NEW YORK
CENTRAL

Lionel
S-2 Electric Locomotive
Owner's Manual

featuring **TRAINmaster**
C·O·M·M·A·N·D

RailSounds
5.0

and

ODYSSEY
SYSTEM

Congratulations!

Congratulations on your purchase of the Lionel S-2 Electric Locomotive! On the outside, this locomotive features numerous prototypical details and expert decoration in your favorite livery. Inside the body, this locomotive is equipped with some of the most advanced sounds and controls in model railroading. The Lionel S-2 locomotive is ready for duty on your layout.

Features of this locomotive

- **TrainMaster Command Control equipped—able to run in Command Control Mode or in Conventional Transformer Control Mode**
- **Odyssey System for speed control with ON/OFF switch**
- **Refined Conventional Transformer Control Mode with lower starting speeds and improved Odyssey System controls**
- **RailSounds 5.0 sound system with new intelligible CrewTalk dialog and more TowerCom announcements, each with different scenarios depending on whether the locomotive is in motion or stopped**
- **Independently adjustable volume control—lower the level of background effects such as the blower with the CAB-1 Remote Controller while keeping operator-controlled effects such as the horn at full volume**
- **Powerful maintenance-free motor with momentum flywheel**
- **Directional headlights including illuminated number boards**
- **Front and rear ElectroCouplers**
- **Traction tires**
- **Illuminated front cab interior**
- **Minimum Curve: O-36**

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   Note! Do not power your locomotive with a direct-current (DC) transformer. Damage to sensitive electronic components may occur.

3. **Wait three to eight seconds as your locomotive determines whether it is in a conventional environment or a TrainMaster Command Control environment. The pantographs will operate automatically.**
4. **Move 'em out! Press the DIRECTION button on your controller, then throttle up.**

TrainMaster Command Control operations

To operate your locomotive in the Command Control environment, you need a Command Base (available separately, 6-12911) and a CAB-1 Remote Controller (available separately, 6-12868). These products are available together in the TrainMaster Command Set (6-12969).

1. **Turn off track power and plug in the Command Base.**
2. **Place your locomotive on Lionel or Lionel-compatible O-36 or larger track.**
3. **Increase track voltage to full power or 19 volts AC.**

   Note! Do not power your locomotive with a direct-current (DC) transformer. Damage to sensitive electronic components may occur.

4. **Press ENG and 1 to address your locomotive with your CAB-1 Remote Controller. The pantographs will operate automatically.**
5. **Throttle up and move 'em out.**

Conventional transformer operations

Conventional operations

Your locomotive is capable of operating in the conventional environment with nothing more than a standard Lionel alternating-current (AC) transformer.

In the conventional environment, your locomotive cycles through a repeating pattern of operations: forward, neutral, reverse, neutral, and so on. To advance to the next operation, press the **DIRECTION** button on your transformer. Alternately, you could use the throttle to briefly turn off track power so that the locomotive advances to the next operation when power is restored.

Once you cycle the locomotive into forward or reverse, you control your locomotive's speed by varying track voltage with the transformer's throttle. To increase the speed of the locomotive, you increase track voltage. To decrease the speed, you decrease track voltage. To stop the locomotive and to change directions (or to enter neutral), track voltage is turned off or interrupted.

Use the **HORN** and **BELL** buttons on your transformer (or separate buttons if your transformer is not equipped with these controls, see page 13) to activate these features.

To experience all of your locomotive's features, we recommend operating in the TrainMaster Command Control environment. With a simple one-wire connection, you can use the CAB-1 Remote Controller to access all of the functions of your locomotive. Refer to pages 19-26 to see how to operate your locomotive in the TrainMaster Command Control environment.

Conventional transformer operations

Operating your locomotive in the conventional environment

1. **Place your locomotive on Lionel or Lionel-compatible O-36 or larger track.**

2. **Power your locomotive at 8-19 volts with your alternating current (AC) transformer.**

   Caution! Power your locomotive with an alternating-current (AC) transformer only. Powering your locomotive with a direct-current (DC) transformer may result in damage to sensitive electronic components.

3. **Wait three to eight seconds as your locomotive determines whether it is in a conventional environment or a TrainMaster Command Control environment.**

   When the locomotive has determined that a TrainMaster Command Base is not connected to the track, the locomotive's headlight will illuminate and the RailSounds sound system will start. You are ready for operation in the conventional environment.

4. **Move 'em out!**

   Press the **DIRECTION** button on your transformer to sequence your locomotive through the repeating pattern of operations: forward, neutral, reverse, neutral, and so on. You may also briefly turn off track power to advance the locomotive to the next operating state. Adjust the throttle until your locomotive moves at your desired speed.

   Note! When placing your locomotive on your layout for the first time, it will start out in neutral. The RailSounds sound system will be silent, except for the pantograph sounds. Thereafter, it will start in forward after every power interruption lasting five seconds or longer.

   Use the **HORN** and **BELL** buttons on your transformer to activate those features. Refer to page 13 if your transformer is not equipped with those buttons. Adjust the volume using the volume control knob located under the removable roof-top hatch. Refer to Figure 1 on page 7.

Conventional transformer operations

Locking your locomotive into a single direction

When the Command reverse unit switch is in the RUN position, your locomotive sequences through a repeating pattern of operations: forward, neutral, reverse, neutral, and so on. To "lock" your locomotive into a single direction (for example, to operate in forward only), you can deactivate the Command reverse unit's sequencing function. Refer to Figure 1 for the location of the Command reverse unit switch.

1. Use your transformer's **DIRECTION** button or interruptions in track power to get your locomotive moving in the desired direction or into neutral.

2. Slow the locomotive down without stopping (reduce the throttle without turning off track power).

3. Slide the Command reverse unit switch to the PROG position. At this point, the locomotive is "locked" into your chosen direction.

