

# Sonic Studios™

## PORTABLE DECK POWERING SOLUTIONS

ALKALINE C & D external battery systems allow for maximized hours-to-days of field recorder powering for least pack size/weight.

These are currently the MOST POWERFUL, RELIABLE, and FASTEST REFRESHING external battery devices available in the world for remote location power!

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<a href="#">MODELS.CHART</a>	<a href="#">KORG.MR-1</a>	<a href="#">DAT.DECK</a>	<a href="#">EDIROL.R-4.R-44.R-4.PRO</a>	<a href="#">FOSTEX.FR2</a>	<a href="#">MICROTRACK</a>	<a href="#">SOUND.DEVICES</a>	<a href="#">TASCAM.HD-P2</a>	<a href="#">MARANTZ</a>	<a href="#">BATTERY.TIPS</a>
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For occasional recording of several hours short running time per day, low capacity AA cells or internal deck rechargeable batteries may work well enough, making economical - environmental good sense.

An alternative power solution is required when recharging deck batteries and/or packing quantities of low capacity AA cells is not practical for field projects.

Extended-time, maximum reliability operation of audio recording devices require practical higher wattage capacity external deck battery solutions for remote recording projects lasting many hours to days.

This is especially true where charger power - recharging time, and rechargeable cell reliability prove problematic for professional recordists.

50-to-270 watt *super* capacity C & D alkaline battery power sleds are way more reliable, have smaller size - weight compared to NiMH or Lithium batteries.

**FYI Recent *fastest electric car speed record* was powered by thousands of *alkaline C cells*!!!**

### MICROTRACK 1 & 2 HIGH EFFICIENCY 4 CELL POWER



BC/BD-MT USB connected power sleds for 20+/ 55+ hours powering of M-Audio's MicroTrack 24/96 compact flash recorder.

Power sleds keep Microtrack's internal lithium battery fully charged while powering the deck's recording.

### THE ALKALINE ADVANTAGE

ALKALINE BATTERY SLED packs *never* need a charger, and are remote-field refreshed with new cells in just minutes.

Compared this to same size, but much lower watt capacity rechargeable packs needing hours of charger-connection time.

ALSO, alkaline cells are very economical for cells can last up to 100 hours operating time, and (as compared to usual 1-2 year lifetime of rechargeable packs), alkaline sled stays field reliable for 10-20 years of rugged field use!



BC-MR4 for 15+ Hrs powering KORG MR-1 HD

BD-MR operates KORG MR-1 for 45+ Hrs.



**BD-8 Ruggedized Power Sled**  
Long Running Power



Deck models often requiring external powering solutions for remote location recording include: [KORG MR-1](#) (~15-45+ Hrs), [M-Audio Microtrack 24/96](#) (20-50+ hrs.), [Edirol R-4, R-4 PRO, R-44](#) (~20-30+ hrs/8 D cells); [Sound Devices 722T, 702, 702T, 744T, and 788T](#) (~20-28+ hrs/12 D cells); [Fostex FR2, FR-2LE](#) (~15-30+ hrs/8 D cells); Marantz PMD-[670/671](#) (~15-30+ hrs/8 D cells); Tascam [HD-P2](#) (~25-30+ hrs/8 D cells)

