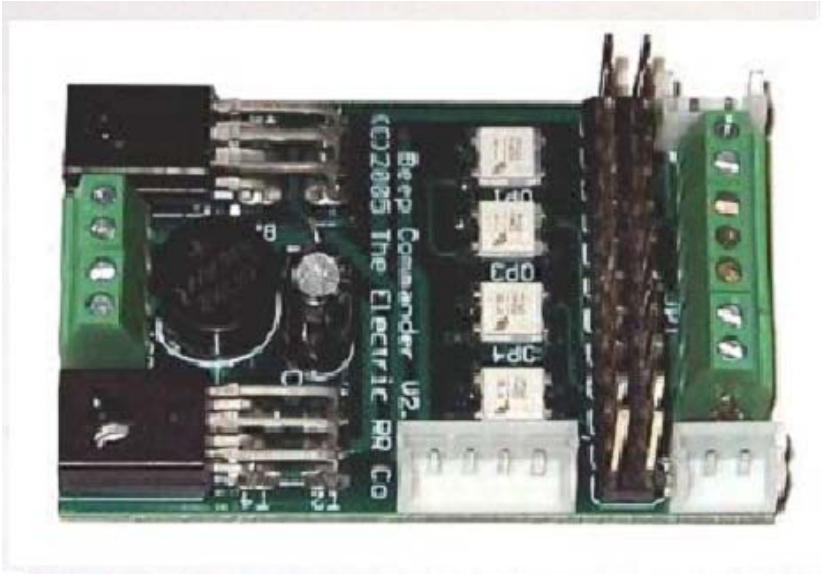




RMT Buddy Command and Sound Upgrade Kit

Installation & Operation Manual



The Electric Railroad Co.
939 Wood Duck Avenue
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Buddy Command and Sound Upgrade Kit

Overview

The Beep Commander v2 with Sound Commander is an integrated kit to add TMCC and Sounds for added realism to the RMT Beep & RMT Buddy.

The Beep Commander v2 is a full wave DC driver board that works in conjunction with the R2LC receiver board to add TMCC operation. All needed parts are provided to facilitate installation.

The Sound Commander is designed to mate directly to the Beep Commander v2 upgrade, and includes a low-profile speaker, baffle, and mounting supplies.

Enhanced Features:

- Solder-less connections make installation simple and quick
- Uses Lionel R2LC to be fully compliant with TMCC standards
- Coil Couplers supported, Strobe or Cab / Marker Lamp connections
- Conventional and Command mode operation
- Complete Kit, Simple Installation, Fully Integrated
- Horn / Bell / Prime Mover Revs

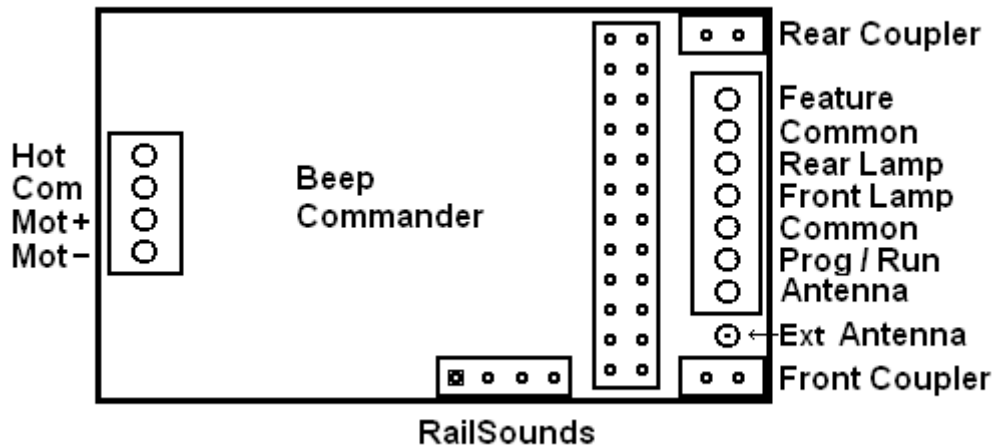
Also included:

Extension antenna, and mounting hardware.

Please Note:

Installation pictures of products may vary from actual products received. The Electric Railroad Company reserves the right to improve the products on successive manufacturing cycles.

