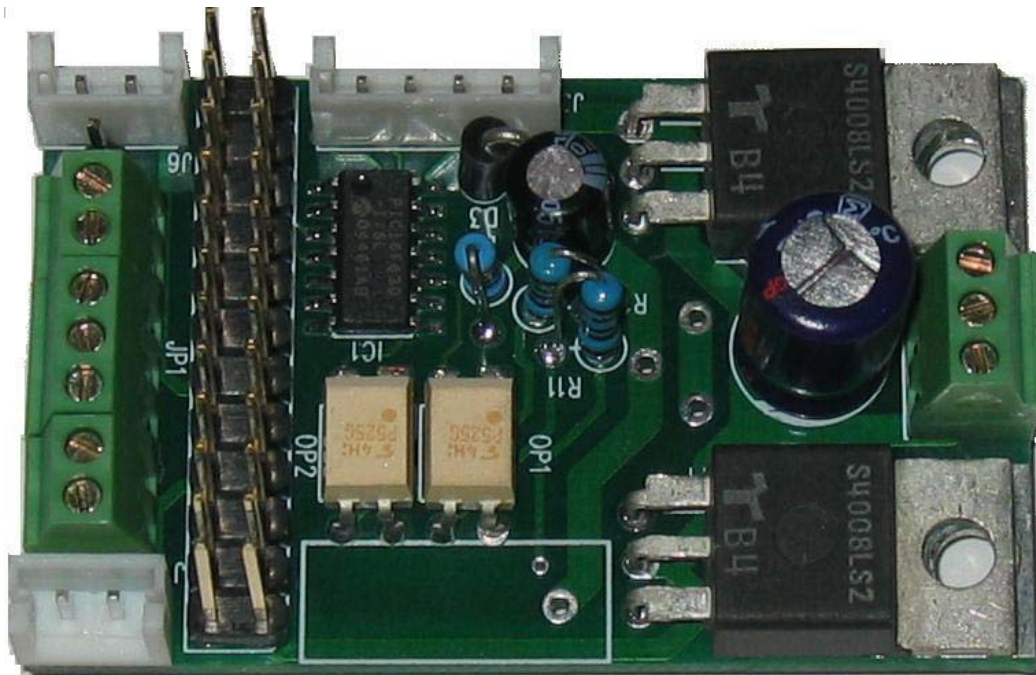# Beep Commander
Instruction Manual

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Beep Commander

TMCC Compatible Beep Command Upgrade Board

Overview

The Beep Commander with patented SMS* Technology ^{tm} is the perfect Beep upgrade for those who desire more speed steps than the usual 32. The Beep Commander is capable of operating in the 32 speed step mode for speed profile compatibility with existing engines. When desired, the Beep Commander can be switched to operate with 100 speed steps. The low-end speed control performance is noticeably improved in this mode of operation.

SMS* - Speed Management System

Enhanced Features

- CAB-1^{tm} selectable 32 (default) or 100 speed steps
- On-board micro-controller provides future enhancement capabilities
- Horn pulse output to control modern-era horns
- Solder-less connections make installation simple and quick
- Uses Lionel R2LC to be fully compliant with TMCC standards.

Speed Selection

Activate   32 speed steps: AUX1 + 0 + AUX1 + 0 + BRAKE
Activate 100 speed steps: AUX1 + 0 + AUX1 + 0 + BOOST

Full Functions

Connections for RailSounds, Front and Rear coil coupler, Front and Rear lights, and Smoke or Strobe light outputs are available