## Portable Recorder & Preamplifier External Battery Systems Chart

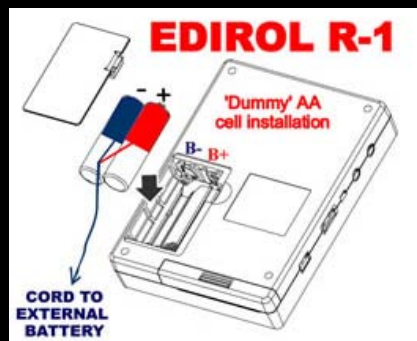
DEVICE MODEL	BATTERY MODEL	*RUN TIME	CASE (Lbs.) w/cells	L x H x D Inches with cells size	Alkaline ONLY	USA \$ PREPAID	<a href="#">Additional Details</a>
MEG / MODEL	Model	HOURS	MASS	DIMENSION	CELLS	Price	
SONY TCD-D3, DENON DTR-80P, CASIO DAR-100	BC	7-10	1.0		6-C	\$80	*NO CARRY CASE
	BD	23-30	2.3	8.5x2.9x1.4"	6-D	\$125	
SONY TCD-D100	BD-1	55+	1.4	15x7x/4cm	4-D	\$90	No Case; Battery Sled Only
SONY PCM-M1	BD-1c		1.5	**5x6.3x3.3"		\$110	**Two case styles available
TEAC / DA-P20, DENON / DTR-100P, CASIO / DA-7	CD	35	3.5	*	6-C + 6-D	\$225	n/a External deck power plug & cord is customer supplied at this time
SOUND DEVICES 702 / 722 / 744T	BD-12T	20-30	4	8.5x2.5x2.5" NO Case, Bare Sled Dimensions	12-D	\$275	Hirose 4-pin DC power plug external deck connection
EDIROL R-4 PRO	BD-8 PRO	20-30	3	*7x2.5x2.5"  Bare sled dimensions only.  Optional \$40 padded cases now available.	8-D	\$225	XLR 4-pin DC power plug external deck connection
EDIROL R-44	BD-8 R44						Molded R/A DC power plug external deck connection
FOSTEX FR2 EDIROL R-4 MARANTZ PMD-670/671	BD-8						Internal dual 2-AA cell 'dummy' to external D cell battery pack: <a href="#">Click</a>
HHB PortaDisc Tascam HD-P2	BD-8PD	15-25				\$250	Internal dual 4-cell 'dummy' connection. External D cell pack:

M-Audio Microtrack I & II	BC-MT	*20+	1.2	7.4x2.6x1.3"	6-C	\$175	USB precision regulated 5 volt power sled, protected ON/OFF slide switch, power/low-battery LED indicator
	BD-MT	*50+	2.5	9.0x3.3x1.5"	6-D	\$250	
	BC-MT4	*18+	0.8	5.5x2.6x1.3"	4-C	\$275	
	BD-MT4	*40+	1.5	6.3x3.3x1.5"	4-D	\$225	
KORG MR-1	BC-MR	*20+	1.2	7.4x2.6x1.3"	6-C	\$175	Precision regulated 5 volt 1 ampere power sled, exact molded right/angle plug, protected ON/OFF slide switch, power/low-battery LED indicator
	BD-MT	*45+	2.5	9.0x3.3x1.5"	6-D	\$250	
	BC-MR4	*15+	0.8	5.5x2.6x1.3"	4-C	\$275	
	BD-MR4	*35+	1.5	6.3x3.3x1.5"	4-D	\$225	
Grace Designs V2	BD-6V2	*25-35	2.3	8.5x2.9x1.4"	6-D	\$225	XLR 4-pin DC power plug preamplifier connection
Grace Designs V2	BD-6V3	*15-25				\$250	Low profile molded R/A power plug connection

\*Run time varies w/deck-preamplifier device operating modes/temperature



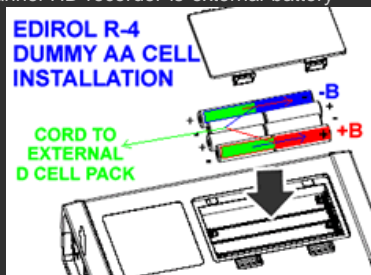
Edirol-Roland R-4, Fostex FR2 (CF)/(HD) models mostly exclude full featured, fail-safe external battery connection to the AC adapter jack, instead requiring internal 'dummy AA cell' connection with small cord leading outside the hatch.



DISCONTINUED R-1 MODEL: FOR EXAMPLE ONLY

NOTE: New Edirol R-4 PRO deck uses secure external 4 pin XLR power plug/cord connection instead of dummy battery method shown at left.

EDIROL-ROLAND R-4 4-channel HD recorder is external battery powered by **BD-8** model's 8 alkaline D type cells using internal deck 'dummy cell' connection shown at right.



Battery compartment connection retains low battery warning feature, also is most secure connected power method that helps avoid recording data loss, or CF damage if power is briefly interrupted.

