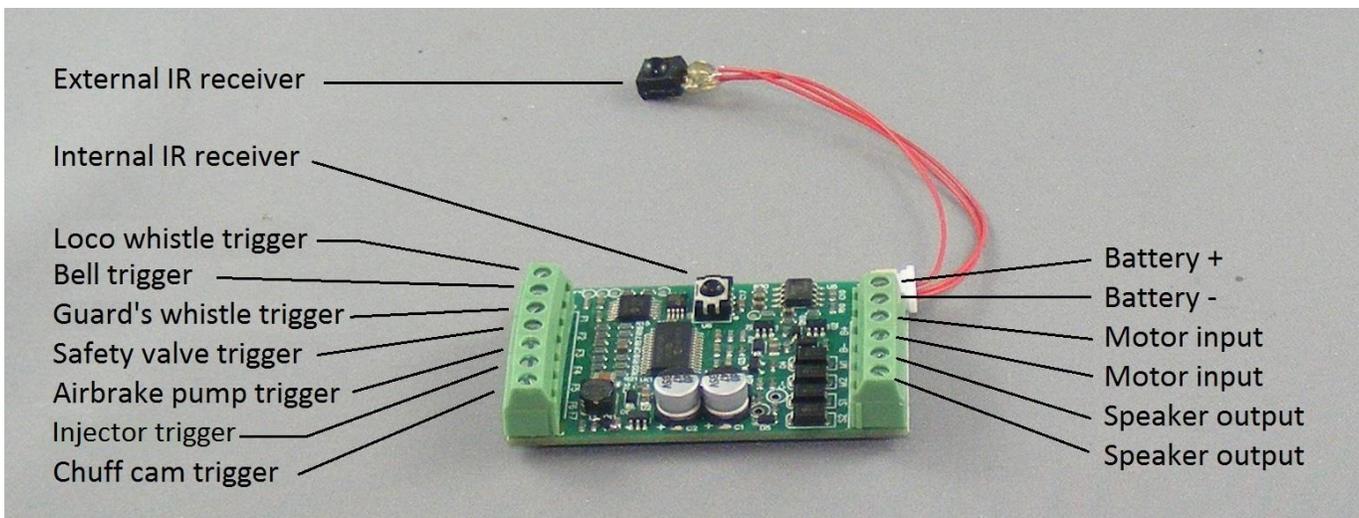


MYLOCOSOUND

UNIVERSAL SOUND FOR LARGE SCALE, DC, STEAM LOCOMOTIVES

1. OVERVIEW

- Easy installation using screw terminals with no soldering.
- Uses a TV remote control to adjust the volume and sounds to match the prototype loco.
- Provides a chuff sound which matches the loco speed and load.
- Sixteen pre-selected whistles, each with adjustable tone to suit the loco.
- Selectable sounds include whistle, bell, safety valve, “All aboard”, brake pump, injector, guard’s whistle and brake squeal.
- For track powered DC or battery powered radio controlled railways



2. CONTENTS

The soundcard generates synthesised sound which is adjustable to reproduce the sounds of most steam locos and railmotors. The terminal connections on the right are necessary for the soundcard to generate a chuff which varies with the loco speed and load. The terminal connections on the left trigger the various sounds where the locomotive controller has the appropriate outputs available. The trigger terminals are labelled F1 to F7 and are referred to by these labels in these instructions.

Sounds can also be triggered by the infra-red TV remote control which works with the soundcard. Although it can be used when running in the garden, the remote control is intended mainly for the adjustment and testing of sounds due to its short range.



The remote control communicates with the soundcard via two infra-red receivers. One is located on the soundcard and the other is on a flying lead which allows it to be fixed to any external surface of the loco.

Adjustments to the sounds can then be made without taking the loco apart to access the soundcard.

3. SPEAKERS AND SOUND QUALITY

The soundcard requires an 8 ohm loudspeaker which is not included. A 4 ohm speaker can also be used but you may cause the soundcard to overheat and temporarily shut down if the volume is very high and the soundcard is in a confined space.. Your choice of speaker is highly important because it determines the quality of the sound produced.



The lowest cost option is to fit speaker from your local consumer electronics store. Typically these come in 27mm or 57mm diameters. Use the largest which you can fit in your loco.



For a better quality sound and more volume, the speaker needs to be baffled. That means that it needs to be built into the front face of an airtight box so that sound is heard only from the front of the speaker and none from the back. The plastic top of a spray paint can is good for making a baffle as shown in the diagram.

A good solution, which ensures high quality sound with lots of deep throbbing bass, is to purchase an 8 ohm impedance external speaker unit for iPod and MP3 music players and remove the two speaker modules, in their enclosures, for use in two locos. These are readily available at consumer electronics stores.