Beep Commander v2 Connector Pin Designations



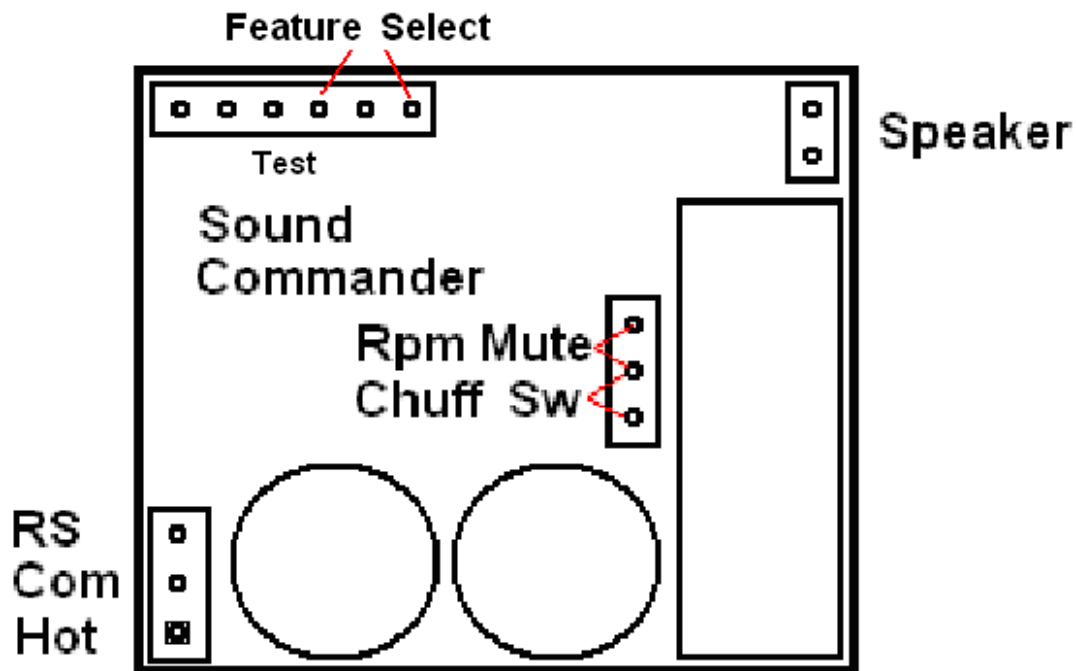
Connector Pin Description

- Hot** - 3rd rail power connection
- Com** - Outer rails power connection
- MOT +** - Motor connection (brown wire)
- MOT -** - Motor connection (blue wire)

- Prog / Run** - Program / Run switch connection
- Ext Antenna** - External Antenna connector

The **Feature** terminal can be used as a smoke unit, a strobe light, or cab / marker lights.

Sound Commander Connector Pin Designations



Connector Pin Description

- Hot** - 3rd rail power connection
- Com** - Outer rails power connection
- RS** - RailSounds[™] Serial Data input
- Speaker** - 8 ohm speaker connector

- RPM Mute** - Jumper to mute Prime Mover Revs
- Chuff Sw** - Steamer Chuff trigger connector
- Test** - Factory programming and test connector

Installation Overview

Please take time to plan out your installation. Before you begin, examine the wiring already present in the Buddy. 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. The lighting is managed by circuit boards in the Buddy, and no attempt is made to re-wire these. The direction lamps and strobes will not activate unless the Buddy is moving. While it is possible to re-wire and have true directional lighting, the loss of the lighting selector switch feature is not desirable.

Note: Strip all wires ¼” and twist the ends for attachment to the Beep Commander circuit board to prevent stray strands of wire. Do not over tighten the terminal screws when attaching the wires.

The kit can be installed without soldering; however it is best to add a capacitor on the motor leads, which requires a minimal amount soldering. A 22uf / 35v Non-polarized capacitor is included in the kit for this purpose. This capacitor will smooth out low speed motor operational performance, and protect the Beep Commander from transients on the track power. Additionally, some transformers may create transients that could damage the Beep Commander circuit board with extended use. These instructions show the installation of this capacitor as it is recommended.

Installation Procedure

Preparation:

1. The first step is to remove the shell; there are 4 screws in each corner of the Buddy. The screws are *not* the ones at the end of each slide switch; they are located under the trucks. You will have to swing the trucks to gain access to them.



Remove these screws to release shell (4 places)

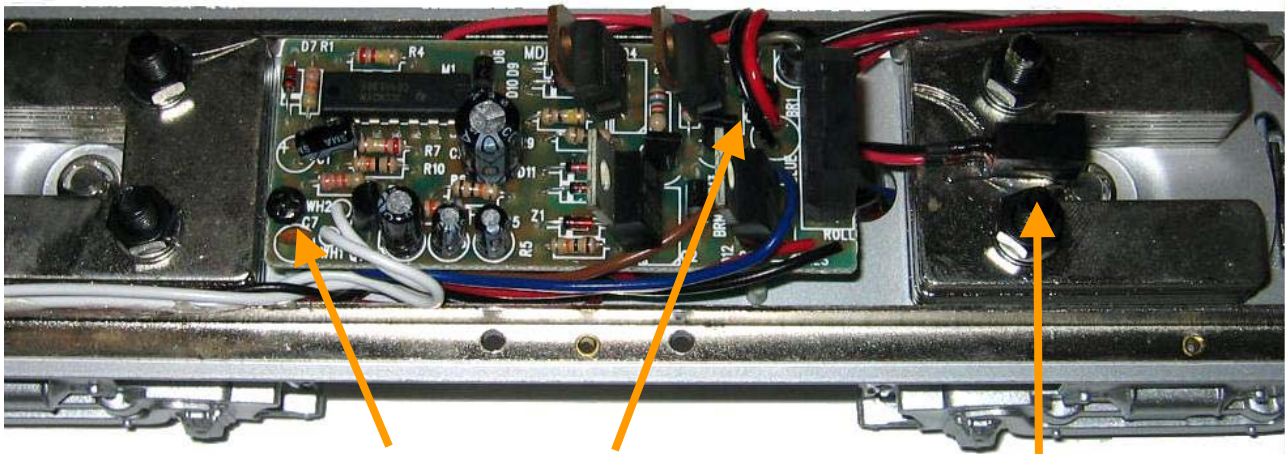
2. When you remove the shell, most Buddy cars will have a wire soldered to the lighting mode switch. Optionally, to protect the shell it is recommended to remove the wire at the switch and solder the connection back together when replacing the shell.
3. Release the remaining wires to the shell by depressing the clip and unplugging the connection. Try not to dislodge the connector attached to the Buddy chassis, if that happens, there is extra double stick tape to remount the connector or simply leave it loose.
4. It is recommended to remove the light bulbs so they do not get damaged in the installation process. They could be a bit hard to remove, so take your time to prevent breaking them.

