IN LOCOMOTIVE ELECTRIC 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. Save the anti-static bag for possible reuse of storing or shipping the sound unit!

OVERVIEW

This device is an electronic, self contained, sound system for installation in model electric locomotives that are designed to operate with AC track power. This system consists of a Sound Board (dimensions 3.75" x 1" x approx. 1" high), and a Power Supply / Decoder Board (dimensions 4" x 1.25" x 1.25" high). The sound system may be limited to larger gauge models and may also require the use of a "dummy" unit or a trailing car.

If there is sufficient input power, the audio amplifier can produce SEVERAL WATTS of power which is well in excess of what these small speakers can handle. Sound volume is adjustable and a 2" speaker is supplied unless a larger speaker was specified. Refer to our catalog for available speaker substitutions. If space permits, the optional oval speakers (Items 662, 664, 665) which are higher wattage speakers, are the best choice. They are an additional cost.

Sounds produced include user controlled horn and bell, brake release and cooling blower motor sound automatically adjusted to speed and load conditions.

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

Refer to the general sheet on page 2 to familiarize yourself with the connectors and controls on the sound board and power supply board. Then refer to the instruction sheet for the installation. Before proceeding with the installation read the balance of the instructions carefully so you will be completely familiar with what is required and what sounds you should hear.

The Sound circuit board should be mounted so that the volume and other 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 in available space. Be certain that the components on both circuit boards do not come in contact with any metal objects as such contact can destroy the sound system. The speaker should be mounted as per available space bearing in mind that sound reproduction is enhanced when a speaker is properly enclosed and baffled.

When connecting the DC power leads from the Power Supply board to the Sound board be absolutely certain that the positive wire connects to terminal #3 of the main header and the negative wire connects to terminal #4 of the main header. IF THESE CONNECTIONS ARE REVERSED YOU WILL DAMAGE THE SOUND SYSTEM. This is not covered under any warranty and will be obvious to us when returned for repair (tracks are burned through on the circuit board and parts can be totally destroyed). Damage resulting from loose wire or other metal making contact with the circuit board or its components is also not covered under warranty. These sound systems are thoroughly tested and inspected before packing to insure proper function. There is a minimum charge of $30.00 (+$6.00 s/h, also sls tax in PA) for non warranty repair so please be careful when making these power connections.

SOUND INFORMATION

COOLING BLOWERS are needed whenever the locomotive is moving to remove heat generatd by the traction motors. As a throttle is advanced to put the locomotive in motion, a brake release will sound (see below) and the COOLING BLOWERS will be heard. There will be a distinct volume increase during acceleration.

BRAKE RELEASE sound is produced when the throttle is advanced from the idle position. This brake release should always precede locomotive movement but will only occur if the locomotive has actually been at a stopped condition. This BRAKE RELEASE has been factory preset but is user adjustable.

HORN sound is controlled by operating the WHISTLE control on the AC transformer or appropriate throttle. The HORN will sound as long you are holding the control on. This will allow you to actually play the sound as on a real locomotive.

BELL sound is controlled by the BELL control button on the remote control box or appropriate throttle.The sound system includes a routine which ignores intermittent BELL requests, resulting in a delay when activating or deactivating the BELL. When deactivating, the BELL will stop at the end of a ring. The BELL CAN ONLY BE ACTIVATED at slower locomotive speeds, but once activated, the BELL will continue regardless of locomotive speed. Depress and release the BELL button to turn on the BELL and then again depress and release the button to turn the BELL off.

SPEAKER MOUNTING

The speaker generally should be mounted so that the sound can actually "get out" of the locomotive. A hole in the floor is acceptable but open grills or a doorway may be a better choice as the sound can exit upward rather than down toward the track. In some cases, particularly with plastic body shells, just mounting the speaker against the shell will be adequate as the vibrations of the shell can enhance the sound. Enclosing the speaker in a chamber will also enhance sound reproduction. A very simple enclosure can be made with a tube. The longer the tube the better the speaker will reproduce low frequency sound. It is usually best to seal the end of the tube, so there are no air passages to the rear of the speaker, thus creating a sound chamber. By carefully sealing all openings it may be possible to use the entire body shell as a sound chamber. A simple wall behind the speaker may be all that is possible or perhaps all that is needed.

