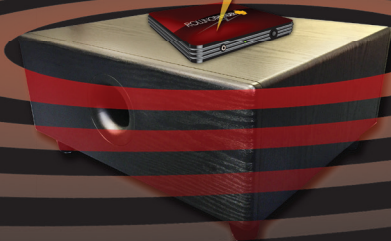


ROLLINGTHUNDER™



SYNCHRONIZED FULL
SPECTRUM SOUNDS
YOU CAN **FEEL.**

Thank you for purchasing the Broadway Limited Rolling Thunder™ System. We strive every day to make model railroading a more enjoyable hobby and to that end, we've developed Rolling Thunder™. Real trains shake the very ground they roll on. Their sounds are unmistakable in their depth and power. With your new Rolling Thunder™ system, you can unlock the more realistic sounds of your Paragon3 equipped BLI locomotives in both frequency and volume. Rolling Thunder™ truly represents the next generation in model railroading technology. Enjoy.

A handwritten signature in black ink, appearing to read "Rob Grubba". The signature is stylized with a large "R" and a cursive "Grubba".

Robert Grubba
President / CEO
Broadway Limited Imports, LLC

Model train sound systems have always been limited by the physical size of the speakers that can fit in a scale model. Until now.

Broadway Limited locomotives equipped with the Paragon3 sound system transmit the low frequency portion of the locomotive sounds to the Rolling Thunder™ receiver. The receiver is connected to a powerful subwoofer that reproduces the deep rumbling sounds of a real locomotive, perfectly synchronized to the movement of the model and to the higher frequency sounds that continue to play through the speaker in the model. The result is the most realistic sounding model train ever made.

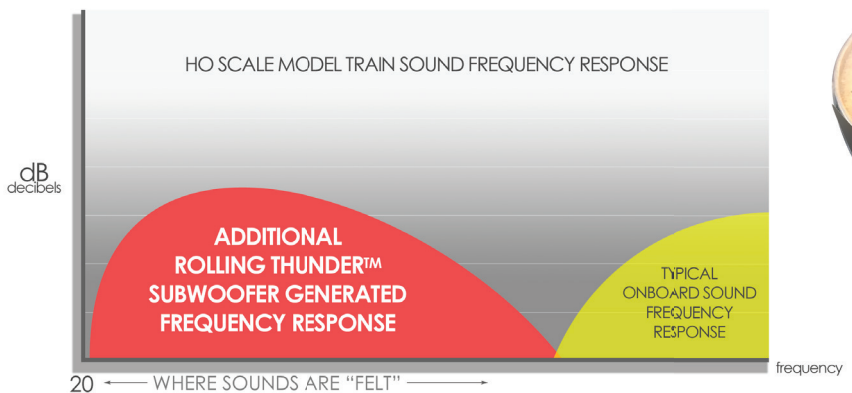


Chart for illustrative purposes only. Not intended to be actual representation of exact response curves.

