E-27ca
2-8-0 Consolidation

The Engineer & Fireman's Operating Manual

Dedicated to Howie Waelder 1925 - 2004, L.I.R.R. Engineer (ret.)

DCC VERSION

THE SHOWCASE LINE®

Quality S-scale model trains from S-Helper Service, Inc.

S HELPER SERVICE INC.©2006
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Table of Contents

Thank You

Thank you for purchasing our 2-8-0 Consolidation. We are very proud of this locomotive, and we believe it sets a new standard for scale accuracy and detail in a mass produced S scale locomotive, as well as a new standard for sound with its included SoundTraxx™ Tsunami™.

This has been a long and difficult project, and it would not have been possible without the great patience and support of our customers and friends. Thanks you for sticking with us!

PS: Your locomotive will run best now and in the future if you break in your engine before placing it in normal operation. See Section 4.1 for further details.

Section 1 – Features

Your new S scale 2-8-0 Consolidation steam engine comes Ready-to-Run. This is a highly detailed scale model, with many separately added detail parts. Standard features include: die-cast zamac boiler and cab, ABS plastic, injection molded tender body, metal hand grabs and hand rails, prototypical road and switcher pilots included, lost wax coupler lift rings, brass and cast boiler details, and full cab interior with backhead detail. The cab includes a 2-man hand-painted crew, opening cab windows, and opening roof hatches. Front and rear headlights are golden-white, very bright LEDs. Automatic directional lighting control is standard, and you'll hear the dynamo spool up as the lights come on (DCC sound only)! Or you can control the lights individually.

The engine features a precision 5-pole, DC can motor, which with the new SoundTraxx Tsunami DCC decoder with Back-EMF gives amazing low speed running. The smoke unit has a separate motor to blow the smoke out in wisps when sitting, puffs while running (synchronized with the chuffs from the Tsunami), and full volume for blow-down. The smoke can be turned off and on under DCC control, and there is also a switch to shut it off under the hatch cover on the tender.

The SoundTraxx™ Tsunami DCC decoder provides the best and most complete sound ever in an S scale locomotive, with synchronized exhaust, selectable whistle, (both long and short toots), bell, steam blow-down, water stops, and many more. In all, there are over 22 steam sound effects, including the bell, air pump, exhaust chuff, coupler, steam release, cylinder cocks, snifter valves, brake release, side rod clank, Johnson bar/power reverse, blower, injector, pop valve and Fireman Fred.

When you accelerate, the chuff gets louder. When you coast, the chuff becomes very light and you can hear the side rod clank. Put on the brakes and you can hear the brake squeal!

Engines are factory equipped with either American Flyer compatible wheels and couplers, to operate on AF track, or code 110 wheels and KD style couplers for operation on track built to the NASG standards. It is not practical to change the drivers, but it is easy to replace the AF compatible coupler with our KD style coupler, which is included. See section 8.

The tender has a 16 pin socket which makes it easy to convert the locomotive to one of four power and sound options:

- DC no sound.
- LocoMatic™ AC/DC sound
- DCC no sound (Lenz Gold decoder with interface board)
- DCC SoundTraxx™ Tsunami sound

Also included with the locomotive:

- Vial of "All Aboard" Super Smoke™
- Smoke fluid funnel
- Smoke fluid pipette
- SHS #01295 KD style coupler

Replacements and additional 'All Aboard' Super smoke fluid is available from SHS.

Section 2 Getting started (Quick Start Guide)

2.1 Initial Smoke Unit Filling The smoke unit needs some smoke fluid in it whenever the smoke unit is on, to avoid damage to the unit. Unless you never plan to use the smoke unit, add 2 or 3 drops now using the funnel and smoke unit pipette supplied. Also add 2 or 3 drops to refill. The smoke unit is small and can easily be flooded with too much smoke fluid. If flooded, it may take several hours for the excess fluid to evaporate.

There is a switch under the hatch cover near the top rear of the tender, that is used to turn on/ off the smoke unit. Looking forward to the locomotive. move the switch to the right for smoke off, and to the left for smoke on. With the switch in the on position, the smoke can be turned on and off by F6 (DCC Function 6) as listed below.

2.2 Running the Locomotive

Your new 2-8-0 Consolidation has been shipped with a SoundTraxx™ Tsunami DCC decoder installed and preconfigured. The address is set to the Road Number of the locomotive (or, if an unlettered loco, to address 03). Place the locomotive on your DCC layout, select the locomotive's road number, and start running! (Note: If your DCC system does not permit operation of locomotives at the road number of the locomotive, then you simply need to program it an address of your choice before operating. See your DCC system manual for information on how to program addresses.)

2.3 Breaking in the Locomotive

Your new 2-8-0 comes factory lubricated and ready for the break-in period. Simply operate it for 20 minutes in each direction at medium speed. When break-in is completed, lubricate per the instructions in section 9.1.

2.4 Function assignments:

F0 Directional Headlight and dynamo sound
F1 Bell
F2 Whistle
F3 Short whistle
F4 Steam blowdown (hiss) and smoke blower
F5 Dim the headlight and rear headlight
F6 Smoke on
F7 Brake and brake squeal (see Note 2 below)
F8 Mute (all sounds off)
F9 Water stop
F10 Injectors
F11 Brake and brake squeal
F12 Coupler clank

Caution: Be sure you know how to activate the function numbers on your specific DCC throttle. Guessing or randomly pressing buttons on your throttle to activate functions can have unexpected effects!

