

TOPA Portable Power Guidelines

Introduction

Gone are the days of the intrepid globetrotting photographer armed with a manual FM10 around the neck and a hipsack full of film. At the most, her power requirements amounted to a pack of AA lithiums. Today's professional travel and outdoor photographer is more likely to be found with a couple power-hungry digital SLRs bristling with fast-recycling smart flashes. She might even be toting a portable hard drive, a laptop and location light kit. Still, she finds herself in the same remote areas for extended periods of time as before. That means she needs portable power, and a sack of AAs aren't going to cut it anymore. This document will explore the current technology of portable power for the modern outdoor and travel photographer.

Power Primer

You need to convert fuel to electricity and deliver it to your device. Portable fuel sources include gas/diesel, solar and battery. There are two main types of power delivery schemes: Alternating Current (AC) and Direct Current (DC). DC technology has come a long way in terms of power and longevity, mostly in the form of batteries. Today even high-power devices such as laptop computers, automobile lights, digital cameras and flashes are powered by DC supplies *inside*.

So why do we still use AC power? A wire can carry higher voltage over long distances more efficiently than lower voltage, and AC can be amplified (via a *transformer*) more easily to higher voltages than DC, so it makes sense that centrally-generated power for cities would use AC. As a result, most household appliances, and powerful studio lights, are designed to run off AC power. Some devices like computers are actually using DC power inside. That brick in the middle of your power cord is an AC-to-DC *converter*.

Still, generating continuous AC power requires a fuel source very close by. In the case of portable light power, it is actually another DC battery! This reverse conversion from DC-to-AC is done by an *inverter*.

Many DC-powered devices use a *rechargeable* battery such as a Lithium-Ion or Lead-Acid cell. These batteries can only recharge from an AC current. Even high-power portable studio strobes such as Lumedyne and Hensel Porty will eventually need to be plugged into AC power to recharge. True studio strobes such as Speedotron have "power packs" which are just really big converters that take AC power and distribute them intelligently to all the lights. Realistically, you will almost always need AC power at some point. It's up to you to decide what devices you are going to need out in the field.

Here is a list of common types of AC and DC power available today, from least to most portable, with common examples

| Power Source | Pros | Cons |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outlet | Unlimited high-voltage AC power, reliable, regulated, “free” | Reliance on access to the grid, not portable, different regions have different voltage standards so you will need a voltage converter. |
| Gas/Diesel Generators (Honda) | Nearly unlimited high-voltage AC power, extremely reliable, tested technology, relatively inexpensive | Have to carry gas or diesel fuel, smelly, loud, dangerous, heavy, outdoor only. Powering sensitive devices may require special circuitry |
| Fuel Cell Generators (AirGen Hydrogen) | High-voltage AC power, reliable, low-emissions, can use indoors, safer, quieter | Have to carry fuel cylinders (compressed gas), loud, untested, heavy, expensive |
| Solar Generators (Brunton, Coleman, many others) | High-to-low-voltage AC and DC power | Big size for amount of power, reliability depends on weather, expensive, voltage power is variable. |
| Lead-Acid Battery with inverter (Profoto, Dynalite, Vagabond, car battery + inverter) | Medium-voltage AC power, more portable. Inverter for the car is particularly handy for traveling photographers | Must constantly trickle-charge or battery will die eventually. Inverter has to have the right circuitry to supply power to sensitive electronics. |
| Lead-Cell DC battery (Quantum) | Medium-voltage DC power, highly portable, holds charge for long time even when not charging, reliable with the proper cord, can directly power the majority of SLRs, small flashes and some monolights | DC power only, can only power certain devices, can’t be used to recharge devices. |
| Small Batteries: Alkaline, Li-Ion, etc. (Duracell, manufacturer-specific such as Nikon) | Low-voltage DC power, can be “ganged” for higher current needs, disposable, cheap. Most manufacturers offer an external battery pack of this type for their devices | DC power only. Low voltage, not great in cold weather. With the exception of consumer batteries like AAs, these batteries are not interchangeable or standardized. |

Collected Wisdom from TOPA

Chris Barth: Two of the **solar chargers** I've seen, and one for smaller devices is at: <http://www.solio.com/html/index.html>. Also, a search on B&H for solar charger found a couple of hits for chargers for the Digital Camera Battery system.