Small Footprint

Only a 2.00" L x 1.25" W x 0.9" H footprint including the R2LC. The R2LC tucks neatly onto the provided connector supplying solid electrical and mechanical mounting.
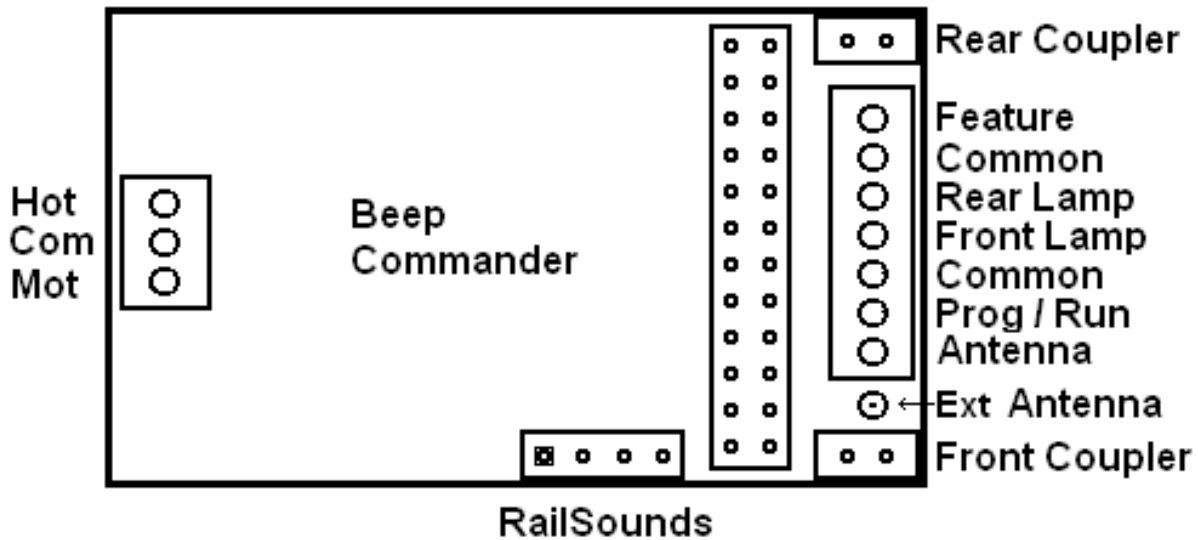
Easy Installation

Uses miniature screw terminal connectors for wires, and specialized connectors to connect coil couplers and sound systems.

Included with Board

Two replacement lamp sockets, one replacement solder lug for power, extension antenna, and mounting hardware.

Beep Commander Connector Pin Designations

Connector Pin Description

Hot – connected to the 3rd rail roller pickup
Com – connected to the outer rails, and the motor common
Mot – motor hot lead connection
Prog / Run – Program / Run switch connection
Ext Antenna – External Antenna connector

RailSounds – Connector for RailSounds. This connector has the track power and a serial signal from the R2LC. Pin 3, normally not connected, has a special control signal for controlling non-RailSounds Sound cards. Contact support@electricrr.com for details on interfacing to these sound cards.

The **Feature** terminal can be used as a smoke unit, a strobe light, or cab / marker lights. In the Beep Installation in this manual, the Front / Rear (coil) Couplers and the feature terminal are not connected. They are active and available for use as needed.

The Beep Commander has additional circuitry to allow LED's to be used on the lamp connections. This circuitry is exclusive to the Beep Commander. To use, simply add the LED with a 1k series resistor to the appropriate connections.

Installation

Please take time to plan out your installation. Before you begin, examine the wiring already present in the Beep. Before starting the installation, you will need to change several existing connections and remove the circuit board. The original "direction lock" switch will become the "program / run" switch. Save the masking tape for later fastening down the new wiring. Strip all wires ¼" and twist the ends for attachment to the Beep Commander circuit board to prevent stray stands of wire. Be sure that the screws in the mini terminals are turned a few turns counter clockwise before wiring. Do not over tighten terminal screws.

Preparation:

Remove the shell, masking tape, and the lamp bulbs and set them aside so they will not be damaged. Follow these preparatory steps carefully. When freeing wires, be careful not to flex the soldered connections excessively – or your install will no longer be solder-less!

Refer to Figure 1 while performing the following steps:

1. Using a flat blade screwdriver, slightly spread open each lamp holder and then pull out the lamp socket. Cut the wires from their attachment point on each motor. Use caution to only cut the wires going to the lamp socket. The sockets will *not* be re-used.

2. Remove the circuit board mounting screw, and flip it over. Cut the 6 wires going to the circuit board right at the circuit board to preserve wire length.

