DALLEE
ELECTRONICS, Inc.

Quality Products
Since 1976

Catalog #58

246 W. Main St.
Leola, PA 17540
717-661-7041

www.dallee.com

$10.00

COMPANY PROFILE

DALLEE ELECTRONICS was started in 1976. Our first product was the ENGINEER throttle, which having been updated and improved with time, remains the industry's most powerful full featured momentum with memory throttle available. The company added detection circuitry in 1983 with a full line of variations to follow. Electronic reversing units were being requested by the AC operator, DALLEE ELECTRONICS not only gave the industry its first replacement market E-Unit for permag "DC" motors but also made the unit available in over six variations, four for the replacement market with the others going to various manufacturers.

While other products filled the line we became a full time company in 1987. We also provided electronics to some large custom layout builders. DUNHAM STUDIOS designed and built the famous CITIBANK STATION layout which was displayed at Citicorp headquarters (1987 - 1990) in New York City. DALLEE ELECTRONICS not only supplied all of the electronics to operate the layout but also provided the expertise in the wiring and automation circuitry required. Various other commercial and large home layouts have been done since including another crowd pleaser at Citicorp Center (1996 - 1998). An updated layout is presently displayed at Citicorp during the Christmas Season.

DALLEE ELECTRONICS started work on sound systems in 1990. These sound systems have evolved to the ultimate obtainable (within a reasonable price range) in today's market. Although many companies try to flatter their customers with other sounds or claim that they are the only ones using real recordings, our sound systems have always been created with recordings from the real locomotives. Our sound systems, in various configurations and custom designs, are used in the production of Koh's & Company "O" scale locomotives, FINE ART MODELS "#1" gauge locomotives. They have also been used in the Smithsonian edition of the NYC DREYFUSS HUDSON (both DC and AC versions), PRR K4, and German BR50 locomotives which were produced for LIONEL® TRAINS INC. DALLEE ELECTRONICS provided the control system and electronics for the BUCYRUS ERIE CRANE, produced by FINE ART MODELS. The crane control system included control of six motors (both directions), headlight, back up light, and sound. We also furnish various custom and standard designs for Koh's & Company "O" scale locomotives, Atlas O "O" gauge locomotives, S Helper Service, and other manufacturers.

DALLEE ELECTRONICS released a less expensive sound system late 1994, this unit actually fits inside HO gauge trains. This same unit is usable in any gauge larger than HO or under the table as a stationary sound system for any size. This unit has become a much talked about sound system for both sound quality and value. Since the introduction of this unit it has been downsized to accomodate installation in tight spaces. At present there are over 50 different sounds available with more to come. At present, we have redesigned this unit into a package much smaller than the previous units with easier wiring. We have since made available units to be compatible with the standard "G" operation utilizing magnets to trigger the Whistle / Horn and Bells.

DALLEE ELECTRONICS was incorporated in early 1996 and continues in it's previous tradition of bringing to you a quality product that is built to last. DALLEE ELECTRONICS, INC. is constantly developing new products for your enjoyment and appreciates input from our customers. DALLEE ELECTRONICS, INC. has a showroom to demonstrate our products and offer retail sales. It is best to call ahead to insure that we will be setup to accomodate you, instead of at a show or loading / unloading from one.

DALLEE ELECTRONICS, INC. designed an easy to use SOUND & CONTROL system which has been embraced by S-Helper Service for many existing and upcoming projects. It was also used by Atlas O in their AEM7/ALP44 locomotive. This system was designed with the AC operator in mind. The main goal of this unit is to not only be fully compatible with existing operations but to allow an unintrusive control system that is so easy to use it really requires next to no training! Although this system was designed in 1992, it was introduced to the AC market as LocoMatic™ in 1998. Although this system is different than other systems in the market, we feel very confident in the users embrace of this simplified control system. After all, isn't it important to enjoy your model railroad without cumbersome manuals to read and decipher? As an update, in 2004, we reduced the system to a very small size for S-Helper Service. This is available as the type 2 system. This makes the smallest sound, motor, and lighting control system available. Another custom LocoMatic system was designed for S-Helper Service's 2-8-0.

DALLEE ELECTRONICS, INC. not only redesigned the standard small universal sound system but we have also introduced a high end, full featured sound system for the serious modeler. This unit is featured in the Kohs & Company products. In 2006, we also introduced our standard sound system to the "G" modelers with software appropriate for reed switches triggered by magnets to create various Horn/Whistle play patterns as well as Bell operation. These systems can also be utilized as a stationary sound system with a magnet mounted on the engine or car. Our sound systems have also been included in the 2007 Aristo-Craft Trains catalog. New sounds are always being added to our selections as well.

DALLEE ELECTRONICS, INC. also redesigned the entire family of current sense track detectors which remain a super reliable industry standard. This new design efficiently utilizes space and printed circuit board materials allowing four different designs to be built on one main board. We added the Trak-DTRL in 2008 making a unique product for those in automation requiring memory between power applications. In 2003 we also redesigned and compressed our popular electronic E-Unit and added a second type which is much smaller than any previously available E-Unit.

DALLEE ELECTRONICS, INC. continues to expanded the product line. We introduced many new products from six new high intensity, low power, LED lighting boards, to a super reliable 12 ampere E-Unit, momentum control unit for automation applications. More sounds were made available in all three types of our popular sound systems, and more signaling/automation expansion units.

DALLEE ELECTRONICS, INC. exhibits at major trade shows, primarily in the east, and continually advertises in various magazines.

DALLEE ELECTRONICS, INC. has always maintained the philosophy of designing a quality product with quality components for durability and long life. DALLEE ELECTRONICS, INC. not only designs, assembles, and manufactures its products in the U. S. A. but we also try to use as many parts produced in the U. S. A. as well. 

DALLEE ELECTRONICS, INC. also provides custom design and services to other companies throughout the model railroad and electronics industry.

DALLEE ELECTRONICS, INC. can be found on the world wide web at www.dallee.com.

CONTENTS

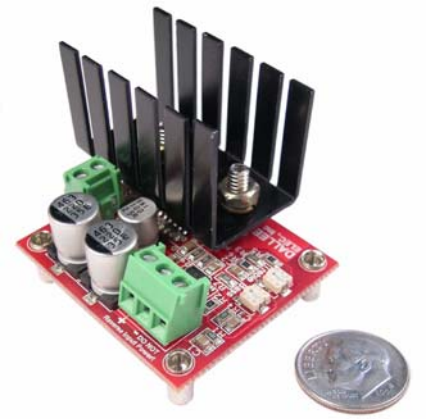
Get our MODEL RR WIRING GUIDE for numerous drawings utilizing our signaling & automation products on your layout and much more!

Visit our web site, www.dallee.com, and get instructions for our products both new and old as well as applications notes and many other items whenever you need them.

E-Mail: info@dallee.com

SOUND SYSTEMS Accessory Items

Audio Amplifier



22 Watt

Item # 672

Small Footprint - pcbd: 1.6" x 1.4"

mount with three 2x56 screws

The 22 watt amplifier not only amplifies your sound, but include both Treble and Bass controls to enhance any speaker system. Although it was designed to be used with all Dallee Electronics Inc. sound systems, it may also be used with other systems. The amplifier is designed for use with an 8 ohm, or higher, speakers. The amplifier is small enough to fit most 'O' gauge and larger type trains. Heavier wattage speakers, available from Dallee Electronics, are recommended.

The maximum DC input is 25 volts. Typical operation is achieved utilizing 12 to 24 volts. The highest output power is achieved with 20 - 24 volt input power. Proper ventilation is required to achieve the maximum output power. For most applications, the full power will not be necessary but it's always nice to have it available!

SOUND CONTROLLER

Item # 755

Sound Controller #755 operates ALL sound systems utilizing conventional DC or AC track power and our LocoMatic™ Systems. This unit connects between your throttle output and track power. Various features are obtained depending on the sound system installed. This only sends the message to the sound unit for what to play or do - it does not send the sound nor does it interfere with any track power. It is a "pass through device" when nothing is pressed or not powered. Therefore you do not have to remove it from any circuit when not in use. It also does not have any track power loss when wired into the track power circuitry. Since this is a universal controller, not all buttons control functions, that is dependent on what type of features are on the sound system purchased. The proper button operations for the system controlled is explained in the individual sound systems instructions. This Controller will also operate Dallee legacy DC sound systems as well. For DC operators best results are obtained with either a filtered DC power source or a phase controlled unit such as the Dallee Yard Master or similar type of track power systems. Various PWM type power supplies will require extra filtering to prevent interference from them.

Presently out of stock. Preorders will be taken for this item.

See page 21 for the AC Sound Controllers.

SOUND SYSTEM SPEAKERS

The following is a list of speakers for use with all sound units. All speakers are 8 ohm impedance.

The low profile speakers we offer have superior performance to other speakers. Samarium Cobalt magnets are far stronger than ferrite or Alnico type magnets thus making a more efficient speaker (creating more sound per watt of input power). These speakers have a mylar diaphram.

Item#	Size (dia X h)	Freq. Resp.	db	Watts
661	1.5 X 0.2	320 - 10kHz		0.5
659	2.6 X 0.5	380 - 7.5kHz	84	0.8


#661


#659

The following speakers have a higher wattage handling capacity and efficiency rating. They are better suited for most higher volume applications. Especially for use with an EMD prime mover when a higher power, high compliance speaker, can't be used. These speakers have a mylar diaphram.

Item#	Size (diaXh)	Freq. Resp.	db	Watts
210	0.87 X 0.23	240-20kHz	86	1
211	1.1 X 0.23	250-20kHz	88	0.8
213	1.57 X 0.2	230-20kHz	83	1.5
214	1.97 X 0.3	350-20kHz	86	1


#211


#213


#214

since manufacturers may change specifications and physical appearance, we cannot guarantee that the speaker's shown will exactly match that received.

not all speakers pictured but are similar in appearance.

The following is a list of higher compliance speakers for use with all sound units. These speakers are recommended for applications that require heavy pounding such as an EMD prime mover. All of these speakers have a paper diaphram.

Item#	Size (w-l-h)	Freq. Resp.	db	Watts
215	0.8 x 1.6 x 0.41	300 - 20kHz	80	1
662	1.1 x 1.6 x 0.48	350 - 20kHz	83	2
664	1.6 x 2.8 x 1.3	280 - 20kHz	86	2
216	1.6 x 2.8 x 0.9	310 - 12kHz	82	3
667	2.0 x 3.5 x 1.5	200 - 20kHz	90	5
217	6 x 2.2 x 2	30 - 20kHz	95	13
660	2" round x 1.2h	100 - 5kHz	85	5
668	3" round x 1.5h	200 - 15kHz	90	3


#215


#662


#664


#667


#660


#668

#217

IN LOCOMOTIVE STEAM Deluxe SOUND SYSTEMS for DC operators, DCC, and Other receivers!

as featured in the

Kohs & Company INCORPORATED

N&W Y6a and Y6b.

Item #300

also featured in the

Kohs & Company INCORPORATED www.kohs.com

Item #301,

PRR K4

Item #302,

and

C&O

Item #303.

This Steam Sound system offers the highest expectations of any steam system available on the market today. Not only does it have the most complete polyphonic sounds, it also offers features never expected of any sound sytem for the DC operator but can also be utilized by most any operator. Not only are the sounds polyphonic but they are digitized at high sample rates to yield a clear, crisp sound unlike any others. Three boards make the complete system with three audio channels! Two in the engine and one mono channel in the tender.

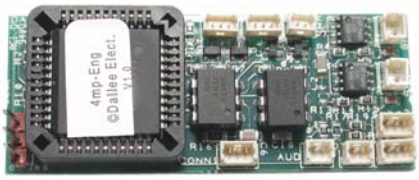
Features:

- full polyphonic reproduction with three audio amplifiers!
- Whistle - fully user playable. Not only does the whistle offer continuous play time, you can produce short bursts with a small echo but you can also produce full, long whistles with appropriate echo duration.
- Cylinder blow down - manually controlled. This unit offers the full synchronized blow down operating with the ball cocks open and synchronized when pulling out, just like a real locomotive would operate. The N&W Y6 system automatically switches from simple to compound exhaust chuffs at the appropriate speed or time. When slowing back up, you can switch back to simple mode if desired.
- Chuff - full dynamic rate with synchronized infra-red optics (included) or cam operated switch. Volume increases and decreases with locomotive acceleration and deceleration speed. Cutoff control also adjusts automatically.
- Bell - user operated
- Blowers
- Cross Compound Air Pumps (random)
- Air Pumps - played at random
- Safety Valve - played at random
- Three audio channels and amplifiers with adjustable Volume, Treble, and Bass controls for each one.
- works with DC track power*, DCC receiver, or other receivers (Aristocraft, RCS, & Others)
- Requires three 8 ohm speakers (not included), select from our full range of high efficiency speakers. Two speakers for inside the boiler with a third mono channel in the tender.
- Designed and assembled in the U.S.A.

* conventional DC requires controller #755, batteries, and other items not included.

* conventional AC adapter board available. Allows for Whistle/Bell operation via standard controls and optionally wired for full control with #755 controller.

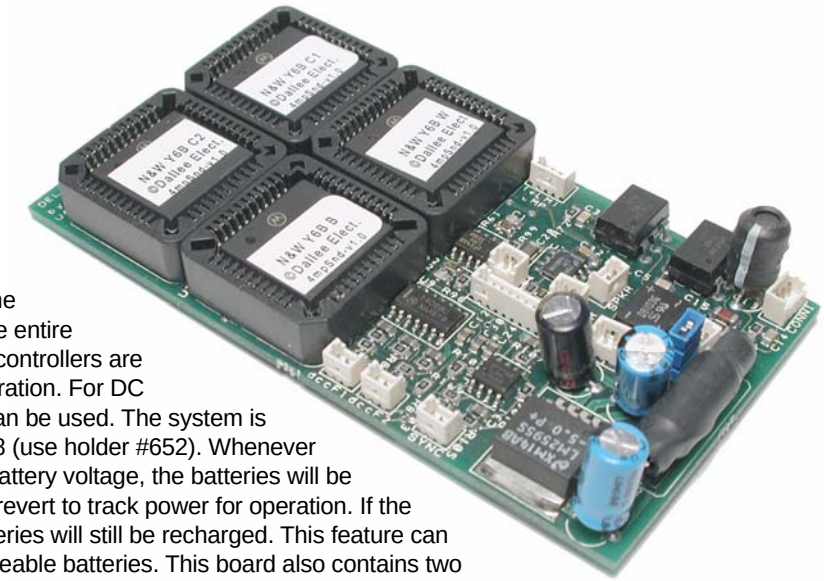
Deluxe STEAM - continued



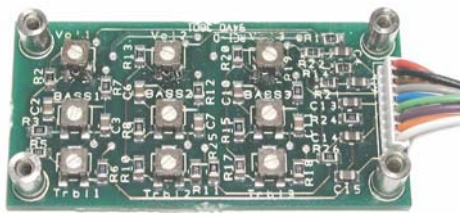
Engine Board - measures 1" x 2.5" x 1/2" h. This board accepts the optical inputs for the synchronized exhaust chuffs and sends the information to the deluxe sound system's mother board. It also contains two audio amplifiers for the front speakers and four lighting outputs. The lighting outputs are all 5vDC regulated lamps and consist of front headlight, front markers, cab interior, and a flickering fire box output. These are 2.4mm 5v lamps, item #756. Track pickup and motor power are wired to this board and the main board. A total of eight wires need to be connected between the engine and tender (seven for simple type locomotives). To better facillitate these connections, connectors have been included. See page 53 for more types.

For Whistle and locomotive types (simple or compound) available, consult the price schedule or call.

Pictures are from units used in the Y6B for Kohs & Company, Inc.

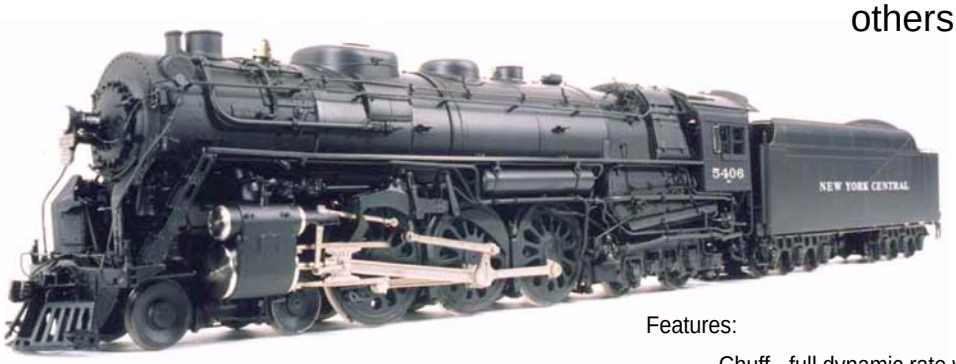


Deluxe sound system mother board measures 1.95"w x 3.75"l x 1/2"-3/4" h. This unit is the heart of the entire sound system. It not only produces all of the sounds required but also powers the entire system. As can be seen, four microcontrollers are used for full polyphonic sound generation. For DC operators, rechargeable batteries can be used. The system is designed to recharge AA's, item 648 (use holder #652). Whenever track power is present, exceeding battery voltage, the batteries will be charged and the sound system will revert to track power for operation. If the sound system is turned off, the batteries will still be recharged. This feature can be disabled when not using rechargeable batteries. This board also contains two lighting outputs for backup and rear marker lights. For DCC and Radio receiver operators, this board contains the inputs required from the receiver to operate the Whistle, Bell, Cylinder blow down, and one other function depending on the type sound purchased. As stated before, this unit not only powers all of the other boards but it also powers the 5 volt lighting. The 5 volt circuitry output can handle up to one full ampere of current, which is needed for all lighting functions and sound production. With this system, DC operators can have their headlights, and other lights, turned on manually with the use of the LocoMatic™ controller or automatically via the sound system sensing the motor polarity and adjusting the lighting accordingly.



The last board consists of the three Volume, Treble, and Bass control circuitry. This board measures 1" x 2" x 3/8" h and mounts with four 2x56 screws. The 9 pin wire harness merely plugs into the deluxe sound system's mother board. It has been made seperate for ease of mounting in a convenient location for accessibility.

STEAM SOUND SYSTEMS for conventional DC operators, DCC operators, Other receivers, 1½" and others, or Stationary use!



Kohs & Company
INCORPORATED

J3A

Hear your STEAM LOCOMOTIVE the way the real ones SOUND with our STEAM SOUND SYSTEM for model railroading that will fit HO and larger gauge trains! Unlike other sound systems which may offer make believe sounds, we play the actual raw, pure, appropriate sounds from the real locomotive. Just like it's suppose to be. Our sound systems are aimed at those desiring the sound as it was in the prototype, not the pretend sounds that locomotives did not produce.

While some whistle's aren't very pleasing to be heard, they are indeed correct! Whistles are warning devices designed to get your attention, not something that is to be a pleasurable sound. More pleasing multi-chime whistles came into existence during the later years of passenger service. We also have them in the lineup.

With our sound systems you can actually produce real whistle play patterns to signal exactly what the locomotive action is going to be or signal for a grade crossing, station stop, or departing from the station. The whistle will play the way you want it to, dips & all (whistle dependent). No canned play patterns here! By offering a playable Whistle, you can operate it correctly. Play the real BELL sound. Hear the EXHAUST CHUFFS increase to your selected locomotive speed (automatically or synchronized). Listen for the BLOWERS, AIR PUMPS, and SAFETY VALVE while your locomotive is at rest under fire. Featuring real sounds from the real thing. Sound's from actual real recordings! The whistles are as pleasing or obnoxious as the real whistle. Don't forget, they were warning devices. Again, more pleasing whistles came about as passenger service evolved.

Realism at it's best !

Simple installation in some tenders or a trailing box car.

The STEAM SOUND SYSTEM is available with different whistle types, we also change the other sounds as appropriate! Please refer to the following pages and price schedule for types available. If you don't see yours there we are either working on it or if the need is there we just might possibly do it for all requesting it!

Available whistles range from robust multichime passenger whistles to the shrill single chime hooter used in freight or yard service. The actual Reading Company whistles could be appropriate for many North American railroads. They also pass for many narrow gauge railroads. The hooter, Reading I10, is very similar to those found in Europe. The Switcher (#742) single chime whistle is lighter in sound depth than the Reading I10.

If space permits, it is possible to use two standard steam sound systems together or add the chuff sound system, item #711. The two systems can be the same or different than the other steam sound unit. Remember that the exhaust chuff changes with the type of whistle family. You can choose to operate two independent speaker systems, allowing the placement of the exhaust chuff sound over the cylinders, or utilize one speaker system with our 11 or 22 watt amplifier shown on page 5.

You can also use two units to obtain dual chuffs for articulated steam locomotives. A second unit could also be used to obtain cylinder exhaust (chuff) in conjunction with any other sound. You can also select to turn off the main sounds (this includes the exhaust chuff) from the one unit, using it for only the whistle and bell, while using the other for all other sounds, including the exhaust chuff to yield simultaneous chuff operation.