Note: There is a small amount of acceleration delay and deceleration delay programmed in as standard. This greatly improves the sound of the locomotive, as the chuff will get louder while accelerating and softer while decelerating. You will also hear the side rod clank while coasting. The delays can be increased, for more realism, or removed so that the loco will start and stop immediately. Instructions are in section 3.

Note 2: F7 is programmed as a brake as well as brake squeal. While the locomotive is running at any speed, turning on F7 will cause the train to stop, with associated squealing from the brakes, at a faster rate than just setting the throttle to zero. The brakes really work! You will not be able to start the locomotive again until you release the brakes by turning off F7. You can stop by turning on F7, without changing the speed on the throttle. You can then accelerate back to your original speed by shutting off F7, to release the brakes.

That's it! There is a lot of flexibility built into the SoundTraxx™ Tsunami to modify the way your locomotive operates and sounds. We will cover some "tuning tips" in a later section. But right now, you probably want to have some fun playing with your locomotive!

Section 3 Customizing The DCC Operation and Sound

The SoundTraxx Tsunami decoder in your locomotive is very customizable. The settings chosen should work best for most people and most layouts, and they have been set as defaults in the decoder. Some of the settings you most likely will want to change or experiment with are listed in the sections below. DCC decoders use CVs (configuration variables) to store these settings. CVs are changed by "programming". If you are unfamiliar with CV programming see section 6.
You should also download the Tsunami manuals from the SoundTraxx site:
www.soundtraxx.com
The Tsunami Steam Sound Users Guide available on their website contains detailed information on most of the CVs, including ones that we don't cover below.

3.1 Acceleration and Deceleration

Both CV 3 (acceleration delay) and CV4 (deceleration delay) are set to 20 as default. The advantage of more delay is that you will notice the change in the chuff sound and side rod clank more. Longer acceleration delay means that you can increase the throttle a lot, and hear the exhaust bark as the loco slowly accelerates. On deceleration the loco will coast with almost no chuff, but you will hear the side rod clank. The disadvantage to more delay is that it takes a long time to get up to speed, and of course to stop. It's easy to overrun a switch when you have deleration delay. You can of course use the emergency stop button (or on the Lenz LH100 the direction button) to stop immediately.

We suggest trying more delay, a bit at a time, and see what you like best. The range is 0 (no delay) to 255 for maximum delay. CV3 = 100 and CV4 = 50 is the way we run our Consolidations!

3.2 Volume

The Tsunami has a multitude of CVs to adjust the volume of almost everything. Detailed instructions are given in the Tsunami Steam Sound Users Guide. The CVs you will most likely want to change are:

CV		Default
128	Master Volume Control	192
129	Whistle Volume	255
130	Bell Volume	192
131	Exhaust Volume	128
132	Air Pump Volume	48
133	Dynamo Volume	32
134	Blower Volume	16
135	Side Rod Clank Volume	32
136	Steam Release Hiss Volume	128

All of these CVs have a range of 0 (no volume) to 255. You can use PoM (programming on the main line) to adjust these volumes and immediately hear the effect.

The Dynamo sound is set to come on with the lights. The sound of the dynamo starting up while the lights brighten is very cool! Some people find the dynamo sound annoying while running, however. You can either turn the dynamo sound down with CV 133, or remove it from the light function altogether.

3.3 Lighting Effects

The default is directional lights with the dynamo sound on when the lights are on. F5 dims the lights. The lights can be set to operate independently, but because of all the sound effects there is a shortage of functions to control independent lights. There are instructions in the Tsunami Steam Sound Users Guide on Function Mapping if you want to try this.

Lighting effects are controlled by CV49 for the headlight and CV50 for the rear headlight. There are lots of options detailed the Tsunami Steam Sound Users Guide, but the two you are most likely to want to change are decoupling the dynamo sound from the light function, and increasing the dimming effect.

The default for both CVs (they would normally be set the same) is 15, which couples the dynamo sound to the light function (Dyno-light). By setting CV 49 and 50 to 129 (dimmable, no dyno-light) or 143 (Dyno-light, includes dimmable) the effect will be improved over the default setting.

CV49 and CV50	Effect
128	On/Off
129	Dimmable
143	Dyno-light

If you shut off Dyno-light, you may want to map the dynamo sound to F11 so that you can turn it on manually. There is a good discussion in the Tsunami Steam Sound Users Guide on function mapping.

3.4 Whistle Selection.

There are 8 different whistles in this decoder, selected by CV115. Feel free to try all the whistles and find the one you like best.

CV115 Value	Whistle
0	B&O 3-Chime
1	Colorado & Southern #74 (yard mix)
2	Reading 6 chime
3	Santa Fe Freight
4	Baldwin Class B-4G Consolidation 2-8-0
5	D&RGW Single Chime
6	Colorado & Southern #74 (road mix)
7	USRA 6-Chime

3.5 Other Sound CVs of Interest.

A few other characteristics you may want to experiment with are listed below.

CV		Default	
113	Quiet Mode Timeout	255	If 0, loco sound comes on with layout. If 1-255, sound comes on when loco moves or a function is turned on. Sound will go off again if the loco is stopped and all functions are off after a number of tenths of seconds specified in CV113. The default is 25.5 seconds.
114	Bell Ring Rate	3	Higher numbers slow the rate
198	Auto Sound Config	18	Default auto sound functions are steam blowdown on stop, and auto whistle on stop, start, and reverse. Set to 0 to stop these effects. Set to 2 for auto whistle only, or 16 for auto steam blowdown only. There are other automatic sounds available, see the Tsunami Steam Sound Users Guide.

