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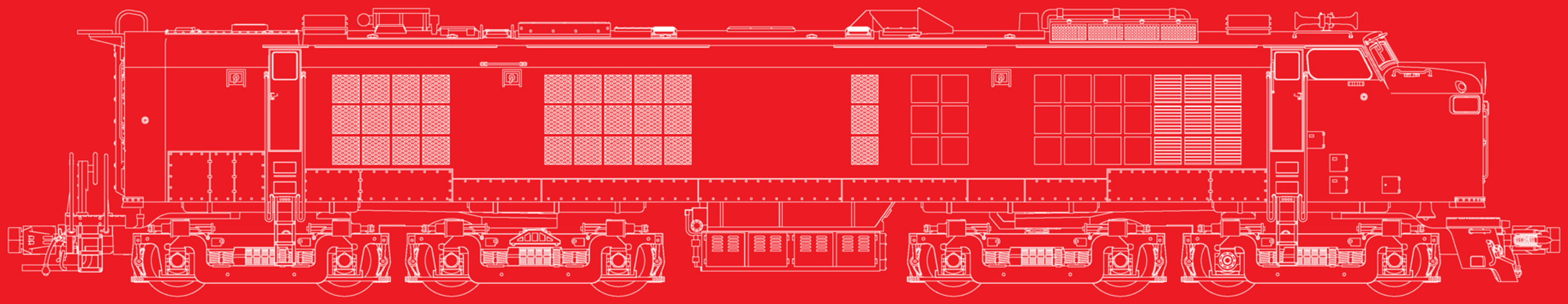
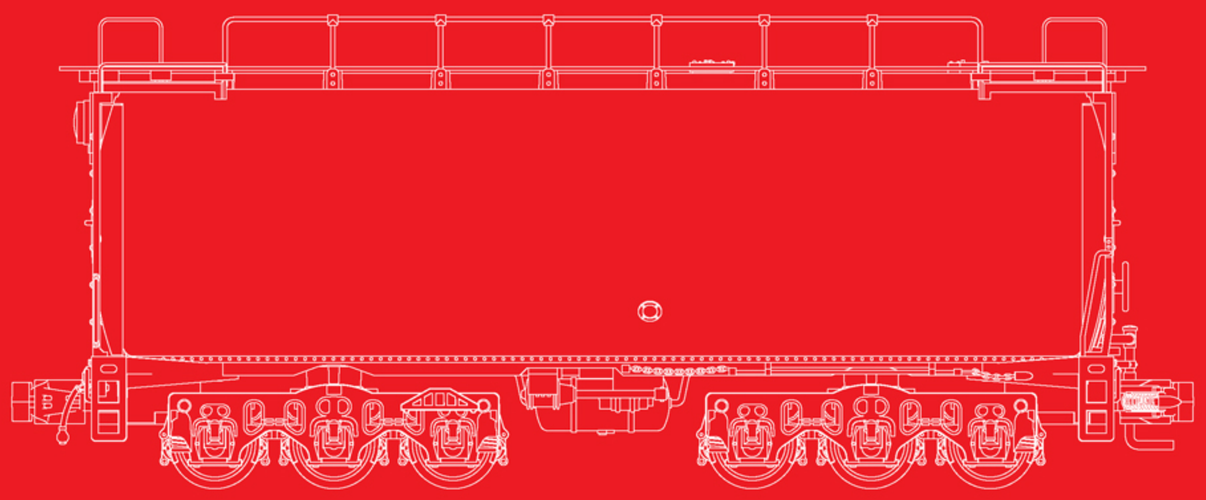
OPERATOR'S MANUAL

GTEL 4500 STANDARD TURBINE





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DCC & Sound by... Lok Sound

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Introduction

Thank you for your purchase of our UP 4,500hp Standard Turbine Locomotive. In this booklet you will find information in regard to maintenance, lubrication, body removal and some basic DCC instructions. **For additional information, part numbers and exploded drawings please see our web page.**

If you have purchased a sound and DCC equipped model then you will have access to all the features of this outstanding locomotive. For those that have purchased the DCC and sound ready version the DCC information contained in this manual will not be applicable to your model. All our models are equipped with a 21 pin MTC plug should you want to install DCC at a later date. Our UP 4,500hp Standard Turbine should be able to accept any 21 pin DCC decoder.

