When hooking up accessory lighting, regardless of mode being used, use light bulbs rated at maximum track power. The bulbs receive full track power when the functions are activated. Auxiliary factory installed locomotive lighting that use LEDs or 1.5-volt bulbs will need a resistor (1 K ohm, 0.25 Watt) placed in line to prevent them from burning out.

HOW TO SELECT THE MRC *LIGHT EFFECTS*

The AD370 is shipped from the factory in the normal/default mode (address #3) normal lights & functions. There are two ways to access the **MRC** *Light Effects:*

1. The MRC EZ way (for all DCC systems except the MRC Command 2000): Place your locomotive on a programming track. Program your locomotive to address #1. This step turns our **MRC** *Light Effects* on. Final step: Now program in your locomotive running address, either 2 or 4 digit, and adjust the rest of your running parameters (momentum, start voltage, etc). That's it! To turn off the **MRC** *Light Effects*, simply program the locomotive to address #3 and then follow the final step above.

You cannot run a locomotive on address #1 and retain normal lights/ function or run a locomotive on address #3 with **MRC** *Light Effects*. These two addresses are reserved for turning the functions on and off, but a locomotive will still be able to run on these addresses.

2. The other way:
   If your non-MRC DCC system has the ability to program CVs, you can go directly to CV 64 to turn on your **MRC** *Light Effects*. You can use the register/ CV chart we have provided for you in this instruction booklet or visit the National Model Railroad Association website at **www.nmra.org** for a more comprehensive understanding of CVs and registers.

PROGRAMMING

The AD370 decoder supports the following register and CV programming.

MRC PRODIGY DCC and MRC Command 2000 users do not need to know all these register/CV numbers because the MRC DCC systems use model railroading terminology. It is easy to understand and easy to program.

The MRC AD370 decoder should perform well when used with other brand command systems. See your DCC command station's manual to learn how to program and operate the decoder. For more information about register/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.**

FCC COMPLIANCE
This device complies with the part 15 of FCC rule. 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 cause undesired operation.

CV	Register	Description	Range	Factory Value
CV1	R1	Short address	1-127	3
CV2	R2	Start voltage	0-32	0
CV3	R3	Acceleration	0-32	0
CV4	R4	Deceleration	0-32	0
CV5	---	Max voltage	0-32	0
CV29	R5	Basic configuration	---	2
CV7	R7	Manufacturer version number	---	32
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	1-127	0
CV64	---	Light effect setting (0=special light effect/1=normal light effect)	0-1	1
CV105	---	User identifier number	0-255	0
CV106	---	User identifier number	0-255	0
---	R6	Page number	0-31	1

RETURN PROCEDURE

If it should become necessary to return your decoder, unplug the decoder and return the decoder only. Please include a letter (printed clearly) with your name, address, a daytime telephone number, and a detailed description of the problem you are experiencing. Please also include a $15.00 check for handling and shipping fee. **Be certain to return the decoder only.**

Send the decoder to:

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

AD370 HO Gauge Diesel Sound Decoder with MRC *Light Effects*

Thank you for purchasing our highly advanced DCC locomotive decoder. Combined with any DCC System, our decoder will make your model railroad more realistic and exciting.

- 1.5 amp capacity
- 3 accessory functions at 0.1 amp rate (F1 – F3)
- 4 sound functions, (bell, long horn, short horn, uncoupling), plus diesel idle and diesel rumble
- Programmable for either 2-digit (1-127) or 4-digit (1-9999) addresses
- Programmable start voltage
- Programmable acceleration rate
- Programmable deceleration rate
- Programmable top voltage
- Programmable 14, 28, 128 speed steps
- Directional lighting control for front and rear lights at 0.2 amp rate.
- Supports advanced consisting (CV19)
- Supports programming on the main
- Compatible with NMRA DCC standard
- Complies with the part 15 of FCC
- 20mm speaker included
- Dimensions: 44.0mm x 17.5mm x 7.0mm

INSTALLATION

It is quite a challenge to install a decoder into a locomotive. You should have some basic electrical knowledge and soldering skills. If you do not have the above requirements, please ask the dealer for help in installation.

