



OPERATORS GUIDE

Default DCC Address for All Locomotives: 3 (no leading zeros)

Decoder Reset: CV8 = 8

Thank you for your purchase of the InterMountain Railway Company ET44AC locomotive. Your locomotive is equipped with either a LokSound Select 21-Pin Sound decoder or a LokPilot 21-Pin non-sound decoder. These decoders are compatible with all DCC systems. This guide directs you through basic operational and decoder functions for DCC operation. More in-depth information is available on our website in the regularly updated DCC Assistance section. Should you have any questions that are not answered in this guide or online, please feel free to contact InterMountain at the contact information listed above.

Removing and Operating your ET44AC Locomotive

Your locomotive is attached to the black plastic packaging via two Phillips head screws below the fuel tank. Removal of these screws can be done with a standard sized Phillips screwdriver. Please save the packaging!

We do not recommend operating your decoder equipped locomotive on analog DC track power. If you operate your locomotives on DC only and do not want to purchase a DCC system, please contact us to obtain a 21-pin DC plug that will allow the locomotive to operate properly with DC track power. Note that some lighting functions may not work correctly when the DC plug is used. If you decide to convert to DCC later, you can easily do so.

DCC Non-Sound Decoder Operation

The non-sound DCC equipped locomotive responds to address 3 (no leading zeros) out of the box. Increase the speed on your DCC throttle and the locomotive should move in the direction your throttle is set for. The locomotive lighting is controlled by various function keys. Please see the table on the following page for the functions available in the non-sound decoder. Please verify that all lighting and motion is working properly before making any programming changes to the decoder. If you should have any issues, contact us.

DCC Sound Decoder Operation

The DCC sound equipped locomotive responds to address 3 (no leading zeros) out of the box. Upon placing your locomotive on the track, you will not hear any sound. **You must press the F8 function key in order to get the locomotive's prime mover started.** As the prime mover is starting, your locomotive will not move even if you give it a speed command. A prototype locomotive cannot move until it is fully started and your model simulates this! After about 25 seconds, the prime mover enters a high idle. At this point you can give it a speed command and it should start to throttle up and move. If you wait another 10-15 seconds, the prime mover will settle into idle. You can force it to idle by quickly going to speed step 1 and then back to 0. The brake squeal will initiate if the locomotive is moving and the throttle reduced to 0. Press F8 again while the locomotive is in idle and the prime mover will shut-down. You'll hear the ET44AC air dryer sound for 1 minute after shut-down. A prototype locomotive's horn and bell can be operated when the prime mover is shut down as long as enough air is available. Your ET44AC is no exception! Please see the table on the following page for all of the lighting and sound functions available in the sound decoder.

The F8 function key operation can be changed to allow track power to start the prime mover by setting CV32 to 2 FIRST, and then CV419 to 32. (CV32 to 2, CV403 defaults to 16 to have F8 start the prime mover)

The 25 second start-up delay can be removed by simply changing CV124 to 16. This will allow the locomotive to start moving immediately when the throttle is increased during the start-up sound sequence.

Sound and Non-Sound Decoder Extended Addressing:

After you have verified that your locomotive operates properly on address 3, you'll want to give it an address other than 3. Today's DCC Systems allow you to enter any DCC address from 1-9999 (Digitrax addressing is from 1-9983). The cab number of the locomotive makes for a great address. Addresses from 128-9999 are considered long addresses. Addresses from 1-127 are considered short addresses. Refer to your DCC System's manual for step-by-step guidance as to how to set the address. Once you have set the new address, verify that all lighting and motion works properly before proceeding to any other programming. LokSound decoders are compatible with all DCC systems.

Full Throttle Features

Function 9 activates **Drive Hold** in both the sound and non-sound units. This allows you to throttle the prime mover sound up or down while your locomotive maintains a constant speed. This helps to simulate pulling heavy "loaded" cars working independent of BEMF for better realism. It's like having custom momentum at your command!

Function 10 activates and releases the **Independent Brake**. This feature is only available in the sound equipped units.

Run 8 and **Coast** are included in the sound decoder only but are not mapped to a function key. Visit our website's DCC Assistance section for more information on mapping Run 8 and Coast.

