

Power Management in the Field

This guide describes the aspects that have to be taken into account when working in the field where there is no continuous power supply, but where modern technology has to be used.

General Framework:

- Modern field work has to use state-of-the-art technology such as notebooks, CDROM burners, DV cameras, audio recorders etc. Each of these devices is consuming a certain amount of power.
- In regions where there is no continuous power supply the field workers have to find ways to provide the necessary power and they have to be aware of ways to minimize power consumption.

1. General Remarks

Power is what a passive device actually is consuming when it is switched on, in stand-by mode or in operation. Power is also what a generator is able to produce. As a rule of thumb one can say power is voltage times current. Power can be produced by devices like a battery, then we can say that the battery has stored or can produce a certain energy which is the power delivered over time. Generators have to be able to produce more power than the active devices are consuming. All devices come with their own specification for voltage, adapters and connectors – yet there is only little standardization, i.e. each device requires its own treatment wrt power.

2. Power Generation

- Non-rechargeable batteries (NRB) are reliable – but heavy, since you need many of them
 - Lithium NRB offer the best weight/energy ratio (~6 Ah/24 gr)
 - Alkaline NRB are less optimal (~2.5 Ah/24 gr)
- rechargeable batteries (RB) are less reliable
 - differences in behavior, meters are not reliable – so take at least a reserve one
 - Lithium RB are the best choice compared with Nickel-Cadmium and Nickel-Metalhydrid
 - Lithium RB don't have a memory effect, no need for discharging, no self-discharging effect, a better weight/energy ratio (~0.13) compared to NIMH (~0.09) and Ni-Ca (~0.05)
 - however, Lithium RB have a maximum number of re-charging cycles (~300), every re-charging counts – so better don't use batteries when you are connected and don't charge a battery if you can still work a time with it
 - check the state of a battery before leaving
- recharging batteries costs time (full charge of NP-F950 with 32 Wh costs about 3 hours)
- good external rechargers are often more efficient than built-in ones
- solar panels are primary choice for generating power
 - performance depends on light, dust and packaging
 - typical stiff panels with glass: 40 W max, 15-22 V
 - typical enrollable plastic panels: 32 W max, 15-22 V
 - use solar panels only with control circuitry and a RB (car or other special RB)

3. Power Consumption

Dependent on electronic circuitry and usage the power consumption of devices will differ. Some typical values: Cassette recorder = 4 h; DAT recorder = 3 h; MiniDisc = 5 h; 3 DV Camcorder = 1-5 h dependent on the model and the settings

- usage of the LCD when making video recordings requires about 20 % of the power
- normal notebook baseline consumption is about 16 W; with minimal light on screen it is about 23 W and with maximal light it is about 28 W; with a high-load on graphics or CPU circuitry it is about 23 W; when copying from CDROM to hard disc it is about 24 W

So be aware of the effects and don't use features when it is not necessary!