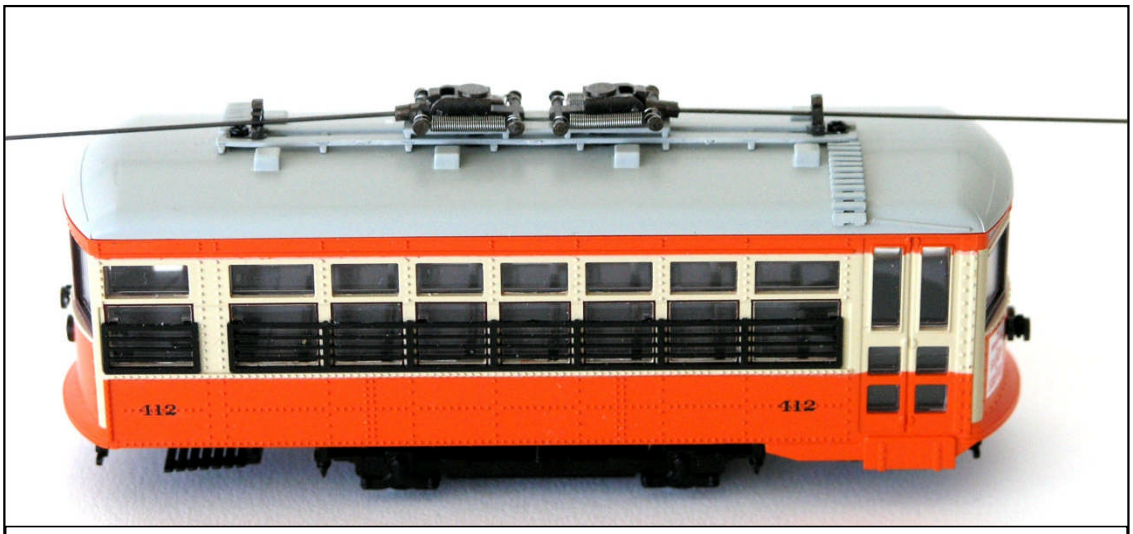
Sounds for a Birney Streetcar

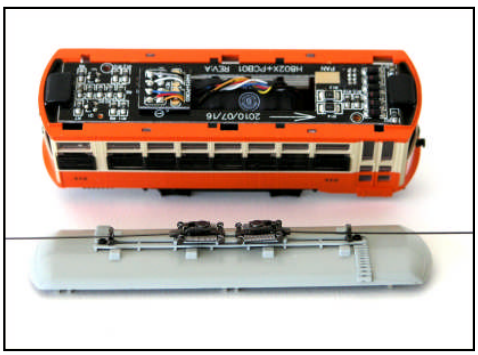
by Fred Miller, MMR

In an attempt to reduce operating costs for streetcar operations, many large and small traction companies ordered cars built to a unique 4-wheel, one man crew design. That design was attributed to Charles O. Birney and was subsequently named the Birney Safety car. Almost 1700 cars were built in the years 1916 through 1920. Many car builders participated including St. Louis Car Company, J.G.Brill and Cincinnati Car Company. The little Birney spread to 43 states but most traction properties started to drop the Birneys (along with other trolley operations) in the thirties. The cities of Birmingham and Fort Collins ran their Birneys into the 50's.



Bachman Spectrum® HO Birney Safety Streetcar in New York & Queens Livery

The 4-wheel Birney has always been popular in the trolley modeling community. Various kits and brass imports have shown up over the years in the most popular scales. Corgi introduced an unpowered 'O-Scale' car in a number of liveries. The Bachmann Spectrum® line recently released a beautifully modeled HO DCC powered car. This article discusses the author's installation of sounds in that Spectrum® HO Birney model.



The Spectrum® model is constructed with a removable roof that covers up a full-length circuit board. The Bachmann supplied E-Z Command® DCC motor decoder fits into a slot in the middle of the circuit board and plugs into the board with a standard NMRA 8 pin plug. The model provides directional headlights, each dimming in the reverse direction. Red "tail lights" also light up on the end with the dimmed reverse headlights. The car has internal lights but the E-Z Command® decoder does not control these. The circuit board plug (Pin 3) is wired with two diodes to activate the internal lights at all times. All lights are appropriately colored LEDs. The trolley wheels and rope are way out of scale and need to be replaced.

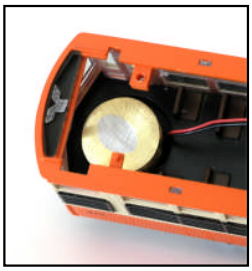
Sounds for a Birney Streetcar

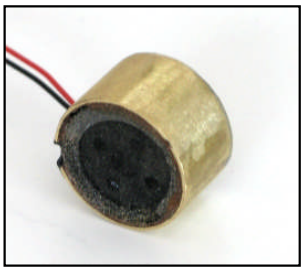
by Fred Miller, MMR

The Digitrax SDN144PS SoundFX™ Sound/Motor decoder is a bit larger than the supplied Bachmann motor decoder but none-the-less fits into the same location. The Digitrax decoder was designed for N Scale but with a 1 Amp motor capacity it is quite capable of driving the little Birney. Similarly the 4 Function 200ma outputs easily handle the LED lighting load. The SDN144PS decoder is equipped with a standard NMRA 8-pin plug but the Green and Purple decoder wires are not connected. The author soldered the Purple wire to vacant Pin 3, marked "optional" in the NMRA standards. Re-mapping the functions in the decoder made it possible to control the inside lights with Function 5. Programming a '1' into CV39 and a '0' into CV36 does the re-mapping.