3. Remove the black wire going down into the "well" in the middle of the weights by removing the center screw. Replace this wire with the black wire provided. Orient the lug so the wire exits on same side as the red wire.
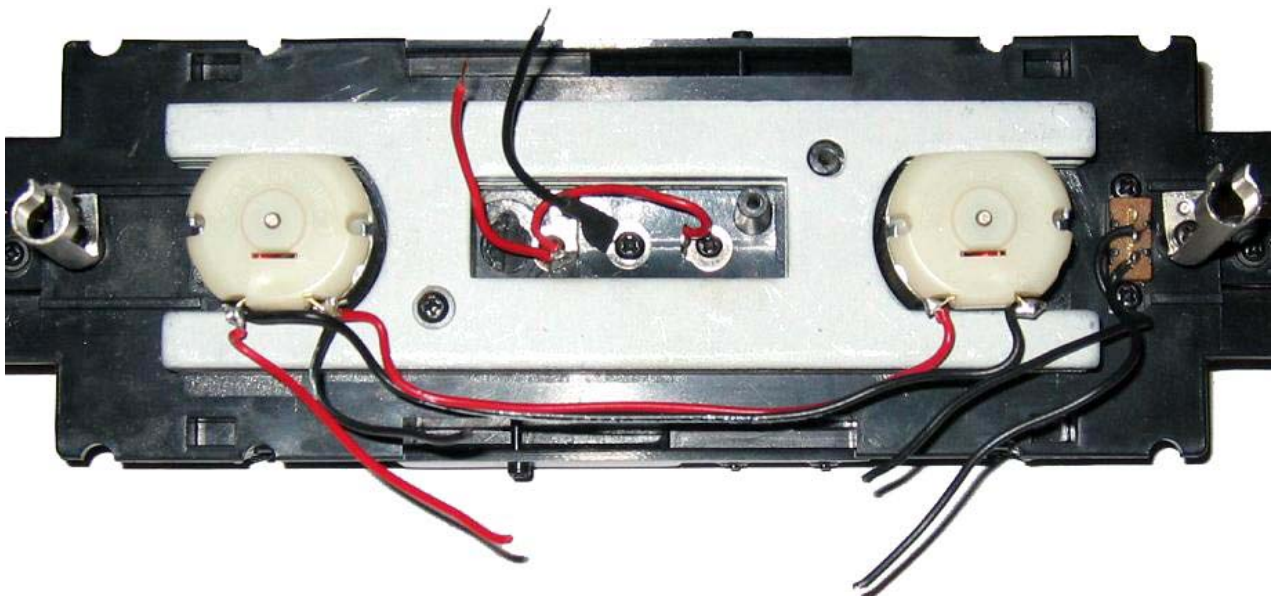

Figure 1

4

Installation:

1. Prepare 2 pieces of double stick tape by cutting them to 1.25" long. Remove one side of the protective coating on each, and stick them together. Attach double stick to the weights as shown in figure 2. The "top" edge in the picture is the flush edge. This will leave a little room for the wires to pass the tape between the motors.
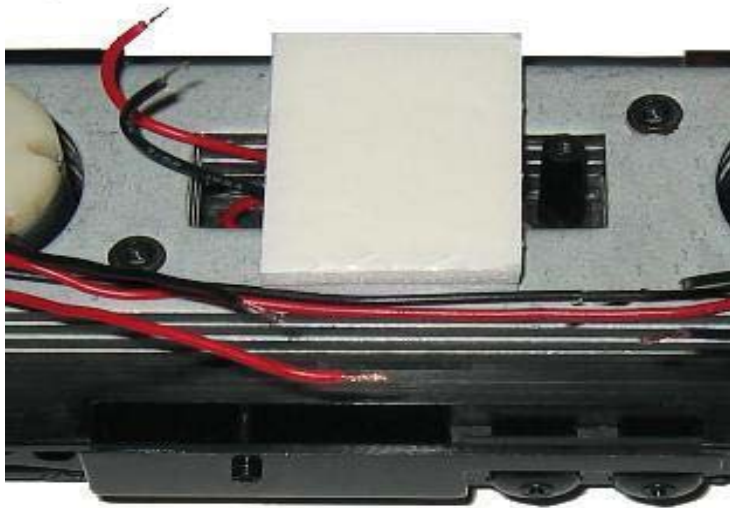