Note: Although the Buddy has no “front” and “rear” per say; the initial startup direction has the direction control switch on the “rear”. This convention will be good to keep in mind and follow so multiple units (MU’s) can be constructed and lashed-up easily.

Preparation cont:

After removing the shell, the electronics will be visible as shown; the center shell support bracket has been removed for clarity. It is highly suggested to remove the shell support bracket for easier wiring.

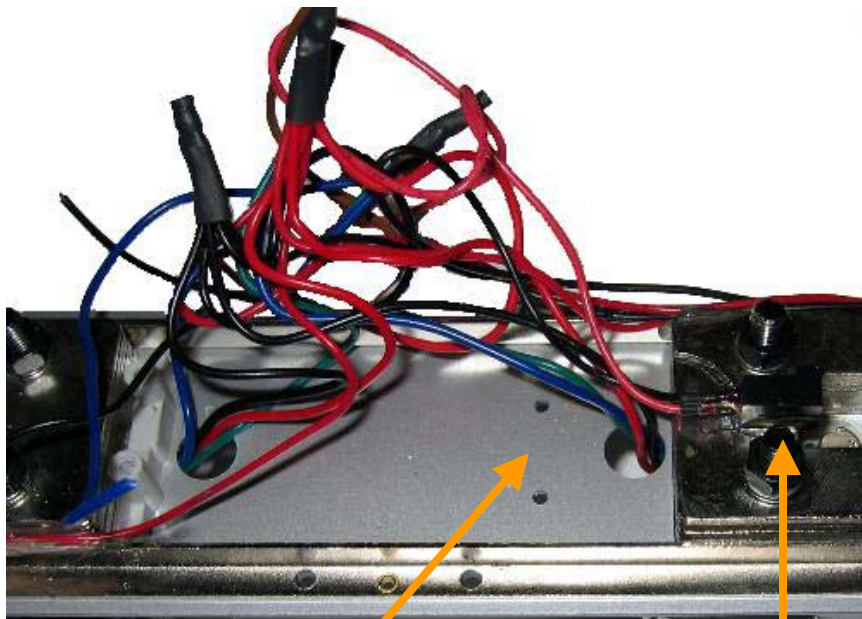
5. Remove the two (2) mounting screws for the “E” unit electronics indicated below.



Electronic “E” mounting screws

Shell lighting connector

6. Remove all wires from the “E” unit electronics, cutting them as close as possible to the board. Additionally, remove the mounting bracket indicated below.



Removed mounting bracket

Shell lighting connector

Preparation cont:

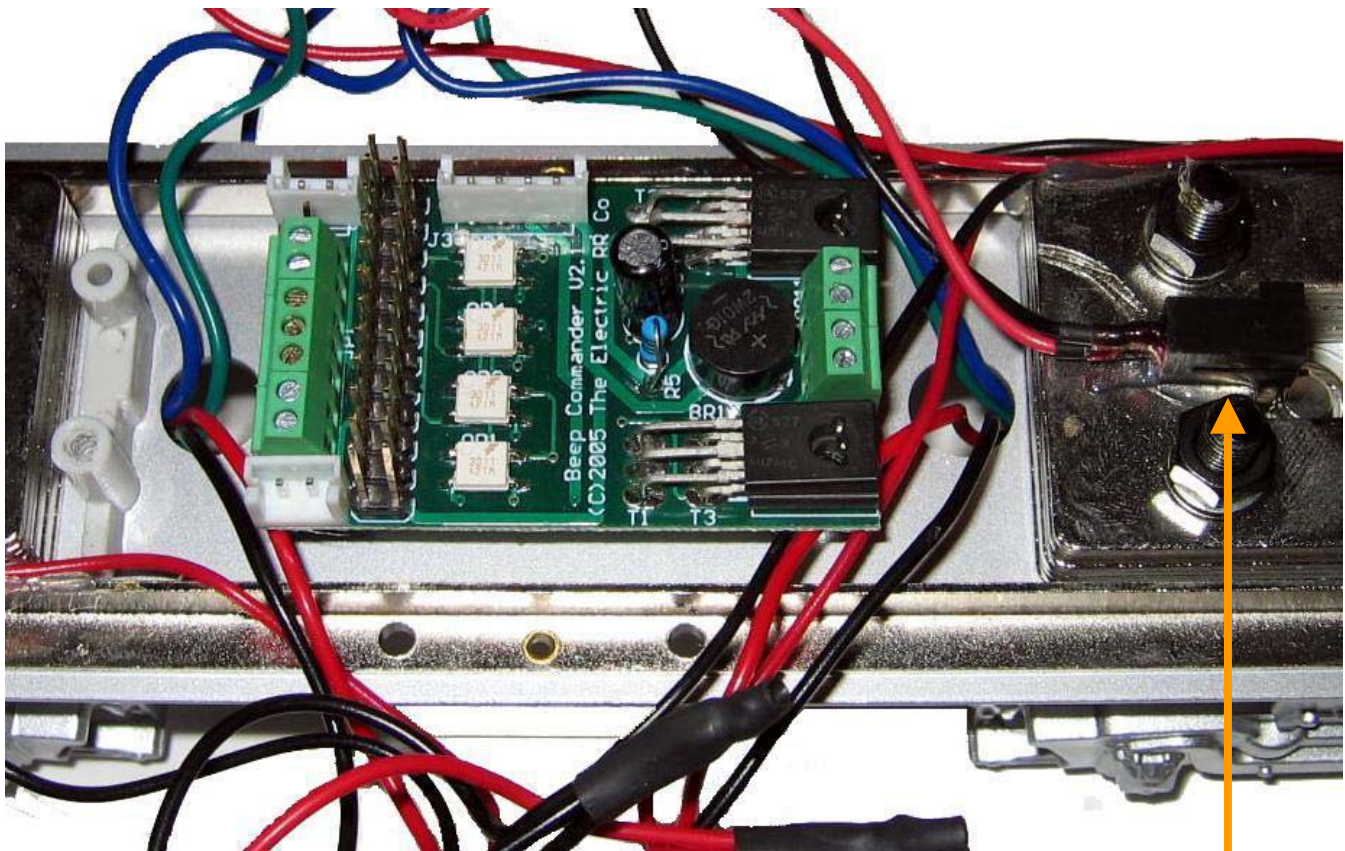
7. Identify wires. In the center of the chassis, there will be 4 wire clusters insulated with heat-shrink tubing. The pure red group is the track common, the pure black group is the track 3rd rail, and the other two (2) multi-colored groups are connected to the truck mounted motors.
8. Remove the heat shrink from both multi-colored groups and attach the 22uf capacitor to these wire groupings. Next apply the included heat shrink tubing to insulate the connections as shown.



22uf / 25v capacitor installed on the motor wires

Installing the Beep Commander v2 in the Buddy:

1. Prepare four (4) layers of double stick tape by cutting the two (2) pieces in half and remove the backing to create a 4 layer thick mounting.
2. Mount the Beep Commander v2 circuit as shown using the 4 layers of double stick tape. Situate the wiring as shown for access. The excess wire will need tucked into the space around the Beep Commander v2 circuit board afterwards, so this will spread out the wire out to make this easier. *Note the shell lighting connector in relation to the orientation of the Beep Commander v2.*



Shell lighting Connector

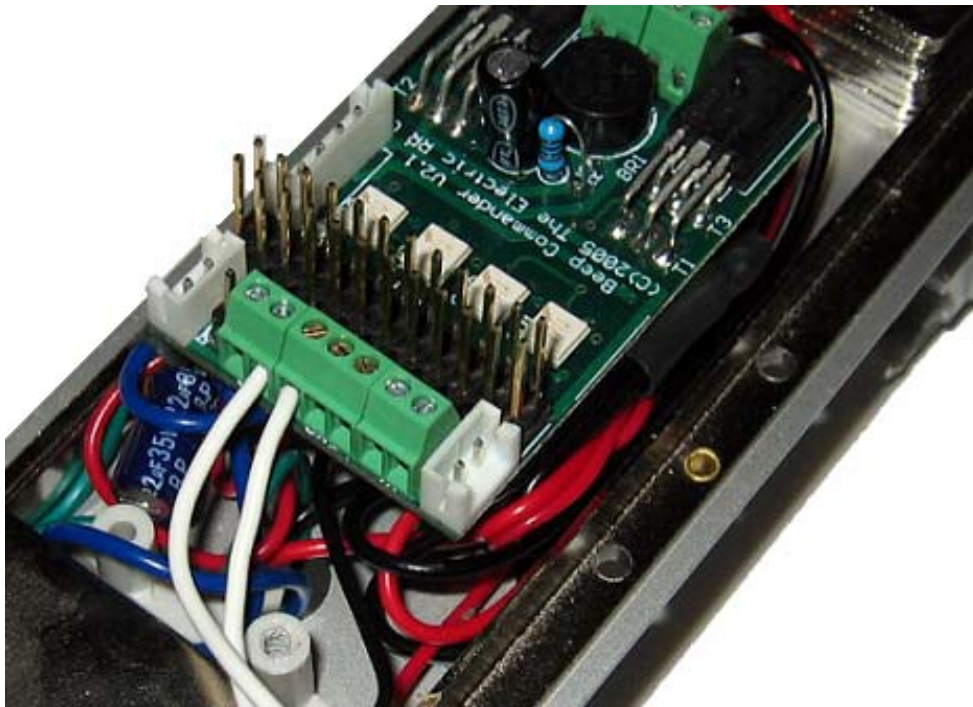
3. After mounting the circuit board, tuck the wires under the circuit board in preparation for connection; making sure the blue, brown, red, and black wires can reach to the four (4) connection terminals on the right. Take care not to damage the capacitor on the blue / brown wires installed earlier. Refer to the wiring details on the next page for how this should look.