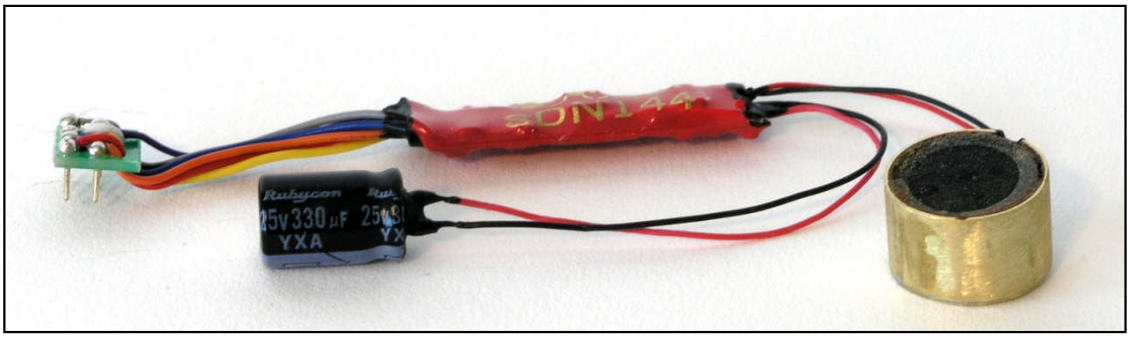
Even though the Spectrum® Birney model is not available with sound, it does contain a speaker recess and floor cover for "after-market" sound installations. The Digitrax SDN144PS decoder features a 13mm 8 ohm speaker that fits easily into that location. However, the sound from such small speakers is substantially enhanced by a speaker enclosure. Based on an analysis of speaker and enclosure options for the Birney car the author decided to construct a custom brass enclosure made out of K&S 9/16 inch Round Brass stock (#141) and some brass sheet soldered on one end for a cover. The Digitrax provided speaker fits comfortably in the other end with a little notch for the wires. Painted black the speaker enclosure is unobtrusive from the outside.

Option	Sound Quality	Cost
Digitrax Speaker in frame with floor cover	Poor	None
Digitrax Speaker in frame without cover	Fair	None
Digitrax Speaker in brass enclosure	Good	Minimal for brass stock
0.62" Speaker in plastic or brass enclosure	Best	$20 includ-ing plastic enclosure



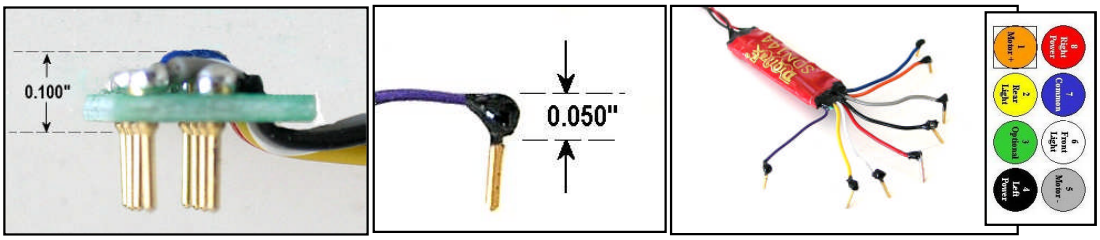


The SDN144PS decoder also includes a small capacitor which helps keep "dirty track" from interrupting the sound performance. This capacitor and the speaker are connected



to the sound decoder by separate wires. The wires and capacitor are easy to fit within the Birney streetcar under the removable plastic decoder hanger brackets.

One problem was discovered as the project progressed. The NMRA 8-Pin plug included with the Digitrax sound decoder was a bit too high to fit under the roof of the Birney car. Since the roof casting was a bit thin, it was decided NOT to remove part of the plastic to



clear the plug assembly. Instead, the plug assembly was discarded in favor of individual pins made by soldering the 8 decoder wires to pin material captured from an electronics pin assembly known as a "male header." Care must be used to insert each single pin into the correct socket hole. Note the author makes use of "Liquid Tape" to both insulate and protect decoder wires and components.

Digitrax decoder installed in Birney with individual wire pins to NMRA socket

Most of the Digitrax SoundFX™ sound decoders come factory equipped with a "sound project" containing generic Steam Loco and Diesel Loco sounds. The decoders, however, are capable of accepting different sounds and even replaced programming to change the decoder's reaction to Function Keys, Throttle direction and speed settings and other internal and external events. The author has prepared a number of traction sound projects for HO and O cars such as the Peter Witt streetcar, both the pre-war and post-war PCC streetcars and various other generic Interurban and traction freight equipment. Many of these sound projects include actual recorded sounds of prototype equipment. A sound project was prepared for the Spectrum® Birney car making use of various pre-recorded trolley sounds, albeit not from a Birney prototype.