3.6 Braking

One of the coolest features is operating brakes along with the brake squeal sound effect. For this to operate you need some momentum (deceleration delay) programmed in. The default delay of 20 will work fine. When F7 is on, the brakes are set, and you will hear the squeal while the locomotive decelerates. The loco will stop faster with the brakes than it will by setting the speed to 0. After stopping, the loco will not move again until the brakes are released. The strength of the braking is set in CV61. If you increase the deceleration delay (CV4) you may want to try increasing CV61 for more braking effect. Experiment, and see what you prefer!

CV	Effect	Default	Range
61	F7 Train Brake	139	129-255 larger numbers increases effect

Section 4 DCC Operation

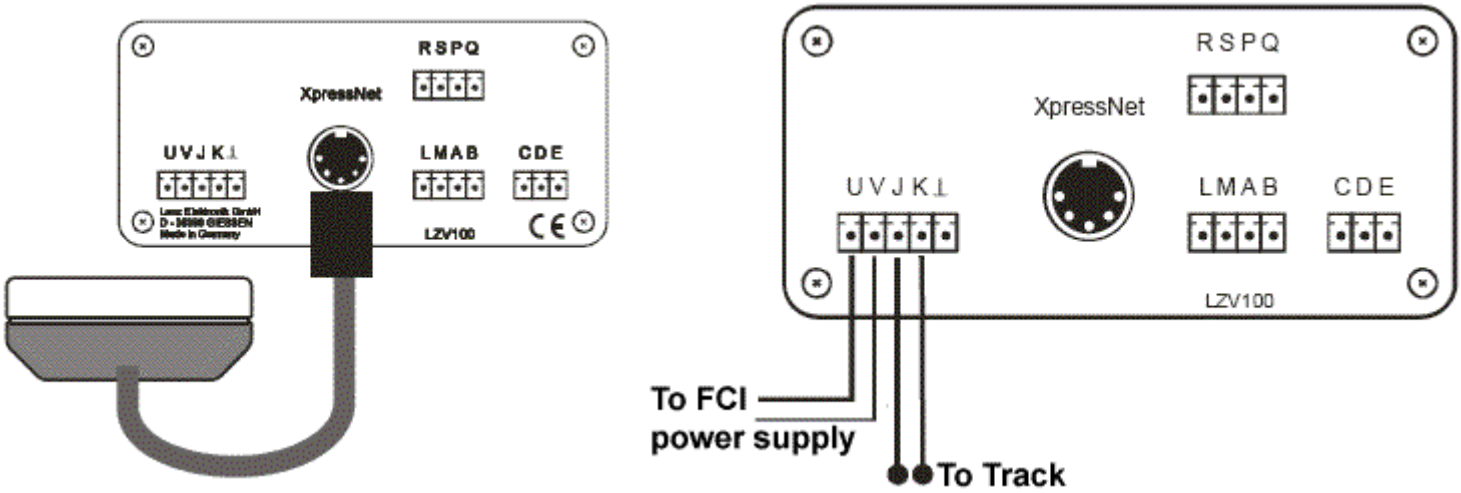
S Helper Service has partnered with The Lenz Agency to make DCC more accessible to "S" people just starting out in DCC. More information on this effort is on our website:

http://www.showcaseline.com/DCC/LenzIntro.htm

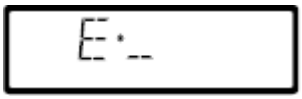
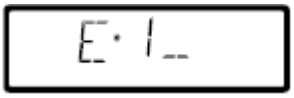
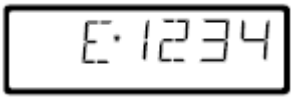
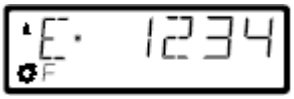
Your locomotive will work with any compatible DCC system, that's the beauty of DCC! But different systems have different procedures for operating and programming, and we cannot cover them all here. If you have a different DCC system, please check that system's documentation.

This section is for people who bought a Lenz Set 100 with their locomotive, and are new to DCC. The idea is to get you up and running right away! After you have everything running well, you can read all the documentation which came with your Lenz set, and also the Tsunami Steam Sound Users Guide to understand all your options, or just save the documentation as a reference for when you need it! Thanks to Deb Ames of the Lenz Agency for letting us include Illustrations and some of the text from the Lenz website:
http://www.lenz.com/

1. If you have one connection from your track to your power supply (transformer, etc) you can just remove your power supply, and connect the Lenz system as shown below. If you have blocks, turn all the blocks on. If you layout wiring is more complex, or if connecting the DCC system causes a short (DCC system will not put power on the tracks), you'll need to refer to the DCC System documentation. If you can set up a loop of track just to get familiar with DCC operation, that may be useful.
2. Connect the other end of the hookup wires to terminals J and K of the LZV100 DCC unit. You can pull off the green terminal connectors on the back of the LZV100 to make it easier to connect the wires.
3. Plug the 5 pin din plug at the end of the LH100 (handheld throttle) cord into the 5 pin din socket that is located on the rear of the LZV100.
4. Connect the output wires from the FCI 5W power supply to terminals U and V of the LZV100.
5. Plug in the FCI power supply.
6. Place your 2-8-0 locomotive on the track. Remove all non-DCC equipped locomotives from the track.

