



**The Big Book of**  
**BigSound™**

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## Table of Contents

Introductory Notes.....	3
Terminology .....	3
General Controls.....	4
BigSound™ System.....	4
Terminals.....	5
DCC.....	6
DCC Control Variables.....	6
Effects.....	7
Common.....	7
Diesel.....	7
Steam.....	7
Bell.....	8
Horn/Whistle.....	8
Coupler.....	8
Brake.....	8
Steam Controls.....	9
Chuff.....	9
Chuff Mode.....	10
Air Pump.....	10
Coal Loading.....	10
Water Fill.....	11
Fireman.....	11
Generator.....	11
Rod Clank.....	11
Pop Off.....	11
Hiss.....	11
Diesel Controls.....	12
Prime Mover / Electric Motor.....	12
Fan.....	12
Notches.....	12
Air Pop.....	12
Electric and Trolley Controls.....	13
Track Noise.....	13
Electrical.....	13
Pantograph.....	13
Compressor.....	13
Door Slam.....	13
Pole.....	13
Fare Box.....	13
Goose Controls.....	14
Goose Engine .....	14
Instrument Panel.....	14
Specialty Controls.....	14
Station Announcement.....	14
Rotary.....	14
Rotary Engine.....	14
Track Noise.....	15
Motion.....	15
Rack Noise.....	15
Ambiance/Crickets/Cows.....	15
Tips & Hints.....	16
Saving Configurations.....	16
Powering the sound system.....	16
Common Errors.....	16
Communications Errors.....	16
Cable Length.....	16
Special Configurations.....	16
Manual Sound.....	16
Locoline®.....	17
LGB MTS .....	17
2K2 Configuration without the Computer Interface.....	17

## Introductory Notes

The sounds, effects and functions in this document are separated as they are when using the Phoenix Computer Interface. This, hopefully, will enable you to find the section and information you are interested in much more readily.

When using the computer interface, the sliders and drop down menus that control a particular sound or feature are collected under an identifying icon. For example, when you click on the bell icon a window opens containing the controls associated with the bell.

The icons that appear depend upon which sound is loaded. The available controls under a particular icon may vary from one sound to another, depending upon availability.

You can always return to the factory default settings if you wish. To do this, simply load the original ROM file into the sound board.

There are three control levels. The levels are Basic (Volumes), Intermediate (Volume & Trigger Assignments) and Advanced (Everything). The level setting will also effect what controls show up when you click on a particular icon.

### Terminology

This document assumes certain meanings and actions for several terms. They are as follows. All sound and effects listed as “Triggers” will have both a Pin and DCC trigger associated with it unless otherwise noted. The trigger limitation will be listed as either [Pin Only] or [DCC Only] immediately following the name of the parameter. Parameters such as Volume and other relational based (more/less, faster/slower, etc.) parameters are not triggered and therefore do not have Pin or DCC options.

**Trigger - General reference to the activation of a sound or effect. This can be either by pin or DCC Function.**

**Volume Controls** - Every sound has a volume control. Volumes range from 0 - 150%. 100% is the original recorded level. To turn off a sound, simply sets its volume to 0.

**CAUTION!** INCREASING THE VOLUME ABOVE 100% MAY CAUSE UNACCEPTABLE DISTORTION IN SOME SOUNDS DUE TO THE NATURE OF THE RECORDING AND AMPLIFICATION PROCESSES.

**Pins** - Sounds can be activated by connecting the associated trigger terminal to ground. Most sounds have an auto play option which can be selected by itself or in conjunction with a trigger terminal.

The 2K2 has 6 trigger pins, terminals 10 through 15. Terminal 10 is shared with the computer interface but will function as a normal trigger when you are not connected to a computer. Terminal 16 is a common ground.

The PB9 has 4 trigger pins, terminals 7 through 10. Terminal 11 is a common ground. The addition of a P5T Auxiliary Input Board will add 2 Motor Voltage inputs and 6 trigger pins. The motor voltage inputs are labeled M1 & M2, the pins are Aux Board X/T1 through Aux Board X/T6.

The P5 has 2 trigger pins, C2 pins 2 & 4 (C2 pins 1 & 3 are grounds), these are labeled P5 Trigger 1 and P5 Trigger 2 respectively. The addition of a P5T Auxiliary Input Board will add 2 Motor Voltage inputs and 6 trigger pins. The motor voltage inputs are labeled M1 & M2, the pins are Aux Board X/T1 through Aux Board X/T6.

**DCC** - Functions range from F1 to F12. Addresses are from 1 to 9999; the factory default address is 3. The address can also be programmed the same way you program your locomotive decoder. You will have to send the command twice if you are using a 2K2 on the programming track. The first time will wake the sound system up, then before the system shuts off send the address again and the sound system will accept the new address. The P5 system also supports several DCC Control Variables (CV).



PHOENIX SOUND SYSTEMS DO NOT SUPPORT PROGRAMMING ON THE MAIN TRACK. IF YOU ATTEMPT TO PROGRAM EITHER A P5 OR 2K2 ON THE MAIN YOU WILL SET THE SYSTEM TO A RANDOM ADDRESS. YOU WILL THEN NEED TO USE THE COMPUTER INTERFACE TO RE-ADDRESS THE UNIT.

## General Controls

### BigSound™ System

**Current Volume:** The percent of the recorded volume at which all sounds play. This is the master volume, it is the volume level adjusted by the volume switch or DCC Function – if assigned.

**Start Voltage:** The voltage at which the engine starts to move in units of 0.1 volt. This parameter can be adjusted to synchronize the start of the sound system with initial movement of the locomotive. This does not effect the motion of a locomotive controlled by DCC.

**Rate - Speed vs. Volts:** The percentage of 12 Volts that represents maximum locomotive speed. The setting is used only when the sound system is configured to derive speed from motor voltage rather than from triggers or DCC speed signals.

**Shutdown Triggers:** When activated, either by pin or DCC, the shutdown function will cause the sound system to run through the shutdown sequence. The unit will start up when either the command is activated again, the system is powered off and then on or the locomotive is moved.