Features:

- Chuff - full dynamic rate with track power or synchronize with an optional optical switch, #583 (pg 19), or cam operated switch. Volume increases / decreases with motor voltage. Cutoff control also adjusts automatically.
- Whistle - user playable *
- Bell - user operated *
- Cylinder blow out
- Blowers
- Air Pumps - played at random
- Safety Valve - played at random
- Adjustable volume control
- Works with DC track power, receivers, and as a stationary unit as well as 1 1/2" and others!
- 2.7" x 0.95" footprint
- Easy to install
- Made in the U.S.A.

*note: conventional DC requires controller #755, batteries, battery holders, power switch - see accessories DC sound, page 3. OR use the "automated" whistle units on page 9.

DCC receiver requires 2 function unit.

stationary operation requires switches (item's 524, 618) & remote power (item 689).

See page 4 for speaker selections.

DCv3

Sound System

Actual footprint - 0.95" x 2.7" x 0.5"

STEAM - continued

Compound
Air Pumps

Whistle Type key:

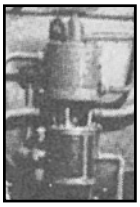
M - Multi Chime S - Single Chime

The following sound units contain cross compound air pumps with a heavy exhaust chuff for main line locomotives.

Item#	Whistle	type
704	Reading G-3	M
705	Reading I-10	S
706	PRR T-1	M
713	PRR K-4	M
714	PRR Banshee	S
710	SP GS-4	M
712	NYC	M
715	NKP Berkshire	M
720	C&O	M
735	Mallet	M
736	AT&SF	M
737	UP	M
738	Shay	M
739	Heisler	S
740	K27	M
596	German BR-50	M
	more to come!	

Optional Chuff Synchronization can be found on page 19.

Single Stage
Air Pumps



The following sound units contain single stage air pumps with a light exhaust chuff for switcher / yard type locomotives.

Item#	Whistle	type
742	Switcher	S
744	Reading G-3	M
746	Reading I-10	S
748	NYC	M
749	C16	M
750	C & O	M
752	PRR Banshee	S

The following sound units Do Not have Air Pump sound for British, European, and other appropriate locations.

Item#	Engine	type
707	W&LLR	S
741	Small	S
743	Small	M
745	Large	S
747	Large	M
595	Small, higher pitch Whistle	S

STEAM - exhaust chuff sound unit

Chuff sound system, Item #711. This sound system is for the more pure at heart. It enables the basic sound system to become more robust with the exhaust chuff and cylinder blow out. It contains four different exhaust chuff pitches to enable use with light locomotives to those with heavy cylinders producing sounds from thunderous large cylinder locomotives to that of small cylinders found on switcher type locomotives. This system requires optical synchronization with either item #584 or #585 to obtain perfect exhaust with your locomotive. It does not work with track / motor voltage for an autochuff operation as the standard sound systems do. If you want simul-chuff with the standard sound systems and require auto-chuff, use two of the standard sound systems. What makes this unit more unique, other than superb exhaust chuff's, is the fact that when the ball cocks are open for the cylinder blow out and the locomotive starts to move, the open ball cocks actually play exhausting steam rather than the sound of closed ball cocks. This steam exhaust sound continues for several chuff's or until the operating voltage gets higher for a faster moving locomotive and then they automatically close producing a smooth transition to closed ball cock, full exhaust chuff, sounds. You can also manually close the ball cocks at any time, thus leaving you in control as the real locomotive engineer. The board is physically the same as all of the other DC type sound systems pictured above. For wiring diagrams, visit our web site technical downloads section. It also requires a speaker to be used as well, if operated independently of an amplifier. See page 4 for a good selection of speakers.

This unit can operate independently, or with another DC sound system, or with any AC sound system.

STEAM Systems with Automated Whistle play patterns.

Sound Systems with the "G" operator in mind.

These STEAM LOCOMOTIVE SOUND SYSTEM's were designed for the model railroader utilizing magnetic trips of the Whistle and Bell. Each activation of the Whistle switch triggers a different prototypical play pattern of the Steam Locomotive's Whistle. The Bell activates first by tripping the Bell sound on. The second trip will signal the Bell to turn off. Whistle triggers can occur during Bell triggers as well. This system can operate from track power and/or battery power. The steam locomotive sound system will automatically adjust the chuff rate with changes in track or motor voltage. It can also be synchronized with optional switch inputs or utilizing our optical input. Sounds produced are similar to the standard DC sound systems (page 9) except the Whistle and Bell are triggered on and off with various Whistle play patterns. The sound systems can be mounted in an engine or car (with track pickups) or they can be utilized in a stationary mode with the Whistle and Bell being triggered by either the train carrying a magnet or other momentary switch input. These systems are packaged with two reed switches.

To make life easier, we made available the more pleasant and popular steam whistles. All 9xx series sound systems have the automatic Whistle / Horn play patterns. Steam sound systems available are listed below as well as our price schedule. They have the same physical appearance as the standard DC sound systems shown previously.

While the "Auto-Whistle" systems can be utilized with Radio Receivers and Stationary use, we recommend using the Standard DC types that do not have the "auto-play" feature. By utilizing a standard DC type system, the Whistle will only play as long as you keep the transmitter function or switch input activated instead of playing random Whistle patterns when activated. This enables you to play any pattern desired. For those that don't deem this as important, or desire both reed switch and radio receiver use alternately, then the "auto-play" units are necessary.

Optional Chuff Synchronization can be found on page 19.

DCv3 / auto-Whistle

Sound System

Actual footprint - 0.95" x 2.7" x 0.5"

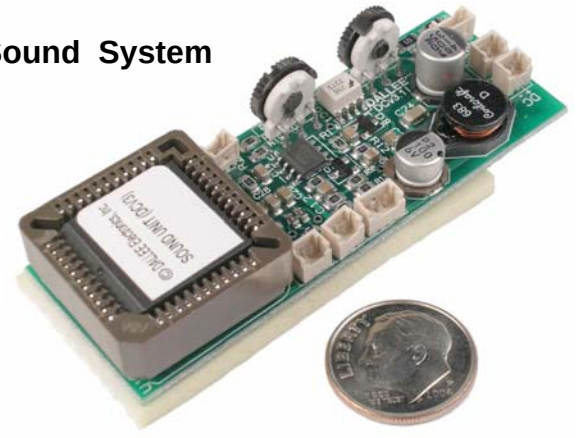
Photo courtesy Aristo-Craft Trains

The following sound units operate the Whistle play patterns with reed switches:

Item#	Whistle	type
901	Reading G-3 / Consolidation	M
902	Reading I-10	M
903	Small Steam	S
904	PRR T-1	M
905	PRR K4	M
906	PRR Banshee	S
907	W&LLR	S
908	NYC	M
909	C16	M
910	GS4 / Daylight	M
911	Shay	M
912	Heisler	S
915	K27	M
916	AT&SF	M
917	UP	M
918	Mallet	M
920	C&O	M

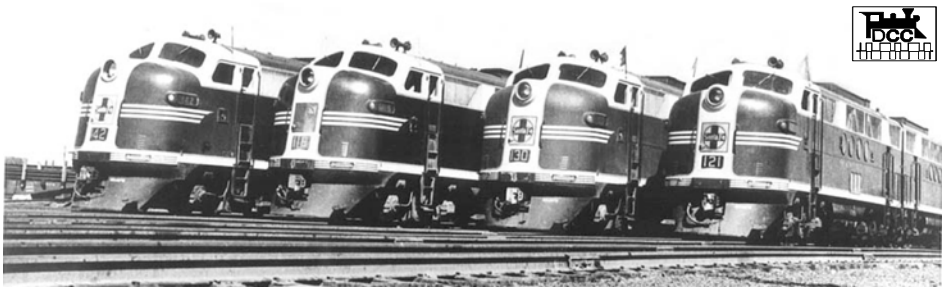
(M - Multichime, S - Single chime)

Sound System



see page 52 for trip magnets and extra reed switches.

DIESEL SOUND SYSTEMS for conventional DC operators, DCC operators, Other receivers, 1½" and others, or Stationary use!



DIESEL SOUND for your model train that will fit HO and larger locomotives. Featuring remote operation of the Horn and Bell where you want it and when you want it! Real motor sounds, with true 8 notches like the real thing. We offer actual raw, pure, appropriate sounds recorded from the locomotives. Just like it's suppose to be. Operate your railroad locomotive with the correct sounds instead of inappropriate sounds. While some Horn's aren't very pleasing to be heard, they are indeed correct! Horns are warning devices designed to get your attention, not something that is to be a pleasurable sound.

With our sound systems you can actually produce real Horn play patterns to signal exactly what the locomotive action is going to be or signal for a grade crossing, station stop, or departing from the station. The Horn will play as long as you request it to play. No canned play patterns here! Operate the real BELL with the motor running. Hear the BRAKE RELEASE as your locomotive starts to pull out. While checking for other sounds, listen for the COMPRESSOR RELIEF VALVE while your at idle or are running down the tracks. Real motor sounds, with a full 8 notches like the real thing. Force full rpm (notch 8) at any time to make that heavy load up the grade or simply to pump up the air tanks while sitting still. All sounds from actual recordings.

Realism at it's best!

Simple installation in some powered units or in a dummy unit (even a box car will do). You can also use this sound system as a stationary unit. Wire it to our 22 watt amplifier and a large, 10" or larger speaker, to shake the walls with our EMD systems.

Prime mover sounds available are the ALCO (both Road Engine and Switcher Engine), BALDWIN, EMD, FAIRBANKS MORSE, and GE with a choice of various horns. The horn selection consists of the Leslie 3 chime (most commonly used horn in North America), Leslie S3K, Leslie 5 chime, Nathan K3, Nathan K5L, Nathan P5, Wabco E2, and a single chime. The horn type must be selected with the motor type upon order. Since some prime movers would have only used early type horns we do not offer later type horns as a selection.

The DIESEL SOUND SYSTEM is available with different horns and prime mover sounds. These sound systems are designed and assembled in the U.S.A. offering long term reliability and support. Please refer to the following pages and the price schedule for additional types not shown in the catalog. If you don't see yours there we just might be working on it or if the need is there we just might possibly do it for all requesting it! Don't forget to also select a proper speaker (see page 6) for your sound unit selection. To view the installation instructions visit our web site. They can be found under Technical Downloads, Product Instruction Sheets.

Features:

- Prime Mover sound with 8 notches !
- Full RPM setting regardless of motor power - user operated *
- Horn - user operated *
- Bell - with simul motor sound ! user operated *
- Brake release sound
- Compressor relief valve sound
- Works with DC track power, receivers, and as a stationary unit as well as 1 1/2" and others!
- Adjustable notch threshold
- Adjustable volume control
- 2.7" x 0.95" footprint
- Easy to install
- Designed and assembled in the U.S.A.

*note:

- conventional DC requires controller #755, batteries, battery holders, power switch - see accessories DC sound, page 3. OR use the "automated" Horn units on page 14.
- DCC receiver req. 2 functions min.
- stationary operation requires switches (item's 524, 618) & remote power (item 689).

See page 4 for speaker selections.

Extra Facts - all of the early diesel prime movers are offered with the LESLIE A-200-156 horn .

Per excerpts from "EXTRA 2200 SOUTH" issue 49, page 25 (November - December 1974): The WABCO E-2 and LESLIE A-200 and A-125 were extensively used with first generation cab units and road switchers . . . . . The voice of the LESLIE A-200-156 is best characterized as the sound of the classic GG-1.

DIESEL - continued

ALCO Switcher prime mover

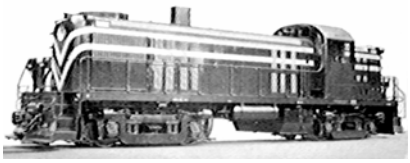
Item#	Horn type	Item#	Horn type
727	Leslie S3	728	Nathan K3
729	1 Chime	730	Wabco E2

such as: S-1, S-2, S-3, S-4, RS-1

ALCO Road Engine prime mover

Item#	Horn type	Item#	Horn type
675	Hancock	696	1 Chime
692	Leslie S3	721	Leslie S3K
693	Leslie S5	722	Nathan K5LA
694	Nathan K3	723	Wabco E2
695	Nathan P5	794	Leslie A200

such as: FA, FB, RS-2, RS-3, RSD, PA, PB



Baldwin prime mover

Item#	Horn type	Item#	Horn type
762	Leslie S3	764	Nathan K3
766	1 Chime	768	Wabco E2
796	Leslie A200		

such as: AS-16, AS-616, SHARK NOSE, CENTER CABS, also Switchers.

EMD prime mover

Item#	Horn type	Item#	Horn type
676	Hancock	701	1 Chime
697	Leslie S3	724	Leslie S3K
698	Leslie S5	725	Nathan K5LA
699	Nathan K3	726	Wabco E2
700	Nathan P5	798	Leslie A200

such as: FT, F-3, F-7, Passenger E UNITS, GP-7, GP-9, etc., also switchers.

DIESEL - continued

EMD Class66 item#639

Features manual play of each horn "De" and "Dar", controllable engine startup / shutdown sounds, and force N8. Brake release and prime mover notches are automatic based upon motor voltage application.

Fairbanks Morse prime mover

Item#	Horn type	Item#	Horn type
776	Leslie S3	778	Nathan K3
780	1 Chime	782	Wabco E2
799	Hancock	800	Leslie A200

such as: TRAINMASTER, C-LINERS, also Switchers & Bud Cars

GE prime mover

Item#	Horn type	Item#	Horn type
716	Leslie S-3K	717	Nathan K-5LA
718	Leslie S-3	719	Nathan K-3

such as: U boats, also Dash series.

GE 44 Ton

Item#	Horn type	Item#	Horn type
731	Leslie A-156	732	Hancock AW

ELECTRIC SOUNDS

GG-1

Item # 792

Put our authentic electric sounds into your locomotive! Hear PRR #4877 as actually recorded while in service! Actual sounds of the Cooling Blowers, Horn, Bell, and Brake Release. Pull the mighty GG1 out and hear the brakes release followed by the Cooling Blowers whining up to full rpm. Play the Horn the way #4877 did.....as long as you want! No canned play patterns here! Signal the appropriate locomotive movement with the activation of the Horn. Ring the bell with the blowers running or by itself sitting still!

Realism at it's finest.

ELECTRIC SOUNDS - continued

EP-5

Item # 677

All electric's, except MP54, features similar to GG-1 features with appropriate sound changes.

AEM7 / ALP44

Item # 793

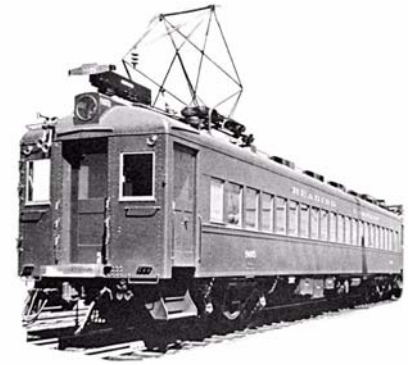
featuring the Hancock Air Whistle.

featuring a Nathan K5LA Horn used by AMTRAK.

MP-54 SOUND

Item # 636

Our prototypically correct MP54 Sound features are similar to the P.C.C. "Air Electric" Sound with an appropriate Horn.



MU SOUND

Item # 674

Our prototypically correct MU Sound features are similar to the other electrics shown above but with an appropriate Horn.

TRACTION CAR SOUNDS

TROLLEY SOUND

Early type w/o compressor - #634
Later type w/compressor - #635

Our prototypically correct Trolley Sound features: Bell, Horn, Door Operation sounds and Wheel on Rail sounds, each of these affects can be individually selected for integration into your operation. If desired, the horn can be manually operated. The bell will ring twice when the trolley begins to move as a warning for the passengers. With the door operation sounds integrated in your operation you will hear the doors close as the trolley pulls out from the station and then open shortly after making your next stop. You will hear the wheels ‘clicking’ over the rail joints at a varying rate based on motor voltage or you can choose for it will be as though you are operating on welded rail. For those who don't have any doors, like older trollies, they can be set not to play. Select an appropriate speaker from page 4.

P.C.C. SOUND

Early Type: "Air-Electric" - #636
Later Type: "All-Electric" - #637

Our prototypically correct P.C.C. Sound features are similar to the Trolley Sound with an appropriate Horn. The "Air-Electric" includes air operated doors and compressor sounds. The "All-Electric" includes electrically operating doors. The door sound can be selected to play or not.

DIESEL Systems with Automated Horn play patterns.

Sound Systems with the "G" operator in mind.

While the "Auto-Horn" systems can be utilized with Radio Receivers and Stationary use, we recommend using the Standard DC types that do not have the "auto-play" feature. By utilizing a standard DC type system, the Horn will only play as long as you keep the transmitter function or switch input activated instead of playing random Horn patterns when activated. This enables you to play any pattern desired. For those that don't deem this as important, or desire both reed switch and radio receiver use alternately, then the "auto-play" units are necessary.

DCv3 / auto-Horn

Sound System

Actual footprint - 0.95" x 2.7" x 0.5"

These DIESEL LOCOMOTIVE SOUND SYSTEM's were designed for the model railroader utilizing magnetic trips of the Horn and Bell. Each activation of the Horn triggers a different prototypical play pattern of the Diesel Locomotive's Horn. The Bell activates by tripping the Bell to play. The second trip will signal the Bell to stop. Horn triggers can occur during Bell triggers as well. This system can operate from track power and/or battery power.

Real motor sounds, with true 8 notches like the real thing. We offer actual raw, pure, appropriate sounds recorded from the locomotives. Just like it's suppose to be. Operate your railroad locomotive with the correct sounds instead of inappropriate sounds. While some Horn's aren't very pleasing to be heard, they are indeed correct! Horns are warning devices designed to get your attention, not something that is to be a pleasurable sound.

The sound system will automatically adjust the diesel prime mover rpm with changes in track or motor voltage (depends on wiring). Hear the BRAKE RELEASE as your locomotive starts to pull out. While checking for other sounds, listen for the COMPRESSOR RELIEF VALVE (air pops) while your at idle or running down the tracks. Real motor sounds, with a full 8 notches like the real thing. All sounds from actual recordings.

Realism at it's best!

The DIESEL SOUND SYSTEM is available with different horns and prime mover sounds. Please refer to the following pages and the price schedule for types available. If you don't see yours there we just might be working on it or if the need is there we just might possibly do it for all requesting it! These sound systems are designed and assembled in the U.S.A. offering long term reliability and support.

Prime mover (main engine) sounds available are the ALCO (both Road Engine and Switcher Engine), BALDWIN, EMD, FAIRBANKS MORSE, and GE with a choice of various horns. The horn type must be selected with the prime mover type upon order. Since some prime movers would have only used early type horns we do not offer later type horns as a selection.

These sound systems can be mounted in the engine or car (with track pickups) or they can be utilized in a stationary mode with the Horn and Bell being triggered by either the train carrying a magnet or other momentary switch input. The sound systems are packaged with two reed switches (item 989). Appropriate speakers can be found on page 6.

The following pages show the present Diesel and Electric systems available. Refer to the price sheet for additional units not shown in the catalog. Don't forget to also select a proper speaker (see page 4) for your sound unit selection. To view the installation instructions visit our web site. They can be found under Technical Downloads, Product Instruction Sheets. All item 9xx type sound systems listed operate via the automated Horn play patterns.

see page 52 for accessory items!

DIESEL System Automated Horn Selections

ALCO Switcher prime mover

Item#	Horn type	Item#	Horn type
921	Leslie S3	924	Leslie A200
922	Leslie S3K	926	Wabco E2

such as: S-1, S-2, S-3, S-4, RS-1

Photo's courtesy Aristo-Craft Trains

ALCO Road Engine prime mover

Item#	Horn type	Item#	Horn type
931	Leslie S3	934	Leslie A200
932	Leslie S3K	936	Wabco E2

such as: FA, FB, RS-2, RS-3, RSD, PA, PB

EMD prime mover

Item#	Horn type	Item#	Horn type
941	Leslie S3	944	Leslie A200
942	Leslie S3K	946	Wabco E2
943	Nathan K5LA		

such as: FT, F-3, F-7, Passenger E UNITS, GP-7, GP-9, etc., also switchers.

EMD Class66

item# 949

Features play of each horn pattern "De-Dar" and "De-Dar-De" via reed switch or other input.. Also features brake release with automatic "De" horn upon pulling out. Upon powering the board, an automated startup sound sequence is initiated.

For radio and other remote / DCC controls: controllable engine startup / shutdown sounds, and force N8.

GE prime mover

Item#	Horn type	Item#	Horn type
951	Leslie S3	953	Nathan K5LA
952	Leslie S3K		

such as: U boats, also Dash series.

Photo courtesy Aristo-Craft Trains

GE 44 Ton

Item#	Horn type	Item#	Horn type
958	Hancock AW	959	Leslie A-156

see page 52 for accessory items!

