SECONDWIND

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TRITON POWER CONSUMPTION FAQ

Q1: Does Triton really only consume 7 Watts?

A: Yes.

Q2: How many days should I expect Triton to operate on batteries?

A: At least 10 days from full charge on Triton's standard two batteries. Triton will internally accommodate two more batteries, for a total of at least 20 days.

Detailed Discussion:

Triton really does consume 7 Watts on average, less than one-tenth of any other commercially available Sodar system. The number includes *everything:* operation, full processing, data acquisition, and satellite communications. Because the Triton's optional heater uses propane, it consumes only a small amount of additional power.
We achieved the low power consumption via numerous design innovations. All electronic components were chosen for low power, and circuits are all exceedingly efficient.

The unheated Triton's *maximum* power consumption can be as high as 50 Watts for very brief periods. However, the *average* power consumption determines how quickly the battery discharges as long as the rate is a small percentage of battery capacity. This is the case for Triton, which comes standard with 2 deep-cycle batteries having the total capacity to provide 7 Watts for at least 10 days without recharging. The batteries may last over 2 weeks under ideal circumstances, but in remote applications it pays to be conservative. And remember that it can take more than one day to fully charge the batteries depending on the hours and intensity of sunlight.

It is relatively easy to verify Triton's power consumption with a handheld digital multimeter, which can measure average ("integrated") load current with high accuracy. It is also possible to estimate both Triton's power consumption and how long the batteries will run by monitoring how quickly the batteries discharge. This can be done with any unit in service by downloading "Operational Data" from SkyServe for spreadsheet processing. Examples of this follow, along with some useful operational information like battery capacity, battery cutoff voltage, etc.

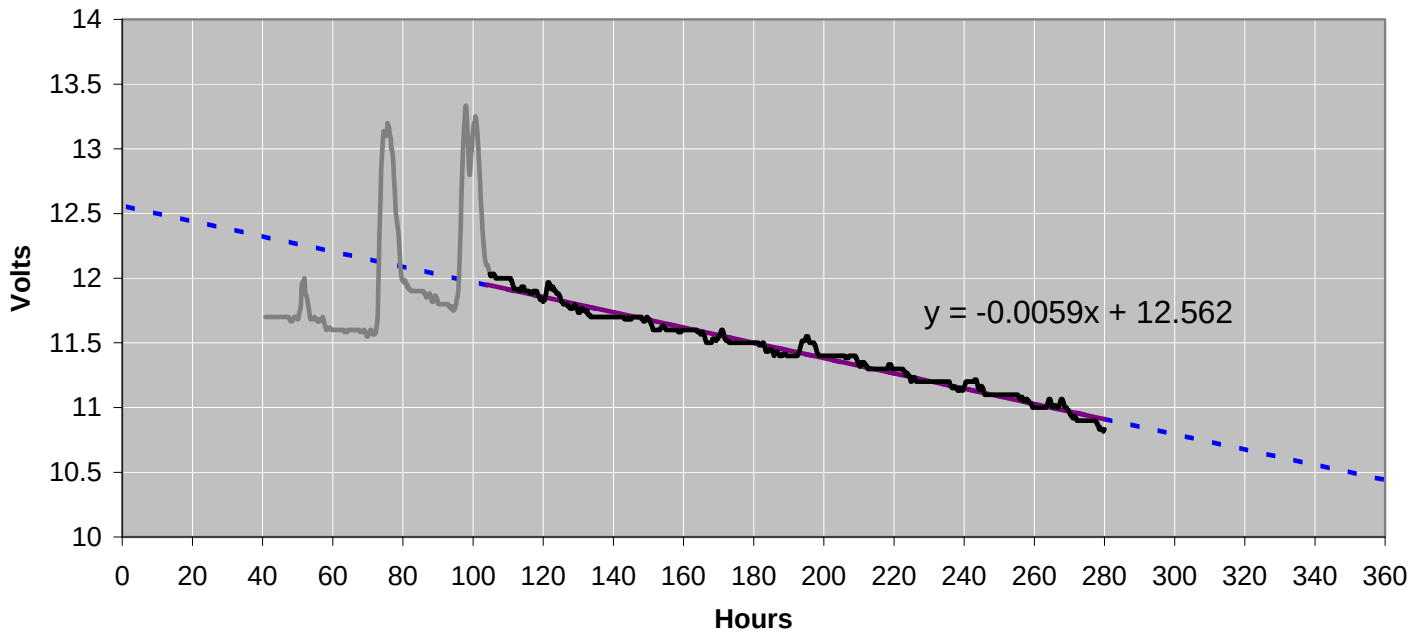
A few caveats about using the latter method are in order:

1. Battery temperature needs to be fairly stable to accurately estimate state of charge from battery voltage. *Rate* of discharge is easier to verify.
2. When the discharge rate is relatively low, it takes a while for the battery voltage to accurately reflect state of charge after the end of a charge cycle. It takes almost a full day in the case of Triton. (See graph 2, following.) The best way to get a good estimate is to examine several days of no recharging. That is, wait for a few days of dense cloud cover. (See graph 1, following.)

Calculations, Measurements, and Constants

Average Temperature	8 C	Battery compartment
Discharge Rate (Volts/Hour)	0.006	See Graph 1
Discharge Rate (Volts/Day)	0.14	
Rated Amp-Hours	184	2 x 92 Amp-Hour Deep Cycle Batteries
Maximum Voltage for Rating	12.5	See Graph 2
Minimum Voltage for Rating	10.5	Also low battery cut-off
Calculated Hours of Operation	333	[Vmax-Vmin]/[Discharge Rate]
Calculated Average Amps	0.55	[Rated Amp-Hours]/[Calculated Hours of Operation]
Calculated Average Watts	**6.63**	[Calculated Average Amps] x [12 Volts (nominal)]

Graph 1: Triton battery discharge with no sun for about one week, with trend line



Graph 2: Triton battery voltage achieving full charge daily