Figure 1 shows the electrical circuit of most standard locomotives. The terminals of the motor and light(s) are directly connected to the wheel pick-ups. Each type of loco has its own method of electrical pick-up and distribution. The connection between the wheels, motor and light(s) could be wires, clips, the body or chassis, a PC board or any other type of conductor. Figure out your loco's electrical system and how to disconnect (isolate) the motor and light(s).

Figure 1. Connection of standard locomotive. *Note: The 'X' marks indicate where to disconnect (isolate).*
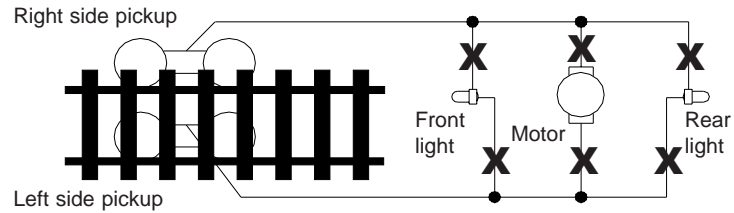
The decoder will be inserted between the wheel pick-ups and the motor. The 'X' marks in Figure 1 show you where to disconnect (isolate).

Figure 2 shows you how to wire the decoder. After disconnecting the motor terminals from pick-ups, connect the red wire to the right side pickup and the black wire to the left side pick up. Connect the orange wire to the motor terminal that originally connected to the right pickup. Connect the gray wire to the motor's other terminal. Connect the front light to the blue wire and the white wire. Connect the rear light to the blue wire and the yellow wire.

The blue wire is the common terminal for lights and accessory functions. You may use the black wire or the red wire to replace the blue wire. This is very useful when you find that it is hard to isolate one of the light terminals from the pickup. Wiring the bulb this way will also make the light dimmer. If your loco has only a front light, you should connect the white and the yellow wires together.

Figure 2. AD370 wiring diagram
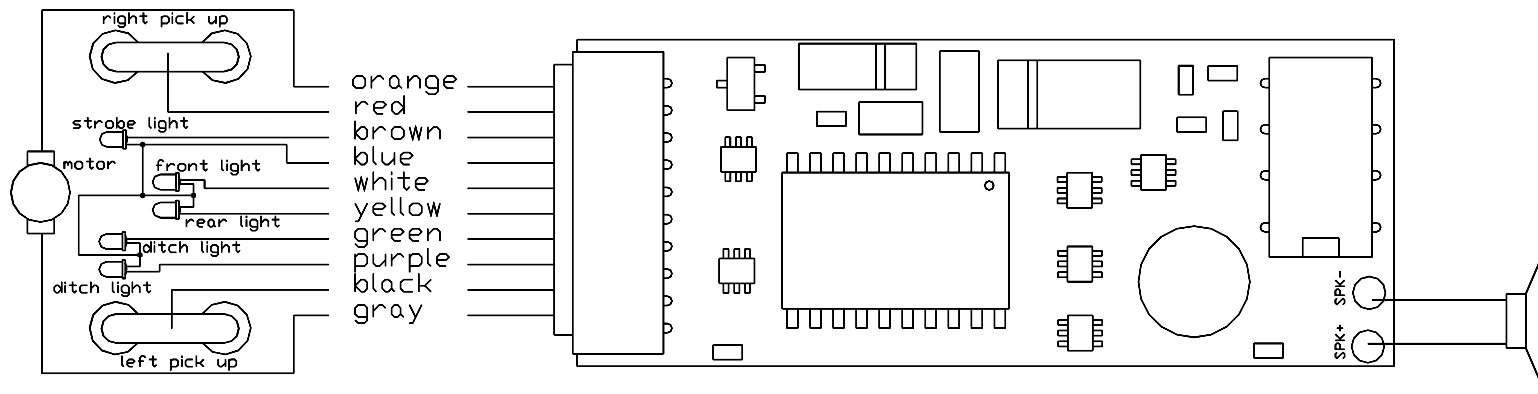
SPEAKER PLACEMENT

Your AD370 HO scale diesel sound decoder comes with a speaker rated at 8 ohms. Placement of the speaker is up to you.