For more information about all of the FULL THROTTLE features visit: <http://intermountain-railway.com/fullthrottle.html>

Default DCC Decoder Function Table

Function Key	DCC Sound ET44AC	DCC Non-Sound ET44AC
F0 Fwd / Headlight	Front Headlight	Front Headlight
F0 Rev / Headlight	Rear Headlight	Rear Headlight
F1 / Bell	Graham-White E-Bell	N/A
F2 / Horn	Air Horn + Auto E-Bell + Flashing Ditch Lights	Flashing Ditch Lights
F3	Coupler	N/A
F4	E4C6T Dynamic Brake	Dynamic Brake (used when operating with a sound unit)
F5	Number Board Lights	Number Board Lights
F6 Fwd	Front Ditch Lights	Front Ditch Lights
F6 Rev	Rear Ditch Lights (if equipped)	Rear Ditch Lights (if equipped)
F7	Dimmer	Dimmer
F8	Prime Mover Start-up / Shut-down (mute if moving)	Virtual Drive Sound (used when operating with a sound unit)
F9	Drive Hold	Drive Hold (used when operating with a sound unit)
F10	Independent Brake	N/A
F11	Walkway Lights (front and rear)	Walkway Lights (front and rear)
F12 Fwd	Rear Red DPU Light (CN Units Only)	Rear Red DPU Light (CN Units Only)
F12 Rev	Front Red DPU Light (CN Units Only)	Front Red DPU Light (CN Units Only)
F13	Handbrake - Electric	N/A
F14	GE Sanding Valve	N/A
F15	Short Air Let Off	N/A
F16	ET44AC Radiator Fan	N/A
F17	ET44AC Brake Set / Brake Release OFF	N/A
F18	GE Air Dryer OFF	N/A
F19	GE Air Dryer on Shutdown OFF	N/A
F20	Tier 4 GEVO Compressor	N/A

To make the ditch lights not flash with the horn: Set CV32=2 FIRST, then set CV316=0 (Default: CV316=128)

Ditch Light Flash Rate:

CV112 Default = 19 (0.95 seconds)

Range: 1-255

Higher numbers = Slower Flash Rate

NS units have rear flashing ditch lights with the horn as per the prototype.

Due to function limitations, the CN ET44AC does not have flashing ditch lights.

The CN ET44AC has working red DPU lights.

The FRONT DPU light illuminates when function 12 is active and the locomotive is set for REVERSE.

The REAR DPU light illuminates when function 12 is active and the locomotive is set for FORWARD.

When operating a non-sound unit with a sound unit, activate function 8 on the non-sound unit so the two units start together.

Drive Hold can be used when sound and non-sound units operate together.

Sound Volume CV Defaults Table:

Function	CV #	Range	ET44AC
Master Volume Control	63	0-192	180
**** SET CV32 to 1 BEFORE CHANGING CV 257 THROUGH CV 511 ****			
Prime Mover	259	0-128	128
Drive Hold	267	0-128	128
Horn	275	0-128	128
Bell	283	0-128	40
Coupler	291	0-128	128
Dynamic Brake	299	0-128	90
Air Compressor	307	0-128	50
Radiator Fan	315	0-128	50
Auto E-Bell	323	0-128	40
Independent Brake	339	0-128	35
Brake Set / Brake Release	347	0-128	35
GE Sanding Valve	355	0-128	128
Short Air Let Off	363	0-128	128
GE Air Dryer	387	0-128	50
GE Air Dyer on Shutdown	395	0-128	50
Air Reverse	403	0-128	50
Run 8	411	0-128	128
Coast	419	0-128	128
Handbrake - Electric	427	0-128	128
Random Sounds	451	0-128	50
Brake Squeal	459	0-128	40

CV48 Sound Selection Table:

The default horn in the ET44AC locomotive is the Nathan Airchime K5HL. There are 7 other horns to choose from if you should prefer a different horn sound, or your prototype uses a different horn. The horn can be changed easily with any DCC system. There is only one bell available, the prototype's Graham-White E-Bell. This is currently the only bell used on the ET44AC. The value for CV48 is calculated by adding the values for the prime mover, the horn, and the bell sounds using the charts below.

Track Power MUST be interrupted to the locomotive after changing the value of CV48. The locomotive can be simply rocked off one rail briefly to accomplish this task.

