

# IN LOCOMOTIVE DIESEL SOUND

for AC TRACK POWER by **DALLEE**  
**ELECTRONICS, Inc.**

CAUTION-THIS DEVICE CAN BE DAMAGED BY STATIC DISCHARGE. PLEASE EXERCISE CARE DURING INSTALLATION TO AVOID THIS POSSIBILITY. DISCHARGE YOURSELF TO AN ELECTRICAL GROUND (OUTLET COVER SCREW) BEFORE REMOVING THIS DEVICE FROM ITS ANTI-STATIC BAG. PLEASE READ INSTRUCTION SHEET COMPLETELY BEFORE ATTEMPTING TO INSTALL AND OPERATE THIS PRODUCT.

## OVERVIEW

This device is an electronic, self contained, sound system for installation in model diesel locomotives that are designed to operate with AC track power. This system consists of a Sound Board (dimensions 3.75" l x 1" w x 1" h), and a power supply / decoder board (dimensions 4" l x 1.25" w x 1.25" h). The sound system may be limited to larger gauge models and also may require the use of an unpowered "dummy" unit or a trailing freight or passenger car.

Sound volume is adjustable. A 2" speaker is supplied, unless requested otherwise. Other size speakers can be substituted. The audio amplifier is capable of producing several watts of power providing the input power is sufficient. Sounds produced include user controlled air horn, bell, periodic air system pressure release, brake release and diesel prime mover sound automatically adjusted to speed and load conditions.

This sound system is designed to be operated with standard AC track power Whistle / Horn transformer control and a remote Bell button. Other throttle systems, such as our HOSTLER/AC, have these functions built into the throttle.

## INSTALLATION INSTRUCTIONS

The sound system consists of two printed circuit boards, a speaker, and appropriate connectors between the two boards. Also included are three 2 pin connectors with wires.

The sound circuit board should be mounted so that the controls are accessible either through the frame or via a hatch or a hole in the locomotive body shell. The power supply board can be mounted where all parts clear other objects. Make sure that the components on the sound unit and power supply board do not come in contact with any other metal object. This will destroy them and is not covered under warranty! The speaker is to be mounted as suits your preference and available space.

Refer to the general sheet (page 2) to familiarize yourself with the connectors and controls on the sound board and power supply board. Then proceed to the installation pages.

When connecting the DC power leads be absolutely sure that the positive wire connects to terminal #3 of the main header and the negative wire connects to terminal #4 of the sound unit main header (as shipped). Failure to do so will damage the sound unit! This is not covered under any warranty and is obvious to us when returned for repair (tracks are burned off of the board & parts destroyed). Parts destroyed from wires or other metal touching the boards is also not covered under warranty. We inspect these units thoroughly before packing. There is a minimum repair cost of \$30.00 (+ \$6 s/h & sls tx in PA) so please be careful not to confuse these connections!

## SOUND INFORMATION

PRIME MOVER (DIESEL) sounds range from engine idle to full RPM with eight notches. With the motor unpowered (E-UNIT in Neutral) engine idle sounds are heard. With the locomotive actually in motion, diesel sound is varied according to speed and load with a distinctly increased volume during acceleration. Since actual prime movers take

some time to accelerate and a long time to decelerate, you will also see this affect in the sound system. Some prime movers (like an EMD) take a long time to return to idle. If you want the sounds to track your locomotive more realistically, you will have to adjust your operating skills of the particular locomotive to the prime mover sounds desired. The prime mover's RPM (Notch) can be adjusted to the track voltage with the Notch Control. By turning this control counter clockwise, you will increase the amount of track voltage required for the higher notches. DO NOT turn this control completely CCW since this will yield only idle sounds. Typical settings would be from 1 O'clock to full clockwise.

BRAKE RELEASE sounds will be produced when motor power is turned "on". This BRAKE RELEASE will always precede the motion of the locomotive. The BRAKE RELEASE will not occur again until the prime mover has actually accelerated and then returned to idle. The BRAKE RELEASE control is set at the factory to noon time (straight up). It can be trimmed but by turning it too far counter clockwise you will never get the prime mover sound to go to idle. By turning this control clockwise, you will increase the voltage required for brake release sounds to occur.