To restore the forward-neutral-reverse sequence, turn off track power and slide the Command reverse unit switch back to the RUN position.
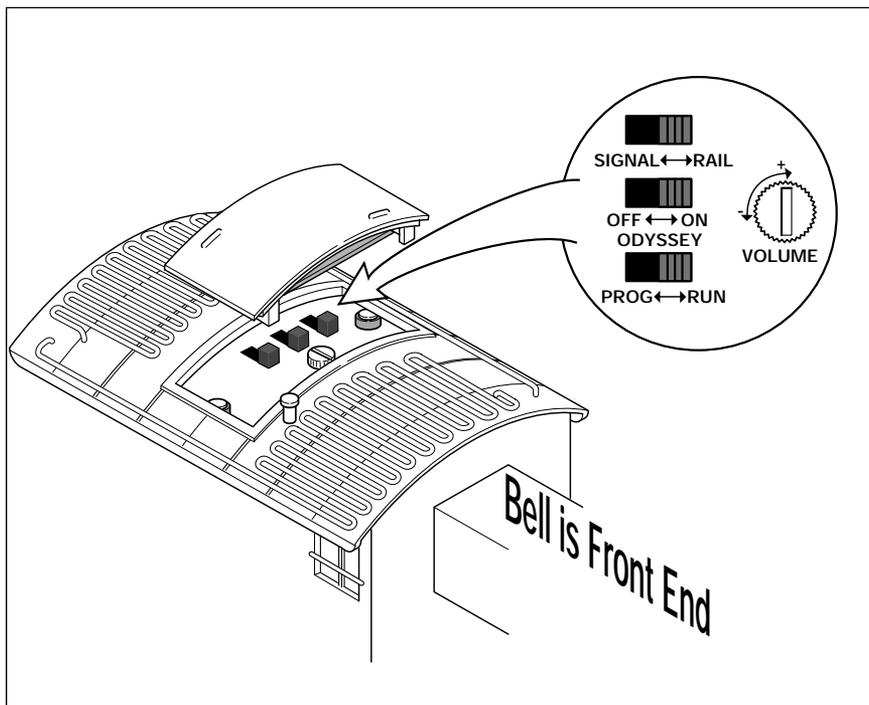
Figure 1. Switch locations

Conventional transformer operations

Uncoupling your locomotive in the conventional environment

Your locomotive features two ElectroCouplers that are released by remote control at any point around your layout in the TrainMaster Command Control environment.

In the conventional environment, the ElectroCouplers will not open manually or by using a Remote-Control Track section. To couple your locomotive in the conventional environment, you must rely on a piece of rolling stock equipped with a magnetic coupler. Simply release the magnetic coupler and couple the rolling stock to the locomotive, even if the ElectroCoupler is closed.

Keep in mind that you may still make use of Lionel Remote-Control Track sections (6-65530 for O gauge; 6-12746 and 6-65149 for O-27 gauge; and 6-12020 for FasTrack layouts) with the magnetic couplers on the rolling stock. Place the trigger disc on the magnetic coupler over the central coil on the Remote-Control Track section, then press UNCOUPLE on the track section's controller. As illustrated in Figure 3, the magnetic field pulls the disc downward, releasing the coupler.

Remote-Control
Track Section
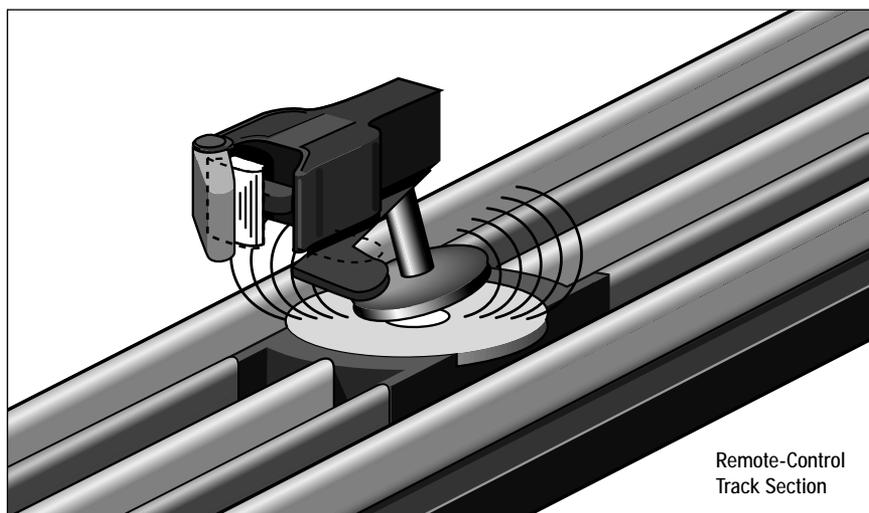
Figure 3. Magnetic coupler operation

RailSounds 5.0 sound system operations

RailSounds sound system operations

Your locomotive is equipped with the Lionel RailSounds 5.0 sound system, the most realistic model railroad sound system in the world. The RailSounds sound system brings the sounds of the railroad to your layout through high quality sound recordings of real locomotives.

When you operate your locomotive in the conventional environment, you get the realistic sounds of the electric motor, which automatically rev up as the speed of the locomotive increases. You can sound the locomotive's horn or activate the ringing of the mechanical bell. CrewTalk dialog and TowerCom announcements are triggered with the horn button on your controller. When you are through with operations and power down the track, your locomotive's RailSounds sound system starts a realistic shutdown sequence (a nine-volt alkaline battery is required, see page 10).

When you operate your locomotive in the TrainMaster Command Control environment, you get full control of the RailSounds 5.0 sound system. In addition to the horn and bell sounds, the locomotive's RPM sounds automatically rev up, and you can also set a particular RPM level using your CAB-1 Remote Controller. In the Command Control environment, the release of the ElectroCouplers is accompanied by a coupler release sound. Use the **BRAKE** button, and listen for the sound of squealing metal. You can also trigger CrewTalk dialog and TowerCom announcements, which simulate the interaction between the locomotive crew and the dispatcher. Whenever you choose to shutdown your locomotive, the realistic shutdown sequence commences (a nine-volt alkaline battery is required if track power is turned off, see page 10).

RailSounds 5.0 sound system operations

Installing the battery

Although the RailSounds sound system is powered through the track, we recommend that you install a nine-volt alkaline battery to prevent the sound system from shutting down during track power interruptions (for example, at a switch or a dirty section of track). Follow these steps and refer to Figure 4 as you install the battery.