Prime Movers	ET44AC
0	GE GEVO 12LDD6 (No Smart Start) - (Default)
16	GE GEVO 12LDD6 (3 minute smart start cycle*)
32	GE GEVO 12LDD6 (6 minute smart start cycle*)
48	GE GEVO 12LDD6 (Auto Shutdown, throttle up to start)
Horns	ET44AC
0	Nathan Airchime K5HL - (Default)
1	Nathan Airchime K5HL #2
2	Nathan Airchime K5HL #3
3	Nathan K5H
4	Nathan K3HL Forward / K2H Horn Reverse
5	Nathan K3HL
6	Nathan K5LLA
7	Nathan K5LLA #2
Bells	ET44AC
0	Graham-White E-Bell - (Default)

As an example, the ET44AC **default** values include: Prime Mover = 0, Horn = 0, Bell = 0 Total = 0 + 0 + 0 = 0

*The Smart Start feature means that when the locomotive is stopped, the prime mover will idle for the time indicated and then automatically shut down for the same amount of time before automatically re-starting and running again for the time indicated over and over. While the prime mover is shut down, any speed command from the throttle will start the prime mover again. The 25 second start-up delay applies before the locomotive will move unless turned off by CV124=16.

ET44AC Locomotive Minimum Recommended Turn Radius: 22"

Decoder Reset: CV8 = 8

Troubleshooting

DCC equipped locomotives require very reliable electrical connections and contacts. If you are experiencing operating issues with your locomotive, the track and/or locomotive wheels might be dirty. Both of these items need to be cleaned thoroughly on a regular basis for reliable operation. Denatured alcohol works very well for these tasks.

DCC in general also requires plenty of power to the rails in all locations. If you have problem areas with any DCC locomotive, it may be beneficial to add more feeder wires in these locations. It is also recommended that the first feeder to the rails be within 6 feet of the command station. Items like turnouts and rail joints are never reliable for passing electrical current. Rail joints can be soldered and extra feeders can be wired to the track around turnouts to ensure reliable power distribution.

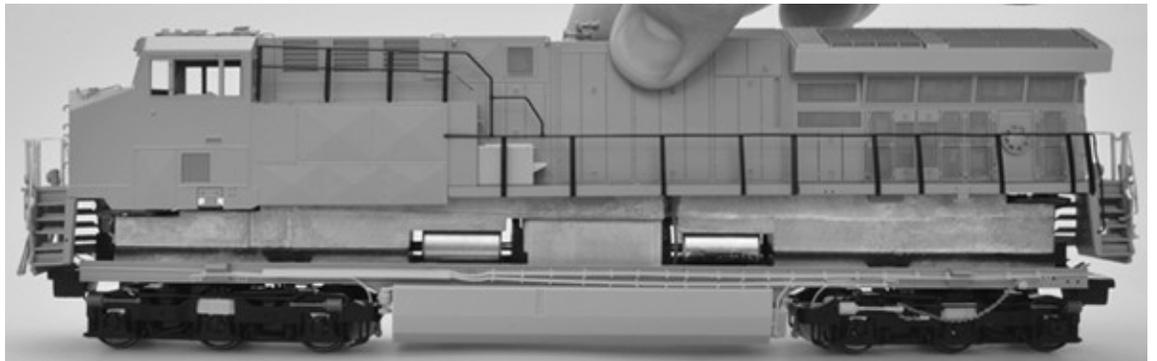
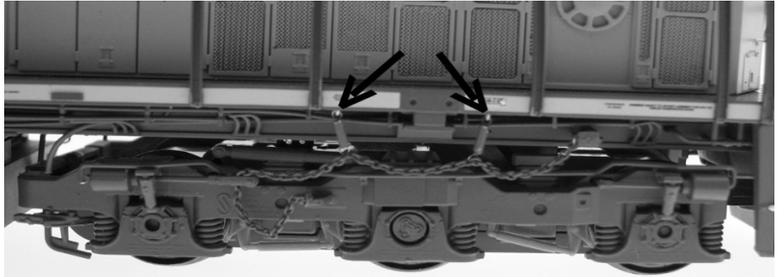
If the above is not improving the operation of your locomotive, check that the wires are properly soldered to the trucks on both sides. These wires are visible by looking above and behind the truck side frames. If any wire is detached, it needs to be soldered back on. You can do this yourself or send the locomotive in to us for the repair.