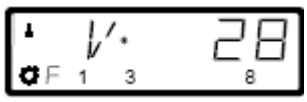


You are now ready to select your locomotive, and run! The DCC system communicates with locomotives on the track (actually the DCC decoder in the locomotive) by means of an "address". The addresses available on the Lenz system are from 1-9999 (address 0 is for operating a loco without a decoder in it). Most people assign an address to a locomotive based on its road number. The 2-8-0 follows this scheme. Thus, to control your locomotive, you need to select its road number on the LH100 throttle.

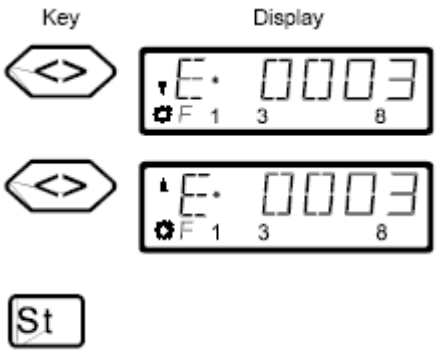
Press	On the display you see	Explanation
Cl		This clears the display so that you can enter a new address
1		Begin by entering the first digit of the road number
234		Continue with the rest of the road number. It can be 1 to 4 digits. You don't need leading zeros
Enter		Confirm the address by pressing Enter. The display now shows Engine 1234, the up arrow means it is going forward, and the light symbol to the left of the F means the lights are turned on.

Now you are ready to run your train! Here's how you control your locomotive:

Loco speed is controlled with these four buttons. The single up arrow increases speed by one step (the minimum amount) the single down arrow decreases speed the same way. The double up arrow increases speed by several steps, the double down decreases it the same way. Experiment speeding up and slowing down.



Whenever you change speed the display changes to a "**V**elocity" screen which shows the speed step you are on. The default is 28 speed steps, so the number will range from 0 (stopped) to 28 (full speed). You can toggle between the **E**ngine display and the **V**elocity display by pressing Enter.



The direction of travel key toggles the locomotives direction, which will be shown by the small up or down arrow at the left of the display. The loco has to be stopped for the reversing to happen. If the loco is moving when you press this key, it immediately stops. Press it again to reverse direction.

And finally, the emergency stop key stops all locomotives on the layout. Pressing it again lets operation resume.

That's it! You are up and running. There is one more thing I'd like to cover here, and that is Functions. Functions are the way you control lights, sound, and some other features on your locomotive. You always control functions the same way, but they sometimes do different things on different locomotives. The functions used on the Showcaseline Consolidation are Functions 0 through 12, normally shown as F0, F1 ... F12. For Functions 0-8, you turn a function on by pressing the corresponding key on the LH100. Key 0 turns on F0, Key 1 turns on F1, etc. Pressing the key again turns it off. For Functions 9-12, press 9. This will display a small 8 at the left bottom if the screen. This means add 8 to get a function. Thus, press 1 for F9, 2 for F10, etc. Pressing 8 again goes back to normal mode.

Try it! Press 0 and the Headlight should come on if your loco direction is forward. Directional lights is the standard, but you can change it. Press 1 and the Bell should start ringing. Press it again to shut it off. F2 will blow the whistle. All the functions are listed above.

Section 5 DC Operation

The SoundTraxx™ Tsunami decoder has limited support for DC operation. We have chosen default settings that give the best overall operation. If you want to experiment with tuning any of the CVs related to DC operation, you will need access to a DCC system.

On DC, as the voltage increases, first the sound will start, then the locomotive will start moving. The Tsunami does not support cam synchronization of the chuff, so you will notice some mismatch especially at low speed. The smoke puffs will be synchronized to the drivers, not to the sound.

There is no way to manually control sounds under DC. Automatic sounds as defined by the various CVs will operate. The CVs are listed in the appendix.

Section 6 Programming CVs

The Tsunami decoder in your locomotive (or any DCC locomotive) stores the information it needs to operate in Configuration Variables, or CVs. Setting these CVs is commonly referred to as “programming” the decoder. Again, different DCC systems require somewhat different steps to “program”. We’ll give a short example using the Lenz LH100.

There are two different ways to program. The first uses an isolated “programming track”. This method allows all CVs to be set, including the address of the decoder. It also allows all CVs to be read back.

The second method is called “Programming on the Mainline” or PoM. As the name implies, this method does not require an isolated track, and all locomotives, including the one being programmed, can continue to run. Some systems will allow you to change the address in PoM mode, others will not. Lenz will not. This method is especially good for modifying things like volume, because you can instantly check the results of your change.

6.1 Using a Programming Track

1. Place the locomotive on the isolated Programming Track. There should be nothing else on it.
2. On the LH100, press the F Key. Press the + key until PROG shows on the display.
3. Press Enter.
4. Press the + key until the mode you want shows on the display, then press enter.
    a. DIR is handy for setting the address, and acceleration or deceleration delay.
    b. CV will allow you to set any CV by number.
5. If you chose DIR
    It will now be waiting for an address. If you press Enter again, the current address will be displayed. To change the address, Clear (Cl) and type in the desired address, and press enter.
    a. Use the + key to page through the other menu options.
6. If you chose CV
    a. It will be waiting for a CV number. Type in the CV number you want to change, then enter.
    b. Press enter again to read the CV. Clear (CL) and type the new value, then Enter to change the value of the CV.
7. To return to operating trains, press ESC 3 times.