Installing the Beep Commander v2 in the Buddy cont:

4. First attach the four (4) wires on the right side of the Beep Commander v2, starting from the top the order of the colors are: Blue, Brown, Red, and Black.



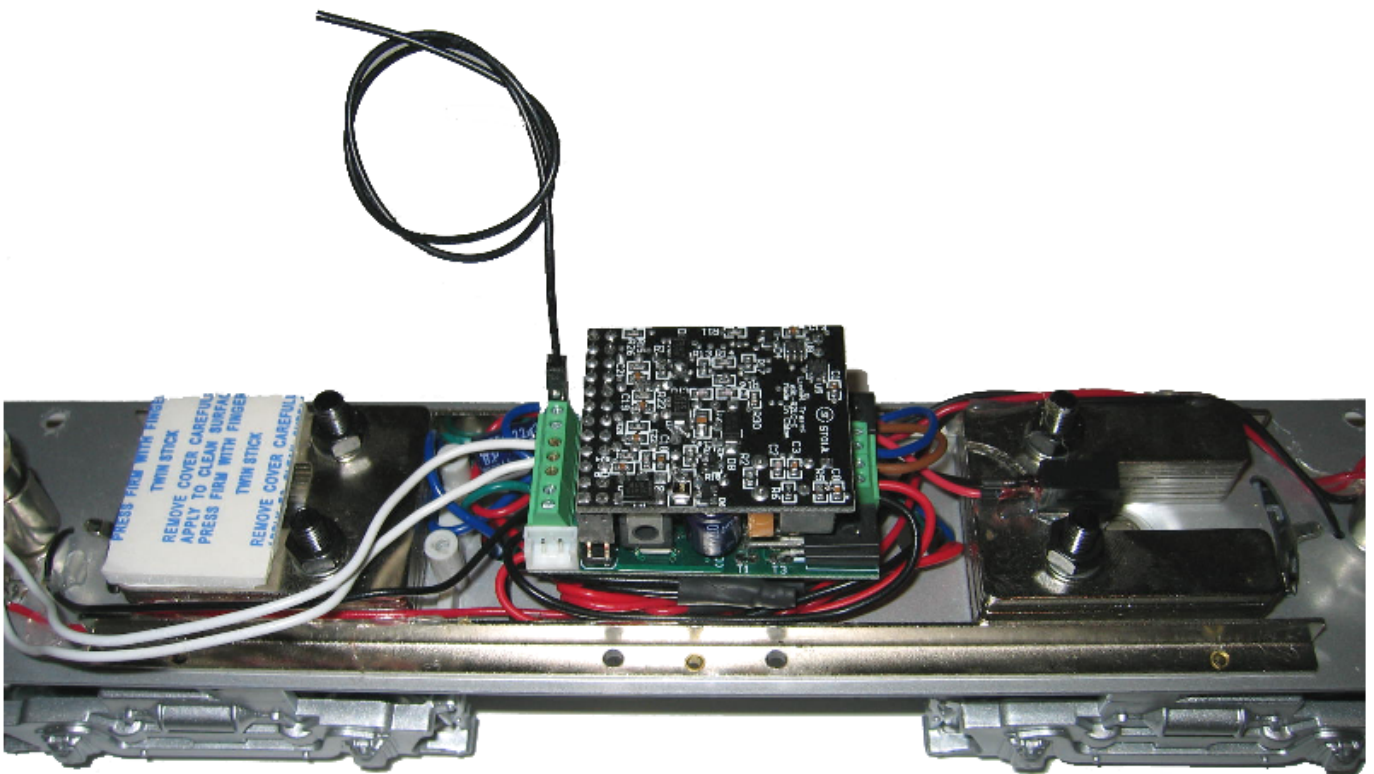
5. Next, attach the two (2) white wires on the left side come from the direction lock switch; their polarity is not important. This connection is for the “Program / Run” requirement to set the ID of the Buddy.