**Engine Start Up Volume [Diesel]:** The volume at which the engine start up sequence plays.

**Shutdown Volume:** The volume at which the shutdown sequence plays.

IN GENERAL THE STARTUP AND SHUTDOWN VOLUMES OF A DIESEL SHOULD BE EQUAL TO THE ENGINE IDLE SOUND VOLUME, SHOWN UNDER THE PRIME MOVER ICON.

**Track Voltage Filter:** This control adjusts the amount of filtration on the track voltage inputs. The filtration is a basic compensation for voltage variation over the length of the track.

**Maximum Volume:** The maximum percent of the recorded volume that can be obtained with the volume switch or DCC functions.

**Maximum Current [2K2]:** The maximum current draw of the sound system in mA. Typical current draw is around 100mA when traveling at a constant speed. The current draw can go significantly higher depending upon operating conditions. For example, a draw of 800mA would not be uncommon when running at maximum volume with maximum battery charging in progress.

**Peak Speaker Wattage [P5]:** The maximum power output to the speaker. This is the P5 system equivalent to the 2K2 current limiting function.

**Shutoff Delay:** Seconds until the board shuts off after main input (terminals 1 & 2) volts equals or drops below 0.5V.

SETTING THE PARAMETER TO 0 DISABLES THE SHUTOFF FUNCTION, MEANING THE SYSTEM WILL RUN FROM THE BATTERY INPUT UNTIL THE BATTERY SOURCE IS TURNED OFF OR DISCHARGED. IF DISABLED, THE SOUND SYSTEM WILL NEVER GO THROUGH THE SHUTDOWN SEQUENCE. THIS IS THE COMMON SETTING FOR RIDE ON LOCOMOTIVES.

**Track Polarity:** Normal means Forward is when Pin 1 voltage is greater than Pin 2. If the sound system is wired backwards there is no need to disassemble the and rewire, simply switch the track polarity.

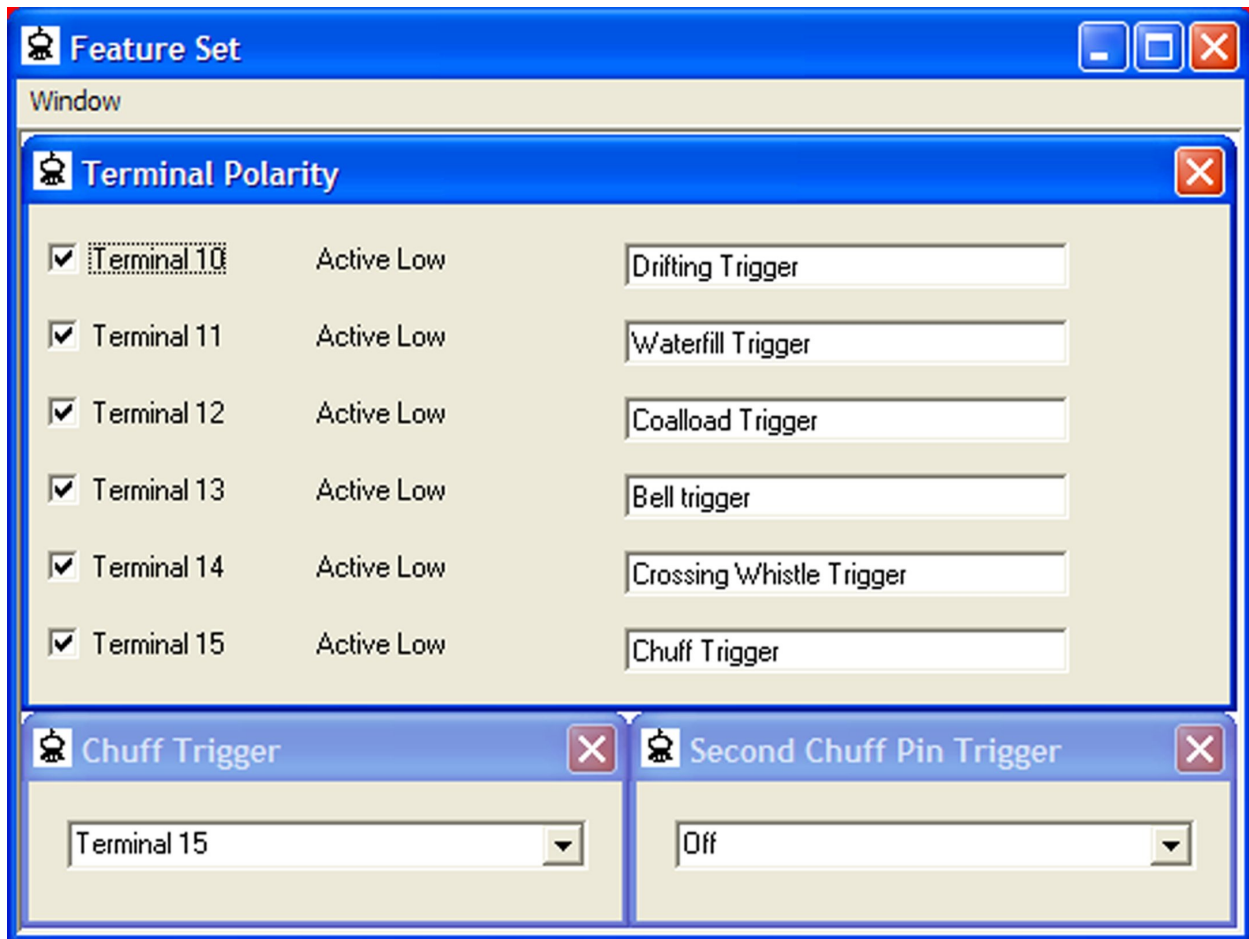
**Demo Mode[2K2]:** cycles through sounds in a factory set pattern when powered.

