

# IN LOCOMOTIVE DIESEL SOUND for AC TRACK POWER by **DALLEE ELECTRONICS**

**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. The sound system is an add on to your locomotive, so existing direction sequencing devices (E-UNIT) are retained. Horns or other sounds in the locomotive should be removed or disconnected. Because of its dimensions (6.2" x 1.25" x approx. 1" high) 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.

An alternative installation (not in locomotive) between the transformer and the track with an under the layout speaker location is possible but will require a switch, if desired, to identify if the locomotive is actually moving or is in NEUTRAL.

Sound volume is adjustable and a 2 inch diameter speaker is supplied. Sounds produced include user controlled bell, air horn, 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 by all existing AC transformer-throttles which have whistle and/or bell controls either incorporated or as add on devices. Please see also the DALLEE ELECTRONICS HOSTLER — AC, a voltage regulated, walk-around with memory, throttle which was designed specifically to operate with this sound system and is also fully compatible with all LIONEL RAILSOUNDS™ locomotives.

## INSTALLATION INSTRUCTIONS

The sound system consists of a printed circuit board, a speaker prewired with a two pin connector, a capacitor, also prewired with a two pin connector and a three pin connector with red, black and grey wires attached. Also included is a jumper wire, with miniature plugs on each end, and mating female connectors, with wires attached, to be used to connect multiple unit locomotives together.

The circuit board should be mounted so that the volume control is accessible either through the frame or via a hatch or a hole in the locomotive body shell. The speaker and capacitor are to be mounted as suits your preference and available space.

On the circuit board you will find a small potentiometer which adjusts the speaker volume, a two pin connector, a five pin connector and an additional two pin connector with an installed red shorting jumper. Removing this jumper disables the bell and horn of the sound system so that multiple units can be run together with only one bell and horn sounding.

The connector prewired to the capacitor attaches to the circuit board via the two pin connector to the right of the volume potentiometer (refer to the layout diagram on page 2). The speaker is attached to the circuit board via the innermost two pins (J1 pins 4 and 5) of the five pin connector. The three pin receptacle attaches to the remaining pins (J1 pins 1, 2, and 3) of the five pin connector so that the red wire (J1 pin 1) is

closest to the edge of the circuit board and the grey wire (J1 pin 3) is toward the speaker connector. The red and black wires from this three pin connector provide the power pickup for the sound system. Connect the red wire to the center rail pick up roller and the black wire (J1 pin 2) so it is grounded to the outside running rails. The grey wire should be connected to one of the motor brushes of the powered locomotive. This connection is necessary so that the sound system can determine whether the locomotive is actually running or in "NEUTRAL". The jumper wire and mating connectors are ideal when the SOUND is in a "dummy" and must connect to the powered locomotive. This wire can be of a very light gauge (#28-32). If the chassis is plastic you may find it easy to "GLUE STICK / HOT MELT" the connector onto the chassis floor or by the steps with a hole drilled through the frame to guide the jumper. If the frame is metal, then it becomes necessary to be sure that none of the connector body or jumper plug come in contact with the metal chassis (this is what the heatshrink tubing is included for - just cut a piece to cover each mating end, shrink it, then glue or "GLUE STICK / HOT MELT" it in place). For two rail AC operation it is suggested that the right hand rail be "hot" (red wire) and the left rail be "ground" (black wire).

## SOUND INFORMATION

**PRIME MOVER (DIESEL)** sounds range from engine idle to full RPM simulating an eight notch throttle. With track powered and locomotive 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.

**BRAKE RELEASE** sounds will be produced whenever track power turns "on" with the locomotive in either the FORWARD or REVERSE positions. This BRAKE RELEASE will always precede the motion of the locomotive.

**HORN** sound is controlled by operating the whistle lever or button on your transformer/throttle. The horn can actually be played by practiced manipulation of the control. Should the bell ring instead, there is a reversal of wires either between the transformer and the track or from the track to the sound system. In all cases the "hot" of the transformer should go to the center rail and the "U" or "base post" should go to the ground (outside) rails.

**BELL** sound is controlled by the BELL control on transformer/throttles so equipped or by a separate BELL button. When the control button is depressed the sound system will lock in the circuit and the bell will ring continuously. To stop the bell cycle you must again depress the control and release. The bell ring will stop at the end of a ring. The BELL sound is automatically turned "off" as a moving locomotive increases above a normal yard movement speed.

Air is continuously 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 are generated at random intervals not only while the locomotive is in motion but also while standing still with track power "on" in NEUTRAL.

## OPERATING INSTRUCTIONS

Initially, begin with the locomotive on the track, all connections made, and the volume control set at about mid range. When track power is applied in NEUTRAL the sound system will simulate diesel engine idle. The horn and bell can be activated during NEUTRAL and the air release will occur at random intervals. A brief interruption of track power will sequence the locomotive to either the FORWARD or REVERSE position as provided by your E-Unit. The sound system will now release the brakes and increase diesel RPM and sound volume as the locomotive increases speed. When running speed has been reached the sound levels will stabilize, however variations in sound will occur if the speed matches a throttle notch range and the load changes due to curves or

grades. Horn, bell and air release sounds are available with locomotive in motion except that the bell is only operational at low speeds.

This sound system is equipped with a substantial capacitor which allows the system to store track power so that it can continue to operate during the brief sequencing interruptions. If track power remains "off" beyond the several second storage time, the sound system will also turn "off".

