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## INSTALLATION INFORMATION POWERING EMG'S / TIPS AND TRICKS

### Powering EMG's:

Only one 9-Volt battery is required to power the pickups and any accessories such as the EXB, BTC, B125 Blend, and BQ Controls. There are instances where using +18 Volts for the supply is preferred and these are explained here. Compared to many devices that use a battery, EMG Pickups require very little power, and can be described as "micro-powered".

### Battery Choice:

It is always best to use an Alkaline or Lithium Battery for EMG's. Re-Chargable batteries and inexpensive carbon batteries are not recommended. Alkaline and Lithium batteries are also easily recycled. A battery is the cleanest supply you can have, guaranteeing low noise.

### Using an AC Adapter (Battery Eliminator):

Using an AC Adapter is not a great idea. They tend to be noisy. EMG has yet to spec or design an AC Adapter. Effects pedals tend to be noisy because they usually add a lot of gain. Since the pickup is the first element of the chain it's best for it to have as quiet a power supply as possible, thus a battery. Both the ES-9 and ES-18 power supplies from EMG have inputs for Adapters. The choice is yours if you can tolerate any extra noise from an Adapter.

### Battery Life:

The typical 9-Volt Alkaline battery is rated at 500 maH (Milliamp Hours). Lithium batteries can be rated as high as 1200 maH. The more current capacity (maH) the battery has, the longer it will last. The most important specification (known as the "hours to cutoff voltage") is often not specified by the makers. The cutoff voltage is typically 1/2 of the original battery voltage, or 4.5V in this case. Because batteries are used in so many different types of applications it's hard to predict battery life.

See: [http://en.wikipedia.org/wiki/Nine-volt\\_battery](http://en.wikipedia.org/wiki/Nine-volt_battery)

### Current/ Voltage:

The typical EMG Pickup requires about 80 Micro-amps of current. For a battery rated at 500 MilliAmp Hours it translates like this:

1 MilliAmp = 1000 MicroAmps

1000 MicroAmps / 80 MicroAmps = 12.5 times

12.5 \* 500maH = 6250 maH

6250 / 2 (battery cutoff voltage 4.5V) = 3125 Hours per pickup

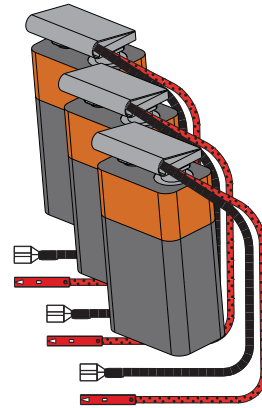
The Lithium Cell will usually deliver about twice as many hours as the Alkaline cell, but the cost is higher.

So, from a typical 9-Volt battery you can expect about 3000 hours of battery life until the battery voltage will be reduced to 4.5 Volts. With 2 pickups in the instrument, battery life will be about half that, or about 1500 Hours. Adding EMG Accessories will increase the current drain and lessen battery life.

### Headroom (+9 or +18 Volts):

Headroom is defined as the ability of the pickup to deliver a clean, undistorted waveform. But...while current is being drained from the battery, the battery voltage is decreasing, and so is the headroom.

EMG Pickups never put out more voltage than is being supplied. Using a 9 Volt battery will limit the output signal of the pickup to slightly less than 9 Volts. Older EMG Pickups may have a maximum output of 4.5 Volts, one half of the supply. If you supply the pickups with 18 Volts the headroom will double, creating even more headroom for the signal. Doubling the supply voltage to 18 Volts will increase the amount of current drain. You don't get something for nothing.



### Rules of thumb for choosing a 9 or 18 Volt Supply:

#### Single-Coil Pickups for Guitar:

If you are using EMG Single-Coil pickups a 9-Volt supply allows sufficient signal headroom even when using EMG accessories that boost the signal like the EMG-SPC or EXG.