**Slave Triggers:** Assigns the triggers to the Slave Mode selector. Slave mode is useful for double heading locomotive. When Slave Mode is on the directional toots, bell and horn/whistle are disabled as they would be in normal American double headed operations.

**Slave Mode:** Displays the current Slave Mode Status (On or Off) and allows for it to be quickly changed.

## Terminals

Shown below is the terminal window from the Computer Interface. The check boxes determine how the input is treated - whether it should be 'on' when the input is low (grounded) or high (above 2.5 volts). Connections are summarized in this screen. Clicking the check boxes has the same effect as triggering the input because it changes the sense of the input.



**Chuff [Pin only, Steam]:** Determines the method for deriving speed. Assigning the Pin to a terminal value means that each contact closure produces one chuff cycle – the number of chuffs per closure is set by the Chuff Hits feature which is found under the Chuff Mode icon. A setting of “Auto” means that the system will derive speed from the input voltage.

**Second Chuff [Pin Only, Steam]:** Assigns a trigger source for a secondary chuff system. This is common to articulated locomotives such as a Big Boy or Cab Forward.

**Speed [Pin Only, Diesel]:** Determines the method for deriving speed. A setting of “Auto” means that the system derives speed from the input voltage. The “Auto & Terminal” Option will use voltage for engine control until a trigger occurs, and then use the trigger derived speed.

PLEASE NOTE: THE “AUTO & TERMINAL” OPTION DOES NOT FUNCTION IN STEAM SOUNDS.

## DCC

**DCC Address:** Select a DCC Address, 0 will disable DCC. For the address change to take effect the submit button must be pushed. This will only change the address of the sound system and does not effect any other DCC decoders installed in the locomotive.

**Speed from DCC:** Speed determined from DCC signals rather than physical triggers or voltage variation.

**DCC Mode Start Setting:** The DCC Speed at which the sound of the engine begins. This is the DCC equivalent to the Start Voltage parameter.

**DCC Mode Rate Setting:** The speed multiplier in DCC mode. 100% means 12 triggers/second at a DCC speed of 25 above the start setting.

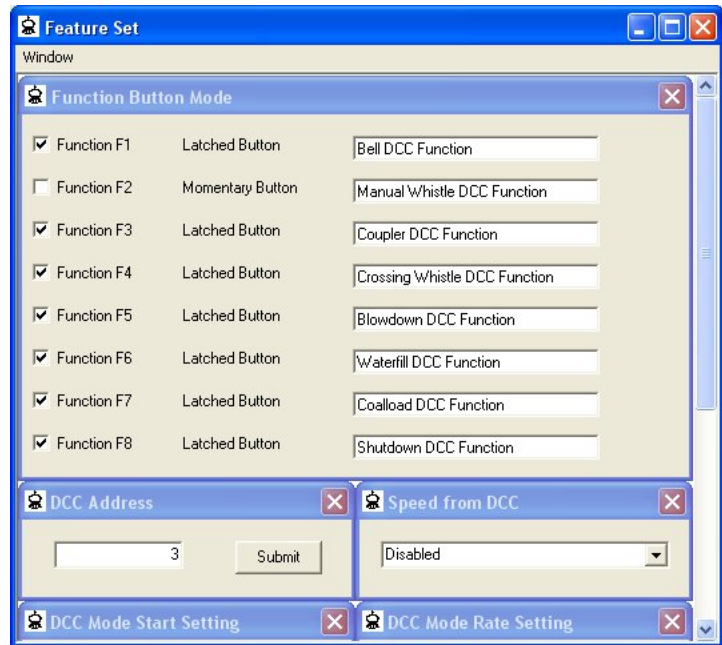
**Volume Up DCC:** Selects a DCC function to increase the current volume.

**Volume Down DCC:** Selects a DCC function to decrease the current volume.

**MTS Detection:** Selects whether MTS style decoders are automatically detected.

**DCC Timeout:** The amount of time the decoder will remain in its current state when DCC signal is lost. 0 is no timeout, meaning the unit will stay in its last state until DCC signals are reacquired.

The screen to the right, from the Computer Interface, summarizes the DCC function assignments and the type of trigger - momentary or latched - that the system is watching for. *Momentary* Buttons are those where the sound is triggered only as long as the button is depressed. *Latched* Buttons are those which remain on once depressed and require a second press to deactivate.



### DCC Control Variables

Versions of the P5 and PB9 firmware after 1.00 support the following Control Variables. These can be programmed on the program track or using **service mode** programming..

OPS MODE PROGRAMMING IS NOT CURRENTLY SUPPORTED.

CV	Description
1	Short Address
17	Long Address
18	Long Address
49	0 = Speed from Triggers; $\neq 0$ , speed from DCC
50	The DCC Value where motion starts.
51	The DCC Rate (Speed vs. Throttle)
52	Seconds to simulate DCC if DCC signal is lost. 0 = Forever
53	Seconds in idle before shutdown. 0 = Never shutdown

## Effects

### Common

**Tunnel Volume:** The percent of the recorded volume that overrides the current volume when tunnel mode is triggered. Tunnel Volume reduces the volume of all sounds. This is useful when going into a mountain or the backside of a layout when the sound should be less dominant. You may also use this as a mute function by setting the tunnel volume to 0.

**Tunnel Volume Triggers:** Selects the trigger sources for the Tunnel Volume effect.

**Tunnel Volume Fade Rate:** This control sets the rate of fade to/from the tunnel volume.

**Doppler Triggers:** Selects the trigger sources for the Doppler effect. Doppler works differently for diesel and steam. On steam it alters the pitch of the chuff as if the locomotive were approaching and then going away. On diesel the horn pitch is shifted as if the locomotive were rushing towards you and then past you. Doppler is speed sensitive. If you are going slow the effect will be hard to notice. For the manual diesel horn, the Doppler effect comes in if you hold the horn button for longer than 5 seconds.