HORN sound is controlled by operating the WHISTLE control on your power transformer or appropriate throttle. The HORN will continue to operate as long as the signal is present. When the horn sound is not requested simply request it again to obtain the desired effect. Some types of HORN's offer a "Feathered" effect. To obtain this simply request the HORN again at the tail end of the existing horn play.

BELL sound is controlled by the BELL control button on your remote control box or appropriate throttle. When the BELL button is depressed the sound system will lock in the bell request and adjust the prime mover to match the RPM required for simultaneous play. To stop the bell cycle you must again depress the control and release - do not wait for the bell to stop ringing. The bell will stop at the end of a ring and the prime mover will resume the appropriate notch setting. The BELL cannot be activated when the prime mover is above notch 4.

AIR RELEASE - Air is pumped in a diesel locomotive to maintain air pressure in the train brake line and for other purposes. Periodically pressure will increase excessively and it is necessary to release air through a safety valve. These AIR RELEASE sounds (pops) are generated at random intervals not only while the locomotive is in motion but also while standing still.

## GENERAL OPERATING INFO

VOLUME ADJUSTMENT should be set as desired. Please remember that more output power is available than any small speaker can handle so you should not set the volume very high with a low wattage speaker. To obtain "louder" sound, you should consider mounting an additional speaker and / or baffling the speaker better. Any sound level beyond 1/2 way on the volume control far exceeds the power rating of small speakers. If you have the room, you might want to consider one of the oval speakers shown in our catalog.

## SPEAKER MOUNTING

It is necessary to mount the speaker in a location that the sound can actually "get out" of the locomotive. Some engine shells have metal or plastic grills that are excellent locations. Mounting through a hole placed in the floor or close to the end of the chassis allows the sound to exit the speaker. In some diesel locomotives open the door at the end and mount the speaker pointing out (glue flush to the end of the shell). Once the location has been established, the speaker has to be secured in place. This can be accomplished by either glue or HOT MELT. For flush mounting glue is just fine otherwise HOT MELT is recommended since it can be used as a filler for creating a sound chamber.

Various methods can be tried to enhance the low frequency response of the speaker system (in this case the poorest link - even though your Diesel sound system contains many low's the speaker system cannot

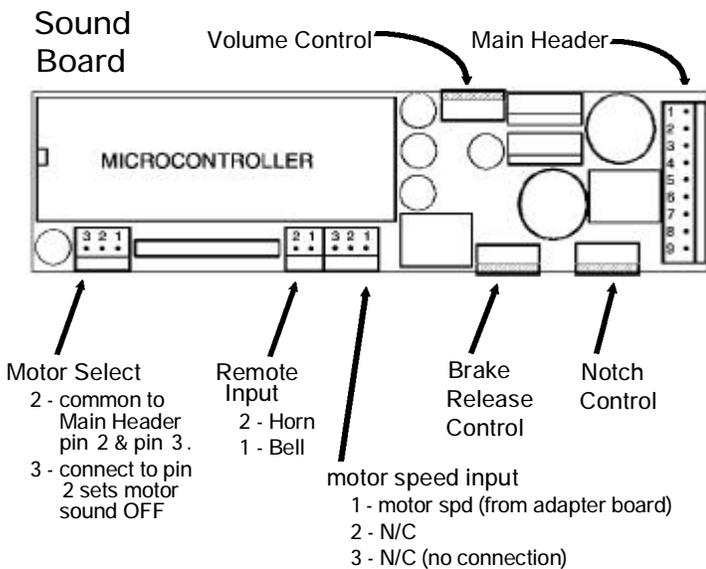
re-produce them to any great extent - small speakers just don't cut it). One simple method of enhancement is to place a tube around the speaker, the longer the tube the better the lows. The end of the tube should also be sealed making a sound chamber. Placing a tube about the speaker is not necessary when you use the entire engine / car body as the sound chamber.