Bill Stevenson: I just returned from Tibet where we were off the grid for a while. Before I went I tried to get a **solar system** set up for my laptop and found it to be more complicated than imagined. I know almost nothing about electricity but what I learned, if I remember correctly, is that the output amps of the charger have to match or exceed the input amp requirements of the device you're charging. If you don't get to this threshold then the device won't charge. It turned out I couldn't get to the threshold for the laptop with my solar panel. The smaller devices such as battery chargers and mp3 players were no problem. The solution I used was to get a **Brunton Solar Roll combined with their Solo**. The Solo stores the current from the solar panel and then outputs it at a high-enough amperage to charge the laptop. It's not cheap though.

Mike Tittel: I have done a fair bit of research on solutions to lightweight portable power as I frequently shoot 7 to 10 day trips digitally in backcountry settings. For me weight has been an issue since I end up carrying most of the gear I use. My solution has been the **Solar Roll 14 from Brunton** (www.brunton.com). It's fairly light (under 2 lbs) and works extremely well for its intended uses. However, I must warn it does have its limitations. Bill is correct in that the output of the solar charger has to exceed the input requirements of the device you are trying to charge. Furthermore the chargers are designed to work with devices that have **cigarette chargers** available for them or those in which the supplied adapter fit into (which in my experience was nothing). In tests at home I have tried a **power inverter with the Solar Roll** (as Nikon doesn't make a car adapter for my D2x's MH-21 quick charger) will poor results. Also worth noting is the device will charge on cloudy days but it takes much longer. Therefore my solution and standard set up for multi-day shoots in backcountry locations includes **Brunton's Solar Roll 14, 1-2 Smartdisk Flashtrax** mass storage devices (with a car charger), extra batteries for the Flashtrax to ensure power for cloudy days and spare batteries for my D2x. I am still looking for a way to remotely charge the batteries for my D2x but due to the great battery life 3 spares have kept me going for over 2 weeks of shooting with no problem. I should also note that I have also used the Solar Roll 14 to run/charge my laptop with its car adapter with good luck. Brunton's tech guy did tell me that if I needed more power I could link multiple units together with the included cord. My best piece of advice is that you **thoroughly test whatever system you decide on at home** before you need to rely on it in the field. Specs are great but I found out they aren't always reliable.

John Elk: ...Though the [**Brunton**] solar panels are there the Solo seems to have completely disappeared, with no acknowledgment and no replacement. When going on-the-road I travel with a small Windows **laptop** and 2 80GB **LaCie USB external hard drives** for backup. But for the sake of redundancy I also carry an **80GB Wolverine** (which thankfully I've never had to use; there are lots of other similar devices), sometimes 2 more external hard drives and duplicate chargers and cables for everything. (At some point I decided I did not want to have to deal with a proliferation of disks and to trust multiple hard drive backups instead, so though my computer has a DVD burner I no longer use it). BUT, so far everywhere we've traveled I've been able to get power on a regular basis and have only had to worry about "what ifs"

should we go elsewhere. The only other piece of equipment I have is a small **inverter for the car**, which I got at a discount store somewhere; with it I just use the regular chargers I have for my various pieces of equipment and it seems to work just fine.

Andrew Kornylak: “Most strobe manufacturers offer a “portable” solution, and generally these are DC-powered strobes with rechargeable battery packs. The alternative is a “monolight”, which has a AC-DC converter built into the head and can run off any AC source. I have rented many portable studio strobe systems, including Hensel Porty, Lumedyne, Comet and JTL. Having rented almost every type of portable solution, I decided that **monolights** were the way to go, as I could use them on location and in the studio. I own two **White Lightning “Vagabonds”** which are just big lead-acid batteries bundled with an inverter with a standard 3-prong outlet. Its reliable, 20lbs, and inexpensive. The Alien Bee monolights are also inexpensive and decent. I use **Quantum Turbo batteries for a DC source**, and with the right cable, this will power your digital SLR, small flashes, and even some monolights such as the JTL Mobilite. The Quantum Turbo 2x2 in particular is ultra-reliable, lightweight, and seems to have unlimited charge. I highly recommend it. For image backup in the field, a portable drive like **Epson P-4000 or Nikon Coolwalker** is great, but has limited battery life and its slow, but you can preview/show your images with it. See Harrison’s note below for an excellent no-preview alternative, which claims 2 min per GB transfer speed and 80GB of transfers on one charge(!)... I may just buy one myself! A couple Quantums can power your SLR and flash for a week or weeks, and a good 20-lb portable AC pack such as the Vagabond, **Dynalight** (\$!) or **Profoto** (\$\$!) will supply your AC needs for laptop, charging, etc.”