If you are having programming difficulties using the program track, remember that ESU LokSound decoders DO NOT require a program track booster! If you have a program track booster such as the PTB-100 or PowerPax in-line between your DCC system's program track outputs and program track, you must bypass it for programming ESU decoders on the program track. You should also use Direct Mode (DIR) programming. Refer to your DCC system's instruction manual for system specific information. Visit our website's DCC Assistance Section for decoder related information.

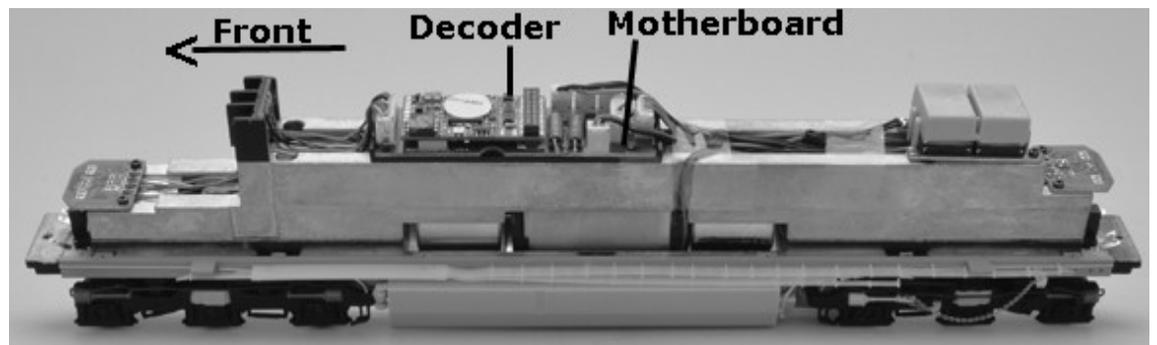
The ESU LokSound Select decoder's address and all CVs may be programmed on the mainline in OPS mode or on the program track in Direct Mode (DIR). Note that some systems may not be able to program CVs higher than 255. Should you have this issue, there is an alternate method. You can set CV96 to the hundreds digit of the CV number you're trying to program, set CV97 to the tens and units digits of the CV number you're trying to program. Set CV99 to the value that you're trying to program. Visit our website's DCC Assistance page for more information.

ET44AC Locomotive Shell Removal Instructions

1. Place the locomotive upside-down on a soft surface or foam cradle. Remove the front and rear coupler boxes from the locomotive by unscrewing the Phillips head screws. Gently slide the coupler boxes out from the shell and frame. Keep the pieces together for re-assembly.
2. Using tweezers, carefully remove the brake chain springs from the hooks above the left rear truck as shown by the arrows in the photo to the right. Note that BNSF units have 3 springs.
3. Pull upward on the shell using a steady controlled pressure. Be gentle and take your time to avoid damaging any of the locomotive details. Once the die-cast chassis begins to slide out from the shell, take care to guide the front and rear portions evenly. **DO NOT** wedge the chassis against the shell.



4. The shell should slide off of the chassis to reveal the mechanism and electronics. There are no wires attaching the shell to the drive.



5. To reassemble the locomotive, place the shell over the drive mechanism and gently press downward and evenly until the shell snaps into place. Reassemble the front and rear coupler boxes with the couplers and slide them back into place and replace the screws. Replace the brake chain springs onto the hooks above the left rear truck.

MAINTENANCE TASKS

Your InterMountain locomotive is designed to provide hours of enjoyment with little or no maintenance. On occasion the drive gear mechanisms should be lubricated. Utilize a plastic compatible lubricant such as Labelle[®] 107 Oil. To lubricate your locomotive place a few drops on the gears of the trucks by carefully removing the bottom gear cover on the trucks. Only a small amount of oil is required.

Service Needs: Although rare, at some time you may require service for your locomotive. **If you feel the need to send your locomotive in for repair, you do not need to contact us first!** The instructions for sending your locomotive in for repair are located on our website: intermountain-railway.com. Click [Customer Service](#) and then click [Service and Repair](#).

Decoder related issues may be solvable by checking the links on our website under the DCC Assistance section. We regularly update this section to help you get the most out of your InterMountain locomotives. If you cannot find the answer to your specific issue, please contact us at: intermountain@intermountain-railway.com or 303-772-1901.

Resetting the decoder solves 95% of the decoder related issues we handle. Decoder Reset: CV 8 = 8