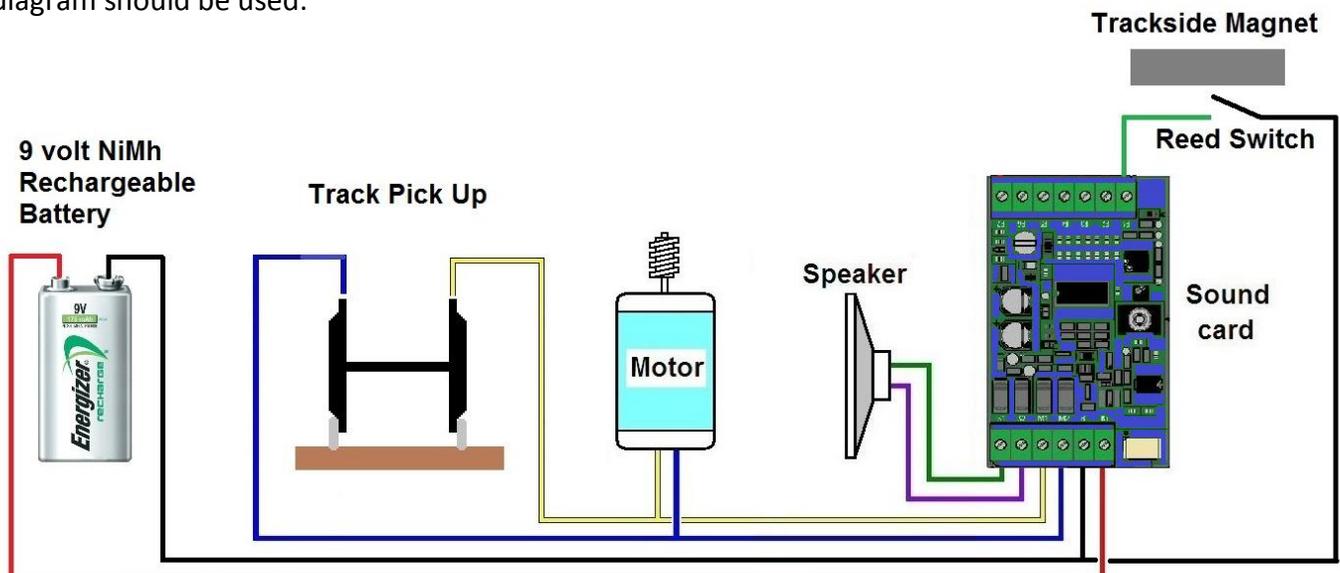


Speakers can be connected to the terminals either way around.

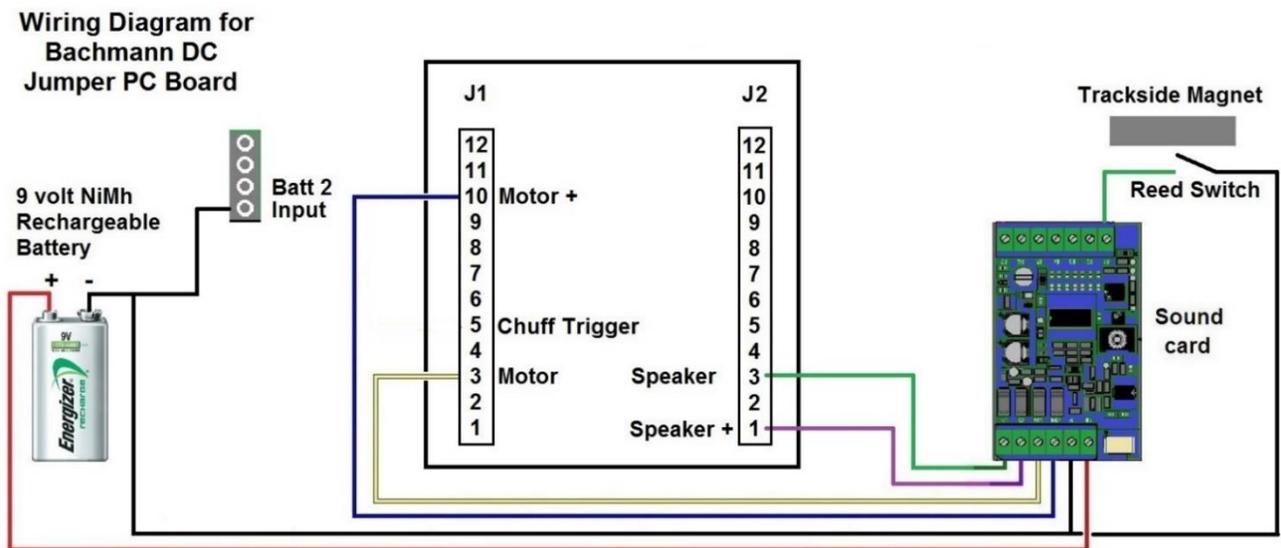
It is also possible to boost the volume by using a commercial stereo amplifier. Section 13 of these instructions shows how this can be done. Use of an external amplifier is recommended for ride on railways.

4. INSTALLING THE SOUND CARD IN A TRACK POWERED LOCOMOTIVE, DC OR DCC

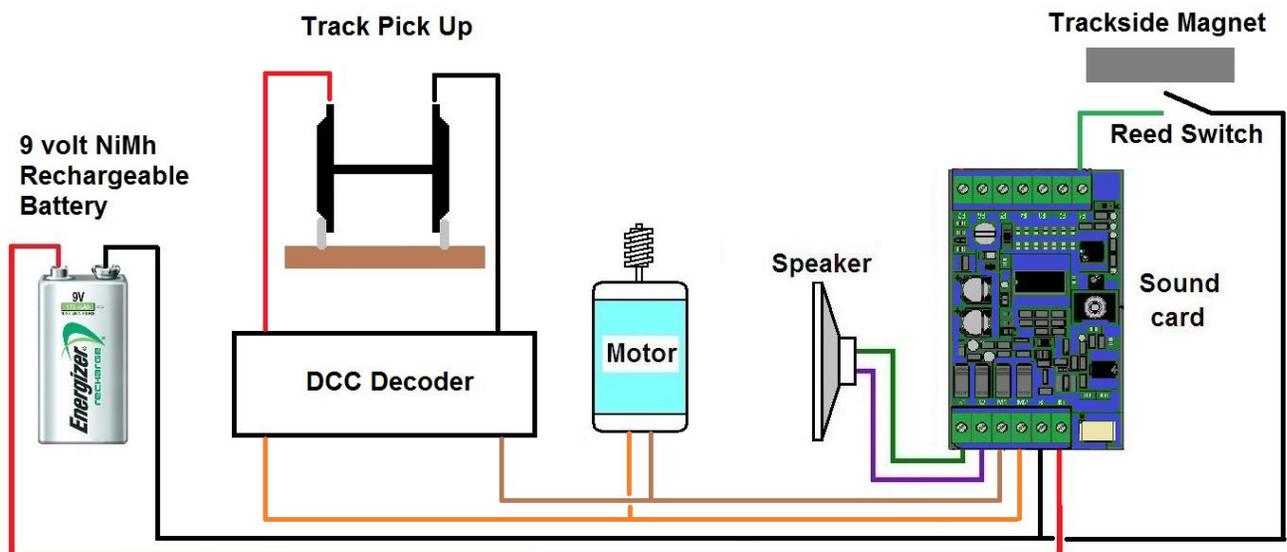
The soundcard is suitable for use on analogue DC track powered railways on which the following wiring diagram should be used:



The wiring diagram below shows the connections for the DC jumper board in a Bachmann locomotive.