One new and exciting feature of your new Rivet Counter UP 4,500hp Standard Turbine equipped with DCC and sound is that it has the latest version of ESU software installed which include their "Full Throttle" Feature. This allows even more realistic locomotive operation. We recommend that you download the "Full Throttle" Quick Start Guide and the full decoder manual from the ESU website at the following address to learn all about this new feature and other features of the decoder.

http://www.esu.eu/en/downloads/instruction-manuals/digital-decoders/

Our DCC and Sound Equipped UP 4,500hp Standard Turbine Locomotive model is fitted with the ESU Loksound V5 decoder (ESU#58429) full-function decoder. The link above this section will direct you to manuals for many ESU products.

For those purchasing a DCC Ready locomotive and wishing to install sound later, the same decoder may used. If you wish to install a non-sound decoder, ScaleTrains.com recommends the ESU LokPilot 5 DCC #59629. When choosing a decoder for a DCC and Sound Ready unit it is important to remember that ONLY ESU decoders will have access to the advanced lighting features of our Rivet Counter™ locomotives. Please contact our sales department for assistance in selecting the proper decoder and programming for your operation. The manual for this decoder may be found in the same location on the ESU website and is document #51989. Either choice will allow you to get the most out of the sound or lighting functions designed for your locomotive.

Your state-of-the-art locomotive model is designed to utilize a single sugar cube type speaker.

NOTE: Other brand 21-pin decoders may fit however they will not have access to certain electronic components on the main board that control some lighting functions.

History

After World War II, General Electric began work on a locomotive using a gas turbine power plant specifically designed for locomotive usage. A gas turbine compresses large amounts of air, mixes it with atomized fuel, and ignites it in a combustion chamber. As the hot gases are exhausted, they spin a turbine, which drives a generator to create electrical power for the traction motors. GE's locomotive gas turbine was about 20 feet long and created 4,500 horsepower, three times as much as a contemporary diesel. The gas turbine locomotive also had an advantage in that it burned Bunker "C" fuel oil, a residual of the refining process, which was both very cheap and widely available. The only problem was that it needed to be heated to 110 degrees so that it would flow into the turbine properly.

At the same time, Union Pacific, always a champion of large locomotives was looking for a diesel equivalent to the Big Boy. After year of extensively testing GE's gas turbine demonstrator, on March 31, 1951, Union Pacific placed order number 5922-6 for ten gas turbine locomotives. Each cost $502,035 and the first was delivered to the Omaha shops on January 28, 1952 and went into service three days later.

The first ten gas turbines became known as Standard Turbines as tbey were car body units much like a contemporary F-unit. Inside the car body, behind the cab, were the turbine and generator, a 250-horsepower diesel engine and a steam generator to keep the fuel oil at 110 degrees. The locomotive carried 7,200 gallons of fuel oil, 1,000 gallons of diesel fuel, and 700 gallons of water. The diesel was used to move the locomotive around yards, power the auxiliaries, and crank the turbine up to the 900 RPM firing speed. The gas turbine locomotives were 83 feet 6 and a half inches over the couplers, 15 feet six inches tall, and weighed 551,720 pounds. They produced a 137,930-pound starting tractive effort. Just like UP's diesels, the gas turbines were equipped with dynamic brakes. On the first six locomotives, numbers 51 through 56, the air intake was through banks of screened openings in the car body sides. These intakes would change through out the life of the locomotives. Locomotives 51, 52, and 56, had stainless steel Farr grills added to protect the intakes. Within a year of delivery, Number 53 was changed to a roof mounted air intake which proved successful. The other five of the original group were converted to the roof air intake in 1953 and the second group, numbers 57 through 60, were delivered with roof intakes. Of the second four, numbers 57 and 58 came with Farr grilles over the side intakes.