General Description: DAT deck power plugs are molded right/angle original deck manufacturer type. ALL power cord is extra-flexible 350+ strand 20 gauge 'zip' type for maximum power transfer efficiency.

Power sleds have self resetting thermal safety fusing. All contacts are silver-alloy-welded reliable.

2 YEAR LIMITED WARRANTY ON SYSTEMS & COMPONENTS

MicroTrack 24/96 Versions I & II Lowest Costing, Longest Running Power Sled Models

MT4 USB Power Sleds

- External USB connected power sleds are available in two practical sizes.



\*Red LED power ON indicator works until batteries have less than 20% remaining capacity. Gives many hours of margin before cells require replacement. Deck continues operating on internal fully charged battery when power sled's alkaline cells are finally exhausted.

- Power Sled keeps Microtrack's internal battery fully charged while powering deck
- Sleds use (6) six common C or D alkaline flashlight cells
- Internal precision 5 volt, 600 ma switching regulator
- Protected ON/OFF power slide switch
- LED power on, low battery indicator\*
- 3 foot length molded USB power connector cord with Velcro strap
- Robust nylon cell holders with over-molded ends

BC-MT  
\$175.00 USD

BD-MT  
\$225.00 USD

BD-MT4  
\$225

BC-MT4  
\$275



**BOOST NOTE:** MT4's High Efficiency operating mode delivers OVER 100% rated alkaline cell capacity!!!

MT4 is ALWAYS attempting to power the deck when connected, regardless of boost operating. Boost ON mode provides continuous full power delivery when alkaline cell voltage drops below deck requirements, as is a typical characteristic of alkaline type cells.

MT4 allows exceptional full usage of low cost, high capacity, and highest reliability alkaline cells to power Microtrack decks for exceptionally long times with most compact pack size

All MT4 power sleds use super-high reliability circuitry with full 1000 milliampere output.

MT4 uses a 'military-aerospace quality' switching module that boosts/precision regulates.

With boost switched ON over 100% available alkaline cell capacity allows exceptional long running time using 4 cells.



MT4 Series use 4 cells for reduced size/weight

All MT4 use 'hi-efficiency/hi-rel' 5 volt, 1000 milliampere output boost module





MT4 Series power sleds cost is higher as compared to far less efficient 6 cell models.

THE best choice for professional requirements where smallest size, lowest weight, and exceptionally reliable long running Microtrack deck (or other devices) requiring up to 1 ampere 5 volt USB power.

BD- \$250 Compact, highest power 4 D alkaline cell  
MT4 USD model

BC- \$275 Most compact 4 C Alkaline cell model  
MT4 USD

## BD-6V2/6V3

GRACE Designs Preamp Power Sleds

 <p><b>BD-6V2</b> External Battery Sled for Grace Designs V2 RUNTIME = 30+HOUR www.SonicStudios.com</p>	<p><b>AVOID SHORTS</b> KEEP BD-6V2 DC PLUG AWAY FROM D-CELL TERMINALS</p>
	<p>Replace ALL 6 D Cells with new alkaline type for 30+ hour run time</p>

BD-6V2 has standard XLR-4F power plug with connected shell for activating V2's external power mode

 <p><b>BD-6V3</b> External Battery Sled for Grace Designs V3 RUNTIME = 15+HOUR www.SonicStudios.com</p>	<p><b>AVOID SHORTS</b> KEEP BD-6V3 DC PLUG AWAY FROM D-CELL TERMINALS</p>
	<p>Replace ALL 6 D Cells with new alkaline type for 15+ hour run time</p>

BD-6V3 has exclusive custom molded very low profile locking right/angle power plug.