Speakers can be attached with double sided tape, with glue or with "hot melt". Enclosures can be made with plastic, wood, card stock or even metal. Film cans or medicine bottles make excellent sound chamber enclosures for small diameter speakers. Attachment with "hot melt" is advantageous as the "hot melt" can be used as a gap filler when creating an enclosure.

A second speaker, wired in series with the main speaker, can also enhance sound quality and will permit a higher volume without damage to the individual speakers. A tube with a speaker at each end or a speaker in a doorway at each end of a body shell is an excellent approach.

Speaker enclosure is an art and experimentation is definitely in order for your installation so as to gain the maximum benefit of the superb sound quality available in this sound system.

GENERAL OPERATING INFORMATION

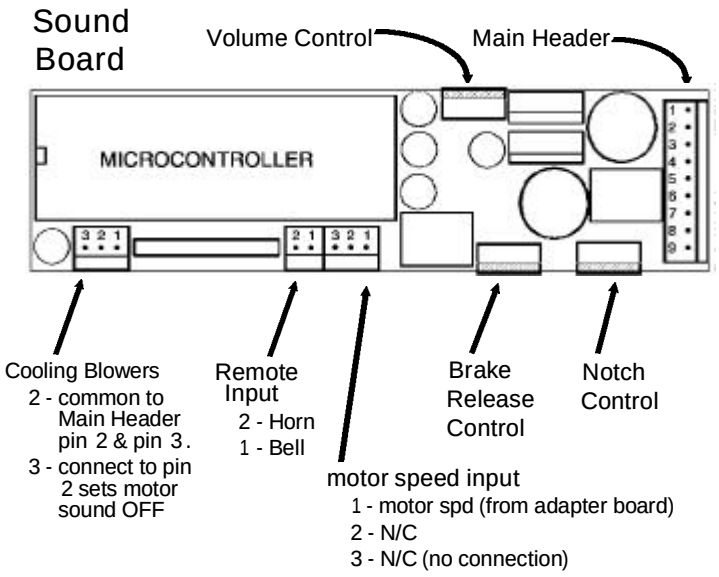
VOLUME ADJUSTMENT should be set as desired for your application. Please remember that the amplifier can produce more power than a small speaker can handle and that the sound will be louder if the speaker is properly enclosed and baffled. The volume control is factory preset at less than 12:00 o'clock which is about maximum for the 2" speaker.

NOTCH ADJUSTMENT is factory preset full CW and has effect on this sound system only as to the sensitivity to voltage changes. Do not rotate this control full CCW as this will indicate to the sound system that there is no input power to the motor. If you change the setting other than full CW it may be necessary to readjust the BRAKE RELEASE.

BRAKE RELEASE has been factory preset to a relative position of approximately 1 volt to the motor. Rotating the control CW increases the voltage at which brake release occurs. To properly readjust the BRAKE RELEASE, rotate full CW, then slowly rotate CCW until a BRAKE RELEASE sounds. At this point rotate the control a bit CW again. This should re-establish a proper BRAKE RELEASE setting. Remember that when a BRAKE RELEASE sounds, the COOLING BLOWER sound may activate. The COOLING BLOWER sound must stop before the BRAKE RELEASE can sound again.

