letters from several EPS manufacturers stating their capacity to meet the future demand for CEC complying EPS.

Should you wish to discuss any of this information further, please do not hesitate to contact me at 415-875-6100 or [nhorowitz@nrdc.org](mailto:nhorowitz@nrdc.org).

Sincerely,



Noah Horowitz  
Sr. Scientist

## **Attachment 1**

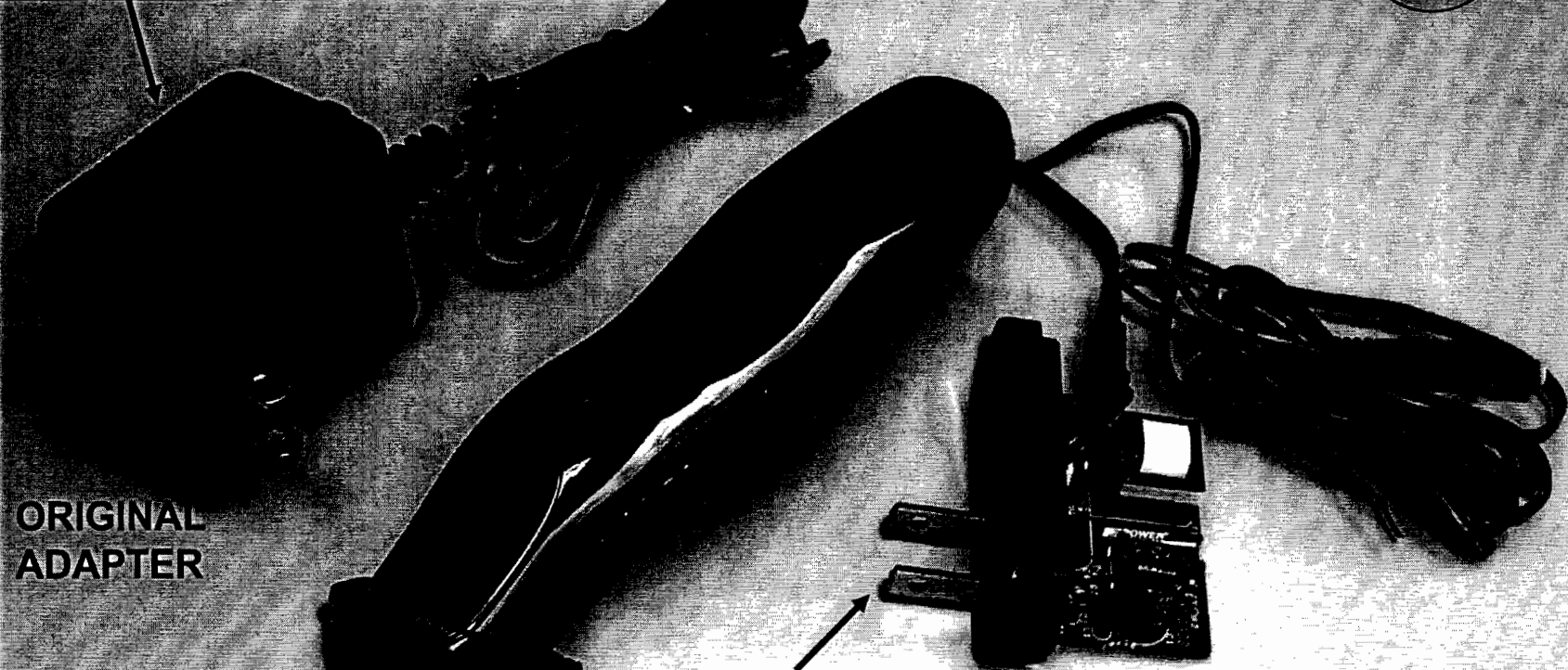
**External Power Supply Examples  
for Various Products Covered by  
the CEC Title 20 Regulations**

**Prepared by NRDC  
April 17, 2006**

# Example 1 – Groomsman cord/cordless

1

NAMEPLATE SPEC 3Volts @ 0.2Amps (0.6Watts)			
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	1.19W	0.50W	FAIL
Ave Active Efficiency	27.6%	29.4%	FAIL



**ORIGINAL  
ADAPTER**

NAMEPLATE SPEC 3VOLTS @ 0.2Amps (0.6Watts)			
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	0.08W	0.50W	PASS
Ave Active Efficiency	66.3%	29.4%	PASS

Estimate Cost Difference \$0.2 - \$0.4

## Example 2 – HomePro cord/cordless

NAMEPLATE SPEC 1.2VOLTS @ 2Amps (2.4Watts)			
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	0.52W	0.5W	FAIL
Ave Active Efficiency	33.0%	56.9%	FAIL

ORIGINAL ADAPTER

UNIT SPEC 1.25VOLTS @ 1.9Amps (2.4Watts)			
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	0.06W	0.5W	PASS
Ave Active Efficiency	58.8%	56.9%	PASS

2

Estimated Cost Difference \$0.35 - \$0.6

## Example 3 – Cordless Phone

NAMEPLATE SPEC 6VOLTS @ 0.7Amps (4.2Watts)