Installing the Beep Commander v2 in the Buddy cont:

6. Double check all wiring, then install the R2LC receiver board onto the Beep Commander v2 circuit board as shown below. Use caution not to miss by one pin pair to either side, as this will certainly damage the components on both cards!
7. Re-install the light bulbs on the chassis (if removed).
8. Before proceeding, do an operational check. Verify the direction lock switch on the bottom is set to “F-N-R” for “Run”. The “FORWARD ONLY” position is now the “Program” position. Next, attach the antenna as shown in, looping as shown to keep it from touching anything.
9. Test by operating the Buddy in command (Engine #1) and conventional modes.

Completed Buddy chassis with TMCC upgrade...



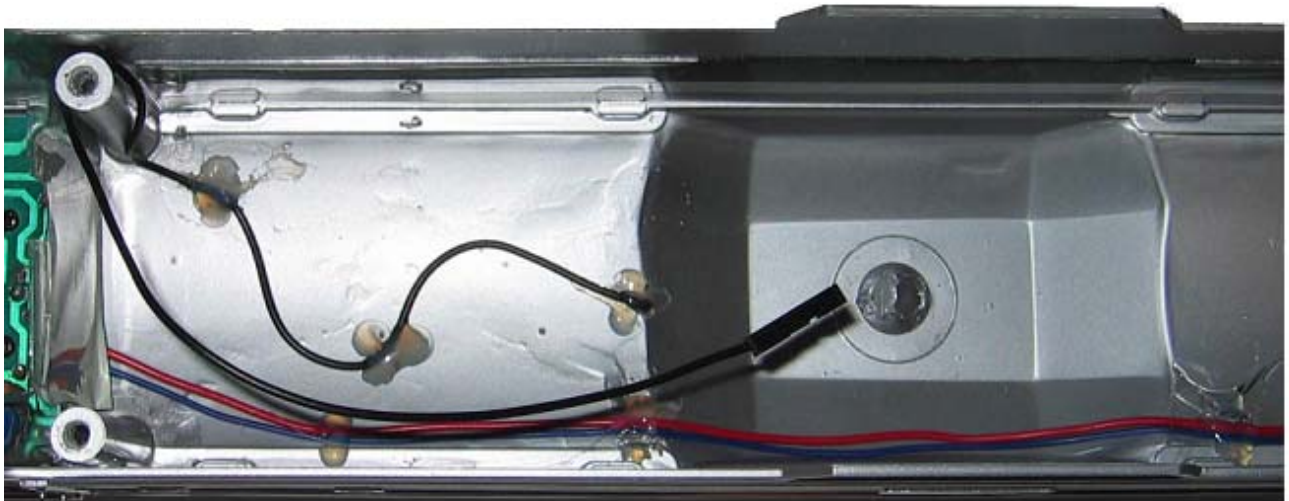
10. **IMPORTANT:** After successfully testing, replace the center shell support bracket and attach with the 4 screws removed earlier.

Installing the Beep Commander v2 in the Buddy cont:

11. After checkout, un-plug the antenna wire from the Beep Commander v2 circuit board for attachment in the shell. Loop the antenna wire around the post shown, with equal lengths on each side of the post; note the position of the connector on the wire end.



12. Install the antenna in the shell as shown, note the position closely. 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. Don't run the antenna too close to the center, as the center shell support bracket will attenuate the TMCC signal.



Installing the Sound Commander (optional):

1. Locate the speaker / baffle assembly, and pass the 2-pin connector up through the bottom the Buddy chassis, on the *same* end as the direction lock switch.
2. Test fit the speaker mounting as shown. The rivets on the bottom of the chassis form a “centerline” to align the speaker with. The picture shows the baffle skewed to the side to show a rivet. When mounted, the rivets will be covered, and the baffle flat edge will sit close with the edge of the chassis.



3. Final speaker placement; after test fitting the speaker, remove the double stick tape protection and permanently attach the speaker in the position shown.

