Lionel
Action Recorder
Controller
Owner’s Manual
Congratulations!

Congratulations on your purchase of the TMCC Action Recorder Controller (ARC)!
The ARC is capable of recording and playing eight different programs. Use your CAB-1 Remote Controller to perform any scenario on your layout, and the ARC will memorize and play back every command.

Table of contents

Wiring your Action Recorder Controller
- Powering the Action Recorder Controller 3
- Connecting the COMM wires 4
- Connecting additional TMCC products in a “daisy chain” 5-6

Using your Action Recorder Controller
- Assigning accessory (ACC) ID#'s to the ARC 7
- Understanding the ARC 8
- Operating the SC-2 with the ARC 9

Simple Recordings
- Making a simple recording 10
- Playing your recording 11
- “Looping” a recording 12
- Removing a loop 13
- Example: Creating a simple recording 14

Advanced Recordings
- Cueing one recording to start in the middle of another 15
- Making a sensor 16
- Using track sensors 17
- Using a Track Sensor with a recording 18-19
- Advanced recording techniques 20
- Example: Completing an advanced recording using track sensor 20-23
- CAB-1 Commands 24
- Questions and answers 25-26
- Specifications 26
- Template 27
- Limited Warranty/Lionel Service 28

The following Lionel marks may be used throughout this instruction manual and are protected under law. All rights reserved.

Lionel®, TrainMaster®, Odyssey®, RailSounds™, CrewTalk™, TowerCom™, DynaChuff™, StationSounds™, Pullmor®, ElectroCoupler™, Magne-Traction®, CAB-1 Remote Controller®, PowerMaster®, Lionel ZW®, ZW®, PowerHouse®, TMCC™, Lionelville™
Wiring your Action Recorder Controller

Powering the Action Recorder Controller

Use a separate accessory power supply to power your ARC with 12-18 volts (AC). Figure 1 illustrates the location of the power terminals. Follow these steps and refer to Figure 1 as you connect your power supply to the ARC.

**Hint!** Color code all Common/Ground/U and Power/A wires throughout your layout!

1. Attach a wire to the Common/Ground/U terminal on your transformer and connect it to the POWER/U terminal on the ARC. Do not connect this terminal to the outside rail.

2. Attach another wire to the Power/A terminal on your transformer and connect it to the POWER/A terminal on the ARC.

---

**Figure 1.** POWER and COMM connections

---

**Note!** DAT (Red wire)pc

**COMM Connections**

- Common/Ground/U
- Power/A
- DAT (Red wire)
- COMM (green wire)
- TXC (Black wire)

**POWER Connection**

- Common/Ground/U
- Power/A
Wiring your Action Recorder Controller

Connecting the COMM wires

To send and receive commands, the ARC will need to communicate with the Command Base (available separately, 6-12911). Messages to and from the Command Base are sent through the 3-Wire Command Base Cable (available separately, 6-14192). Follow these steps and refer back to Figure 1 on page 3 as you connect the ARC to the Command Base using the 3-Wire Command Base Cable.

**Note!** Your ARC is equipped with two additional COMM terminals, AX+ and AX-. At this time, make no connections to those terminals. They are intended for future use. Do not connect the DAT, TXC, or COM wires to the AX+ and AX- terminals.

1. Connect the DB9 connector at the end of the 3-Wire Command Base Cable to the COMPUTER terminal on the Command Base.
2. Connect the red wire to the COMM/DAT terminal on the ARC.
3. Connect the black wire to the COMM/TXC terminal on the ARC.
4. Connect the green wire to the COMM/COM terminal on the ARC.
Wiring your Action Recorder Controller

Connecting additional TMCC products in a “daisy chain”

Power additional TMCC controllers using the same power supply and connected to the same Command Base by creating a “daisy chain,” or a series of TMCC controllers wired in succession. Refer to Figure 2 on page 6 and follow these steps as you connect the ARC to the next TMCC product.

When in a daisy chain, the COM LED on the ARC will flash for a tenth of a second to indicate that the ARC is receiving commands for another TMCC product (i.e., the ARC is simply passing along a command). The COM LED will stay on for half of a second to indicate that the ARC itself has received a command.