### Diesel

**Dynamic Brake Volume:** The percent of the recorded volume at which the dynamic brake plays.

**Dynamic Brake Triggers:** Selects a trigger source for the Dynamic Brake.

**Engine Working Volume:** The percent of the recorded volume at which the engine sound plays when working mode is triggered. Working simulates the strain of the engine working under heavy load.

**Working Pin:** Selects the trigger sources for the Engine Working effect.

**Rev Up Triggers:** Selects the trigger sources for the Rev Up effect. Rev Up causes the engine to rev up into the next notch with each trigger. The engine can be revved from idle all the way into notch 8. The prime mover will remain in the higher notch until locomotive speed reaches the triggered level, then normal operation will resume. If the locomotive speed is decreased before reaching the revved level the prime mover will rev down to the new lower notch.

**Rev Down Triggers:** Selects the trigger sources for the Rev Down effect. Rev Down functions as the inverse compliment to Rev Up.

**Rev Wandering:** Selects the amount of rev wandering. The rev level will wander up and down the amount selected here over the period. This effect simulates the prime mover adjusting to work load variations, such as uneven terrain, while trying to maintain a constant train speed.

**Rev Wander Period:** The amount of time between changes in the rev level based upon the Rev Wandering setting. If Rev Wander Randomization is set, then the Rev Wander *may or may not* occur within the time frame of (Period  $\pm$  Randomization). Once the Wander has occurred or the calculated time frame has elapsed (if no wander occurs) a new time frame is calculated and the wander process begins again.

**Rev Wander Randomization:** The maximum amount of time that is either added to or subtracted from the Rev Wander Period. Setting the Randomization to "0" will cause the rev to wander based upon the Period alone.

### Steam

**Drifting Triggers:** Selects a trigger source for the Drifting effect. Drifting simulates the locomotive coasting, common when approaching a station or coming to a stop slowly.

## Bell

**Bell Volume:** The percent of the recorded volume at which the bell plays.

**Bell Triggers:** Selects the trigger sources.

**Bell Trigger Mode:** Selects the mode of the bell when triggered. In Programmed mode the bell plays for a set duration when triggered. In Manual mode the bell plays until the trigger is released if the trigger is held longer than two clangs; if triggered for less than two clangs the bell latches on until triggered again. The auto bell can not play more frequently than every 30 seconds.

**Bell Type [Steam]:** Selects the type of bell sound, either Mechanical or Hand rung.

**Stopping Bell Speed:** The speed at which the stopping bell plays.

**Stopping Bell Duration:** Controls how long the bell plays when stopping, in seconds.

**Startup Bell Duration:** Controls how long the bell plays when starting, in seconds.

**Triggered Bell Duration:** Controls how long the programmed bell plays when triggered, in seconds.

**Auto Bell Speed Limit:** The speed at which the automatic bell stops playing.

**Bell Hold-off:** Determines the minimum interval between automatic starting and stopping bell signals. Useful when operating in a switching role with frequent short stops, when signaling would not normally be used.

## Horn/Whistle

**Horn/Whistle Volume:** The percent of the recorded volume at which the horn/whistle plays.

**Crossing Horn/Whistle Triggers:** Selects the trigger sources for the Crossing Horn/Whistle. The Crossing Horn/Whistle plays the Grade Crossing sequence of *Long-Long-Short-Long*. Not in European locomotives.

**Manual Horn/Whistle Triggers:** Selects the trigger sources for the Manual Horn/Whistle, which plays as long as the trigger is activated. This allows you to control and play your own signals.

**Crossing Horn/Whistle Speed:** The speed at which the crossing signal plays. Setting the Pin trigger to a setting without 'Auto' disables the automatic crossing sequence.

**Fwd Horn/Whistle Volume:** The percent of the horn/whistle volume at which the forward toots play.

**Rev Horn/Whistle Volume:** The percent of the horn/whistle volume at which the reverse toots play.

**Stopping Horn/Whistle Volume:** The percent of the horn/whistle volume at which the stopping toot plays.

**Horn/Whistle Hold-off:** Determines the minimum interval between automatic starting and stopping toot signals. Useful when operating in a switching role with frequent short stops, when signaling would not be normal.

## Coupler

**Coupler Volume:** The percent of the recorded volume the coupler plays.

**Coupler Triggers:** Selects the trigger sources.

**Coupler Play Speed:** The speed, which must be met backing up, at which this sound plays. The coupler sound plays when you stop backing up if the speed window is met. A forward movement is needed before the coupler clank will play again.

## Brake

**Brake Screech Volume:** The percent of the recorded volume at which the brake screech plays.

**Brake Release Volume:** The percent of the recorded volume at which the brake release plays.

**Wheel Squeal Volume:** The percent of the recorded volume at which the wheel squeal plays.

**Brake Screech Triggers:** Selects the trigger sources for the brake screech.

**Brake Release Triggers:** Selects the trigger sources for the brake release.

**Wheel Squeal Triggers:** Selects the trigger sources for the wheel squeal.

**Brake Screech Speed:** The speed at which the brake screech plays.

**Brake Release Speed:** The speed at which the brake release plays.



## Steam Controls

### Chuff

**Chuff Maximum Volume:** The maximum percent of the recorded volume at which the chuff plays after all special effects are applied.

**Chuff Minimum Volume:** The minimum percent of the recorded volume at which the chuff plays after all special effects are applied.

**Johnson Bar Level:** Amount of Chuff volume reduction caused by slowing down. 0 is no change, 100% is about 1/2 volume

**Light Chuff 1 - 4 Volume:** The percent of the recorded volume at which light chuff # plays before any special effects are applied. Changing individual chuff volumes will result in different chuff rhythms.

**Heavy Chuff 1 - 4 Volume:** The percent of the recorded volume at which heavy chuff # plays before any special effects are applied. Changing individual chuff volumes will result in different chuff rhythms.

**Chuff Volume Ramp Rate:** Controls the rate the volume of the chuffs fade in.

**Johnson Bar Rate:** How fast the Johnson Bar reduction occurs.

**Minimum Chuff Time:** This sets the minimum time between chuffs, in mS. Often model trains are run much faster than real speeds, setting the minimum chuff time will keep the chuff sound more realistic.