**DO NOT DISCONNECT OR OTHERWISE ADJUST PLACEMENT OF THE SOUND SYSTEM FOR A LEAST ONE MINUTE AFTER TURNING OFF TRACK POWER TO ALLOW THIS CAPACITOR TO DISCHARGE ITS STORED ELECTRICITY.**

### 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/plastic grills that are excellent existing locations while others can find mounting through a hole placed in the floor or close to the end of the chassis that still allows the sound to exit the speaker to fill the room. Once the location has been established, the speaker has to be secured in place. This can be accomplished by either glue or GLUE STICK / HOT MELT. For flush mounting glue is just fine otherwise GLUE STICK / 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.

Another method is to use the casing that you are mounting the speaker in as the chamber. To do this you will have to ensure that the speaker does not have any air passages to the rear of the speaker (you may find that sometime 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 GLUE STICK / HOT MELT it in place. Experimentation is definitely in order for your installation.

If you decide to operate the sound unit while deciding on speaker location DO NOT operate the sound unit at much higher than minimal voltage since you can get shocked from contact to the main board or large capacitor!!

### HORN SIGNALS

#### SOUND

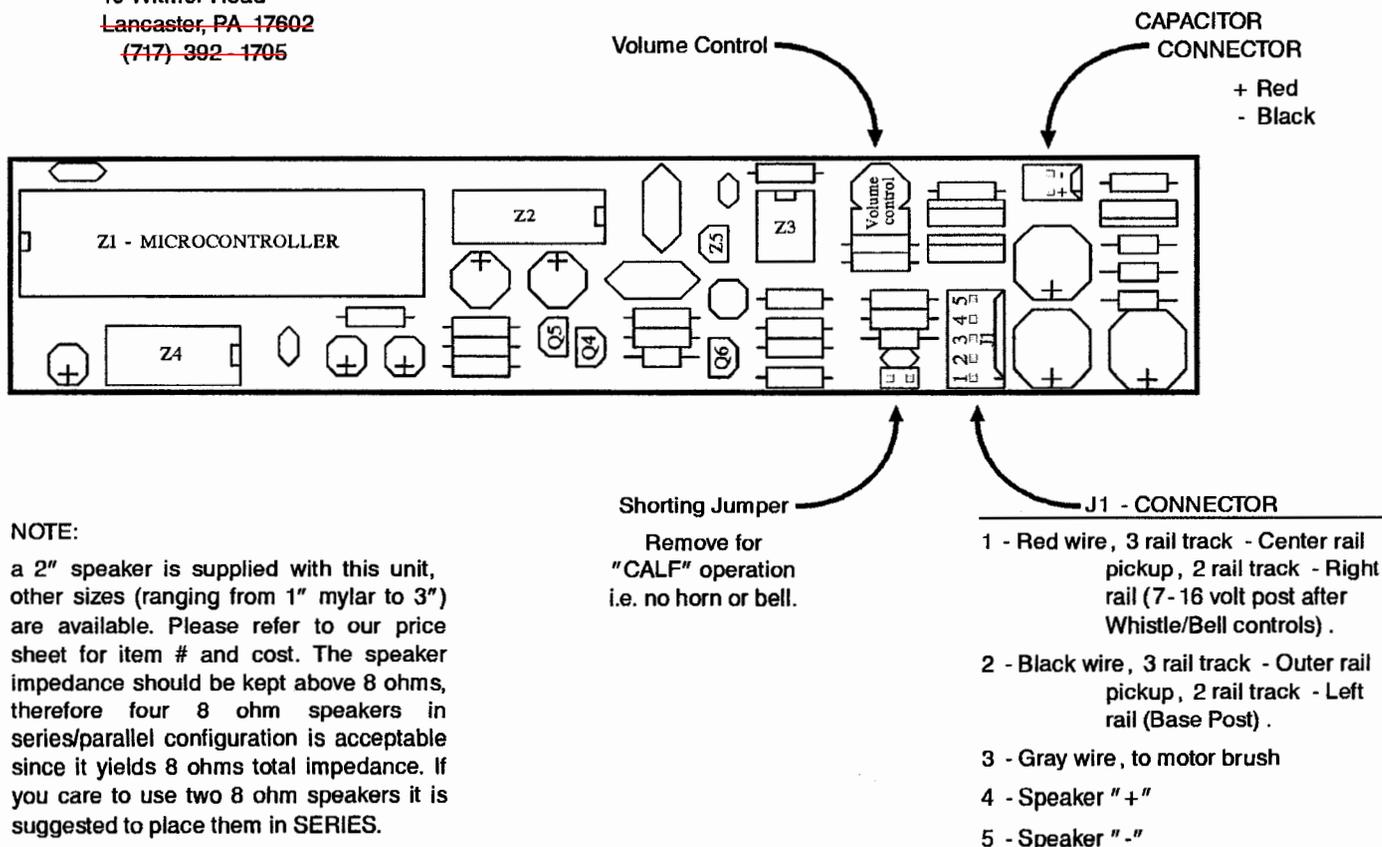
short  
2-long  
long, 3-short  
4 or 5 long  
2-short  
3-short  
4-short  
short, long  
2-long, short  
2-long, short, long  
continuous long  
successive shorts

#### INDICATION

apply brakes, stop  
release brakes, proceed  
flagman protect rear of train  
recall flagman  
acknowledgment  
back up movement  
call for signals  
inspect train line for leak or brakes sticking  
approaching meet or wait point  
approaching grade crossings  
approaching stations or junctions  
alarm for something on track

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### NOTE:

a 2" speaker is supplied with this unit, other sizes (ranging from 1" mylar to 3") are available. Please refer to our price sheet for item # and cost. The speaker impedance should be kept above 8 ohms, therefore four 8 ohm speakers in 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.