ELECTRIC System Automated Horn play selections

GG-1

Item # 971

Put our authentic electric sounds into your locomotive!

Hear PRR #4877 as actually recorded while in service! Actual sounds of the Cooling Blowers, Horn, Bell, and Brake Release. Pull the mighty GG1 out and hear the brakes release followed by the Cooling Blowers whining up to full rpm.

The Horn features automated play patterns triggered via a reed switch (included) and track side magnet. The Bell operates via another reed switch (included) and operates via a trip "on" - trip "off" triggering method. This way the bell can ring for as long as you like.

Realism at it's finest.

AEM7 / ALP44

Item # 973

The AEM7/ALP44 features all sounds appropriately recorded from that engine as well but utilizing a Nathan K5LA Horn used by AMTRAK.

EP-5

Item # 972

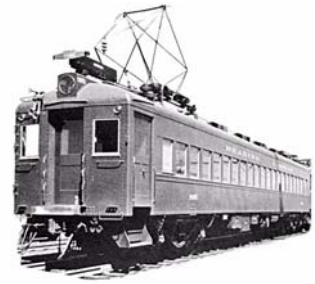
The EP-5 is equipped with the Hancock Air Whistle featured on all New Haven railroads!

All electric's, except MP54, features similar to GG-1 features with appropriate sound changes.

MP-54 SOUND

Item # 979

Our prototypically correct MP54 Sound features are similar to the P.C.C. "Air Electric" Sound with an appropriate Horn.



MU SOUND

Item # 974

Our prototypically correct MU Sound features are similar to the other electrics shown above but with an appropriate Horn.

TRACTION CAR SOUNDS

TROLLEY SOUND

Early type w/o compressor - #984
Later type w/compressor - #985

Our prototypically correct Trolley Sound features: Bell, Horn, Door Operation sounds and Wheel on Rail sounds, each of these affects can be individually selected for integration into your operation. If desired, the horn can be manually operated. The bell will ring twice when the trolley begins to move as a warning for the passengers. With the door operation sounds integrated in your operation you will hear the doors close as the trolley pulls out from the station and then open shortly after making your next stop. You will hear the wheels 'clicking' over the rail joints at a varying rate based on track voltage or you can choose for it will be as though you are operating on welded rail. Trolley sound system comes with two reed switches for the Horn and Bell operation. You can select if you want to utilize them or not. For those who don't have any doors, like older trollies, they can be set not to play. Select an appropriate speaker from page 4.

P.C.C. SOUND

Early Type: "Air-Electric" - #986
Later Type: "All-Electric" - #987

Our prototypically correct P.C.C. Sound features are similar to the Trolley Sound with an appropriate Horn. The "Air-Electric" includes air operated doors and compressor sounds. The "All-Electric" includes electrically operating doors. The door sound can be selected to play or not.

see page 52 for accessory items!

RDC, RAILBUS & DOODLEBUG SOUNDS

Standard DCv3 Systems

Item#	Type	Item#	Type
630	RDC - Hancock (New Haven)	632	Rail Bus
631	RDC - Leslie	633	Doodlebug

RDC

The RDC New Haven units feature the Hancock Air Whistle found on the New Haven RR. Standard RDC units are equipped with a single chime horn as equipped from the factory. Many railroads changed these horns after delivery or use over a period of years.

Auto Horn systems

Item#	Type	Item#	Type
980	RDC - Hancock (New Haven)	982	Rail Bus
981	RDC - Leslie	983	Doodlebug

Doodlebug

While the Auto-Horn systems can be utilized with Radio Receivers and Stationary use, we recommend using the Standard DCv3 types that do not have the "auto-play" feature. By utilizing a standard DC type system, the Horn will only play as long as you keep the transmitter function or switch input activated instead of playing random Horn patterns when activated. This enables you to play any pattern desired. For those that don't deem this as important, or desire both reed switch and radio receiver use alternately, then the "auto-play" units are necessary.

The standard DCv3 SOUND SYSTEM's were designed for the model railroader utilizing a switch input or LocoMatic™ controller for operation of the Horn and Bell. They can be used with DC, DCC, Radio, Stationary, and with AC track power (requires control via the LocoMatic™ controller).

They are similar to the Diesel systems shown on page 10. They will automatically adjust the prime mover rpm with changes in track or motor voltage.

Sounds produced are appropriate for the type of unit listed. These systems can be mounted in the engine or car (with track pickups). They can also be utilized in a stationary mode.

Appropriate speakers can be found on page 4.

All of these sound systems have the same physical appearance as the standard DC sound systems seen on page 14.

Rail Bus

Sound Systems with the "G" operator in mind.

The automated type (9xx series) SOUND SYSTEM's were designed for the model railroader utilizing magnetic trips of the Horn and Bell. Each activation of the Horn triggers a different prototypical play pattern of the Horn. The Bell activates by a magnet tripping the Bell on and then off.

This system can operate from track power and/or battery power. It will automatically adjust the diesel prime mover rpm with changes in track or motor voltage.

Sounds produced are appropriate for the type unit listed. These systems can be mounted in the engine or car. They can also be utilized in a stationary mode with the Horn and Bell being triggered by either the train carrying a magnet or other momentary switch input.

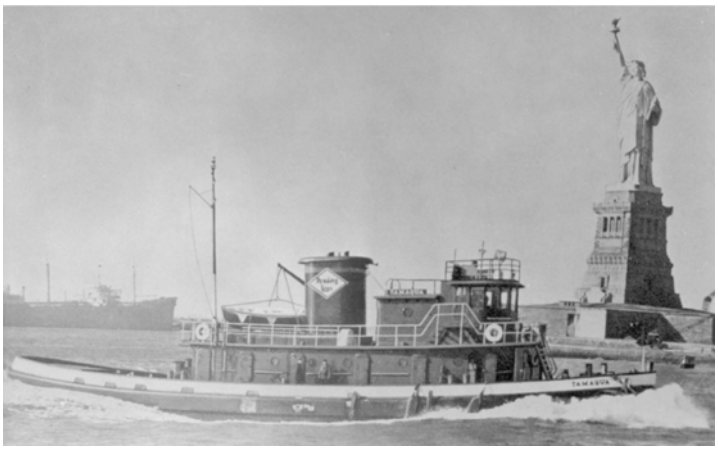
The sound systems are packaged with two reed switches. Appropriate speakers can be found on page 6.

All of these sound systems have the same physical appearance as the standard DCv3 sound systems seen on page 14.

see page 52 for accessory items!

Photo's on this page courtesy Aristo-Craft Trains

TUG BOAT & BOAT SOUNDS



The TUG BOAT / BOAT sound system can be powered from a battery, carrier control, radio control, fixed DC, or fixed AC. The TUG BOAT sound system is available in different configurations as shown in the table below. Item #623 contains a Fairbanks Morse Prime Mover (Diesel Engine) sound, as used in the Reading Co. and other tug boats. Item #687 has the deep throb of the EMD along with an appropriate single chime air horn. You may wish to add Item #672, our 22 watt amplifier, so that the low frequencies can be heard better in the larger outdoor space with the EMD prime mover. You can also add the amplifier to any of the other sound systems. Item #688 has the sound of a Steam powered Tug with an appropriate single chime air whistle with exhaust chuffs from the cylinders. All sound systems are coupled to the speed setting of the tug boat motor for automatic speed adjustments of the main sound, and include an appropriate boat Horn or Whistle. Since it can be wired to a radio receiver, it can be placed in any remote controlled seaworthy boat. The controller would have to provide a function output or a servo operated switch would be necessary to operate the Horn/Whistle and other appropriate options. Select an appropriate speaker from page 4. The Boat systems available are listed below as well as our price schedule. They have the same physical appearance as the standard DC sound systems.

Item#	type Diesel Engine	Horn/Whistle
623	Fairbanks Morse	W
624	Alco SW	H
625	Alco RE	H
626	Baldwin	H
687	EMD	H

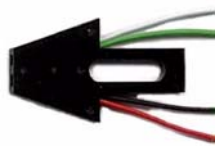
Item#	type Steam Whistle	
688	Single Chime	W

Photo courtesy Alan Zulberti

PT boat sound system, Item 627, features the PT boat engine starup to idle to full RPM with smooth transistions throughout. Engine speed is automatically adjusted from the motor voltage. The engine can be signaled to restart at any time. The system also has an appropriate Horn that can be activated at any time via a switch input. The Horn will continue to play as long as the input is activated. This system works with most radio control systems as discussed above. Select an appropriate speaker from page 6. The PT Boat systems available are listed below as well as our price schedule. They have the same physical appearance as the standard DC sound systems.

Steam Sound: Optical Synchronization

Item #583

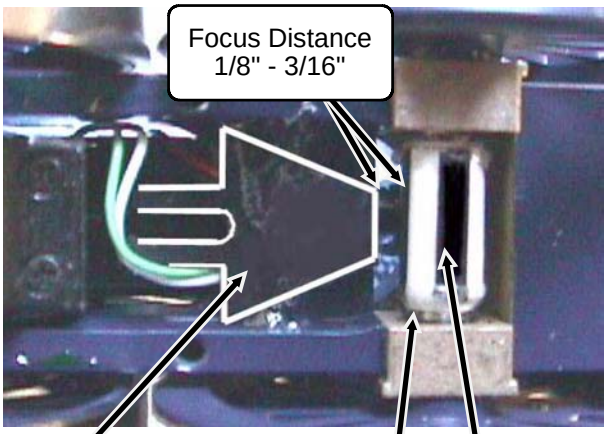


OPTICAL COUPLER

(ITEM #583)

SOUND UNIT optional reflective optical coupler mounts parallel to axle, can read reflective tips of installed square cam (factory installed on some engines) or install provided (or paint) black / white stripe quartered to drivers.Using reflective infra-red light, this coupler reads axle pattern for true chuff synchronization (4 chuffs per revolution or whatever you desire). Packaged with the pickup are various laser printed stripes for mounting on a drive axle (various diameters included) or rim locations. This pickup is optional for all steam sound systems. The infra-red optical pickup has 16" of wire attached to it. Since only 3 wires are necessary between the engine and tender, our item 521 or 758 are ideal for this application. See page 53 under heading - accessories / small connectors.

Optical coupler measures 0.1" thick X 0.25w @ front, 0.5" deep & 0.6" wide @ main optical rear - before mounting slot, mounting slot is 0.5" long X 0.25" wide.



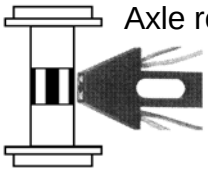
Optical Coupler (hi-lighted for ease of viewing) glued to frame 3/16" from optical end to pattern. In this installation, the end mounting ears had to be trimmed to obtain clearance to the drive gear box. When doing so care must be used to not damage the optics.

Optical pattern mounted on drive axle

apply a thin layer of glue on each side to prevent oil from contaminating the optical pattern.

Rim read

Axle read



Steam Sound: Reed Switch Synchronization

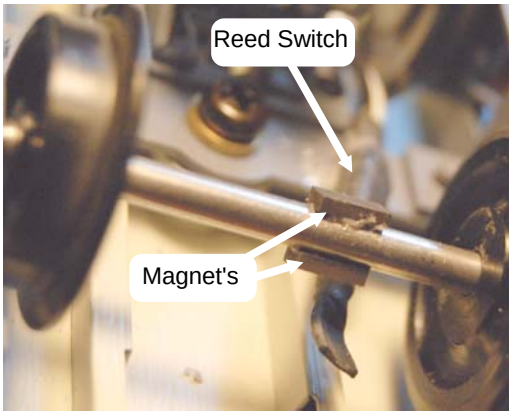
Item # 584

Axle synchronization can also be accomplished by gluing one or two magnets onto any axle. The reed switch is supplied with two wires and heatshrinked inside heatshrink tubing. These merely connect to the White and Black wires from the "sync" connector.

To create one chuff per revolution, which most will find creates the sound effect desired, merely glue one magnet onto the axle. For two chuff's per revolution, the second magnet needs to be glued onto the axle in the opposite position. Most trailing wheel sets are 1/2 the diameter of the main drivers, so two magnets would yield 4 chuffs per revolution of the main drivers.

These magnets are very small and measure only 0.1" wide x 0.2" long x 0.045" thick.

Two magnets and one reed switch assembly are included in this package.



AC SOUND SYSTEM OVERVIEW

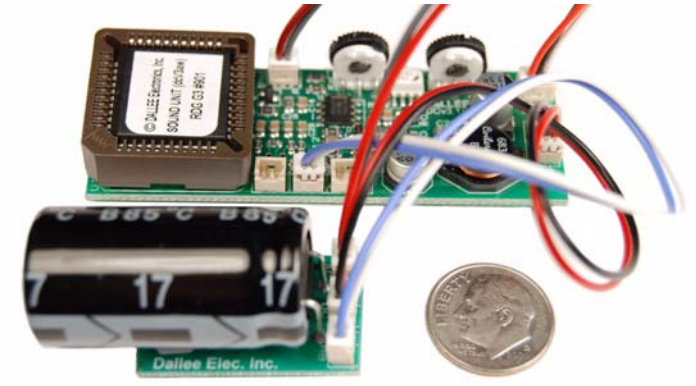
The AC SOUND SYSTEM consists of two boards. The first board is the power supply board and Whistle/Horn/Bell decoder for standard AC operators. The second board is the main sound system. This system can be connected to virtually any locomotive operating with standard AC track power. To operate the Whistle/Horn and Bell requires conventional control buttons. These can be found as external control units or integral to the transformer. Dallee also offers two conventional controllers. Information on these can be found on the following page.

The main sound board measures less than 1" wide X 2¾" long X ½" high. The power supply board is quite small, it measures less than ¾" wide X 1.¾" long X 1" high. The volume control is located on the main sound board as well as a rate control. There are two connecting wire harnesses between the power supply board and the main sound board which are 6" in length. They both are equipped with double sided tape to secure them to the chassis. You do however have to select an appropriate speaker, listed on page 6. These speakers were specifically selected for their sound output versus the audio input power as well as their sound quality and durability. They are quite efficient! For most "O" gauge installations, the recommended speaker would be item #214, "S" gauge installations would use item #212 or #213. Both gauges could also utilize some of the oval speakers as well. The oval speakers are highly recommended for diesel locomotive's with an EMD type prime mover since these produce low frequencies.

The steam sound systems feature an "auto-chuff" function. This will produce 16 levels of exhaust chuff versus the applied motor voltage. This way the exhaust chuff will speed up and slow down in a smooth fashion instead of jumping to different exhaust rates as you run your locomotive. You can also elect to make the steam sound system synchronized via our optical pickup (item 583) or a switch input.

There are two controls on the sound board. The first is to set the volume, the second is to either set the auto-chuff chuff speed or the diesel rpm versus the motor voltage. This allows you to set the desired speed at which the sounds operate in regards to the applied motor voltage. This way you can fine tune how your sound system will respond to the applied motor voltage.

If you choose to utilize the LocoMatic™ Controller, then you can also operate extra features of the sound system. You will however require an additional choke (item 701 or 702). The extra features for a Steam sound system include "main sounds off" and "cylinder blow down". The "main sounds off" feature allows the operator to turn off all of the sounds produced by the sound system except for the Whistle and Bell. The "cylinder blow down" function allows for the operator to open the ball-cock's up on the steam locomotive before pulling the engine out. This allows for steam to clear up any condensed water in the cylinders before pulling the train out. The extra features for a Diesel Locomotive are "main sounds off" and "force Notch 8". Again, the "main sounds off" feature allows the operator to turn off all of the sounds produced by the sound system except for the Horn and Bell. The "force Notch 8" feature allows the operator to override any existing notch (RPM) that the prime mover is operating at. This allows the prime mover to operate full bore so that enough propulsion energy can be made to pull the heavy load up a grade as well as pump up the air tanks before pulling the train out. Don't forget, Diesel locomotives operate via electric motors. The Diesel motor turns a generator which makes the electricity to power the electric traction motors. So it is necessary for the prime mover to generate a lot of electric power when pulling a heavy load up a grade. With this function, you can simulate this type of operation yielding a more prototypical operation or your train.



AC power board

Actual footprint - 0.75" x 1.75" x 1"

DCv3

Sound System

Actual footprint - 0.95" x 2.7" x 0.5"

Wire harnesses between boards are 6" in length to assure easy placement of boards. Other connectors, with 6" wire lengths, included.

AC SOUND CONTROLLERS

Item #1101, 1102

For conventional sound systems operating on standard AC track power!

AC controllers will operate standard sound systems in AC powered trains. The AC Sound Controllers have three buttons: Direction, Whistle / Horn, and Bell.

Controller item 1101 exhibits a slight voltage loss to the track when the Whistle/Horn or Bell buttons are operated. Item 1102 does not.

Wiring is simple, two wires from the AC transformer's variable output to the controller and then from the controller to the track.

Both units operate from the standard AC transformers variable output power and can handle up to 10 ampere's of track current.

AC STEAM SOUND

Unlike other sound systems playing pretend sounds we play the actual raw, pure, appropriate sounds from the real locomotive. Just like it's suppose to be. Operate your railroad locomotive with the correct sounds instead of the make believe sounds. While some Whistle's aren't very pleasing to be heard, they are indeed correct! Whistles are warning devices designed to get your attention, not something that is to be a pleasurable sound. More pleasing multi-chime whistles came into existence during the later years of passenger service. We also have them in the lineup.

With our sound systems you can actually produce real Whistle play patterns to signal exactly what the locomotive action is going to be or signal for a grade crossing, station stop, or departing from the station. Play the real WHISTLE the way you want to. The Whistle will play as long as you request it to play, dips & all (whistle dependent). No canned play patterns here! Hear the real BELL operate. Hear the EXHAUST CHUFFS increase to your selected speed automatically or if you choose, correctly synchronized (optional feature). Listen for the BLOWERS, AIR PUMPS, and SAFETY VALVE while your locomotive is at rest under fire. The whistles are as pleasing or obnoxious as the real whistle. Don't forget, they were warning devices. More pleasing sounding whistles came about as passenger service evolved.

Realism at it's best !

The STEAM SOUND SYSTEM is available with different whistle types, we also change the other sounds, such as the bell or exhaust chuff, as appropriate for the type of locomotive that would use the selected whistle! Please refer to the following pages and the price schedule for present types available. These sound systems are designed and assembled in the U.S.A. offering long term reliability and support.

AC STEAM SOUND

Features:

- Chuff - full dynamic rate with motor power or synchronize with an optional optical switch (see page 19 for details) or cam operated switch. Volume increases / decreases with motor voltage. Cutoff control also adjusts automatically. Adjustable max Chuff rate when used in auto-chuff mode. Can select no chuff.
- Whistle - user playable
- Bell - user operated
- Cylinder blow out*
- Blowers
- Air Pumps play at random
- Safety Valve plays at random
- Works with any E-Unit
- AC track power
- LocoMatic™ Compatible*
- TMCC™ compatible in conventional mode**
- Adjustable volume control
- Easy to install
- Designed and Made in the U.S.A.
- Select an appropriate speaker on page 4
- Other sound control features*

*Requires LocoMatic™ Controller and other items for extra features. LocoMatic™ of Dallee Electronics, Inc.

**TMCC™ of Lionel L.L.C.

The following sound units operate with standard Whistle/Bell control's:

Item#	Whistle	type
1001	Reading G-3 / Consolidation	M
1002	Reading I-10 / Freight	M
1003	Small Steam / Switcher	S
1004	PRR T-1 / Passenger	M
1005	PRR K4	M
1006	PRR Banshee / Freight	S
1007	W&LLR	S
1008	NYC	M
1009	C16	M
1010	SP-GS4 / Daylight	M
1011	Shay	M
1012	Heisler	M
1016	AT&SF	M
1017	UP	M
1018	Mallet	M
1020	C&O	M

(M - Multichime, S - Single chime)

AC DIESEL SOUND

Real motor sounds, with true 8 notches, just like the real thing. Unlike other sound systems playing pretty sounds we play the raw, pure, appropriate sounds from the real locomotive. Just like it's suppose to be. Operate your railroad locomotive with the correct sounds instead of the pretend sounds. While some horn's aren't very pleasing to be heard, they are indeed correct! Horns are warning devices designed to get your attention, not something that is to be a pleasurable sound.

With our sound systems you can actually produce real horn play patterns to signal exactly what the locomotive action is going to be or signal for a grade crossing, station stop, or departing from the station. The horn will play as long as you request it to play. No canned play patterns here! Operate the real BELL with the motor running. Hear the BRAKE RELEASE as your locomotive starts to pull out. While novel in some systems, in our systems, we always require the brakes to release before applying any motor power. When motor power is applied, it is done in a smooth transistion, no jack rabbit starts here. After all, it just wouldn't be appropriate. While checking for other sounds, listen for the COMPRESSOR RELIEF VALVE while your at idle or are running down the tracks.

Realism at it's best !

This is the most accurate, realistic, playable, sound system on the market. They are the closest to real life locomotives!