On DCC track powered railways in locomotives using a basic decoder, the wiring is a little different:



When the motor voltage is below nine volts it is insufficient to power the soundcard. Therefore a nine volt PP3 battery is used to drive the soundcard and produce sound when the loco is static or moving slowly. This battery will be automatically recharged whenever the motor voltage is at least one volt higher than the battery voltage so there should never be a need to remove the battery for recharging. However, the battery must be a Nickel Metal Hydride type; Lithium and Nickel Cadmium batteries must not be used. On small shunting layouts, the loco speed is often not high enough for charging to take place. Some owners of shunting layouts put an isolation switch on the loco motor circuit so that they can turn up the power to recharge the battery without having the loco moving.

On analogue DC layouts which have pure DC controllers (as opposed to PWM controllers) you may need to give the throttle a bit of a tweak to start the sound. On those layouts, the sound will

automatically turn off after one minute of inactivity and another tweak will turn it back on. With the more common PWM controllers and with DCC the sound will turn on automatically and stay on.

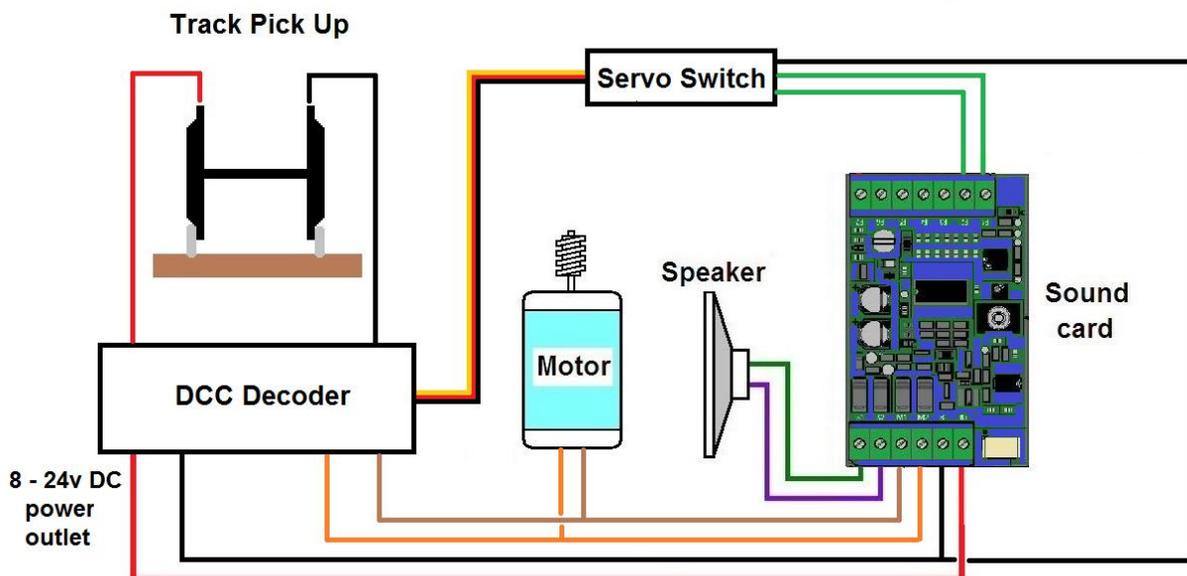
When the loco is removed from the track the soundcard will go into a “sleep” mode to preserve the battery charge. A fully charged PP3 battery should retain charge for over a year.

Because most DC controllers do not have function buttons, an alternative way of triggering the horn, bell and other sounds needs to be found. The options are:

1. You can set the whistle to sound automatically three times a minute when the train is running. Other sounds can also be triggered automatically. This is described in section 6.
2. You can connect the soundcard whistle trigger to a reed switch which you mount on the bottom of the loco. Then install magnets in the track where you want the horn to sound eg. at the approaches to a level crossing. The horn will then sound briefly as the loco crosses each magnet.
3. Use the remote control, supplied with the soundcard, to trigger all the sounds as described in section 6. However, infra-red remote controls are not designed for long distance use outside. On an overcast but bright day, the remote control, powered by AA or AAA batteries will probably operate up to three metres away.

Any combination, or all, of these methods can be used.

With DCC, the soundcard is not a decoder and cannot trigger sounds directly from the controller. Therefore the above methods are used to trigger the sounds. Some decoders have a servo output which can be used to trigger sounds from the controller buttons by using a servo switch. They may also have a constant DC power output which can replace the battery if it is in the voltage range 8 to 24 volts. These connection options are shown below:

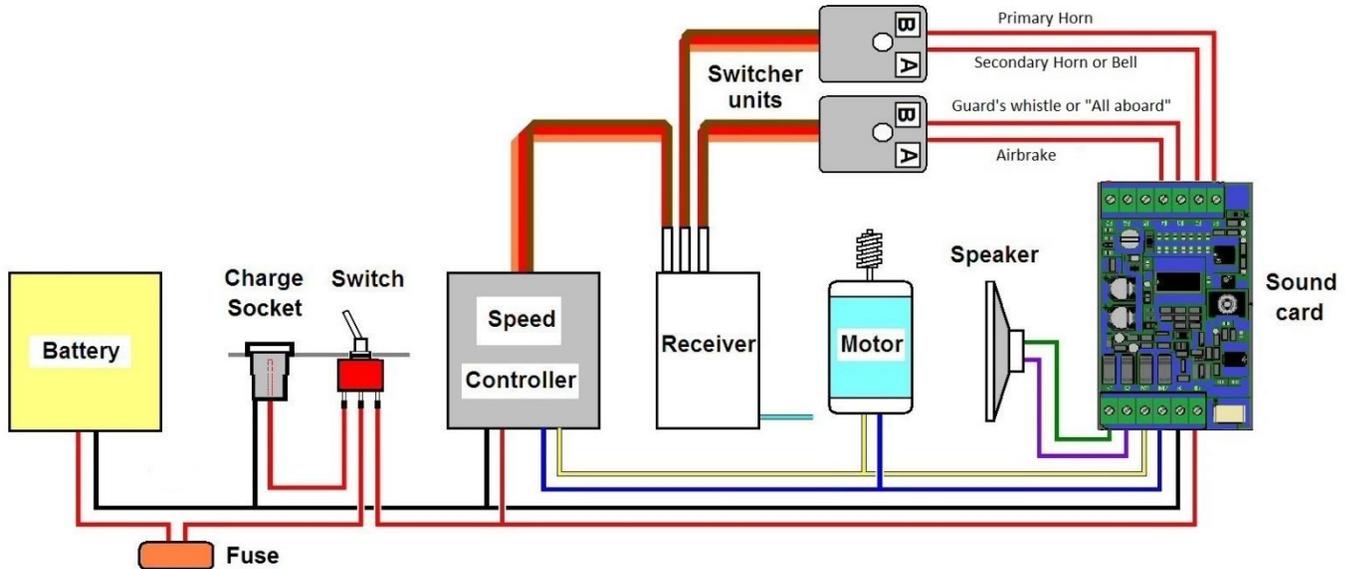


Many decoders also have function outputs which can be used to trigger sounds. However, this is technically difficult and you should only attempt it if you are very familiar with your decoder and the setting of CVs.

Now continue reading at section 6.

5. INSTALLING THE SOUNDCARD IN A BATTERY POWERED LOCOMOTIVE OR RAILCAR

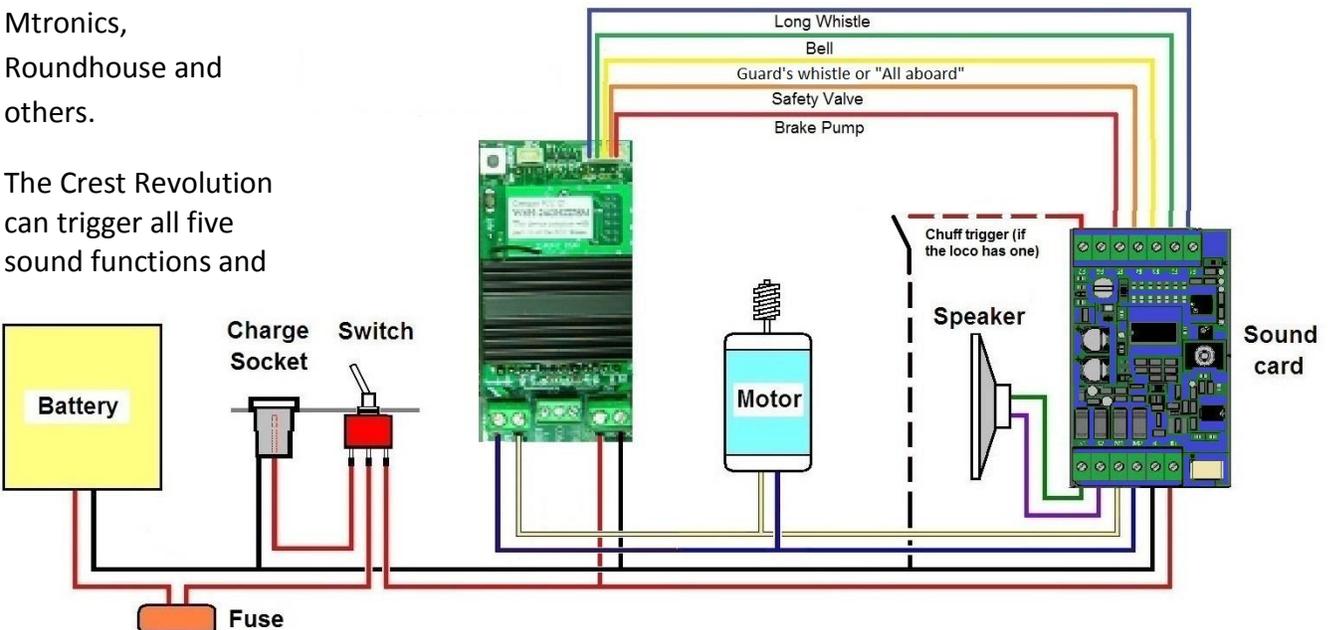
The wiring diagram below shows a typical installation for common types of battery powered radio control systems.



The receiver shown has two function channels, each of which can operate two triggers via two switcher units. The fifth soundcard trigger, the turbocharger, therefore cannot be radio controlled and will need to be switched on, if required, by the IR remote control. A suitable switcher unit is the Pololu 2802.

The above wiring diagrams can be seen in colour by visiting the web site at www.mylocosound.com/installs. Also shown are specific wiring diagrams for RCS, Spoerer, Mtronics, Roundhouse and others.

The Crest Revolution can trigger all five sound functions and



is connected as shown in the diagram below. To connect the Crest Revolution, the adaptor plug for custom installations is used with the outer red, orange, grey and black wires being

connected as shown. The whistle and despatch functions should be set to momentary by selecting MENU – ASSIGN FUNCTIONS – AUX FUNC SETUP.