Common 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

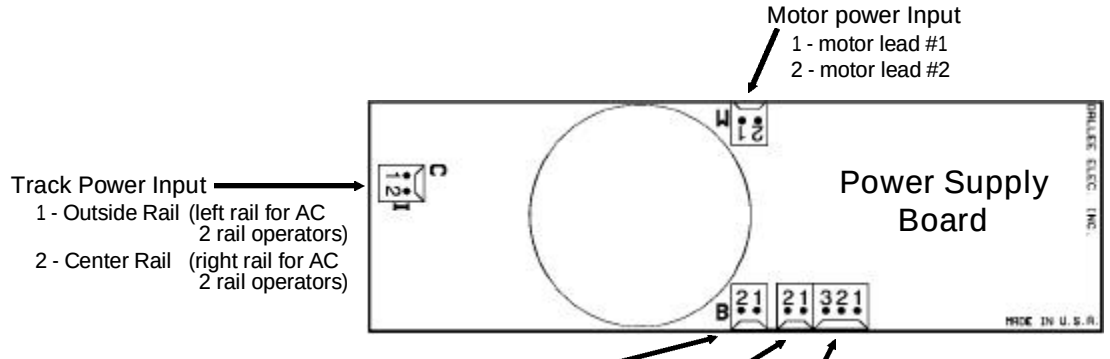


1 - Speaker . . ." - " . . . (to speaker " - ")
2 - Speaker . . ."+" . . . (to speaker "+")
3 - DC power . ."+ " . . . (from Power Supply Bd "+ ")
4 - DC power . ." - " . . . (from Power Supply Bd " - ")
5 - N/C
6 - N/C
7 - N/C
8 - N/C
9 - N/C

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 absoloutly 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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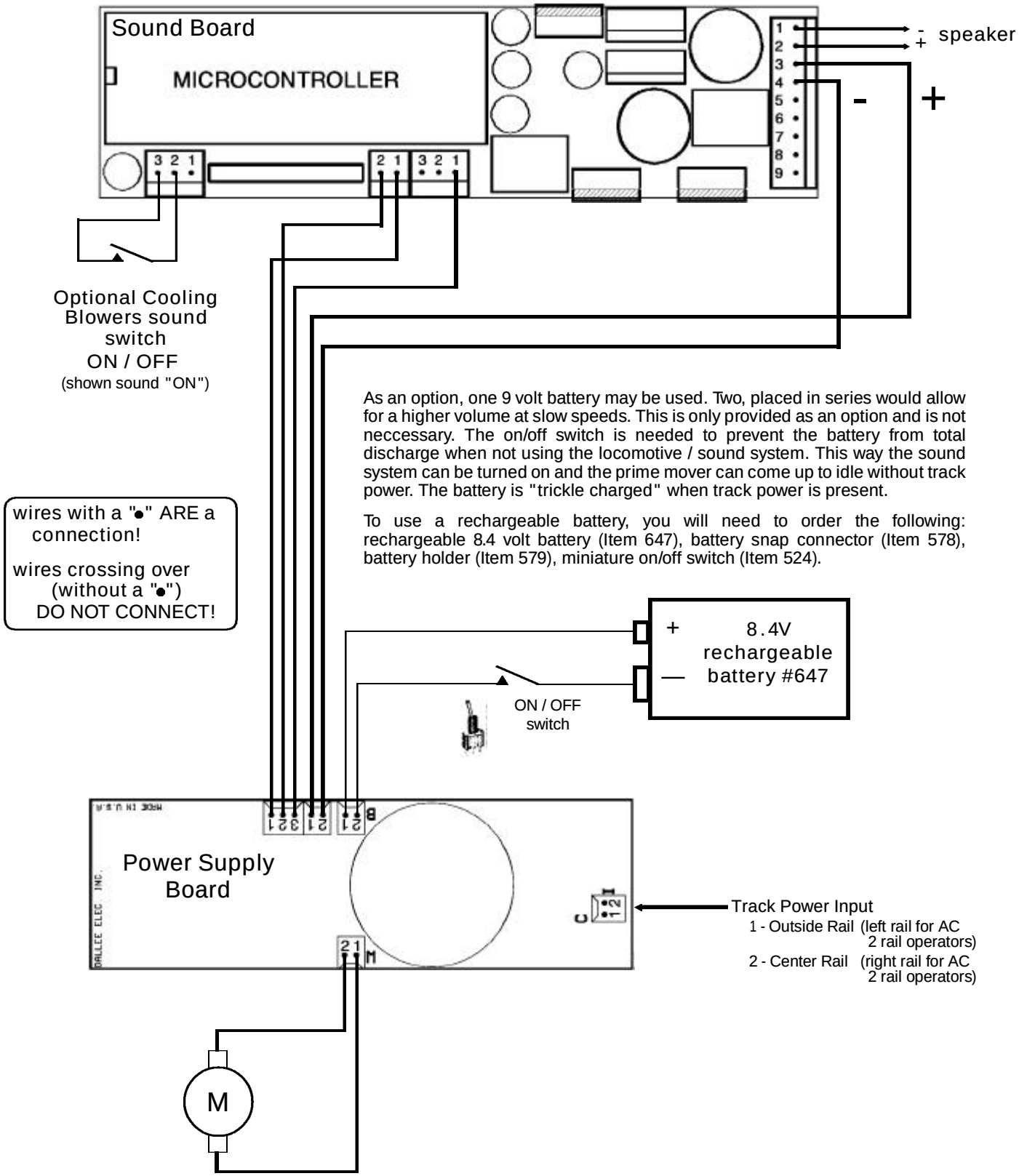
AC track power installation