## BD-6V3(6V2) +140 WATT POWER SLED FOR GRACE DESIGNS V3 (& V2) PORTABLE PREAMPLIFIERS

Super-Rigid/Reliable All-Welded Contacts Sled Keeps Cells Connected/Secure

Over-Molded Ruggedized End Caps



www.sonicstudios.com

## Sony TCD-D100 & PCM-M1 DAT 25-55 Hr. Battery System

The **BD-1** (the 55+ hour D cell battery sled ONLY) is \$90

The **BC-1** (shown at left)

2008 NOTE:

BC-1 MODEL NO LONGER AVAILABLE



**MODEL BD-1C**  
 Uses 4 Alkaline D Cells  
 +55 Hours Recording Time



*(The 4 Alkaline Batteries Shown Are Not Included)*

**Model BC-1C**  
 Uses (4) C Alkaline  
 25 hours of REC



BD-1 Gives 55+ Hours of Recording

**MORE VINTAGE DAT DECK EXTERNAL POWER SOLUTIONS (Models rarely used these days)**

**CD BATTERY SYSTEM**



Dual Battery; (2)...6C/6D Holders ; uses customer supplied N/A AC/Charging Power Cord; 35+ Hours Running time.

**IMPORTANT NOTE:** The dual compartment case (*photo*) IS NO LONGER AVAILABLE. The CD model IS STILL AVAILABLE, BUT WITHOUT THE CARRYING CASE, and the customer needs to supply the unavailable AC adapter-to-deck power cord.

**BC BATTERY SLED**



6C Alkaline Battery System for TCD-D3, DTR-80P, DAR-100 DAT Decks; 7-12 hours running time (varies with model/run mode); NO longer supplied with shown carrying case; (*shown with DTR-80P DAT*); All silver alloy welded (*NO wire crimp connections*) for reliability.

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**TIPS SECTION**

**Most Portable Decks Run on Four Battery Types**



**Some Simple Facts** about rechargeable NiCAD/NiMH, Sealed Lead/Acid, Lithium Ion, & Disposable Alkaline, Lithium, OXY-Nickel) deck batteries

+ Maintenance TIPS For Best Chance of Reliable Service

**RECHARGEABLE BATTERY INFORMATION FOR ELECTRIC VEHICLES, BUT DIY USEFUL**

(If too much information, please click [HERE](#) general recorder battery tips section)

**ELECTRIC VEHICLE BATTERY GLOSSARY  
 AEC-Q100 STANDARD**

The AEC-Q100 standard includes customer specific requirements (CSR). ISO/TS-16949. It is an international standards Automotive Quality Systems technical specification. It defines the purpose of establishing common part-qualification and quality-system standards for automotive components. It contains detailed qualification and re-qualification requirements, and includes unique test methods and guidelines for the use of generic data.

Components meeting these specifications are suitable for use in the harsh automotive environment without additional component level qualification testing.

#### BATTERY PROTECTION

Battery protection and monitoring are a necessity with Li-ion battery packs. At the higher operating voltages experienced in electric vehicles, an overvoltage can be catastrophic. Although the quality of battery fabrication has improved, guarding against higher temperature and fault conditions in any automotive application remains crucial for reliable operation.

#### BATTERY STACKS

For electric vehicle transportation applications they can typically involve hundreds of cells, providing several hundred volts. Although these stacks are inherently dangerous, they must still communicate with the cell monitoring electronics, which are usually located within the battery enclosure. Thus, the communications method must be safe and reliable.

#### C20, C6, C1, ETC

An expression describing rate of discharge. The number indicates the number of hours to completely discharge the battery at a constant current. So C/20 is the current draw at which the battery will last for 20 hours, C/1 is the current at which the battery will last 1 hour. The useful capacity of a battery changes depending on the discharge rate, so battery capacities are stated with respect to a particular rate. For instance, a battery is rated at 42 Ah (ampere-hours) at the C/10 rate of 4.2A, but only 30 Ah at the C/1 rate of 30A.

#### COLD CRANKING AMPS

A performance rating for automobile starting batteries. It is defined as the current that the battery can deliver for 30 seconds and maintain a terminal voltage greater than or equal to 1.20 V per cell, at 0°F (-18°C), when the battery is new and fully charged. Starting batteries may also be rated for Cranking Amps, which is the same thing but at a temperature of 32°F (0°C).

#### CYCLE LIFE

How many charge/discharge cycles the battery can endure before it loses its ability to hold a useful charge. Cycle life typically depends on the depth of discharge (DOD). For example, if a hypothetical battery pack will propel your car for a maximum range of 100 miles, and you drive 50 miles between charges, (50% DOD) then you may get 600 trips before replacing the pack; but if you drove 80 miles between charges, you might only get 400 trips before the pack wears out.