Note that volume is adjusted by the remote control and not by the transmitter 7, 8 and 9 buttons.

Note also that early Revolution receivers, without the onboard sound, will start the soundcard immediately that power is switched on. However this will not happen with later Revolution receivers with the onboard sound. With the later ones you will need to throttle up three button presses to switch on the sound which will then stay on.

6. THE INFRA-RED RECEIVERS

The infra-red receivers accept commands from the handheld remote control to adjust or trigger sounds. Two receivers are provided. One is fixed in the middle of the soundcard. The other is on a flying lead which plugs into the small white socket as shown on page one.

In some installations, the soundcard is visible when installed in the loco. This usually occurs when the soundcard is mounted on the floor of a cab, with or without windows. In this case, the remote control can be pointed directly at the soundcard and the on-board receiver is all that is needed.

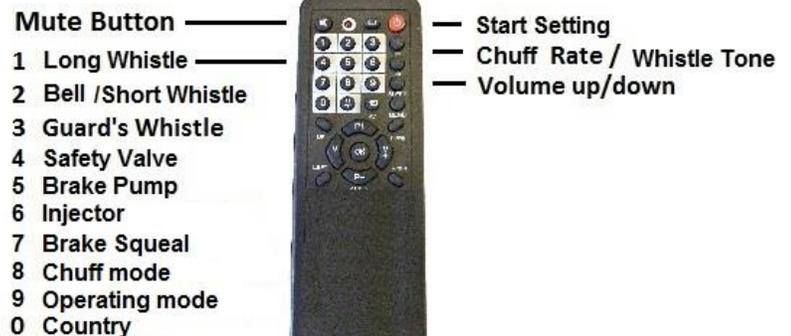
If the soundcard is within the loco and is not visible then the flying lead needs to be used. Plug it into the white socket and glue the black receiver, round side outwards, to any external surface of the loco to which you can easily point the radio control. Do not paint the receiver.

7. THE REMOTE CONTROL

The soundcard will operate with any Sony™ TV remote control using the buttons described in this section. It will also operate with any universal remote control when the code is set to 0140. However, in the interests of domestic harmony, in which stealing your partner's TV remote is probably a bad idea, MyLocoSound supplies a suitable remote control illustrated here.

It is a universal device which has been pre-programmed to Sony™ coding. If your remote control stops working then please refer to the Trouble Shooting Guide at the end of these instructions to re-establish the coding.

Please ensure that your chosen remote control has batteries installed.



Note that the buttons on the MyLocoSound remote control auto-repeat if held down. If you want a single event to occur, like turning on the safety valve, then press the safety valve and release it immediately. If you want to make a large change in volume or tone then you can hold the button down to avoid the need to press the button repeatedly.

8. CONFIGURING THE SOUND CARD

The soundcard has two modes:

1. Setting mode in which you can select the sounds you want and can make adjustments to them.
2. Run mode in which the soundcard does its job on your railway.

All settings are done using the remote control and we will cover that first. So place the soundcard into Setting mode by pointing the remote control at the soundcard or the receiver on the end of the flying lead and press the **Mute** button. The LED on the soundcard will blink slowly and all sounds will cease. Next press one of the keys on the remote control to change the sounds listed below. When you press a button, the LED will start blinking faster. At any time, you can press the **Mute** button to hear the sound you have selected and then press **Mute** again to turn it off. The options are:

Power Button – Battery or Track Power. The soundcard can be used with battery powered, radio controlled locomotives or with locomotives which are powered from the track (but not DCC). Press this button to change from one to the other:

1 beep – Battery powered radio control.

2 beeps – Track power. In this case, the soundcard will automatically turn itself off when the locomotive has not moved for thirty seconds. Turning the track power up a little will turn the soundcard back on.

The power button is also used to set the chuff start as described under Button 7 below.

Button 0 – Country. This is used to select the part of the world which your locomotive comes from. Your choice here will determine the selection of whistles offered and how those whistles are sounded. When you press the 8 button, one or more beeps will be heard to indicate the country currently selected as follows:

1 beep – Britain

2 beeps – North America

3 beeps – Australasia

Press the 0 button repeatedly to select the region you want. The sole purpose of changing the country is to select default whistles and sounds which are appropriate. If you want to use a whistle from another country because it fits your particular locomotive then there is no problem with changing the country to access that whistle.

Button 1 – Whistle. This is used to select the style of whistle which suits your locomotive. Every one of these whistles has an adjustable pitch and volume. Each time you press the 1 button the number of beeps will increase to indicate that the whistle listed below has been selected. If you wish to hear that whistle, press the Mute button on the remote control to reactivate the sound then press the 1 button to start the whistle and then again to stop it. While the whistle is sounding, you can use the channel up/down buttons to vary the pitch and also the volume buttons. The pre-selected whistles available are:

Beeps	Britain	North America	Australasia
1	Classic Original (default)	American 5" 3 Chime	Puffing Billy NA
2	Churchward	Hancock 3 Chime	NSW Chime
3	Stanier hooter	Reading 6 Chime (default)	Victorian Chime (default)
4	Bullied	Nathan 6 chime	South Australian Chime
5	Gresley chime	C & O 6 chime	New Zealand Chime
6	Thomas	Thomas	Thomas

Button 2 – Bell. This is used to select the type of bell from the list below.

- 1 beep – Manual bell. Starts ringing repeatedly when the button is pressed until the button is pressed again.
- 2 beeps – Timed bell. When F2 is triggered, rings repeatedly for a predetermined time. To set that time, press the Mute button to exit setting mode and then press Button 2 to ring the bell. When the bell has rung for as long as you want, press Button 2 again to stop the ringing. The time is then set and the bell will ring for that time when F2 is triggered while running.
- 3 beeps – Automatic bell. Rings repeatedly when the motor voltage is less than 4 volts. **(US Default)**
- 4 beeps – Automatic bell. Rings repeatedly when the motor voltage is less than 8 volts.
- 5 beeps – Automatic bell. Rings repeatedly when the motor voltage is less than 12 volts.
- 6 beeps – Manual bell. Rings once only each time the button is pressed. **(Australasian Default)**
- 7 beeps – Bell not required. Button sounds a short whistle toot. **(British Default)**

Button 3 – Guard. This is used to select the guard's sounds from the list below.

