Discount Two-Way Radio
EST 1997
WE KNOW RADIOS, SO YOU DON'T HAVE TO!

Guidebook Series

The Complete Guide to

Battery Maintenance

Last longer and keep your signal strong!

A Quick Look at Battery Technology

The four most common types of rechargeable batteries include **Nickel-Cadmium (NiCad), Nickel Metal Hydride battery (NiMH)**, L**ithium-Ion battery (Li-ion)**, and **Lithium-Ion Polymer battery (LiPo)**. To better understand how batteries work, let's take a quick look at these common battery types.

1. Nickel-Cadmium Batteries (NiCad)

For many years, Nickel-Cadmium batteries were almost the exclusive battery for 2-way radios. The reason was that they are very robust batteries and, in some cases, provided up to 60 percent higher capacity than other batteries. These batteries are also very rugged and work well in harsh environments, like super-hot or super cold locations. On the downside, they have a charging problem called the "memory effect" which means that unless the battery is full discharged before being recharged, it will only remember the previous energy delivered, and will not give more. Also, Cadmium is toxic, and cannot be disposed of in landfills. Because NiCd batteries need to be replaced often, the cost of keeping your charging capacity at full level can be more expensive that the original price of the walkie-talkie.

2. Nickel Metal Hydride Batteries (NiMH)

NiMH batteries can provide up to 40% higher capacity than NiCad batteries, and they are less susceptible to "memory effect". In addition, the NiMH batteries are more environmentally friendly and not subject to storage or regulatory controls. However, the NiMH batteries are harder to charge, much heavier, and have one of the highest self-discharge rates of any other battery type.

3. Lithium-Ion Batteries (Li-ion)

Lithium-Ion batteries have enormous energy density, typically twice that of the common nickel-cadmium battery. They are also an incredibly low maintenance battery; a trait other battery cannot make. Li-Ion batteries also do not have the memory effect that NiCad batteries do, and they their self-discharge is less than half that of nickel-based batteries. Finally, Li-Ion batteries are environmentally safer to dispose of, and they can handle heavy input and output voltage, making it ideal for use in two-way radios. Unfortunately, Li-Ion batteries are more expensive – typically more than 40 percent pricier that NiCad and NiMH batteries.

4. Lithium-Ion Polymer (Li-Po)

Lithium-Ion Polymer batteries are considered a "next generation" battery technology because they use a dry, solid polymer electrolyte instead of a liquid electrolyte. Lithium-Ion Polymer batteries provide higher specific energy than other lithium battery types and are lighter in weight. Lithium-Ion Polymer batteries can provide up to 24 hours of battery life per charge in a typical charging cycle. Unfortunately, they have poor conductivity and cannot deliver the needed power modern devices or computing equipment need. These batteries also can heat up to 140 degrees or higher, making them unsuitable for common uses. However, scientists are making constant improvements to this battery class.

Types of RCA Two-Way Radio Battery Charging Methods

To keep two-way radios charged, there are three charging methods that can be used, including a **microUSB cable**, **a single unit charger**, and **multi-unit charger.**

MicroUSB Cable:
The RCA1520 DMR radios have a MicroUSB port that enables the radio to be charged through a USB cable connected to the AC power adapter that comes with the radio. Allow at least six hours to fully charge the radio battery.

Single-Unit Charger:
Nearly all RCA portable two-way radios use a single-unit cup charger. The cup allows the radio to sit inside and connect the electrical contacts of the radio with those inside the cup charger. The charger is powered by an AC power adapter that plugs into a 110 AC outlet. Single-unit chargers provide rapid charging and can fully charge the battery in as little as three hours. The charger will provide a full charge for the first 85% of the charge, and then provide a slow "trickle" charge for the remaining 15%. This prevents overcharging the battery, which will shorten the life of the battery.

Multi-Unit Charger:
Multi-unit chargers, also called "bank chargers", work the same way as single-unit chargers, and can simultaneously charge up to six radios. Six bank chargers work well when you want to interchange two or more fleets of radios over the course of a working week. Employ the fully charged radios at the beginning of the day and place another fleet of radios in the charging bank for charging throughout the day. The next day, simply repeat the process and you will always have fully charged batteries.

Tips for Extending the Life of Your Two-Way Batteries

There are many ways you can help your batteries last longer. Here are five simple tips you can use to improve the life of your 2-way radio batteries.

