

# ***Power Yourself: The Tout Terrain Solution***

by William Ramey  
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## **Part 1: Overview**

*The Plug I* from [Tout Terrain](#) debuted in early 2010 as an integral part of a high-tech bicycle power system. They advertised it on their website as “the world’s first electric power supply, which is fully integrated and can be operated and serviced on devices such as GPS devices, mobile phones or MP3 players.”

The product’s first use was after taking delivery of my Panamericana bicycle in early February 2011, purchased from and quality-built by [Peter White Cycles](#). Tout Terrain’s description of the device’s purpose intrigued me because I always take on tour a few electronic devices such as a cell phone, digital camera, and a GPS. As everyone knows, batteries require periodical charging to keep electronic devices functioning. So, I asked Peter to install *The Plug I*, with the Schmidt Son28S front hub dynamo serving as its power source.

I have enjoyed *The Plug I*’s benefits the past year during my fitness training and long-distance touring in conjunction with a Garmin [705/800](#) GPS, [Apple’s iPod Touch 4](#), a [Sanyo Eneloop USB AA/AAA Charger](#), and a cell phone. I recently upgraded and installed on my bicycle *The Plug II* with the optional P.A.T. (Power Amplification Technology) module. The combination offers unparalleled benefits for the committed urban commuter or the long-distance touring cyclist. Unless otherwise stated, this article pertains to *The Plug II* and not its predecessor, *The Plug I*.