- 1 beep – Sounds a guard's Acme Thunderer whistle. **(British Default)**
- 2 beeps – Sounds "All aboard". **(US Default)**
- 3 beeps – Sounds "All aboard" and then the guard's whistle. **(Australasian Default)**

Button 4 – Safety Valve. This will operate in four ways:

- 1 beep – Manual. Starts blowing when the button is pressed and stops when pressed again. **(Default)**
- 2 beeps – Throttle controlled. When the loco is stationary, turn the throttle up a little and the safety valve will blow off until you turn the throttle off or forwards to move off.
- 3 beeps – Automatic. Blows for ten seconds once a minute.
- 4 beeps – Automatic. Blows for ten seconds once every three minutes.

Button 5 – Westinghouse Brake Pump. This will operate in two ways:

- 1 beep – Manual. Sounds only if the 5 button is pressed. **(Default)**
- 2 beeps – Automatic. Sounds whenever the locomotive is stationary.

Button 6 – Injectors. This will operate in three ways:

- 1 beep – Manual. Starts blowing when the button is pressed and stops when pressed again. **(Default)**
- 2 beeps – Automatic. Operates for twenty seconds once every two minutes.
- 3 beeps – Automatic. Operates for twenty seconds once every four minutes.

Button 7 – Steam Chuff. The locomotive chuff can be generated in three ways:

- 1 beep – Automatic chuff based on the motor voltage for two or four cylinders. **(Default)**
- 2 beeps – Automatic chuff based on the motor voltage for locomotives with three cylinders.
- 3 beeps – Mechanically triggered chuff. For locomotives which have a built in chuff trigger on an axle. The output from that chuff trigger needs to be connected to the F7 terminal on the soundcard. Note that the chuff trigger will function only when there is a voltage the M1/M2 terminals.

When automatic chuff is selected, the chuff needs to be set to correctly match the loco. This is done with the sound active. Starting from static, turn up the throttle until the loco just starts moving and then press the Power button on the remote control. This will set the voltage at which the chuff starts.

Next the chuff rate needs to be set to four or three beats per wheel revolution depending on the number of cylinders as above. Before doing this step it is a good idea to turn off all other sounds so that you can clearly hear the chuff alone. Then throttle up the loco so that it is running at a scale walking pace and use the channel up/down buttons on the remote to adjust the chuff rate to the correct number of beats per revolution. When you are satisfied then restore the other sounds.

A customer, Rik Bennett, has made an excellent video of setting the chuff which can be seen by going to YouTube and searching for “MyLocoSound steam setting”. It can also be accessed through the steam page at www.mylocosound.com.

Button 8 – Brake Squeal. This will operate in two ways:

- 1 beep – Not required. **(Default)**
- 2 beeps – Automatic. Sounds whenever the locomotive comes to a halt.

Button 9 – The Operating Mode. There are three operating modes available:

One beep – Indicates manual mode. In this mode all sounds are triggered according to the above settings. The whistle will sound for as long as its button is pressed.

Two beeps – Indicate simple automatic mode. This is designed for controllers which have no function buttons, as is often the case with track power, or at exhibitions, etc. where you don't want to operate manually. The whistle will sound once automatically when the loco moves off and then once more three times a minute when the loco is on motion. A reed switch can be placed under the loco and be connected to the F1 terminal to make the whistle sound when the loco passes over a magnet. Another reed switch, connected to the F2 terminal, can be

used to trigger the bell. If the bell is set to one beep then it will ring continuously until the loco passes over another magnet. If the bell is set to two beeps then it will ring for the set time.

Three beeps – Indicate American automatic mode. Again this is designed for controllers which have no function buttons, as is often the case with track power, or at exhibitions, etc. where you don't want to operate manually. However, it follows American rules. The whistle will sound two long toots when the loco moves off forwards or three short when backing up. If these occur the wrong way around then reverse the leads at the M1/M2 terminals. When the loco stops, a single short toot will indicate brakes on. A reed switch can be placed under the loco and be connected to the F1 terminal to make the whistle sound the grade crossing sequence when the loco passes over a magnet. Another reed switch, connected to the F2 terminal, can be used to trigger the bell. If the bell is set to one beep then it will ring continuously until the loco passes over another magnet. If the bell is set to two beeps then it will ring for the set time.

Channel up/down buttons– Load Sensitivity. The soundcard can be programmed to make the engine loud when accelerating and softer when coasting and slowing down. The channel up/down buttons change the level of sensitivity as indicated by the number of beeps when pressed. One beep indicates maximum sensitivity. Five beeps sets minimum sensitivity ie. the engine will be loud all the time. The default sensitivity is two and change to one if you want more sensitivity or three or more if the chuff sounds erratic.

Resetting the soundcard back to factory default settings. If you get in a bit of mess and want to start again then you can reset the soundcard by holding down the 0 (zero) button of the remote control for three seconds. You will then hear five beeps and all settings will revert to the defaults for the country you have selected. These include the default sounds, 2/4 cylinders and a voltage controlled chuff. It will not change the country.

You can change all the above settings whenever you wish and the changes will be effective immediately.

11. OPERATING THE SOUND CARD

When the loco is running, the engine sounds should operate automatically, getting louder when accelerating and softer when slowing down or idle.