Note! If the RailSounds sound system turns off during interruptions in track power, you may need to replace the battery.

1. Remove the body screws from the underside of the locomotive and lift away the body. Refer to Figure 4 on page 27 for the screw locations.

2. Snap the battery harness onto the battery terminals.

3. Slide the battery into the holder.

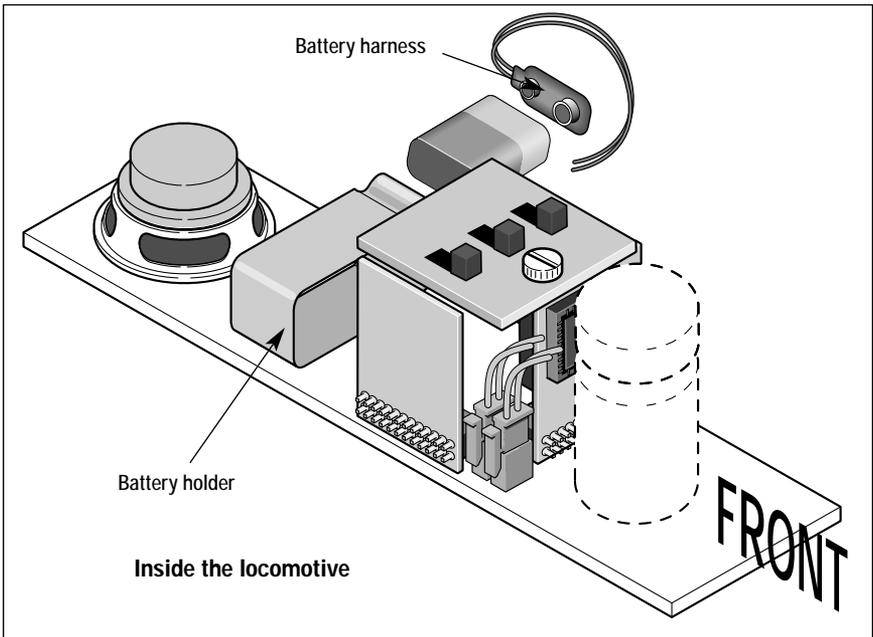5. Replace the body, securing it with the body screws.

Figure 4. Battery installation

RailSounds 5.0 sound system operations

Using the RailSounds 5.0 sound system in the conventional environment

When you first power up your locomotive, you will hear the sounds of the locomotive at rest. As the locomotive moves, the RPM sounds automatically increase with the locomotive's speed. In the conventional environment, the horn and bell sounds are activated by your transformer controls.

To silence the motor sounds, slide the RailSounds 5.0 sound system switch located on the under the front roof-top hatch to the SIGNALSOUNDS position before you power up the locomotive or after the locomotive has been powered down for a minimum of ten seconds. The horn and bell sounds will still be active. To adjust the volume, use the volume control knob located beneath the front roof-top hatch. Refer to Figure 1 on page 7.

Note! For proper operation of the RailSounds 5.0 sound system during track power interruptions and for the locomotive shutdown sequence, you must install a nine-volt alkaline battery. See page 10.

In the conventional environment, you will experience several features of the RailSounds 5.0 sound system.

- **Eight levels of electric motor RPM.** The level of electric motor RPM automatically varies with your throttle adjustments.
- **MultiHorn.** A different horn sound at different speeds—a RailSounds sound system exclusive.
- **Mechanical bell.** Press **BELL** on your transformer to begin the effect, then press **BELL** a second time to discontinue the effect.
- **CrewTalk dialog and TowerCom announcements.** CrewTalk dialog is triggered by your transformer's **HORN** button.
- **Reverse unit reset sound.** Power down your track, wait three seconds, and listen for the air-release sound—that's the locomotive telling you that its Lionel Command reverse unit has reset to forward.
- **Shutdown sequence.** When you turn off track power, you have two seconds to power up again after you hear the reverse unit reset sound. If you do not restore power, you will hear the realistic electric shutdown sequence. Because track power is off, a nine-volt battery is required for this sequence to function.

RailSounds 5.0 sound system operations

Activating the CrewTalk dialog and TowerCom announcements in the conventional environment

In the conventional environment, CrewTalk dialog and TowerCom announcements are triggered by short horn blasts and vary with the state of the locomotive.

- If the locomotive has been stopped for less than 15 seconds, a short horn blast triggers a "please standby" dialog.
- If the locomotive has been stopped for longer than 15 seconds, a short horn blast triggers a "cleared outbound" dialog.
- If the locomotive is moving, a short horn blast triggers an "all clear ahead" dialog.
- If the locomotive is moving with the bell activated, a short horn blast triggers a "slow to caution" dialog.

RailSounds 5.0 sound system operations

Installing a Lionel Sound Activation Button for conventional operation

If your transformer lacks **HORN** and **BELL** buttons, you will need to install Lionel no. 610-5906-001 Sound Activation Buttons (available separately) to activate the locomotive's horn and bell sounds.

Connect the buttons as shown below. Be sure that all track power passes through the Sound Activation Button(s). Do not bypass the buttons.

For AC transformers lacking a bell button

Black wire

Common/Ground/U

Existing wire

POWER SUPPLY

Red wire

Power/A

Lionel no. 610-5906-001 Sound Activation Button for activating the bell
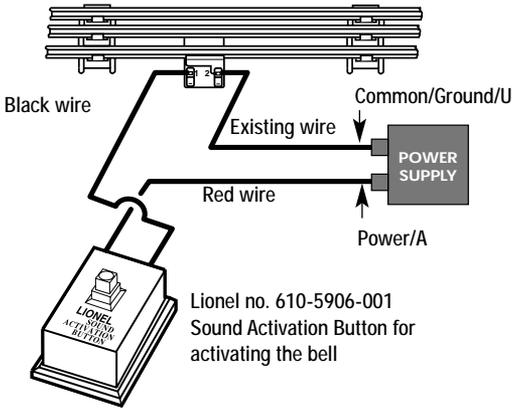
For AC transformers lacking bell and horn/whistle buttons