**Starting Chuff Mix:** The amount of light chuff mixed in with heavy chuff when not drifting.

**Ending Chuff Mix:** Chuff mixture when drifting.

**Mixed Chuff Rate:** The transition rate into and out of drifting.

**Chuff Volume Randomization:** Controls the amount of chuff volume randomization.

**Base Chuff Pitch:** This control sets the base pitch of the chuff.

**Chuff Pitch Start:** Controls the speed where the chuff pitch begins to change.

**Chuff Pitch Rate:** Controls the amount the chuff pitch increases as the engine speeds up.

**Chuff Pitch Randomization:** Controls the amount of randomization of the chuff pitch.

**Chuff Compression Start:** Controls the speed at which the chuff compression starts.

**Chuff Compression Rate:** Controls the amount the chuff compression as the engine speeds up.

**Alternate Chuff Rhythm 1 & 2 Volumes:** Sets the relative volume level for the Alternate Chuff Rhythm.

**Alternate Chuff Rhythm 1 & 2:** Selects the Alternate Chuff patterns that may or may not be applied, based upon these settings, the Alternate Chuff Rhythm Period and Alternate Chuff Rhythm Randomization. These settings are based upon the volumes of Chuffs 1 through 4. Selecting "100% -100% - 100% - 100%" will disable the Alternate Chuff Rhythm effect, indicating that all 4 chuffs should be played at 100% of their normal volume. Selecting "xxx-xxx-xxx-xxx" will cause all 4 chuffs to be played at the corresponding Alternate Chuff Rhythm Volume. In selecting the Alternate Chuff Rhythms, "xxx" represents the chuff volume that may or may not – depending upon the period and randomization settings – be replaced with the corresponding Alternate Chuff Rhythm Volume.

**Alternate Chuff Rhythm Period:** The amount of time between changes in the chuff rhythm based upon the Alternate Chuff Rhythm 1 & 2 settings. If Alternate Chuff Randomization is set, then the Alternate Chuff Rhythms *may or may not* occur within the time frame of (Period ± Randomization). Once the Alternate Rhythm has occurred or the calculated time frame has elapsed (if no alternate rhythm occurs) a new time frame is calculated and the wander process begins again. Setting the Period to "Off" will also disable the Alternate Chuff Rhythm.

**Alternate Chuff Rhythm Randomization:** The maximum amount of time that is either added to or subtracted from the Alternate Chuff Rhythm Period to calculate the time frame for the Alternate Chuff Rhythm effect. Setting the Randomization to "0" will cause the Period alone to determine transitions.

IN ORDER TO ADD A MORE ANALOG INTEREST TO THE SOUND, THE CHUFF RHYTHM CAN BE RANDOMLY CHANGED. IT IS SUGGESTED THAT WHICHEVER ALTERNATE RHYTHM IS CHOSEN, THE ALTERNATE CHUFF RHYTHM VOLUMES SHOULD BE ADJUSTED SO THAT THE EFFECT IS JUST PERCEPTIBLE.

## Chuff Mode

**Chuff Hits:** This control sets how many chuffs each input trigger produces. This is especially useful when adding a reed switch and axle magnets for chuff synchronization on geared locomotives.

**Chuff Averaging:** Compensates for uneven chuff signals, useful when the chuff triggers are not evenly spaced.

**Double Chuff Triggers:** Selects the trigger sources for the double chuff mode. Double Chuff Mode simulates two locomotives or a simple articulated locomotive where there is a second set of chuffs wandering in and out of phase with the primary set of chuffs. This is also called Mallet Mode.

**Double Chuff Sweep Rate:** This control sets the sweep rate for double chuffs. That is, the rate the chuff sets move in and out of phase.

**Maximum Double Chuff Speed:** The maximum speed at which 2 discreet chuffs are played, above this speed only the primary chuffs will be played. This mimics the 'blurring' of articulated locomotives at high speed, where only one distinct set of chuffs is heard.

**Canyon Chuff Volume:** The percent of the chuff volume at which the canyon chuff effect plays.

**Canyon Chuff Triggers:** Selects the trigger sources for Canyon Chuff effect. Canyon Chuff adds variability to the chuff sound by flanging the sound at various delay times as though the locomotive is moving through terrain that effects the sound of the chuff.

**Chuff Mode:** Selects the chuff mode, either Normal, Double Chuff (Mallet) Mode or Canyon Chuff.

**Three Chuff Mode:** Used on certain three cylinder engines whereby the sound of a fourth chuff does not occur.

## Air Pump

AIR PUMP 2 IS A LONGER RUNNING AIR PUMP; IT WOULD PLAY AFTER BRAKING HAD USED UP THE AIR RESERVE. AIR PUMP 2 IN AUTO IS TRIGGERED BY A DROP IN VOLTAGE. AIR PUMP 1 IS MAINLY FOR KEEPING THE AIR RESERVE "TOPPED OFF." IT CYCLES PERIODICALLY IN IDLE.

**Air Pump Volume:** The percent of the recorded volume the air pump plays.

**Air Pump Triggers:** Selects the trigger sources.

**Air Pump Interval:** This control sets the period between air pump cycles. If Air Pump Randomization is set, then the Air Pump *may or may not* play within the time frame of (Period  $\pm$  Randomization). Once the Air Pump has played or the calculated time frame has elapsed (if no Air Pump occurs) a new time frame is calculated and the process begins again.

**Air Pump Randomization:** The maximum amount of time that is either added to or subtracted from the Air Pump Interval to calculate the time frame for the Air Pump sound. Setting the Randomization to "None" will cause the Interval alone to determine the air pump cycles.

**Air Pump 2 Volume:** The percent of the recorded volume air pump 2 plays.

**Air Pump 2 Triggers:** Selects the trigger sources.

**Air Pump 2 Duration:** This control sets the length of the air pump 2 cycle.

**Air Pump 2 Interval:** This control sets the period between air pump 2 cycles. If Air Pump 2 Randomization is set, then the Air Pump 2 *may or may not* play within the time frame of (Period  $\pm$  Randomization). Once the Air Pump 2 has played or the calculated time frame has elapsed (if no Air Pump 2 occurs) a new time frame is calculated and the process begins again.