Figure 2

2. Looking at figure 3, attach the Beep Commander circuit board. Take your time, and position roughly centered between the motors. Keep flush on the "top" edge – same as the double stick tape.
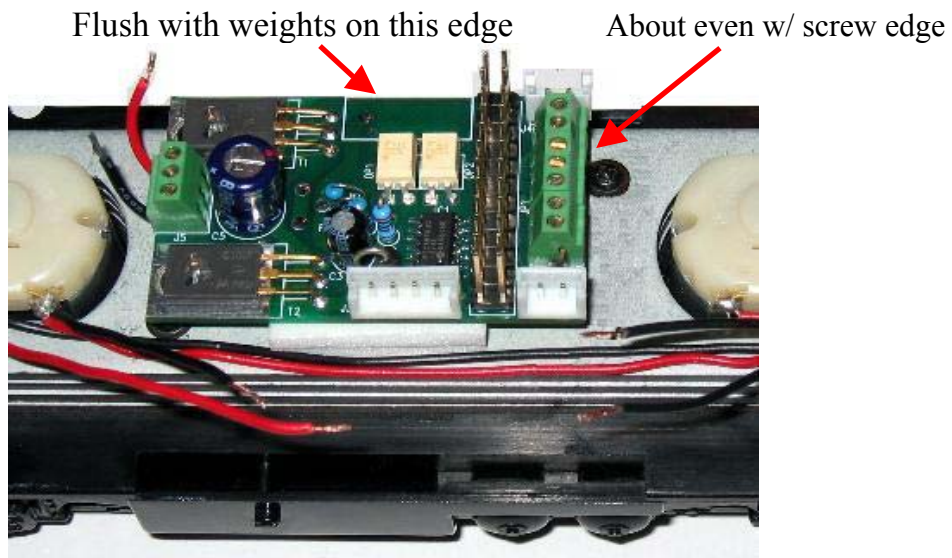
Flush with weights on this edge   About even w/ screw edge

Figure 3

Wiring:

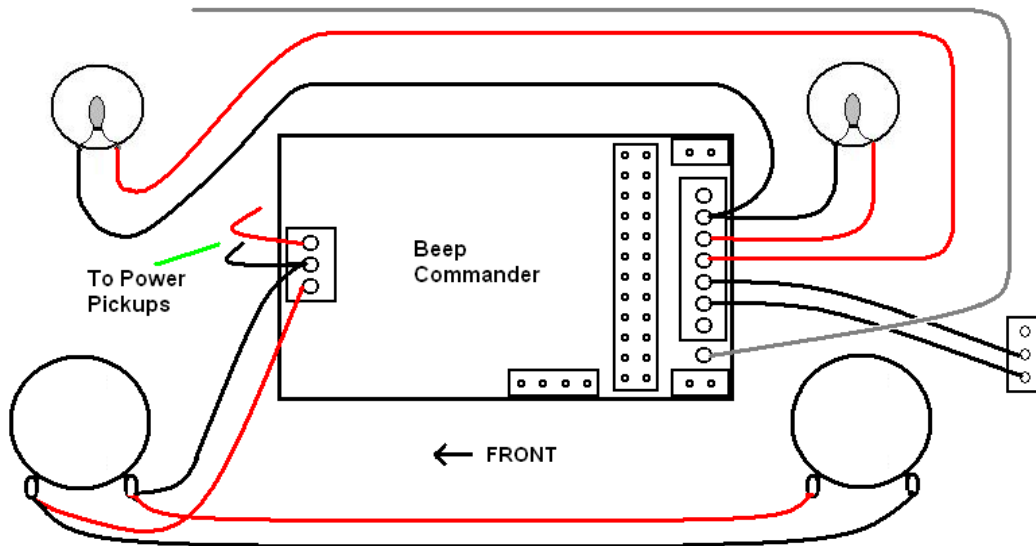Schematic overview of the Beep Commander wiring:

Figure 4

NOTE: Take your time, twist the wire ends, use your needle nose pliers or tweezers to place the wires; patience is required to make all the connections as shown in Figure 4 and 5. The board will flex on the double stick tape, so move it around to facilitate the connections.

3. Start by attaching the power connections. Twist the motor black wire and the black wire from the pickup together and insert in the center terminal on the left connector block. Check all connections; insure no wire frays are causing a short circuit.

4. Slip the provided new lamp sockets into the holders; the socket with the longs leads goes in the front. After wiring, screw in the lamps on the front and rear lamp sockets.