- **Initialize Your Batteries:** When charging your battery for the first time, make sure you leave it in the charger for up to 12 hours. This is known as "initializing" your battery and it will help you get the longest life from your battery.
- **Keep Contact Points Clean and Dry:** Keep the contacts clean and dry on both the radio and the chargers. This will make sure your battery will not short out and will also improve the speed of the charging process. Try some paper towels with a little rubbing alcohol.
- **Avoid Extreme Temperatures:** Always protect your battery from heat including direct sunlight or flames. Batteries should be kept and charged in a cool, dry environment. Try to keep your batteries away from extreme cold temperatures like inside of a car in the winter.
- **Don't Overcharge Your Batteries:** Overcharging your radio can also reduce battery life. Charge only when necessary to maximize the life of your batteries. A charge is recommended once the battery is down to 10% or 20% of its capacity. When the radio begins to beep, this is often an alert that the battery needs charging. Once completed, remove your batteries from the charger. Also, using the charging station as a battery stand will ultimately shorten the life cycle of your batteries.
- **Don't Leave Your Battery in the Charger:** Don't use your charger as a stand!! Many desks With chargers use the charger as a stand do not use your charger as a stand pull it out in the beginning of the day turn it on turn it off at the end of the day and put it back in the charger.

Nickel-Cadmium Two-Way Radio Batteries (NiCd)	
Advantages	• Robust • High Charging Capacity • Works Well in Super Cold and/or Super-Hot Environments • Affordable
Disadvantages	• Memory Effect • Cadmium is Toxic • Impossible to Discard in Normal Ways • Need to be Constantly Replaced
Nickel Metal Hydride Batteries (NiMH)	
Advantages	• Provides 30-40% Higher Charging Capacity than NiCd • Less Susceptible to Memory Effect • More Environmentally Friendly • Not Subject to Storage Controls
Disadvantages	• More difficult to charge than NiCd Batteries • Much Heavier • High Self-Discharge Rage • Need to be Regularly Replaced
Lithium-Ion Batteries	
Advantages	• Super Energy Density • Highly Reliable • No Memory Effect • Environmentally Safe • Longer Charging Capacity
Disadvantages	• More Expensive to Manufacture • Subject to Aging – Even When Not Being Used • Transportation Restrictions for Large Quantities
Lithium-Ion Polymer Batteries	
Advantages	• Very Low Profile (thickness of Credit Card is Possible) • Extremely Lightweight • Flexible Form Factor
Disadvantages	• Lower Energy Density Compared to (Li-Ion) Batteries • Expensive to Manufacture • No Standard Form Design

Make Sure to Ask for A RCA High-Capacity Lithium Ion Battery

The last thing you need is for your radio battery to die when you need your radio most. Stop worrying about battery life, and get high-quality radio batteries from Discount Two-Way radio today! Discount Two-Way Radio buys direct from the factory, so you get the best, longest lasting radio batteries on the market at the best prices. We carry a wide variety of batteries for many different types of radios, promising that you'll find something for your needs, no matter your radio brand or type. Discount Two-Way Radio almost exclusively uses Lithium-ion batteries that charge quickly, maintain their charge, and have as slim a profile as possible. In addition to the excellent energy-to-weight ratio,

The RCA B433LI Battery

For example the RCA B4335LI battery is a super charger, able to last up to 25-plus hours!!

Or the RCA B4530LI battery that has an ultra-high capacity, a one year warranty, and up to 22 hours of charging power.

Understanding the Battery Charging Cycle

A charging cycle for any battery is the defined as the daily usage and recharging of the battery. Many people refer to this as the “5-5-90 cycle” which means 5 percent of the radio’s usage is spent transmitting, another 5 percent receiving, and 90 percent is sitting idle. All batteries have a limited lifespan or charging cycle. This concept is important because most batteries are judged by how long their charging cycle is.

Generally speaking, most Lithium-ion radio batteries will provide enough charging life to last approximately 18 to 24 months, depending on how the radio is used and charged. Another advantage of batteries with longer charging cycle is that they will also provide a longer shift, and therefore don’t have to be recharged as often, which also extends the battery life.

Always select high-quality, long lasting batteries for your two-way radios.

RCA Communications Systems

Why Digital Radios Get Better Battery Performance

When your radio is in standby mode, both digital and analog radios use about the same amount power. However, once they start transmitting, digital radios use drastically less battery power. The reason is because analog signals transmit as a constant wave which eats more of your battery power. Conversely, digital signals travel in intermittent digital “packets” which means the radio is not using power consistently. This will make a digital radio battery last up to 40% longer. And longer battery life will keep your communications channels open and productivity at its maximum.

Why First Responders Choose RCA Professional Two-Way Radio Batteries

Two-way radio technology is critically important to businesses, organizations, and schools. But, for our first responders batteries are a critical lifeline. Loss of power or weak battery life can have serious implications. Imagine police radio batteries going dead while responding to a dangerous situation or EMS communications losing power as they are trying to find an injured person. It is important for emergency personnel to understand the battery life cycle and to have the very best professional two-way radio batteries.