Red wire

Common/Ground/U

Existing wire

Red wire

POWER SUPPLY

Wire nut

Black wire

Power/A

Black wire

Lionel no. 610-5906-001 Sound Activation Button for activating the horn

Lionel no. 610-5906-001 Sound Activation Button for activating the bell
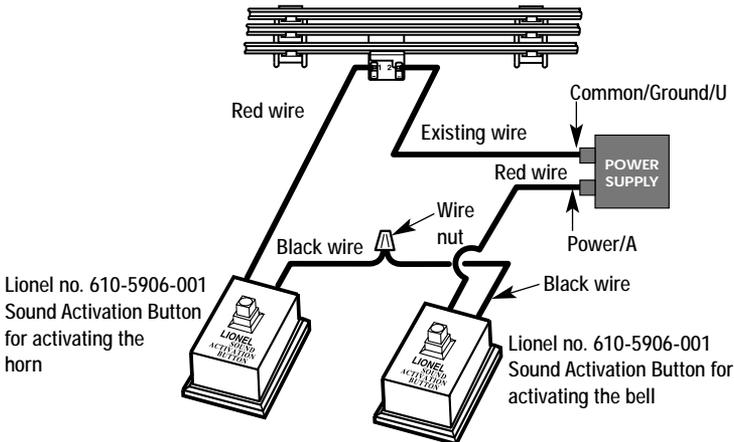
RailSounds 5.0 sound system operations

Using the RailSounds 5.0 sound system in the TrainMaster Command Control environment

To access all of the features of the RailSounds 5.0 sound system, you must operate your locomotive in the TrainMaster Command Control environment. The CAB-1 Remote Controller is required to activate features such as TowerCom announcements, CrewTalk communication, and coupler release sounds. Refer to pages 19-26 to learn how the RailSounds 5.0 sound system is integrated into TrainMaster Command Control operations.

Note!	For proper operation of the RailSounds sound system during track power interruptions and for the locomotive shutdown sequence, you must install a nine-volt alkaline battery. See page 10.

In the TrainMaster Command Control environment, you will experience all of the features of the RailSounds sound system.

- **Eight levels of electric motor RPM.** Your CAB-1 Remote Controller throttle automatically determines the level of the electric motor RPM. You may also set the RPM sounds to a particular level manually using your CAB-1 Remote Controller.

- **MultiHorn.** A different horn sound at different speeds—a RailSounds 5.0 sound system exclusive.

- **Mechanical bell.** Press **BELL** on your CAB-1 Remote Controller to begin the effect, then press **BELL** a second time to discontinue the effect.

- **Squealing brakes.** Press the **BRAKE** button and listen for the squealing of the locomotive's brakes as the locomotive slows down.

- **Coupler release sounds.** Use your CAB-1 Remote Controller to release an ElectroCoupler, and you get the sounds of the coupler opening.

- **CrewTalk dialog and TowerCom announcements.** Use your CAB-1 Remote Controller to trigger conversations between the dispatcher and locomotive engineer. You'll hear "hold for clearance," "cleared for departure," and many other exchanges. See pages 15 and 16.

- **Shutdown sequence.** When you turn off track power, you have two seconds to power up again after you hear the reverse unit reset sound. If you do not restore power, you will hear the realistic electric shutdown sequence. Because track power is off, a nine-volt battery is required for this sequence to function. You may also trigger the shutdown sequence using **AUX1, 5** command without powering down the track.

RailSounds 5.0 sound system operations

Activating the CrewTalk dialog and TowerCom announcements in the Command Control environment

With the RailSounds 5.0 sound system, CrewTalk dialog and TowerCom announcements feature a variety of brief radio conversations between the engineer and dispatcher. All dialog is intelligible, and each comment is followed by at least one automatic response.

CrewTalk dialog is an engineer-initiated radio conversation with the dispatcher. TowerCom announcements are a dispatcher-initiated radio conversation with the engineer. Be sure to listen for the different combinations of words and phrases that comprise these exchanges.

Refer to Table 1 below for the dialog commands. The dialog in the table provides examples of the conversations you can trigger. The actual dialog will vary.

Locomotive	Commands	Example dialog
Stopped	AUX1, 2	Crew: Can we go? Tower: No, please standby
	AUX1, 7	Tower: Stand by for clearance. Crew: Roger.
	2	Crew: Can we go? Tower: Roger, you are clear.
	7	Tower: You are clear for departure. Crew: Roger, we are clear.
	AUX1, 5	Crew: Signing off. Shutdown sequence
Moving	AUX1, 2*	Crew: Train is arriving. Tower: Roger, you are clear inbound.
	AUX1, 7*	Tower: You are clear for arrival. Crew: Roger.
	2	Crew: Are we clear ahead? Tower: You are all clear.
	7	Tower: You are all clear. Crew: Roger.
	AUX1, 5	Tower: Come to an immediate stop. Crew: We are stopping now.
	5	Tower: Slow to caution speed. Crew: Roger, slowing now.

* Activating either **AUX1, 2** or **AUX1, 7** while the locomotive is in motion enables a "train has now arrived" conversation for 15 seconds. If the train stops within this time, pressing **2** or **7** will play this special conversation.

Table 1. CAB-1 Remote Controller dialog commands

RailSounds 5.0 sound system operations

RailSounds 5.0 sound system dialog on a round trip

Refer to Figure 5 for a sample dialog script for the locomotive's round trip.

TOWER-INITIATED DIALOG

AUX1, 7 - "Stand by."
7 - "You are clear."

5 - "Slow to caution speed."
AUX1, 5 - "Come to a full stop."

7 - "Welcome back, stand by."

7 - "All clear ahead."
AUX1, 7 - "You are clear inbound."

ENGINEER-INITIATED DIALOG

AUX1, 2 - "Are we clear?"/" No, stand by."
2 - "Can we go yet?"/"Yes, you are clear."

2 - "Still clear ahead?"/
"Roger, you are clear."

7 - "we have arrived and
we are standing by."

