OVERVIEW:
This device is an electronic sound system for installation in model locomotives that are designed to operate with conventional AC track power with standard Horn and Bell operation. In addition to conventional control of the Horn and Bell, this sound system may also use of our LocoMatic™ Controller (Item 755) to operate the horn, bell, force notch 8, and main sounds on/off.

The audio amplifier can produce 1.1 watts 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, web site, or price schedule for available speakers. If space permits, more than one speaker can be utilized as well as an additional 11 watt or 22 watt amplifier (item 671 or 672) but these will also need an additional speaker as well as different wiring.

Sounds produced include user controlled Horn and Bell. Non-user controllable sounds include periodic air system pressure release, brake release and diesel prime mover sound automatically adjusted to speed and load conditions.

INSTALLATION INSTRUCTIONS:
The sound system consists of two printed circuit boards, two 2-pin jumper cables (already installed), three 2-pin connectors with wires and one 3-pin connector with wires. Not included is a choke (item 702 or 703 depending on motor power requirements) which is required for LocoMatic™ track power installations. It is not required for conventional operation.

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 on this page 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 at minimum, the volume control is accessible either through the frame or via a hatch or a hole in the locomotive body shell. The power board can be mounted anywhere convenient. Be certain that the components on the circuit boards do not come in contact with any metal objects as such contact can destroy them. To mount, degrease the area and then simply remove the coating on the tape. Once mounted they will be quite difficult to remove after a period of time. 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. Be extra careful to insure that none of the speaker wires come into contact with any other metal or wires!

There is an on-board storage capacitor to keep the sound operational during power sequences. If the sequence time is too long, or if the volume is set high, the storage time will be shorter therefore requiring a fast sequence.

If any connections are not done properly, especially the power connections, you will damage the sound system. This type of damage is not covered under any warranty. The sound system is thoroughly tested and inspected before packing to insure proper function. There is a minimum charge of $40.00 plus s/h for repair.

SOUND INFORMATION:
TRAVELING: sounds range from no sound when stopped to full speed based upon motor voltage present and the "Notch" control setting. The traveling sounds default to sectional rail. You can select welded rail by merely connecting J5, pin 1 (red wire) to the ground connection (J2, pin 2, gray) as shown on pg 5.

HORN: sound is controlled by the HORN button on the transformer or other conventional controlling device. The LocoMatic™ Controller can also be used if connected for it. 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 button on the conventional transformer's remote controller or again by the LocoMatic™ Controller if wired for it. When BELL sound is requested the sound system will first adjust the diesel sound to the RPM required for simultaneous play. When deactivating, the BELL will stop at the end of a ring and the diesel sound will return to the correct notch setting. For all operators, you depress and release the BELL button to turn on the BELL and then again depress and release the button to turn the BELL off. You do have to pause between requests. When BELL sound is activated while running, it will start a bit after the MP54 has stopped and is sitting at rest.

The bell will automatically turn off if the MP54 starts to move. The bell sound may have a delay until it starts to ring after activation while running.

AIR COMPRESSOR: runs at random.

SPEAKER MOUNTING: The speaker generally should be mounted so that the sound can actually "get out" of the locomotive. A hole in the floor or fuel tank 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 or pill container. The longer the tube the better the speaker will reproduce low frequency sound which is inherent in diesel 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. A better method is to utilize the entire engine or car body cavity. 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.

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.

NOTCH ADJUSTMENT: for most AC operators, full counter-clockwise will yield notch #8 with a higher track / motor voltage. Rotate the control CW to decrease the voltage required to reach notch #8. This setting is an arbitrary setting to whatever best suits your needs.
Connections & Locations

AC-track power input:
1 - (RED) .......... 3 rail: Center Rail, 2 rail: right rail
2 - (GRAY) ........ 3 rail: Outside Rail, 2 rail: left rail
if these are reversed, the Horn/Bell will operate reversed of normal

DC power connections: (preconnected to sound board J2)
1 - DC power "+" (RED)
2 - DC power "−" (BLACK)

HB connections: (preconnected to sound board J4)
1 - Horn Signal (WHITE)
2 - Bell Signal (BLUE)

Remember, the default sound for the MP54 is sectional rail sounds. You don't have to connect anything to J5 since this is the default playing mode of this sound unit. You only have to connect to J5 if you want to change the traveling sounds to welded rail! See page 6, "Options Wiring Help".

SPECIFIC INSTRUCTION SHEETS
PAGE INSTALLATION TYPE
3 ........ Conventional/ Standard AC
4 ........ using LocoMatic™ Controller
5 ........ sample speaker installation
6 ........ Options Wiring Help

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.

DO NOT touch the speaker wires to anything else, this will damage the amplifier which is not covered under warranty!
AC track power - Conventional Installation.

M - motor armature / brush connections. The black and white wires connect to the existing motor brushes. The E-Unit is only shown as a convenience. Existing E-Units remain wired as they presently are. You only need to wire the Power Board AC (Red / Gray) input power to the track and the sound boards J3 connections (Black / White) wires to the existing motor brushes.

E-Unit color codes match item #400. Other manufacturer's color code will vary.
AC track power installation using conventional Horn/Bell or DALLEE controller #755

Use 1.5 amp choke, item 702, as supplied with sound system or item 703 for larger motor loads.

2 rail - connect to right rail pickup.
3 rail - connect to center rail pickup.
2 rail - connect to left rail pickup.
3 rail - connect to outside rail, chassis, pickup.

E-Unit color codes match item #400. Other manufacturer's color code will vary. If you have a series motor, connect the Yellow and Orange wires to the field as instructed in the E-Unit's instructions.

If you do not want the sound system to operate from the standard Horn/Bell signals, then disconnect the HB - J4 wire harness.
Sample Speaker Installations

Mounting a speaker facing out from inside of the body. You have to seal all edges of the speaker for a proper baffle.

Using the fuel tank as a speaker baffle is quite easy. In this case the speaker emits sound into the body.

Mounting speaker in hood of engine using a metal grill for the exhaust.

For open body shells it is necessary to make a speaker baffle instead of using the body for a baffle. In both cases, the backside of the speaker is closed off.

When mounting the sound unit in an open chassis (car or locomotive) area with a power feed entering under the speaker requires raising the speaker from the chassis floor. This is easily accomplished by adding item #388, 1/8" thick double sided tape, to the rim of the speaker. As you can see, only a small amount is needed. This creates an air tightness from the front side of the speaker which is required for a good baffle. In this case, the entire body shell is used for the speaker baffle which is why nothing is required on the back side of the speaker.

DO NOT allow the speaker wires to contact ANYTHING else including the chassis of the engine or the speaker frame. This will damage the sound unit and voids the warranty.
Options wiring help:
Connect all other connectors as shown. If you want to change the default play of the Sectional Rail to Welded Rail sound, add connection as shown below.

Splice the RED wire onto the Black wire that goes between the Sound Board and Power Board. Be sure to insulate properly (best to use heat shrink tubing).