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OPERATING

INSTRUCTIONS

PLEASE READ BEFORE USE

**RailKing®
New York MTA
R-21 4-Car Subway Set**

Transit Announcement Sounds (TAS) Operating Instructions



Thank you for purchasing the New York MTA R-21 4-Car Subway Set. The set's durable ABS bodies and die-cast trucks are patterned and decorated after the New York Mass Transit Authority R-21 cars. The cars should operate on any O-27 Gauge track. This RailKing Subway contains state-of-the-art electronics with many built-in automatic features for incredibly realistic operation. Considering these advanced features, the subway set is easy to operate with any compatible standard AC transformer (see the compatibility chart on page 16), and is completely compatible with most other 3-rail locomotives, rolling stock, and accessories.

This subway set is equipped with Proto-Sound 2.0 with Digital Command System (DCS). This new system will allow you to operate your subway set in Command mode (when used with the DCS Remote Control System, sold separately) or Conventional mode. Conventional operating features are described in the following pages, while the DCS operating features are covered in the set of operating instructions that accompanies the DCS equipment. Conventional Mode operation of this subway set is much simpler than operation of original Proto-Sound engines. For your own safety and that of your equipment, please read the instructions before you operate this engine.

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Service and Warranty Information

CAUTION: Electrically Operated Product:

Not recommended for children under 10 years of age. M.T.H. recommends adult supervision with children ages 10 - 16. As with all electric products, precautions should be observed during handling and use to reduce the risk of electric shock.



WARNING: When using electrical products, basic safety precautions should be followed including the following:

- Read this manual thoroughly before using this device.
- M.T.H. recommends that all users and persons supervising use examine the hobby transformer periodically for conditions that may result in the risk of fire, electric shock, or injury to persons, such as damage to the primary cord, plug blades, housing, output jacks or other parts. In the event such conditions exist, the transformer should not be used until properly repaired.
- As with all electrical appliances, this product should not be left in operation when unattended.

Initial Lubrication

Although the engine was lubricated at the factory, it is important that you lubricate the chassis before operation. Lightly grease the outside idler and drive gears (marked "G" in Fig. 1) to prevent them from squeaking. Use light household oil and follow the lubrication points marked "L" in Fig. 1. Do not over-oil. Use only a drop or two on each point. Please refer to page 11 for extended maintenance instructions.

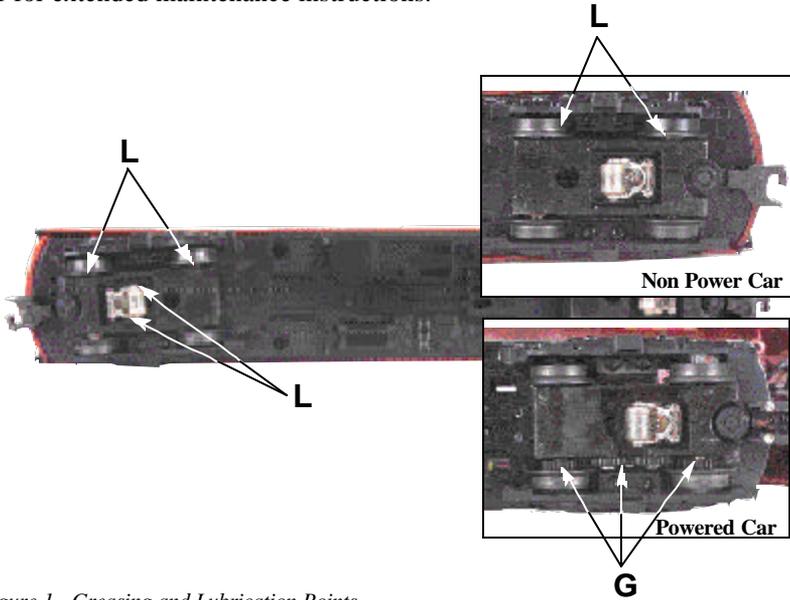


Figure 1 - Greasing and Lubrication Points

At this point, you are ready to put your engine on the track and begin running it.

Couplers

The couplers included with this set are O-27 and larger operation. For a more prototypical look, shorter couplers that operate on O-54 or larger layouts are available separately from the M.T.H. Parts Department (phone: 410-381-2580; fax: 410-423-0009; e-mail: parts@mth-railking.com; mail: 7020 Columbia Gateway Drive, Columbia, MD 21046-1532). Ask for a part number DD-4000005.