Another method is to use the casing (engine or car body) that you are mounting the speaker in as the chamber. To do this you should ensure that the speaker does not have any air passages to the rear of the speaker (you may find that sometimes leaving one isn't all that bad - it depends on the size of the engine shell used). The easiest way of sealing air passages is to cut thick card stock into the shape needed and then simply HOT MELT it in place.

Experimentation is definitely in order for your installation. Another suggestion is to add a second speaker in series to the main speaker or several in a series / parallel arrangement. If you have the room, you might want to consider one, or more, of the oval speakers shown in our catalog.

## HORN SIGNALS

SOUND	INDICATION
short	apply brakes, stop
2- long	release brakes, proceed
long, 3- short	flagman protect rear of train
4 or 5 long	recall flagman
2- short	acknowledgment
3- short	back up movement
4- short	call for signals
short, long	inspect train line for leak or brakes sticking
2- long, short	approaching meet or wait point
2- long, short, long	approaching grade crossings
continuous long	approaching stations or junctions
successive shorts	alarm for something on track

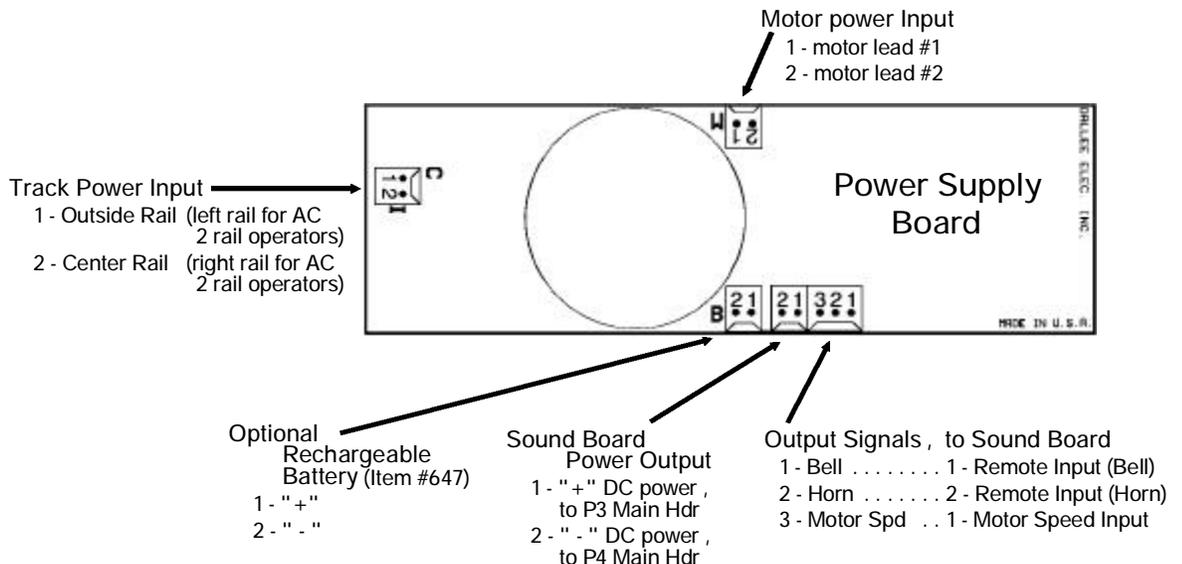


- 1 - Speaker ... "-" ... (to speaker "-" )
- 2 - Speaker ... "+" ... (to speaker "+" )
- 3 - DC power .. "+" ... (from Power Supply Bd "+" )
- 4 - DC power .. "-" ... (from Power Supply Bd "-" )
- 5 - N/C
- 6 - N/C
- 7 - N/C
- 8 - N/C
- 9 - N/C

note: Main Header pin 2 connects to Main Header pin 3 on the printed circuit board. They also connect , on the printed circuit board , to the Motor Select header pin 2. This information is useful when you wish to run a wire differently than shown on the wiring diagrams .