If you add the LocoMatic™ controller you not only get lighting features, you also get the ability to have the locomotive operate at notch 8 while sitting still. Locomotives do this to pump the air up in the tanks so that the train can release the brakes on all of the cars leaving the locomotive as the controlling element.

Features:

- Motor sound with 8 notches !
- Horn - user operated
- Bell - user operated, with simul motor sound
- Brake release sound
- Compressor relief valve sound
- Force Full RPM*
- Works with any "E" unit.
- Conventional AC track power
- LocoMatic™ Compatible*
- TMCC™ compatible in conventional mode**
- Adjustable volume control
- Easy to install
- Already built & tested!
- Designed and Made in the U.S.A.
- Select an appropriate speaker on page 4
- Other sound control features*

*Requires LocoMatic™ Controller and other items for extra features. LocoMatic™ of Dallee Electronics, Inc.

**TMCC™ of Lionel L.L.C.

The DIESEL SOUND SYSTEM is available with different horns and prime mover sounds. Please refer to the following pages and the price schedule for present types available. Choose the system that fits your locomotive.

Visit our web site for installation instructions and pictures under Technical Downloads, Product Instruction sheets. These sound systems are designed and assembled in the U.S.A. offering long term reliability and support.

For those needing to know, a prime mover is the actual motor inside the locomotive. Different manufacturers of the locomotves used different motors which all had a different sound. This is why we have such a wide selection of prime movers!

AC DIESEL SOUND

ALCO Switcher prime mover

Item#	Horn type	Item#	Horn type
1021	Leslie S3	1024	Leslie A200
1022	Leslie S3K	1026	Wabco E2

such as: S-1, S-2, S-3, S-4, RS-1

ALCO Road Engine prime mover

Item#	Horn type	Item#	Horn type
1031	Leslie S3	1034	Leslie A200
1032	Leslie S3K	1036	Wabco E2

such as: FA, FB, RS-2, RS-3, RSD, PA, PB

BALDWIN prime mover

Item#	Horn type	Item#	Horn type
1091	Leslie S3	1096	Wabco E2
1094	Leslie A200		

such as: AS-16, AS-616, SHARK NOSE, CENTER CABS, also Switchers.

EMD prime mover

Item#	Horn type	Item#	Horn type
1041	Leslie S3	1044	Leslie A200
1042	Leslie S3K	1046	Wabco E2
1043	Nathan K5LA		

such as: FT, F-3, F-7, Passenger E UNITS, GP-7, GP-9, etc., also switchers.

Fairbanks Morse prime mover

Item#	Horn type	Item#	Horn type
1061	Leslie S3	1064	Leslie A200
1062	Leslie S3K	1066	Wabco E2

such as: TRAINMASTER, C-LINERS, also Switchers & Bud Cars

GE prime mover

Item#	Horn type	Item#	Horn type
1051	Leslie S3	1053	Nathan K5LA
1052	Leslie S3K		

such as: U boats, also Dash series.

GE 44 Ton

Item#	Horn type	Item#	Horn type
1058	Hancock AW	1059	Leslie A-156

AC ELECTRIC's SOUND

Put our authentic electric sounds into your locomotive! Now you can hear PRR #4877 as actually recorded while in service! Actual sounds of the Cooling Blowers, Horn, Bell, and Brake Release. Pull the mighty GG1 out and hear the brakes release followed by the Cooling Blowers whining up to full rpm. Play the Horn the way #4877 did.....as long as you want! No canned play patterns here! Signal the appropriate locomotive movement with the activation of the Horn. Ring the bell with the blowers running or by itself sitting still!

Realism at it's finest.

GG-1

Item # 1071

All electric's, except MP54, features similar to GG-1 features with appropriate sound changes.

EP-5

Item # 1072

featuring the
Hancock Air Whistle.

AEM7 / ALP44

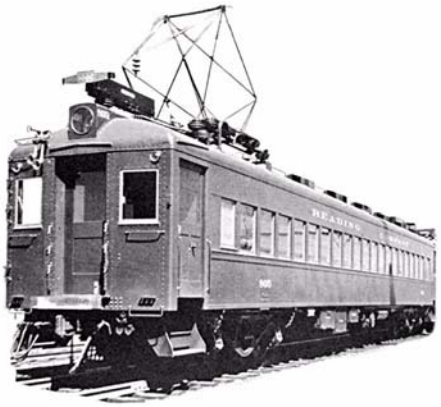
Item #1073

featuring a Nathan K5LA Horn used by AMTRAK.

MP-54 SOUND

Item # 1079

Our prototypically correct MP54 Sound features are similar to the P.C.C. "Air Electric" Sound with an appropriate Horn.



MU SOUND

Item # 1074

Our prototypically correct MU Sound features are similar to the other electrics shown above but with an appropriate Horn.

AC TRACTION CAR SOUNDS

TROLLEY SOUND

Early type w/o compressor - #1084
Later type w/compressor - #1085

Our prototypically correct Trolley Sound features: Bell, Horn, Door Operation sounds and Wheel on Rail sounds, each of these affects can be individually selected for integration into your operation. If desired, the horn can be manually operated. The bell will ring twice when the trolley begins to move as a warning for the passengers. With the door operation sounds integrated in your operation you will hear the doors close as the trolley pulls out from the station and then open shortly after making your next stop. You will hear the wheels 'clicking' over the rail joints at a varying rate based on motor voltage or you can choose for it will be as though you are operating on welded rail. For those who don't have any doors, like older trollies, they can be set not to play. Select an appropriate speaker from page 4.

P.C.C. SOUND

Early Type: "Air-Electric" - #1086
Later Type: "All-Electric" - #1087

Our prototypically correct P.C.C. Sound features are similar to the Trolley Sound with an appropriate Horn. The "Air-Electric" includes air operated doors and compressor sounds. The "All-Electric" includes electrically operating doors. The door sound can be selected to play or not.

AC operators: RDC, RAILBUS & DOODLEBUG SOUNDS

AC Sound Systems

Item#	Type	Item#	Type
1030	RDC - Hancock (New Haven)	1032	Railbus
1031	RDC - Leslie	1033	Doodlebug

RDC

The RDC New Haven units feature the Hancock Air Whistle found on the New Haven RR. Standard RDC units are equipped with a single chime horn as equipped from the factory. Many railroads changed these horns after delivery or use over a period of years.

The standard AC SOUND SYSTEM's were designed for the model railroader utilizing the standard conventional Whistle / Bell controller or the LocoMatic™ controller for operation of the Horn, Bell and other sound functions. This system consists of two boards, the AC power board and the sound board.

They will automatically adjust the prime mover rpm with changes in motor voltage.

Sounds produced are appropriate for the type of unit listed. These systems can be mounted in the engine or car (with track pickups). If mounting in a car, for best results you should have an e-unit connected as well, otherwise the sound system will ramp up and down with track voltage. E-Unit #518 would be ideal for this type of installation.

Appropriate speakers can be found on page 4.

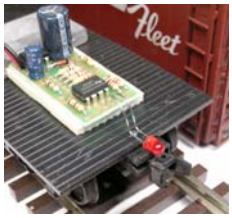
Doodlebug

Rail Bus

F. R. E. D.

3mm - # 556

5mm - #1539



The FRED can be powered by a 9 volt battery, fixed voltage (6-20 volts) AC, DC, DCC, or by track power. The electronic circuitry produces a high intensity flash of an ultra bright red LED and is usable as an "end of train" device, on top of water tanks, towers, ambulances, fire trucks, locomotives, caboose's or other applications. They will fit HO and larger cars.

The FRED is furnished with double sided mounting tape and includes wire leads with a 9 volt battery clip installed. For other power sources simply cut the battery clip from the wires. If an on/off switch is desired, item #524 does the job!

F.R.E.D. stands for Flashing Rear End Device.

STROBE

3mm - # 545

5mm - #1535

On top of caboose or engine

The STROBE can be powered by a 9 volt battery, fixed voltage (6-20 volts) AC, DC, DCC, or by track power. The electronic circuitry produces a high intensity flash of an ultra bright T1 incandescent white LED and is usable on top of water tanks, towers, ambulances, fire trucks, locomotives, caboose's or other applications. They will fit HO and larger cars.

The STROBE is furnished with double sided mounting tape and includes wire leads with a 9 volt battery clip installed. For other power sources simply cut the battery clip from the wires. If an on/off switch is desired, item #524 does the job!

MARS LIGHT

Mars Light in engine

3mm : single # 546

dual # 547

5mm : single #1537

dual #1538

The MARS effect is achieved utilizing a high intensity ultra-bright incandescent white LED. This type of LED produces light similar to that of a regular filament light bulb. The MARS is usable in locomotives, on top of water tanks, towers, ambulances, fire trucks, or caboose's. Wherever the effect is desired.

The MARS is designed to operate from track or motor power and is directional in operation for DC operators, or those utilizing DC motors in their engines with any type of track power (AC, DC, DCC, Radio Receiver - track or battery powered). The MARS light will start to illuminate at approximately 4 volts DC and start it's gyration at a slightly higher voltage. AC operators, with DC motors or utilizing E-Units similar to DALLEE #518 or #400, can merely connect the input power to the motor leads and the MARS will operate when the motor is in one direction and not the other. Otherwise, on AC track power, the MARS light will operate continuously without regard to engine direction. For stationary operation, a fixed AC or DC voltage may be used.

The MARS will accept any type of input voltage up to 24 volts. It consumes only a few milliamps to operate. It can also be powered with a 9 volt battery or fixed voltage AC, DC, DCC or other, for those seeking constant operational settings.

The MARS is furnished with double sided mounting tape and includes wire leads. If an on/off switch is desired, item #524 does the job.

Item #547 is a dual mars light which contains two incandescent white LED's which work in unison.

Customized high current MARS LIGHTS are also available for the 1 1/2" operators. Call for details.

BEACON LIGHT

3mm - # 557

5mm - #1536

The BEACON utilizes a high intensity ultra-bright RED LED. The BEACON is usable on top of water tanks, towers, and bridges as well as many other places wherever the effect is desired. The BEACON oscillates it's LED gradually on and off with a flash of high intensity when it's fully on.

The BEACON can be powered by a 9 volt battery, fixed voltage (6-20 volts) AC, DC, DCC, or by track power.

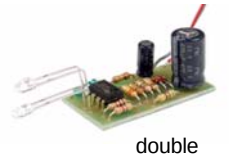
The BEACON is furnished with double sided mounting tape and includes wire leads with a 9 volt battery clip installed. For other power sources simply cut the battery clip from the wires. If an on/off switch is desired, item #524 does the job!

Strobe

Beacon

single

Mars



double

All units have the same footprint of 0.84" x 1.65" but vary in their LED color and operation as described.

Halogen Lamp type F.R.E.D, STROBE, MARS, BEACON

These units are primarily for 1" and larger operators. They can also be used in a stationary environment.

Description	size	item#
Beacon	5/8"	1540
Beacon	2"	1541
STROBE	5/8"	1543
STROBE	2"	1544
MARS	5/8"	1546
MARS	2"	1547
F.R.E.D	5/8"	1550
F.R.E.D	2"	1551

All units produce white light, proper colored lenses are required for different light production.

Replacement high intensity 5/8" halogen lamp: Item #1548

Replacement high intensity 2" halogen lamps: Item #1549

MR-8 lamp

MR-16 lamp

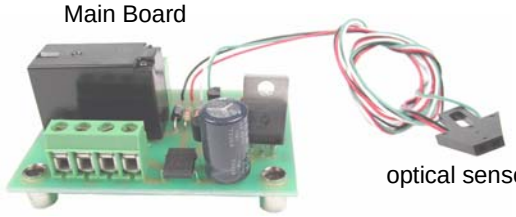
All lamps are a narrow beam for the best concentrated light and effect.

These units are designed to operate with a 12 volt, high capacity, battery or fixed supply of 12 volts. They require at least 20 watts. The lamp is supplied with a proper socket to the base. Mounting the lamp properly is required.

Turntable Indexer

Item # 617

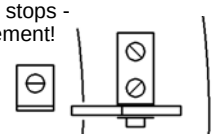
Main Board



optical sensor

rotating lower disc with multiple stops - may be set for any degree increment!

shown aligned to stop position.



The TURNTABLE INDEXER is designed to stop the motor driving any turntable at many locations set by you. This unit consists of a main circuit board that requires the use of a fixed AC voltage to power it and a variable source to operate the turntable motor. The TURNTABLE INDEXER consists of a relay to switch the power to your motor on and off as neccessary, and INFRA-RED OPTICS to be used for alignment purposes. Space is needed to mount the optics and a rotating disc below the turntable is neccessary for angle brackets that are needed for alignment to the optics. Installation and alignment is quite simple. You merely fabricate angle brackets out of thin shim stock or paper clips, mount them at appropriate positions for bed alignment to the optics, and then secure them with a screw. If at any point a stall becomes misaligned, you merely loosen the angle bracket and resecure at the corrected position. You can also use the pre-printed laser patterns supplied. These need to be mounted to any angle bracket or small blocks of wood (not included).

Once the unit is installed and aligned you merely press the pushbutton (included) to start moving to the next stop position. If you do not want to stop at the next position, merely press the pushbutton during transition past the undesired stop position. A pushbutton is supplied since it is easier to align with, you can substitute a single pole single throw toggle switch instead.

This turntable indexer was designed specifically for the BOWSER turntable and motorizing kit but can be adapted for use with practically any turntable.

Adjustable Regulated "LED" Lighting

Regulated LED Lighting uses track or other low voltage input power to provide illumination. Maximum illumination is reached at a very low voltage and remains constant for the balance of the speed range. Regulated LED Lighting gives a more intense and uniform illumination, uses less current and tends to ignore power interruptions caused by dirt on wheels and track resulting in more flicker free lighting.

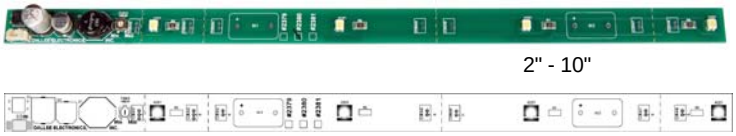
Warm White....similar to a filament bulb for most cars. Cool White ....lighting found in modern cars.

Amber.....kerosene lamp look.

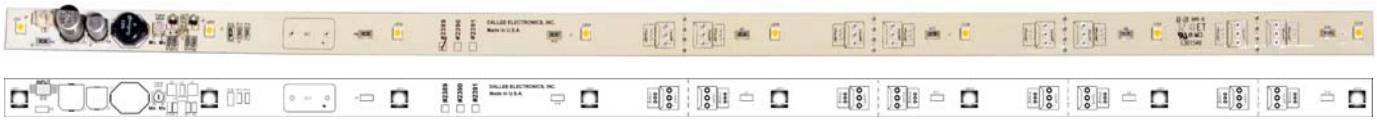
Regulated LED Lighting is available in the following configurations:

item #	2½" - 10" color
2379	Warm White
2380	Cool White
2381	Amber

item #	9" - 18" color
2389	Warm White
2390	Cool White
2391	Amber



2" - 10"



9" - 18"

The RL-LED boards are ½" x 10" or ½" x 18" long and contain four or eight LED's (depending on unit) positioned to create uniform lighting throughout its length. The RL-LED contains regulated variable intensity adjustment from a minimum brightness to full brightness. The power section is located on one end of the board, for the 10" units, thus allowing for the LED sections to be broken off and moved from the straight strip thus accommodating various size installations such as cabooses (most will only need 1 LED) or other shorter cars. The sections can be connected with wires or utilize item #757 connectors (10" boards). Larger connectors, item 521, can also be used with the 18" boards. The 18" boards, cannot be made smaller than 9" length while the 10" board can have the entire power module removed from the LED's with a small amount of wiring between the two units (power module and LED's). The RL-LED is secured with double sided tape. More can be purchased if needed (item 388).

The LED's are less than 0.1" in height and have a 120 degree viewing angle thus allowing for illumination in all directions. The typical light output for the Warm and Cool White LED's is 18 lumens per LED which is 72 lumens per 10" board and approximately 140 per 18" board! This intensity is greater than that of any group of light bulbs at the same power level. They are blinding to the naked eye and really can't be viewed directly - unless you want to see spots before your eyes! The 18" boards use the same amount of low current as the 10" boards! The Amber LED's do not produce the intensity of the other units but do provide the same 120º viewing angle.

Instructions, on our web site, show how to add extra LED's if needed for markers or drumheads.

The RL-LED boards can also be used to illuminate display cases, as well as buildings, without worrying about heat generated by lamps or paint pigment discoloration due to infra-red light as from standard florescent lamps. Besides the cool operation, you will also be saving on the cost of electricity to illuminate your displays!

Item 2379 installed in an "O" gauge passenger car taken in a daylight illuminated room.

Item 2390 installed in an Atlas-O Bombardier car.

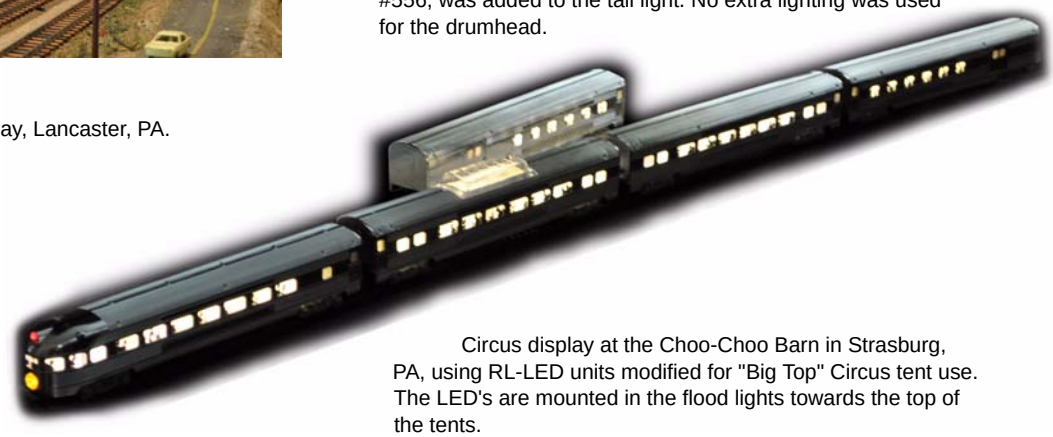
LED lighting installations, continued

Item 2380 installed in "G" gauge caboose. Marker lamps were changed to use red led's, item 532, and wired to work with the LED lighting strip. Item 541 limiting resistor is also required. All pictures was taken in a daylight illuminated room.

Amber boards were used in the Aristo heavyweight (upper left) & Am Models.

Warm white, #2379, used in AF chrome coaches. A F.R.E.D., #556, was added to the tail light. No extra lighting was used for the drumhead.

Cool White used in Amtrak cars.
Picture from "All Aboard RR" display, Lancaster, PA.



As with these examples, you can see how versatile these lighting strips can be. Illumination of stations and other areas is easily done for a long lasting operation! More application pictures can be seen on our web site!

Item 2379 installed in cut glass display cabinet. Four boards were used. Not only saving a lot of power to illuminate it, but the internal heat is next to non-existent compared to using light bulbs. The background was fairly dark and has been removed to save toner when printing.

Circus display at the Choo-Choo Barn in Strasburg, PA, using RL-LED units modified for "Big Top" Circus tent use. The LED's are mounted in the flood lights towards the top of the tents.

Baseball diamond at the Choo-Choo Barn display in Strasburg, PA, using four RL-LED units modified for "flood light" use.

Electronic "E" Units
Sequence Reverse

The Electronic "E" Unit provides direction sequencing of locomotives that are designed to operate with AC track power. Our Electronic "E" Unit provides the user with greater control at slower speeds since it is completely solid state! There are no relays to activate or drums to turn yielding positive control with power engaged to the motor with minimal track voltage.

These Electronic "E" Units are designed to provide sequential direction control for the later locomotives with permanent magnet DC motors as well as series AC motors. Item #1400 is the grand daddy of all three types of E-Units. It will power earlier series AC and permag DC motors with up to twelve (12) amperes of current! It is the ideal unit for multiple motored engines, and standard gauge units, requiring that extra power handling capability. Item #400 powers earlier series wound field type AC motors as well as DC motors. Item #400 will handle four (4) amperes of current flow, sufficient for some dual motored locomotives. Item #518 is limited to two (2) ampere and is intended for smaller locomotives with single DC motors. While most operators will use AC track power, these "E" unit's will also sequence with DC track power.

The initial "power on" state is user selectable so you can decide if you want the locomotive to start in either FORWARD or NEUTRAL. Provision is made so that a switch (item 524, not supplied) can be installed to lock the "E" unit in its initial state. Lock in FORWARD for automation applications or lock in NEUTRAL to allow sound systems to function with a static locomotive. If power is off for approximately 6 seconds, the "E" unit will reset to its initial "power on" position. The "E" unit was also designed for easy installation of accessory items such as lighting. Many lighting variations are possible and easy to incorporate because of the design of this "E" unit. Complete installation instructions are included with the unit. Lighting variations are shown on page 2 of the 400 "E" unit which is available on our web site. As with all of our AC product line, this unit is compatible with all types of acceptable AC track power. These units offer superior operation over previous older units as well as other manufacturer's.