Figure 5

5. Double check all wiring, then install the R2LC receiver board onto the Beep Commander board as shown in figure 6 below. Use caution not to miss by one pin pair to either side, as this will certainly damage the components on both cards!
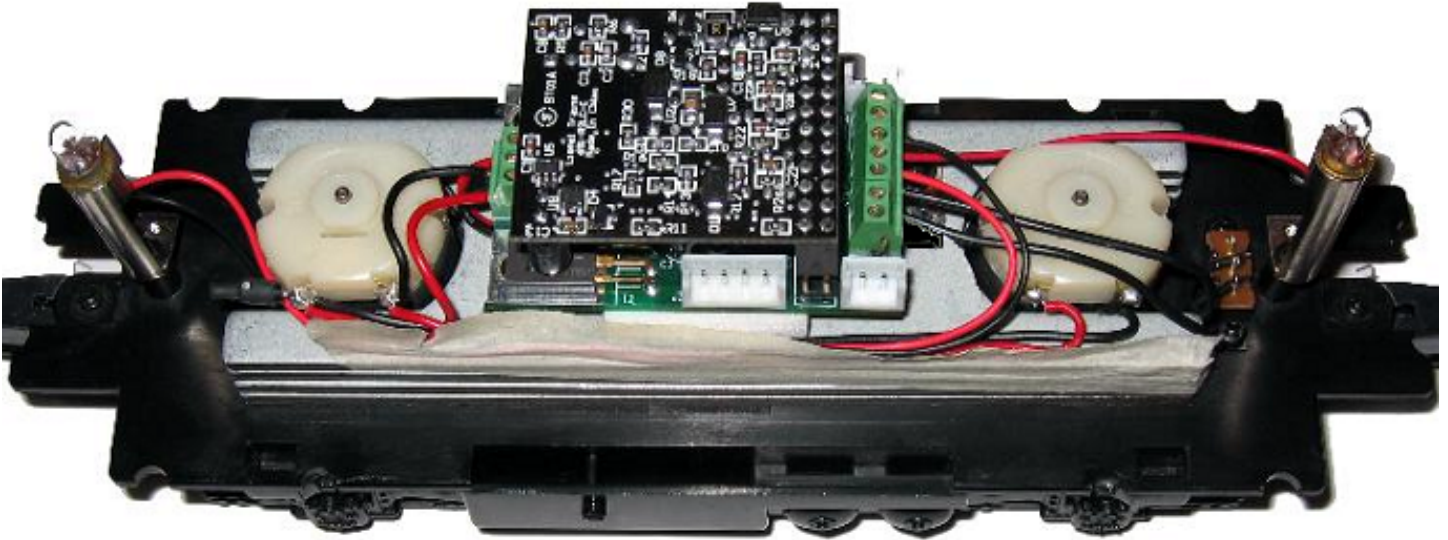

Figure 6

6. Before replacing the shell, do an operational check. Verify the "ON / OFF" switch on the bottom is set to "ON" for "run". The "OFF" position is now the "program" position.   Next, attach the antenna as shown in figure 7, looping as shown to keep it from dragging.
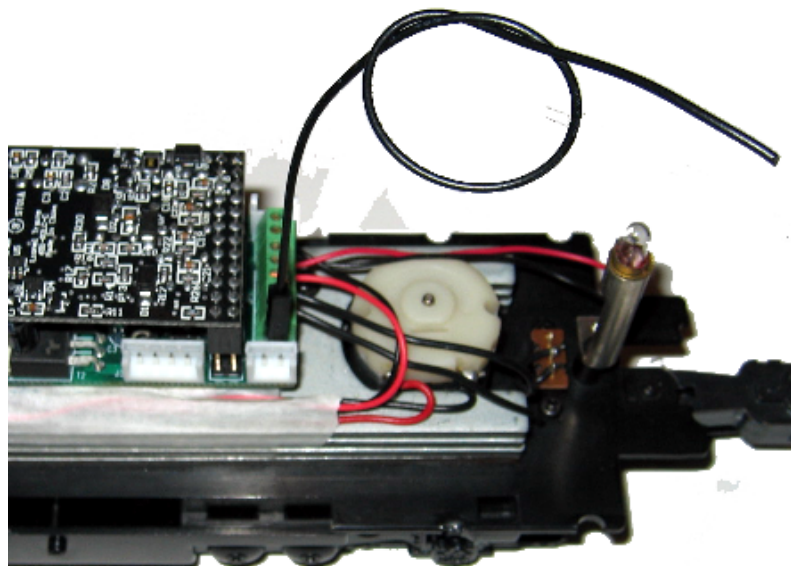

Figure 7

7. Test by operating the Beep in command and conventional modes; verify the lighting operates directionally. If the command mode lighting is not directional, re-program the R2LC *and* feature code (set the code to 5, 6, or 8).   If a bulb does not light, check for a "glue-like" substance on the threads preventing the bulb from fully seating; tighten as needed.