Use hot glue to affix the speaker to the locomotive.

MAKE A TEST TRACK

Before you start with your decoder installation, we strongly recommend building a test track that uses a 20-ohm resistor to limit current. Only test your installed decoder on the test track. The test track will prevent any damage due to an incorrectly wired decoder.
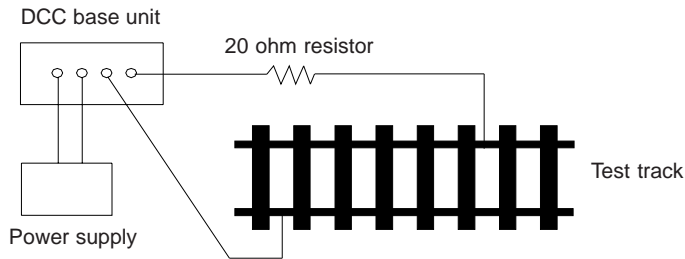
Figure 3. Diagram of test track

TEST

All MRC decoders have been factory programmed with address #3, 28/128 speed steps and maximum top voltage. After you have finished your decoder installation, you are ready to test it. **Never run the installed decoder on your layout without first passing the test.** You may damage the decoder if it is not wired correctly or if you have not properly isolated the motor and the lights.

Put the loco on the test track. Select the Run Mode of your DCC system and select or acquire address #3. Move up throttle and the loco should move forward. Push the light button and the front light of your loco should turn on. Push the reverse direction button. The loco should move backward and the rear light should turn on. The loco cannot get normal speed because there is a 20-ohm protection resistor in the test track. If you are able to turn on/off the front and rear lights and you are able to move the loco forward and reverse, you did a great job. Congratulations! **Do not test the loco on the test track for an extended period of time. To do so will cause the protection resistor to 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 your decoder. This is why making a test track is so important.

OPERATION

The AD370 decoder can be operated with diesel idle and rumble turned on or off. If your DCC system has an F8 button, you can use it to activate the engine sound. Otherwise you must double click your headlight button (F0) to turn the diesel idle rumble on or off. When the diesel idle and rumble are turned off, your bell, long horn, short horn and uncoupling sounds can still be activated by using the appropriate function buttons (F1-F4).

The sounds of the AD370 are also active regardless of which mode you program the decoder to: (Normal light/functions mode or **MRC *Light Effects*** mode).

The AD370 decoder can be operated in either one of two ways:

1. Normal light/functions:
   Headlights are directional and are controlled by your DCC system's light button (F0). Decoder functions (accessory lights) are normal on/off controlled by F1-F3 buttons. Sounds will also be activated at the same time with the pressing of these buttons.

2. **MRC *Light Effects:***

   A. "Rule 17" directional headlights: Headlights on/off (F0) light button. One light is bright to indicate direction of travel and the other is dim. Also in this mode, the (F0) light button turns on the strobe light if hooked up. Normal headlight wiring is used for "Rule 17" lighting (white, yellow & blue common wire).

   B. Ditch lights: Use of the long horn (F2) or short horn (F3) buttons will activate ditch lights with horn sounds. Ditch lights will flash 5 times after horn sound ceases. If your DCC system has an F5 button, you can use it to turn ditch lights steady on/off. Otherwise you must use the uncoupling button (F4) to turn ditch lights steady on/off. When horn is activated, the ditch lights will flash. To wire ditch lights, use green and purple accessory wires with blue (headlight) common wire.

   C. Strobe light: This light simulates the rooftop strobe light on some locomotives. In the **MRC *Light Effects*** mode, the strobe will flash when "Rule 17" headlights are on regardless of loco direction. To wire strobe light, use brown accessory wire with blue (headlight) common wire.