

## **Streamlined Backshop Services (SBS) Sound Car Kit Instructions**

1. Remove the factory-supplied speaker from the decoder if using a sound decoder supplied with a speaker.
  - MRC and most Digitrax sound decoders are supplied with a speaker already attached. In most cases, these speakers are either over-sized so that they do not fit or are undersized which produces inferior in sound quality, especially when compared to the speaker supplied in the kit.
  - CAUTION! Be sure to verify the speaker specifications required for the selected decoder. The speaker supplied with this kit is rated at 8 ohms impedance and 1 watt input power and is suitable for most applications.
  - CAUTION! The ESU-Loksound family of decoders require a 100 ohm speaker for use with their design. Follow the instructions except make changes as required to fit and mount the factory-supplied speaker.
  
2. All instructions provided here-in are based on installation of this kit in an N-Scale Atlas Trainman 50' Box Car. Adjustments may be required for use in any other type of car.
  
3. Remove the car body from the car floor. Remove trucks and weight from the car floor. Remove the wheel sets from the trucks. Discard the weight and wheels. If using the 4-40 screws to mount the trucks, discard the King Pins. Otherwise, set them aside for use in Step 8.
  
4. If using the 4-40 screws to secure the trucks, drill and tap the truck mounting holes in the bolsters. Otherwise, proceed to Step 5.
  - Drill the king pin pilot holes out using a SBS #43 drill bit
  - Tap the holes using a SBS #4-40 tap

(The SBS 4-40 Drill and Tap Set is available at [www.sbs4dcc.com](http://www.sbs4dcc.com))
  
5. Mark and drill holes in the floor for the speaker and the power wires.
  - The enclosed drill template has multiple location options for the power wire holes. Before proceeding, study your installation to determine which location is appropriate for your contact and application. It is not necessary to drill holes for every slot shown on the template.
  - Secure the enclosed template to the floor with or mark hole locations with a center punch
  - Drill the speaker holes using a 1/8-inch drill bit
  - Drill the power wire slots using a 1/16-inch drill bit. Drill (2) holes for each slot you plan to use, one at each end of the slot. Then use a small file or the drill bit to remove the material left between the holes.
  - Remove the excess flashing with needle files and a hobby knife.
  
6. Secure the speaker to the inside face of the car floor.

- Apply a light coat of Adhesive Caulk to the edges of the front face of the speaker and place it over the holes drilled in the floor.
  - Inspect the caulk once the speaker is in place to be sure there is a complete and continuous seal around the speaker. Touch up any gaps in the bead. A tooth pick is useful to “roll” the caulk into the joint.
  - Set the car floor aside to dry. I like to use clear caulk because it is white when wet and clear when dry so I know when it is safe to handle the car floor again.
7. Attach the enclosed wires to the SBS F4W-440 contacts.
- Be sure to lay out the contacts as they will be installed. They will have a definite orientation... Right Front, Right Rear, Left Front, Left Rear.
  - Be sure to lay out the wires as they will be installed. The red wires should be used on the Right contacts and the black wires should be used on the Left contacts.
  - The small hole in the solder lug is to allow the wire to be attached along the same axis as the rotation of the truck. Simply insert the wire into the hole from the side that will face the car body and solder the other side. Be sure to trim or otherwise minimize the height of the final surface so as not to extend below the wheel axles.
8. Mount the contacts in the trucks and mount the trucks to the car floor.
- Place the Right Front contact in the inside of the truck frame.
  - Place the Kapton Washer on top of the contact.
  - Place the Left Front contact on top of the Kapton Washer.
  - Insert the 4-40 screw through the center hole of the assembly.
  - Mount the assembly to the car floor by insert the wires into the power wire slot and tighten the screw to hold in everything in place.
  - Using a pair of fine tipped tweezers or other instrument, gently squeeze the ends of the contacts together and insert one wheel set.
  - Repeat to install the second wheel set.
  - The wheel sets included in the kit are insulated on both ends. While not critical, it is a good idea to note orientation of the insulated wheel if using a different brand.
  - Repeat the process to mount the Rear Truck Assembly.
  - Adjust each trucks pivot friction by turning the screw until the truck pivots freely but has little to no vertical movement along the pivot axis.
  - Place the 4-40 jam-nut on the screw and tighten to lock the assembly in place.
9. Inspect the installation of the contacts and verify they are isolated by performing a continuity test using a multi-meter.
- Place a test lead on each wheel of a single wheel set. The circuit should be open (the meter SHOULD NOT beep). Adjust the contacts until there is no continuity between the wheels.