6.2 Programming on the Main (PoM)

1. Select the locomotive (which must be on the active DCC track) you want to program on your LH100.
2. On the LH100, press the F Key. Press the + key until POM shows on the display.
3. Press Enter.
    a. Enter the CV number you wish to program, press Enter.
    b. Enter the value you want, press enter.
    c. Press ESC once to program another CV.
4. Press ESC 3 times to go back to operating mode.

6.3 Reading CVs using Digitrax and NCE systems

There have been some issues reported reading CVs when programming on the programming track with some DCC systems. In particular, both NCE and Digitrax systems may not read back CVs from the Tsunami decoder. You still will be able to program all CVs using POM. If you want to be able to read back CVs from the Tsunami on your Digitrax or NCE system, SoundTraxx sells a PTB-100 Programming Booster. The PTB-100 is not required with the Lenz LZV100 system.

For more detail on programming Configuration Variables, check the documentation that came with your DCC system and the SoundTraxx Tsunami User's Guide.

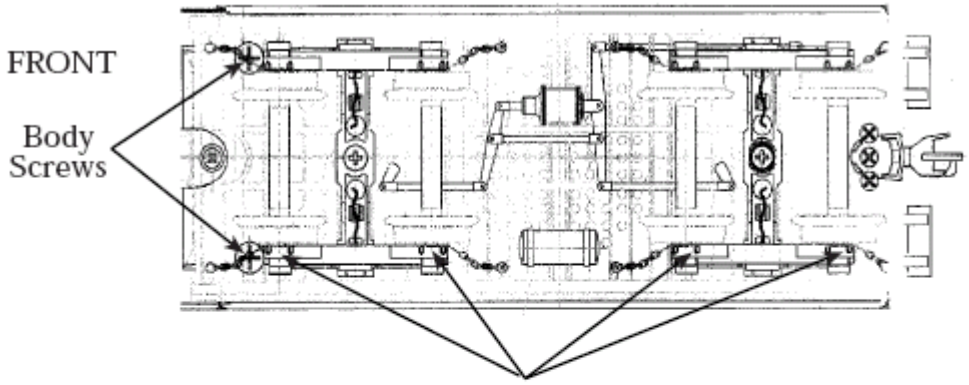
Section 7 Installing a DCC Decoder

If you ordered your locomotive with DCC it will have been delivered with the DCC decoder already installed. If our locomotive was delivered as either DC no sound or AC/DC sound, then you will need to install a decoder for full operation on DCC.

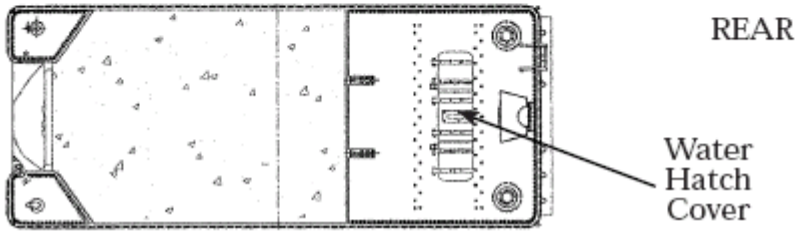
SHS supplies a DCC Interface Board with an attached SoundTraxx Tsunami Decoder with custom settings specifically for this locomotive. This board supplies a regulated voltage for the lights and smoke unit. If you want to plug in decoder with a standard NMRA medium plug you will need resistors in the white and yellow leads to protect the LEDs, and the smoke unit will not operate.

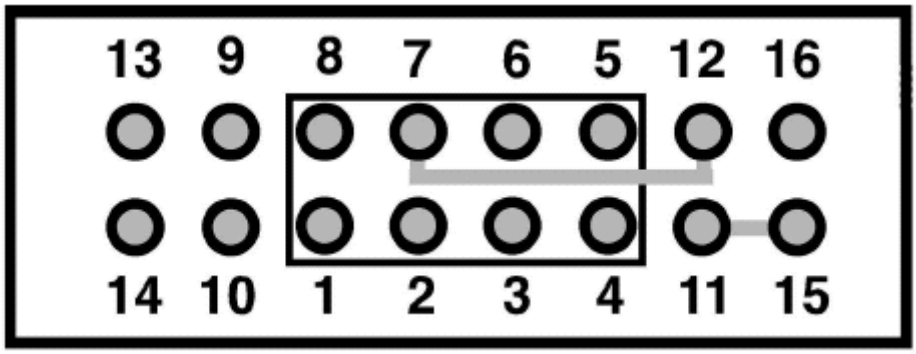
To install the DCC Interface Board with Tsunami decoder:

1. Turn over the engine and tender placing it on a soft cloth to protect the fine details.
2. Remove the 2 body screws at the front of the tender. (see figure below)
3. Turn the engine and tender right side up and carefully lift off the tender body.
4. Remove the factory installed circuit board from the 16 pin socket. A DC shorting plug is small, and just pulls out. If an AC/DC sound board is installed, you will need to remove the 4 small screws holding it in place. Then it will just lift out.
5. Plug in the DCC Interface board with attached SoundTraxx Tsunami decoder. Secure it with the 4 small screws.
6. Set the engine & tender on the track and test with DCC power.
7. Re-assemble the tender body to the chassis **(Do not over tighten screws)**.



Lightly lubricate both sides with Conducta-Lube.





