User Guide

Congratulations on your purchase of a PowerMax™! This transmitter is designed to give the best range of any short antenna falconry transmitter. The PowerMax no longer uses the heavier base-loaded antenna and in keeping with its name, the antenna has been lengthened slightly to provide maximum power – ideal with the new Marshall TrackPack™ mounting system. For the shortest available antenna use the Marshall RT Plus, which has the power of the previous generation of PowerMax. If your bird is lost with a new battery, the PowerMax will run continuously for at least 8 days!

Battery
The PowerMax uses the Panasonic or Renata CR1632 lithium 3-volt battery. Be sure to use only batteries marked "high-drain" (CR) that are designed for the more demanding applications. As soon as the battery is installed, the transmitter will start running. *Note: The CR1632 battery can be hard to find in some locals, so always be sure to have a few spares on hand when going into the field or planning that hunting trip.*

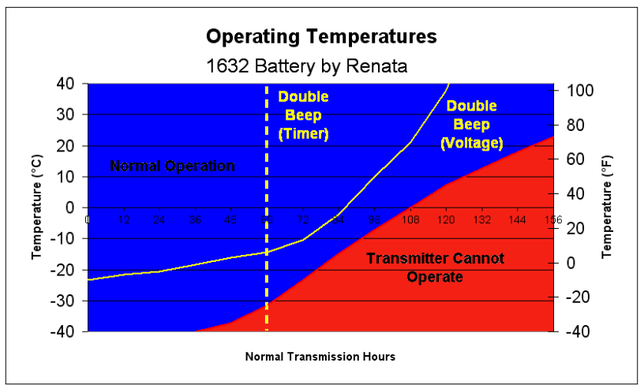
> ☞ **Important***: The PowerMax has a memory which keeps track of the total run time for each battery. The transmitter "remembers" its state from the last time the battery was removed. To clear this memory (every time a new battery is installed), the battery should be installed backward for a moment (positive side facing transmitter) and then put back in normally.*

To remove the battery, use a sharp object, such as the end of the tail spring of another transmitter, to pry the battery out through the open slot on the edge of the battery compartment.

Apollo 13 Mode™: This special feature gives you the most possible time to find your bird. After transmitting continuously for *sixteen hours*, the PowerMax figures your bird is probably lost and acts to conserve battery life with shorter and less frequent pulses. Because of this feature, the actual battery life if you loose your bird will be approximately double what is shown in the chart below. In other words, the chart shows battery life with normal hunting, assuming the bird is not lost for long periods and Apollo 13 Mode is never activated. If you loose your bird with a fresh battery, Apollo 13 Mode will double the life of the battery.

Low Battery Warning: After a battery has been used for a total accumulated time of about 60 hours, the normal single beep of the transmitter changes to a double beep on every tenth pulse. The transmitter runs at the same power, but is simply warning you to change the battery.

Recommendation: *You should <u>get into the habit of changing the battery when you hear the double beep.</u> If you were to fly your bird right before the double beep warning began and the bird became lost, you would have about five days or so to search for it. If you loose your bird after the double beep, you will have considerably less time to look for it.*



Cold Temperature Use: If the bird will be in very cold conditions or if it may become lost overnight when the temperature drops, you should *always use a new battery*. As coin cell batteries run through their life cycle, they lose some of their ability to provide current to run the transmitter in cold temperatures. While the CR1632 battery will work at arctic temperatures for the first 36 hours of its life, after 72 hours it may not operate below -20°C (0°F) and subsequently will require even warmer temperatures.

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In cold weather flying, the cost of a new battery is negligible compared with the protection it provides against loss of the bird. Keep plenty of batteries on hand and use them – the shelf-life of these lithium batteries is over seven years.

In addition to the 60 hour timer, the PowerMax monitors the battery voltage. The 2005 PowerMax does check the battery voltage and will warn with a double beep if you put in a weak battery.

There is a slight drain on the battery even when not transmitting. We recommend not leaving the battery in the transmitter more than six months.

Tap On /Tap Off™ Switch

The PowerMax uses a unique magnetic switch to turn transmitter on and off. You can leave it on bird while not in use, removing only to change battery. To turn PowerMax off, touch magnet to transmitter case near the base of the antenna until you hear 5 rapid beeps on receiver as confirmation. Repeat process to turn back on, confirmed by 3 rapid beeps. If you lose magnet, transmitter can be turned on and off by un-screwing the lid and removing the battery. Always double check for transmitter signal by tuning in on receiver before flight, and when turning it off. With extremely weak batteries, the Tap On /Tap Off™ may not work.