Basic Operation

Throttle - Throttle up the power to your track. Advance the throttle until 12 - 16 volts is applied, then put the subway set into forward motion by either firmly pressing the Direction button on your transformer or remote once or dropping and advancing the throttle.

Operation Buttons

Use the operation buttons on your transformer or remote as described below.

Horn/Whistle - To sound the horn, firmly press the Horn/Whistle button. The horn will sound for as long as you continue to depress the button. It will stop when you release the button. The horn has four different endings, depending on whether you hold the button for less than three seconds, three seconds, four seconds, or five seconds or longer.

Bell - To sound the bell, quickly press and release the Bell button. If you press the button for too long, you will trigger the Transit Announcement Sounds described later in this book. To turn the bell off, press and release the Bell button again. The bell will continue to ring from the time you turn it on until you press and release the button again to turn it off.

Direction - Your train is programmed to start in neutral. The first direction from neutral upon start-up is forward. Firmly press and release the Direction button to allow the engine to move forward. Just as you must stop your automobile between forward and reverse, this engine will not go directly from forward to reverse; it goes into neutral between directions. If the train has been moving forward, the first press of the Direction button will put the train from forward into neutral, the second press into reverse, the third press back into neutral, and the fourth back into forward. To prevent accidental high-speed start-ups, this engine is programmed to restart in neutral each time the track voltage is turned off for approximately 25 seconds or more.

Manual Volume Control - To adjust the volume of all sounds made by this subway set, turn the manual volume control knob located under the engine clockwise to increase the volume and counter-clockwise to decrease the volume (see Fig. 2).

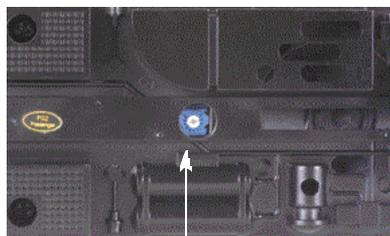


Figure 2 - Volume Adjustment Knob

Proto-Sound 2.0 Operating Instructions

This manual contains the operating instructions for Proto-Sound 2.0 in conventional mode only. Instructions for accessing DCS command mode features accompany the DCS Remote Control System equipment.

Because Proto-Sound 2.0 is an all-new system developed by M.T.H.'s own research and development team, it operates differently from original Proto-Sound. Most Proto-Sound 2.0 features are automatically enabled, and Reset has been eliminated, so there is no need to program features as with original Proto-Sound. Although the new system is easier to operate than original Proto-Sound, you should read these instructions thoroughly before using Proto-Sound 2.0 features in order to prevent harm to yourself or your equipment.

Activating Proto-Sound 2.0 Conventional Mode Features:

Proto-Sound 2.0 features are activated by sequences of Bell and Whistle button pushes described below. Please read the full descriptions of each feature before using it. To use these buttons to activate features rather than to blow the whistle or ring the bell, you should press the buttons firmly, but with a rapid cadence with a ½-second pause between button presses. You may need to practice your timing to make this work smoothly.

| Timing Chart | | | | |
|-------------------------------|--------------|---------------------|--------------|---------------------|
| Tap Bell Quickly | ½ Sec. Pause | Tap Whistle Quickly | ½ Sec. Pause | Tap Whistle Quickly |
| Total Time Lapse: 1 ½ Seconds | | | | |

Operating Modes

1. Manual Mode

Upon initial power application, the subway set will start up in manual mode. The chart below lists the features available to the operator when in Manual Mode. Different features are available when operating in Learn and Auto Modes.

Feature to Be Activated: Button Code:

| Feature to Be Activated | Button Code: |
|---|--|
| Transit Announcement Sounds (TAS) | 1 Bell (depress button approx 2 seconds) |
| Fire the Front Coupler | 1 Bell, 4 Horns |
| Speed Control On/Off | 1 Horn, 2 Bells (from neutral only) |
| Lock into a Direction | 1 Horn, 3 Bells |
| Reset to Factory Defaults (including default Auto Mode Route Settings) | 1 Horn, 5 Bells (from Neutral only) |

Transit Announcement Sounds (TAS):

Your Proto-Sound 2.0 Subway Set is equipped with operator controlled Transit Announcement Sounds, hereby known as TAS. This easy to use feature plays digitally reproduced transit announcements and platform action sounds whenever you activate and stop your subway set. No additional wires or modifications are needed on your layout to enjoy these amazing sound effects. These different sounds are heard each time you give a long bell button press. The entire TAS sequence is designed to simulate the arrival, disembarking, embarking, and departure of a subway train stop. The sounds include the subway driver announcing the stop and the upcoming stop, passenger disembarking and embarking sounds, driver to passenger requests, door openings and closing and general subway platform action sounds. After the station sounds have finished, the engine will shift back into gear and, if the throttle is set high enough, will pull away from the station.

