



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 V5 21-Pin Sound decoder or a LokPilot V5 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!

DC Operation

Your ET44AC will operate on DC, however it will require more voltage than traditional DC locomotives. 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. This allows the locomotive to operate properly with DC track power. Note that some lighting functions may not work correctly when the DC plug is used. Sound is not possible 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 on address 3 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 3 FIRST, and then CV419 to 32. (CV32 to 3, CV403 defaults to 4 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

Drive Hold – Activate with Function 9 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!

Independent Brake – Turn on Function 10 to set the brakes while moving. Turn it OFF to release the brakes!

These are the most common two Full Throttle Features. More features are explained below the Function Table on the next page.

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 Fan	Dynamic Brake Logic (use 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 (use when operating with a sound unit)
F9	Drive Hold	Drive Hold (use when operating with a sound unit)
F10	Independent Brake	Independent Brake (use when operating with a sound unit)
F11	Walkway Lights (front and rear)	Walkway Lights (front and rear)
F12 Fwd	Rear Red DPU Light (CN Units) / Flange Squeal (Non-CN Units)*	Rear Red DPU Light (CN Units Only)
F12 Rev	Front Red DPU Light (CN Units) / Flange Squeal (Non-CN Units)*	Front Red DPU Light (CN Units Only)
F13	E4C6T Radiator Fan	N/A
F14	E4C6T Handbrake - Electric	N/A
F15	Isolation Switch	N/A
F16	GE Air Dryer on Shutdown OFF	N/A
F17	Brake Set / Brake Release Automatic	N/A
F18	GE Sanding Valve	N/A
F19	Short Air Let Off	N/A
F20	E4C6T Air Compressor	N/A
F21	GE Modern Air Dryer	N/A
F22	Cab Door	N/A
F23	Engine Compartment Doors	N/A
F24	Reverser Center	N/A
F25	Load Mode – (F15, F24, F26, F27, F28 must be OFF!)	Load Mode (use when operating with a sound unit)
F26	Manual Notch UP – F28 must be turned ON First!	N/A
F27	Manual Notch DOWN – F28 must be turned ON First!	N/A
F28	Manual Notching Logic On - Use F26 and F27 to notch up/down	N/A
F29	Shutters Open/Closed	N/A
F30	Automatic Brake	Automatic Brake Logic (use when operating with a sound unit)
F31	Fade Out Sound	N/A

*Non-CN units F12 = Flange Squeal. Locomotive must be moving for sound effect to play.

"Isolation Switch" Mode on F15 while Stopped:

Pressing F15 while stopped will lower the prime mover and lock the motor. F15 must be turned off to begin moving.

"Reverser In Center Position": Pressing F24 while stopped locks the motor so you can throttle through the notches like the prototype in neutral. F24 must be turned off to begin moving.

"Run 8" mode: When turning on F26 with F28 off, the prime mover goes to run 8. Turning off F26 returns the prime mover sounds back to normal mode.

"Coast" mode: When turning on F27 with F28 off, the prime mover goes to idle for coasting purposes. Turning off F27 returns the prime mover sounds back to normal mode.

Manual Notching: Keep both F26 and F27 OFF before pressing F28 to turn on manual notching. Once F28 is on, use F26 to notch up and F27 to notch down. F26, F27, and F28 must be turned off to return to normal mode.

"Load" mode: When turning on F25 with F15, F24, F26, F27, F28 off, the prime mover goes into load mode. While in load mode, the prime mover will notch up 1 or more notches based on primary load settings in CV104. The throttle notches up using speed instead of requested speed while using the load feature. F25 must be turned off to return to normal mode.

To make the ditch lights not flash with the horn: Set CV32=8 FIRST, then set CV309=0 (Default: CV309=4)

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.

The CN ET44AC does not have flashing ditch lights as per the prototype.

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 and Independent Brake can be used when sound and non-sound units operate together.

Programming CVs above 255 if your DCC system doesn't allow it:

Set CV96 to the hundreds digit of the CV number you're trying to program.

Set CV97 to the tens and units digit of the CV number you're trying to program.

Set CV99 to the value that you're trying to program.

Example: Set CV275 to 160.

