

Tug Boat Sound

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 or other appropriate ground) 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 or storing or shipping the sound unit!

OVERVIEW: This device is an electronic, self contained, sound system for installation in model Tug Boats that are designed to operate with conventional DC power or other types of control systems including radio with battery power, also as a stationary sound unit.

An on/off switch (not included) must be used to power the sound unit on and off in some applications. The audio amplifier can produce 1.1 watt of power which is in excess of what most small speakers can handle. The speaker impedance must be 8 ohms or higher. Sound volume is adjustable. Refer to our catalog for available speakers. If higher wattage is needed, an auxiliary amplifier may be used. Item 672 is ideal for this application. Besides being a 22 watt amplifier, it also contains Treble and Bass controls.

Sounds produced include user controlled air Horn, Bell, and Force notch 8 and main sounds on/off (leaves the main sounds off while allowing for horn operation). Non-user controllable sounds include the Tug Boat prime mover sound which automatically adjusts to speed and load conditions of the motor.

This sound system, provides many different applications. Operators can use remote functions on their systems to activate different features. For stationary installations, these functions can be accessed by switches.

INSTALLATION INSTRUCTIONS: The sound system consists of a printed circuit board, a speaker, five 2-pin connectors with wires and one 3-pin connector with wires.

Refer to the drawing on page 2 to familiarize yourself with the connectors and controls on the sound board. Then refer to the specific instruction sheets for the type of installation you intend to make. 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 circuit board should be mounted so that at minimum, the volume control is accessible either through the frame or via a hatch or a hole in the body shell. Be certain that the components on the circuit board do not come in contact with any metal objects, or water, as such contact can destroy the sound system. If contact to water occurs, immediately power the sound system off, if not already, and dry the board thoroughly before applying power again. 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. The hull of a boat makes for a great baffle.

For proper power, this system can utilize battery power from one 9 volt or 6 AA or 6 AAA batteries in series to maximize volume potential and battery life. You can operate the sound system on any power up to 28 volts DC. The power to operate the sound system can be the same as the power for the remote receiver as well. When connecting the battery (DC) power leads be absolutely certain that wires connect to the proper DC input leads, i.e. proper polarity, plus to "+" and minus to "-". **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 water damage, loose wires 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 \$35.00 (+\$9.70 s/f, also s/s tax in PA) for non-warranty repair so please be careful when making these power connections. The sound system is packaged in an anti-static bag. It should be stored there until installed. The anti-static bag should be saved in the event that you should need to return it for repairs or keep it in storage between installations. Be sure to discharge yourself to a ground potential before handling any electronic devices to prevent any pre-mature damage from static discharges to the board.

SOUND INFORMATION:

PRIME MOVER (Tug Boat): sounds range from idle to full RPM with eight notches. With no power to the motor input the sound system will produce engine idle sounds. As the throttle is advanced to put the Tug Boats motor in motion, the Tug Boat sound will initially accelerate to notch #4, and then seek the correct notch setting for Tug Boat speed. There will be a distinct volume increase during acceleration. Full RPM can also be achieved with a switch input via the remote receiver function. This feature allows the simulation of a heavy load with very slow Tug Boat speed while throttling the motor sound to Full RPM. The prime mover can be turned off without turning off the sound system utilizing another switch input. This way you can still activate the Horn and Bell (if present).

AIR HORN: sound is controlled by the HORN input by a momentary push button or by remote function, dependent upon the type of installation. The AIR HORN will sound as long you are holding the control switch input on. This will allow you to actually play the HORN sound and signal as a real Tug Boat would. Some Tug Boat Air Horns are actually Air Whistle.

BELL: sound of the BELL is controlled with a toggle switch or by remote function, dependent upon the type of installation. When BELL sound is requested the sound system will first adjust the Tug Boat sound to the RPM required for simultaneous play. When deactivating, the BELL will stop at the end of a ring and the Tug Boat sound will return to the correct notch setting. The BELL CANNOT BE ACTIVATED if the Tug Boat prime mover sound is above notch #5. Note: some tug diesels do not have a bell sound included.

