

All Aboard the BigSound™!



Bringing You
The World's Finest
Sound Systems
Since 1995



Phoenix Sound Systems, Inc.
3514 West Liberty Rd
Ann Arbor, MI 48103
sales: 800-651-2444 • fax: 734-662-0809
email: phoenixsound@phoenixsound.com
www.phoenixsound.com

Getting To Know the BigSound™ 2K2

U.S. Patent 5,754,094

THE STORY OF A SYMPHONY OF SOUND



It's early morning, and you've just risen from a refreshing slumber.

With a gleam in your eye, you approach your railroad display even before breakfast. Your Phoenix Sound equipped locomotive is still sleeping, but not for much longer. With great anticipation, your hand moves toward your engine . . .

First, you nudge the throttle and send power to the sound system. The engine seems to leap to life almost immediately. Steam pressure builds up in the boiler, soon you hear it whining out of the engine. The electrical generator spins up and the air pump cycles. You know that every now and then you'll need to inject some water into the boiler or shovel a little coal for added effect.

You nudge the throttle slightly to back out of the engine house. On key, the reverse whistle blows and the bell chimes. You deliberately move slowly so the side rods clank and the valve clearing is turned on. You coast over the switch to the station and stop. The horn lets loose one toot. Then you move forward, with two more toots, and pass the string of box cars you're going to connect with. You stop again past the switch and back slowly into the siding. Just as the couplers engage, you stop, and the whole train shakes a little as the rattling couplers echo down the train.



With clearance from the dispatcher, you head out on the track and the long crossing whistle blows. As the engine slows into the station, after running at higher speed on the main line, you hear the bell chime once more. Then, the brakes

squeal into a stop and the engine returns to idle. What a thrill!



BigSound™ 2K2

THE PACKAGE

Your Phoenix sound system comes pre-configured. In most cases, you only have to connect to track power and position the components – battery, board, volume switch, access jack and speaker. Many of our customers install their own systems.

The main sounds and most of the auxiliary sounds can be operated by changing the speed of the train. However, you might want to generate sounds at certain intervals without adjusting speed. For this, your kit includes two reed switches that can be wired to sense magnets in the track. These are traditionally used to blow the crossing whistle or sound the station bell. On Phoenix systems, you may want to install them in order to hear sounds like coal loading, water fill or dynamic braking (on diesels). The trigger inputs can also be used to control effects like the diesel's Doppler horn, tunnel fade, and so forth.

Some library selections include unique ancillary sounds that you may want to activate by connecting to a remote control receiver instead of a reed switch that closes only when you pass a magnet. You can push a button on your transmitter and hear the door slam on the galloping goose, the first rev up on the diesels, a steam release, coal shoveling, dynamic breaking – you get the idea. It's all in there.

THE SPEAKERS

The BigSound™ board outputs a high quality audio signal; however, the sound cannot be reproduced to its full potential without the proper speaker, installed in an acoustically sensible enclosure. Bigger is generally better, especially at the small end of the speaker size spectrum. We ship the largest speaker with our system that one can reasonably install in your engine.

For optimum sound, the speaker enclosure should have rigid walls and a minimum volume twice the size of the speaker. It is very important that the speaker frame be sealed to the enclosure so that air leakage does not occur from the back of the speaker to the front.

The 2K2 sound board amplifier is protected from short circuits and can handle loads down to 4 ohms. It is quite common to run an additional parallel wired 8 ohm speaker in diesel A-B lash-ups. Essentially, you can use any multiple speaker wiring configuration that presents a 4 ohm or greater load to the sound board. Phasing between multiple speakers will have an effect on the overall sound the volume.

THE BATTERY

Trains make sounds even when they're not moving, and especially when they are moving slowly (the starting whistle, the bell, squealing brakes . . .). Under these conditions, there is not enough voltage on the track to operate the sound system.

That's where the battery comes in. When the track voltage is below 5 volts, the system is using the battery.

Above that voltage, it is recharging the battery. If you run for extended periods at low track voltage, the battery will run down. Most engines have a motor cutoff switch so you can let the engine sit still on a powered siding with the sound system still running. Turn the



volume down if you don't want to listen, or head out on the main line for another long, brisk ride.