Set CV96 to 2 (hundreds digit of 275)

Set CV97 to 75 (tens and units digit of 275)

Set CV99 to 160 (value of CV275)

Sound Volume CV Defaults Table:

Function	CV #	Range	ET44AC
Master Volume Control	63	0-192	128
**** SET CV32 to 1 BEFORE CHANGING THE CV's BELOW ****			
GE GEVO 12LDD6 Prime Mover	259	0-255	100
Horn	275	0-255	128
Bell	283	0-255	50
Coupler	291	0-255	60
Dynamic Brake	299	0-255	40
E4C6T Air Compressor	307	0-255	20
E4C6T Radiator Fan	315	0-255	40
Auto Brake Emergency	323	0-255	30
Automatic Brake	331	0-255	30
Independent Brake	339	0-255	30
Independent Brake Bail Off	347	0-255	30
GE Sanding Valve	355	0-255	20
E4C6T Hand Brake Electric	363	0-255	40
Cab Door	371	0-255	30
Engine Compartment Doors	379	0-255	30
GE Modern Air Dryer	387	0-255	30
GE Modern Air Dver on Shutdown	395	0-255	30
Reverser	403	0-255	20
Reverser Center	411	0-255	20
Isolation Switch	419	0-255	10
Alarm Bell	427	0-255	10
Flange Squeal	435	0-255	30
Short Air Let Off	443	0-255	30
GE-752AH Traction Motor	451	0-255	30
Starting Delay	459	0-255	60
Manual Notching Logic	467	0-255	20
Smart Start Beep	475	0-255	30
Brake Set / Release Automatic	483	0-255	30
Alerter	491	0-255	30
Shutters Open / Closed	507	0-255	20
**** SET CV32 to 2 BEFORE CHANGING THE CV BELOW ****			
Brake Squeal	259	0-255	20

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 (even brand new out of the box). 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. 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 you are having programming difficulties using the program track, remember that ESU LokSound decoders DO NOT require a program track booster! Digitrax users should use Direct Mode (DIR) programming on the program track connected to the "PROG A" and "PROG B" outputs. Do not use Page Mode. Refer to your DCC system's instruction manual for system specific information.

Minimum Required Radius is 22".

A Radius of 24" or greater is recommended for optimal performance.

Decoder Reset: CV8 = 8

Horn List

CV163	3 rd Generation Horn Type
0	Leslie S-3L-R
1	Leslie S-5T-RRO-R
2	Nathan K-2H
3	Nathan K-3H-L
4	Nathan K-3L
5	Nathan K-3LA
6	Nathan K-5HL (Default)
7	Nathan K-5H-R24
8	Nathan K-5L
9	Nathan K-5LA
10	Nathan K-5LA-R24
11	Nathan K-5L-LA
12	Nathan K-5L-R24
13	Nathan P-3
14	Nathan P-5-R24
15	Nathan GECX Nathan K3HL & K2H Forward/Reverse

Bell List

CV164	GE Modern Bell Type
0	GE M 6731022A Steel Bell 031
1	GE M 6731022A Steel Bell 033
2	Graham-White E-Bell 001 (Default)
3	Graham-White E-Bell 002
4	Graham-White E-Bell 008

Brake Squeals

CV165	3 rd Generation Brake Squeal Type
0	Composition Shoe #1 (Default)
1	Composition Shoe #2

GE Modern Air Dryers

CV166	GE Modern Air Dryer Type
0	AC4400CW Air Dryer 1
1	AC4400CW Air Dryer 2
2	AC4400CW Air Dryer 3
3	E4C6T Air Dryer 1 (Default)

Smart Start

CV168	Smart Start Timer
0	No Smart Start Cycle - (Default)
1	3 Minute Cycle
2	6 Minute Cycle
3	9 Minute Cycle
4	12 Minute Cycle
ETC...	...
255	765 Minute Cycle

Auto Bell:

Many Second and Third Generation locomotives have been fitted with an Automatic Bell that is triggered when the horn is blown. In MANY cases this cannot even be bypassed on modern locos. Before the FRA mandated this feature on new locomotives the bell was of course turned on and off separately. Some locomotives were delivered with a manual bell and have been converted to an automatic bell.

We realize that not every loco had this feature. As such there is an option to turn the feature on and off. The default in the InterMountain Tier 4 is **ON**.