**Air Pump 2 Randomization:** The maximum amount of time that is either added to or subtracted from the Air Pump 2 Interval to calculate the time frame for the Air Pump 2 sound. Setting the Randomization to "None" will cause the Interval alone to determine air pump 2 cycles.

## Coal Loading

**Coal Loading Volume:** The percent of the recorded volume at which the coal loading plays.

**Coal Loading Triggers:** Selects the trigger sources.

**Coal Loading Trigger Mode:** Selects the mode of the coal loading when triggered - manual or programmed.

**Coal Loading Duration:** This control sets the time the programmed coal loading sound will play.

## Water Fill

**Water Fill Volume:** The percent of the recorded volume at which the water fill plays.

**Water Fill Triggers:** Selects the trigger sources.

**Water Fill Mode:** Selects the mode of the water fill when triggered, programmed or manual.

**Water Fill Duration:** This control sets the time the programmed water fill sound will play.

## Fireman

**Coal Shovel Volume:** The percent of the recorded volume at which the coal shoveling plays.

**Coal Shovel Triggers:** Selects the trigger sources.

**Coal Shovel Duration:** Controls the length of time the coal shoveling plays.

**Coal Shovel Interval:** This control sets the period between coal shoveling cycles. If Coal Shovel Randomization is set, then the fireman *may or may not* shovel coal within the time frame of (Period  $\pm$  Randomization). Once the fireman has shoveled or the calculated time frame has elapsed (if no shoveling occurs) a new time frame is calculated and the process begins again.

**Coal Shovel Randomization:** The maximum amount of time that is either added to or subtracted from the Coal Shovel Interval to calculate the time frame for the Coal Shovel sound. Setting the Randomization to “None” will cause the Interval alone to determine the fireman’s shoveling schedule.

## Generator

**Generator Volume:** The percent of the recorded volume at which the generator plays.

**Noise Volume:** The percent of the recorded volume at which the background engine noise plays.

**Generator Triggers:** Selects the trigger sources.

**Generator Run Time:** This control sets the maximum time the generator will run at idle, in seconds.

## Rod Clank

**Rod Clank Volume:** The percent of the recorded volume the rod clank plays.

## Pop Off

**Blow down Volume:** The percent of the recorded volume at which the blow down plays.

**Blow down Triggers:** Selects the trigger sources.

**Blow down Speed:** The speed at which the blow down plays.

**Blow down Mode:** Selects the mode for the Blow Down, either Programmed or Manual.

**Blow down Interval:** This control sets the period between blow down cycles. If Blow down Randomization is set, then the blow down *may or may not* play within the time frame of (Period  $\pm$  Randomization). Once the blow down has played or the calculated time frame has elapsed (if no blow down occurs) a new time frame is calculated and the process begins again.

**Blow down Randomization:** The maximum amount of time that is either added to or subtracted from the Blow down Interval to calculate the time frame for the Blow down sound. Setting the Randomization to “None” will cause the Interval alone to determine the Blow down schedule.

**Steam Release Volume:** The percent of the recorded volume at which the steam release plays.

**Steam Release Pin:** Selects a trigger source.

**Steam Release DCC:** Selects a DCC trigger source.

## Hiss

**Hiss Volume:** The percent of the recorded volume at which the hiss of the cylinders clearing plays.

**Slowdown Hiss:** Selects whether the hiss plays when the engine slows down.

**Hiss Cut Off Speed:** The speed above which the hiss sound will not play.

## Diesel Controls

### Prime Mover / Electric Motor

**Engine Volume:** The percent of the recorded volume at which the engine rev sound plays.

**Idle Sound Volume:** The percent of the recorded volume at which the idle sound plays.

**Idling Engine Rev Volume:** The percent of the engine rev volume that can be mixed in when idling.

**Speed 1 - 8 Engine Rev Volume:** The percent of the engine rev volume at which the rev sound plays when at speed 1-8.

**Rev Falling Volume:** The percent of the engine rev volume at which the rev sound plays when decreasing speed levels.

**Rev Rising Volume:** The percent of the engine rev volume at which the rev sound plays when increasing speed levels.

**Enter Idle Volume:** The percent of the engine rev volume at which the rev sound plays when going from speed 1 into idle.

**Leave Idle Volume:** The percent of the engine rev volume at which the rev sound plays when going from idle into speed 1.

**Engine Momentum:** The speed at which the engine sound changes speed in relation to input power variations.

### Fan

IN A TURBOCHARGED LOCOMOTIVE THE FAN SOUND CONTROLS THE WHINE OF THE TURBOCHARGER, IN AN ASPIRATED ENGINE THE FAN SETTINGS CONTROL THE ROOTS BLOWER WHINE.

**Master Volume:** The percent of the recorded volume at which the whine plays.

**Idling Volume:** The percent of the volume at which the whine plays when at idle.

**Speed 1 - 8 Engine Whine Volume:** The percent of the volume at which the sound plays when at speed 1-8.

**Falling Volume:** The percent of the volume at which the whine plays when decreasing speed levels.

**Whine Rising Volume:** The percent of the volume at which the whine plays when increasing speed levels.

### Notches

**Speed 1 - 8 Rising:** The point at which the diesel will rev up into the next higher notch.

**Speed 1 - 8 Falling:** The point at which the diesel will rev down into the next lower notch.

### Air Pop

**Air pop Volume:** The percent of the recorded volume at which the air pop plays.

**Air Pop Triggers:** Selects the trigger sources.

**Air Pop Interval:** This control sets the period between air pop cycles. If Air Pop Randomization is set, then the Air Pop *may or may not* play within the time frame of (Period ± Randomization). Once the Air Pop has played or the calculated time frame has elapsed (if no Air Pop occurs) a new time frame is calculated and the process begins again.