Note! The ARC must be the first TMCC product in a daisy chain. The ARC must communicate with the Command Base directly through the 3-Wire Command Base Cable.
Wiring your Action Recorder Controller

Connecting additional TMCC products in a “daisy chain” (continued)

**POWER connections for additional units**

1. Attach a wire to the additional POWER/A terminal on the ARC and connect it to the POWER/A terminal on the next TMCC product. Refer to Figure 2 below.

2. Attach another wire to the POWER/U terminal on the ARC and connect it to the POWER/U terminal on the next TMCC product.

3. Connect additional TMCC controllers in the same manner, connecting the POWER/A terminals and the POWER/U terminals.

**Note!** Use a Controller to Controller Cable (available separately, 6-14193, 6-14196, or 6-14197) to make the COMM connections.

**COMM connections for additional units**

1. Attach the red wire to the COMM/TXA terminal on the ARC and connect it to the COMM/DAT terminal on the next TMCC product. Refer to Figure 2 below.

2. Attach the green wire to the COMM/COM terminal on the ARC and connect it to the COMM/COM terminal on the next TMCC product.

3. Add additional TMCC controllers, connecting the COMM/DAT terminals and the COMM/COM terminals on each controller in the same manner.

**Note!** The ARC must be connected directly to the Command Base.

Figure 2. Connecting additional TMCC products in a “daisy chain”
Assigning accessory (ACC) ID#s to the ARC

You will need to assign accessory ID#s to the eight recordings, or programs, that your ARC has available. Keep in mind that you only need to assign the first ID#, the remaining seven recordings will be automatically assigned the next seven numbers. The ID#s are in blocks of eight: 1-8; 9-16; 17-24; etc. For example, if you assign ID# 9 to the first recording, the other seven recordings will be ID#s 10 through 16. Be sure that no other item on your layout is assigned the same ACC ID#s.

**Note!** The default ID#s are 1-8.

1. Remove the RUN/PROGRAM jumper from the side of the ARC. Pull the black connector from the terminal on the side of the ARC. Refer to Figure 3 for the location of the jumper.

**Note!** Assign ID#s to only one ARC at a time. The jumpers on all other controllers should remain in place.

2. Press the ACC button on your CAB-1 Remote Controller.
3. Enter the first ID# using the numeric keypad on the CAB-1 Remote Controller.
4. Press SET on your CAB-1 Remote Controller.

**LED** The COM LED illuminates for one second.

**Note!** You have actually assigned all eight ID#s when you assigned the first. The other seven recordings have automatically been assigned the next seven ID#s.

**Note!** Single-digit ID#s are best for quick access when you are recording.

5. Replace the RUN/PROGRAM jumper on the side of the ARC.

Figure 3. Jumper location
Using your Action Recorder Controller

Understanding the ARC

Take a moment to understand how your ARC works. This device is capable of storing up to eight separate recordings (or programs). You can play any combination of recordings simultaneously.

You may decide to cue a recording to start playing in the middle of another. Keep in mind that the first recording does not stop when the second starts; they play simultaneously. For example, imagine that recording #1 is playing. At some point, recording #2 is cued to begin. Later, recording #1 cues recording #3 to play. As illustrated in Figure 4, all three recordings play simultaneously until recording #2 ends, but recording #1 and #3 continue. Recording #1 ends, followed by recording #3. If you wanted, you could add a cue to go back to the beginning of recording #1 at the end of recording #3, making a continuous loop.

Note! You may add these cues in any other recording. All cues do not have to be contained in Recording #1.

It is also important to note that the ARC will not know where your locomotive is on your layout without help. When making a recording, the ARC memorizes the intervals between the commands that you give. The problem is that there is no guarantee that the train will be in the same spot the next time around. To solve the problem, sensors are used to locate the trains and cue the ARC to begin or continue the recording. (See “Making a sensor” on page 16.) For example, imagine that you want to activate an accessory whenever the locomotive approaches it. You would need to place a sensor on the track just before the accessory. When you are making the recording, you would then tell the ARC to activate the accessory when the sensor detects the locomotive.