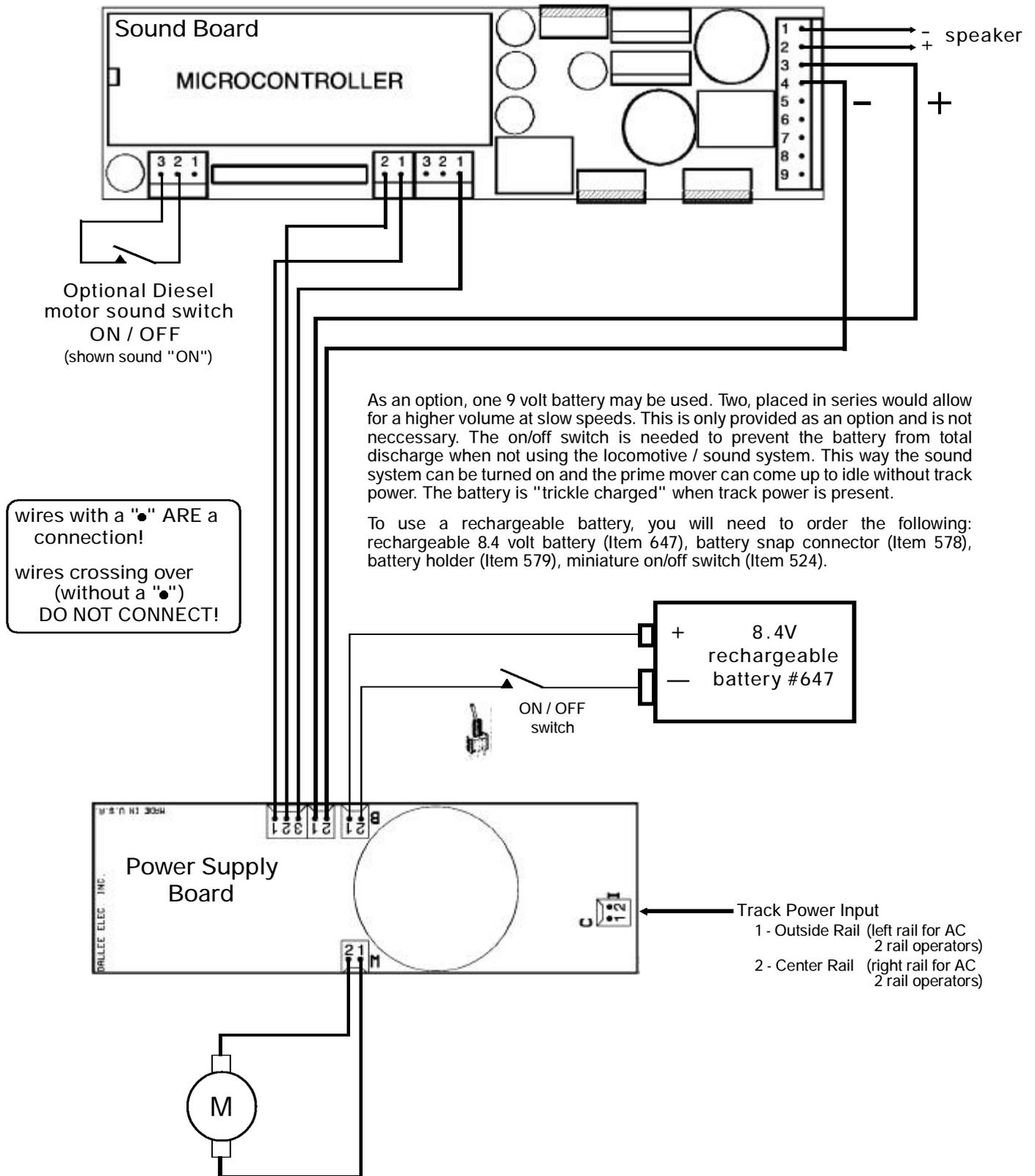
When connecting DC power to the sound unit be absolutely sure that the "+" and "-" are connect correctly !! If not , you will either burn out the sound unit or the supply feeding it . This is not covered under warranty!