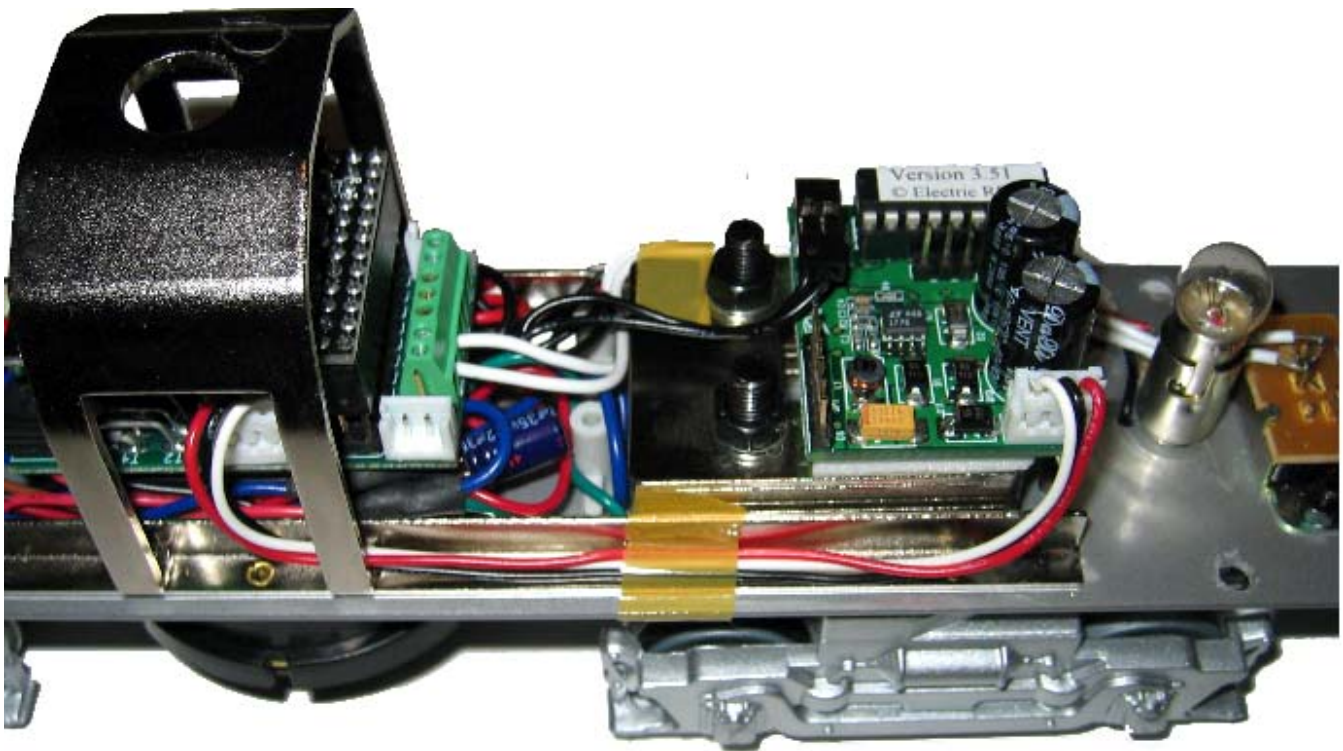


Speaker baffle is about 1/16” from the edge

Installing the Sound Commander cont:

4. Cut a piece of double stick tape 1.25" long and mount the Sound Commander on the weights as shown.
5. Attach the speaker wire connector to the 2-pin connector in the upper left of the Sound Commander; the polarity is not important.
6. Attach the 4-pin end of the Sound Commander power cable to the Beep Commander v2 RailSounds connector. This connector is now under the shell support bracket, and you may need to lift or remove the R2LC to facilitate the insertion. This connector is keyed, and only plugs in one way.
7. Attach the 3-pin end of the power connector on this cable into the power connector in the lower right of the Sound Commander. This connector is keyed, and only plugs in one way.
8. Secure the wires in place with a small piece of tape as needed.

Completed Buddy chassis with Sound upgrade...



Finishing the Installation:

IMPORTANT NOTE: *If you plan to install coil couplers, skip ahead in the instructions to “Installing Coil Couplers”, then return here to finish the installation.*

9. Reconnect the shell lighting connector and solder the wire to the lighting mode switch as needed.



Solder lighting wire here from the shell

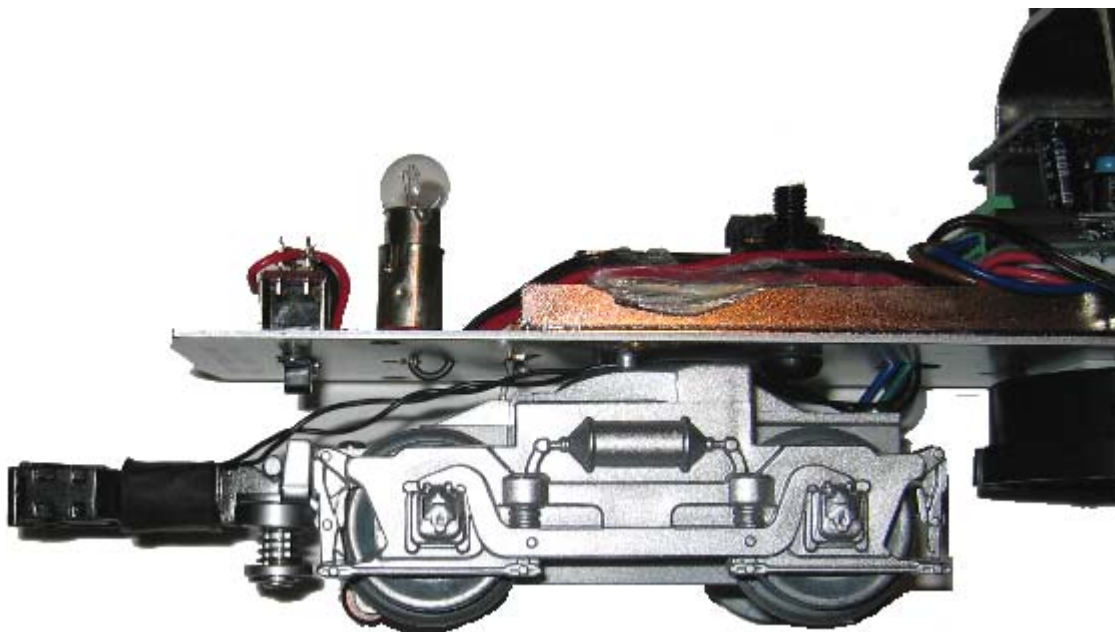
10. Replace and secure the shell, attaching the antennal wire to the ANT post. When attaching the shell, use caution not to pinch the antenna or lighting wires.

