

AN150

Using batteries in AEA Technology Equipment

Written by Bill Ashley for
AEA Technology Inc.

Abstract:

AEA Technology's equipment operates from either wall power packs or 8 AA batteries. This paper discusses the use of batteries in AEA Technology equipment and how to squeeze the most from a set of batteries.

General

Battery types:

Since AEA Technology equipment uses 8 standard size AA batteries, there are multiple options available in the choice of batteries: Alkaline, NiMH, or NiCd. Sealed Lead Acid (SLA) or Starved Gel (SG) batteries with a 12-14 volt output are usable as an external power source.

Alkaline Batteries:

A set of alkaline batteries will run longer than a NiCd types (on a single charge), but must be replaced after discharging. Alkaline batteries cost the most over the long run, but make a good stop gap solution when you are on the road and have forgotten to recharge your NiMH or NiCdNiCd set. Most convenience stores stock alkaline cells, plus newly purchased NiCd batteries may not have a full charge.

Using alkaline batteries in AEA equipment may result in a gradual display contrast shift caused by heat buildup in the unit. If alkaline cells are used on a consistent basis, try these solutions:

1. Set the "Battery Saver" time out to reduce power consumption when not in use.
2. Preset the contrast to a somewhat light setting, this will give a longer time before the display darkens to a re-adjustment level.
3. Reduce the backlight intensity to a lower level. The backlight's heat can be useful to operate in colder temperatures, but it can darken contrast at room temperature and warmer environments.
4. Use NiMH batteries instead. While NiMH batteries may have less capacity, they have a lower and very flat resistance (approx ½ Ohm), so the power loss in the batteries improves significantly. With NiMH batteries, the total power in the case is less than 4W for the entire battery life. NiMH batteries "hit the wall" rather suddenly compared with alkalines. The flatter resistance curve may even allow the 2000maHr NiMH batteries to outlast the 3500maHr alkaline batteries.

NiMH:

NiMH offer the most advantages compared to NiCad or Alkaline. When properly recharged they last for over 500 cycles thus the costs over the long haul are very inexpensive. Unlike NiCads they do not lose capacity (burn time) when recharged early in fact they last longer when recharged prior to full discharge.

One drawback of NiMH: you must use a recharger specifically designed for NiMH or the batteries will suffer damage long before 500 cycles. Do not attempt to recharge NiMH unless the temperature lies between 10 to 50 degrees C. Do not attempt to recharge batteries that show signs of outgassing (gunky residue near anode).

The second NiMH drawback: They should not be fully discharged. When a NiMH cell fully discharges cell voltage reversal occurs and continued discharging eventually causes outgassing. Higher quality rechargers will revive these cells (that have not yet outgassed) by starting off with a low precharge current. Cheap rechargers may damage these cells. Batteries that show signs of outgassing should be replaced. Most battery authorities recommend replacing all the batteries as a set many rechargers operate best when all the cells are similar.

NiCad:

NiCad is less popular now that NiMH is available. NiCads are rechargeable in a NiMH charger but not vice versa. NiCads lifetimes are shorter and they require a full discharge prior to recharging or a loss of capacity occurs. Do not over charge overcharging NiCads result in outgassing. Allow NiCads to cool off prior to recharging.

Sealed Lead Acid (SLA):

This type of battery will not fit into the internal compartments so an external power cord will need to be made. SLA batteries (or car batteries) are advantageous when operating in high magnetic field or when you are powering off of your automobile. You must use a SLA recharger for this battery. The required voltage for external batteries on AEA Technology units is 12 to 14 volts.

Battery Tips:

Reduce backlight Intensity. **The brighter the Backlight the more power is consumed.**

Use the Backlight timer. **Set the timer to 10 or 0 sweeps the power consumption drops when the timer turns off the backlight. Pressing Enter (or any other key) activates the backlight for another interval.**

Turn the battery saver on **The battery saver turns the unit off after approximately 5 minutes of inactivity. If you press any key prior to auto shutdown the timer will reset.**

Remove Batteries prior to long period of inactivity. This will prevent the mess caused from leaking batteries.

Always use a recharger that matches the battery. Do not attempt to recharge alkalines.

Typical Current Draw:

Model	Name	Function	Current (ma)	With Backlight	Eternal Battery
5015000	IA	ector 50	NA		
5005001	1055	SR 00	NA		
0105000	Cellmate	SR 00	5		
01500	Bravo	Network	0000		Add 15 ma
015500		Analysr			
005000	TDR	TDR 10	15		