AUX1, 2 - "We are arriving,"/
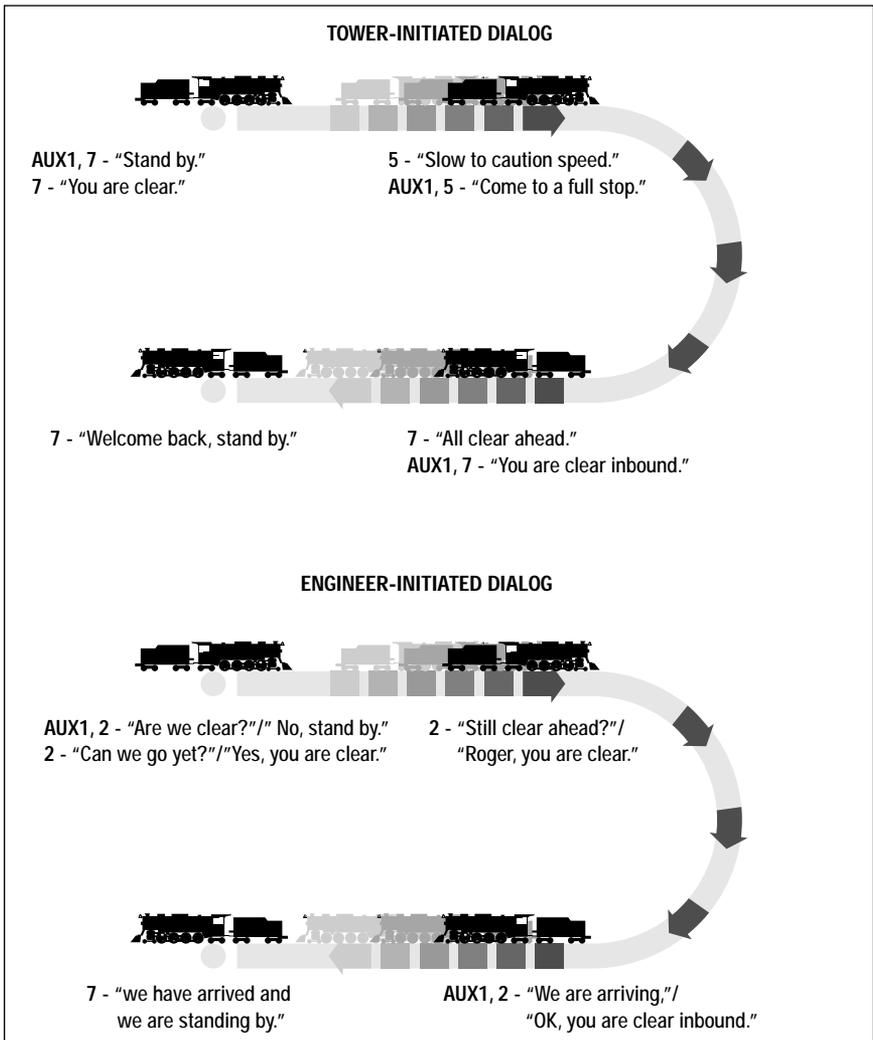"OK, you are clear inbound."

Figure 5. RailSounds 5.0 sound system dialog on a round trip

Odyssey System operations

The Odyssey System

The Odyssey System is "cruise control" for your locomotive. Once the speed is set (see below), your locomotive will maintain a constant speed, no matter what loads the locomotive pulls or what grades you have on your layout. This digitally-controlled system also allows for extremely slow movement that will amaze any "scale" enthusiast.

Odyssey System conventional (transformer) operation

The Odyssey System is automatically active when you operate your locomotive in conventional (non-Command Control) mode, as long as the Odyssey switch is in the ON position (see Figure 1 on page 7). This means that your locomotive will maintain a constant speed, compensating for grades, loads, and turns. Simply use your transformer's throttle to adjust the speed of your locomotive. If you would like to deactivate the speed control feature, slide the Odyssey switch to the OFF position while the locomotive is not in motion.

Caution! In conventional operation, the lights in the locomotive are connected directly to track power. Do not exceed 16 volts for extended periods. Doing so will reduce the life of your lamps.

Note! Because of the way that speed control operates in conventional mode, you will notice a slight delay between adjusting your transformer throttle and the change in the speed of your locomotive. If you desire instantaneous response to throttle changes, turn off the Odyssey System.

Odyssey System operations

Odyssey System Command Control operation

When the Odyssey System is activated, changes in the speed of the locomotive will correspond to each signal from the Command Base. For example, when you address the locomotive and slowly turn the throttle knob, the first flash of the light on the Command Base corresponds to the first speed step, which is the slowest speed of the locomotive. The locomotive will maintain that speed until you increase or decrease the throttle.

In the TrainMaster Command Control environment, you can use your CAB-1 Remote Controller to turn the Odyssey System on or off. The position of the Odyssey System switch (see Figure 1 on page 7) is the Odyssey System default setting when you power up the locomotive. You can override the default setting with the following commands. The override settings will be cleared and the default setting will be restored when you power down the locomotive.

Do not wait longer than two or three seconds between pushing the buttons in each sequence. If the command is not accepted, repeat the sequence.

Note! The locomotive must be in "neutral" when you enable or disable the Odyssey System.

[AUX 1] [BRAKE] [7] [BRAKE] Turn off the Odyssey System.

Note! When you press **7**, you will trigger a TowerCom announcement. This has no impact on the Odyssey System function.

[AUX 1] [BRAKE] [9] [BRAKE] Turn on the Odyssey System.

Note! When you press **9**, you will activate the Air release sound and turn on the smoke unit for five seconds of operation if the smoke unit switch is in the ON position. This has no impact on the Odyssey System.

TrainMaster Command Control operations

TrainMaster Command Control is the advanced model railroad control system from Lionel. To operate your locomotive in the Command Control environment, you need a Command Base (available separately, 6-12911) and a CAB-1 Remote Controller (available separately, 6-12868).

Your commands are sent by the CAB-1 Remote Controller to the Command Base, which then translates the command into digital code. That code is sent through the outside rails to your locomotive, which will not respond until it recognizes its unique ID#. TrainMaster Command Control gives you the power to operate multiple Command-equipped locomotives on the same track at the same time.

Keep in mind that track power is like gasoline in the tank of a car—it gives you the power to go places, but it doesn't tell you where to go or how fast to get there.