SPEAKER MOUNTING: The speaker generally should be mounted so that the sound can actually "get out" of the Tug Boat. A hole in the upper floor is acceptable but open grills or a doorway may be a better choice as the sound can exit upward. Enclosing the speaker in a chamber will also enhance sound reproduction but make sure this is a fairly large chamber. Small chambers don't assist in making proper sound or sound levels. A very simple enclosure can be made with a tube. The longer the tube the better the speaker will reproduce low frequency sound which is inherent in Tug Boat prime movers. 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, which would sound better than a tube. A simple wall behind the speaker may be all that is possible or perhaps all that is needed. An excellent chamber would be the sealed hull of a boat!

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. Again, most speakers are not water proof, so care in placement should be considered for the least amount of water mist striking the speaker front. Mylar speakers, items 210 - 214, are excellent

for water resistance. To get a louder volume for the same amount of audio wattage, a combination of four speakers will do the job or add our 22 watt audio amplifier (item 672). The amplifier also contains true Treble and Bass controls so you can set the tonal timbre of your sound system to your liking.

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. A four speaker approach will yield the highest volume while still maintaining the 8 ohm minimum speaker impedance requirement from the sound system. Drawings for this are included in the speaker instructions.

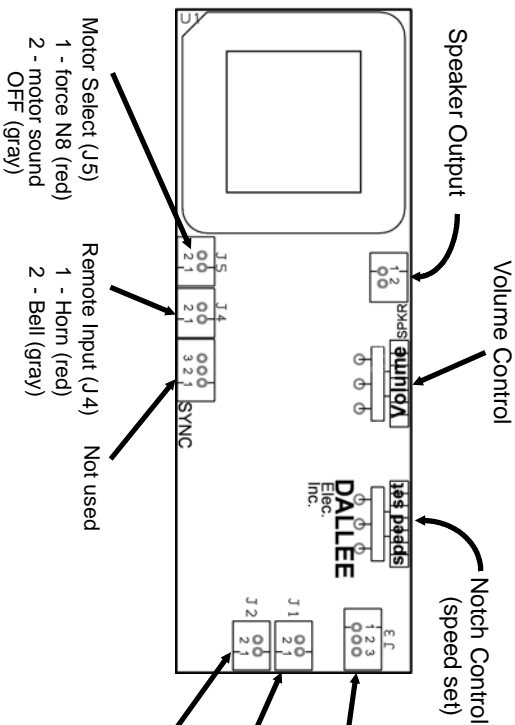
Speaker enclosure is an art and experimentation is definitely in order for your installation so as to gain the maximum benefit of the superb sound quality available in this sound system.

GENERAL OPERATING INFORMATION:

VOLUME ADJUSTMENT: should be set as desired for your application. Please remember that the amplifier can produce more power than most small speakers can handle and that the sound will be louder if the speaker is properly enclosed and baffled. If you are using batteries, the louder the volume the shorter the battery life.

NOTCH ADJUSTMENT: full clockwise will yield notch #8 on the Tug Boat at approximately 8 volts to the motor. Full CW would be a proper setting when operating with 12 volt DC motor controls. Rotate the control CCW to increase the voltage required to reach notch #8. Operators using higher motor voltages will probably want to set this control full CCW. In some applications, you may need to place a series resistor in one or both leads from the motor to lower the apparent RPM vs motor voltage. This is typically a 1k - 2.2k ohm resistor.

Overview:



This system features an optically coupled motor input sensor. This means that any connection to J3 pins 2 and 3 do not electrically connect to any other power to the board!