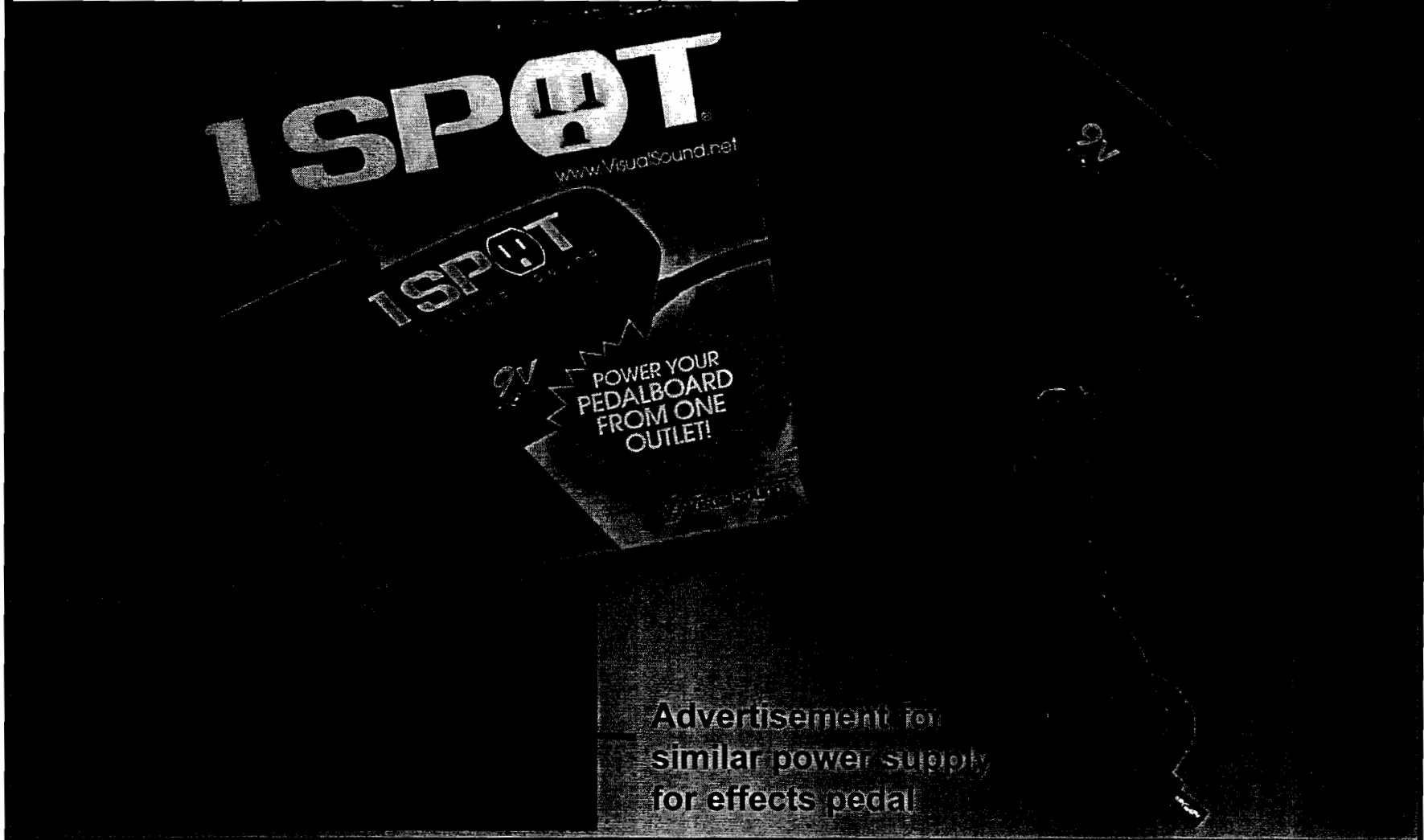
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	0.08W	0.5W	PASS
Ave Active Efficiency	71.4%	61.9%	PASS