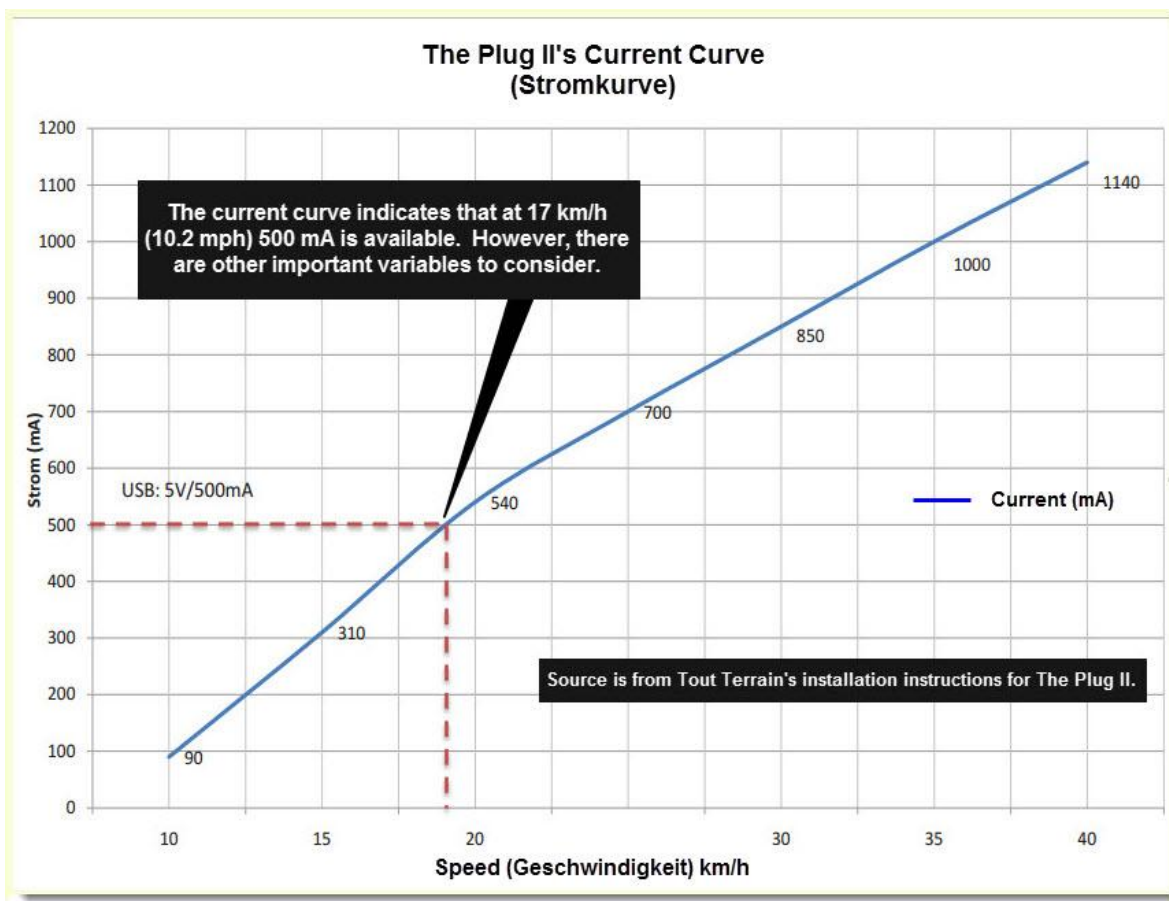


**THE PLUG II INSTALLED ON TOUT TERRAIN’S PANAMERICANA BICYCLE**

### Application

*The Plug II* is an electric power supply, not to be confused with a power source. What is the difference? A power supply provides electrical energy to an electric load. It must obtain the energy it supplies (and any energy it consumes while performing its task) to its load from an energy source, such as a battery, alternator, or generator.

*The Plug II*'s power source is from a hub dynamo (electromechanical generator) built into a bicycle's front hub, although it can also be built into a bicycle trailer's wheel hub. Tout Terrain's bicycle-specific power supply converts the hub dynamo's alternating current (AC) to direct current (DC) and supplies power for small electronic devices' batteries. Although the hub dynamo may supply higher voltage, *The Plug II* regulates a constant 5 DC voltage output. Whereas the voltage output remains constant, the amperage varies, depending on several important variables.