**Air Pop Randomization:** The maximum amount of time that is either added to or subtracted from the Air Pop Interval to calculate the time frame for the Air Pop sound. Setting the Randomization to “None” will cause the Interval alone to determine the air pop cycles.

## Electric and Trolley Controls

### Track Noise

**Track Noise Volume:** The percent of the recorded volume at which the track noise plays.

**Track Noise Start Speed:** The speed at which the track noise will begin playing.

**Track Noise Compression:** The amount of time compression on the track noise. This is adjusted to match the track sound with the train speed.

### Electrical

**Volume:** The volume at which the reversing sounds play.

**Direction Switch Triggers:** Selects the trigger sources.

**Direction Switch 2 Triggers:** Selects the trigger sources.

### Pantograph

**Volume:** The volume at which the pantograph sounds play.

**Pantograph Triggers:** Selects the trigger sources.

**Pantograph 2 Triggers:** Selects the trigger sources.

### Compressor

**Compressor Volume:** The percent of the recorded volume at which the compressor plays.

**Compressor Triggers:** Selects the trigger sources.

**Compressor Interval:** This control sets the time, in seconds, between compressor cycles.

**Compressor Duration:** Sets the time, in seconds, the compressor plays.

### Door Slam

**Door Slam Volume:** The percent of the recorded volume at which the door slam plays.

**Door Slam Triggers:** Selects the trigger sources.

**Delay after Idle:** Seconds after stop when the sound plays.

### Pole

**Volume:** The volume at which the trolley pole sounds play.

**Pole Triggers:** Selects the trigger sources.

**Pole 2 Triggers:** Selects the trigger sources.

### Fare Box

**Fare Bell Volume:** The percent of the recorded volume at which the Fare Bell plays.

**Fare Bell Triggers:** Selects the trigger sources.

**Fare Bell Interval:** This control sets the time, in seconds, between Fare Bell cycles.

## Goose Controls

### Goose Engine

**Goose Engine Volume:** The percent of the recorded volume at which the engine sound plays.

**Idle Sound Volume:** The percent of the recorded volume at which the idle sound plays.

**Gear 1-3 Volume:** The percent of the engine volume at which the engine sound plays in 1<sup>st</sup> - 3<sup>rd</sup> gear.

**Engine Shift 1-3 Volume:** The percent of the engine volume at which the engine sound plays during shift 1-3.

### Instrument Panel

**Maximum Engine Speed:** Sets the maximum engine speed as a percentage of the recorded speed.

**Shift 1-3 Volume:** The percent of the recorded volume at which the shifting sound plays in 1<sup>st</sup> - 3<sup>rd</sup> gear.

## Specialty Controls

### Station Announcement

**Station Announcement Volume:** The percent of the recorded volume at which the station announcement sound plays.

**Station Announcement Triggers:** Selects the trigger sources.

### Rotary

**Snow Blade Volume:** The percent of the recorded volume at which the snow blade sound plays.

**Idling Snow Blade Volume:** The percent of the snow blade volume at which the snow blade sound plays when at idle.

**Speed 1 - 8 Snow Blade Volume:** The percent of the snow blade volume at which the snow blade sound plays when at speed 1-8.

**Snow Blade Falling Volume:** The percent of the snow blade volume at which the snow blade sound plays when decreasing speed levels.

**Snow Blade Rising Volume:** The percent of the snow blade volume at which the snow blade sound plays when increasing speed levels.

### Rotary Engine

**Engine Volume:** The percent of the recorded volume at which the engine sound plays.

**Idle Sound Volume:** The percent of the recorded volume at which the idle sound plays.

**Speed 1 - 8 Engine Volume:** The percent of the engine volume at which the engine sound plays when at speed 1-8.

**Engine Falling Volume:** The percent of the engine rev volume at which the rev sound plays when decreasing speed levels.

**Engine Rising Volume:** The percent of the engine rev volume at which the rev sound plays when increasing speed levels.

**Engine Stopping Volume:** The percent of the engine rev volume at which the rev sound plays when going from speed 1 into idle.

**Engine Starting Volume:** The percent of the engine rev volume at which the rev sound plays when going from idle into speed 1.

**Engine Momentum:** The speed at which the engine sound changes speed in relation to input power variation.

**Idling Engine Volume:** The percent of the engine volume at which the engine sound plays when at idle.

## Track Noise

**Track Noise Volume:** The percent of the recorded volume at which the click clack sound plays.

**Idling Track Noise Volume:** The percent of the click clack volume at which the click clack sound plays when at idle.

**Speed 1 - 8 Track Noise Volume:** The percent of the click clack volume at which the click clack sound plays when at speed 1-8.

**Track Noise Falling Volume:** The percent of the click clack volume at which the click clack sound plays when decreasing speed levels.

**Track Noise Rising Volume:** The percent of the click clack volume at which the click clack sound plays when increasing speed levels.

**Track Noise Stopping Volume:** The percent of the click clack volume at which the click clack sound plays when going from speed 1 into idle.

**Track Noise Starting Volume:** The percent of the click clack volume at which the click clack sound plays when going from idle into speed 1.

**Engine Momentum:** The speed at which the engine sound changes speed.

## Motion

**Track Noise Volume:** The percent of the recorded volume at which the track noise sound plays.

**Idling Track Noise Volume:** The percent of the track noise volume that the track noise sound plays when at idle.

**Speed 1 - 8 Track Noise Volume:** The percent of the track noise volume at which the track noise sound plays when at speed 1-8.

**Track Noise Falling Volume:** The percent of the track noise volume at which the track noise sound plays when decreasing speed levels.

**Track Noise Rising Volume:** The percent of the track noise volume at which the track noise sound plays when increasing speed levels.