UP was satisfied with the turbines. On the grade through the Wahsatch Mountains eastbound out of Ogden, the gas turbine's tonnage rating exceeded that of the Challengers and matched the Big Boys. The only problem with turbines was that they burned 900 gallons of fuel an hour at full load, which meant that they had just enough fuel to get from Ogden to Green River. In late 1955, UP added fuel tenders to the turbines. The tenders were built from the frame, water tank, and running gear of one 18-C tender from retired 4-12-2 locomotives along with the water tank from a second 18-C tender, creating a 22,000-gallon fuel tank. The new tender was designated 22-C-GTE, and were insulated and heated with steam to maintain the 110-degree fuel oil temperature.

WARRANTY

ScaleTrains.com, Inc. (ScaleTrains.com) warrants product purchased from authorized resellers to be free from defects in material and workmanship for a period of one (1) year from the date of purchase. The warranty period can be increased to two (2) years by registering your product on line at http://www.ScaleTrains.com

If the product fails during the limited warranty period, carefully pack the model in the original packaging and include the sales receipt and explanation of the issue. Ship the model to our Customer Service address noted below. We recommend using a traceable service and adding insurance. Costs associated with shipping are not covered under warranty. If ScaleTrains.com deems the product to be defective, we will either (1) repair or(2) replace at our discretion.

Defects due to misuse, improper maintenance, and/or modification are not covered under warranty. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state. These terms are covered by the State of Tennessee.

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MAINTENANCE, LUBRICATION & HOW TO REMOVE SHELL

Lubrication

The ScaleTrains UP 4,500hp Standard Turbine Locomotive represents hours of careful research and design work, and we are proud to present it to you. With the right care, it should provide years and years of model railroading enjoyment. Out of the box, the model should be ready for service, no lubrication should be necessary; it has been carefully lubricated at the factory for optimum performance. However, if the need to lubricate should arise, please follow these guidelines:

• Be sure to use a plastic-compatible lubricant! Most household lubricants, such as "3-in-1" type oils, may damage the slippery engineering plastic found in the driveline of the model. Wherever possible, use lubricants designed specifically for model railroad or similar hobby uses, and if in doubt, check the label for any compatibility warnings.

• Use the right type of lubricant in the right location! For metal-to-metal bearing surfaces, the use of light or medium oils is recommended. For plastic-to-plastic applications, such as gears, light greases are recommended.

• Always use lubricant sparingly! As the saying goes, a little goes a long way. When applying lubricant to bearing surfaces, a tiny drop or dab applied with a fine point, such as a toothpick, should be more than sufficient. Any excess lubricant oozing from a bearing surface should be carefully wiped away with a paper towel.

Lubrication points will be the same as would be expected in most any model locomotive. On the locomotive power trucks the bearing surface for the axles are behind the wheel so a small drop of light plastic compatible oil can be used behind each wheel as necessary. The interior of the both the A and B units are filled with circuit boards and wiring for the many features of your UP 4,500hp Standard Turbine Locomotive so great care must be taken when applying lubrication to areas that may require lubrication inside the locomotive. Refer to the below disassembly instructions and exploded diagrams to understand how to remove the body to access the inner workings of the locomotive. Lubrication points inside the model would be the motor bearings, where a small drop of oil between the motor ends and the brass flywheels, on the motor shaft, will be sufficient. The other location would be the at the worm shafts on the top of the gearboxes. These too can use a small drop of oil at both ends of the shaft. One end being where the driveshafts are attached to the metal worm shaft and the other being the opposite end where the shaft slightly protrudes out of the bearing. Grease can be applied to the gear box gear by removing the worm cover and then the worm and shaft. Once the worm and shaft are removed a small amount of grease can be applied to the top gear box gear, the one that contacts the worm gear then the worm and worm cover can be reinstalled. As the locomotive runs the grease will be distributed inside the gearbox to all the gears. Whenever possible, avoid contact of lubricants with the model's exterior finish. Oils and greases can possibly harm the factory paint and lettering; any excess that may make contact should be gently wiped away with a paper towel or other fine cloth. Due the delicate nature of the interior components inside the locomotives if there is any concern it may be best to contact your local dealer or contact us directly to help guide you through the lubrication process.