Harrison Shull: For the in-the-field image backup, in addition to the Epson P-2000 (4000) and Nikon Coolwalker, you might to also consider the Hyperdrive. I just got one and like it. Some advantages: compact size, super-fast file transfer, half the price of a P2000, many HD sizes, uses 4AA NiMH rechargeable batteries (included with unit), the unit works as a NiMH charger, unit comes with cig lighter adapter and nylon case. Biggest disadvantage for some is that there is no screen to review images. I have used it sparingly thus far, but I did a lot of research on it first. More info at:

<http://www.hyperdrive.com/shop/index.php?osCsid=080e60f13e67eb581a46435d39fa376b>

Here’s a comment from the SS message board pertaining to a “real-life” test of the Hyperdrive’s performance....

“I downloaded a card that had 1.3gb of images. With my Lexar (purple) FireWire reader, it took Nikon Transfer 8:30 (with 'add thumbnail' and 'view preview' turned off to make it as fast as possible). PhotoMechanic disk ingest took 6:45. Doing a straight drag and drop in the finder took 5:10.

The CompactDrive (another name for Hyperdrive in Asia) copied the card in 2:30!!! When plugged into the computer, it transferred the same files across in 3:10. It's faster to move the files twice then to use PhotoMechanic or Nikon Transfer.”

Erick Leskinen: There is a article on PDN Online about **Quantum Turbo 2x2 Battery Pack**:

http://www.pdnonline.com/photodistrictnews/reviews/article_display.jsp?vnu_content_id=1000799473

Harrison Shull: Here's some beta [from TOPA member Jef Maion] on opting for digital capture when traveling to remote areas of the world for **expeditionary travel** - <http://www.fredmiranda.com/A19/>

Jef Maion: I wrote this article, and it needs some updating, especially on the camera battery issue: **Li-Ion** battery packs do not seem to be very durable, and it shows painfully in cool conditions. I could not do the same again with the same battery packs, they don't work in the cold anymore, unless if kept in a warm pocket and tethered to the camera. The Canon 1 series' battery packs seem to be much more predictable, although I wouldn't take my series-1 brick above Base Camp.

Yvette Cardozo: I don't know about extreme altitude and packs with multiple batteries but I can vouch for the hardiness of my **Canon Rebel Li-ion battery** with the camera and similar third batteries in 50 below temps. We were south of Churchill, Manitoba one February photographing polar bear cubs. My Canon Rebel, with the 300 IS lens and the 1.4 teleconverter stayed on my tripod for four hours straight while I shot several hundred images ...and we did this several days. I was able to get through the four hours with only one battery change. And yes, I was using the LCD screen heavily. My 20D (which I got after the Churchill shoot) seems to be even better on batteries.

Fima Gelman: "I am using this [**Innovatronix**] portable battery/inverter for my 1200 w power pack with really good results: www.innovatronix.com"

Jack Howard: [on AC adapters for different countries] Almost all rechargeable devices work on variable currents. I brought my iPod, Canon Cameras, and Mac Powerbook to Portugal earlier this year, and was able to charge everything worry-free using the **bathroom outlet and a 3-way power splitter plug-in** (the one that says electric razors only...) because we brought the wrong power adapter. You can also go to stores like Brookstone, Sharper Image, or many luggage-type stores and get a **world adapter kit**, where you are not locked to using the bathroom 2-prong US style outlet, but can plug your rechargers into the adapter and then into any wall outlet in the world, be it 2-round, 3 slant or whatever.

<http://treehouse.ofb.net/guide/voltage/Chile?lang=en> Chile plug info.

<http://treehouse.ofb.net/guide/voltage> World plug database.

Jake Norton: Check out the **I-GO power adaptors** - they are excellent. You can charge multiple items at one time, and need only to buy changeable tips at about \$5-10/each for new devices. Really not a bad deal. You can see it online at <http://www.igo.com/home.asp> or go to **Radio Shack** to see it in person. I just got back from India and used the I-GO to charge laptop, batteries (both camera and AA), PDA, phone, mp3 player, and all the digital things we carry these days. Worked great.

Another good resource for all kinds of info on a wide array of topics on the subject - batteries, portable power, portable storage, wireless, and much more - is the message board at SportsShooter.com. Visit the link below and type in your search parameters.

http://www.sportsshooter.com/message_index.html