## Rack Noise

**Rack Volume:** The percent of the recorded volume the rack noise plays.

**Reverse Rack Volume:** The percent of the recorded volume at which the sound plays in reverse.

**Rack Triggers:** Selects the trigger sources.

**Rack Start Speed (Electric):** The speed at which the rack will begin playing.

**Rack Compression (Electric):** The amount of time compression on the rack sound.

**Rack Chuff Counter (Steam):** This control sets the number of chuffs between the rack sounds.

## Ambiance/Crickets/Cows

**Cricket Volume:** The percent of the recorded volume at which the crickets play.

**Cricket Triggers:** Selects the trigger sources.

**Cricket Interval:** This control sets the time between Cricket cycles.

**Stella Volume:** The percent of the recorded volume at which the Stella call plays.

**Stella Triggers:** Selects the trigger sources.

**Wolf Call Volume:** The percent of the recorded volume at which the crickets play.

**Moo Volume:** The percent of the recorded volume at which the cow plays.

**Moo Triggers:** Selects the trigger sources.

**Moo Delay after Idle:** Seconds after stop when the sound plays.



## Tips & Hints

### Saving Configurations

As you make adjustments to your sound board, the new values overwrite the old values and there is no undo. If you have a configuration that you like and might want to go back to it you should save it. To save your current configuration, choose **Save** from the File menu, select **Configuration Only**, name your file, hit **Open**.

### Powering the sound system

In order to communicate, the sound board must be on. This sometimes presents a problem, as the train may want to move when the sound board is on. A motor cut off switch is useful for lengthy sessions. For short sessions, you can keep the 2K2 board alive with a small track voltage and run off the battery. This will work for about 15 minutes with a fully charged battery. The P5 system will need to see at least 9V to produce sound, even though it will connect to the PC at lower voltage. If you installed in a tender or boxcar, you can simply set it on the track.

### Cable Length

The Phoenix Computer Interface Cable is 6 feet long and we do not recommend using extensions on the 2.5mm Mini Plug end. You can, however, add RS232 (serial) cable extensions between the computer and the Interface cable. Extensions should be no more than 25 feet, beyond this length we can not guarantee that the software will communicate accurately.

## Common Errors

- Check that your cables are connected.
- The power supply may be inadequate (notably starter set power supplies) - your power supply should provide at the minimum 30V/A.
- Your PC's FIFO buffers may need to be increased - to do this in Windows right-click on My Computer and select Properties, then select Device Manager. Highlight your COM port in the list and click Properties. Click the Port Settings tab then the Advanced button. Use FIFO Buffers should be checked and both sliders should be set to maximum.

### Communications Errors

**'Connecting.....' displayed, but never connects:** This has three very common causes. The first, and most common, is that the interface cable is not fully seated in the access jack. When inserting the plug into the jack you should feel two distinct 'clicks' when the cable has been fully seated. Second, the computer's modem may have been selected under the 'Port' menu. The default modem assignment in the majority of PCs is COM3. Finally, the yellow wire on the access jack is not connected to the sound board. On a 2K2 this should be firmly seated into terminal 10, making sure that the wire is making contact and that the insulation is not caught in the terminal. On a P5, make sure the yellow wire is seated into its connector and has not pulled free.

**Runtime Error 13, Type Mismatch:** Your .ini files are out of date. Download and install the latest update from the Phoenix Sound website.

**Runtime Error 7, Out of Memory:** This, as well, may have several causes. Primarily it is caused by having too many processes (applications) running. Try closing all nonessential programs and restarting the Phoenix application.



## Special Configurations

### Manual Sound

The latest version of the Phoenix software allows the programmed and the manual whistle to be available simultaneously on different triggers. To configure the 2K2 system for complete manual operation do the following:

First, turn off the programmed horn/whistle and turn on the manual horn/whistle. To do this click on the horn/whistle icon and find the crossing whistle/horn pin trigger. Change this from “auto and terminal 14” to “Off”. Go to the manual whistle/horn trigger and change this from “Off” to “terminal 14”. If you also want to eliminate the automatic forward, reverse and stop signals, set their respective volumes to zero.

Next, modify the Bell settings. The “Bell Trigger Mode” should be set from programmed to manual. The “Bell Trigger” should be set from “auto and terminal 13” to “terminal 13”.

Now your BigSound™ system is completely under your control. A P5 system can be configured the same way.

### Locolinc®

When connecting to a Locolinc® system, the trigger inputs need to be switched from active low to active high. This is done through the check boxes in the “terminals” menu. You will only need to change the input settings for the triggers you connect to the Locolinc® unit, typically the whistle and bell are chosen. We also suggest that you run the system in real time mode rather than programmed responses for the whistle and bell with Locolinc®.

### LGB MTS

LGB’s Multi-Train System and the BigSound™ work well together, however for button assignments that are consistent with LGB’s, a few of the functions should be reassigned. Please make sure that you remove a feature from a function before adding one to it. Our recommended MTS function assignments are:

- F1 Whistle
- F2 Brake
- F3 Bell
- F4 Coal Shoveling
- F5 Coupler Clank
- F6 Water Fill
- F7 Coal Load
- F8 Shutdown (Sound On/Off)

## 2K2 Configuration without the Computer Interface

All of the following adjustments can be more easily made using the Phoenix Computer Interface. You can still do a great deal of configuration without the Computer Interface.

The functions that can be configured without the interface are summarized in the table below:

<b>Input</b> (terminal)	<b>Open</b> (Not Connected)	<b>Grounded</b> (Connected to terminal 16)
10 Horn (Diesel) Whistle (Steam)	Multiple Chime Hand rung	Single Chime Mechanically rung
11 Signal Sequence	Programmed	Manual
12 Input Sense	Active Low	Active High
13 Demo Mode	Off (normal)	On
14 Chuff (Steam) Slave Mode (Diesel)	Normal Off (normal)	Double (Mallet) On
15 Train Speed by	Voltage	Trigger

PLEASE SEE THE BIGSOUND™ 2K2 HANDBOOK FOR A MORE DETAILED EXPLANATION OF THESE CONFIGURATION OPTIONS AS WELL AS SEVERAL STEP BY STEP EXAMPLES.