Handling

Due to the delicate nature of the model, it is advised that care should be taken when removing the model from its packaging, and placing it onto your test track or layout. Carefully remove each component of the model Loco and Tender, if equipped) from its compartment in the box foam. To remove each component, carefully slide off the outer sleeve from the "clamshell" plastic holder cradling each unit, and set it aside.

Next, unsnap the plastic clamshell holder; note that at one end is hinged, and designed to snap into the top half of the holder. Do this on a flat surface, to reduce the risk of the clamshell or the model slipping from your grip and falling to the floor. Once the clamshell is fully open, carefully remove the model; reverse the process to place it back into its packaging for storage. When handling the model, it is recommended that it is gripped firmly at its mid-section, avoiding the fine stirrup steps, doors, grab irons, or other small details that may be present.

Disassembly

In order to remove the body shell from the Turbine there are four inner locking tabs on the body that lock it to the die cast chassis. There tabs are located directly above the outboard brake cylinder on each inboard truck. There is a slot in the die cast chassis where these tabs are located. To remove the body insert a small flat screwdriver into the slot and gently pry outward an up to release the tab. Repeat on the other three tab. Take care as to not reengage the other tabs as you work in each one. One all four tabs are released gently lift the body from the chassis. There are not wires connecting the body with the chassis to be worried about but care must still be taken when removing the body. To reinstall the body just position it over the chassis and gently press down until the four tabs lock into place.

To dissamble the tender simply remove the four small screws, two on each side of each coupler box and then gently lift the body off the chassis. Use caution when separating the body and chassis. The circuit board for the tender light is just a press fit into the chassis and can be easily dislodged. Be sure that the PCB is properly installed in the slot in the chassis before reassembling the tender.

Cleaning

If kept out of its protective packaging for extended periods, it is likely your UP 4,500hp Standard Turbine Locomotive may accumulate dust or other debris. While unsightly, it can also potentially damage the finish of the model if allowed to accumulate. To remove light dust, it is recommended that a fine paint brush is used to gently knock off dust particles. For heavier accumulations, canned air dusters (commonly used for cleaning electronics), or air from an airbrush, can be used.

Basic DCC/DC Instructions

The Model

Your UP 4,500hp Standard Turbine Locomotive model is a meticulously designed and crafted model to match the prototype. DCC and sound equipped UP 4,500hp Standard Turbine Locomotive models includes an on-board sound system, featuring speakers designed to replicate the roar of the prototype. Also included are sounds for the horn, bell and various auxiliary systems.

Start Up Cycle F8

Like most LokSound equipped models, the sound is off when you first put the locomotive on the track. In DCC, pressing F8 will initiate the start-up sequence. In DC the start up sequence will start as soon as there is sufficient electrical power on the track. The start-up sounds of the UP 4,500hp Standard Turbine Locomotive is one of the most realistic in the hobby to date! If you wish for the sound to be on upon layout power up, please change the following CV's.

CV31 = 16, CV32 = 2

CV403 = 32

**Please note, like the prototype the model will not move while in the start up process.

Headlights F0

Like most models, in DCC, F0 will illuminate the headlight in the chosen direction of travel. You may dim the headlight by pressing F12. Please note that headlights are only illuminated in the direction of travel. In DC operations the headlights are automatic in their direction control, and are on all the time with sufficient track power. For uints that included a tender the rear locomotive headlight only will come on when in the reverse direction and F5 is pressed.

Hostler Mode

When the turbine engine is not on, and all is heard is the hostler engine you will be in “hostler mode”. As the speed was limited on the prototype while in this mode, it too is limited on the model. Once you have activated the turbine engine, you will notice you will have full range of throttle. Hostler mode will only work in DCC. In DC operations both the hostler engine and the turbine engine will come as soon as there is sufficient track power. You will have full operational speed for your turbine. Please note that with your Turbine, as with most sound equipped locomotives running in DC, it takes quite a bit of track power to operate the sound system and therefore quite a bit of power is necessary to start and run your Turbine in DC.