Where your controller has function buttons then you can use them as follows:

- Button 1. Sounds the whistle for as long as the button is pressed.
- Button 2. Operates the bell for as long as the button is pressed.
- Button 3. Sounds the guard's whistle or "All aboard".
- Button 4. Sounds the safety valve blowing off.
- Button 5. Switches the Westinghouse brake pump when manual mode has been selected.
- Button 6. Sounds the live steam injector.

12. TROUBLE SHOOTING GUIDE

THE REMOTE CONTROL WON'T WORK

Press any button. If a red light does not flash next to the SET button then the battery is missing. If it flashes twice then the battery is flat and the remote control is not sending anything. Using a small flat screwdriver or knife blade, lever open the battery compartment and insert two new AAA. Then, when you press a button, the red light should flash rapidly to indicate that it is sending.

If the remote still does not work then the Sony™ coding may have been lost. Hold down the SET button for about four seconds until the red light stays on. Press and release the 0, then the 1, then the 4 and then the 0 button in turn. The red light will then go out and the remote control is then ready for use.

If the remote control still does nothing then the problem may be the infra-red receiver on the loco which must not be painted or obstructed.

I GET NO SOUND AT LOW SPEEDS WHEN USING TRACKPOWER

On trackpower, you may get no sound at low speeds until the track voltage gets up to about nine volts. Indicates that the support battery is flat. Charge it by running the loco at half speed for ten minutes.

I GET NO SOUND AT ALL

Press the Mute button on the remote control in case the sound has been accidentally turned off.

Switch the loco off and then on again. When the soundcard starts, the LED should flash once. If not then use a multimeter to check that there is at least nine volts at the B+ and B- terminals. If not then check your wiring in case something has come adrift. Check that the speaker is connected correctly.

If you are bench testing and there is a light shining on circuit board then this can put the soundcard into factory programming mode and stop the sound. In that case, the yellow LED next to the F1 terminal will stay on. You can fix this by covering the IR receiver on the soundcard and on the flying lead, if fitted.

THE SOUND CARD MAKES A CLICKING NOISE OR SHUTS DOWN

This most often occurs when the whistle is sounded. It is caused by the soundcard restarting because there is insufficient voltage in the track or battery to sustain the volume setting. Recharge the battery.

WHEN INSTALLED IN A LOCO, THE LOCO AND SOUND STOP INTERMITTENTLY AND I HAVE TO RESET THE CONTROLLER TO GET IT GOING AGAIN

The soundcard maximum output is 1.5 amps. If this is exceeded as a result of a short circuit, a heavy load and/or high volume settings then the soundcard will shut down. Also, if the soundcard is installed in a very confined space and is run for a prolonged period at high power then it can overheat and switch itself off while it cools down.

HOW TO RESET YOUR SOUND CARD

A time may come when you have been adjusting the sound and you want to start again. This can be achieved by resetting the soundcard back to the settings when it left the factory. You can do this by pressing the 0 button on the remote control and hold it down for three seconds. The soundcard will beep five times when the reset is complete.

THE SOUND IS ERRATIC (ON TRACKPOWER ONLY, NOT RADIO CONTROL)

When using track power, some controllers have an output which is so rough as to cause the soundcard to run erratically. This can be cured by fitting a 220µF bi-polar capacitor across the M1/M2 terminals to smooth the DC pulses. The capacitor rating needs to be at least 30 volts to ensure that it is more than the maximum voltage of the controller. A bi-polar capacitor is one which can be connected either way around.

MY RADIO CONTROL HAS BECOME ERRATIC

If the soundcard is installed very close to the loco radio receiver e.g. back to back, then it can interfere with the radio commands and operation can become erratic. To avoid this problem move the soundcard a little away from the receiver. You can also avoid the problem by wrapping the soundcard in silver paper but would have to be very careful to avoid shorts and component overheating.

13. USING AN EXTERNAL AMPLIFIER FOR RIDE ON RAILWAY LOCOMOTIVES

When used in 5 inch and 7¼ inch ride on railways there is a lot of environmental noise. The output of the soundcard alone is not sufficient for these environments and an external amplifier needs to be used. The wiring diagram overleaf shows how the soundcard can be interfaced to a commercial stereo amplifier in a loco with 24v motors powered by two 12 V batteries.

Note that the soundcard can handle a maximum of 24 volts DC. A battery which is labelled as 24 volts will typically output 28 volts when fully charged and will therefore damage the soundcard if connected directly. The two 10K resistors on the M1/M2 terminals keep the voltage down to 24v.