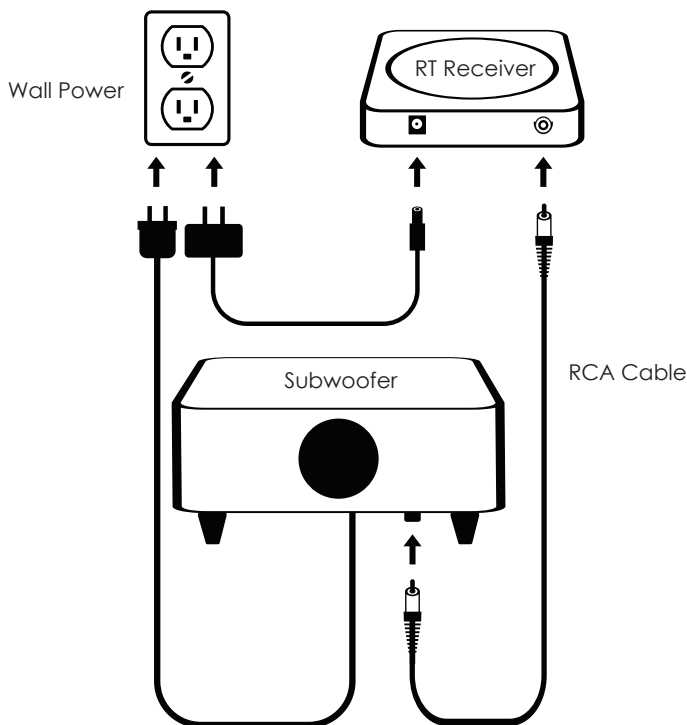
**SUBWOOFER GENERATED
SYNCHRONIZED
LOW FREQUENCIES
YOU CAN FEEL**



ONBOARD
SYNCHRONIZED
MID/HIGH FREQUENCIES
+
ROLLING THUNDER™
SIGNAL TRANSMITTER

WIRELESS RT SIGNAL TO
ROLLING THUNDER™ RECEIVER
W/ PROXIMITY MODULATED
SOUND INTENSITY

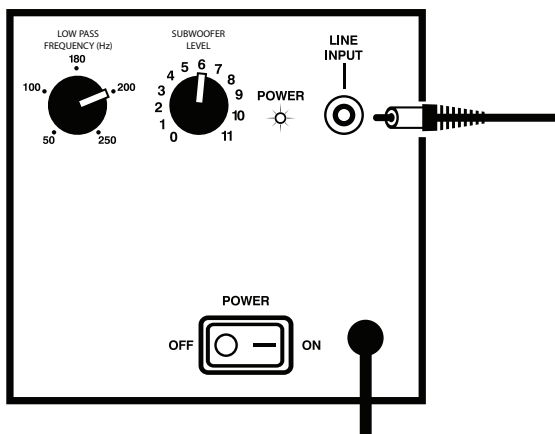
Setup



For most layouts, the subwoofer should be positioned under the center of the layout. The receiver should be

ROLLING THUNDER™

positioned near the layout controls, plugged into a household outlet. The red power light will flash for a few seconds, then stay on. The supplied RCA cable should be used to connect the receiver to the subwoofer. To start, set the Subwoofer Level knob to 6 and the Low Pass Frequency knob to 200. Turn on the power switch.



Place your Paragon3 locomotive on the track and operate normally. You should hear the deep low frequency

sounds coming from the subwoofer within a few seconds of starting the locomotive. If you do not hear the subwoofer after the first 10 seconds of running the locomotive, you may need to position the receiver and the locomotive closer together. The locomotive can typically transmit about 15 feet, but may need to be closer to the receiver to begin transmitting. Positioning the receiver near the height of the track will improve reception.

When running a locomotive, adjusting the volume of the locomotive with Function Key 8 or with the DC Master will also adjust the volume played through the subwoofer.

Setting CV214 for a locomotive will adjust the subwoofer volume for that locomotive. The range is 0-255. A

higher number is louder. The default is 128.

If you are running one locomotive at a time on a layout less than 15 feet long, you probably don't need to read the rest of this manual.

Using Multiple Locomotives

The subwoofer can only play the sounds of one locomotive at a time. Once the receiver locks onto the first locomotive, it will continue to play the sounds from that locomotive until that locomotive moves out of range or is turned off, after which the next available locomotive will begin playing through the subwoofer. If more than one locomotive is running at the same time, each locomotive must be set to a unique transmit channel. There are 29 channels,

selected by setting CV 212 for that locomotive to a value between 1 and 29. Channels 1-4 should be used first, Then 5,6, 7, etc. (Using channels 5-29 require changing CV143 in the receiver to match the highest channel number. See page 16).

Larger Layouts

For larger layouts or in areas with unusual electrical interference, it may be necessary to increase the transmitter power of the locomotive. To do that set CV213 for that locomotive according to the following table.

Transmitter Power Level (915 MHz)	Locomotive CV 213 Value
1 (Lowest)	240
2	224
3	208
4	192
5	176
6	160
7	144
8 (Highest)	128

Fading

It is difficult for our ears to tell the direction of low frequency sounds, so when the locomotive is close to the subwoofer it appears that all the sounds are coming from the locomotive. If the locomotive gets too far from the subwoofer while still transmitting, it becomes apparent to the listener that the low frequency sounds are not coming from the locomotive. For this reason, once the locomotive starts to get out of transmission range, the subwoofer sounds will begin to fade away. Once the locomotive (or another locomotive) gets close to the receiver again, the low frequency sounds will gradually fade in and begin playing again.

On smaller layouts, this effect is kind

of cool, so you may want to achieve it by moving the receiver all the way to one end of the layout, or farther. You may also need to lower the transmitter power of the locomotive so the sounds can fade in and out. Very small layouts may require some fine tuning of the receiver. See below.

Multiple Receivers and Subwoofers

Larger layouts can be equipped with multiple receivers and transmitters. If they are spaced out around the layout, the low frequency sounds will follow the locomotive as it moves around the layout. This provides a very realistic effect.