Item #518 and #400 come equipped with appropriate wire harness to plug into the E-Unit headers. Item #1400 has a clamp style barrier strip to connect your wires. All units contain a 2 pin wire harness to connect to the lockout input.

#518 E-Unit

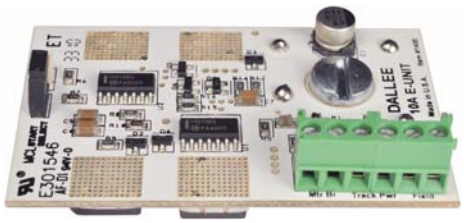
2 ampere capacity for DC motors

0.95"w x 1.95"l x 0.4"h
(0.5" at jumper select)

#1400 E-Unit

12 ampere capacity for AC and DC motors

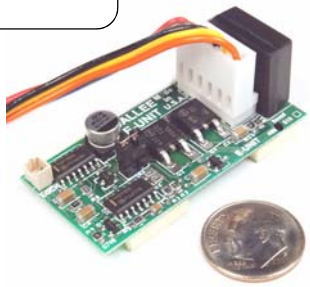
1.5"w x 2.5"l x 0.9"h

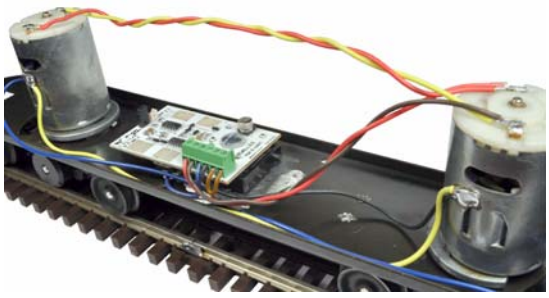


#400 E-Unit

4 ampere capacity for AC and DC motors

0.95"w x 1.95"l x 1" to ½"h (varies)

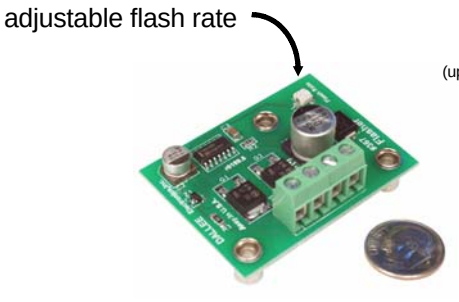




#1400 shown connected in a chassis using dual DC (permag) motors.

FLASHER
Grade Crossing Light Flasher

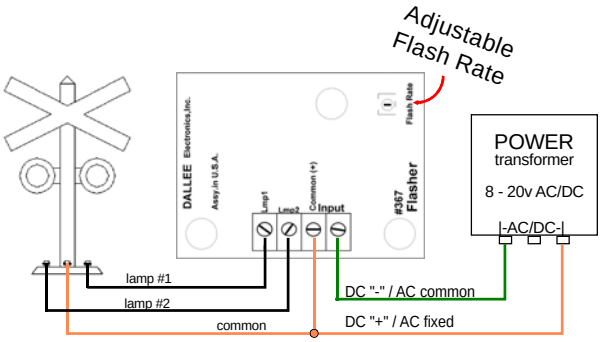
Item # 367



Meas 1.5" x 2.0"

two crossbucks may be connected to 1 flasher

(up to 3 amps per lamp ouput)



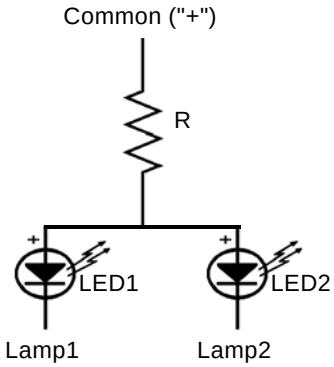
The FLASHER circuit is completely solid state and operates with either AC or DC input power.

Each of the two outputs can handle up to 3 ampere of current so it is possible for the FLASHER to illuminate several crossing lights at the same time. The FLASHER has an adjustment potentiometer allowing the flash rate to be varied to suit the users preference. Typical range is from 1 - 3.5 Hz (1 - 0.275 second).

A simple on-off switch in the "INPUT" or "COMMON" connection can be used to manually activate the FLASHER. For automatic operation with 3 rail track, insulate a section of one outside rail allowing the wheels and track to function as the switch in the "common" (instructions illustrating this installation included with Flasher). It is also possible to use TRAK-DT, TRAK-DTT, TRAK-DTT2, TRAK-DTL, OPTO-DT, or similar items as a switch to turn on the FLASHER.

Multiple crossbucks would be wired in parallel to each other. A single crossbuck is shown for ease of wiring instructions.

Crossbuck wiring using LED's



input V_{max}	R	Item#
12	390	535
22	1k	558

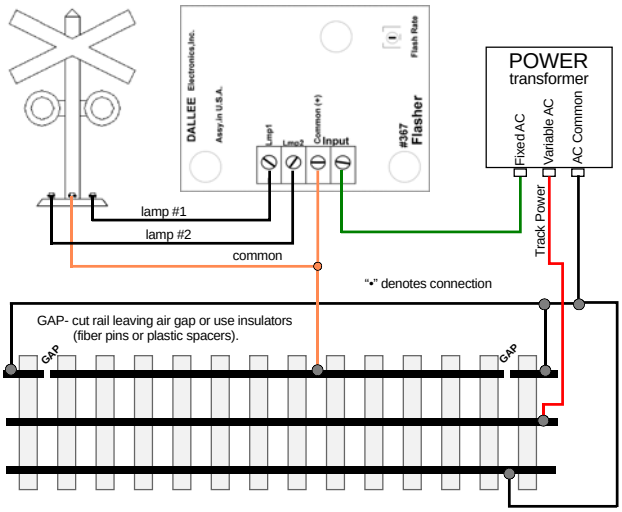
LED's are current type devices, not voltage devices like light bulbs. Therefore you have to use a limiting resistor to operate the LED's. Otherwise you will burn out the LED's. Since only one LED is on at a time, only one limiting resistor is required for one crossbuck. Values shown are for RED LED, item 532.

The "input Vmax" shown is for the opeating voltage of the Flasher (item 367), or Grade Crossing Controller with Bell Sound (item 587) units.

Only 1 resistor is needed per pair of LED's since only one is on at a time.

Wiring 3-Rail track for automatic operation

Crossbuck shown has the "common" terminal in the center. Some crossbuck's may have the "common" connection on one end instead of the middle. If the lights don't flash alternately, then you don't have the common wire connected to the common of the crossbuck lamps.

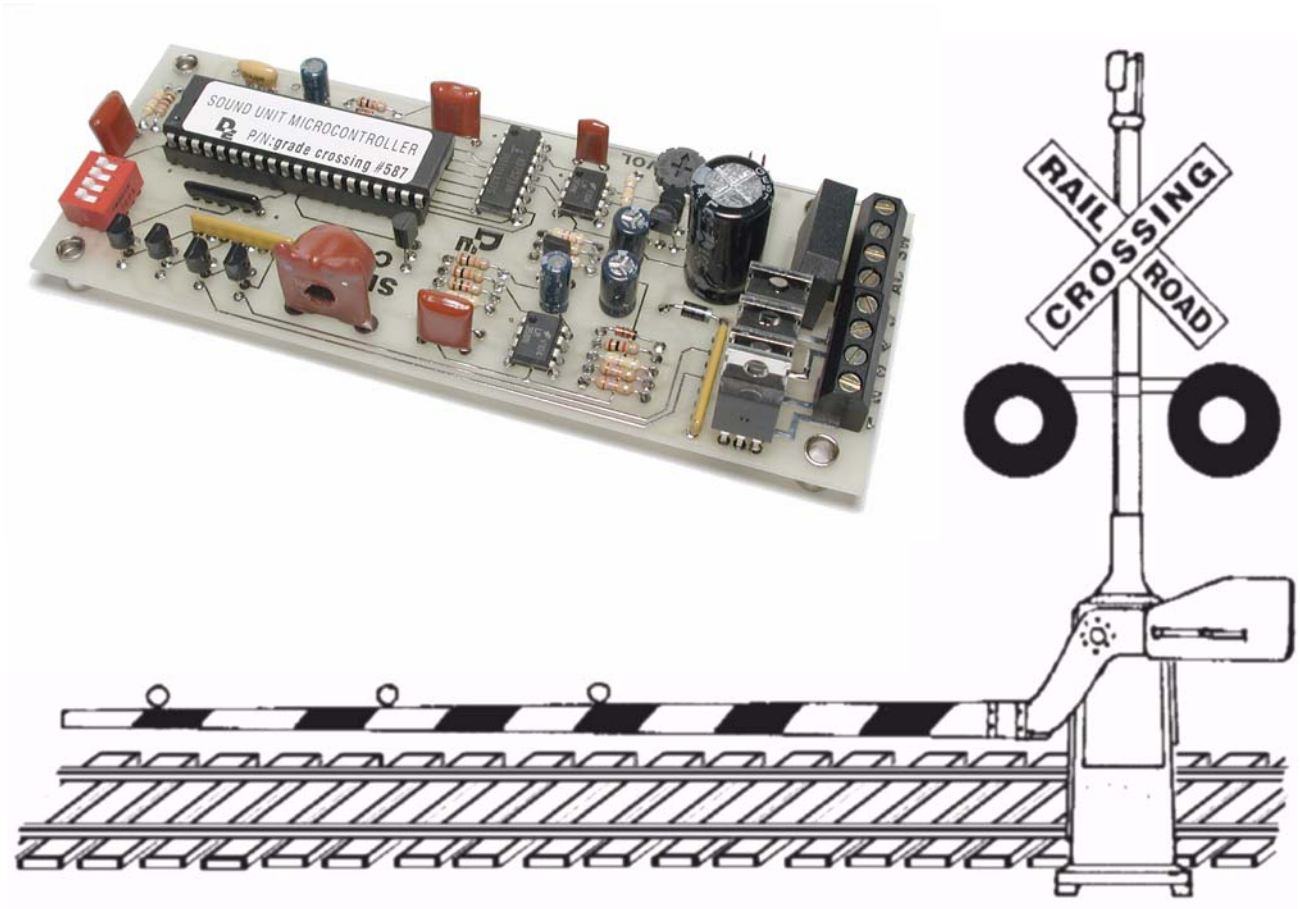


Wiring the Flasher for automatic operatoin with 3-rail track requires using track that has one outside rail electrically insulated from the other outside rail. Most modern track with either wood or plastic ties has the outside running rails electrically insulated.

Although there is only one connection shown for the "Variable AC", as well as the "Track common", to the track, it is best to have more than one power feed for all layouts. It is also a good practice to wire the track common to the opposite outside rail for better operation, as shown.

GRADE CROSSING CONTROLLER with BELL SOUND

Item #587



Make your intersection come alive with the GRADE CROSSING CONTROLLER with BELL sound. This unit features full synchronization of the crossbuck lights and a true bell sound with four user selectable speeds including either simultaneous or delayed bell. The GRADE CROSSING CONTROLLER with BELL sound can be turned on automatically with it's unique built in current sense detection circuitry or manually with a switch. For precise operation, you can use our OPTO-DT to activate the switch input or a combination of the TRAK-DT and TRAK-DTT. The GRADE CROSSING CONTROLLER with BELL sound features four outputs. Two outputs for your crossbuck lamps or LED's. The other two outputs are to drive a coil or relay for crossing gate operation and an additional output simulates a warming fire in a can or stove for the gate operator. The later two outputs can also be switched to momentary drives for activation of a twin coil solenoid, if that is what you have elected to use to drive your gates. For better realism we suggest using a slow motion switch machine. This also requires the use of item #555 to reverse the power to the slow motion, polarity reversing, switch machine. A volume control is provided on the main board with a three inch speaker included with the unit. The GRADE CROSSING CONTROLLER with BELL sound is completely assembled, except for the speaker wiring and enclosure, on a 5.75 X 2.75 inch circuit board which has standoffs at the four corners for easy mounting. Wiring for the automatic detection circuit is accomplished by insulating a section of rail with gaps, fibre pins, or plastic rail joiners. In three rail applications it is suggested that the center rail be used for simplicity. This insulated rail section is now electrically dead and must receive power from an additional wire attached to the power source or to the adjacent rail sections. This additional wire must be passed through the hole in the "SENSE COIL" before being attached to the insulated rail section. Input power can be from 12 to 20 volts AC or DC. Item 690, page 52, is an ideal power transformer to use.

Detection Equipment, current sense

TRAK-DT Family of detectors.

Overview

This family of detectors has a long history of operation. They were originally produced in 1984 and have been working flawlessly ever since. While the circuitry has evolved as components have changed and more types have been added to the line, the basic detection concept remains the same. These are the most reliable detection circuits in the model railroad industry with the longest service history. There are actually thousands of these in use both commercially and by the home model railroader. Not only do they detect DC track power but also work with all types of track power. This includes AC, DCC, and all other types of command control equipment. For the DC operator that wants complete detection, add the Keep-A-Live and detection continues even when there is no DC track power present! For the true outdoor railroad that requires low voltage, low current and isolated detection, this is the equipment to use. Contact us for details involved for this type of operation. It will certainly meet all of the requirements of a safe detection system for all kinds of weather. This is especially of concern for the 1" and larger outdoor railroads.

The TRAK-DT family of devices provide detection by sensing the flow of electrical current in a wire that is passed through a hole in the detection coil of the device. These devices are electrically isolated, but function as if they are in series with the current flow. When current is sensed, a double pole, double throw (DPDT) relay is activated. By connecting the relay to lights, accessories, other electronic devices, signals or even track power, all forms of automation and / or indications become possible. A two pin connector is placed on the board so that an additional relay (Item 555) can be added when extra contact sets are required. While some signals do not require the current capacity of the relay, our customers find it quite nice to have the added current capacity and to be able to hear the relay engage. This really helps trouble shooting an installation.

TRAK-DT (TRAcK DeTector) (Item 365, page 37) The basic TRAK-DT activates its relay when current flow is sensed and the relay is relaxed when current ceases to flow. To detect a train on track it is necessary to isolate a section of rail defining the block length and to pass the wire feed for this rail section through the detection coil of the TRAK-DT.

TRAK-DTT (TRAck DeTector Timer) (Item 565, page 38) The TRAK-DTT is a variation of current detection that provides for event timing. The TRAK-DTT has two modes of operation. One mode provides a timed output regardless of extended current sense, the other requires current sense to cease and then times out.

TRAK-DTT2 (TRAck DeTector Timer2) (Item 368, page 40) The TRAK-DTT2 is a variation of the TRAK-DTT and TRAK-DT current detection that provides for event timing. The TRAK-DTT2 has three modes of operation. The first is trigger of the timer function is preceeded by a latch function. This is activated by the flow of current. The one mode allows for the timer to time out regardless if the latch input was cleared or not. The other two modes require the latch input to be cleared. This happens by having current flow ceasing and then reflowing again and ceasing. The time function will then time out and clear the output. This unit has some very interesting applications. The easiest is a time stop function.

TRAK-DTRL (TRAcK DeTector Resettable Latch) (Item 566, page 42) The TRAK-DTRL is a variation of current detection that includes a latching relay that retains it's position, even during power on/off cycles! This latching circuit is also triggered differently than that of the TRAK-DTL since it consists of two input coils, one for setting the relay, the other for resetting. Since two input sensors exist, it is possible to constantly retrigger a setting as many excessive times as needed without changing the state of the relay. This is extremely handy when doing certain types of automation.

TRAK-DTL (TRAcK DeTector Latch) (Item 366, page 41) The TRAK-DTL is a variation of current detection that includes a latching circuit to hold the relay position. As a result of this latching circuit, each time current flow is sensed by the detection coil, the TRAK-DTL changes the state of its relay.

In order for the electronics to function properly it is essential that a "regulated" power supply of 12 VDC be employed. This 12 VDC power is only for the electronics and has absolutely nothing to do with track power or the power of the devices connected to the relay contacts. Failure to use a "regulated" 12 VDC can cause erratic functioning and/or actual destruction of these devices. For proper power supply refer to the 12VPS (Item 369, page 35).

12VPS - Regulated 12 volt Power Supply

Item # 369

The 12VPS is a "regulated" 12 volt DC power supply. It is intended to power devices such as the TRAK-DT family, OPTO-DT, and the KEEP-A-LIVE. Failure to power these items with an appropriate regulated 12DC supply may damage the boards. This damage is not covered under any warranty. Input to the 12VPS should be 14-20 volts AC (16vAC typical, Item# 690). This input power can come from the accessory terminals of most power packs or from a separate transformer (preferred method). A DC input may also be used but should be 16-22 volts DC. The 12VPS is "regulated" so it can supply a consistent 12 volts DC to numerous TRAK-DT type devices regardless of changes in load current. The 12VPS is capable of operating 10-15 TRAK-DT type devices. Adequate input power is required for proper operation.

RELAY BOARD - EXPANSION

Item #555

RELAY BOARD-EXPANSION consists of a Double Pole Double Throw (DPDT) 12 volt DC relay with appropriate connectors. The RELAY BOARD serves two functions. It can either be used with 12 volts DC coil power or by connecting to other DALLEE products to yield a 4PDT set of relay contacts. It comes supplied a two prong cable to plug into the "expansion jack" (EXP) on the Trak-DT or other DT type board. The Trak-DTRL (Item 566) requires the use of one set of it's contacts in order to provide more contacts. Hence, adding one 555 to it would yield a 3PDT set of relay contacts and not a 4PDT. To create a 4PDT with the Trak-DTRL, use item 568.

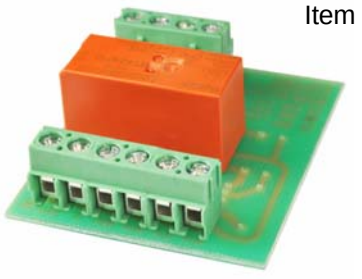
RELAY contacts maximum rating is 5 amperes.

RELAY BOARD - LATCH

Item #568

RELAY BOARD LATCH consists of a dual coil Double Pole Double Throw (DPDT) 12 volt DC latching relay with appropriate connectors. It will latch any momentary input and remember that position with or without power applied to it. It can either be used with 12 volts DC coil power or by connecting to other DALLEE products with the supplied two prong cables. It comes with 2 two prong wire harnesses to easily plug into multiple Trak-DT type units. When used with the TRak-DTRL, you will have to solder 3 wires to the bottom of the TRak-DTRL and connect them to the appropriate connections.

RELAY contacts maximum rating is 8 amperes.



RELAY BOARD - INVERTER

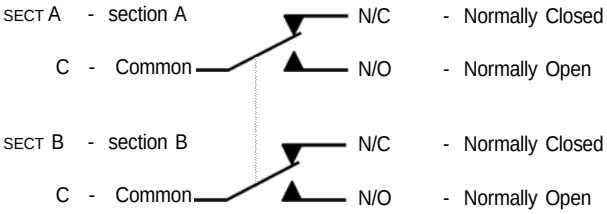
Item #569

The RELAY BOARD - INVERTER consists of a Double Pole Double Throw (DPDT) 12 volt DC relay with appropriate connectors. The unit serves two functions. It can either be used with 12 volts DC power and a separate trigger line to ground or by connecting to other DALLEE TRak-DT type products with the supplied two prong wire harness. This board will invert the signal, when the DT is on this relay is off! This function comes in handy when doing automation with other sensors (such as motion sensors) on commercial layouts by allowing the system to only turn off power when the detection device indicates that the train is in it's proper location to turn the main power off. There are other applications as well.

RELAY contacts maximum rating is 5 amperes.

Relay Contacts - electrical diagram

Relay contacts are used on most all of our Signaling Components. These are used since they are the most forgiving when mis-wiring occurs and they provide for electrical isolation of the load to the circuit.

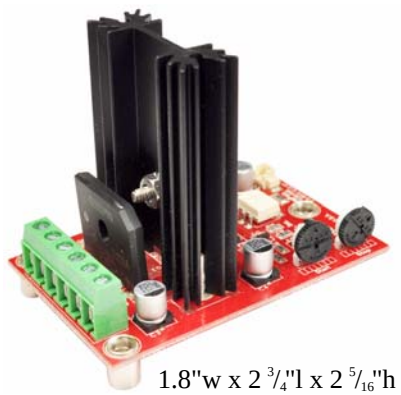


When the relay is relaxed the "C" Common terminal is connected to the "N/C" Normally Closed. When the relay is activated the "C" Common terminal is then connected to the "N/O" Normally Open terminal. The relays used on our circuitry contain Double contact sets indicated by section A and section B. This is referred to as a DPDT (Double Pole Double Throw) type of relay.

Remember - a relay is nothing more than an electrically activated switch!