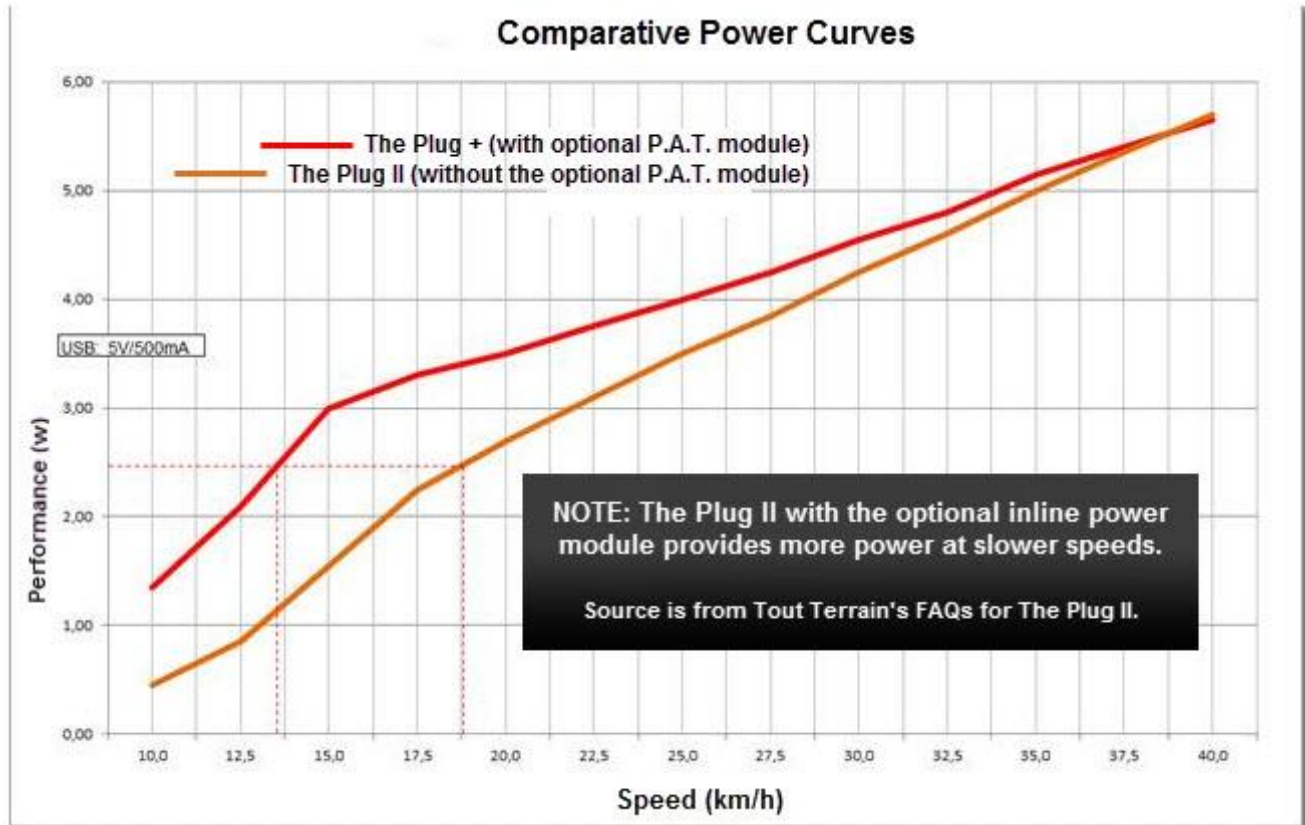


### Important Considerations

*The Plug II*'s capability to supply appropriate power to a 5V DC device largely depends on five critical variables: first and foremost, the hub dynamo's maximum power output (usually 3 watts at 6 volts); second, whether a lighting system or other

electric load simultaneously shares the hub dynamo's generated power; third, the wheel's diameter in which the hub dynamo is built and the forward velocity at which the bicycle is travelling; fourth, the device's charging and operating characteristics as well as any intermediary inline cache battery; and fifth, whether the optional inline power module is installed (marketed as *The Plug II +*). Several other mitigating factors also affect *The Plug II's* performance, including the inherent resistance in conductors to and from it, as well as any dirty or ill-connected connections at the hub dynamo or device. These potential compromising variables will be individually examined later concerning their impact on *The Plug II's* overall performance.

*The Plug II +* with the optional inline P.A.T. module provides more power at a slower speed. This is Tout Terrain's exciting patent-pending innovation that optimizes a hub dynamo's available output power with *The Plug II* by 50% at 12 mph (20 km/h). More information about *The Plug II +* will be forthcoming.



### Making the Connection

*The Plug II's* host portal interface is a standard A-Series USB female upper connector port. The USB port is the same type of port found on laptop and desktop computers. Depending upon the above five important variables, if a device's battery charges when connected to a computer's USB 2.0 port, then *The Plug II* will also charge it with a hub dynamo as its power source. It's built-in compatibly with E-Bikes

with 12-48V DC output and the [Apple iPhone 4](#) is a plus. However, there is a notable exception: Tout Terrain's literature expressly states that the Apple iPad will not work properly with *The Plug II*.

*The Plug II* replaces the headset's top cap during installation; hence the main unit's name "TopCap" on Tout Terrain's website and elsewhere. A stainless steel button head bolt slips through the TopCap's center, firmly securing it to the bicycle by threading into a headset's expander female nut in the steerer tube. This yields a "quick grab" theft-proof assembly. All necessary wiring feeds up from the hub dynamo to the TopCap through the bicycle's hollow steerer tube and the provided channel slot in the headset expander nut. Although not unsightly, after assembly the stainless steel bolt's head is visible on top. If one prefers, a 6mm anodized-black button head bolt could substitute for the supplied bolt to make the assembly more cosmetically pleasing, albeit less weather-resistant than the stainless steel bolt.