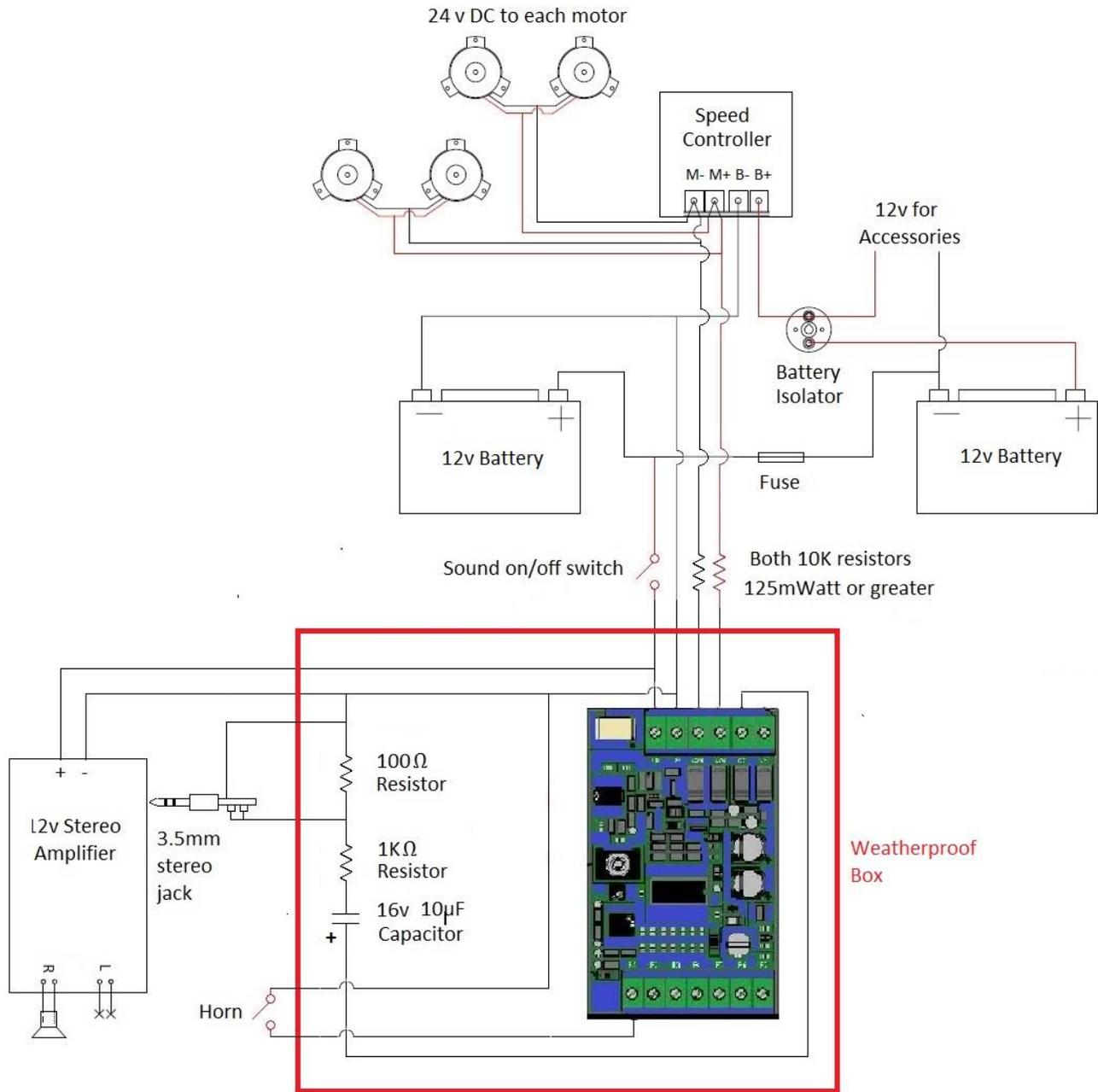
In Australia, the 2x15 watt AA0487 amplifier from Jaycar is suitable. Other amplifiers may require the 100Ω resistor to be changed. If the output volume is too low then raise the value of the 100Ω resistor.

A single speaker can be used on the right output or two speakers on the left and right outputs.

Any of the five functions can be used by means of a pushbutton between the function terminal and ground. The sound functions available are horn, bell, guard's whistle, airbrake release and engine start/stop. Only the horn wiring is shown in the diagram.

The installation can be made more robust by enclosing the soundcard, capacitor and two resistors into a plastic project box as shown in the diagram. The whole can then be fixed to the top of the amplifier using silicon.

Select a speaker which matches the impedance and power output of the amplifier. In the case of the Jaycar AA0487 a 15 watt speaker of four ohms impedance is needed. It is also important to make a soundbox which is an airtight fit to the back of the speaker. This will improve both volume and sound quality.



PLC009 UK Steam Instructions.doc 17/06/18

For more information, please visit the web site at www.mylocosound.com or e-mail sales@mylocosound.com.

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Remote Control	Radio Control	Sound Selection	US Defaults shown in bold
Mute		Tums setting mode and sound on/off	
Power	In run mode	Sets start voltage for chuff	
	In settings mode	1 beep	Locomotive is radio controlled
		2 beeps	Locomotive is track powered
Button 0		Country	1 beep Britain
			2 beeps North America
			3 beeps Australia and New Zealand
Button 1	F1	Whistle	Six to select from in each country
Button 2	F2	Bell	1 beep Manual on/off
			2 beeps Automatic timed ring when F2 is triggered.
			3 beeps Rings when motor below 4 volts
			4 beeps Rings when motor below 8 volts
			5 beeps Rings when motor below 12 volts
			6 beeps Single rings
			7 beeps Short whistle
Button 3	F3	The Guard	1 beep Guard's whistle
			2 beeps "All aboard"
			3 beeps "All aboard" followed by guard's whistle
Button 4	F4	Safety Valve	1 beep Manual on/off
			2 beeps Throttle nudge operated
			3 beeps Automatic once a minute
			4 beeps Automatic once every three minutes
Button 5	F5	Brake Pump	1 beep Manual on/off
			2 beeps Automatic each time the locomotive stops
Button 6	F6	Injector	1 beep Manual on/off
			2 beeps Automatic once every two minutes
			3 beeps Automatic once every four minutes
Button 7		Chuff Control	1 beep Voltage triggered 2/4 Cylinder (4 chuffs per rev.)
			2 beeps Voltage triggered 3 Cylinder (6 chuffs per rev.)
			3 beeps Switch/Wheel trigger at F7 terminal
Button 8		Brake Squeal	1 beep Not used
			2 beeps Automatic each time the locomotive stops
Button 9		Control Mode	1 beep Manual
			2 beeps Auto Whistle every 20 secs
			3 beeps American automatic whistle
	F7	Chuff trigger input at F7 terminal	
VOL up/down		Change Volume of active sound	
CH up/down	In run mode	Change Sound	Whistle Tone when whistle sounding Engine Chuff Rate when moving
	In settings mode	Load sensitivity 1 to 5, Default=2	
		1 beep	Chuff maximum sensitivity to power changes
		2 beeps	Chuff average sensitivity to power changes
		5 beeps	Chuff minimum sensitivity to power changes
Reset		Reset above settings to defaults	Hold button 0 down for 5 seconds with Mute off