PowerMax Range
Like any transmitter, the range of the PowerMax varies with the terrain. Tests have shown its range in our deserts of the western United States to be anywhere from 10 to 80 miles, depending on the height of the transmitter, the height of the receiver, and the type of terrain and obstructions. Higher ground always gives better range.

Remember that tests done in different places will always give different results. Even testing at different times of day can give different results. This is why you must always compare two transmitters by testing them together at the same time in the same place and at the same height off the ground.

It is best to test the PowerMax on a bird while the bird is on a perch. However, the range of the PowerMax is less if there is metal near its antenna. Therefore, do not use a metal perch for testing the range. If you want to compare the PowerMax with another transmitter, you must test them at the same time. This means you must use two birds on perches, one with the PowerMax and the other with the other transmitter. Make sure that the birds are always facing the same direction during the test (easy to do if there is a wind), because the strength of the signal from a bird depends on its direction.

Using the Receiver
The signal from the PowerMax is strongest if the receiver antenna is lined up in the same orientation as the PowerMax antenna. Since a falcon on a perch keeps its tail almost vertical, you will get the best signal if you hold your receiver antenna with its elements vertical. However, there are some cases, such as when the falcon is on a kill, when the transmitter's antenna could be nearly horizontal. In such a case, hold your receiver antenna horizontally.


Bird on perch


Bird on ground

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Hint: *When you are tracking a bird, if signal is weak try both orientations. Always rotate the receiver antenna from vertical to horizontal and choose the position that gives the strongest signal. The best orientation may be somewhere between vertical and horizontal. If both orientations are usable, horizontal gives better pin-point accuracy.*

Replacing the Antenna

The antenna is user replaceable. Use only Marshall replacement antennas with *Power Line Static Protection* TM. The length of the antenna may vary between transmitters. Measure or keep the old antenna and cut the new one to the same length.

1. Remove old antenna using a sharp knife to cut the epoxy (or heat shrink) around the base of the antenna. Then unscrew antenna by hand (never use pliers or any type of tool to remove or install antenna as this could damage antenna stud). Screw on replacement antenna 'finger tight.'

2. Secure new antenna in the same manner that the old antenna was secured. Important: To maintain the optimal tuning of your PowerMax, always use the original method of securing the antenna. If you PowerMax's antenna was secured with Epoxy, use a small bead of quick drying (5 minute) epoxy around the base of the antenna. If your PowerMax had heat shrink securing the antenna, use the new piece of special *heat shrink* supplied with replacement antenna. Slide heat shrink tube along antenna onto neck of the case. Use a cigarette lighter or heat gun to shrink tube to tight fit around neck of the case. Take care to heat only the heat shrink tube, not main body of the transmitter. A direct flame to the metal case can destroy your transmitter's internal components in just a few seconds!

Note*: Never use liquid super glue or any type of thread locking compound to secure the antenna. Liquid Super Glue can wick up the threads causing them to permanently bond to the antenna stud. This may permanently damage your transmitter.*

The PowerMax was intended as the primary high-power transmitter to be used with a second, backup transmitter. Marshall recommends that falconers always use two transmitters whenever they fly their birds. The odds of two transmitters failing at the same time are so remote that this is always the best policy.

Note*: All the numbers given here are approximations and are not guaranteed.*

Customized Transmitter

If your needs change in the future, the frequency (channel) of the PowerMax can be changed electronically without opening it up. A 216 MHz transmitter can be set anywhere from 216.000 to 219.995. A 173 MHz transmitter can be set to 173.000 to 173.995. Also, the pulse width and pulse rate can be adjusted to give either better battery life or more, longer, easier-to-track pulses. The low battery trigger point can also be set earlier or later if you prefer. The default operational settings are: 50 pulses per minute (ppm), 60 millisecond pulse width and approximately 60 hours before low battery mode begins. Send transmitter to Marshall Radio to custom re-configure it for $35 plus shipping. Same day turn-around guaranteed.

Warranty

Marshall Radio Telemetry warrants that the PowerMax Transmitter will be free from defects of workmanship and materials for Three (3) Years from the date of purchase by end-user. Return defective transmitter directly to Marshall Radio Telemetry and we will repair or replace it and return it free of charge. However, we will not be responsible for damage from misuse or normal wear and tear incurred during use. Damage to the transmitter threads from any cause is not warranted. Warranty is void if a non-Marshall Radio Telemetry antenna has been used. *Under no circumstances will Marshall Radio be responsible for damages or loss beyond the value of the transmitter itself, including but not limited to the loss of a bird, equipment or lost time.*

FCC Notice: This device does not interfere with TV reception or Federal Government radar.

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PowerMax high output transmitter

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