MO-1, momentum unit

Item # 567



1.8"w x 2 3/4"l x 2 5/16"h

The MO-1 is a self-contained momentum board which has adjustable stopping and acceleration timing that gives operators utilizing standard DC or AC track power the ability to accomplish gradual stops and starts without manually adjusting the throttle. The MO-1, in conjunction with a manual switch or other device such as our Trak-DT family of detectors, will start to lower the track power when a switch is closed or a Trak-DT type unit is activated. The timing for decreasing the track voltage is adjustable for a fast to a long gradual stop. When the control input becomes cleared, the MO-1 will gradually apply power to the track until full power is restored. The MO-1 comes with a connector set that allows a direct connection from its 'EXP' connector to our Trak-DT family of detectors which minimizes wiring. The MO-1 would typically be used with a DALLEE Trak-DTT2, item 368, to accomplish automated timed station stops with momentum. It can also be used with our Trak-DTRL, item 566 and the Trak-DTT2, to accomplish automatic Back-N-Forth operation providing momentum stops with reverses at the ends as well as additional stops in between. Various other DALLEE detection circuits may also be used. Commercial layouts may want to use it to allow trains operating from a visitor's push button to gradually pull out and when combined with other DALLEE components, time out to come to a gradual stop. Eliminating extra gear strain, wheel slippage and excessive initial motor currents is an added benefit of using the MO-1. The MO-1 can handle up to 10 amperes of DC current or 8 amperes of AC current with minimal "in circuit" voltage loss. The MO-1 can be wired in various fashions with many configurations. See our Wiring Guide (#20 or newer) or web site for some of these wiring diagrams.

KEEP-A-LIVE

Item # 588

The KEEP-A-LIVE was designed to allow the DALLEE ELECTRONICS family of current sensing detection devices (TRAK-DT, TRAK-DTT) to display proper signal and occupancy indications even though there is no propulsion power in the track. Previously, there had to be power in the track and something drawing current in order to activate the detection devices. With the KEEP-A-LIVE connected to the track and the 12 VDC regulated power applied to the detection circuits all locomotives or rolling stock that normally draw current will be detected. For simplicity of operation the KEEP-A-LIVE installs on the output of each throttle (CAB) and acts as a pass through for that throttle. For complete coverage, an additional KEEP-A-LIVE should also be connected to the track in situations when no throttle is selected.

It is also necessary to provide power for the electronics. In order for the electronics to function properly it is essential that a "regulated" power supply of 12 VDC be employed. This 12 VDC power is only for the electronics and has absolutely nothing to do with track power. Failure to use a "regulated" 12 VDC can cause erratic functioning or actual destruction of the KEEP-A-LIVE. For proper power supply refer to the 12VPS (Item 369).

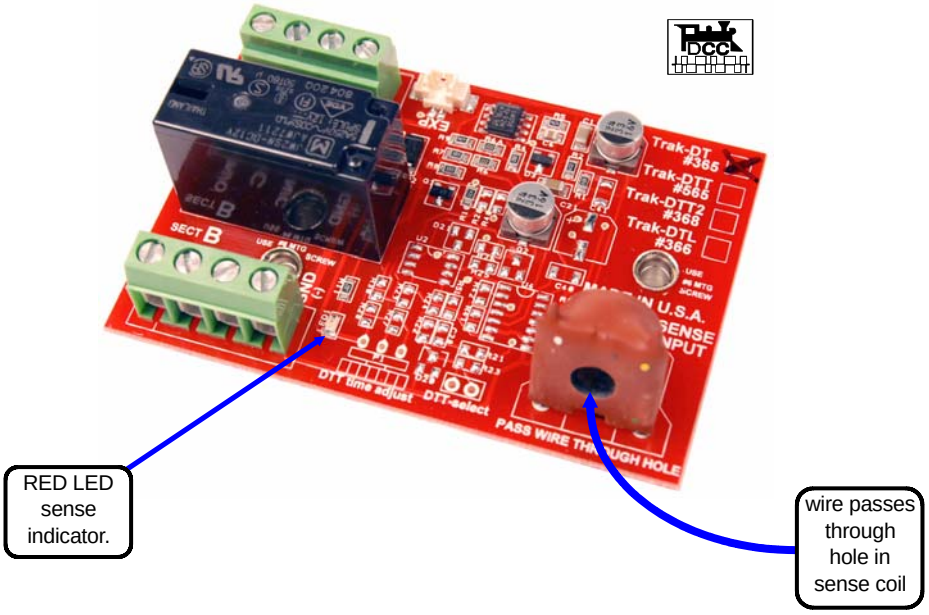
Sample wiring is shown below. Remember, this is a PASS THROUGH device. It does not interfere with track power provided. If you are also using a LocoMatic™ controller, connect it's input to the wires from the KEEP-A-LIVE output (shown going to the track) and then from the LocoMatic™ controllers output to the track.

TRAK-DT

Item # 365

Block Detector - current sensed

for: SIGNALS - both TWO and THREE aspect types
AUTOMATIC POWER ROUTING
MULTIPLE TRAIN OPERATION such as Train following Train



The only non-optical detection system on the market that provides block detection without interference to the electrical power operating your trains. This means that all carrier operated layouts need not worry about distortion of their signal to the track. Conventional operators will not suffer from any loss of power or the need of separate power sources for each block detector used! The TRAK-DT family of devices provide detection by sensing the flow of electrical current in a wire that is passed through a hole in the detection coil of the device (similar to clamp on current probes). These devices are electrically isolated, but function as if they are in series with the current flow. See page 41 for basic wiring diagram.

The basic TRAK-DT activates its double pole, double throw (DPDT) relay when current flow is sensed and the relay is relaxed when current ceases to flow. By connecting the relay to lights, accessories, other electronic devices, signals or even track power, all forms of automation and/or indications become possible. A two pin connector is available so that an additional relay (Item 555) can be added when extra contact sets are required.

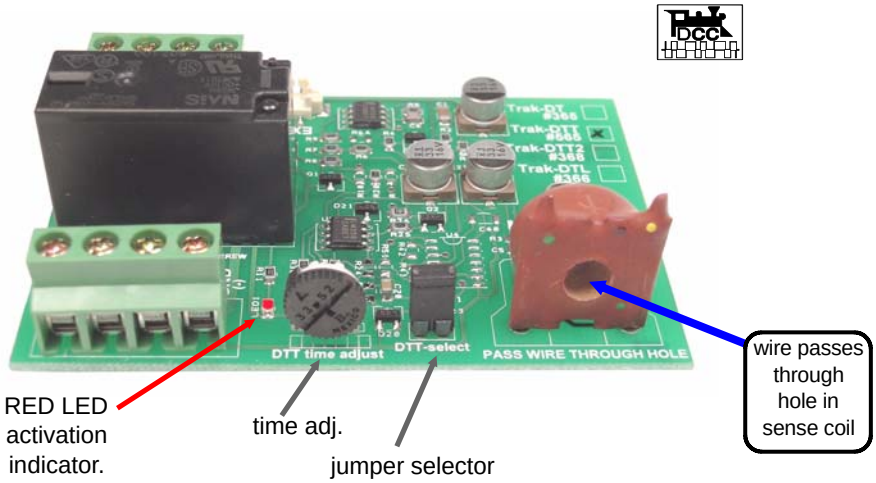
To detect a train on the track it is necessary to isolate a section of rail (for 3-rail, center rail is easiest) defining the block length and to pass the wire feed for this rail section through the detection coil of the TRAK-DT. By inter-connecting several TRAK-DT's (one per block) complex signal systems can be installed, including fully automatic operation if so desired. The TRAK-DT is also equipped with a RED LED which illuminates when the TRAK-DT senses current flow. The RED LED provides for an easy visual indication for activation.

It is also necessary to provide power for the electronics. In order for the electronics to function properly it is essential that a "regulated" power supply of 12 VDC be employed. This 12 VDC power is only for the electronics and has absolutely nothing to do with track power. Failure to use a "regulated" 12 VDC can cause erratic functioning or actual destruction of the TRAK-DT which is not covered under warranty. The 12VPS (item 369, pg 35) is ideal for this function.

TRAK-DTT

TRAcK DeTector with adjustable Timer

Item # 565



Add a station stop easily with the TRAK-DTT or use the TRAK-DTT as a "short block" detector with fixed timed occupancy. Simply create an isolated section of track to trigger the TRAK-DTT, change a few wires, and you have it (reference page 39 for wiring). Use the TRAK-DTT to operate your solenoid type switches or semaphores. You can also use the TRAK-DTT as a momentary power supply for all your solenoid switch machines on your layout.

The TRAK-DTT combines two functions in one unit. There is a jumper selector located on the small circuit board which also contains the time frame adjustment potentiometer. With the jumper selector removed the device becomes a timer where, when current flow is sensed, the relay activates for a time frame and then relaxes. Interrupting current flow for a few seconds resets the time circuit. With the jumper selector installed, the device functions as an adjustable detector where the relay is activated for the duration of current flow, PLUS an adjustable time period.

The TRAK-DTT is a variation of current detection that provides for event timing. The TRAK-DTT has two modes of operation:

1 - used as a TIMER. When current flow is sensed in the detection coil, the relay is activated for a time period (user adjustable) and then relaxes for the duration of current flow. Once current flow has ceased for a few seconds the time circuit resets and can then be reactivated.

2 - used as a DETECTOR - TIME ADJUSTABLE. As with the TRAK-DT, when current flow is sensed in the detection coil, the relay is activated. However, with the TRAK-DTT in this mode, the relay is held activated for an adjustable time period after current ceases to flow. In other words the TRAK-DTT activates for the duration of current flow PLUS the adjustable time period.

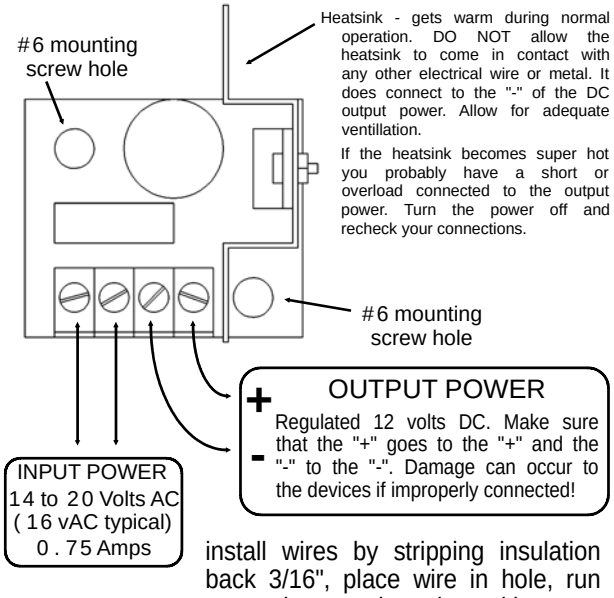
The time period of the TRAK-DTT is adjustable from a momentary relay activation as minimum to a maximum of approximately 75 seconds. Longer time is available as a custom order. The momentary function is very useful in operating solenoid type switch machines or semaphores. The RED LED provides for an easy visual indication for activation. Custom units can be ordered to yield up to 5 minutes of timing.

It is also necessary to provide power for the electronics. In order for the electronics to function properly it is essential that a "regulated" power supply of 12 VDC be employed. This 12 VDC power is only for the electronics and has absolutely nothing to do with track power. Failure to use a "regulated" 12 VDC can cause erratic functioning or actual destruction of the TRAK-DT which is not covered under warranty. The 12VPS (item 369, pg 35) is ideal for this function.

TRAcK-DT family, basic wiring instructions

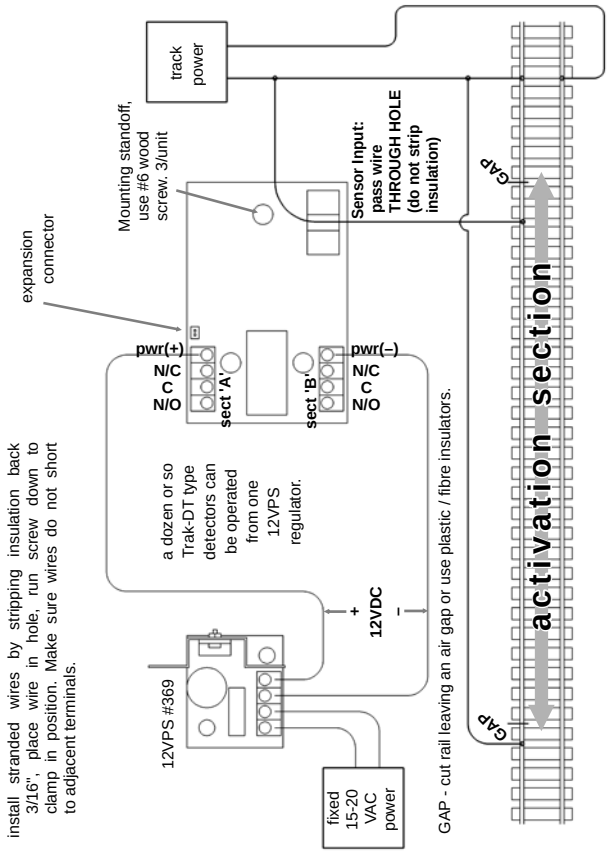
12VPS

12 VOLT / 0.5 Amp
REGULATED POWER SUPPLY

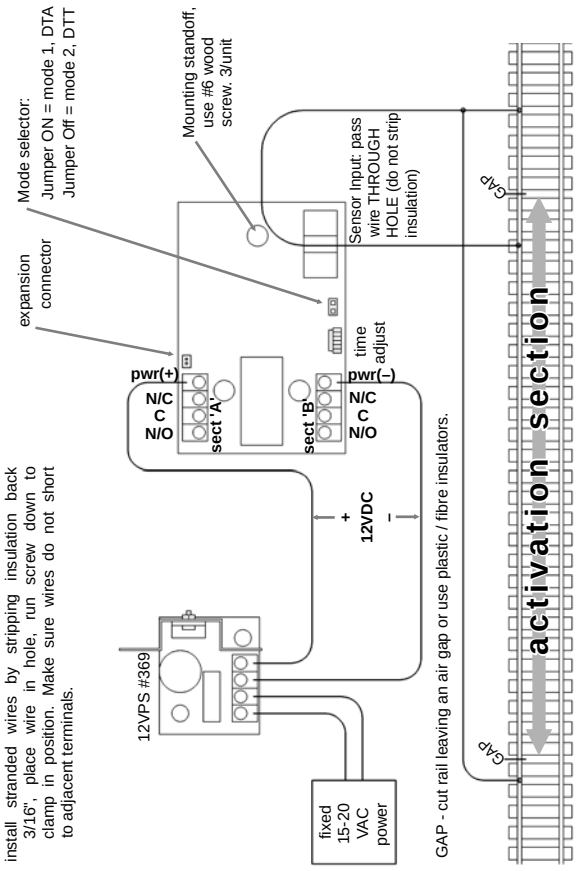


install wires by stripping insulation back 3/16", place wire in hole, run screw down to clamp in position.

TRAK-DT



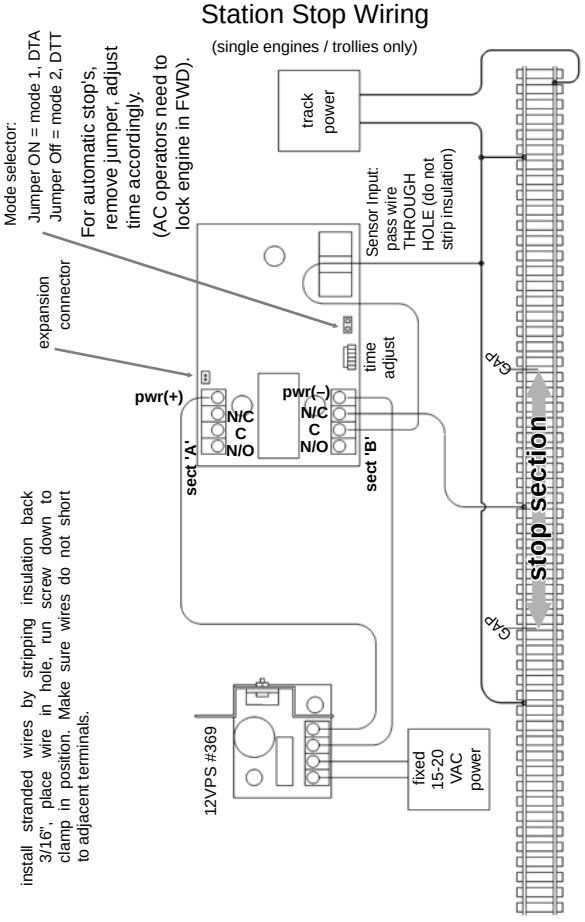
TRAK-DTT



TRAK-DTT2

Station Stop Wiring

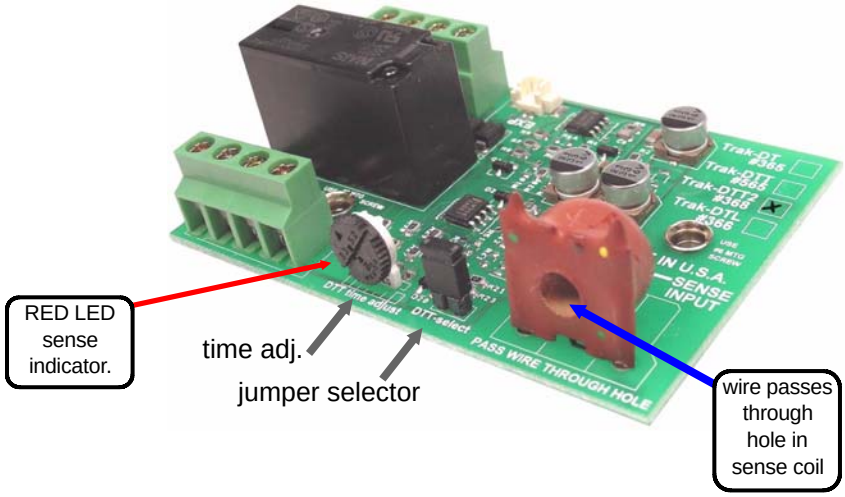
(single engines / trollies only)



TRAK-DTT2

TRAcK DeTector with adjustable Timer and Latch

Item # 368



Add a station stop easily with the TRAK-DTT2 or use the TRAK-DTT2 as an alternating detector with fixed timed occupancy. Simply create an isolated section of track to trigger the TRAK-DTT2, change a few wires, and you have it.

The TRAK-DTT2 combines three functions in one unit. The input circuitry has a latch function incorporated into it. Therefore the timer function is only activated on every other sense of current flow. The first time current flows, the timer is activated. The second time current flows the input to the timer is "reset" for the next current activation. There is a jumper selector located and time frame adjustment potentiometer on the circuit board as well. With the jumper selector removed (which is the configuration for most all STATION STOP applications) the device becomes a timer where, when current flow is sensed, the relay activates for a time frame and then relaxes. Interrupting current flow for a few seconds resets the time circuit. With the jumper selector installed, the device functions as an adjustable detector where the relay is activated for a time period or for the duration of current flow, whichever is longer. This only occurs every other time current flows in the sense coil, as explained previously.

The TRAK-DTT2 is a variation of the TRAK-DT (#365) current detection and the TRAK-DTT (#565) that provides for event timing. The TRAK-DTT2 has two main modes of operation:

1 - used as a TIMER. When current flow is sensed in the detection coil, the relay is activated for a time period (user adjustable) and then relaxes for the duration of current flow. Once current flow has ceased for a few seconds the time circuit needs to have current flow again to reset and can then be reactivated again after a pause in current flow.

2 - used as a DETECTOR - TIME ADJUSTABLE. As with the TRAK-DT, when current flow is sensed in the detection coil, the relay is activated. However, with the TRAK-DTT2 in this mode, the relay is held activated for the entire duration until current ceases to flow and then starts again. Then after the second on/off of current flow cycle, the adjustable time period is activated and the output relay will relax according to the time setting.

The time period of the TRAK-DTT2 is adjustable from a momentary relay activation as minimum to a maximum of approximately 75 seconds. The momentary function is very useful in operating solenoid type switch machines or semaphores but with it's input latch, only every other sense will activate the timer function. Custom units can be ordered to yield up to 5 minutes of timing.

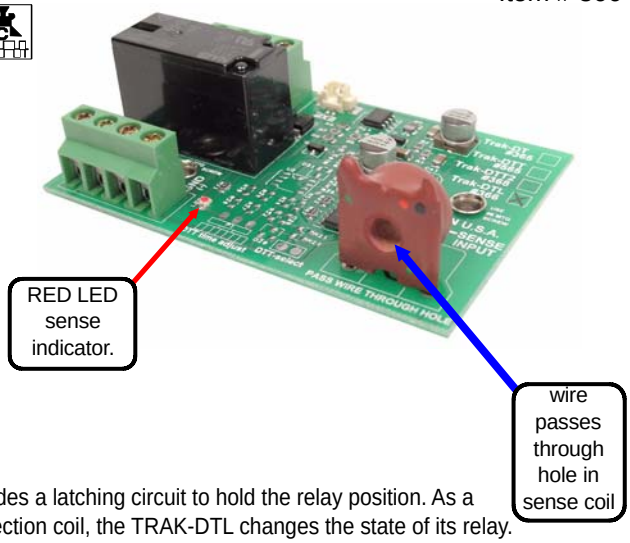
It is also necessary to provide power for the electronics. In order for the electronics to function properly it is essential that a "regulated" power supply of 12 VDC be employed. This 12 VDC power is only for the electronics and has absolutely nothing to do with track power. Failure to use a "regulated" 12 VDC can cause erratic functioning or actual destruction of the TRAK-DT which is not covered under warranty. The 12VPS (item 369, pg 35) is ideal for this function.