Socket	function	color	ga.	Socket	function	color	ga.
1	motor (+R)	orange	28	9	speaker (+)	violet	28
2	light (tender)	yellow	30	10	speaker(-)	violet	28
3	open	-	-	11	ground	green	30
4	pick-up (L fireman)	black	28	12	+ 5 volt	blue	30
5	motor (-L)	gray	28	13	smoke motor	gray	30
6	light (front)	white	30	14	smoke element	brown	28
7	light (common)	blue	30	15	ground	green	30
8	pick-up (R engineer)	red	28	16	chuff input(sync)	purple	30

SECTION 8 Couplers

The 2-8-0 comes fitted with the SHS KD style coupler at the front of the locomotive. If it has American Flyer compatible wheels, it will also have an AF compatible coupler at the rear of the tender. If you wish to replace the AF tender coupler with the body mounted SHS KD style coupler (provided with the locomotive), place your 2-8-0 upside down on a soft foam protected surface. Carefully remove the screw that holds the rear tender truck to the bolster. The tender truck can then be lifted up and the AF coupler bar lifted out. Caution is needed not to pull at the pickup wires on this truck. Place the replacement black square spacer (provided) on the bolster and screw the truck back on. The coupler pad at the rear of the tender has three holes cored for mounting the KD style SHS coupler. Use the three threaded metric machine screws provided to secure the coupler. You can use a #60 drill to open the screw holes and make installation easier. Do not overtighten the screws or they will break.

Section 9 Maintenance

9.1 Lubrication

After break-in and at regular intervals, we recommend inspection and careful lubrication of the wheel bearings, coupling rods and valve gear, without taking any of these apart. Carefully, place the model upside down on a soft foam or padded surface to prevent damage to the details. Then place one very small drop of Aero Lube 'Conducta Lube' on each axle, between the bronze bearings in the frame and the back of the wheels, using the long feed tube provided. Over lubricating can damage the body as well as void the warranty. Aerolube Train Pak Maintenance and Lube Kits are available from SHS.

9.2 Golden White LEDs

The LED's used for lighting your 2-8-0 should yield many flawless years of operation. If they do fail, contact SHS for servicing.

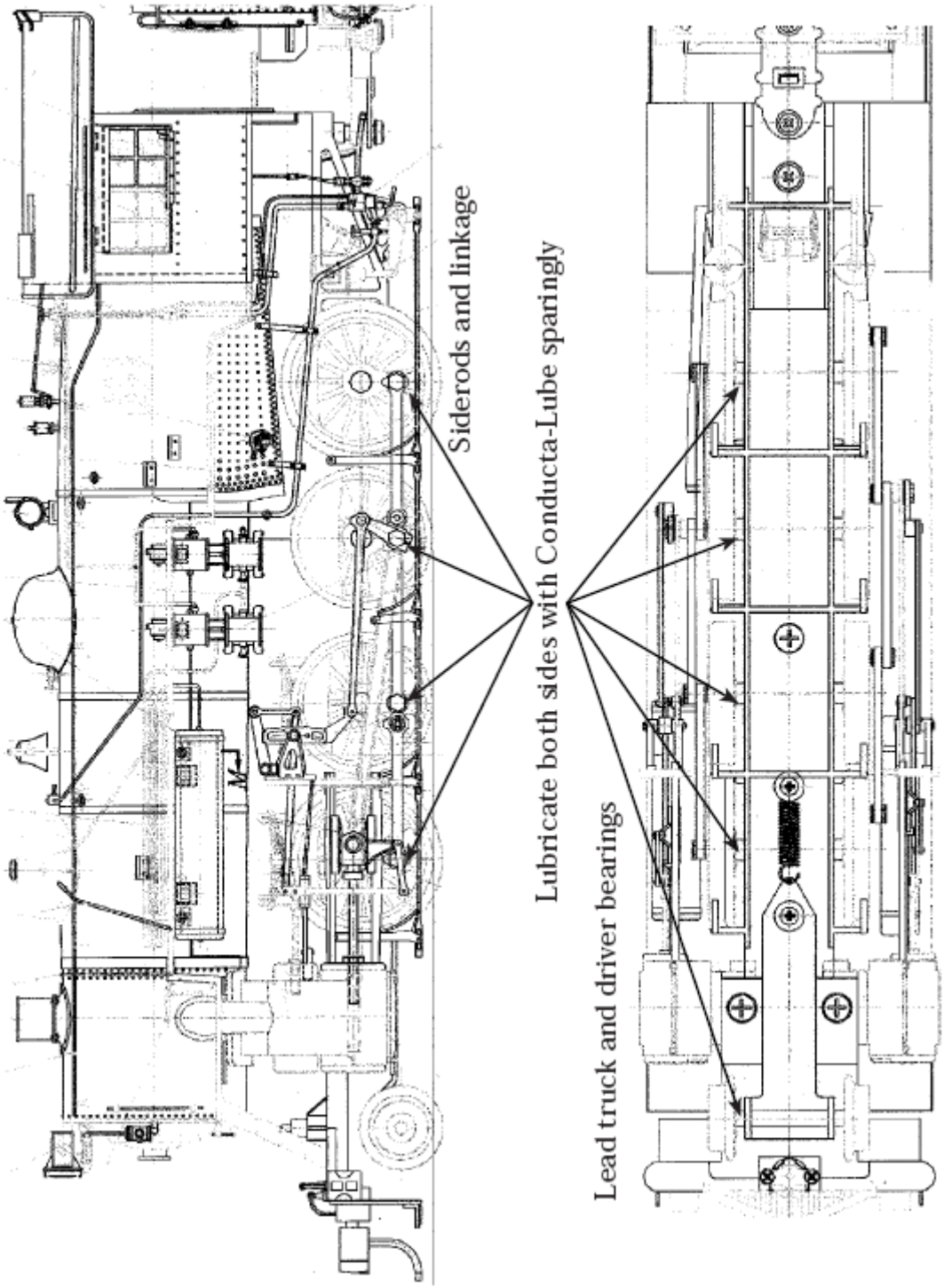
9.3 Cleaning

Body - Remove dust with a small soft brush (make-up brush or similar). We DO NOT recommend removing the body from the chassis for cleaning.