Operating your locomotive in the Command Control environment

1. **Turn off track power and plug-in the Command Base.** Be sure that the Command Base is connected to the outside rail or to the Common/Ground/U terminal on your track power supply.

2. **Place your locomotive on Lionel or Lionel-compatible O-36 or larger track.**

3. **Increase track voltage to full power or 19 volts AC.** On PowerMasters, slide the CMD/CONV switch to CMD. Program Track Power Controllers to Command Control operation.

4. **Press ENG, and enter the locomotive's unique ID#.** All Lionel locomotives come factory-programmed as ID# 1. To change the ID#, see page 24.

5. **Throttle up and move 'em out!** Your locomotive will respond to every command from your CAB-1 Remote Controller.

TrainMaster Command Control operations

CAB-1 Remote Controller commands

The CAB-1 Remote Controller commands are detailed below. *The corresponding RailSounds sound system effects are in bold italic type.*

COUPLER F Releases the front coupler.
Coupler release sound.

COUPLER R Releases the rear coupler.
Coupler release sound.

AUX 1 Activates the numeric keypad.
Air release sound.

AUX 2 Toggles the headlights on and off.

Accelerates the locomotive with a clockwise rotation. Decelerates the locomotive with a counter-clockwise rotation.

Shuts off track power and stops all TrainMaster Command Control and conventional locomotives. Use **HALT** only in emergency situations.

WSTL / HRN Activates the locomotive's horn. Release the button to discontinue the sound. *Multihorn air horn sound.*

BELL Toggles the bell sound on and off. *Mechanical bell sound.*

DIR Changes the locomotive's direction. The locomotive decelerates to a stop and continues in the opposite direction when you increase the throttle.
Pantograph sounds.

BOOST Increases the locomotive's speed while the button is pressed. Release the button to return to the initial speed.

BRAKE Decreases the locomotive's speed while the button is pressed. *Squealing brake sounds.*

See page 27 to change the momentum settings.

TrainMaster Command Control operations

CAB-1 Remote Controller numeric keypad commands

When you press the **AUX1** button on your CAB-1 Remote Controller, you turn the numeric keypad into ten command buttons. These commands are specific to your locomotive, and an overlay is included to help you learn these functions. After you press the **AUX1** button, you will be able to press any numbered button until you address a different Command Control equipped product. ***The corresponding RailSounds sound system effects are in bold italic type.***

0 Stops and resets the locomotive. Resets the locomotive's direction to forward. ***Horn blows. RPM sounds return to automatic.***

1 Raises the volume of the RailSounds sound system background sounds, such as RPM sounds and let-off sounds. The horn, bell and dialog are unaffected. The default is full volume. The volume setting is retained when track power is turned off. ***Sound volume increases.***

2 Engineer begins radio dialog, dispatcher replies (see pages 15 and 16). ***CrewTalk communication.***

3 Enters manual RPM mode and increases the RailSounds sound system RPM level (see page 22).

4 Lowers the volume of the RailSounds sound system background sounds, such as RPM sounds and let-off sounds. The horn, bell, and dialog are unaffected. The volume setting is retained when track power is turned off. ***Sound volume decreases.***

5 Activates the RailSounds sound system shutdown sequence.

6 Enters manual RPM mode and lowers the RailSounds electric motor RPM level (see page 22).

7 Dispatcher begins radio dialog, engineer replies (see pages 15 and 16). ***TowerCom announcement.***

8 ***Electrical arc sound.***

9 ***Air release sound.***

TrainMaster Command Control operations

Tuning your locomotive's performance

TrainMaster Command Control allows you to fine-tune the performance of your locomotive. Use your CAB-1 Remote Controller to make these adjustments.

Note!   These settings will be lost if you assign a new ID#.

RPM LEVEL

Your locomotive's RPM level varies with the CAB-1 Remote Controller throttle in automatic RPM mode. You may choose to set a constant, or fixed, RPM level in manual RPM mode.

Automatic RPM mode

The intensity of the RPM sounds will vary with adjustments to the throttle. When you stop the locomotive for two seconds or more, the RPM sounds will return to their initial intensity. This is the locomotive's default setting.

Manual RPM mode

Manual RPM mode allows you to set a constant RPM level for your locomotive. In this setting, the RPM level will not vary with the throttle settings or the speed of the locomotive.

To set a constant RPM level, get your locomotive moving, then press **AUX1**, **3** or **AUX1**, **6** to enter manual RPM mode. The locomotive will be locked at the current RPM level. To adjust the RPM level, press **3** to ramp up or **6** to ramp down. The locomotive will retain this setting.

When the locomotive is in motion, you may adjust the RPM level. To adjust the RPM level after ten seconds have elapsed, simply press **AUX1**, **3** or **AUX1**, **6** again. To exit manual RPM mode, turn off track power and allow the locomotive to reset, enter the shutdown sequence (**AUX1**, **5**), or reset the locomotive (**AUX1**, **0**).

MOMENTUM

The TrainMaster Command Control momentum feature simulates the labored performance of a locomotive pulling a light, moderate, or heavy load. Press **L**, **M**, or **H** (located under the removable panel on the CAB-1 Remote Controller) to adjust the momentum setting. For quicker response to your commands, press **L**, which is the factory default setting. Your locomotive will keep this setting until it is changed.

ADJUSTING THE SPEED

The **BRAKE** and **BOOST** buttons give you incremental control of your locomotive's speed while you press and hold these buttons, allowing you to make small, gradual adjustments around curves and over grades. The locomotive will resume its initial speed when the buttons are released. Listen for the squeal of your locomotive's brakes when you use the **BRAKE** button.

TrainMaster Command Control operations

Tuning your locomotive's performance (continued)

SOUND LEVEL

Press **AUX1**, **1** or **4** on your CAB-1 Remote Controller to raise and lower the volume of the background locomotive sounds, such as RPMs and air release or let-offs. The horn, bell and dialog will be unaffected. To set the maximum volume, we recommend that you adjust your locomotive's volume control knob (see Figure 1 on page 7 for the location).

SETTING THE MAXIMUM SPEED

You may use your CAB-1 Remote Controller to set your locomotive's maximum speed. This will prevent locomotives from derailing as a result of excessive speed.

