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## Care and Feeding of Wireless Microphones

Today's wireless microphones are very different from the early wireless microphones. At first wireless microphones used to be very temperamental and expensive; now they are reliable and affordable. However, if you expect to get a long and trouble-free life from your wireless microphone, you must still take care of it. The four basic things to monitor are: the batteries, the lavalier or headworn microphone and its cable, frequency selection and antenna location.

### Batteries

Batteries are extremely important for reliable operation (Figure 1). If the battery voltage is too low, the wireless system is more susceptible to pops, fizzes, distortions, or other strange noises.

The key is to have fresh batteries. However, buying a new battery doesn't guarantee it's good. Always check your battery with a battery tester if you want to avoid a nasty surprise. For long battery life, use an alkaline battery. The new lithium types can give an even longer life.



Figure 1 9-volt rechargeable batteries

If you want the convenience of rechargeable batteries, there are several types from which to choose. For a long time the standard rechargeable was the Ni-Cad. Then the nickel metal hydrid or Ni-MH was a welcome improvement. Now there's also Li-Poly (lithium polymer). It has 500 mAh (Milliampere-hour) compared to Ni-MH's 200 mAh. MAh is a measurement of a battery's total capacity. The larger the number, the longer the battery life.

Continued from page 1

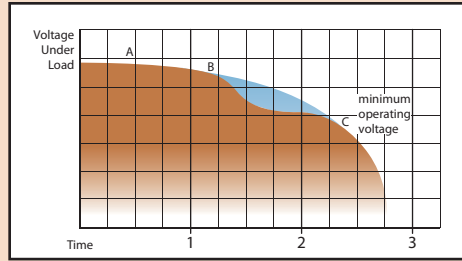


Figure 2 Ni-Cad memory

One thing to look for in a rechargeable battery is the proper voltage output. If your wireless microphone uses 9-volt batteries, it is naturally designed to use a voltage that is close to nine volts. However, many Ni-Cad batteries that are labeled nine volt are actually only 7.2 volts (six cell). This is not adequate voltage for long, interference-free life. You must use an 8.4-volt (seven cell) Ni-Cad battery.

Ni-Cad batteries can also develop a condition called Ni-Cad memory (See Figure 2). This occurs when the battery is only discharged to the same point (B) each time and then charged back up (A). After a while, the Ni-Cad battery won't deliver any more life than it was conditioned to provide (point B in Figure 2). The best way to prevent this memory is to occasionally discharge the battery to point C. This could be done after about 20-30 short discharges. Better rechargeable batteries are the Ni-MH and the Li-Poly. These batteries give longer life and do not have the memory problems.

NOTE: It is not wise to discharge a rechargeable battery to a dead state. This may permanently damage the battery.

### Microphone and Cables

Next to bad batteries, the cables on the lavalier and headworn microphones are often a source of problems. There are several things you can do to ensure a long cable life. First, minimize the flexing of the cable. The wires in the thin miniature cable are very small (Figure 3) and will break if flexed enough. Also, try to keep the cable free from severe kinks or bends.

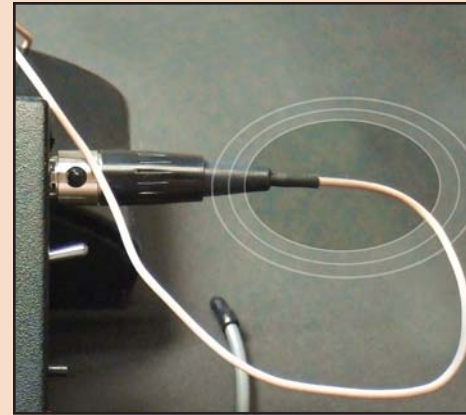


Figure 3 Be careful of microphone cables

If the cable is wrapped tightly around the transmitter case, the cable will have a severe bend at the connector or where the cable comes out of the transmitter case. The cable will eventually break down if it is continually bent at one point. Also, don't pull on the cable or dangle the transmitter from the cable. (These hints also apply to the antenna if your transmitter has a separate antenna wire.)

The microphone is another potential source of problems. It can lose its life if it is dropped onto a hard floor or countertop when it is being put away. Remember, it can be damaged if it is not treated properly.

### Frequency Selection

Frequency selection is also a critical factor in providing reliable operation. As wireless microphones become more and more common, this problem continues to increase.