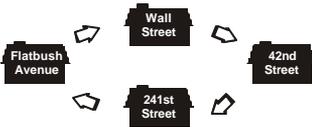
1. To activate the TAS, press and hold the bell button for approximately 2 seconds.
2. If you do not wish to stop at the station that is announced after activating TAS, press and hold the bell button again without throttling down the train.

2. Learn Mode

In Learn Mode, the subway set may be programmed with either an "Out & Back" route or a "Loop" route. An "Out & Back" route begins at the 1st station (as programmed by the operator), stops at intermediate stations, ends at the last station, then reverses its route until it reaches the 1st station. A "Loop" route begins at the 1st station (as programmed by the operator), stops at intermediate stations, ends at the last station, and then begins the route over again at the 1st station.

Example of Out and Back:

Example of Loop:



The following is a list of the stations that may be programmed with this Subway Car Set:

- 241st Street - White Plains Ave
- Pelham Parkway
- Tremont Ave
- 42nd Street
- 34th Street
- Park Place
- Wall Street
- Grand Army Plaza
- Flatbush Avenue

To program stations:

1. Running in the forward direction, stop the subway set at the desired location for the first stop by pressing the direction button. Note: if you stop the subway set with the throttle control, you must re-apply power so that the subway does not shut down.
2. Enter the Learn Mode by pressing Horn - Bell - Bell - Bell - Bell. The train will then announce that you have entered Learn Mode.
3. Press the Bell button to scroll through the available stations until you hear the one that you would like to be your first stop.
4. Press and hold the Horn button until a "saved" response confirms that station's location and name are saved in memory.
5. Proceed to the next stop by pressing the Direction button.
6. Press the Direction button to stop the train again when you have reached the next desired station location.
7. Using the Bell button, select the name of the station, then save using the Whistle button.
8. Repeat steps 5 - 7 until you are ready to program the last stop in the route.
9. The manner of saving the last station in the route determines whether the route will be an "Out & Back" or "Loop" route.
 - "Out & Back": follow steps 5 - 7 to save the last station. After you press the Horn button and the subway plays the "Saved" confirmation, press the Horn button again. Another "Saved" confirmation will play and the subway will exit Learn Mode and enter Manual Mode.
 - "Loop": follow steps 5 - 7 to save the last station. Press the Direction button once to start the subway in forward and stop the subway at the location of the first stop by pressing the Direction button. Press the Bell button as many times as is necessary to hear the name of the first stop. Press the Horn button until the "Saved" confirmation is played. The subway will then automatically exit Learn Mode and enter Manual Mode.

Notes:

- Always approach a desired station stop location while running in the forward direction. Learn mode counts distance traveled, not actual physical locations. However, unlike an automobile's odometer, Proto-Sound 2.0 Subway Learn Mode does erase distance when travelling in reverse. If you operate your subway past the desired stop location, you may back it up to the desired stop location, however you must put the subway into forward and then neutral again before saving the stop name and location into memory.
- If you press the Direction button too soon (stop the subway prior to the desired stop location), press the Direction button to continue to the next desired stop location in the forward direction.
- The factory defaults and your programmed settings both remain in memory after the engine is shut down, so there is no need to re-program your settings each time you run your subway.

Auto Mode

When you have finished programming your stations in Learn the subway will be in Manual Mode. Running in the forward direction, stop the subway at the location of the first station by pressing the Direction button. Press Bell Whistle - Whistle to put the train into Auto Mode. Press the Direction button again to begin operation in Auto Mode. Because Auto Mode operation begins at the first stop, the next stop announced will be the second stop.