INSTALLATION COMPLETED!

Installing Coil Couplers (optional):

Note: Coil Couplers are not included in the “Deluxe Buddy Combo Kit”, but may be purchased separately from the Electric Railroad Company.

1. For each truck, remove the existing coupler by removing the “E” clip and associated washers and spring. Use caution not to lose the parts as the assembly is under tension from the spring. Remove the small thin washer in the bottom of the magnetic coupler; which will probably need pried out.
2. Prepare a coil coupler by carefully twisting the leads together, as when installed this will help to keep the wires manageable and out of sight.
3. Attach the coil coupler to the truck as shown below, using the spring and washer arrangement depicted. First install the “T” bar, next the Coil Coupler, then the thin washer on the top of the mounting plate. Finish with the washer and spring arrangement shown below, then secure with the “E” clip.
4. Route the wires and connector from the coil coupler wire over the truck, and up through the hole in the chassis with the existing wires.
5. Attach the coil coupler connector to the Beep Commander v2. The truck shown below is the truck under the lighting control switch. This is the front coupler. As covered earlier, this switch is on the end of the Buddy that is the default forward direction. The front coupler connection on the Beep Commander v2 is the connector closest to the antenna connection post.



Operation - Conventional Mode

The Sound Commander requires a minimum of nine (9) volts AC applied to operate properly. The bell will continue to operate during direction changes as long as the track power interruption is not unusually long.

The horn/whistle and bell buttons on the transformer operate the respective sounds on the Sound Commander. The horn/whistle will sound as long as the button is pressed. The bell will stay activated until the bell button is pressed again.

Using an extended press of the Bell button may activate the selection of additional sounds, which vary by sound set. Holding down the bell button for less than 2 seconds will turn the bell on or off. When the Bell button is held down greater than 2 seconds, but less than 3 seconds, the 2nd sound is activated. Holding down the bell button for longer than 3 seconds will activate the 3rd sound.

Note: Sufficient load must be present on the transformer for the offset voltage to be developed. If the horn/whistle or bell does not operate, try adding a lighted caboose to the “consist” and see if that helps. The Electric Railroad Company has checked out the transformers listed below and found them to operate satisfactorily.

Note: If the horn/whistle and bell sounds are reversed from the activation buttons, the track power is reversed. Switch the connections on the transformer power terminals to correct this condition.

Transformer Compatibility List:

Lionel 1033

Lionel KW

Lionel ZW

Lionel Sound Activation Button

Lionel PM-1

Lionel TPC 300/400

** The CW-80 is NOT compatible with the sound commander

Important Note: *The PM-1 will not develop sound control signals at full throttle, simply back off from full throttle a bit to operate the sounds.*

MTH Z750

MTH Z1000

MTH Z4000 – CAUTION: do not advance the track voltage over 20v !

Important Note: *Excessive track voltage (>20v) will damage the Sound Commander, and a protection device will activate. The activation of the protection device will void the warranty on the Sound Commander.*

Operation - Command Mode

The Sound Commander should remain silent when power is applied to the track when a solid command signal is present. If the command signal does not get detected within 0.5 second the Sound Commander may “start up” on its own, this is normal.

Several additional features are available in the Sound Commander when operating in command mode. The prime mover revs are enabled and the revs track the throttle settings. Additional sounds in command mode include, a coupler clank and a “brake release” sound that occurs when the “crew talk” button is pressed (AUX1+2).

Volume may be set on the prime mover independent of the other sounds. The prime mover sound volume is controlled with AUX1+3 for up, and AUX1+6 for down. This works on DCS with “labor/drift”. The warning sounds volume is controlled by AUX1+1 for up, and AUX1+4 for down. This is the “volume” button in DCS. To shutdown, or “quell” the sounds, press AUX1+5.

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 Beep direction switch to “OFF”
3. Place the Beep 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 Horn blows, and the ENG ID is stored.
6. Press AUX1 + 5, the Horn blows.
6. Remove power from the track and place the switch back to the ‘ON position.

Note: 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. Simply set this to “5”, as instructed above, as this terminal is not connect in this installation.

When running in Conventional mode:

Cycling of engine direction can be overridden by placing the programming switch in the ‘FORWARD ONLY’ (program) position. This will lock the engine direction into the last direction traveled. You **must** replace the switch back to the ‘F-N-R” (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 out of warranty will be repaired or replaced for a service charge of \$30.00 at our option.

Please email to support@electricrr.com 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!

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