- Place a test lead on the same side of each wheel set in the truck. The circuit should be closed (the meter SHOULD beep). Adjust the contacts until there is continuity between the wheels.
- Inspect the contact pressure between the contacts and the wheel faces. Adjust the contact “wings” until they make good contact AND allow the wheels to roll freely.
- Inspect the solder lugs. Make sure they are not touching the axle of the wheels set or each other. A light coating of liquid tape will insure they don’t move and are well insulated.
- Inspect the height of the solder joints. Remove any material protruding below the wheel axles.

10. Connect the 1000mF Capacitor to the decoder.

- Some sound decoders do and some do not have provisions for a “keep-alive” capacitor. Proceed to Step 11 if the selected does not have this circuit.
- The 1000mF capacitor can be used in addition to the factory capacitor included with the decoder.
- **WARNING!** Be sure to make note of and match the polarity of the capacitor with the circuit. It will explode and make a mess if installed incorrectly. The negative side is clearly marked with a colored band containing several “ – “ marks.
- Insulate the solder joints with liquid tape or shrink tubing.

11. Connect the 100 ohm Resistor to the decoder by soldering the resistor across the motor circuit.

- Some sound decoders are designed for use with powered locomotive. And use the motor function to control notching and other sounds. This type of decoder will have a Gray and an Orange wire for the motor circuit. The resistor is required to simulate the electrical load of the motor. Proceed to Step 12 if the selected decoder does not have this circuit.
- Insulate the solder joints with liquid tape or shrink tubing.
- **CAUTION:** If you use the resistor in the motor circuit you must set the motor voltage CV’s as follows. Failure to do so will cause the resistor to become extremely hot and may cause damage to your car or decoder.

§ CV2 = 1

§ CV3 = 4 or Same as typical setting for your fleet

§ CV4 = 4 or Same as typical setting for your fleet

§ CV5 = 50 (64 max)

§ CV6 = 25 (64 max)

12. Connect the Contact Power Wires to the decoder using the third set of pre-cut wires if needed.

- **WARNING!** Be sure to make note of and match the polarity of the Contact Power Wires with the circuit. The decoder may be damaged if wired incorrectly.

- Insulate the solder joints with liquid tape or shrink tubing.

13. Connect the Speaker to the decoder.

- A single speaker is not polarized so there is no wrong way to wire it.
- CAUTION! Be sure to work quickly when soldering the wire to the speaker as you can damage the internal connection to the solder pads if they become overheated.
- Insulate the solder joints with liquid tape or shrink tubing.

14. Mount the decoder and capacitor in the car body.

- Use double-sided tape or other material to secure the decoder and capacitors to the roof inside the car body.

15. Mount the weights to the car floor

- Be sure to select a suitable location that will not interfere with the other components used in the installation.
- Additional weight can be added if desired. The NMRA recommends ½ ounce plus 0.15 ounces per inch of car length for N-Scale cars.

16. Place the car body on the car floor.

17. Test the installation by placing the unit on the programming track and reading the address. If successful, place on DC powered track and increase the throttle voltage until the sound starts. If successful, place on a DCC powered track and test. Finally, program the decoder as desired for use in your fleet and enjoy all of the sounds of N-Scale Model Railroading!