The preparation of Sound Projects for the Digitrax SoundFX™ sound decoders is beyond the scope of this article. In general the process includes preparation of sound clips carefully selected from longer recordings. Some sounds which will play for an extended

period, e.g., whistles and air pumps, are actually three different sound clips: a starting sound, a repeating sound, and a stopping sound. The repeating sound is edited such that if it is played repeatedly, it sounds like one long sound. Sound file editing can be performed using free sound editing software such as WavePad or Audacity, both available for download on the Internet. When the sound clips are complete, they must be saved in standard Microsoft wave file format but with 11KH sampling, 8 bits, mono settings. This is the format required by the Digitrax SoundFX™ decoders.

The program code that is loaded into the decoder (along with the sound clips) is developed using a macro assembler language. That code can be somewhat obscure and certainly not easy for a non-programmer. The author developed a free software product called SPJHelper© that simplifies the process of creating the operating program using mouse drag-n-drop and pull down menus to select desired activities. SPJHelper© also simplifies the process of assembling the necessary components (sound clips, program code and other control information.) The use of Function Keys and Configuration Variables (CVs) is defined by the project. Once a Sound Project is prepared, a single .SPJ file is downloaded into the sound decoder using the Digitrax SoundLoader® free software and the Digitrax PR-2 or PR-3 hardware interface. More information is available on the process, as well as access to this and other traction Sound Projects on the author's web site. See references at the end of this article.

Digitrax PR-3

Function Keys	Activity
F0	Front/Rear Lights (Depends on Direction)
F1	Continuous Warning Gongs (Keeps sounding while F1 is ON)
F2	One or Two Trolley Gongs (depending on CV154)
F3	Open Door (F3-ON), Close Door (F3-OFF) or Track Squeals car in motion
F4	Passenger Buzzer (Keeps sounding while F4 is ON)
F5	Inside Lights
F6	Mute All Sounds
Configuration Variables	
CV58	Master Volume 1-15 (F6 used for Mute)
CV140	Motor Volume 0-64 (1=Off, 0=Mute All Moving Sounds)
CV141	Gong Volume 0-64 (1=Off)
CV142	Controller Click Volume 0-64 (1=Off)
CV143	Compressor Volume 0-64 (1=Off)
CV144	Passenger Buzzer Volume 0-64 (1=Off)
CV145	Door Sounds Volume 0-64 (1=Off)
CV146	FareBox Volume 0-64 (1=Off)
CV147	Motorman Voice Announcements Volume 0-64 (1=Off)
CV148	Track Squeal Volume 0-64 (1=Off)
CV149	Time between Automatic Pass Buzzers
CV150	Time between Compressor Cycles (2 sec increments)
CV151	Compressor Running time (2 sec increments)
CV154	Number of F2 Gongs (1 or 2) and lazy motorman Auto Start Gong (3)

The sound project the author developed and loaded into the Birney Streetcar makes use of Function Keys and Configuration Variables (CVs) as shown in the table.

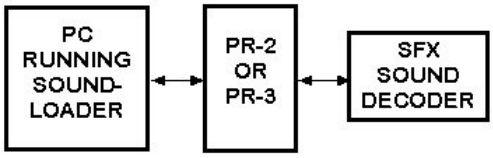
Note that it is possible to vary the sound volume settings for all (Master), or selected sounds, using the listed CVs. F6 mutes all sounds while the streetcar is operating.

This Birney Sound Project includes an array of actual streetcar sounds including Gongs, Passenger Buzzers, Air Compressor, Car Door open/close sequence with random farebox coins/motorman announcements and Track squeals. Most of the sounds were recorded in

Sounds for a Birney Streetcar

by Fred Miller, MMR

Oct of 2008 by the author at the Baltimore Streetcar Museum. Special thanks to the Dispatcher and Motormen at the Museum



The Birney Streetcar sounds project is available on the author's website. Downloading the project to a Digitrax SoundFX™ sound decoder involves the use of SoundLoader® and the PR-2 or PR-3. Since some modelers may not choose to acquire those products for a one-time load of a sound project, the author offers to load sound projects into a modeler's supplied SoundFX™ decoder at no charge except for postage. Contact the author for details.

References and Resources		
Item	Manufacturer	Source
HO Birney Streetcar	Bachmann Industries, Inc. www.bachmanntrains.com	www.hobbylinc.com, Micro-Mark (www.micromark.com) and others
SDN144PS™ decoder	Digitrax, Inc., www.digitrax.com	Tony's Train Exchange - www.tonystrains.com, and others
PR2 or PR3 Interface with SoundLoader® software		Tony's Train Exchange - www.tonystrains.com, and others
Audacity sound editing software		http://audacity.sourceforge.net/)
WavePad sound editing software	NCH Software	www.nch.com.au/software
Birney Sound Project, File: "Birney.spj" containing the sounds and software	Developed by the author	www.fnbcreations.net/projects.htm
Authors Web Site	www.fnbcreations.net/projects.htm	
Authors email address	tractionfan@aol.com	