Each wireless microphone system must be on its own separate channel or frequency. If another system is on the same channel, interference will occur. When you purchase a wireless microphone, try to verify the frequency of other wireless systems in the area such as churches, schools, etc. Then select a channel that won't interfere with those other microphones. If you're using multiple wireless microphones in your church, you must select channels that are compatible with each other. Just



Figure 4 The antenna cable should be straight when it's in use

having different frequencies is not the total answer. Many other factors must be considered, especially if you have systems from several different manufacturers. Please call us for help in selecting the right frequency for your additional wireless systems.

### Antenna Location

Lastly, antenna location is critical for proper operation of the wireless microphone system. The antenna(s) must receive the strongest possible signal at all times, or noise or pops may occur.

First, the antenna on the transmitter must not be coiled, it should be straight (Figure 4). Next, be sure the antenna(s) on the receiver are not placed next to metal. Be aware of any metal in walls, window frames, cabinets or racks.

Consult your system's manual for the manufacturer's recommendations on antenna orientation and positions. If you need to remote the antenna, be aware of the maximum length and proper type of coax cable.

Paying attention to these details and taking proper care of your wireless microphone(s) will result in long life and trouble-free operation.

If you're ready to buy your first wireless microphone or to add another, please give us a call. We'll be glad to help you select the right model for your church.

## Where To Buy A New Sound System

There are four basic sources or vendors for sound equipment. They are (1) music stores, (2) the mail-order catalog or Internet, (3) the traditional radio-TV electronics store, and (4) the systems contractor. Some stores may be a combination of the above sources. For example, a standard music store selling pianos and band instruments may also have a highly-qualified systems contractor division or a systems contractor could also have an Internet store. Be sure to evaluate what is the ability of each potential vendor to provide the answers to your sound system needs?

### Music Stores

The typical music store sells pianos, sheet music, band instruments and rock-and-roll equipment. They are very knowledgeable about pianos. The electronic keyboard salespeople can know everything about MIDI and how to create wonderful sounds. The band department can provide great advice on which instrument is the one to buy. But when it comes to providing a permanently installed sound system for your church, be careful. Most music stores simply do not have the design and installation ability, nor the right equipment to provide your church with the best system for your money.

### Radio-TV Electronics Store

What about the radio-TV electronics store? Likewise, these vendors have similar strengths. They can sell you a great new 52-inch television for your home. But the knowledge that is needed for a well-designed church sound system is far different from the knowledge that is required to put a stereo in your car. Knowing how to install a car stereo

does not guarantee an ability to install a sound system in your church. In addition, these vendors do not usually have access to the proper equipment that will provide you with good quality sound.

### Mail-order Catalogs and Internet

Mail-order catalogs are unique sound system vendors. They can often provide high quality equipment at a price that is very competitive. They may give you good advice on which microphone to buy for your choir or pulpit. The selection of equipment is usually very large. There may be ten different mixers from which to choose. However, can the person taking your order visit your church to understand the acoustics in your sanctuary? Can they attend meetings to answer your congregation's questions? Will they install the equipment? Will they train your sound operator? What about service after the sale? These are some questions that will have to be dealt with if you decide to buy from a catalog. Be careful that you don't lose quality in your hunt for lower prices.

### Professional Systems Contractors

The professional systems contractor provides your church with the knowledge and experience that guarantees a great system for your needs. They will visit your church and take physical and acoustical measurements. Time will be spent in asking your staff about your sound system needs and problems. Then a professionally engineered sound system will be designed.

With today's design methods, the competent contractor can virtually guarantee that the new sound system will meet your needs and will sound

great. And after the system is installed, the contractor provides any needed service over the lifetime of the system.

Yes, the professional contractor may cost more than mail order. They may even cost more than the music or electronics store. But what they install will be the best system for your needs. Don't just look at the price. Many factors determine how the system will perform for your church.

A word of caution: Just because a company says it is a systems contractor does not mean it is a quality church contractor. When you are considering contractors, talk to their church references. Were those churches happy with the results? Did the system perform as promised? What was the quality of the installation? Was the installation crew easy to work with? Does this contractor like to do church sound systems? Ask the contractors how they design their loudspeaker systems. What is their guarantee? How about service? Do they provide training on the new system? What are their qualifications? These are important questions you need to ask of any company you are considering.

Many companies would like to provide your church with new sound equipment. Please consider the previous questions. The answers are invaluable in helping you choose the right people to solve your sound system needs.

We would like to help you with your sound system. We can help with everything from design to installation. And we will be there for you after the installation, too. Give us a call and check us out.

Ron Huisinga