#### DEPTH OF DISCHARGE

The amount of energy that has been removed from a battery (or battery pack). Usually expressed as a percentage of the total capacity of the battery. For example, 50% depth of discharge means that half of the energy in the battery has been used. 80% DOD means that 80% of the energy has been discharged, so the battery now holds only 20% of its full charge.

#### DIGITAL ISOLATOR

Digital isolators provide isolation so that the high voltage output from an EV battery can be monitored at a lower voltage.

#### ELECTRIC VEHICLES

This can refer to a vehicle that employs only batteries (EV) that are rechargeable, or a hybrid electric vehicle (HEV) that uses a car's internal small gasoline engine to recharge the battery, or a plug-in hybrid vehicle (PHEV) that can be recharged from a power line or from a car's internal gasoline engine.

#### ENERGY DENSITY

The amount of energy that can be contained in a specific quantity of the fuel source. Typically quoted in watt-hours per pound, wh/lb, or watt-hours per kilogram, wh/kg. Battery technologies such as NiMH and li-ion are in the 80-135 wh/kg range.

### LEAD ACID/LITHIUM ENERGY DENSITY RELATED INFO

PARAMETER	SLA	Li-ion	Li-ion
Configuration	6S-2P	4S-4P	3S-6P
Volume (l)	1.85	0.34	0.38
Weight (kg)	4.94	0.67	0.76
Thickness (cm)	6.5	3.4	3.4
Voltage Range (V)	10.5 to 13.7	11.0 to 16.8	8.25 to 12.6
Run Time at 12W (hrs:min)	7:12	6:30	7:18
Run Time at 14W (hrs:min)	6:06	5:34	6:15
Run Time at 16W (hrs:min)	5:15	4:52	5:28

#### LITHIUM-ION (LI-ION)

A type of rechargeable battery in which lithium ions move from the negative electrode to the positive electrode during discharge, and reversely when charged. Different types of lithium-ion batteries use different chemistries and have different characteristics. The typical output voltage of a Li-ion battery is 4.0V.

#### LITHIUM-ION POLYMER (LI-POL)

Rechargeable batteries (secondary cell batteries). Normally these batteries consist of several identical secondary cells in parallel to increase the discharge current capability.

#### NICKEL CADMIUM

Newer rechargeable technologies, such as nickel-metal hydride (NiMH) have mostly replaced NiCad, because they have better energy characteristics and don't contain toxic cadmium, a carcinogen. The battery has a nickel-hydroxide cathode, a cadmium anode, and aqueous potassium hydroxide electrolyte. Average battery output is about 1.3 V.

#### NICKEL METAL HYDRIDE

NiMH batteries are common in laptop computers and cellular phones. NiMH is similar to nickel-cadmium but uses a metal hydride anode; a variety of metal alloys are used. Average battery output is about 1.3 V. These batteries are also used in electric cars, like the Toyota Prius.

#### RESERVE CAPACITY

A performance rating for automobile starting batteries, it is the number of minutes at which the battery can be discharged at 25 A and maintain a terminal voltage higher than 1.75 V/cell, on a new, fully charged battery at 80° F (27°C).

#### SLI BATTERY (Lead/Acid type)

Starting, Lighting, and Ignition battery, a battery designed for use in a conventional gasoline automobile. An SLI battery is designed to give a lot of current during starting, but then to be recharged immediately by the car's alternator. Electric cars usually have a portion of the total battery capacity set aside for SLI use.

#### STATE OF CHARGE

The amount of electrical charge in the battery, expressed as a percentage of the difference between the fully-charged and fully-discharged states.

#### TRACTION BATTERY

A battery designed to be used to provide the power to move a vehicle, e.g. to be used in an electric car. An electric car can have a battery pack consisting of 100 Li-ion cells.

## RECHARGEABLE SECONDARY CELLS

### [NiCAD & NiMH](#)

### [CHARGERS CHARGING](#)

### [Sealed Lead/Acid](#)

### [Lithium Secondary](#)

### [Standard Alkaline](#)

### [L91 Photo Lithium](#)

### [OXY-NICKEL](#)

## PRIMARY AA BATTERY INFO

### NiCAD AND NiMH AA CELLS

NiCAD & NiMH batteries are often less reliable with unexpected loss of capacity, especially IF NOT properly maintained.