STATION STOP wiring for multiple stops within a loop of track can be made by simply cutting the track and making more stop sections wired as the previous stop section.

TRAK-DTL

Item # 366

for: SEQUENTIAL FUNCTIONS
AUTOMATIC LATCH
AUTOMATIC POWER REVERSE



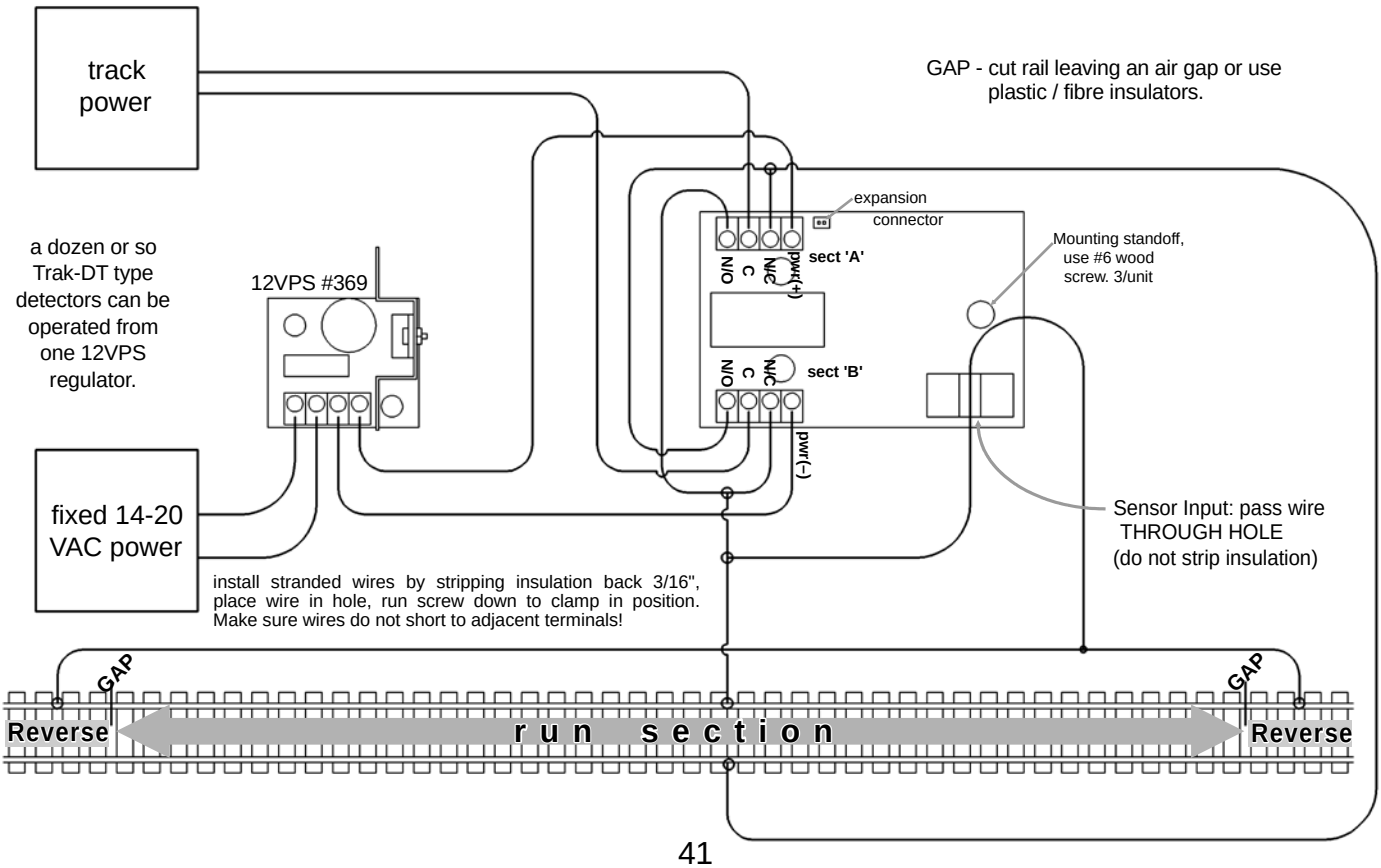
Automate those nasty reverse loops with the TRAK-DTL. This is useful in both conventional DC operation or carrier control. Use the TRAK-DTL to automate the reverse polarity function required to operate an automatic back-n-forth. You can also use the TRAK-DTL to automate the control of polarity reverse type switch machines. You might also want to sequence things in a certain manner, i.e. automate station stops so that every other train must stop at the station. Whatever you want to operate on an every other occurrence the TRAK-DTL will do it for you!

The TRAK-DTL is a variation of current detection (TRAK-DT) that includes a latching circuit to hold the relay position. As a result of this latching circuit, each time current flow is sensed by the detection coil, the TRAK-DTL changes the state of its relay. When current ceases to flow for a few seconds, the TRAK-DTL is then ready for the next sense of current flow to change the state of its relay. This event is repeated again after a few seconds of no current flow occurs.

Since the relay has double pole, double throw (DPDT) contacts it can be wired as a polarity reversing switch. This allows the TRAK-DTL to be used to automate reversing loops or to provide a continuous "back and forth" operation on a single track such as for a trolley car or on a work bench, utilizing DC track power. Reverse loop's are normally broken into 1/3 sections. This way when the engine enters the "sensed section" the relay would immediately reverse but the TRAK-DTL will continue to sense current flow until the entire engine clears the section of track. This way a caboose that has lights with no other cars in the train drawing any current, you would not re-trigger the TRAK-DTL causing a double reverse. The TRAK-DTL can also be used to create every other type of operations such as alternating station stops. Drawings utilizing the TRAK-DTL can be found in our Wiring Guide.

The TRAK-DTL can also be used to set up sequential functions by having the relay enable other devices when activated and disable these devices when relaxed. A typical way of forcing block or timed stops is to merely turn on a ballast lamp while passing the lamp power through the other detectors sense coils. All kinds of automation and wiring can be done with the TRAK-DT family with simple wiring of the logic you want your trains to do! The RED LED provides for an easy visual indication for activation.

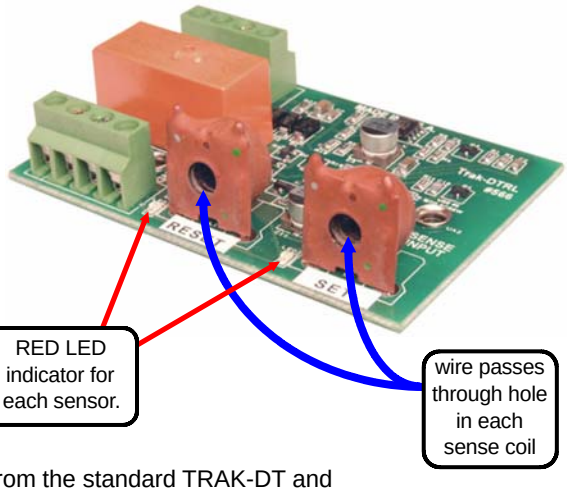
It is essential that a "regulated" power supply of 12 VDC be employed. This 12 VDC power is only for the electronics and has absolutely nothing to do with track power. Failure to use a "regulated" 12 VDC can cause erratic functioning or actual destruction of the TRAK-DT which is not covered under warranty. The 12VPS (item 369, pg 35) is ideal for this function.



TRAK-DTRL

Trak=DeTector Resetable Latch

Item # 566



Automate those nasty reverse loops, back-n-forth's, and much more with the TRAK-DTRL. This is useful with all types of track power. Use the TRAK-DTRL to automate the reverse polarity function required to operate an automatic back-n-forth. You can also use the TRAK-DTRL to automate the control of polarity reverse type switch machines. You might also want to sequence operations in a certain manner. Whatever you want to operate with a settable and resettable occurrence, the TRAK-DTRL will do it for you!

The TRAK-DTRL is a variation of current detection (TRAK-DT) that includes a latching circuit to hold the relay position. The TRAK-DTRL is unique in that it has memory to its operation. Not only will it remember its last state during a session, it will also remember it between power cycles as well. The TRAK-DTRL varies from the standard TRAK-DT and other members of it's family in that it has two sense coils. One of these coils operates the relay to its "SET" position, the other input coil operates the relay to its "RESET" position. It does not matter how many times current flows in its "SET" or "RESET" sense coil. It will not change state until a different sense coil is activated. Each sense coil activation is also shown via a RED LED. In the case that both sense coils are triggered at the same time, the "RESET" input coil will take precedence over the "SET" coil's action. Also, if one of the inputs is active, the other input coil is deactivated. This prevents rapid reversal of the relay's position and yields a positive outcome.

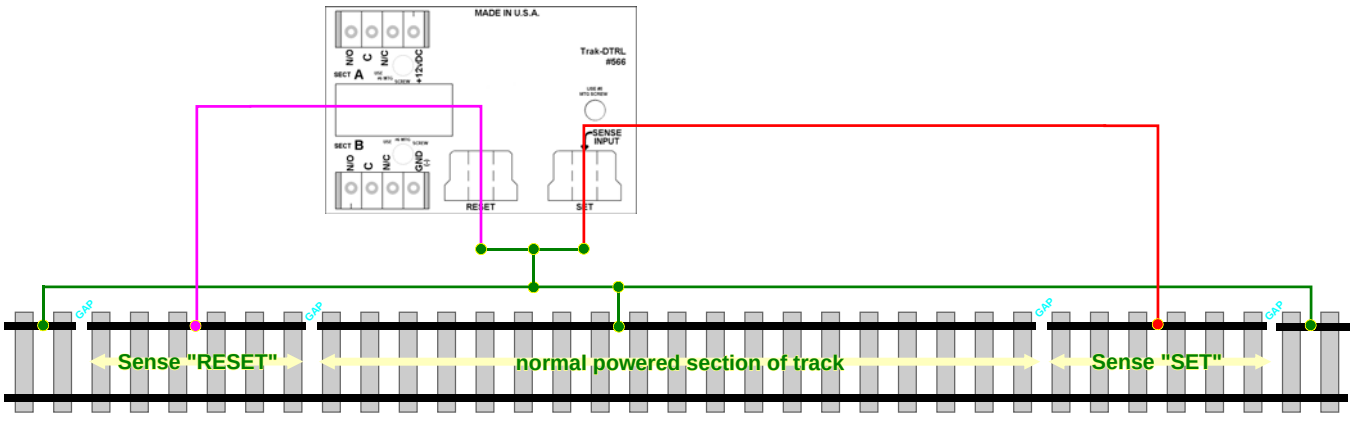
Since the relay has double pole double throw (DPDT) contacts, it can be wired as a polarity reversing switch. This allows the TRAK-DTRL to be used with signal's as well as automated reversing loops, various train automation, or polarity reversing switch machine (dc type) control to operate switch machines as well as various other items.

The TRAK-DTRL can also be used to set up sequential functions by having the relay enable other devices when activated and disable these devices when relaxed. A typical way of forcing block or timed stops is to merely turn on a ballast lamp while passing the lamp power through the other detectors sense coils. All kinds of automation and wiring can be done with the TRAK-DT family with simple wiring of the logic you want your trains to do! The RED LED provides for an easy visual indication for which activation has been sensed. They are only illuminated during the sense period and do not indicate the status of the relay's contacts.

It is also necessary to provide power for the electronics. In order for the electronics to function properly it is essential that a "regulated" power supply of 12 VDC be employed. This 12 VDC power is only for the electronics and has absolutely nothing to do with track power. Failure to use a "regulated" 12 VDC can cause erratic functioning or actual destruction of the TRAK-DT which is not covered under warranty. The 12VPS (item 369, pg 35) is ideal for this function.

Below is a basic wiring diagram showing how to splice the Trak-DTRL into a piece of track. Although this scenario might not be of much utility, it can surely be used. When traveling from left to right, the SET would first be triggered followed by the RESET. The distance between the two can be as long as desired. Each input, SET or RESET, can be triggered by any track anywhere. It does not have to be from the same track. That makes many types of operational scenarios for the Trak-DTRL.

The green wire connection makes the existing track power connect to each section of track that was made "dead" from the "GAP". The change in color, when routing through the SET and RESET coils, are only for clarification. They all contain the top rail's track power. The relay contacts would be connected to whatever you wanted to operate.

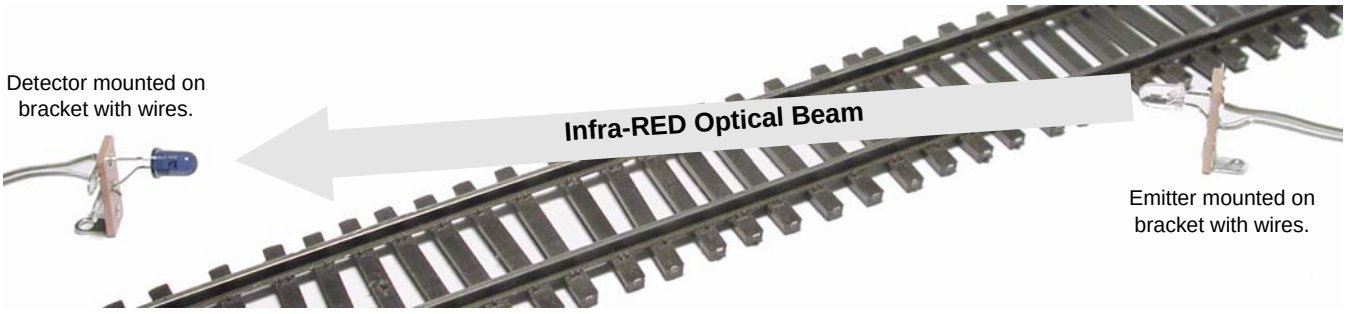


GAP - insulated section via an air gap or nylon rail insulator/joiner

OPTO-DT

Item #552, 553

Infra-red Optical Detection - optically sensed via broken beam



OPTO-DT3 (#553) main board pictured

Optical detection without interference from ambient light is possible with our OPTO-DT. Use our single input OPTO-DT1 to sense any given area using line of sight for 6 feet or more (align diagonally to the track) or use our OPTO-DT3 to obtain detection with one, two, or three input detector pairs. Both units offer a single block type detection output, utilizing a 5 ampere double pole double throw relay and an expansion connector for a second relay (Item #555), with the timing features offered like our TRAK-DTT (Item #565) all included in one unit. The OPTO-DT detection is for those requiring line of sight without current detection as our TRAK-DT family of detectors.

The OPTO-DT1 (Item 552) is a detection device in which the output relay (Double Pole Double Throw) is activated when the optical path of an infra-red beam is interrupted. The OPTO-DT3 (Item 553) version allows up to three separate infra-red beams activating the same relay.

The infra-red beam is generated by an input set consisting of an emitter (looks like a clear LED) and a detector (looks like a black LED). The emitter and detector are mounted on the layout so as to establish a line of sight beam across an area where detection is desired. The emitter and detector can be separated by more than 6 feet but must be precisely aligned. To assist in this alignment, there is an LED on the OPTO-DT which illuminates when proper adjustment is achieved. The OPTO-DT3 unit, with multiple inputs, has switches so that each emitter/detector set can be independently aligned. If a hood or shield is placed on the detector, the range of the infra-red beam can be extended substantially. The actual distance will depend on conditions within your layout area and on how precisely you are able to align the emitter/detector set. With careful alignment, distances of 15 to 20 feet or more are usually obtainable.

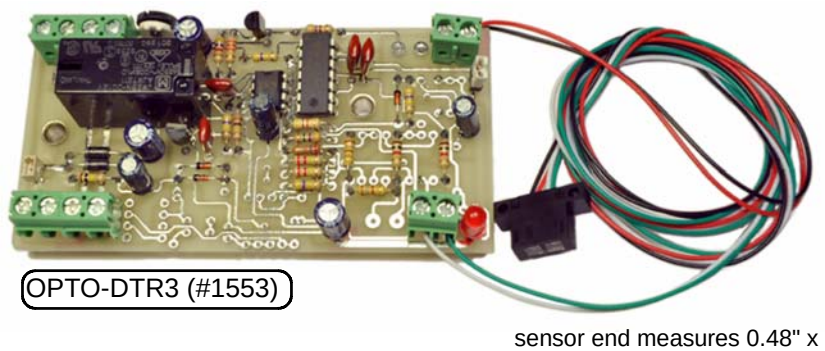
The OPTO-DT has two distinct modes. In NORMAL mode, with the time adjustment at minimum setting, the relay will be activated (on) when the infra-red beam is interrupted and relaxed (off) when the beam is restored. As the time adjustment is increased a minimum (on) time for the relay is established. When the beam is broken the relay is (on) for at least the minimum time period. If the beam remains interrupted beyond the minimum time period the relay stays (on) until the beam is restored. In TIMER mode, when the beam is broken, the relay is (on) for the duration of the time adjustment, then relaxes (off). The relay will not again activate until after the beam is restored which will allow the time circuit to reset. This time adjustment is variable from momentary to about 60 seconds.

Each OPTO-DT is furnished with the appropriate number of optical coupler input sets. It is also necessary to provide power for the electronics. In order for the electronics to function properly it is essential that a "regulated" power supply of 12 VDC be employed. Failure to use a "regulated" 12 VDC can cause erratic functioning or actual destruction of the TRAK-DT which is not covered under warranty. The 12VPS (item 369, pg 35) is ideal for this function.

OPTO-DTR

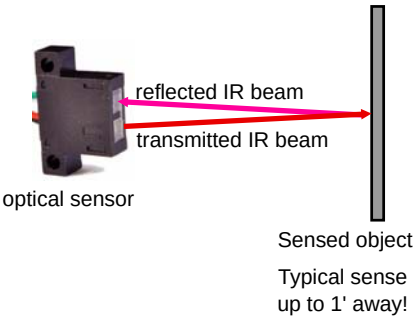
Item #1552, 1553

Infra-red Optical Detection - optically sensed via reflection



OPTO-DTR3 (#1553)

sensor end measures 0.48" x 0.2"



The Opto-DTR's are set for detection up to 1 foot away from the sensor. Angling the sensor helps when reading cars passing in front of the sensor. The long sense distance allows for hiding the sensor in all kinds of places. Unlike other IR sensors, these are also insensitive to most ambient light interference.

One sensor is included with the Opto-DTR1 while the Opto-DTR3 is equipped with 3. The Opto-DTR3 can have each sensor individually turned on/off to allow for different configurations. Both units have an LED to assist with alignment and have adjustable timing to keep the 5 ampere, DPDT, output relay engaged longer than the detection exists.

They do require 12 volt regulated DC to power the electronics. This is achieved using Dallee item #369. One #369 can power up to 12 detection boards.

For advanced uses and applications refer to the information provided on our web site at: USE & ADVANCED APPLICATION SUGGESTIONS. Also be aware that the OPTO-DT's can be substituted for the TRAK-DT's and Trak-DTT's in the suggestions provided there.

TIMER-1

Oscillating on / off Timer

Item # 505

The TIMER-1 provides an on/off power sequence of items with equal durations of time. The time can be set from approximately 1 to 90 seconds. You can either have the item that you want to turn on and off start in the "ON" state or "OFF" state. Besides using it as a simple on/off switch, it is also possible to operate a DC switch motor. A DC switch motor could be used to operate motion items on your layout. Other time ranges are available on special order. Seperate power of 14-18 volts AC is required. The relay output handles 5 amperes.

TIMER-2

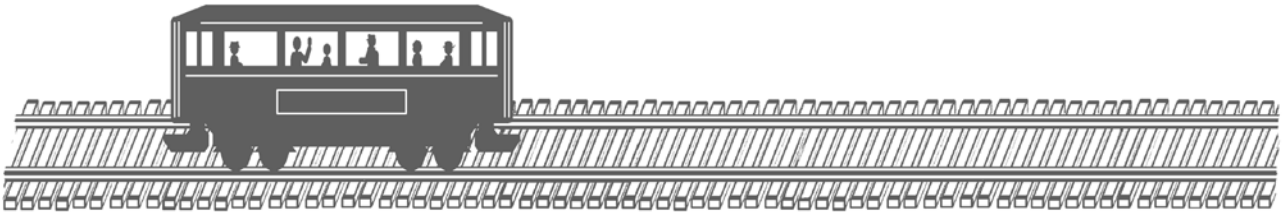
Dual Oscillating on / off Timer

Item # 506

The TIMER-2 provides two independent timers on one board. The specifications are the same for each timer (2 on this unit) as item #505, Timer-1. Since the TIMER-2 contains two independent timers and output's you can do different events with each of them. Other time ranges are available on special order. Seperate power of 14-18 volts AC is required. The relay output can handle up to 5 amperes.