![Figure 4. Example recording with simultaneous playback](image-url)
Using your Action Recorder Controller

Operating the SC-2 with the ARC

The SC-2 Switch and Accessory Controller (available separately) was designed to require a delay between throwing the switches. When creating your recording, be sure to wait several seconds between throwing switches controlled by the SC-2.
Simple Recordings

Making a simple recording

These steps are used to create a simple recording. Use your CAB-1 Remote Controller to enter the commands. The ARC will memorize each command and the time between them.

**Hint!** Plan out your recording before you begin. Remember that the ARC memorizes every command—including the unintentional ones! If you make a mistake, just start over. You can always record over a program.

1. Remove the jumper from the side of the ARC. Refer to Figure 3 on page 7.
2. Press ACC and enter the ID# of the recording. (Choose one of the eight recordings to work with.)
3. Press AUX1, 9 on the numeric keypad to start recording.
4. Address one particular item on your layout. For example, press ENG and enter 23 to address the locomotive previously assigned ID# 23.
5. Use your CAB-1 Remote Controller to operate the item that you have addressed. For example, sound a locomotive’s whistle or operate an accessory.
6. Press ACC and enter the ID# of the recording to address the recording started in step 2.
7. Press AUX1, 0 on the numeric keypad to stop recording.
8. Replace the jumper.
Simple Recordings

Playing your recording

Play your recording by following these steps.

Hint! Always keep the starting points, speeds, voltages, and positions the same. Before playing the recording, be sure to position the locomotives and accessories where they were when you started to record. To help, have the program start by waiting on a sensor.

1. Press ACC and enter the ID# of the recording. Choose the recording that you have completed.

LED When playing a recording, the STATUS LED flashes the number of that recording.

2. Press AUX2 on the CAB-1 Remote Controller to play the recording.

3. Allow the recording to end on its own. Press AUX1, 0 to discontinue the recording at any time during playback.
Simple Recordings

“Looping” a recording

You may choose to have a particular recording “loop,” or play over and over again. Keep in mind that the looping command is not a part of the actual recording; instead, this function can be turned on and off. Follow these steps to create a loop.

**Note!** Do not remove the jumper.

1. Press ACC and enter the ID# of the recording. Choose the recording that you have completed.
2. Press AUX1, 8 on the numeric keypad.
3. Press SET on the CAB-1 Remote Controller.
   
   LED The COM LED will flash for one second.

At this point, the recording will go back to the beginning and start over each time it is played.

**Note!** Refer to page 13 to completely remove the looping function.

4. To stop this cycle, press ACC, the ID#, AUX1,0 on the CAB-1 Remote Controller.
Simple Recordings

Removing a loop

Because the looping command is not a part of the recording, you can disable it without erasing the recording.

**Note!** Do not remove the jumper.

1. Press ACC and enter the ID# of the recording. Choose the recording that you have completed.
2. Press AUX1, 7 on the numeric keypad.
3. Press SET on the CAB-1 Remote Controller.

**LED** The COM LED will flash for one second.

At this point, the recording will play through one time only.
Simple Recordings

Example: Creating a simple recording

Follow along with this example to create a simple recording.

**Note!** Explanations are provided in italics.

1. **Remove the jumper from the side of the ARC.**
   The ARC is ready to record.

2. **Press ACC and 1 on the numeric keypad.**
   In this case, you are telling the ARC that you want to use the first of eight recordings, or Recording #1.

3. **Press AUX1, 9 on the CAB-1.**
   The ARC starts recording.

4. **Press ENG, 23.**
   The locomotive that was assigned ID# 23 is ready to receive your commands.

5. **Throttle up, and move your train forward.**

6. **Sound the horn or whistle two times.**

7. **Press DIR on the CAB-1.**

8. **Throttle up and bring the locomotive back to the starting position.**

9. **Sound the horn with one long blast.**

10. **Press DIR on the CAB-1.**
    The train is set to move forward the next time.

11. **Press ACC, 1.**
    This addresses the recording itself.

12. **Press AUX1, 0.**
    The recording stops.

13. **Replace the jumper.**

    The recording has been completed. To play the recording, press ACC, 1 to address the recording, then press AUX2 to play. The locomotive will move forward, sound the horn twice, move back, and then sound the horn once. To loop this recording, refer to page 12.