Notes:

- The engine will always power up in Manual Mode.

| Feature to Be Activated | Button Code: |
|-------------------------------------|---|
| Learn Mode | |
| To Enter Learn Mode | 1 Horn, 4 Bells |
| To Stop at Each Station | Direction |
| To Scroll through the Station Names | Bell (release as soon as you hear the desired station name) |
| To Save Station | Horn (hold for "Saved" response) |
| Auto Mode | |
| To Enter Auto mode from Manual Mode | 1 Bell, 2 Whistles |
| To Begin Programmed Run | Direction |
| Manual Mode | |
| To Enter Manual Mode from Auto Mode | 1 Bell, 2 Horns |

Proto-Coupler® Operation

This subway set is equipped with one or more coil-wound Proto-Couplers for remote uncoupling action. Because Proto-Couplers are controlled through the Proto-Sound 2.0 microprocessor, they do not require an uncoupling track section or modification to your layout to function. You can

fire a coupler from neutral or while in motion. Use the code shown below (and in the chart on p. 6) to fire the coupler(s).

Front Coupler:

To fire the front coupler, quickly tap the Bell button once followed by four quick taps of the Horn button, allowing approximately ½ second to lapse between each quick button press. The sound of the liftbar and air line separation will play, and the knuckle will be released.



Tap buttons quickly but allow ½ second between each press

Speed Control:

M.T.H. engines equipped with Proto-Sound 2.0 have speed control capabilities that allow the engine to maintain a constant speed up and down grades and around curves, much like an automobile cruise control. You can add or drop cars on the run, and the engine will maintain the speed you set.

While the engine is programmed to start with the speed control feature activated, you can opt to turn it off. This means the engine's speed will fall as it labors up a hill and increase as it travels downward. It is also affected by the addition or releasing of cars while on the run.

To turn speed control on and off, put the engine in neutral, then quickly tap the transformer's Horn button one time then quickly tap the Bell button two times, allowing approximately ½ second to lapse between each quick button press. Two horn blasts will indicate that the engine has made the change. Repeat the 1 Horn, 2 bells code to return it to the other condition. You will want to do this during the initial neutral upon start-up if you ever couple this engine to another engine that is not equipped with speed control to avoid damaging the motors in either engine. Each time you shut down the engine completely, it will automatically turn speed control on.



Tap buttons quickly but allow ½ second between each press

Note:

When speed control is turned off, the Proto-Sound 2.0 system will limit the volume in order to operate more smoothly at lower voltages. Full volume is restored upon reactivating speed control.

Lock into a Direction:

You can lock your engine into a direction (forward, neutral, or reverse) so that it will not change directions. To do this, put the engine into the direction you want (or into neutral to lock it into neutral), run it at a very slow crawl (as slowly as it will move without halting), and quickly but firmly tap the Horn button once followed by three quick taps of the Bell button, allowing approximately ½ second to lapse between each quick button press. Two horn blasts will indicate that the engine has made the change. The engine will not change direction (including going into neutral) until you repeat the 1 horn, 3 bells code to return the engine to its normal condition, even if the engine is kept without power for extended periods of time.



Tap buttons quickly but allow ½ second between each press

Reset to Factory Defaults:

To override the settings you currently have assigned to the engine and reset it to its factory defaults, while in Neutral quickly tap the Horn button quickly once, followed by five quick taps of the Bell button, allowing approximately ½ second to lapse between each quick button press. Two horn blasts will indicate that the engine has made the change.



Tap buttons quickly but allow ½ second between each press

Automatic Sounds:

Certain Proto-Sound 2.0 sound effects automatically play in programmed conventional mode conditions:

- Squealing Brakes play any time the engine's speed decreases rapidly.
- Platform Action Sounds play at random intervals when the engine idles in neutral.
- Engine Start-up and Shutdown sounds play when the engine is initially powered on or is powered off for five seconds or more.

Maintenance

Lubrication and Greasing Instructions

The Subway Set should be oiled and greased in order to run properly.

You should regularly lubricate all outside idler gears and pickup rollers to prevent them from squeaking. Use light household oil and follow the lubrication points marked "L" in Fig. 1 on page 3. Do not over oil. Use only a drop or two on each point.

The locomotive's internal gearing was greased at the factory and should not need additional grease until after 50 hours of operation or one year, whichever comes first. Use lithium-based grease and follow the greasing instructions below. Note that in some tightly packed engines you may need to move internal components temporarily in order to access the gears.