Fine Tuning the Receiver

There are a number of settings in the receiver that can be adjusted

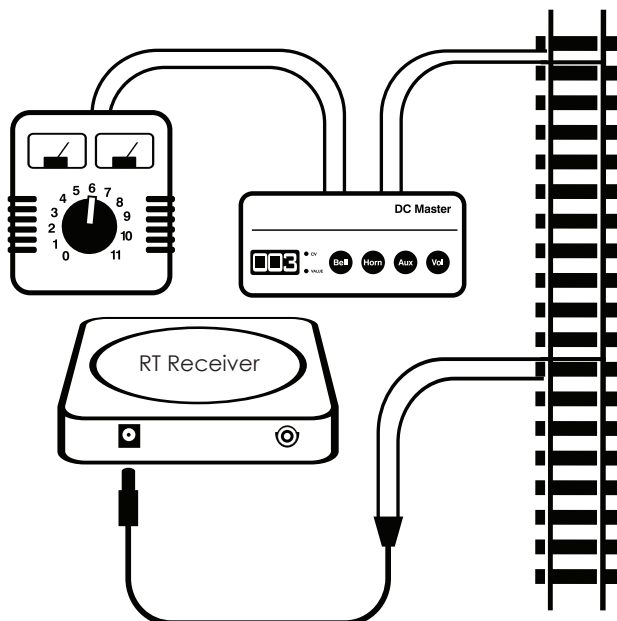
using the BLI DCMaster or any NMRA compliant Digital Command Control (DCC) system. To set using a DC Master or DCC, instead of plugging the receiver into household power use the supplied track power cable and connect the receiver to your track.

Using DCMaster, hold both the Aux and Vol buttons down while turning on track power all the way. Then use the Bell and Horn buttons to display the CV you want to change. Press Vol to select. Then use Bell and Horn to display the new value. Press Vol to select.

For DCC, the receiver's default address is 1. You will need to use Operations Mode programming. To change CV's, press the Program/Reset button on the receiver for one

second. The power light will start flashing. Program the desired CV's and then press the Program/Reset button again to exit the programming mode.

After programming, it is best to switch back to the wall power plug to prevent inadvertent reprogramming.



Receiver Channels

The receiver must scan all available channels until it finds a locomotive. To scan faster, the channels it scans are limited by CV's 142 and 143. CV142 sets the starting channel. Its default is 1. CV 143 sets the ending scan channel. Its default is 4. To use more than 4 separate locomotive channels, set CV143 for the receiver equal to the highest locomotive channel used. Acceptable values are 1-29. Setting the value higher than needed can increase the time required for the receiver to connect to each locomotive.

To dedicate a subwoofer to one locomotive, set the receiver CV142 & 143 to the channel of the locomotive. Using this setup, you could, for example,

set all the locomotives operating on one track loop to channel 1 and all the locomotives operating on second loop to operate on channel 2, and dedicate a receiver and subwoofer for each loop:

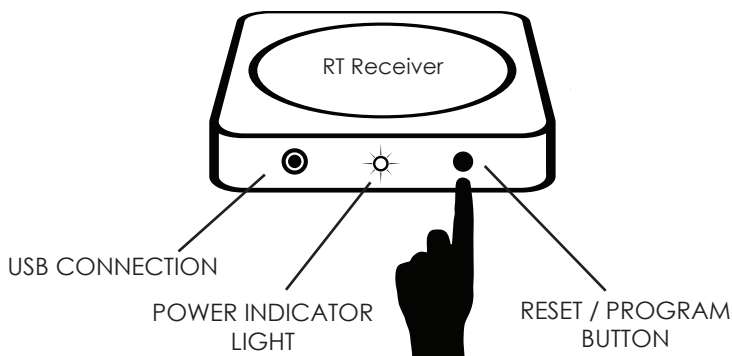
Loop 1, CV212 of the locomotives =1 and for that receiver CV142 = 1 and CV 143 = 1.

Loop 2, CV212 of the locomotives =2 and for that receiver CV142 = 2 and CV 143 = 2.

Two receivers can be connected to one subwoofer using BLI part #1597, Multi-Receiver Expansion Cable. Plug the expansion cable into the subwoofer, and connect the RCA cables from the receivers into the expansion cable.

Reset

To reset the receiver to factory defaults, unplug the power cord. Hold down the Program/Reset button while plugging the power cord back in. (Or set CV8 to 8.)



If the engine does not transmit far enough:

First, set CV213 to 128 in the locomotive, which sets the transmitter strength to maximum.

If that is not sufficient, change the following CV's in the receiver, using the instructions on page 14.

Set CV141 to 40

Set CV136 to 50

Set CV135 to 60

These settings lower the signal strength needed to lock onto a locomotive.

CV141 is the minimum signal strength to lock onto. Default is 100, so 40 is pretty low. Setting lower than 40 can cause it to lock onto background noise.

CV135 is the signal strength above which the bass sound fades in. (Default is 135)

CV136 is the signal strength below which the bass sound starts to fade out. (Default is 111.) It has to be lower than CV135. If the range is still insufficient, set CV142 and CV143 to 1.

CV143 is the upper scan channel.

CV142 is the lower scan channel.

If CV142 and CV143 both equal 1, the receiver will only receive from locomotives on channel 1, instead of scanning. This helps if the signal strength is weakened by local interference. The locomotive must be set to channel 1 also, which is the default setting. (CV212 = 1 in the

locomotive.)

As a last resort, set CV132, (minimum bass volume) to 60, and try setting CV141 to a lower value than 40.

For more detailed instructions, refer to the Rolling Thunder Technical Reference manual at:

www.broadway-limited.com

NOTES:

NOTES:



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