**Note!** You may notice that your locomotive does not move to the same location. Keep in mind that the ARC does not know the location of your train; it only gives commands. To move your train to an exact location, you must use track sensors. Refer to pages 17-19 to learn how to make recordings using track sensors.
**Advanced Recordings**

**Cueing one recording to start in the middle of another**

You may choose to have a different recording begin to play in the middle of another. When creating the first recording, you will need to add a cue to activate the next recording. Remember that the recording will play simultaneously when the second one is cued during playback. Refer to Figure 5 below.

- The number of times the LED blinks on corresponds with the recording numbers (in playback only). For example, if recording #3 and #4 were playing simultaneously, the LED would repeatedly blink on three times, then four times.

1. Remove the jumper from the side of the ARC. Refer to Figure 3 on page 7.
2. Press ACC and enter the ID# of the recording. (Choose one of the eight recordings to work with.)

- When creating a recording, the STATUS LED blinks off the recording number.
3. Press AUX1, 9 on the numeric keypad to start recording.
4. Create the first part of your recording.
5. Press ACC followed by the ID# of the recording you would like to cue, then press AUX2.
   During playback, this recording will start to play in the middle of the first. (You will actually create this recording later.)
6. Press ACC and enter the ID# of the recording started in step 1.
7. Complete the first recording, then press AUX1, 0 on the numeric keypad to stop recording.
8. Create the second program. Press ACC and enter the ID# of the second recording (from step 5), perform the actions, then enter AUX1, 0 to end the recording.
9. Replace the jumper.

![Figure 5. Adding cues to start another recording](image-url)
Making a sensor

An insulated track section can be used as a simple track sensor. Insulated track sections are available separately (6-12841 or 6-12840) or you can insulate a section of track yourself. To make a track sensor, carefully remove one of the outside rails, insulate the rail from the track tie contact points with electrical tape, and add insulating pins at each end of that outside rail. Refer to Figure 6.

Use a Lionel Lock-On (available separately) or solder to attach one wire to the center or power rail and another wire to your completely insulated outside rail. Connect the center rail to one of the SENSOR/1 positions; connect the insulated outside rail to the corresponding SENSOR/2 position. When a train passes over that section of track, the wheels and axles will complete the circuit. This acts as a trigger for the ARC.

![Figure 6. Creating and wiring a track sensor](image)

**Note!** The track sensor input operates with any voltage from 3-20 volts (AC or DC). Any circuit that applies this voltage across the track sensor inputs will operate it.
Advanced Recordings

Using track sensors

Track sensors are used to synchronize the location of your trains with the recording. Four sensors can be used on your layout. Without the sensors, the ARC would not know where your trains are. This would be a problem if you wanted to perform an action when the train reached a certain spot (e.g., throwing switches, loading cars, etc.).

There are many options for creating track sensors. A track sensor simply does the job of a switch, completing an electrical circuit that passes through the sensor terminals. While you may create your own sensors using switches or optical devices, the simplest sensor is a special insulated track section. Refer to the “Making a sensor” section on page 16.

Note! Never have different recordings waiting on the same sensor at the same time.

General overview of using track sensors

1. Remove the jumper from the side of the ARC. Refer to Figure 3 on page 7.
2. Press ACC and enter the ID# of the recording. (Choose one of the eight recordings to work with.)

   LED When creating a recording, the STATUS LED blinks off that recording number.
3. Press AUX1, 9 on the numeric keypad to start recording.
4. Create the first part of your recording.
5. Press ACC and enter the ID# of the recording, then press AUX1 and enter the number (1-4) of the sensor that you want to wait on. Keep in mind that Sensor #1 is connected to the SENSOR 1 terminals; Sensor #2 is connected to the SENSOR 2 terminals; etc.

   Note! During playback, the recording will pause here until the train triggers that sensor or you press AUX2.
6. Complete the first recording, then press AUX1, 0 on the numeric keypad to stop recording.
7. Replace the jumper.
   When you play back the recording, the first portion will play through. The recording will pause where you inserted the sensor command. When the train activates the sensor, the recording will continue. If you want the recording to continue without waiting for the train, press ACC, enter the ID#, then AUX2 on the CAB-1 Remote Controller. AUX2 will force the recording to continue.

   Hint! Always keep the starting points, speeds, voltages, and positions the same. Before playing the recording, be sure to position the locomotives and accessories where they were when you started to record. To help, have the recording start by waiting on a sensor.