QUALITY – FIRST AND FOREMOST

The Phoenix philosophy is simple: sound quality and product reliability first, cost last. We have reasonably priced our system in order to allow our customers to add quality animation to their engines. Our cost is slightly more than our competitors because we strive for only the best materials. In light of this, we are certain that you'll agree you are getting a great value, and the additional cost is justified by the satisfaction you will experience for years to come.

Our quality shines through in every component of the sound system. For example: the connectors are small, reliable, and corrosion-free; the diodes operate at a lower-than-normal voltage for optimal track power. We use considerable memory space because there is a notable fidelity difference between sounds stored at 8 bits versus 16 bits. We mix and modify the sounds based on what the train is doing at any given moment, this takes an expensive high power processor; we do not simply cycle through a digitally-stored sound sample.

In regards to quality, we are aware that mistakes occasionally occur. People can cross-wire or insulation can rub off. We even recognize that electrical surges and unregulated voltage are common. As a result, design to compensate for them as well as possible. No consumer wants a dead sound system. We understand that you're in the hobby to have fun, and we want to deliver fun. We include some extra parts with the system so your sound board can be comfortable in the real world, and so you can be happy in the model world.



Components of a typical BigSound™ 2K2 diesel kit.

The standard BigSound™ 2K2 system is a complete kit typically consisting of the following:

- 16-bit digital soundboard with a preloaded library selection.
- A high-quality, 8-ohm speaker (size varies with installation requirements).
- A 3-cell (3.6V) nickel cadmium rechargeable battery.
- A volume Switch
- A computer access jack
- 2 Reed Switches (3 for steam kits)
- A pair of axle magnets (steam kits)
- Locomotive specific connectors are included with kits where necessary

Complete kits list for \$295.00. Additional components are available separately by order.

In addition to the unsurpassed quality behind every Phoenix Sound Systems product, we provide a warranty with each kit that you purchase. This warranty guarantees correct performance of materials and operation for one year. We also offer our technical support and guidance during regular business hours by telephone, email, or fax.

CONFIGURATION / COMPUTER INTERFACE

We initially configure your system in the manner that most modelers will want to use it. But modelers like to play, so we've built in the tools for you to do extensive customizing of the way the system works and sounds.

Using the Phoenix Computer Interface, you can assign sounds to pins, adjust the relative volume of individual sounds, tune the playing of sounds to the performance of the engine, turn effects on and off, select manual or automatic whistles/horns . . . the list goes on and on.

The Phoenix Computer Interface uses the 3 wire remote access jack that came with your sound system. If you install this jack when you install the system, you should not have to open your engine again. There are no adjustments on the board.

With the Phoenix Computer Interface you can also save and reload configurations, load completely new sounds, experiment with different chuff rhythms, change the rates at which things occur, and set the durations of sounds.

DCC/MTS

If you have or will be converting to DCC/MTS, the 2K2 board is ready. You will not need to hook the sound board to a decoder in order to have the sounds play. The 2K2 board will see that there is DCC on the track and will respond to speed and function commands so your only connection is to the track. This is great for box car installations. Using the Computer Interface, you can assign the sounds to whatever function buttons you like.

You will still need a decoder in the engine to drive the motor and to run lights, etc.

RADIO / REMOTE CONTROL (RC)

The 2K2 board hooks directly to remote control receivers. The motor connection uses the differential voltage between the motor wires to determine speed and direction. If you have batteries on board for the RC system, you don't need ours.

THE PHOENIX SOUND LIBRARY

American Steam

- 4-4-0
- American Classic Steam 1
- American Classic Steam 2
- Big Boy
- Cab Forward
- C-16 Consolidation
- C-21 Consolidation
- Denver & Rio Grande Western
- East Broad Top
- Frisco# 1522
- Grand Trunk Western
- Hudson
- Hud49 (Hudson with Daylight Horn)
- K-463 (K27)
- K-473 (K28)
- K-480 (K36)
- K-487(K36)
- Mallet
- Mogul
- Northern
- Pennsylvania Rail Road
- PRR K4 #1361
- Porter
- Rio Grande Southern 10-Wheeler
- Southern Pacific
- SP GS-4 Daylight #4449
- Sandy River & Rangeley Lakes
- Uintah
- Virginia & Truckee
- Geared Locos
- Climax
- Heisler
- 36 Ton Shay
- 38 Ton Shay
- 55 Ton (3 Truck) Shay
- West Side Lumber Shay