NOTE: The speaker impedance should be kept near or above 8 ohms , therefore four 8 ohm speakers in a series/parallel configuration is acceptable since it yields 8 ohms total impedance . If you care to use two 8 ohm speakers it is suggested to place them in SERIES. Diagrams for these different types of configurations are supplied with the speaker instructions .



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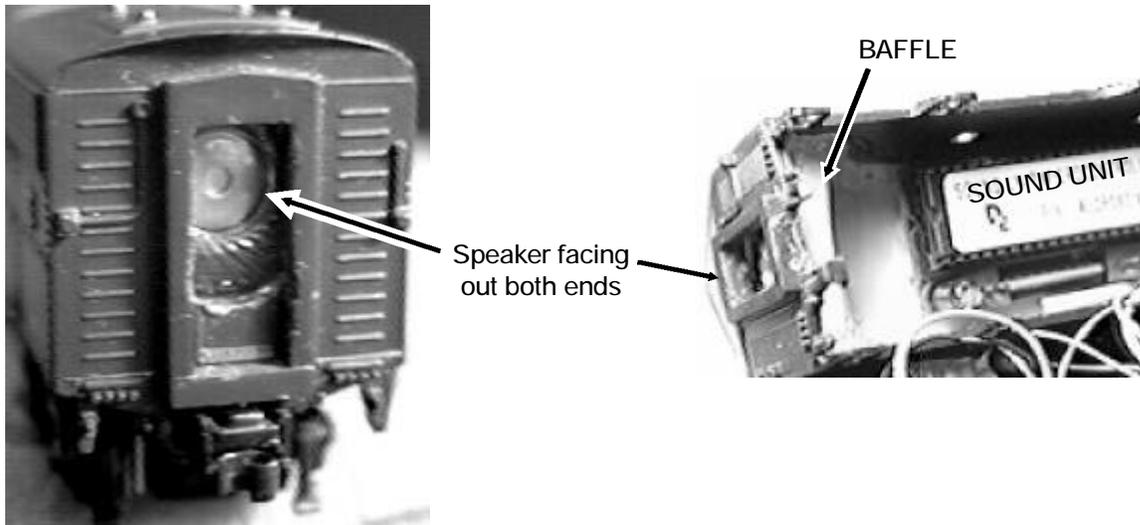
# AC track power installation



The "M" motor input connects to the two motor brushes. This is so that the sound unit can distinguish between forward, reverse and neutral. If you do not care about the sound unit remaining at IDLE during neutral, you can connect these to the track input power. If you are installing this unit in a "dummy" locomotive or trailing car, you might also want to consider using a second "E" unit (such as our Item #386) so that the sound unit can sync up with the locomotive for forward / neutral / reverse / neutral / forward instead of running a set of wires between them. These wires can be very light in gauge since they do not carry any significant current. If running wires between a "dummy" unit and power unit, you should consider using connectors see item's 520 (2 pin pack), 521 (3 pin pack), and 611 (4 pin pack).

## Speaker installation examples

HO Athearn "B"  
unit shown



Although picture quality does not warrant such enlargement, we felt it better to show it enlarged.

HO "B" unit with sound system - speakers are mounted out of each end. Note the cardstock covering the backside of the speaker creating a baffle. This is needed in this type of dummy unit since the entire floor area is open around the trucks and the fragile 1" speakers will break their voice coil wire from overflexing. By making a baffle, air flow is restricted, thus the voice coil does not travel as far so freely. With larger speakers, sealing the backside is not as critical as it is with the 1" types.

When using a box car, the entire car becomes the baffle since the bottom is virtually sealed.

Although these pictures depict HO installations, they are helpful in any scale. If you can project the sound from a speaker upwards, through a grill, cooling fans, windows, you will achieve a better sound than down through the floor. In some scales there is enough room to make a speaker "box" utilizing several smaller speakers (such as in a long narrow cab) and mounting it so that the sound projects through the cooling fans. This works quite well! Again, the speaker mounting / enclosure is the key to achieving great sound and sometimes requires tweaking to get it just right.