1. Remove the Phillips screws from the chassis, labeled as 1a in Figure 3, then lift the body away from the chassis. (*1b Interior needs to be removed before you can get to the motors by removing screws labeled 1b in Figure 3)
2. Lift the interior off of the chassis.
3. Remove the truck blocks from the chassis by unscrewing the black Phillips motor mount screw on the bottom of each truck block, as shown in Figure 3.

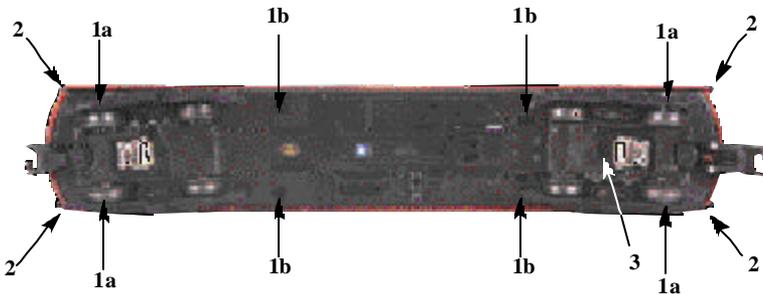
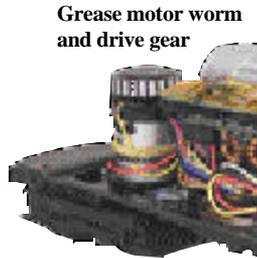


Figure 3 - Removing Motor Mount from Body

4. Once the motor mount screw has been removed, pull the motor away from the truck block and lightly coat the motor worm gear and bronze drive gear (in the truck block) with grease.
5. Reassemble the truck and motor, being careful not to pinch any wires between the truck block and motor mount.



- 6.Repeat the procedure for the other motor and truck
- 7.Reassemble the interior to the chassis and then the body to the chassis, being careful that the wires are not caught between the body and chassis, as this can lead to a short that may damage the electronics beyond repair.

It is also a good idea to lubricate the outside truck block idler and drive gears with grease occasionally. Add grease to the points marked with "G" in Figure 1 on page 3.

Cleaning the Wheels, Tires and Track

Periodically check the subway set wheels and pickups for dirt and buildup, which can cause poor electrical contact and traction as well as prematurely wear out the neoprene traction tires. Wheels and tires can be cleaned using denatured alcohol (not rubbing alcohol), which can be found in home improvement stores, applied with a cotton swab.

Occasional cleaning of the track will also help to ensure good electrical contact and to prolong the life of your engine's tires. To clean the track, use a clean rag and denatured alcohol (not rubbing alcohol). Unplug the transformer and wipe the rails of the track, turning the rag frequently to ensure that you are using clean cloth on the rails.

Traction Tire Replacement Instructions

Your subway set is equipped with two neoprene rubber traction tires on each powered truck block. While these tires are extremely durable, you may need to replace them at some point.

First, remove the truck sides from the truck block. To do this, turn your engine upside down. If there are visible Phillips screw heads between the truck frame and truck block (see Fig. 4).

Remove the two Phillips screws that attach the truck sides to the truck block.

Once the truck sides have been removed:

- 1.Make sure the old tire has been completely removed from the groove in the drive wheel, using a razor blade or small flathead screwdriver to pry away any remains.

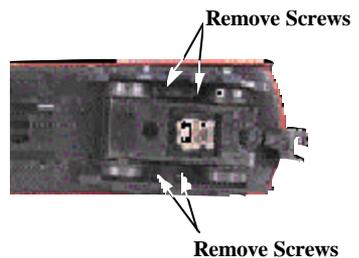


Figure 4- Traction tire Replacement

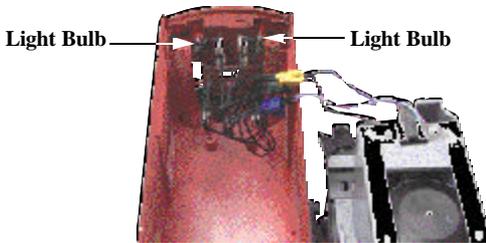
2. Slip the new tire onto the wheel. You may find it useful to use two small flathead screwdrivers to stretch the tire over the wheel.
3. If you twist the tire while stretching it over the wheel, you will need to remove and reinstall the tire. Otherwise your engine will wobble while operating.
4. Make sure the tire is fully seated inside the groove. Use a razor blade to trim away any excess tire that doesn't seat itself inside the groove properly.
5. Reassemble in reverse order.