Nickel-Cadmium (NiCAD or NiCD) batteries need charging just before use, and mostly run NiCAD down to having 50% capacity *before* storage (avoiding fast self-discharge/memory effects).

This is seems a handicap because of additional deck time running down NiCAD cells before being stored.

NiCAD batteries used in this manner can last 300 to over 600 FULL discharge/charge cycles.

In contrast, Nickel-Metal-Hydride (NiMH) batteries (*were supplied with Sony TCD-D100 & M1 decks*), while not needing discharging before storing (*have little or no memory effect*), may need running down to at least 50% before

recharging to avoid the potential for overcharging damage by poorly designed chargers, especially those unable to charge single cells, requiring instead having two or more cells charged at the same time.

NOTE: Most of the newer chargers are designed to avoid NiCAD cell memory and overcharging automatically, but most of these still don't JUST run down NiCAD (as is not needed with memory-free NiMH) for storage or before recharging again.

Be most careful with NiMH battery types as they are much more easily damaged by an overcharge than NiCad types.

Good practice is mostly run NiMH batteries down (at least 50%) before another charge cycle; even though the charger is designed to protect against this type of damage.

Avoid using 'overnight type chargers' even if having a timer as it's very easy to forget when to remove cells, and a brief power outage may initiate another damaging charge cycle.

Although it seems a good idea to remove the cells shortly after the 'Fast-Charge' Ready Light indicates charge completion, this is not really necessary as cell(s) can be damaged if (and only if) the charger power is turned Off & On, initiating another FAST charge cycle, or the charger-to-cell contact is momentarily disrupted (by playing with the cells while in the charger) to cause another FAST charge cycle to start up.

In other words, an immediate fast charge startup on already charged cells will be specially BAD for the newer NiMH types as they (unlike NiCAD) have far less ability to resist damage from being overcharged BUT, are not going to be the least damaged by leaving on a "fast charger" (after FAST charge light is off) for a few more hours.

HOWEVER, and this is the tricky part to remember, NiMH type cells are NOT FULLY CHARGED as yet when the FAST charger light goes off!!!

It takes another 2-5 hours of TRICKLE CHARGING to bring the cells to 100% fully charged capacity! Leaving the charger input power and cell contact undisturbed for an additional trickle charge period is very important to get full service from most NiCD and all NiMH batteries when using FAST (1-2 hour) and newest extremely fast 15-30 minute type chargers.

EVEN WHEN leaving the cells and power undisturbed ALL NIGHT LONG (trickle) charging is not likely to damage cells on well designed FAST chargers! BUT, and this part is important, IF your MAINS power goes out and THEN BACK ON AGAIN during the night, ZAP & Burn goes your NiMH cell capacity (possibly) with poorly designed chargers.

Perhaps plugging the battery charger into a computer UPS AC protected socket, where power is never interrupted long enough to start up a damaging charge cycle, is the best suggestion for having no concern about risking overcharging damage.

SONY DAT : LATE MODEL Sony TCD-D100 and PCM-M1 decks CANNOT be satisfactorily run ON OTHER THAN (2) AA size NiMH cells or Non-rechargeable ENERGIZER brand L91\* photo lithium cells (\*L91s exhaust giving little or no 'low battery' warning so go by minimum expected running hours for your deck model)

RECHARGEABLE BATTERY SETS: Buy several backup battery sets and NUMBER each cell so that you can keep track of sets you've used (that need charging) and ones (that should be fully charged) ready to be used.

Standby cell charge retention (storage) life is variable (4-14 days) before expected working capacity is noticeably reduced; this is ambient storage temperature and cell manufacturer dependent; NiMH self-discharge seems a bit quicker than most NiCD

The GOOD NEWS is that NiMH cells can be stored in any (charged or discharged) state without affecting cell capacity.

NiCD cells should always be stored nearly fully discharge to avoid memory effects typical of this type of cell chemistry.