Turbine Start Up F3

In DCC once you are coupled to your train and ready to depart, you can pres the F3 button and the turbine will go through its start-up sequence. Once fully started, it’s very loud so don’t forget your hearing protection! As noted above in DC operation the turbine will start to run as soon as the track power is sufficient.

Rear headlight for units with tender F5

Since the units that used a tender would use the rear headlight on the tender for reverse movements we have separated the rear headlight on the locomotive to function only when in reverse and F5 is pressed. For units without the tender the rear headlight functions on F0 as with any other locomotive.

Gyralight F7

The UP 4,500hp Standard Turbine Locomotive has a white flashing front gyralight in the upper headlight housing. This is controlled by F7 and only functions in the forward direction. NOTE: Gyralight will only function in DCC operation.

UDE Light F6

The UP 4,500hp Standard Turbine Locomotive is equipped with a red UDE (undesired emergency) light. This light was designed to come on in the event of an undesired emergency brake application. On the model, pressing F6 will illuminate the red UDE light and all other headlights will turn off. Pressing F6 a second time will turn off the UDE light a resort all other headlights to operation. NOTE: UDE lights will only function in DCC operation.

DCC Function Mapping

As with all LokSound decoders, the function buttons can be changed to work in any way you desire. By default, the UP 4,500hp Standard Turbine is set up as follows:

F0 - Front Headlight
F1 - Bell
F2 - Horn
F3 - Turbine Sounds
F4 - Dynamic Brake
F5 - Rear Headlight with Tender
F6 - Big Hole Light
F7 - Gyra Light
F8 - Hostler Motor (On/Off)
Numberboards
F9 - Drive Hold
(See ESU website for info)
F10 - Independent Brake
F11 - Sanding Valves
F12 - Headlight Dimmer
F13 - Short Air Let Off

For more info on changing the function mapping to your liking, please consult the Full LokSound Manuals at www.LokSound.com

Basic Programming Notes

It is recommended that you use Paged Mode programming to adjust CV settings. If you are not familiar with Paged Mode programming, refer to your DCC system manual for more information. Programming track boosters are not necessary in order to program the decoders. If you will operate your model on a DC track or layout, these instructions do not apply.

If you will operate your UP 4,500hp Standard Turbine Locomotive on DCC, it is recommended that you download, read and understand the appropriate LokSound decoder manual covering the decoders used in your model. The UP 4,500hp Standard Turbine Locomotive uses the LokSound V5 decoder. A clear understanding is necessary to maintain your model’s sound and operation to optimum levels. To download the LokSound manual, visit their website at this URL: http://www.esu.eu/en/downloads/instruction-manuals/digital-decoders/.

From the factory the model is set to default address 03
The decoder can be set to 2 or 4 digit addresses with normal addressing on all DCC systems.
The decoders support CV 1 Addressing Short Address 1-127
Each decoder supports CV 17/18 Long Address 128-9999 - Please add 32 to value of CV29 to enter Long addresses.
Each decoder supports NMRA Consisting Using CV’s 19, 21 and 22.
A decoder reset can be accomplished by setting CV8 to a value of 8 on the program track. NOTE: Please see important info on decoder resets in the section below CV8 Resetting the Decoder.
Short address CV1 -03
Manufacturer CV8 -151
Long (Extended) Address CV17/CV18 – 192/128

CV8 Resetting the Decoder

Should it become necessary to reset the decoder on any of the units, place the unit on the programming track and follow these instructions:

Enter Paged Mode Programming on a DCC system. Enter CV programming and change CV8 to a value of 8 *.

NOTES:
1. When reading CV8 to perform a reset, you will note the default value reads: Manufacturer ID: 151.
2. CV1 (Short address) will be returned to default value: 03.
3. Long (Extended) Address CV17/18 – 192/128.

*DO NOT reset the decoder using POM (Programming On the Main) as you will need to cycle the power OFF and ON to complete the reset cycle. Failure to do so may result in the decoder not properly resetting.