One set of replacement tires is packaged with the model. Additional tires are available directly from the M.T.H. Parts Department (phone: 410-381-2580; fax: 410-423-0009; e-mail: parts@mth-railking.com; mail: 7020 Columbia Gateway Drive, Columbia MD 21046-1532).

Light Bulb Replacement

To replace the light bulbs in the subway set, follow these instructions:

Follow the cab removal instructions found in the "Lubrication and Greasing" section of this booklet. Once the body has been removed, remove the lightbulb as shown in Fig. 3 on page 11 and replace it.



*Figure 5 -
Replacing Light Bulb*

You can obtain replacement bulbs directly from the M.T.H. Parts Department.

Self-Charging Battery Back-Up

The special NiCad 7-cell 8.4v self-charging battery in this engine improves performance at any speed. It ensures that power to the sound system will remain on during directional changes, or when travelling over dirty track or switches. The self-charging battery system is automatically turned on or off whenever track power is turned on or off.

Track power (when applied) recharges the battery, which should last for up to five years, and the special NiCad battery is a dry battery that should not

leak or cause any damage to your engine. However, even this special battery will eventually wear down and need to be replaced. When you notice that your engine sounds seem distorted or garbled at low voltages or become silent when power from the transformer is turned off, test the battery to determine whether it should be recharged or replaced.

- Put the engine in neutral and leave the track voltage at 12 volts for 15 minutes
- If the sounds are improved at the end of the 15-minute test charge, the battery charge has run down and can be recharged. Do this by leaving the engine in neutral with track voltage at 12 volts for 6-7 hours so the battery can fully recharge (if your engine has a smoke unit, be sure it is turned off). Or you can remove the battery and charge it in any standard slow charge battery recharger, following the recharger's directions.
- If the sounds are not improved at the end of the 15-minute test charge, it is time to replace the battery.

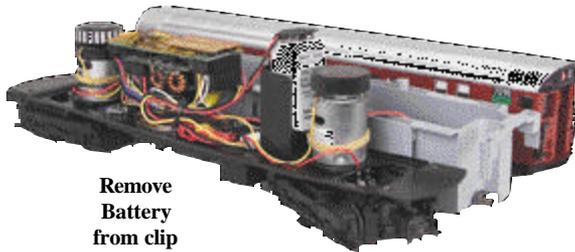


Figure 6 - Remove Battery

Contact the M.T.H. Parts Department (phone: 410-381-2580; e-mail: parts@mth-railking.com; mail: 7020 Columbia Gateway Drive, Columbia MD 21046-1532) for a replacement battery. A standard 9v alkaline battery can be substituted until your replacement arrives, but since alkaline batteries cannot be recharged, it will eventually wear down. **Do NOT** use a 6-cell 7.2v battery like those found in most convenience stores.

Troubleshooting Proto-Sound® 2.0 Problems

Although Proto-Sound 2.0 has been designed and engineered for ease of use, you may have some questions during initial operation.