CAPACITY: Maximum available capacity for AA NiMH cell is now at ~2800 milliampers (MA) capacity; new pocket size Ediol, Sony, and Olympus flash memory model record times is ~6-10 hours using these premium capacity cells

CHOOSING A FAST CHARGER: Important feature consideration with choosing a fast charger.

There are many fast chargers available these days, BUT SOME ONLY looking at PAIRS of AA cells. These chargers have ONE LED indicator for each 2-pair of cells.

This assumes each cell in the pair is IDENTICAL in state of discharge, and charge characteristics. Usually cells purchased in 'sets' of 2 or 4 cells are very nearly identical and should have been produced at the same time from the same production run, so using such cells in 'matched sets' and charging in chargers that can only 'see pairs' of cells is not a big issue.

However, if ever you're matched sets get mixed with other cells, or one cell in a set ages differently from its mate, the charger will overcharge one cell, and under charge the other greatly shortening the reliability and life of the cells.

This results in having cells that fall short of giving expected recording time. Usually when this occurs, ALL the cells used in mismatched sets need be tossed for new sets, or keep used for less critical applications where running short of expected capacity is not an issue.

Suggest best type of charger looks at EACH CELL, not just pairs of cells. This type of charger will have a status light for EACH CELL placed into the charger and will charge correctly any combination of cells from a single

cell to a full 4 or more cells placed into the charger with NEEDED precision regardless of cell's history and state of charge.

Individual cell monitoring type of charger costs a little more, but insures fullest cell capacity and charge cycle life, and is worth paying twice the cost if necessary for having this ability.

## Sealed Lead/Acid are reliable, easily maintained, but heavy, & best for 50% duty

Sealed Lead/Acid (prismatic types) were used in few very early short running-time DAT decks.

Not recently found in any portable, but merits of good reliability, low cost, >15 ampere capacity, and connect-up-and-forget-chargers gives good reason to consider L/A when high carry weight is not a show stopping issue.

L/A batteries have no memory effect, like to be stored fully charged, and routinely run only 50% down.

This means that a L/A battery that might actually, if pushed, run a recorder for 10 hours before 95% exhaustion, should be recharged after only 5-6 hours of use, allowing a maximum of 1000 service cycles; routine heavy duty discharge of 60-100% will shorten life to 200-400 cycles.

Battery life is defined when 80% battery capacity remains.

Sealed Lead/Acid Battery if rarely run down over 50% and kept stored with full charge using a good 2 or 3 stage charger (best when always connected) should last 5-10 years!

Used and maintained as recommended, the sealed Lead/Acid batteries are ready at full 100% capacity the next day or year!

## Lithium Ion rechargeables have high power capacity to weight ratio

Some early to recent miniDISC decks use a single 'gum stick' prismatic Lithium Ion battery. These are (1) cell 3.2 to 4.2 volt batteries giving MD decks long running powering. Some recent compact Flash Recorders also use this same 1 Lithium cell approach for small battery size and light weight advantage, but modest run times on current flash decks with internal lithium cell are barely acceptable.

While past miniDISC decks mostly allowed user battery replacement, lately most MD decks, and most all the Flash decks have 'NOT user replaceable' lithium cell feature. These battery types degrade to less than 80% capacity in 1-3 years depending on use and storage conditions.

Suggestion: For longest service life, store all lithium battery packs and decks with internal lithium batteries with battery at <50% remaining capacity. Recent article states that capacity loss in storage is greatly reduced with NOT storing these at full or near full charge.

Yearly loss of storage capacity with always fully charge cells is as much as

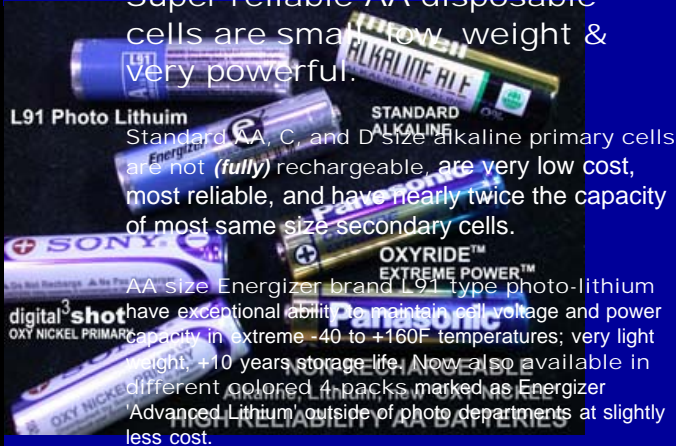
30-40% per year of storage. Batteries stored at <40% charge loose much less capacity (<4-8% per year) while stored.