AUTOMATIC BACK-N-FORTH / DC

with timed stops at ends



Item's 561, 562, 563, 564

- Operates via a simple timing mode for reversing the Trolley or train on a dedicated section of track.
- allows for timed stops at ends.
- provides variable time from a few seconds to minutes!
- available as a single unit or as a dual unit. Dual units have separate time controls.
- units do require you to supply the variable DC track power, fixed AC, track, trolley car or locomotive, wire, and connections to components. Full drawings are included with the units.

Four systems to fit your needs:

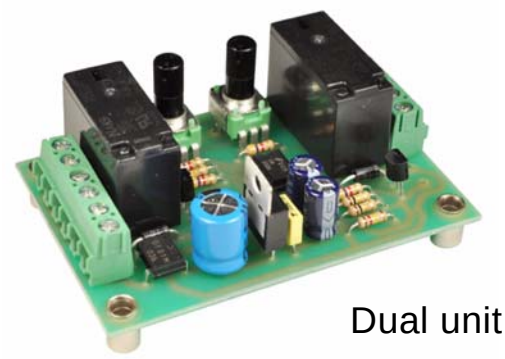
Single	Item#	Dual	Item#
1 Amp	561	1 Amp	562
5 Amp	563	5 Amp	564

Operation: The trolley / train can be started at any location with the Back-N-Forth. If it is in one of the ends that requires the time to expire before reversing, then nothing will happen until then. Otherwise the trolley / train will start operating as soon as track power is applied. If utilizing a train, the one end stop has to be extended far enough to encompass the engine with cars while the other end only needs to contain the engine.

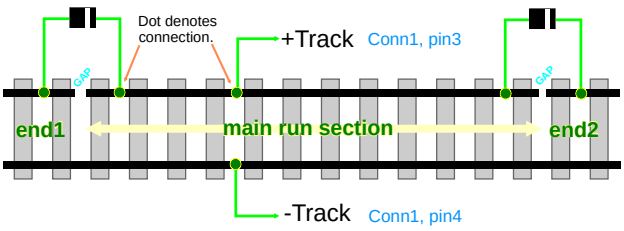
If the timed reverse is not long enough for the length of track desired, you will need to use item 609. The item 609 back-n-forth package utilizes track sense for operation which requires the trolley / train to get to the end before the reverse operation is performed.

Typical timing is adjustable from 25 seconds to 2 minutes. Again, the total time is the traverse time plus the end stop time.

Single unit



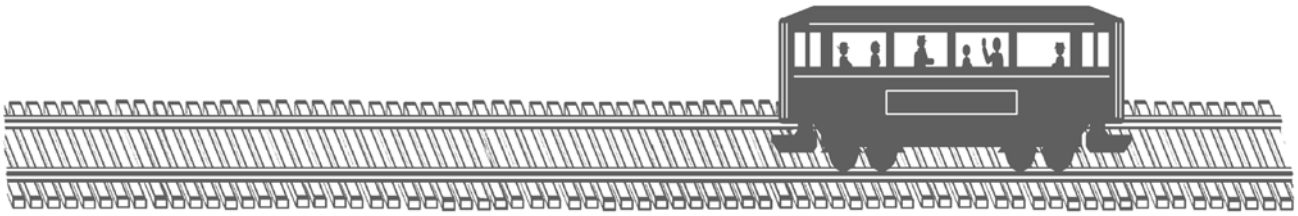
Dual unit



GAP - insulated section via an air gap or nylon rail insulator/joiner

Dual units operate two separate tracks.

COMBINATION PACKAGES



AUTOMATIC BACK-N-FORTH / DC

Item #609

with timed stops at ends and optionally between

For DC track power, consists of 1-#369 (12VPS), 1-#566 (TRAK-DTRL), 1-#368 (TRAK-DTT2), and full instructions. To add additional stops between the ends utilizing the same amount of time set for the end stops, merely add one or more insulated section and wire as shown. If a different time stop is desired for the between stops from the end stops, use another Trak-DTT2 (Item #368).

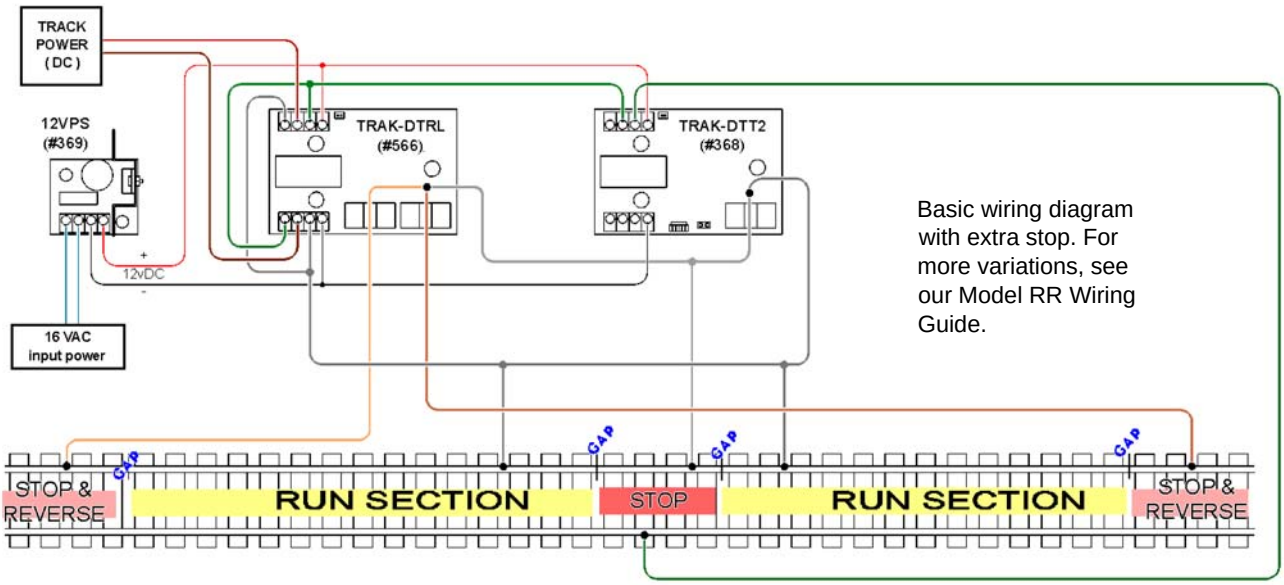
The difference in operation of this back-n-forth over the 56x type back-n-forths is that the end stop time function only starts when you get to the end section. Therefore it does not matter how long it takes you to get to the end section. The timing for the stop is totally independent of the amount of time that it takes you to get there. Therefore you can have an unlimited amount of track between the ends as well as run as slow as you want. This system also remembers which direction you were heading between power applications. So you can turn the layout off and come back another day and the trolley will still continue in the direction it was heading in. It also does not matter if you stop in the end zone, power the layout off, and then power it back on. The trolley will never run off of the end!

You supply the track, trolley car or locomotive, wire, and connections to components. A few seconds must elapse between each stop section.

12VPS #369

TRAK-DTRL #566

TRAK-DTT2 #368



Basic wiring diagram with extra stop. For more variations, see our Model RR Wiring Guide.

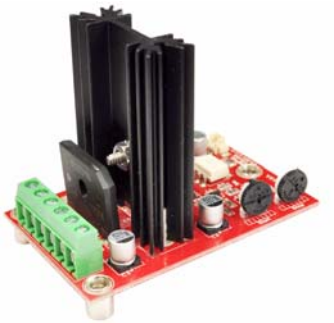
AUTOMATIC BACK-N-FORTH / DC with Momentum

and timed stops at ends and optionally between

Item #610

For DC track power, consists of 1-#369 (12VPS), 1-#566 (TRAK-DTRL), 1-#368 (TRAK-DTT2), 1-#567 (MO-1) and full instructions. This unit is the same as item #609 except it adds a momentum stop/start at each stop location! The stop and start times are adjustable on the MO-1 momentum board.

TRAK-DTRL #566



MO-1 #567

TRAK-DTT2 #368

12VPS #369

AUTOMATIC BACK-N-FORTH for AC operators

with timed stops at ends

Item #682

For use with AC track power. Consists of 1-#369 (12VPS), 2-#565 (TRAK-DTT's), 2-#538 (ballast lamp assy), and full instructions with wiring diagram. Requires 3 position "E-UNIT" (#400 or similar) and lighted engine or caboose/car.

A few seconds must elapse between ends for proper sequencing.

You supply the track, trolley car or locomotive, wire, and connections to components.

12VPS #369

2 x TRAK-DTT #565

2 x BALLAST LAMP ASSY #538

AUTOMATIC STATION STOP

Item #683

for making one or more timed stop utilizing DC or AC track power. Consists of 1-#369 (12VPS), 1-#565 (TRAK-DTT2), and full instructions. Adjustable from a short stop time up to 75 seconds.

You supply the track, trolley car or locomotive, wire, and connections to components.

12VPS #369

TRAK-DTT2 #368

AUTOMATIC STATION STOP withe Momentum

Item #686

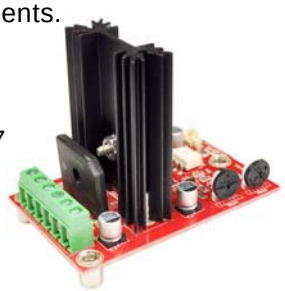
Same as item 683 but adds momentum stops and starts to the station stop. Consists of 1-#369 (12VPS), 1-#565 (TRAK-DTT2), 1-567 (MO-1) and full instructions. Adjustable deceleration, acceleration and stop times from a short stop time up to 75 seconds.

You supply the track, trolley car or locomotive, wire, and connections to components.

12VPS #369

TRAK-DTT2 #368

MO-1 #567



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2 TRAIN AUTOMATION

Item #691

DC or AC track power, contains 1-#369 (12VPS), 1-#566 (TRAK-DTRL), and full instructions / wiring diagram. One train waits at station until other train clears section to release train at station.

You supply the track, train or trolley car, wire, and connections to components.

12VPS #369

TRAK-DTRL #566

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2 TRAIN AUTOMATION with Momentum

Item #1691

same as 691 above but includes 1-567 (MO-1) and full instructions. Adjustable deceleration & acceleration. Stop time is set by how fast the traversing train travels the loop.

12VPS #369

TRAK-DTRL #566

MO-1 #567

COMBINATION PACKAGES

Block Detection, operates with DC, DCC, or AC track power

Signaling Starter Set
or use for
Train following Train operation*

Item 655 consists of:

1 - #369 (12VPS),

3 - #365 (TRAK-DT's),

Plus basic wiring diagrams.

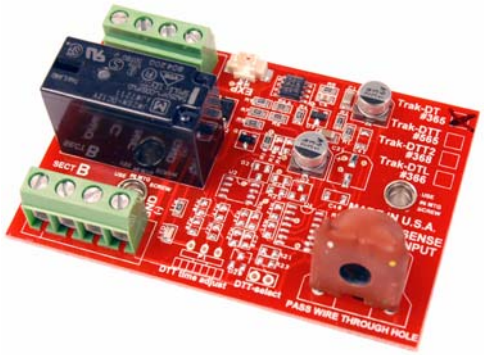
* Refer to wiring guide for more wiring diagrams.

12VPS #369

TRAK-DT #365

Signaling Expansion Pack

Item 684 - contains six - #365 (TRAK-DT's)



9 VOLT BATTERY REPLACEMENT UNITS

9vBRLT

Item #598

9 volt Battery Replacement For Lionel Trains

small size: 1.35" x 0.73" x 1.05"

The 9vBRLT replaces the battery in most engines. The 9vBRLT is intended for use with Lionel type systems, which have no charging circuit, and all others utilizing their system such as Atlas, K-Line, Weaver, and others. These systems all require the use of a 9 volt battery.

The 9vBRLT is similar in size to that of a 9 volt battery so it can fit into most small places. Since the 9vBRLT does not require any maintenance, you can also install the 9vBRLT inside the shell of an engine instead of the compartment initially made for the 9 volt battery.

Installation of the 9vBRLT is simple but does require connecting one wire to the center roller pickup wire. The battery snap merely connects to the existing 9 volt battery connector.

Initial charge of the 9vBRLT occurs in the first 30 seconds. After full charge is achieved, all low voltage operations are performed without the loss of sound for several seconds (time is determined by how well charged the 9vBRLT is). If the locomotive has been sitting idle for more than a few hours simply recharge the 9vBRLT.

9vBRTV

Item #597

9 volt Battery Replacement TV camera power supply

small size: 1.35" x 0.73" x 1.05"

The 9vBRTV is intended to power TV camera transmitters, or other light current devices, requiring 9 volts DC. This electronic circuit, the 9vBRTV, replaces the battery in TV type camera transmitters. Install the 9vBRTV by connecting it's input power to either AC, DC, DCC, or other voltages to obtain the fixed 9 volt output. To maintain the 9 volt output, sufficient input voltage must be present. The 9vBRTV contains on board storage which prevents intermittent connections to the track power from affecting the cameras operation!

typical camera transmitter used with trains & other applications.

Super Capacitor

Item #559

2/pk

Use Super Capacitors for many different applications.

To replace the 9v battery in an MTH/QSI 9v system, use Super Capacitors (item #559), one 9v battery snap connector (item #578 - 2/pk) and a piece of #580 heat shrink tubing. Connect as per included instructions (final assembly pictured to the left). After doing so, first charge the Super Capacitors for 30 seconds before sequencing the locomotive.

3 volt systems require 1 Super Capacitor from item #559.

Create superb "flicker free" lighting. Use one Super Capacitor with regulated lighting (items 2379, 2380).

one super capacitor from item #559

0.85l x 0.3d x 0.65w

ACCESSORIES

Lamps

Item 539.....Ballast Lamp (18 Volt, 0.15 Amps, 2/pack). May also be used to illuminate buildings, great with 16 volt input voltage from transformer Item 690. Uses Item 548 bayonet base.

Item 548.....Bayonet Base for 539 & others. This base is fully insulated from the mounting bracket!

Item 538.....Ballast Lamp Assembly. Includes one lamp and bayonet base as above.

Item 383.....2.7 volt, 60 mA, miniature lamp. Replacement lamps for regulated lighting units and other uses. (0.225" dia x 0.51" h, bright output of 0.040 M.S.C.P., 6000 hour typical life. Physical attributes are typical and may vary).

See price schedule for items not shown!

LED'S

Item 536.....T1 (3mm) Incandescent White LED (color temp. of a light bulb). Super Bright output 6000 M.S.C.P. @ 20ma. typical. 45 degree viewing angle.

Item 537.....T1¾ (5mm) Incandescent White LED (color temp. of a light bulb). Super Bright output 12300 M.S.C.P. @ 20ma. typical. 20 degree viewing angle.

Item 532	Item 533	Item 534
T1 Red	T1 Yellow	T1 Green

Item 542.....SPECIAL SHAPE RED LED. Use for engine and caboose marker lights. Front nib measures 0.079" dia. x 0.14" l, main body x 0.196" dia. x 0.177" length.

Item 593.....DUAL COLOR RED/GREEN LED with common Anode (+). Use for classification lights and other applicatoins. T1 (3mm) case size.

All LED's require an appropriate limiting resistor for the voltage applied. They cannot be reverse biased (i.e., place a voltage reverse of the proper polarity) or they will burn out. To prevent reverse polarity problems either place a diode or bridge rectifier in the power path. Wiring diagrams are shown on our web site.

See price schedule or web site for appropriate resistors, diodes, and bridge rectifiers.

Various wiring diagram's are shown with the LED's package.

Miniature Connectors

All connector packs include appropriate number of male and female connectors with wire crimp connectors, also includes heat-shrink tubing for insulating the male stub end. Connector spacing is 0.1", height (when connected) is 0.65".

Item 520.....2 pin connector pack.

Item 521.....3 pin connector pack.

Item 611..... 4 pin connector pack.

crimp pins for above connectors. Shown without wire and with wire after crimping operation.

Slides into female housing and locks for secure fit.

Ultra Miniature Connectors

Item 757.....2 pin connector pack. Includes 5 sets of ultra miniature connectors. Female connector is supplied with leads already crimped and inserted. Male end requires soldering of wire to pins. Heatshrink tubing is included. Connector spacing is 0.049", height (when connected) is 0.22"h, 0.2" d x 0.147" w footprint.

Item 758.....3 pin connector pack. Same as item 757 except contains 4 / pac, 0.196" w.

Item 222..... 6" 2 pin wire harness

Item 223..... 6" 3 pin wire harness

Item 224.....18" 2 pin wire harness

Item 225.....18" 3 pin wire harness

Terminal Block

Item 340..... 6 position. 15amp, 250v.

Switches

Item 618.....SPST momentary push button. 3amp, 125v. Mounting hole: 0.4" (13/32 - 7/16)

Item 524.....SPDT toggle switch. 3amp, 125v. Mounting hole: 13/64" (0.193").

IItem 989.....SPST reed switch. Small in size, body measures 0.1" dia x 0.591" max. length. 140vAC/DC, 0.75amp. Operate Range 8-16 AT, Release Range 4-14 AT. (2/pk)

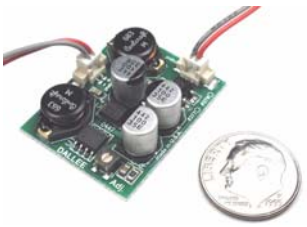
Adjustable Regulated Power Supply module

Item # 378

The VRS can be adjusted from 1.25 to 6.2 volts. The maximum output current is 1/2 ampere.

VRS is suitable for many applications:

- stationary lighting of building interiors, building ceiling and outside lights, street lights, marquees.
- lighting passenger cars, cabooses. This unit is also LocoMatic™ compatible.
- Since it supplies 6 volts, it can be used for various smoke units and other items.
- use with various lamps or LED's with appropriate limiting resistors.
- can be used to power LED's from RL-LED boards (shown on previous page) when removed from the main power strip.



1.25"w x 1"l x 0.35"h

The VRS, item #378, is supplied with plug connectors for the input and output connections with approximately 6" of wire. The VRS has no electrical items on the bottom side of it's board. This makes mounting an easy task on metallic or non-metallic surfaces. The VRS can be secured in place with glue, double sided tape (item 388), or Velcro. Requires input voltage greater than the output voltage up to 25 volts AC, or 35 v DC maximum. Input voltage may be from a stationary supply or track power. Track power can be DCC, DC, AC, TMCC, or DCS!

9VPS - Regulated 9 volt Power Supply

Item # 359

The 9VPS is a "regulated" 9 volt DC power supply. It is intended to power devices that require 9 volts DC. It can be used to replace a 9v battery. Input to the 9VPS should be 12-18 volts AC. This input power can come from the accessory terminals of most power packs or from a separate transformer. A DC input may also be used but should be 12-20 volts DC. The 9VPS is "regulated" so it can supply a consistent 9 volts DC to numerous devices regardless of changes in load current. The 9VPS is capable of delivering 1/2 ampere. Adequate input power is required for proper operation.

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em 513.....DPDT miniature toggle switch. 6amp, 125v. Mounting hole: 1/4".

Item 523.....DPDT miniature toggle switch - center off. 6amp, 125v. Mounting hole: 1/4" hole mounting.

Auto Whistle/Horn Sound System Accessories

(G operators)

Item 988.....Magnet for reed switch operation. 5/8" diamater x 3/8" high. Perfect for "G" gauge track and other uses.

Item 991.....two small magnets, 0.045" x 0.1" x 0.2"

Item 992.....Prewired USA Trains with 2 pin female power plug. Yields "plug-n-play" operation when operating on DC track power.

Item 993.....Prewired AristoCraft engine with a 3 plug mother board to Dallee DCv3 type sound systems. Yields "plug-n-play" operation when operating on DC track power.

Item 996.....complete items for using 8.4v rechargeable battery (included) with Dallee DCv3 type sound systems (standard and auto types).

Item 997.....prewired 996. Includes 8.4v rechargeable battery.

Item 998.....Prewired AristoCraft engine with a 2 plug mother board to Dallee DCv3 type sound systems. Yields "plug-n-play" operation when operating on DC track power.

Item 999.....AristoCraft connector assembly. Includes one two and one three pin connector wire harness.

POWER TRANSFORMER

Item #690

Physical size:

3.6" l x 2.6"w x 2.1"h

(subject to change w/o notice)

Item 690, wall plug in power transformer, is rated at 16vAC, 2.5 ampere's (40VA) output, 120vAC input. It can be used to power several items such as the: 9VPS (item 359), 12VPS (item 369), RL-ADJ (item 379), VRS (item 378), and all LED lighting strips. Use a bridge rectifier (item 371) to make a DC supply capable of powering several polarity reverse switch machines. This power transformer is internally fused, so you have to be careful not to overload or short the output terminals.