| Starting Up | Remedy |
|---|---|
| When I first turn the power on, the engine will not begin to run. I have to turn the throttle off and then on again to get the engine to operate. | This is normal behavior. To prevent accidental high-speed start-ups, Proto-Sound 2.0 is programmed to start up in neutral anytime track power has been turned off for several seconds. See the "Basic Operation" section for more details. |
| Horn | Remedy |
| When I press the whistle button, the bell comes on instead. | Reverse the transformer leads |
| I can't get the horn to blow when I press the whistle button. | You may be pressing the button too quickly. Try pressing the whistle button more slowly, taking approximately one full second to fully depress the button. |
| Bell | Remedy |
| When I press the whistle button, the bell sounds. | Reverse the transformer leads. |
| I can't get the bell to ring when I press the bell button. | You may be pressing the button too quickly. Try pressing the whistle button more slowly, taking approximately one full second to fully depress the button. |
| The bell won't work on a separate bell button. | Check the wiring of the separate button. |
| Coupler | Remedy |
| When I try to fire the coupler, TAS starts. | You are waiting too long between whistle button presses. |
| When I try to fire the coupler, TAS starts. The Proto-Coupler won't let the engine uncouple on the fly. | Try lubricating the coupler knuckle and rivet with a dry graphite lubricant. |
| The coupler does not fire or stay coupled. | The coupler needs to be cleaned. Wipe with denatured alcohol (not rubbing alcohol) and let dry. |
| Platform Action Sounds | Remedy |
| Sometimes the Platform Action Sounds don't play. | Platform Action Sounds play only in neutral at random intervals. |
| Lock-out | Remedy |
| I can't get the engine to run after I power up the transformer. It sits still with the diesel and compressor sounds running. | The engine is locked into the neutral position. Follow the procedure in the "Lock into a Direction" section. |
| The engine won't lock into forward, neutral, or reverse. | Engine speed must be below 10 scale mph (approx. 10 volts or less in conventional mode). |
| Volume | Remedy |
| The sounds seem distorted, especially when the whistle or bell is activated. | Proto-Sound 2.0 volume is set too high. Turn the volume control knob on the bottom of the chassis counter-clockwise to reduce the volume. |
| Battery | Remedy |
| The engine will not leave the initial neutral setting. | Check to be sure the battery is installed and fully charged. See the "Self-Charging Battery Back-Up" section. |
| I get no sounds when the engine shifts between directions. | The battery may be dead or need to be charged. See the "Self-Charging Battery Back-Up" section. |
| After I turn off my transformer, my engine continues to make sounds before quitting. | Proto-Sound 2.0 is designed to continue to sound for a few seconds after power to the track has been shut off. |
| TAS | Remedy |
| The TAS sounds occasionally repeat themselves. | Proto-Sound 2.0 has a built-in random number generator that randomly selects each sound clip to play. Because there are a limited number of sound clips available in each TAS sequence, it is probable that some of these sound clips will be repeated from time to time. |

Compatibility

This engine will operate on any traditional O-31 or larger O Gauge track system, including M.T.H.'s RealTrax® or ScaleTrax™ or traditional tubular track. It is also compatible with most standard AC transformers. (See page 16 for a complete list of compatible transformers and wiring instructions.)

Transformer Compatibility and Wiring Chart

| Transformer Model | Center Rail | Outside Rail | Min/Max. Voltage | Power Rating | Transformer Type |
|---------------------------------------|------------------------|-----------------------|------------------|--------------|------------------|
| MTH Z-500 | Red Terminal | Black Terminal | 0-18v | 50-Watt | Electronic |
| MTH Z-750 | Red Terminal | Black Terminal | 0-21v | 75-Watt | Electronic |
| MTH Z-4000 | Red Terminal | Black Terminal | 0-22v | 390-Watt | Electronic |
| Lionel 1032 | U | A | 5-16v | 90-Watt | Standard |
| Lionel 1032M | U | A | 5-16v | 90-Watt | Standard |
| Lionel 1033 | U | A | 5-16v | 90-Watt | Standard |
| Lionel 1043 | U | A | 5-16v | 90-Watt | Standard |
| Lionel 1043M | U | A | 5-16v | 90-Watt | Standard |
| Lionel 1044 | U | A | 5-16v | 90-Watt | Standard |
| Lionel 1053 | U | A | 8-17v | 60-Watt | Standard |
| Lionel 1063 | U | A | 8-17v | 60-Watt | Standard |
| All-Trol | Left Terminal | Right Terminal | 0-24v | 300-Watt | Electronic |
| Dallee Hostler | Left Terminal | Right Terminal | | | Electronic |
| Lionel LW | A | U | 8-18v | 75-Watt | Standard |
| Lionel KW | A or B | U | 6-20v | 190-Watt | Standard |
| Lionel MW | Outside Track Terminal | Inside Track Terminal | 5-16v | 50V.A. | Electronic |
| Lionel RS-1 | Red Terminal | Black Terminal | 0-18v | 50V.A. | Electronic |
| Lionel RW | U | A | 9-19v | 110-Watt | Standard |
| Lionel SW | U | A | Unknown | 130-Watt | Standard |
| Lionel TW | U | A | 8-18v | 175-Watt | Standard |
| Lionel ZW | A,B,C or D | U | 8-20v | 275-Watt | Standard |
| Lionel Post-War Celebration Series ZW | A,B,C or D | Common | 0-20v | 135/190 Watt | Electronic |

* Conventional Mode Only

Note that many of the operational commands described in these instructions require a bell button, so if your transformer does not have its own bell button, you should consider adding one to get the full benefit of the system.

