PROGRAMMING

This decoder supports all program mode and read back feature. With MRC Prodigy Advance DCC you can read its address and CV value.

CV	Register	Description	Range	Default
CV1	R1	Short address	1-127	3
CV2	R2	Start voltage	0-32	10
CV3	R3	Acceleration	0-32	0
CV4	R4	Deceleration	0-32	0
CV5	---	Top voltage	0-32	32
CV6		Speed curve select (0=linear, 1=slow increase, 2=fast increase at slow speed)	0-2	0
---	R6	Page number	---	---
CV29	R5	Basic configuration	---	2
CV7	R7	Manufacturer version number	27	1
CV8	R8	Manufacturer ID	---	143
CV17	---	Long address upper byte	192-231	192
CV18	---	Long address lower byte	0-255	3
CV19	---	Advanced consist address	0-127	0
CV21	---	When CV21=0, functions follow its own address. CV21=1, functions follow the consist address	---	0
CV49		odd number sound on, even sound off	1	on
CV50	---	Horn type	0-22	6
CV51	---	Horn volume	0-15	12
CV52	---	Bell type	0-7	3
CV53	---	Bell volume	0-15	12
CV54	---	Bell ring rate	0-50	3
CV55	---	Diesel rumble volume	0-15	12
CV56	---	Brake squeal volume	0-15	7
CV57	---	Dynamic brake volume	0-15	12
CV58	---	Air release volume	0-15	12
CV59	---	Air pump volume	0-15	12
CV60	---	Safety pop valve volume	0-15	12
CV61	---	Engine cooling fan volume	0-15	12
CV62	---	Coupling volume	0-15	12
CV63	---	Sand release volume	0-15	12
CV64	---	Rail wheel clack	0-15	12
CV65		Start Kick voltage	0-15	12
CV67-94		28 speed steps table while CV29.4=1	1-255	linear
CV112		Air compressor volume	0-15	12
CV113	---	Coupling fire volume	0-15	12
CV114	---	brake release volume	0-15	0
CV115	---	Auto brake squeal enable/disable	0-1	1(enable)
CV116	---	Flange volume	0-15	12
CV122	---	Notch mode, 0=auto, 3=manual	0-3	0
CV123	---	Prime mover type and off	0-1	1(on)
CV125	---	Programming to "1" will restore some CV's to factory settings	---	0

SPEED TABLE CV67-CV94 FOR 28 SPEED STEPS

When CV29's bit 4 is set to "1" it will use the speed table formed by CV67-CV94 to control speed (motor voltage). It allows you to setup each speed for all 28 speed steps. First, program CV29 to 18 for short addresses (1-127) or program CV29 to 50 for long addresses (128-9999) to enable speed table control. Then select throttle to 28 speed steps and run your loco at speed step 1. Use program CV on the main to change CV67's value (1-255) to adjust step 1's speed. The kick voltage, CV65 is only applied when the speed step changes from 0 to 1. You should switch between 0 to 1 many times to check step 1's speed. When done with CV67, select speed step 2 and program CV68. CV68's value must be greater then CV67's. When done with CV67-CV94, use read back CV to make sure their values are in increasing order. Note: When using MRC Prodigy DCC to program addresses it will automatically disable the speed table (set CV29's bit 4 to "0"). Programming CV125 to 1 will also disable the speed table and re-program CV67-CV94 to a default linear speed setting.

TROUBLE SHOOTING

This decoder should perform well with all DCC systems. The maximum DCC output should be less than 15 V. If the locomotive does not respond to commands, it may have lost its address. Please re-program the address and program CV19 to 0 (disable consist). If it responds slowly, you should clear its momentum by reprogramming CV3 and CV4 to zero. If step 1's speed is too high, you should program start voltage, CV2 to zero. If its top speed is too slow, program top voltage CV5 to 31. You should also clean the track to improve electrical pickup. Read your DCC system manual to learn how to program and operate the decoder. For more information about registers/CVs and their functions, please refer to the NMRA DCC Standard & Recommended Practices, RP-9.2.2. This is available directly from the NMRA or their website at **www.nmra.org**. Whenever the decoder doesn't work please use the program track to program CV# 125 with value 1 to restore the decoder to factory settings. This should bring the decoder to life with address #3.