- J3 connections:
 - 1 - not used (RED)
 - 2 - Motor 1 (BLACK)
 - 3 - Motor 2 (WHITE)
- J1 connections:
 - 1 - DC1.....also AC input 1.....(RED)
 - 2 - DC2.....also AC input 2.....(GRAY)
- J2 connections:
 - 1 - DC power "+" (RED)
 - 2 - DC power "-" (GRAY)

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 you **must** place them in **SERIES**.

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!

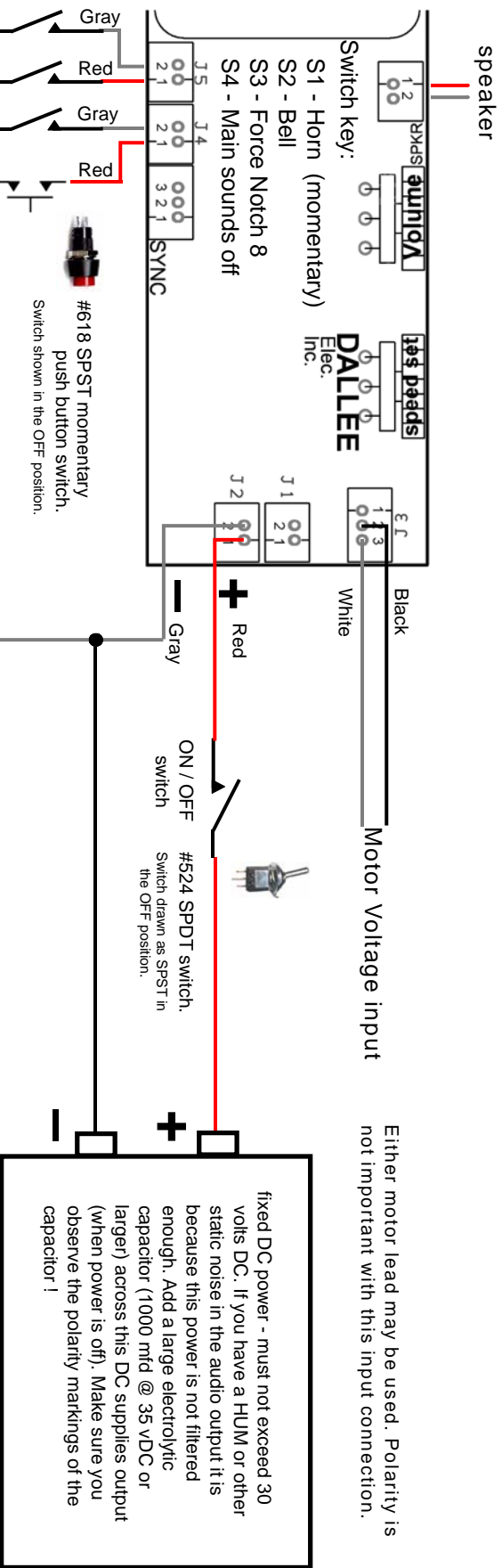
SPECIFIC INSTRUCTION SHEETS	
PAGE	INSTALLATION TYPE
3.....	Receiver
4.....	Stationary
5.....	Auxiliary Amplifier
5.....	Manual Speed Control
5.....	Remote Volume Control