8. After checkout, un-plug the antenna wire from the Beep Commander. Cut the wire to about 7 inches. Install in the shell as shown in figure 8. The antenna is best attached to the shell with hot melt glue (shown) or with tape. Tape tends to dry out or get sticky, so use the hot melt glue technique if you can. It is best to remove the windshield to install the antenna to prevent damage to it.
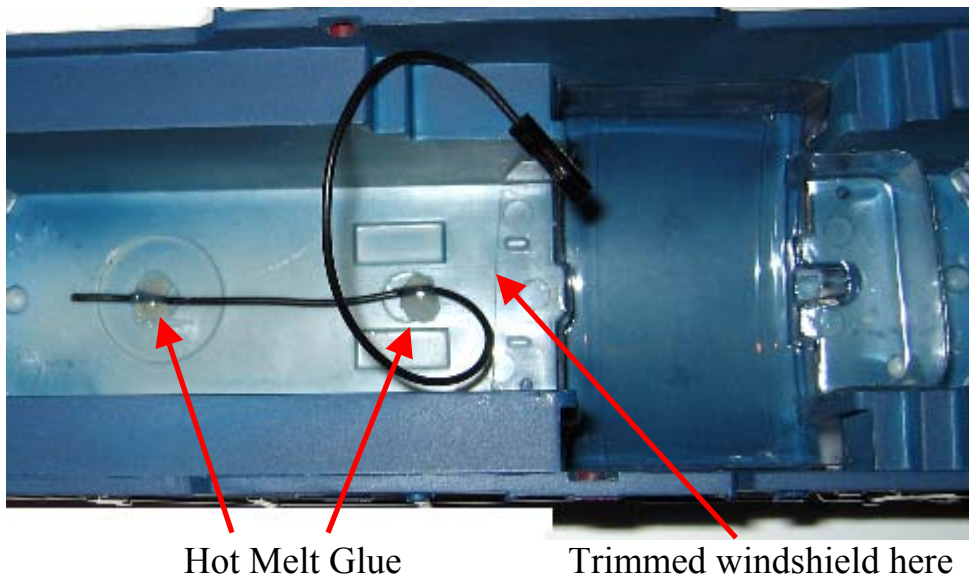

Hot Melt Glue   Trimmed windshield here
Figure 8

9. IMPORTANT: Before re-installing the shell, you need to modify the windshield as shown in figure 8 to clear the newly installed electronics.

   - Remove the windshield from the shell; observe the direction as the windshield only fits one way!
   - Remove the cross member portion on the forward (long hood) side with a pair of scissors.

10. Re-install the shell, routing the antenna wire as needed to prevent pinching between the chassis and the shell.

INSTALLATION COMPLETED!

Operation

The Beep Commander is controlled from the CAB-1 key sequences the same as you control any engine.

- Throttle activates motion and speed.
- Direction "<>" sets the direction of travel.
- Aux1 + 0 resets and stops the engine.
- Aux2 turns the lamps on / off.

SMS Technology^{tm} and Speed Step Selection

The default speed step selection is 32 as shipped. This profile matches the default of the R2LC. This mode of operation is desirable when lashing up to engines that do not have the Beep Commander installed.

The major advantage to the Beep Commander is the ability to set 100 speed steps on the throttle. The 100 speed steps are linear. The speed steps start at a lower threshold, thus the motor is operating at a lower initial voltage with fine adjustment as the throttle is advanced. This greatly enhances the ability to control the engines. The momentum and stall features are not applicable to the 100 speed step operation.

To switch speed steps do the following:

Activate   32 speed steps: AUX1 + 0 + AUX1 + 0 + BRAKE
Activate 100 speed steps: AUX1 + 0 + AUX1 + 0 + BOOST

The speed step selection is stored until changed, and survives power cycling.