   LED When the recording is waiting on a sensor or paused during playback, the STATUS LED will blink the sensor number. For example, if the recording is waiting on sensor #2, the LED will blink twice. At this time, the COM LED will illuminate without blinking.
Advanced Recordings

Using a Track Sensor with a recording

Position the locomotive so that its front wheels are resting on a track sensor, just over the rail joint. (The rest of the locomotive should be off of the track sensor section.) Choose a second location several feet down the track.

**Note!** Explanations are provided in italics.

1. Remove the jumper from the side of the ARC.
   The ARC is ready to record.

2. Press ACC, 1.
   Addresses the recording itself.

3. Press AUX1, 9.
   The ARC starts recording.

4. Press ENG, 23.
   Addresses locomotive #23.

5. Start/Throttle up the locomotive.

6. Move the Engine until the back wheels are in line with the marked second location on the track.

7. Stop the Engine.

8. Press ACC, 1.
   Addresses the recording itself.

9. Press AUX1, 1.
   Addresses the track sensor labeled ID# 1.

    Addresses locomotive #23.

11. Move the Engine back to the start location (front edge of sensor).

12. Press DIR as soon as the locomotive’s front wheels are at the starting point (just touching the sensor).

**Note!** When using a track sensor, only the DIR button on the CAB-1 should be pressed after telling the ARC to wait on a sensor. This will ensure a precise stop at the sensor. When the ARC is told to wait on a sensor, any function performed or button pressed will occur after the sensor is triggered. Be sure to follow this procedure: slow down the train before you tell the ARC to wait on the sensor, set the recording to wait on the sensor, and then use the DIR button to completely stop the train.
Advanced Recordings

Using a Track Sensor with a recording (continued)

13. Press ACC, 1.
   Addresses the recording itself.

14. Press AUX1, 0.
   Stops the recordings.

   Now loop the recording (see page 12). You will notice that the start and stop locations are
   much more precise than the previous example (Example: Creating a simple recording, page 14)
   in which a sensor was not used. As you have witnessed, the advantage of using a track sensor is
   that it allows the ARC to match the recording to the position of the train.
Advanced Recordings

Advanced recording techniques

Here are some additional tricks. With a little practice, you will have your layout operating like clockwork with nobody at the controls!

- Plan your commands before you begin.
- Use any number of CAB-1 Remote Controllers when the action gets fast and complicated. One CAB-1 can control the ARC; the others can control the locomotives or accessories. Let your friends join in as you make the recordings.
- If you are switching a locomotive in a recording, always maneuver the train a few feet beyond the switch. This will account for variations in speed and timing during playback.
- Have the program start by waiting on a sensor. This will help to bring your trains to the proper starting point.
- When recording, operate your trains at moderate speeds (not too slow) to account for variations during playback.
- Refer to the LED indicators for the status of the ARC.
- To make accurate stops, slow trains with the red knob, but bring your trains to a halt by pressing the DIR button on the CAB-1.
- Take some time to perfect your technique. Feel free to record over any program.

Example: Completing an advanced recording using track sensors

This example demonstrates how track sensors coordinate the actions with the train’s location. For this example, a single loop with a siding, a switch, four sensors, and two locomotives will be used.

Scenario: Engine 1 (ENG 1) is on the main loop of track, and Engine 2 (ENG 2) is on the siding. ENG 1 will circle the track and stop, allowing ENG 2 will pull out of the siding. Once ENG 2 is clear, it will stop and allow ENG 1 to pull into the siding. ENG 2 will circle the track.

Setup/Starting positions: Refer to Figure 7 on page 23. Place ENG 2 on the siding (position B) and place ENG 1 on the main loop of track (position A).

Note! Keep track of the starting locations of each locomotive. You must return the locomotives to these exact locations each time you wish to play the recording.
Advanced Recordings

Example: Completing an advanced recording using track sensors (continued)

1. Remove the jumper from the side of the ARC.
   The ARC is ready to record.

2. Press ACC, 1.
   You are telling the ARC that you want to use the first of eight recordings, or
   Recording #1.

3. Press AUX1, 9.
   The ARC starts recording.

4. Press ENG, 1.
   Addresses Engine 1.

5. Start/Throttle up Engine 1.
   Engine 1 proceeds around the track.

6. Press ACC, 1.
   Addresses the recording itself.

7. Press AUX1, 3.
   The ARC waits on Sensor 3 before proceeding to the next commands.
   
   Note! You are telling the ARC to wait on Sensor 3. During playback, the recording will not
   go on to the next command (Step 8) until Sensor 3 is triggered.