Wheels -Dirt will build up on the wheel treads over time. To remove this dirt and improve traction and electrical pickup, we recommend using 91% isopropal alcohol and a cotton swab. Rub each wheel tread with the alcohol-moistened Q-tip, applying slight pressure to remove the dirt build-up. Once the wheels' treads are clean, check the electrical pick-ups on drivers 1 and 4 for cleanliness and contact against the inside surfaces of the drivers wheels. Another method used to clean the tread of the drivers is with JAKS Bearing Blocks with felt pads.

9.4 Storage

Whenever your 2-8-0 is not being operated for extended periods, we suggest you store it in the original packaging with the 2-8-0 sitting upright. This will help prevent fluids entering unwanted areas of the locomotive.



Section 10 Prototype Information

Driver Diameter	**62"**
Cylinder	**24"x30"**
Locomotive Wheelbase	**25'-6"**
Length with Tender	**68'-6"**
Height	**14'-8"**
Weight (loco)	**224,900 lbs.**
Weight (tender)	**148,000 lbs.**
Tractive Power	**50,900 lbs.**
Boiler Pressure	**215 psi.**
Coal	**18 tons**
Water	**7000 gals.**

The Baltimore and Ohio Railroad began to receive the first of 414 E-27 2-8-0's in 1905 from the Richmond Locomotive Works, (later a part of Alco). From 1923, the B&O started upgrading many of these to E-27ca, by increasing the cylinder size to 24"x 30", increasing weight on drivers to 244,900 lbs and tractive effort to 50,900 lbs. By 1948, 165 engines had been modified. Starting in 1925, over 100 E-27s were converted to L-2 0-8-0 switchers. By 1953, 69 E-27ca were still on the B&O, with the last ones retired in 1957.

Hundreds of railroads and industries in America owned over 33,000 consolidations, many similar to the B&O engine, making it the most popular type of steam engine.

Section 11 – Ordering Information

All Showcase Line products are available from Hobby Shops. If your local Hobby Shop is unwilling to stock our products, you can order directly from S Helper Service, Inc.
Master Card/Visa/AMEX/Discover cards are accepted.
Online ordering is available 24 hours a day at http://www.showcaseline.com/
Fax orders can be received 24 hours a day at 732-441-0751.
Phone orders can be placed at 1-800-465-0303. Our newsletter, ***The SHS Update*** is available upon request.

WARRANTY
S HELPER SERVICE, Inc. will replace or repair (at it's discretion) any part which it finds faulty in workmanship or material, provided these instructions are followed:

1. Call 1-732-441-0555 for return authorization. SHS cannot be responsible for products returned without prior authorization.
2. Include a note indicating nature of problem with your name and address.
3. Returned items must be shipped to S HELPER SERVICE shipping fully prepaid along with $20.00 for return shipping and handling. If the part is returned within 90 DAYS of purchase, return postage and handling fee need not be included. NOTE: Proof of purchase with date must accompany returns.
4. Send locomotive in original foam tray and giftbox plus shipping and handling to: S HELPER SERVICE Inc., 77 Cliffwood Ave., Unit 7C, Cliffwood, NJ 07721
5. Pack properly to protect loco against added damage. You must use original blister, polyfoam tray and gift box or risk voiding the warranty.
6. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

This Showcase Line product is warranted against defects in workmanship and materials for one year in the possession of the original purchaser or owner.
This warranty does not include the cost of any inconvenience nor does it cover the cost of transportation damage, misuse, abuse, accident, normal wear or any item which has been tampered with. The warranty does not cover sound units, LEDs, smoke units, dirty wheels, electrical wiper replacement or speakers.

ACKNOWLEDGEMENT
We would like to thank all of our friends who helped us bring this project to fruition: Jeff Freeman, Dallas Gutacker, John Prior, Will Holt, Ron Sebastian, V.S. Roseman, Bill Clark, Hiram Graves, Bob Werre, N.L. Wedekind,
Michael Greene, Edwin Kirstatter, Michael Lytle, Dick Karnes, Nancy Workman and Steve Domingues.

We appreciate Ernest Wong whose gentle patience as our project manager guided this locomotive to completion. Gary Law, Clement Nip, and Jonathan Chung who aided Ernest. Karen Kwok for her superb artwork. Mr. Wai
Shing Ting who was always there for us. And especially our customers! Without this support, there would never have been a Showcase Line® steam engine.
Thank you all.

Appendix SoundTraxx Tsunami Configuration Variables

The SoundTraxx Tsunami decoders supplied with the DCC Interface Board have been programmed with some custom CV defaults. This table lists the standard Tsunami defaults, and where they are different, the custom defaults for the SHS Consolidation. Where the 2-8-0 default is not shown, it is the same as standard.