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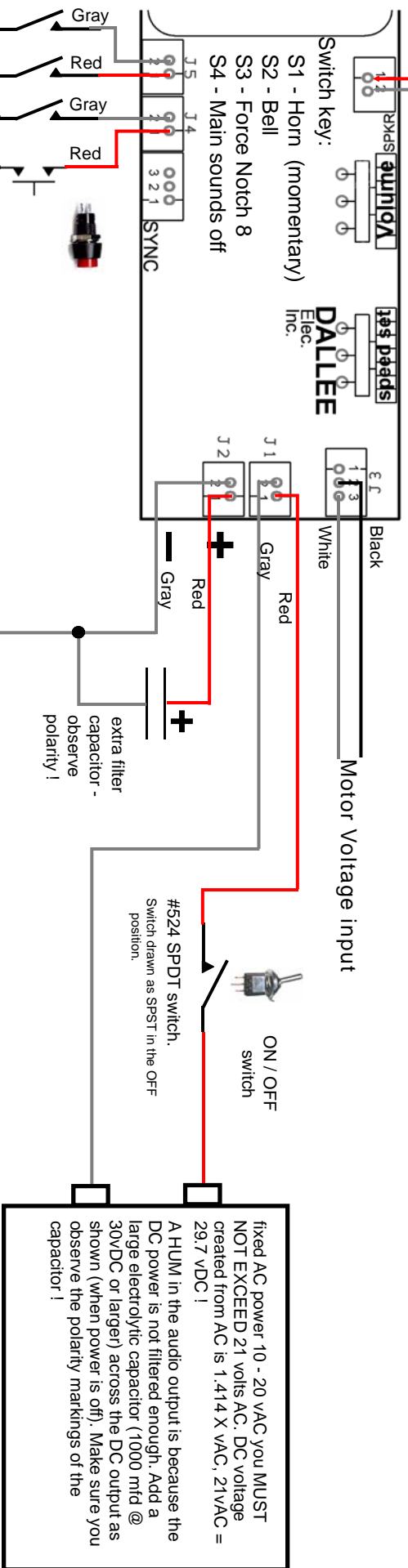
Stationary DC power installation using Motor Voltage for notch setting.

You can also add an auxiliary Amplifier, see page 5.



Stationary AC power installation using Motor Voltage for notch setting.

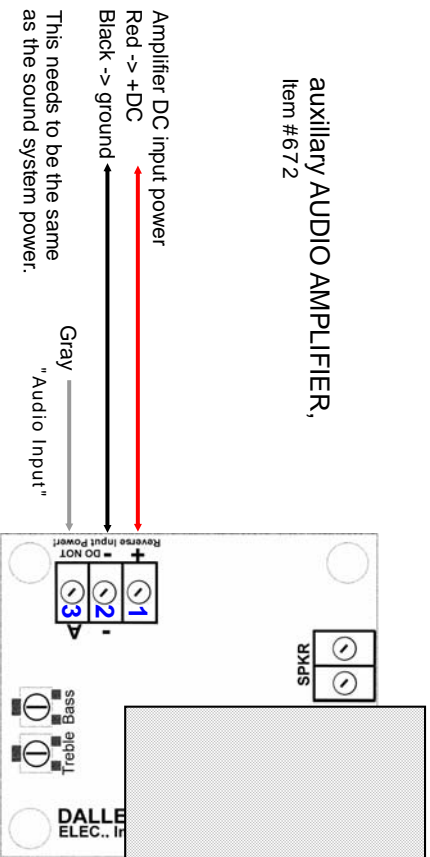
You can also add an auxiliary Amplifier, see page 5.



Auxiliary Amplifier connections

"Audio input" Connect to gray wire from sound system speaker output. Do not use the red speaker wire from the sound system. This wire does not get connected! Either cut or tape the red wire securely so that it cannot short to something. Never connect either of the speaker output wires to ground or any other voltage. This will damage the sound system's amplifier and is not covered under any warranty.

If desired, a speaker can still be connected to the main sound system speaker output as well as another speaker from the amplifier.