1. With the Command reverse unit switch in the RUN position, address your locomotive by pressing **ENG** and entering the ID#.

2. Press **SET** on the CAB-1 Remote Controller. The headlight will flash.

3. Get your locomotive moving at your desired maximum speed.

4. Press **BOOST**.

The maximum speed has been set. To clear this setting, press **SET** and then **BOOST**, holding each button for one second.

SETTING THE MINIMUM SPEED

You may use your CAB-1 Remote Controller to set your locomotive's minimum, or stall, speed.

1. With the Command reverse unit switch in the RUN position, address your locomotive by pressing **ENG** and entering the ID#.

2. Press **SET** on the CAB-1 Remote Controller. The headlight will flash.

3. Get your locomotive moving at your desired minimum speed.

4. Press **SET** again. The locomotive will stop.

The next time you throttle up, your locomotive will start at the speed you set. To clear this setting, press **SET** twice, holding the button for one second each time.

TrainMaster Command Control operations

Assigning your locomotive a new ID#

As your roster of TrainMaster Command Control-equipped locomotives grows, you will want to give each unit a unique ID#. The locomotive will respond to commands associated with its ID# while all other units will disregard these commands.

Note! To restore your locomotive's functions, see page 26.

1. Slide the Command reverse unit switch on your locomotive to the PROG position.

2. Place the locomotive on the track.

3. Connect the Command Base and plug it in.

4. Power up the track.

5. Press **ENG**.

6. Enter the unique ID#. Choose any number from 1 to 99 that has not been assigned to another locomotive (**ENG**). We recommend using a part of your locomotive's cab number.

7. Press **SET**. The locomotive's horn will sound, or the headlights will flash if the RailSounds sound system is off.

8. Slide the Command reverse unit switch back to the RUN position.

    The locomotive's ID# has been set. Be sure to record the new ID# for your reference.

TrainMaster Command Control operations

Building a lash-up

TrainMaster Command Control allows you to couple your Command Control-equipped locomotives together, forming a multiple unit lash-up. Just like with the real railroads, lash-ups allow you to pull longer trains and climb steeper grades. You will find that the lighting operates prototypically—the lead unit's headlight and interior lights are illuminated when the train is in forward, and the rear unit's headlight and interior lights are on when the train is in reverse. For more information, refer to your TrainMaster Command Control manual.

To build a lash-up, assign a unique engine (**ENG**) ID# to each unit. Arrange the units on the track and couple them together. The Command reverse unit must be set to RUN/FORWARD.

Note! If you press a wrong button, start over with that particular unit. The assignment isn't saved until you press **SET**.

Start with the lead (front) unit

1. Press **TR** and enter your lash-up ID# (1-9) on your CAB-1 Remote Controller. No other lash-up or track should share this ID#.
2. Enter the unique ID# of the lead unit.
3. Press **F**.
4. Press **SET** on the CAB-1 Remote Controller.

Add the middle units, one at a time

1. Press **TR** and enter the lash-up ID# (1-9) on your CAB-1 Remote Controller.
2. Enter the unique ID# of the middle unit.
3. Press **SET** on the CAB-1 Remote Controller.
4. Repeat these steps for any additional middle units.

Complete the lash-up by adding the rear unit

1. Press **TR** and enter the lash-up ID# (1-9) on your CAB-1 Remote Controller.
2. Enter the unique ID# of the rear unit.
3. Press **R**.
4. Press the **DIRECTION** button if the unit is facing backward.
5. Press **SET** on the CAB-1 Remote Controller.

You are now ready to operate your locomotive as a lash-up. Simply press **TR** and enter the lash-up ID#, then use your CAB-1 Remote Controller to operate your locomotives. To operate an individual unit within the lash-up, press **ENG** and enter the ID# for that particular unit.

To clear the lash-up, press **TR**, enter the lash-up ID#, press **0** and **SET**.

TrainMaster Command Control operations

Reprogramming your locomotive to restore features

If your locomotive is unresponsive to your commands in the TrainMaster Command Control environment, we recommend that you follow this procedure to reset your locomotive.

1. Slide the Command reverse unit switch to the PROG position.

2. Plug in and connect your Command Base.

3. Place your locomotive on the track, then power up the track.

4. Press **ENG** and enter the locomotive's ID#.

5. Press **SET**.

6. Press **ENG** and enter the locomotive's ID# again.

7. Press **AUX1**.

8. Enter **8** for this particular locomotive.

9. Turn off track power and wait ten seconds.

10. Slide the Command reverse unit switch back to the RUN position.

At this point, your locomotive has been reset. Restore power to the track and operate the locomotive as usual. Be sure to use the ID# entered in Step 4.

Maintaining and servicing your locomotive

Lubricating your locomotive

Help your Lionel locomotive lead a long and productive life on your railroad by maintaining it properly. To keep your locomotive lubricated, we recommend that you purchase a Lionel Lubrication and Maintenance Kit (6-62927), available from your authorized Lionel dealer.