Additional Features Accessible with the DCS Remote Control System:

While conventional mode operation of a Proto-Sound 2.0 engine yields wonderfully realistic sound and several train control features, command mode operation allows the user to access a world of command functions

never before accessible to O Gauge railroaders. With the addition of the DCS Remote Control System (including a DCS remote handheld and Track Interface Unit) users gain many advanced features, including:

- DCS Proto-Speed Control - Establishes desired locomotive speed in scale miles per hour increments via a thumbwheel control and allows operator to set maximum speed and acceleration/deceleration rates
- Locomotive Lighting Control - Controls locomotive headlights, marker and interior lights, beacon lights, ditch lights, and MARS lights
- Emergency Stop-Single button push stops all Proto-Sound 2.0 trains but does not turn off the power
- One Touch Global Mute/UnMute-Single button mutes or unmutes all DCS-controlled locomotives' user-defined actions, including sound, lights, and smoke
- Proto-Dispatch Operation-Public Address-like feature allows users to speak through locomotive speaker during operation
- Proto-Cast-Allows users to play audio recordings through locomotive speaker during operation
- Proto-Doppler Sound Effects Set Up-Users can configure locomotive for Doppler Operation, including setting distance points for Doppler start, repeat, and stop modes
- Independent Volume Control of Engine Sounds, Bell, Horn & Whistle for each Locomotive
- Control several DCS-Equipped Locomotives at one time with multiple TIUs
- Proto-Effects™ Set Up-User can select individual Proto-Effects™ operations to be active or inactive, including cab chatter, train wreck sounds, coupler sounds, and wheel clackety-clack sounds
- Direction Control Set Up-User can set initial individual start-up direction (start in forward or reverse) for double-heading operations
- Locomotive Consist Set-up-User can determine locomotive values for consist make-ups, allowing multiple locomotives belonging to a consist to operate together
- Query Locomotive Information-User can query locomotive programming to learn locomotive address and engine data information, including scale miles traveled
- User Can Query, Set and Operate Track and Accessory Interface Units for Programming Digital Command Operations for up to 250 Accessories and 250 Individual Switches
- User Can Script, Record and Playback Train Routes

Operating instructions for all DCS Command features will accompany the DCS remote control equipment.

SERVICE & WARRANTY INFORMATION

How to Get Service Under the Terms of the Limited One-Year Warranty

For warranty repair, do not return your product to the place of purchase. Instead, follow the instructions below to obtain warranty service, as our dealer network is not prepared to service the product under the terms of this warranty.

1. First, write, call or FAX M.T.H. Electric Trains, 7020 Columbia Gateway Drive, Columbia, MD 21046, (Tel: 410-381-2580; FAX: 410-423-0009; e-mail: service@meth-railking.com), stating when it was purchased and what seems to be the problem. You will be given a return authorization number to ensure that your merchandise will be properly handled upon its receipt.
2. **CAUTION:** Make sure the product is packed in its original factory packaging including its foam and plastic wrapping material so as to prevent damage to the merchandise. The shipment must be prepaid and we recommend that it be insured. A cover letter including your name, address, daytime phone number, e-mail address (if available), Return Authorization number, a copy of your sales receipt and a full description of the problem must be included to facilitate the repairs. Please include the description regardless of whether you discussed the problem with one of our service technicians when contacting M.T.H. for your Return Authorization number.
3. Please make sure you have followed the instructions carefully before returning any merchandise for service.

Limited One-Year Warranty

All M.T.H. products purchased from an Authorized M.T.H. Train Merchant are covered by this warranty.

See our website at www.mth-railking.com or call 1-888-640-3700 to identify an Authorized M.T.H. Train Merchant near you.

M.T.H. products are warrantied for one year from the date of purchase against defects in material or workmanship, excluding light bulbs and traction tires. We will repair or replace (at our option) the defective part without charge for the parts or labor, if the item is returned to M.T.H. Electric Trains within one year of the original date of purchase. This warranty does not cover damages caused by improper care, handling, or use. Transportation costs incurred by the customer are not covered under this warranty.

Items sent for repair must be accompanied by a return authorization number, a description of the problem, and the original sales receipt from an Authorized M.T.H. Train Merchant, which gives the date of purchase. Call 410-381-2580, fax 410-423-0009, or e-mail the Service Department at service@meth-railking.com to obtain a return authorization number.

This warranty gives you specific legal rights, and you may have other rights that vary from state to state.

Service Department
M.T.H. Electric Trains
7020 Columbia Gateway Drive
Columbia MD 21046-1532



www.railking.com

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