*The Plug II* functions as a stand-alone interface (power supply) between a connected power source (hub dynamo) and an electrical load such as cell phones, GPS devices, MP3 players or SPOT tracking devices, typically mounted on the handlebars or stored in a handlebar or top tube wedge bag. It connects to the user's device by its supplied connector-specific plug (such as the iPhone's docking plug, Micro-B, ExtUSB, or Mini-B plug) and mates to *The Plug II*'s standard USB female port by a varying length of conductor cord which terminates with a standard USB A-Series male connector. The TopCap's design allows lateral incremental rotation on the steerer tube to accommodate the USB's port to face any direction.



The white molded connector mates and locks into the TopCap's bottom module.

insulation is black in color. The 43 inch (109.2 cm) cable length amply reaches a front wheel's hub dynamo.

The white molded connector, which mates and locks into the TopCap's bottom module, is already securely attached to one of the cable's ends. The cable's other end is blunt-cut. During installation, the installer first cuts the blunt-cut cable's end to proper length to reach the hub dynamo and separates the cable's two "legs" apart, then removes a short length of insulation and crimps the connector terminals (not supplied with *The Plug II*) onto each cable's leg wire that attaches to the hub dynamo's

connectors. [Peter White Cycles](#) sells connectors for different hub dynamos. Also using [heat-shrink tubing](#) during the procedure to cover the wires' ends to their connectors makes a professional looking job.

Although certainly not absolutely necessary, an intermediary battery between *The Plug II* and an electronic device works best during cycle touring. In this manner, *The Plug II* first supplies power from the hub dynamo to the battery, and then from the battery a device receives constant power irrespective to a bicycle's speed, such as



The Velotrac Pak securely holds the cache battery. The bag attaches to the top tube in which I also place my iPod in a clear pocket in the lid. The bag is large enough to hold other small things like my keys, money, and earphones.

when slowing down at busy intersections or briefly stopping to take a photograph. Also, when an electronic device is not connected to the cache battery, it is trickled-charged for possible later use.

As an illustration, whenever my speed drops too low for the hub dynamo to output enough power, the annoying "External Power Lost" message appears on my Garmin 800 GPS.

However, it no longer does after adding the cache battery. During the past nine months, I have

been extensively testing a [portable external lithium-ion battery pack](#) and do not notice any depreciation in battery life or noticeable "memory effect" because of the battery's repeated charging cycle. I store it in a top tube [Velotrac pac](#), in which I also place my Apple iPod Touch 4 and other small items.

### Appearance and Features

Tout Terrain's logo brands the TopCap with encircling lower-case white letters on top, opposite of a recessed LED green light. Two-tiered, horizontal positioned lower-case white letters flanks both sides of the USB host port with the product's name, "the plug," and below its name, the slogan in smaller cursive letters, "power yourself."



The TopCap's lustrous finish extrudes quality.

The TopCap's stylish cosmetic appearance exudes a lustrous reflective finish, a quality highly desired in component parts. Its anodized-black exterior, composed of tough corrosion-resistant 6061 aluminum

alloy, ingeniously encases all of its internal electronics in a waterproof sealing liquid. This innovation helps to ensure the circuitry's protection against unwanted vibration, as well as corrosive salt water and moisture. However, Tout Terrain's literature strongly suggests that high pressure washers not be used near *The Plug II*; if it has an Achilles' heel, it is the exposed USB port.

A neutral-black colored silicone molded insert, tethered and securely attached to the TopCap's base by a circular plastic ring, helps to protect the TopCap's USB port from moisture and debris when not in use. The insert's proper orientation is labeled by the raised letters "TOP". Depending upon environment and/or usage, some corrosion may form at the mouth of the USB port. However, one may easily swab it away by using an alcohol moisten Q-tip. The overall TopCap's weight with its tethered silicone insert is approximately 145 grams.



The LED green light is easily seen in daylight. The USB port has a female upper connector as shown in the picture on the right.