SMS Technology, or Speed Management System Technology, is a patented system of controlling speed steps under command and conventional operation. In conventional mode, certain products do not require an R2LC for operation. (Beep commander requires the R2LC)

Setting the R2LC ID and Feature code

Setting the engine ID Number:
The R2LC Receiver comes with its engine ID set to number '1'. To change the engine ID, follow this procedure.

      1. Make sure the Command Base is connected to the track.
      2. Set the engine PROGRAM / RUN switch to "PROGRAM".
      3. Place the engine on the track and apply power.
      4. On the CAB-1, press [ENG] then the number (1 - 99) for the engine selected.
      5. Press [SET]. The engine ID is saved until you need to change it again.
      6. Remove power from the track and place the switch back into the 'RUN' Position.

OPTIONAL - Programming the Feature Code:
The R2LC Receiver module can be programmed to operate different features for different engines. The fifth output (labeled "SMK") can be programmed to operate the different features. These include a smoke unit (with boost), a strobe light, or cab / marker lights. Use the table below to determine which feature of your engine you need to operate from your CAB-1. Then, use the corresponding feature code to program your R2LC Receiver.

Code	Engine Type	Feature Terminal
0	Steam w/ Signal sounds	Smoke Unit
1	Diesel w/ Signal sounds	Strobe Light
2	Diesel w/ Signal sounds	Cab / Marker Light
4	Steam w/ Rail sounds	Smoke Unit
5	Diesel w/ Rail sounds	Strobe Light
6	Diesel w/ Rail sounds	Cab / Marker Light
8	Diesel w/ Rail sounds	Smoke Unit

To program the engine features,
      1. Set the engine PROGRAM/RUN switch to PROGRAM.
      2. Place the engine on the track and apply power.
      3. On the CAB-1, press [ENG] then the number (1 - 99) for the engine.
      4. Press [SET], then press [AUX1] [N], where N = the engine feature code.
      6. Remove power from the track and place the switch back into the 'RUN' Position.

Note: For the Beep Commander, select 5, 6, or 8. This sets directional lighting active.

When running in Conventional mode:
Cycling of engine direction can be overridden by placing the programming switch in the 'PROGRAM' position. This will lock the engine direction into the last direction traveled. You must replace the switch back to the 'RUN' position if you wish to run the engine in Command mode.

Limited Warranty

The Electric Railroad Company warrants to the original consumer purchaser that this product will be free of defects in materials and workmanship for a period of 90 days from the date of original purchase. This warranty does not cover service, repair, or replacement to correct any damage caused by improper installation, improper connection, external electrical fault, accident, disaster, misuse, abuse, or modifications to the product. All other express or implied warranties, including the implied warranty of merchantability and fitness for a particular purpose, are hereby disclaimed. If this product is not in good working order as warranted, the sole and exclusive remedy shall be repair or replacement. In no event shall The Electric Railroad Company, or any dealer, distributor, or authorized installation and/or repair service provider be liable for any damages in excess of the purchase price of the product. This limitation applies to damages of any kind, including but not limited to, direct or indirect damages, lost profits, lost savings or other special, incidental, exemplary or consequential damages whether for breach of contract, tort or otherwise, or whether arising out of the use of or inability to use the product, even if The Electric Railroad Company, or any dealer, distributor, or service provider has been advised of the possibility of such damages or any claim by any other party. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. During this warranty period, the product will either be repaired or replaced (at our option) without charge to the purchaser, when returned either to the dealer with proof of the date of purchase or directly to The Electric Railroad Company when returned prepaid and insured with proof of date of purchase. Some states do not allow limitations on how long an implied warranty lasts, so such limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

Repairs

Each and every product is thoroughly tested before it is shipped. The likelihood that it is not working when it reaches you is very small. However, if after troubleshooting it yourself you cannot get it to work properly, you should contact us to help determine the problem.

Should your product ever need repair, you should return it postpaid directly to The Electric Railroad Company. If the product is within the warranty period, it will be repaired or replaced and returned to you free of charge. Units <u>out of warranty</u> will be repaired or replaced for a service charge of $30.00 at our option.

Please email to <u>support@electricrr.com</u> for return authorization before returning any product.

Disclaimer

Improper installation or configuration of the Beep Commander Board can cause overheating and fires! Since it is not possible to understand every installation, it is the consumer's responsibility to verify proper operation of the upgrade to prevent malfunction. If you are unsure of your install, please contact us first before taking any risks!