#### Dual-Coil Pickups for Guitar:

If you have EMG Dual-Coil pickups, i.e. EMG-81, EMG-85 and play the instrument very hard you can consider 18-Volt operation but it's not necessary.

#### Single-Coil Pickups for Bass:

The output from a bass guitar is higher than a 6-string guitar. Single-Coil EMG Pickups such as the EMG-J models will work fine with a +9 Volt supply but if you play aggressively 18-Volts is recommended.

Also, if you use any EMG EQ products, like the BT, or BQ controls and use a generous amount of boost the signal will be cleanest with 18-Volts.

#### Dual-Coil Pickups for Bass:

Dual-Coil Bass Pickups like the EMG-CS and DC Series should be supplied with 18-Volts. The amount of output from slapping the lower strings will benefit with more headroom. As above, if you use any EMG EQ products, like the BT, or BQ controls and use a generous amount of boost then the signal will be cleanest with 18-Volts.

Powering your instrument with more than 9-Volts will not make it louder. You may notice some difference in the distortion quality of your guitar, or a different result from your bass amp. We encourage you to experiment.

### Battery Death:

When the battery is coming to the end of its useful life, and headroom is limited, you will notice a distortion at the initial attack of the string. It will sound like an unnatural (ech!) and you should consider changing the battery. If you just have EMG Pickups in your guitar without any accessories the pickups will operate on a 2.5 Volt battery. Accessories will have a higher threshold, typically about 4.5 Volts. Always, ALWAYS! install a new battery.

### Unplug your guitar:

Be sure to unplug your guitar when you are not using it. You can leave it plugged in during your sessions, rehearsals, or performances, but afterwards be sure to unplug it, even if you leave it on the stand.

### Storing your guitar long term:

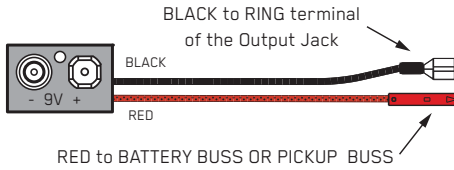
If you're going to store your instrument for a long period you should remove the battery(s) from your instrument. Batteries can have a tendency to leak their chemistry and make a mess. Just don't forget you removed them when you plug back in.

## EMG Standard Battery Connectors:

EMG employs two types of battery connectors.

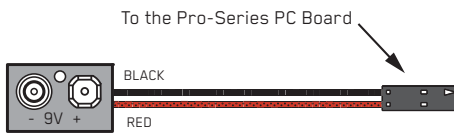
### 1) EMG Standard Battery Connector

The Standard EMG battery connector has two different terminals. The Battery Negative (Black) is a Push-on style connector designed to push directly onto the output jack. The Battery Positive (Red) is made to push directly onto the Battery Buss, or onto the B157 Pickup Buss.



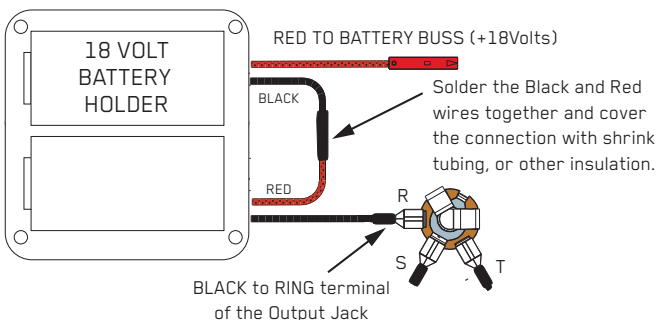
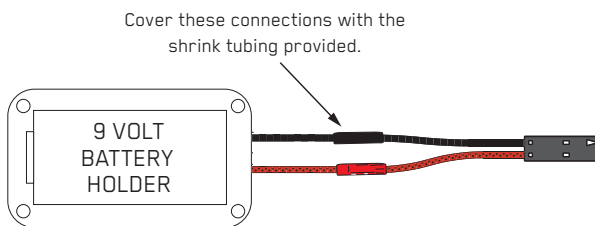
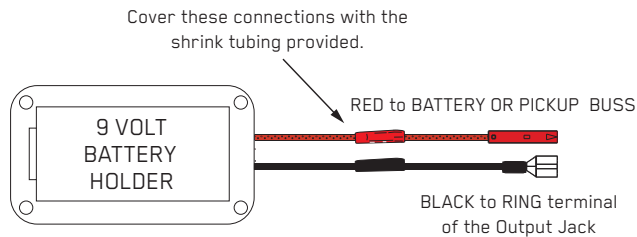
### 2) EMG Pro-Series and S/S/S (H) Systems Battery Connector