To turn the feature OFF - Auto Bell OFF:

1. Remove the Auto bell sound slot from the function mapping chart

CV31 = 16, CV32 = 8

CV311 = 4

2. Change the sound configuration of the Auto bell sound slot

CV31 = 16, CV32 = 1

CV287 = 0

To turn the feature ON - Auto Bell ON:

1. ADD the Auto bell sound slot from the function mapping chart

CV31 = 16, CV32 = 8

CV311 = 12

2. Change the sound configuration of the Auto bell sound slot

CV31 = 16, CV32 = 1

CV287 = 1

Auto Bell Timer

CV169	Amount of Time Bell Plays After the Horn (¼ second segments)
4	1 second
8	2 seconds
12	3 seconds
16	4 seconds
20	5 seconds (Default)
ETC...	ETC...

Track Power **DOES NOT** need to be interrupted after making a change to CVs 163-169 listed on this page.

Decoder Reset: CV8 = 8

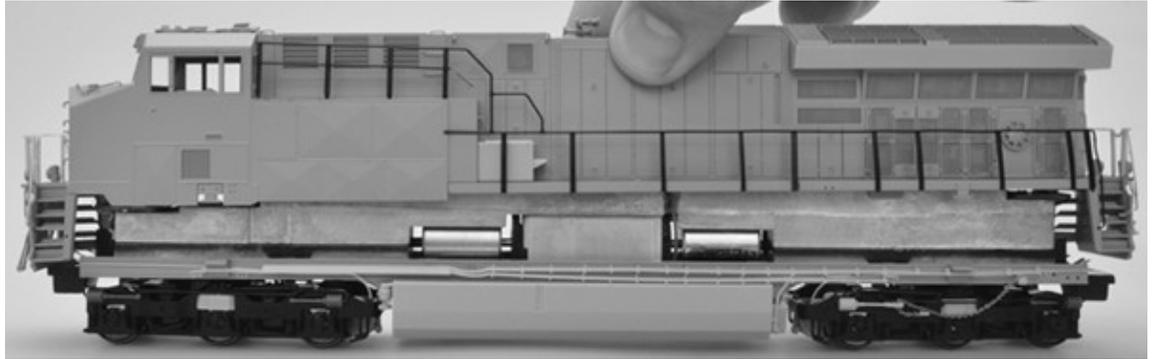
ET44AC Locomotive Shell Removal Instructions

Note: The chain springs DO NOT need to be removed!

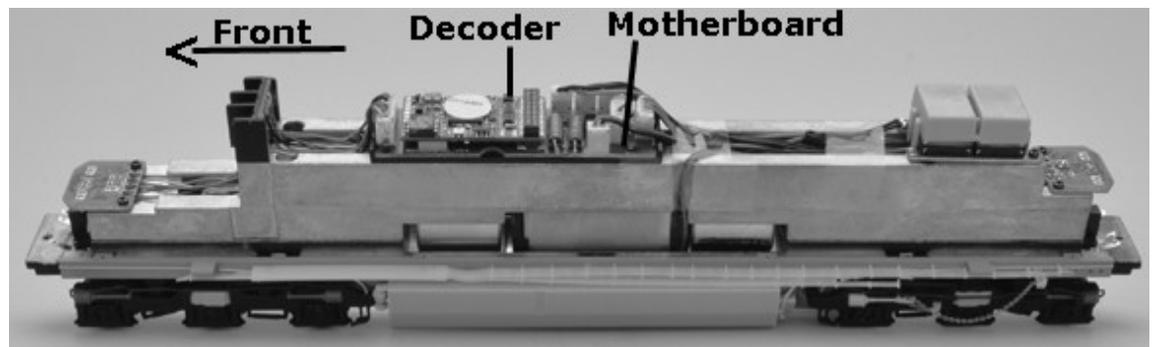
1. Place the locomotive upside-down on a soft surface or foam cradle. Remove the front and rear coupler boxes from the locomotive by unscrewing the Phillips head screws. Gently slide the coupler boxes out from the shell and frame. Keep the pieces together for re-assembly.



2. 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.



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



4. To reassemble the locomotive, place the shell over the drive mechanism and gently press downward and evenly until the shell snaps into place. Slide the front and rear coupler boxes (with couplers) back into place and replace the screws.

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, you may require warranty service for your locomotive. **If you feel the need to send your locomotive in for repair, please contact us first.** E-mail us at: intermountain@intermountain-railway.com or call 303-772-1901 Mon-Fri 8am-5pm Mountain Time.

Decoder related issues may be solved by checking the DCC Assistance section on our website. 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, 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