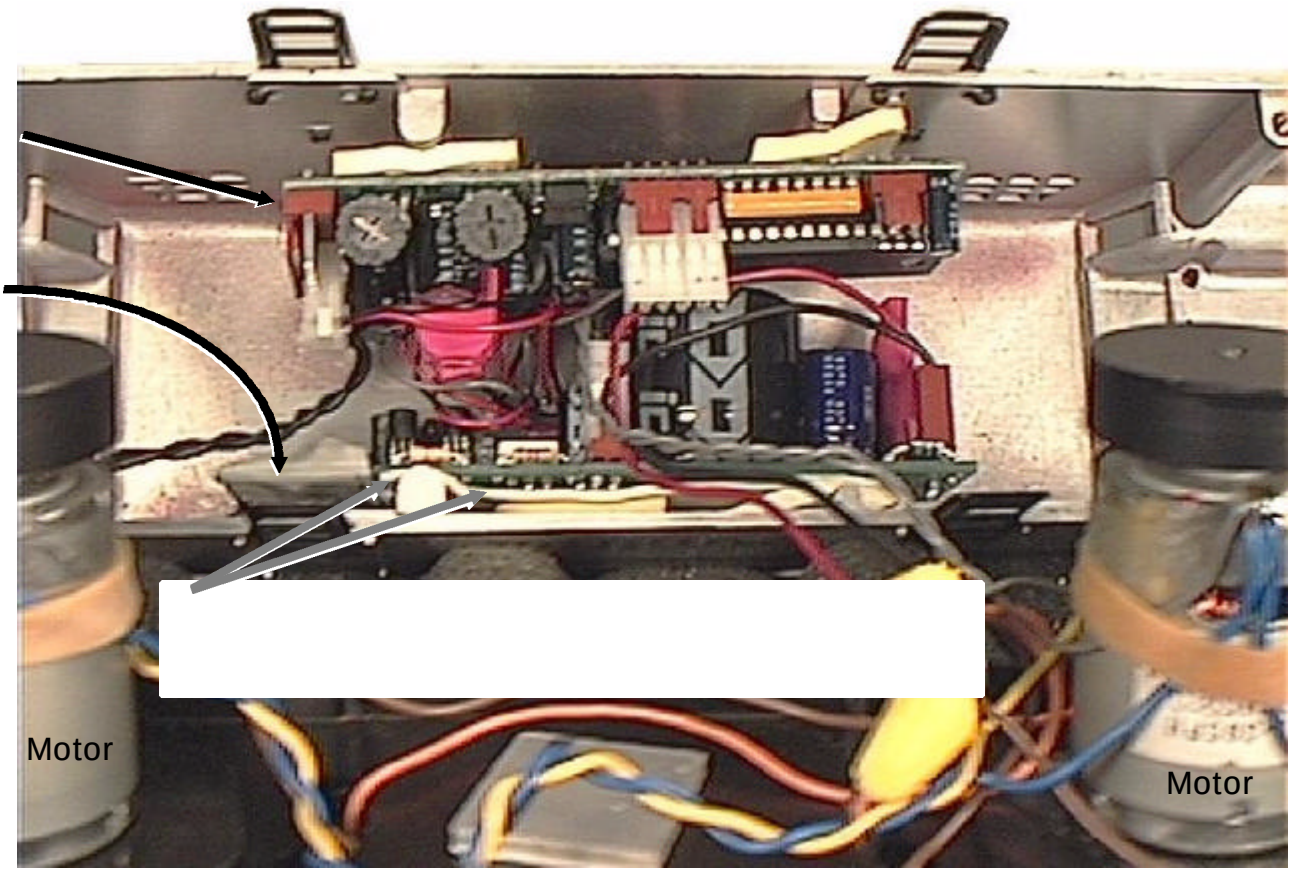


As an option, one 9 volt battery may be used. Two, placed in series would allow for a higher volume at slow speeds. This is only provided as an option and is not neccessary. The on/off switch is needed to prevent the battery from total discharge when not using the locomotive / sound system. This way the sound system can be turned on and the prime mover can come up to idle without track power. The battery is "trickle charged" when track power is present.

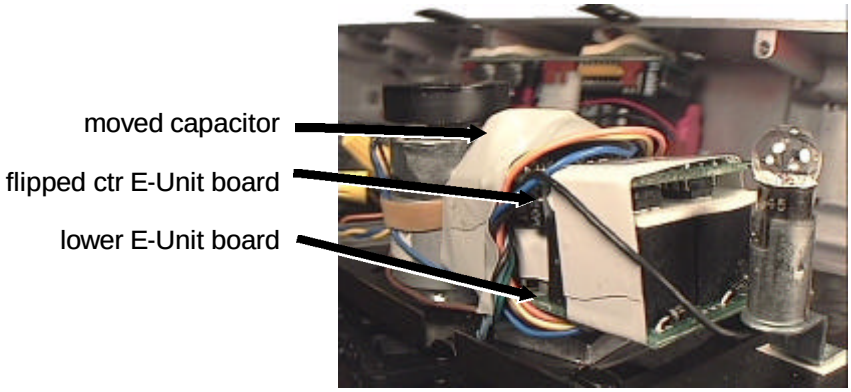
To use a rechargeable battery, you will need to order the following: rechargeable 8.4 volt battery (Item 647), battery snap connector (Item 578), battery holder (Item 579), miniature on/off switch (Item 524).

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).

Sound Unit installation example in MTH GG1



looking between motors into shell of GG1. Note the removal of the existing "E-Unit" to clear space for the sound system components. The boards have to be mounted so that the motor flywheels do not touch them when making turns.



looking at end where existing "E-Unit" other 1/2 exists. Center 1/2 was inverted and placed on top using 1/8" dbl sided tape. The capacitor that hangs out of the end has to be removed and placed on top. The entire assembly was wraped in electrical tape to prevent wires from moving and to allow for easier placement back into the shell.

An easier solution is to replace this E-Unit with a DALLEE unit #444 (2.1"l x 1"w x 0.8"h). This unit is much smaller and can be set for start in Neutral or Forward.

For better directional lighting use DALLEE #380 (RL-1). This unit will give you bright headlights at virtually any speed!

To enhance the sound, place electrical tape across wide openings in the existing plastic tube to try to encase the back side of the speaker from the front side (which in this case is facing the interior shell - facory installed). Electrical tape works best since it allows for the metal foot to come through when needed to make those tight turns but assists in keeping the air motion to one side of the speaker.