CV #	Description	Standard Default	2-8-0 Default Settings	Comments
General CVs				
2	Vstart	0		
3	Baseline Accelaration Rate	0	20	
4	Baseline Braking Rate	0	20	
10	BEMF Cutout	0		
11	Packet Time Out Value	0		
12	Power Source Conversion	1		
13	Analog Function Enable 1	0	32	F6 - smoke
14	Analog Function Enable 2	3		
15	Unlock Register	0		
16	Lock ID Code	0		
17	Extended Address	192		
18	Extended Address	3		
19	Consist Address	0		
22	Consist Function	0		
23	Consist Acceleration Rate	0		
24	Consist Braking Rate	0		
25	Speed Table Register	0	16	User defined speed table
29	Miscellaneous config bits	2	22	28/128, Analog, Speed tables
30	Error Info/Alternate Mode Selection	0		
Function CVs				
33	F0 Forward	65		HL, Dyn
34	F0 Reverse	66		RL, Dyn
35	F1 Bell	8		
36	F2 Whistle	4		
37	F3 Short Whistle	16		
38	F4 Steam Release	32	34	Steam release plus FX5, smoke blower
39	F5	2	128	Dim
40	F6	4	4	smoke - FX6
41	F7	16	128	Brake
42	F8	32		Mute
43	F9	8		Water stop
44	F10	32		Injectors
45	F11	64		Brake
46	F12	128		Coupler clank
47	Analog Whistle Control	0		
Lighting CVs				
49 – 52	**Hyperlight Effect Select**			
49	Headlight Effect Select	15		
50	Backup Light Effect Select	15		
51	FX5 Effect Select	1		
52	FX6Effect Select	1		
59	Flash Rate	3		
60	Crossing Hold Time	4		
61`	F7 Brake Rate	0	139	
62	Transponding Control	0		

Analog Mode Motor Control Parameters

63	Analog Mode Motor Start Voltage	20	25	
64	Analog Mode Maximum Motor Voltage	180		

Speed Table CVs

66	Forward Trim	128		
67	Speed step 1	9	2	
68	2	18	3	
69	3	27	4	
70	4	36	6	
71	5	45	8	
72	6	55	12	
73	7	64	16	
74	8	73	22	
75	9	82	30	
76	10	91	40	
77	11	100	50	
78	12	109	60	
79	13	118	70	
80	14	127	80	
81	15	137	90	
82	16	146	100	
83	17	155	110	
84	18	164	120	
85	19	173	130	
86	20	182	140	
87	21	191	150	
88	22	200	160	
89	23	209	170	
90	24	219	180	
91	25	228	195	
92	26	237	215	
93	27	246	235	
94	28	255	255	
95	Reverse Trim	128		

Sound CVs

112	Sound Config 1	0	128	Cam Sync
113	Quiet Mode Timout Period	0	255	
114	Bell Ring Rate	4	3	Slightly faster
115	Whistle Select	0		Whistle 1
116	Engine Exhaust Rate	80	70	For analog
119	Effect Processor Select	0		
128	Master Volume Control	192		
129	Whistle Volume		255	
130	Bell Volume		192	
131	Exhaust Volume		128	
132	Air Pump Volume		48	
133	Dynamo Volume		32	
134	Blower Volume		16	
135	Side Rod Clank Volume		32	
136	Steam Release Volume		128	
137	Coupler Volume	128		
138	Glad Hand Release Volume	0		

139	Brake Squeal Volume	128		
140	Brake Release Volume	64		
141	Snifter Valve Volume	64		
142	Power Reverse Volume	64		
143	Pop Valve Volume	128		
144	Not Used	0		
145	Blower Draft Volume	128		
146	Water Stop Volume	96		
147	Injector Volume	64		
148	Fireman Fred's Shovel Volume	64		
149	Fireman Fred's Wrench Volume	64		
150	Fireman Fred's Oil Can Volume	64		
151	Fireman Fred's Grease Gun Volume	32		
152	Not Used	0		
153	Equalizer Select	0	2	
154-160	Seven Band Equalizer	0		
161	Reverb Control Presets	0		
162	Reverb Output Levels	128		
163	Reverb Delay	255		
164	Reverb Gain	64		
169-176	Reverb Mixer	0		
Dynamic Digital Exhaust CVs				
177	Throttle Gain	10		
178	Motor Load Gain	32		
179	DDE Attack Time Constant	10		
180	DDE Rlease Time Constant	10		
181	DDE Exhaust Low Volume Limet	255		
182	DDE Exhaust High Volume Limet	255		
183	Side Rod Clank Low Volume	255		
184	Side Rod Clank High Volume	255		
185	Filter Initial Frequency	42		
186	DDE Filter Gain Control	64		
187	DDE Filter Damping	255		
188	DDE Tracking Coefficient	102		
Automatic Sound CVs				Need for analog (DC) Control
193	Bell-On Set Point	15		
194	Bell-Off Set Point	19		
195	Grade Crossing Whistle Sensitivity	4		
196	Brake Squeal Sensitivity	3		
197	Analog (DC) Mode Auto Sound Config	0	16	Auto steam blow-down
198	Digital Mode Auto Sound Config	0	18	Steam blow-down, Whistle signal
Hyperdrive CDs				
209	KP Coefficient	25	40	
210	KI Coefficient	20	10	

212	Back EMF Feedback Intensity	255		
213	Motor Control Sample Aperture Time	15		
214	Motor Control Sample Period	15		
217			2	Runaways