8. Press ENG, 1.
   Addresses Engine 1.

9. Slow down Engine 1 as it passes Sensor 3.

    Addresses the recording itself.

11. Press AUX1, 2.
    The ARC waits on Sensor 2 before doing next commands. Once the locomotive triggers
    Sensor 2, the recording will go on to the next steps (Steps 13 and 14).
    
    Note! Keep in mind that when stopping the train the ONLY key that should be pressed after
    waiting on Sensor 2 is the DIR key to ensure a precise stop.

    Addresses Engine 1.

13. Press DIR as the locomotive reaches Sensor 2.
    Stops the locomotive as the locomotive reaches Sensor 2.

    Addresses Switch 1.

15. Press AUX2.
    Throws the switch to the OUT position.

    Addresses Engine 2.
Advanced Recordings

Example: Completing an advanced recording using track sensors (continued)

17. Throttle-up Engine 2 and pull the Engine out of the siding and onto the loop of track. Allow Engine 2 Proceed around the track.

18. Press ACC, 1. This addresses the recording itself.

19. Press AUX1, 1. The ARC waits on Sensor 1 before proceeding to the next commands.


21. Slow Engine 2 to a stop after the locomotive has passed Sensor 1. At this point, Engine 2 is stopped at Sensor location 1.

   Engine 2 must be far enough down the track to allow clearance for Engine 1. Engine 1 is now ready to pull into the siding.

   Note!


23. Press AUX1. Throws the switch to the THROUGH position.


25. Press DIR. The engine is in reverse- put it in forward.

26. Move ENG 1 forward past siding.

27. Press ACC, 1. Addresses the recording.

28. Press AUX1, 1. The ARC waits on sensor 1.


30. Press DIR as Engine 1 reaches the sensor.


32. Press AUX2. Throws the switch to the OUT position.


34. Back Engine 1 into siding.
Advanced Recordings

Example: Completing an advanced recording using track sensors (continued)

35. Press ACC, 1.
   Addresses the recording itself.

36. Press AUX1, 4.
   The ARC waits on Sensor 4 before moving on to the next commands.

37. Press ENG, 1.
   Addresses Engine 1.

38. Stop Engine 1 on the siding as it reaches the Sensor 4 location by pressing the DIR button.

   Addresses Switch 1.

40. Press AUX1.
   Throws the switch to the THROUGH position.

41. Press ENG, 2.
   Addresses Engine 2.

42. Throttle-up Engine 2.

43. Press ACC, 1.
   Addresses the recording itself.

44. Press AUX1, 0.
   The recording stops.

Note! When operating a long train, the siding must be long enough from the switch to the Sensor to hold your entire train. The train will stop as soon as the back wheels of the train reach the sensor.

Figure 7. Sample layout
Listed below are the CAB-1 commands for your ARC. Refer to the appropriate sections to understand each command in greater detail.

**Normal operation while not recording or playing**

- **CAB-1 Commands**
  - Enter ID# 1
  - Enter ID# 2
  - Enter ID# 3
  - Enter ID# 4

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play recording</td>
<td>Turns off the looping command for that recording</td>
</tr>
<tr>
<td>Returns the looping command</td>
<td>Turns on the looping command for that recording</td>
</tr>
<tr>
<td>Begin recording</td>
<td>Begin recording</td>
</tr>
</tbody>
</table>

**Recording**

- **CAB-1 Commands**
  - Enter ID# 1
  - Enter ID# 2
  - Enter ID# 3
  - Enter ID# 4