FCC COMPLIANCE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

RETURN PROCEDURE

This decoder carries a 6 month warranty against factory defects. This warranty **does not** include abuse, misuse, neglect, improper installation, or any modifications made to this decoder, including but not limited to the removal of the NMRA plug if applicable. If it should become necessary to return the decoder for warranty repair/replacement, **please include a copy of the original sales receipt**. Please include a letter (printed clearly) with your name, address, daytime phone number, and a detailed description of the problem you are experiencing. Please also include a check or a money order for $9.00 to cover return shipping and handling. If the decoder is no longer considered under warranty, then please include a check or a money order for $35.00 to cover the cost of repair or replacement and return shipping and handling. **Be certain to return the decoder only.**
Any questions regarding Warranty Policy can be directed to our Customer Service Department by calling 732-225-6360 between the hours of 8:30am and 6:00pm EST, or by emailing: rrtech@modelrectifier.com
Send the decoder to:

Model Rectifier Corporation
Attn: Parts & Service
80 Newfield Avenue
Edison, NJ 08837-3817 U.S.A

MRC

TECHNOLOGY. PERFECTED.
MODEL RECTIFIER CORPORATION

N Gauge Synchronized Diesel Sound Decoder with Two Authentic Prime Mover Sounds

Item #0001955

Thank you for purchasing our most advanced 16 bit DCC locomotive sound decoder. Combined with any DCC System, our new decoder with authentic diesel sound truly will make your model railroad come to life.

- Two selectable diesel prime mover types with randomly associated locomotive sounds
- User selectable 22 different horns and 8 bells
- 28 accessory functions allowing more sound control than ever
- Programmable individual sound volumes (16 levels)
- 0.75 amp capacity
- Programmable for either 2-digit (1-127) or 4-digit (1-9999) addresses
- Programmable start voltage and top voltage
- Programmable acceleration and decelaration rates
- Programmable 14, 28, 128 speed steps
- Selectable factory default speed curve
- Supports full read back
- Supports advanced consisting (CV19)
- Supports programming on the main (OPS mode)
- Compatible with NMRA DCC standards
- Complies with Part 15 of FCC
- 10mm speaker included
- drop in fits Atlas N scale GP7, GP9, GP30 and GP35

INSTALLATION

It is quite a challenge to install this decoder into an "N" scale diesel locomotive. You should have some basic electronics knowledge
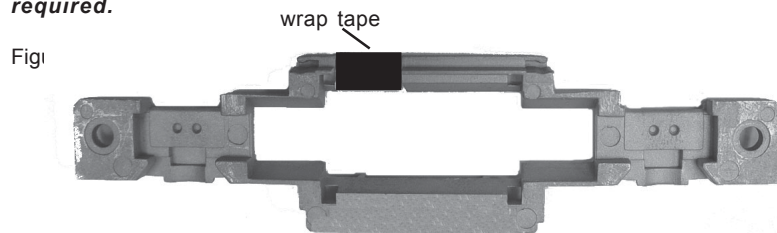
The body shell, and fuel tank casting must be removed from the chassis, and the entire frame must be disassembled. Mark the top of the motor with a dab of paint or permanent marker; remove the original circuit board, motor, driveshafts, bearings, and trucks.

The top portion of each frame half that touches the motor brush tabs should be insulated with a small piece of clear tape.

The decoder replaces the original circuit board of the locomotive and should fit in the same location. Assemble one half of the frame first, installing the decoder, motor, driveshafts, bearings, trucks, and frame spacers. Gently place the other frame half on top of the completed half, checking clearances and if there is any binding of the drive mechanism. Correct any trouble spots at this point. Also check to make sure the motor brush tabs are not touching the frame halves and the clear tape is correctly positioned at the motor brush tab points to avoid shorting out the decoder. Now you can install the insulated bolts and nuts to secure both frame halves together. Apply tape on the chassis under the speaker to prevent the speaker from touching the chassis.
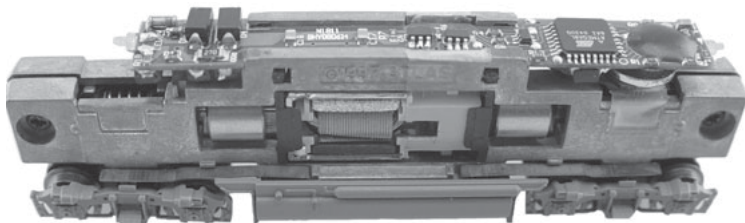
Re-check installation!!! If at this point you are satisfied with the mechanical installation of the decoder and all associated parts, it is time to check the installation on a test track. Do not install body shell until testing is done. See section on "Making a Test Track", and "Testing"

Note- This new decoder has the speaker mounted to the underside of the circuit board. This makes installation easier with no frame milling required.