When you find that the lubrication points illustrated in Figure 5 appear dry, lubricate your locomotive after you have removed any accumulated dirt and dust. There are two basic rules to keep in mind when you are lubricating your locomotive: use only a small amount of lubrication and avoid getting grease or oil on your locomotive's wheels, roller pick-ups, or the track.
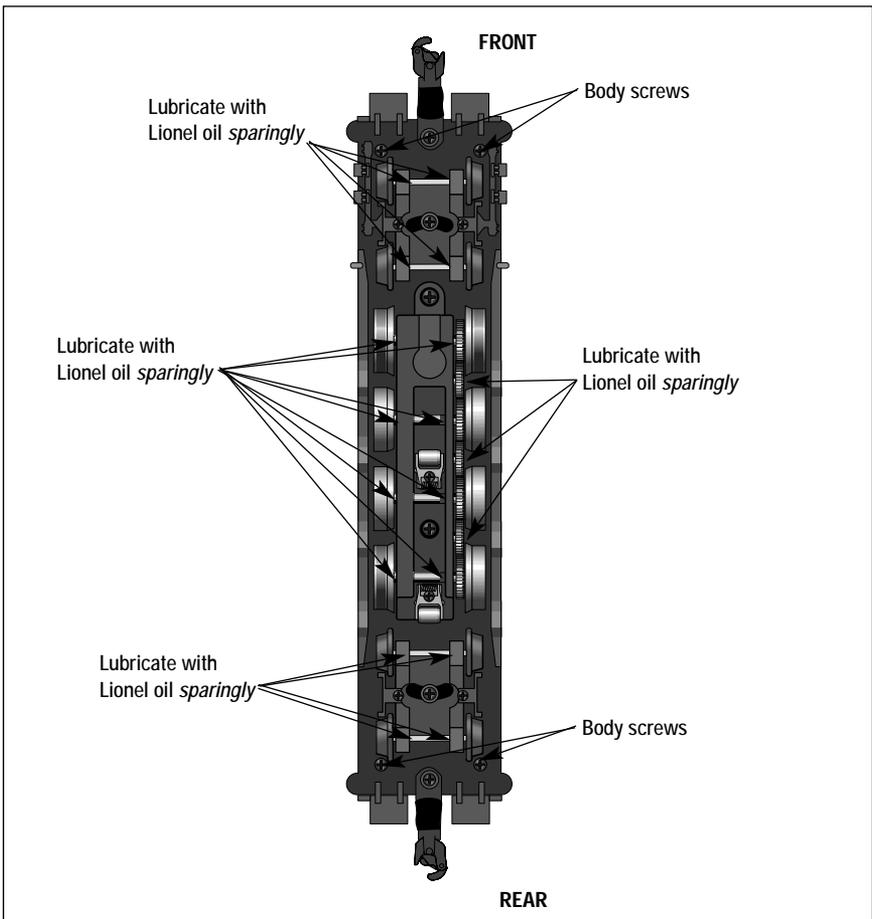
FRONT

Body screws

Lubricate with
Lionel oil *sparingly*

Lubricate with
Lionel oil *sparingly*

Lubricate with
Lionel oil *sparingly*

Lubricate with
Lionel oil *sparingly*

Body screws

REAR

Figure 5. Lubrication points

Maintaining and servicing your locomotive

Servicing your locomotive's lamps

Note! Before changing the lamps in your locomotive, be sure to check that the **AUX2** command was not used to turn off the headlights.

   Your locomotive is illuminated by two lamps. One is located in each of the headlight housings. During the course of normal operations, they may require replacement.

   Removing the body screws as shown on page 27 will allow access to the inside of the cab and the expired lamps. However, due to the close fit of many components and the inter-connected wiring, we recommend that you take your locomotive to your authorized Lionel Service Center for any required lamp replacement.

Lamp Numbers:
Headlights (2)   620-8029-300

Maintaining and servicing your locomotive

Servicing the traction tires

Your locomotive is equipped with traction tires to increase the tractive effort of your locomotive and allow it to pull more cars at once.

During the course of normal operations, the traction tires may become worn out. We recommend that you have the traction tires replaced by an authorized Lionel Service Center because the truck and side frames must be removed to access the wheels. See the Lionel Service section on page 32 for more information.

Maintaining and servicing your locomotive

Maintaining your locomotive's handrail antenna

Your locomotive handrails are more than just a protypically accurate detail—they're the Command reverse unit's antenna for receiving Command Base digital communications. *Please handle the locomotive carefully to avoid handrail damage.* To ensure optimum reception, both handrails are insulated from the die-cast metal shell. If your locomotive experiences difficulty receiving Command Base communications, check that the ends of the handrails are insulated from the cab with either an insulating bushing or an insulating handrail stanchion. Ensure that each insulator is present and in position. Finally, prevent the handrails from touching any part of the die-cast metal locomotive cab.

Notes

Limited Warranty/Lionel Service

This Lionel product, including all mechanical and electrical components, moving parts, motors and structural components, except for light bulbs, is warranted to the original consumer-purchaser, for **one year** against original defects in materials or workmanship when purchased through an authorized Lionel merchant.

This warranty does NOT cover normal wear and tear, light bulbs, defects appearing in the course of commercial use, or damage resulting from abuse or misuse of the product by the purchaser. Transfer of this product by the original consumer-purchaser to another person voids this warranty. Modification of this product voids this warranty.

Any warranted product which is defective in original materials or workmanship and is delivered by the original consumer-purchaser to Lionel L.L.C. or an authorized Lionel L.L.C. Service Center, together with proof of original purchase will, at the option of Lionel L.L.C., be repaired or replaced, without charge for parts or labor. In the event the defective product cannot be repaired, and a replacement is not available, a refund of the original purchase price will be granted. Any products on which warranty service is sought must be sent freight or postage prepaid, as transportation and shipping charges are not covered by the warranty.

In no event shall Lionel L.L.C. be liable for incidental or consequential damages.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.

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

Instructions for Obtaining Service

If service for this Lionel L.L.C. product is required, bring the item, along with your dated sales receipt and completed warranty information to the nearest Authorized Lionel Service Center. Your nearest Lionel Service Center can be found by calling 1-800-4-Lionel, or by accessing our Website at www.lionel.com.

If you prefer to send your product back to Lionel L.L.C. for repair in Michigan, you must first call 586-949-4100 or FAX 586-949-5429, or write to Customer Service, P.O. Box 748, New Baltimore, MI 48047-0748, stating what the item is, when it was purchased and what seems to be the problem. You will be sent a return authorization letter and label to ensure your merchandise will be properly handled upon receipt.

Once you have received your return authorization and label, make sure that the item is packed to prevent damage during shipping and handling. We suggest that you use the product's original packaging. This shipment must be prepaid and we recommend that it be insured.

Please make sure you have followed all of the above instructions carefully before returning any merchandise for service. You may choose to have your product repaired by one of our Authorized Lionel Service Centers after its warranty has expired. A reasonable service fee will be charged.

Warranty Information

Please complete the information below and keep it, along with your dated sales receipt. You must present this and your dated sales receipt when requesting warranty service.

Name _____

Address _____

Place of Purchase _____

Date of Purchase _____

Product Number _____

Product Description _____

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