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop recording</td>
<td>Stop recording</td>
</tr>
<tr>
<td>Cues another recording</td>
<td>Cues another recording</td>
</tr>
<tr>
<td>Wait on sensor 1</td>
<td>Wait on sensor 1</td>
</tr>
<tr>
<td>Wait on sensor 2</td>
<td>Wait on sensor 2</td>
</tr>
<tr>
<td>Wait on sensor 3</td>
<td>Wait on sensor 3</td>
</tr>
<tr>
<td>Wait on sensor 4</td>
<td>Wait on sensor 4</td>
</tr>
<tr>
<td>Stops all playback or recording</td>
<td>Stops all playback or recording</td>
</tr>
<tr>
<td>Clears a recording</td>
<td>Clears a recording</td>
</tr>
</tbody>
</table>

**Playback**

- **CAB-1 Commands**
  - Enter ID# 1
  - Enter ID# 2

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start playback</td>
<td>Start playback</td>
</tr>
<tr>
<td>Pause playback or forces playback when waiting on a sensor</td>
<td>Pause playback or forces playback when waiting on a sensor</td>
</tr>
<tr>
<td>Stop recording</td>
<td>Stop recording</td>
</tr>
<tr>
<td>Stops playback</td>
<td>Stops playback</td>
</tr>
</tbody>
</table>

Beneath this panel
Advanced Recordings

Questions and answers

Q: Can I have more than one ARC on my Layout? Can I daisy chain more than one ARC?
A: Yes. Connect only the first ARC in the daisy chain to the Command Base via the TXC (black) wire. Connect only the DAT, COM, and TXA terminals between the ARC units, not the TXC terminals. All of the ARC units communicate with the engines (ENG), trains (TR), and accessories (ACC) through the ARC that is directly connected to the Command Base.

Q: Do I have to use sensors? Do I need to wait for a sensor every time I want something to happen?
A: Use sensors only if you want your trains to trigger an action at a specific location on your layout. You do not have to wait for sensors to trigger an action if you don’t want the action to be coordinated with the location of the train.

Q: What part of the train has to touch a track sensor to trigger the ARC?
A: The ARC will be activated as soon as two wheels roll over the track sensor. Current flowing through the wheels and across the axle instantly create an electrical circuit.

Q: Can I trigger an action with the train stopped on the sensor? Do I need to pass the sensor before I can trigger an action?
A: Yes. You can trigger an action with the train on the sensor. When you are creating the recording, the ARC will record the amount of time between reaching the sensor and performing the action; that way, the actions don’t have to occur as soon as the train reaches the sensor.

Q: Do I have to enter the address of a locomotive, train, or accessory each time I want to perform a different function with it?
A: No. Once you address the locomotive, train, or accessory, your CAB-1 is talking to that particular component. You need to address that component again only after you have addressed a different component.

Q: Can I have more than one recording trigger the same recording?
A: Yes. Keep in mind that the ARC will disregard a command to play a recording that is already playing. The recording won’t start over.

Q: Why won’t my trains stop where I want them to?
A: To stop a train at a precise location, you need to use a track sensor. As you approach the sensor, begin to slow down the train. As soon as the train reaches the sensor, press the DIR button on your CAB-1.

Q: Can I have a recording start the train?
A: Yes. (This does not require a sensor).
Advanced Recordings

Questions and answers (continued)

Q: Do my trains already have to be moving to use a sensor?
A: No. You may stop a train on a sensor and proceed with the recording; however, this means that the recording will not continue unless the train is always on the sensor.

Q: Can I still control the trains or accessories when a recording is playing?
A: Yes. You can control any part of your layout at any time during playback.

Q: Can I use multiple CAB-1 Remote Controllers when making a recording?
A: Yes. In fact, using multiple CAB-1 Remote Controllers with the help of other people can make it much easier to create a complicated scenario.

Q: Can I use a recording to set all my switches to a particular position?
A: Yes. Simply create a recording that sets all the switches to the desired position and then play the recording.

Specifications

Physical
Size: 3.7” x 2.7” x 1.2”
Mounting: Use two #4 pan head sheet metal screws (not included)

Electrical Ratings
Input voltage: 9-20 volts (AC)
Input supply current: 50 mA
COMM input signal: +/-12 volts

Input sensors
Input voltage: Detects 3-30 volts (AC or DC)
Input current: 10 mA
Figure 8. Controller mount template

**Caution!** Your service and warranty information is on the other side. Be sure to photocopy this page or the warranty.
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 ____________________