*The Plug II* does not have a physical external power switch for the user manually to turn on or off (one less thing to forget); but instead, integrates an automatic internal electronic switch. In addition, when a device is not connected, *The Plug II* does not consume any energy except to power its small indicator's LED green light.

Whenever the hub dynamo is providing a constant 5V DC to the TopCap, the LED's green light steadily illuminates. It also illuminates when sufficient power is available at the USB port for a connected device. Tout Terrain states in *The Plug II's* [installation instructions](#), "When accelerating or after a longer stop this might take a few seconds due to its internal electronics." However, if the light does not illuminate at all, then the TopCap probably is not receiving any power from the hub dynamo. Finally, if the LED light intermittently blinks, then it indicates that the connected device requires more energy than available at the TopCap's USB port.

The TopCap's discreet and elegant tailored design fits into a 1-1/8 inch steerer tube, leaving visible and annoying cable clutter behind, unlike [Busch & Müller E-Werk](#), [PedalPower+](#), and similar competitive products. In short, its simplistic design is brilliant. Its sleek, unobtrusive profile visually complements the lines of the bike and does not disrupt its aerodynamics. Best of all, *The Plug II* advances the idyllic ethos that the bicycle uniquely remains the "most efficient form of human powered transportation," especially when paired with a hub dynamo and a favorite electronic gadget for the committed urban commuter or long-distance touring cyclist. If you need to power

yourself, then *The Plug II* from Tout Terrain may not only be their solution, but yours as well.

### Price Tag

*The Plug II*'s quality and well-engineered design do not come without a monetary investment. At this article's publication, [The Plug II](#) costs \$221.37 USD (€ 167.24) from SJS Cycles. It includes the TopCap with mounting stainless steel bolt, headset expander assembly, cable, and installation instructions. [The Plug II and optional P.A.T. module](#) costs \$253.00 USD (€ 191.13). These prices do not include shipping, the required hub dynamo, or any of the user's electronic devices attached to *The Plug II*. In the United States and Canada, one may purchase *The Plug II* from [Peter White Cycles](#). If *The Plug II* is ordered from Tout Terrain's website, the [headset expander assembly](#) must be separately purchased.

### A Look Ahead

The next segment digs deeper into *The Plug II* by examining the critical variables that affect its performance. In addition to a step-by-step illustration how easily *The Plug II* installs on a bicycle, the P.A.T. power module's benefits are specifically considered for cycle touring. The module conveniently installs inline between the TopCap and hub dynamo, and discreetly hides in the steerer tube. This is Tout Terrain's exciting patent-pending innovation that optimizes a hub dynamo's available output power with *The Plug II* by 50% at 12 mph (20 km/h), thus allowing to ride at slower speeds while using and/or charging at a faster rate onboard small electronic devices.

### Helpful Links

- Tout Terrain's website [[German](#)] [[English](#)]
- FAQs about *The Plug II* [[German](#)] [[English](#)]
- Installation instructions for *The Plug II* [[German and English](#)]
- Purchase from [Peter White Cycles](#) (United States & Canada)
- Purchase from [SJS Cycles](#) (Worldwide)
- Purchase *The Plug II* + from [Tout Terrain](#) (Germany)
- Purchase from [dotbike](#)

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Thank you for reading *Power Yourself: The Tout Terrain Solution (Part 1: Overview)*.

Disclaimer & Acknowledgments: The author is not associated with Tout Terrain or any of its distributors, nor has he received any monetary compensation for this article. The views and opinions concerning *The Plug II* or any other products are solely those of the author and do not necessarily represent those of Tout Terrain. All photographs are the

author's and shot with the [Nikon D7000 16.2MP Camera](#) with a [Nikon 35mm f/1.8G AF-S DX lens](#). Macro photographs were taken using the [Zeikos ZE-CVAFN Auto Focus Macro Extension Tubes](#) and [GTMax Macro Ring Flash LED Light](#).

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