Sound Volume Adjustments

See the chart to the left for function button list, CV numbers for individual sounds and the factory volume setting.

Note: Make sure the index CV31 is set to a value of 16 and the index CV32 is set to a value of 1 before changing the volume of an individual sound. All individual sounds have a volume range of 0-255.

Example for compressor volume: Set CV31 to 16, CV32 to 1 and CV307 to a value between 0 and 255. Master volume CV63. Volume range for master volume is 0-192.

For a full listing of all sound CVs please download the LokSound Bulletin for the SD45 at the following web addresses
http://projects.esu.eu/projectoverviews/6

CV163 / CV164 Sound Options / Alternate Horns and Bells

Your new Rivet Counter UP 4,500hp Standard Turbine Locomotive will come to you with the correct horn and bell right out of the box per the specific prototype. But in case you would like to hear a different horn or bell sound, we have provided an assortment.

Horns: CV163=0 Dual Leslie A200 *Default*
CV163=1 Nathan K3L
CV163=2 Nathan M5
CV163=3 Nathan P3
CV163=4 Nathan Old Cast P5A
CV163=5 Leslie S2M
CV163=6 Leslie RS3L
CV163=7 Leslie S3L
CV163=8 Leslie S5T
CV163=9 Nathan M3
CV163=10 Leslie RS3K
CV163=11 Nathan K5H
CV163=12 Leslie S3LR
CV163=13 Nathan M3H
CV163=14 Leslie Dual A125-A200
CV163=15 Leslie S5T-RF

Bells: CV164=0 EMD Air Bell
CV164=1 GE Air Bell *Default*

Digitrax CV Programming for CV's over 255

Some Older Digitrax Systems do not allow programming of CVs above 255. In order to make full Programming possible, we have implemented an assistance tool. This helps to write the number of the CVs desired temporarily into two assisting CVs (so-called address registers), since the usual CVs cannot be reached. Afterwards the value of the CV desired will be programmed into another assisting CV (so-called value register). When the value register is written, the content will be copied to the actual desired position and the assisting CV will be set back. Consequently, 3 CVs have to be programmed to write one CV. These 3 CVs are described in the following chart:

CV Value range	Name	Description
96 0 – 9	Address offset	Saves the CV number that should be actually programmed in hundreds.
97 0-99	Address	Saves the CV number that should be actually programmed in units and tens.
99 0-255	Value	Saves the value of the CV that should be actually programmed.

Example: You wish to program CV 317 with value 120.
Proceed as follows:
Program the value of the CV number in hundreds in CV 96.
- In this example: CV 96 = 3.

Program the value of the CV number in units and tens in CV 97.
- In our example: CV 97 = 17.

Program the desired value in CV 99.
- In our example: CV 99 = 120.

As soon as you have programmed CV 99, the value of CV 99 will be transferred into CV 317. When the programming finished, CVs 96, 97 and 99 will be set back automatically.
This procedure is ONLY needed when programming CV's above 255 on some older Digitrax DCC Systems.

Function Button and Sound Slot Chart

Key	Function	Sound Slot	CV #	Factory Volume Setting
F0	Directional Headlight			
F1	Bell	4	283	40
F2	Playable Horn	3	275	128
F3	Turbine Sounds	2,9	267, 323	128, 65
F4	Dynamic Brake When Moving	6	299	100
F5	Rear Headlight with Tender	31		
F6	Big Hole Light			
F7	Gyralight			
F8	Hostler Motor (On/Off)/Numberboards	1	259	120
F9	Drive Hold			
F10	Independent Brake			
F11	Sanding Valve	13	355	128
F12	Dimmer (Headlights, Turn Off Ditchlights)			
F13	Short Air Let Off	14	363	128
F14				
F15				
F16				
F17				
F18				
F19				
F20				
F21				
F22				
F23				
F24				
F25				
F26				
F27				
F28				
F29				
F30				
F31				

Notes:

SXT81628 Rev 04-21
ESU V5 Decoder

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