Fig

wrap tape

Wrap the whole notch with tape to prevent the motor's contact from touching the chassis. Otherwise, the decoder will be destroyed if the motor contact touches any unwrapped part of the chassis.

Figure 2. shows how to install 0001955 decoder

MAKING A TEST TRACK

Before you begin decoder installation, we strongly recommend building a test track with a 27 ohm resistor to limit current. Only test your installed decoder on the test track. The test track may prevent damage from an incorrectly installed decoder.

Note: The program track is NOT a test track. The program track does not use a current limiting resistor. So it can't protect an incorrectly installed decoder.
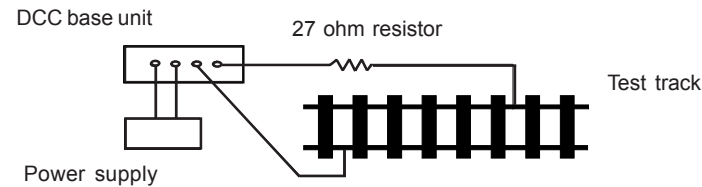

Figure 3. Diagram of test track

TESTING

The decoder has been programmed to address #3, 28/128 speed steps. To test, place the loco on the test track. Select address #3 and 28 speed step. Move up the throttle and the loco should move. Push the light button [F0] and headlight should come on. Change the direction of the loco and the loco should change direction. The loco cannot reach full speed, due to the resistor. If all the above occurs, you passed the test. Congratulations! Do not run the loco for an extended period of time on the test track or the resistor will overheat. If your installed decoder does not pass the test, find the problem, correct it and test it again. As long as you test the decoder on the test track there is little chance of damaging the decoder. This is why the test track is so important.

OPERATION

The decoder has start up and shut down features. If the loco was previously shut down you have to start up the engine. Press any function key to start up the engine before operating the loco. To shut down the engine you must bring the loco to idle and then press F8 three times.

There are four diesel prime mover sounds you may enjoy. You can use F12 to select either prime mover sound or "off". You can use F19 to select 22 different horn sounds and use F18 to select 8 different bell sounds. With MRC Prodigy Advance[2] DCC which has 28 functions, you can easily setup and access all the decoder's functions. If not, you may not be able to access all the features of the decoder. If you DCC system allows CV programming, you would have to use this type of programming to access all the features of the decoder.

The decoder default is set to automatic notch. You can program CV122 to 3 for manual notching for realistic operation. And then use F9 to notch up and use F8 to notch down.

If you don't have DCC system, you have to use the MRC Blackbox (item #0001050) or Tech6 (item 0001200) for the DC operation. It will allow you to control all of the sounds in your sound equipped locomotives. They are easy to setup and use.

Function	Idle/Moving
F0	Headlight on/off or rule 17 or cycle of dim, bright, off
F1	Bell on/off
F2	Horn
F3	Short air release
F4	Coupler cut lever
F5	Brake release (idle) / brake squeal (moving)
F6	Dynamic brake
F7	Air hose firing/uncoupling lever
F8	3 time shutdown/manual notch down
F9	Engine cooling fan/manual notch up
F10	Rail wheel clack (only moving)
F11	Traction air compressor on/off
F12	Change prime mover type and off
F13	Short air release
F14	Coupler crash
F15	Air compressor
F16	Flange squeal
F17	Air release
F18	Change bell type, and off (use F1 to turn off bell after adjustment)
F19	Horn type select
F20	Associated loco sound
F21	Change bell volume (use F1 to turn off bell after adjustment)
F22	Change horn volume
F23	Change prime mover volume
F24	Safety valve pop
F25	Air release
F26	Flange noise
F27	Sand release
F28	Air release

Bell, Dynamic Brake and Rail Wheel Clack cannot play at the same time. If you activate the Bell sound [F1], while either the Dynamic Brake or Rail Wheel Clack sounds are in use, the Bell sound will override the other 2 sounds. Rail Wheel Clack cannot play while the loco is in idle. When you turn off Dynamic brake and Rail Wheel Clack sound there will be one second delay.