So best case for Lithium Ion battery is being used down to 30-40% remaining capacity, and stored in this condition until needed, and then fully recharged just before using. Used in this manner, cell life to 80% capacity may extend to as much as 5 years.

## NON-RECHARGEABLE (*DISPOSABLE, PRIMARY*) BATTERIES

# Alkaline, OXY-Nickel, & Lithium Primary Batteries

Super reliable AA disposable cells are small, light weight & very powerful.



L91 Photo Lithium Standard AA, C, and D size alkaline primary cells are not (*fully*) rechargeable, are very low cost, most reliable, and have nearly twice the capacity of most same size secondary cells.

AA size Energizer brand L91 type photo-lithium have exceptional ability to maintain cell voltage and power capacity in extreme -40 to +160F temperatures; very light weight; +10 years storage life. Now also available in different colored 4-packs marked as Energizer 'Advanced Lithium' outside of photo departments at slightly less cost.

New OXY-Nickel, only available in AA size primary cells, are improved over standard alkaline with excellent ability to start at, and maintain higher cell voltage at lower cell resistance for better power delivery than regular Alkaline cells. Double the cost of standard alkaline.

Many compact flash decks offer easy 2-8+ hours powering using sets of 2-8 AA cells (either alkaline primary or NiMH rechargeable secondary types). However, **ONLY** the flash decks using just 2 AA cells are most practical for getting adequate 4-10+ hours running times; depending on type of AA cell used. Medium size flash decks using 8 AA cells for just 2 hours running time are **NOT** very economical or practical, and often require use of external long running battery solution.

For most reliable, and easy to use external battery solution for over 10 hours use purposes, consider an external [battery pack](#) of Alkaline C or D primary cells for 15-60+ hours run time ability, making practical worldwide remote projects where long running time, small size/light weight, and maximum reliability are most important requirements.

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DSM™ Patented Stereo-Surround Microphone Technology

Passive DSM™ Mic Powering/Bass Filters



**DSM Stereo Mic**

Eye-gear/Headband/HRTF Baffle mountable matched omni mics



**DSM MIC+WHB/N FOR INSIDE/OUTSIDE SOUND RECORDING**

Stops wind blast noise; transparent acoustic design; records real wind sounds

**4 Channel Surround DSM™ Microphone System**  
Headworn or HRTF LiteGUY Baffle Mounted



1 (Front Left) 2 (Front Right) 3 (Back Left) 4 (Back Right)



**PA-10XP DSM Mic Powering Adapter**  
(for MicroTrack 24/96)

miniXLR Input (option)

for MD, DAT, CF, HD, and Video Field/Event/Studio Recording

**Battery Powered-Portable Mic Preamplifiers**

High-definition, low noise, very wide bandwidth preamp designs to fit any field/event/studio application using DSM™ stereo-surround mics.



**HRTF RECORDING**

Stereo-Surround Omni Mic Baffle for Stand, Fishpole, Studio Boom, and Ceiling



**MONO ONLY 'Lombardo' Lapel Mic** for interview, Narration, Lecture, and clip-on acoustic instrument Recording



**LitGUY HRTF Mic Baffle**  
(shown w/optional Windscreen)

**RECORDING ACCESSORIES**



Patch/Adapter Cables



20+ hours using 6 C alkaline cells  
50+ hours using 6 D alkaline cells

Portable Deck Power Solutions

BD-8 Ruggedized Power Sled



Long Running Power for Edinol R-4, Fostex FR2, Marantz 670/671



Short cord + included extension

Field/Studio Monitoring Headphones, Reviews

**DSM™ Magazine Reviews**



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