auxiliary AUDIO AMPLIFIER, Item #672

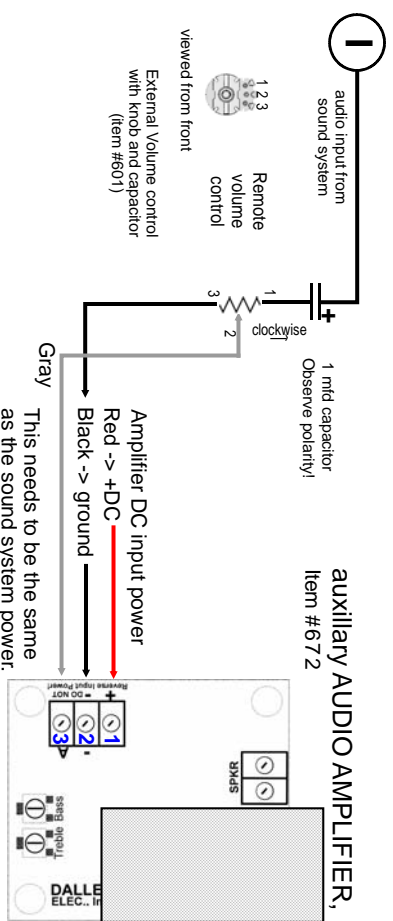
Amplifier DC input power
Red -> +DC
Black -> ground

This needs to be the same as the sound system power.

adding remote volume control when using an Auxiliary Amplifier

With single sound systems, connect the gray wire from the speaker output to input "1". Connect the rest as shown.

If using two sound system as shown on page 9, then merely add the potentiometer as shown. This will only work properly if the amplifier has an industry standard auxiliary input.



auxiliary AUDIO AMPLIFIER, Item #672

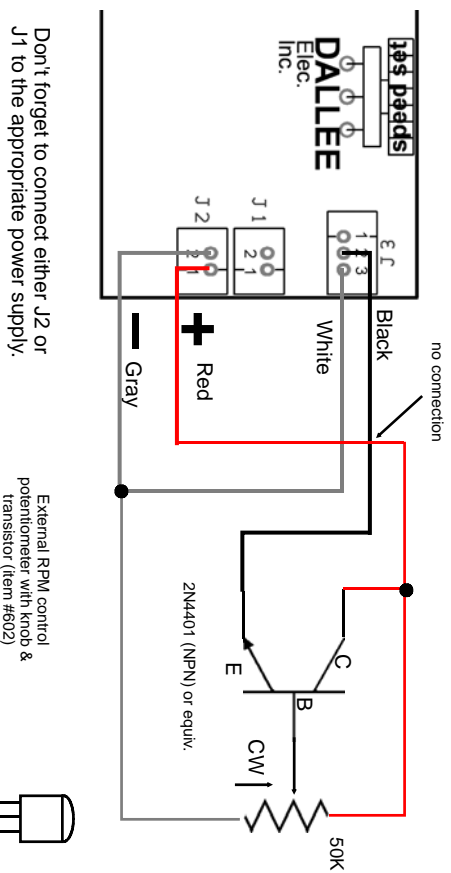
Amplifier DC input power
Red -> +DC
Black -> ground

This needs to be the same as the sound system power.

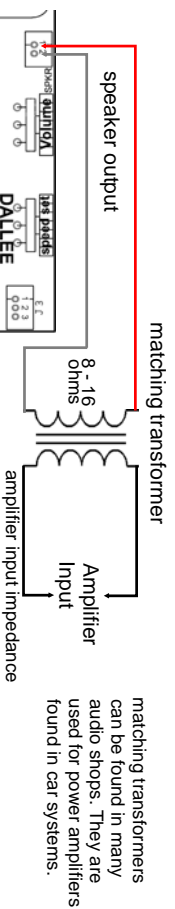
adding manual control to the IN LOCOMOTIVE DC SOUND system as a stationary unit to adjust prime mover sound notches (RPM).

Connect input power, speaker, and all other connections as shown in stationary or other types of installations except no input connections should be applied to the DC motor/track input header (J3) pins 2, or 3. Instead, connections should be done as shown below. All other input power, speaker, switch connections should be done as before.

Basic setup for both types of operation: **Set NOTCH CONTROL (speed set) full CCW.** The potentiometer, transistor, and a knob can be obtained directly from us as item#602 but they may not appear on the price schedule - call or write for prices.



using an Auxiliary Amplifier with matching transformer input



For extra 2 and 3 pin ultra-miniature connectors, see item's 757 and 758. They are listed under Accessory Items / Connectors.