3

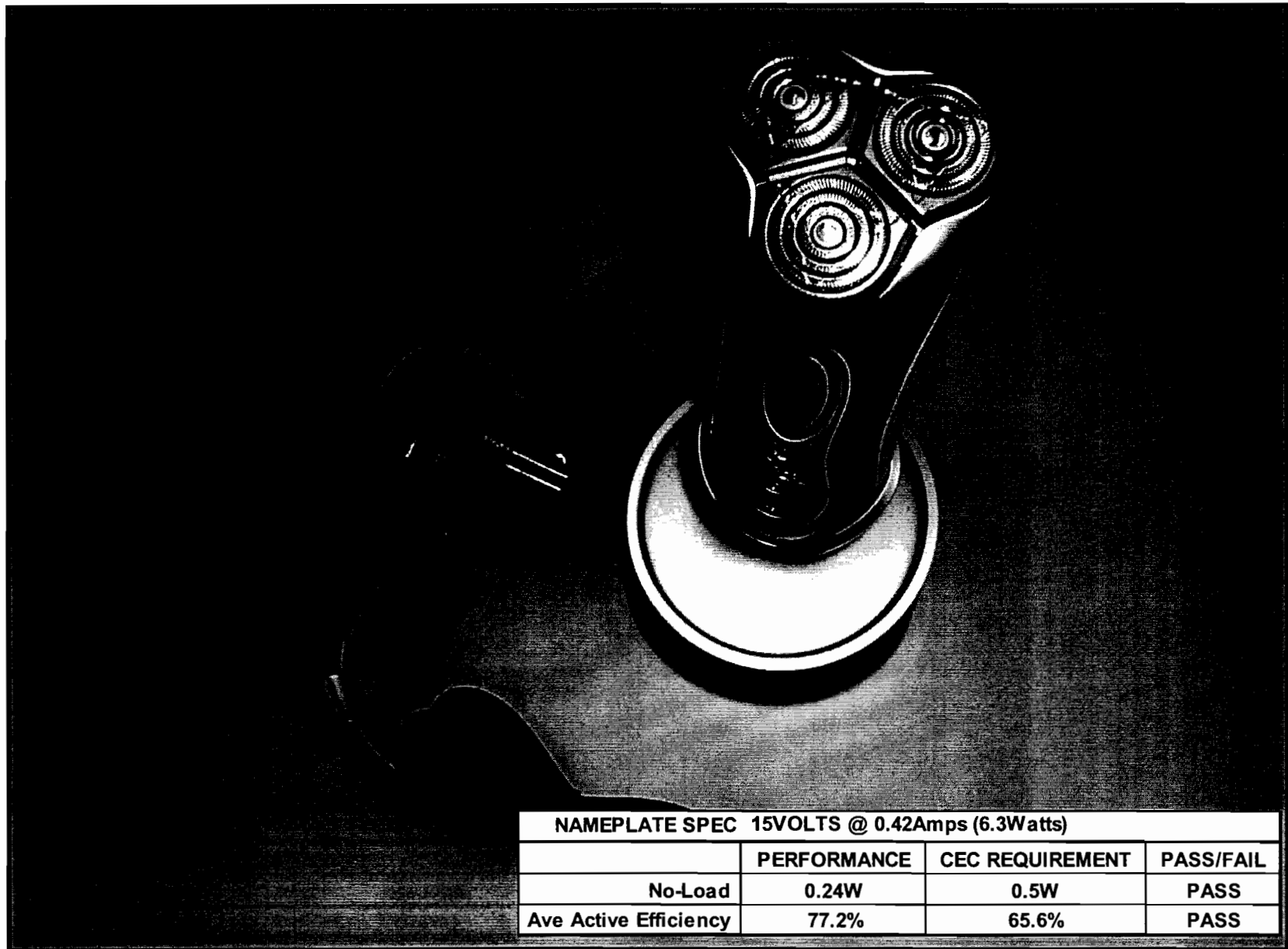


# Example 4 – AC-DC Guitar Effects Power Supply

NAMEPLATE SPEC 9VOLTS @ 1.7Amps (15.3Watts)			
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	0.93W	0.75W	FAIL
Ave Active Efficiency	75.9%	73.6%	PASS



## Example 5 – Shaver



NAMEPLATE SPEC 15VOLTS @ 0.42Amps (6.3Watts)			
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	0.24W	0.5W	PASS
Ave Active Efficiency	77.2%	65.6%	PASS



# Example 6 – Massaging Back Rest

**CONAIR**  
BODY BENEFITS

**POWERFUL  
MASSAGE  
MOTORS**

NAMEPLATE SPEC 12VOLTS @ 0.8Amps (9.6Watts)			
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	1.41W	0.5W	FAIL
Ave Active Efficiency	64.4%	69.4%	FAIL

Therapy Option  
Warm Comfort

- Includes 2 Reusable Hot/Cold Gel Packs
- Fastens to Most Chairs and Automobile Seats
- Home and Auto Adapters Included

2 pockets with zippers for easy insertion of Hot/Cold Gel Packs

NAMEPLATE SPEC 12VOLTS @ 1Amp (12Watts)			
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	0.07W	0.75W	PASS
Ave Active Efficiency	77.6%	71.4%	PASS

Hot/Cold  
Massaging Back Rest

**ORIGINAL  
ADAPTER**

Estimate Cost Difference \$0.0 - \$0.5

# Example 7 – Non-compliant and Compliant Linear Transformer AC-DC Adapters

NAMEPLATE SPEC 9VOLTS @ 0.25Amps (2.25Watts)			
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	0.91W	0.5W	FAIL
Ave Active Efficiency	47.8%	56.2%	FAIL

NON-COMPLIANT LINEAR TRANSFORMER AC-DC ADAPTER

COMPLIANT LINEAR TRANSFORMER AC-DC ADAPTER

NAMEPLATE SPEC 9VOLTS @ 0.25Amps (2.25Watts)			
	PERFORMANCE	CEC REQUIREMENT	PASS/FAIL
No-Load	0.3W	0.5W	PASS
Ave Active Efficiency	61.0%	56.2%	PASS