American Diesel

- ALCO
- Alco RSD
- Alco PA
- Dash 9
- E8
- F
- Genesis
- GP-7 (Hancock Horn)
- GP-9
- GP-30
- GP-38
- HH660
- Plymouth Switcher
- SD40
- SD70
- Turbo (SD45)
- U25B



European Steam

- Euro
- G 4/5
- Harz
- Swiss Rack Loco

European Electric

- Ge 4/4 I
- Ge 4/4 II
- Ge 4/4 III
- Ge 6/6 Crocodile
- ABe 4/4
- Electric Rack Loco

Gas, Electric & Others

- Box Cab Electric
- City Streetcar
- Desire Streetcar
- Doodlebug
- Galloping Goose
- GG1
- RDC
- Rotary Snowplow
- Special Effects
- Speeder
- Trolley



FREQUENTLY ASKED QUESTIONS

How do I control the bell and whistle/horn sounds?

There are three ways to activate the bell and the whistle/horn: Train speed, Trigger Input, DCC commands.



Train Speed. The crossing whistle/horn plays when you reach a set speed and can be played again by slowing down and speeding back up. This crossing whistle speed is adjustable and can be determined by either the track/motor voltage or by an axle magnet/reed switch arrangement. The bell plays when you start out or slow to a stop.

Trigger Inputs. The second method of controlling the bell and whistle is to use reed switches hooked between trigger inputs and ground. This method is similar to the technique used for sound activation in LGB engines with sound. Outputs from remote control receivers can also be hooked directly to the trigger inputs.

DCC Commands. The sound board will recognize DCC Function output commands transmitted on the track. You can assign sounds to these function commands.

Can I shut off the bell and/or whistle?

Yes. The whistle and bell can be disabled using jumper wires or turned off with the Remote Access Jack using the Computer Interface.



Can I choose between the automatic preprogrammed signaling sequences and manual signaling?

Yes. You can select between a crossing whistle sequence or a whistle that plays as long as the trigger is held. You can select a bell that will play a set number of times or will play as long as the button is held down; you can also select a latch on/latch off bell control mode.

Can the Big Sound system be used in O and HO scales?

Yes. Our older model '97 boards were used in O scale and even occasionally in HO. With the smaller and more efficient 2K2 board it will be even easier to fit sound systems in these scales.

What are the maximum voltages to the sound board?

Track: 24 volts – AC, DC, PWM DC, DCC. Protected from over voltage.
Battery: 20 volts. Protected from reverse polarity.

Can I use 4-ohm speakers?

Yes. The 2K2 board can drive speaker loads down to 4 ohms or to two 8 ohm speakers, and the board is short circuit protected.

Is Big Boost™ needed with model 2K2 boards?

No. The 2K2 board contains voltage boosting circuitry and operates at a lower battery voltage so the external Big Boost™ is not necessary.

How long will a battery charge last if I don't run the engine?

The battery will retain adequate charge for normal operation for several months. If the battery does run down, no damage will occur, but the sound system will not function at low track voltage until the battery recovers. Our earlier systems used a lead acid battery so it was much more important to keep the battery charged.

What is AutoChuff™?

AutoChuff™ is the name we give to the mode that converts track or motor voltage to chuffs or train speed. This is used where it is difficult to mount a magnet to an axle or wheel. AutoChuff™ gives a good approximate train speed but is not as precise as a wheel rotation sensor.



Do you have coal shoveling, coupler clank, or other auxiliary sounds or effects?



Yes. On the 2K2 board, we have much more capacity for extra sounds. Our steam sounds now include coal shoveling, coal loading and water fill. Diesels have dynamic braking. All sounds include coupler clank, tunnel fade, and an Engine Working / Engine Drifting effect for up hill and down hill layouts.

Can I install your sound system by myself?

Yes. Any reasonably handy modeler can install one of our systems. We provide a basic instruction manual with every kit we sell. You will need to drill some holes and position and fasten the components. You also need a connection to a track or motor, which in some cases may require soldering. Additionally, non-powered cars involve a little extra work because you need metal wheels and contacts to bring power from the track. Some kits have additional notes that pass along tips we have collected from customers and our own installations.