Shown below is the Pro-Series style battery connector. This is used because of the difficulty making a connection on the Stratocaster style guitars. The Pro-Series 2 pin connector inserts directly on the PC Board.



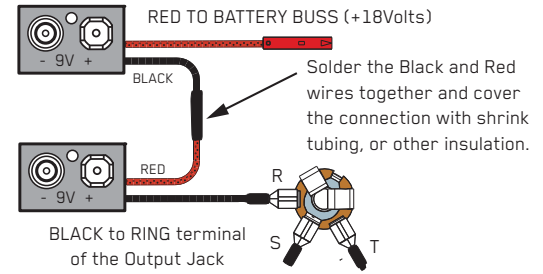
## EMG Systems with a Battery Holder:

If your instrument has a 9 or 18-Volt battery holder and you have an EMG Pro-Series System you can adapt the existing battery clip to use the EMG Connector to supply power to the PC Board. Cut and strip the wires from the battery clip provided. Put Red to Red, Black to Black and use the shrink tubing included to cover the connections. Soldering the wires is recommended.



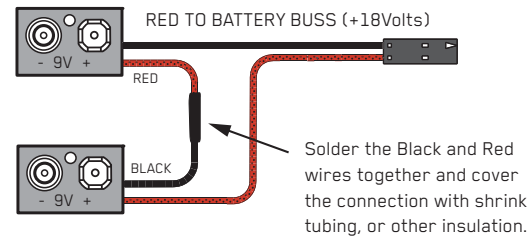
## +18 Volt Wiring Option (Standard Battery Connector):

If you want to operate your instrument at +18 Volts for more headroom then use 2 batteries wired as below. Also, if you are using any type of EQ in your instrument (EMG-BT, BQ) or anything that boosts the pickup signal then +18 Volts is recommended.



## +18 Volt Wiring Option (Pro-Series Connector):

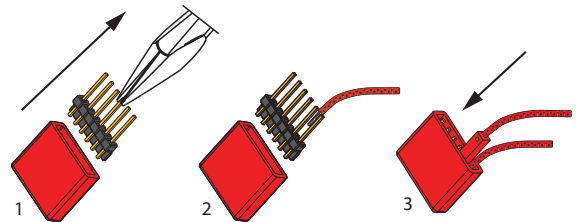
If you want to operate your Pro-Series System at +18 Volts for more headroom then use 2 batteries wired as below. Also, if you are using any type of EQ in your instrument (EMG-BT, BQ) or anything that boosts the pickup signal then +18 Volts is recommended.



## Diagram #10

### Soldering to the battery buss:

If your instrument has an older EMG Pickup you can solder the pickup RED wire to the buss. Simply use some needle nose pliers, pull out the V+ header and solder the RED Wire from the pickup(s) to any of the pins and then re-insert the header into the housing.



Solder the RED wire from the Battery Holder and/or pickups and re-insert the Header into the insulation cover

## Soldering to the 152B Panel Jack:

If your instrument has a long Panel Jack like the one below you will have to solder the output cable as shown. Ground (Black) to the Sleeve  
Signal (White) to the Tip  
Battery Negative (Black) to the Ring

