



## **MTH Reefer Car Mini Commander Installation Guide**

Revised: October, 2008

### **OVERVIEW:**

The Operating Reefer car is normally operated by the UCS track. When over the UCS track, about a 2 second application of power trips a relay in the car. This relay applies power long enough for the motor to move the mechanism inside to close a micro switch, which then keeps the power on the motor until the mechanism cycles and opens the micro switch again. The Mini Commander can apply this trigger when AUX1 or AUX2 is pressed on the remote. If DCS operation is desired, the Mini Commander HC-1 output, controlled by AUX1, should be used.

### **INSTALLATION PROCESS SUMMARY:**

The Mini Commander will need power from the track, which is available on the Operating Reefer Car. You have 2 options for getting the power. The first option is to “tap” into the red and black wires coming from the truck with the power leads.

The second option involves removing the existing circuit board, and attaching the power wires for the Mini Commander. **Take time to label and sketch the connections before disassembly.** There are several black wires, one is the 3<sup>rd</sup> rail power wire, and the others are the UCS track shoes. The Red wire is the common (wheels). On re-assembly, be sure to connect the 3<sup>rd</sup> rail collector (a black wire) and common (red wire) back on the original pins.

The second option is more involved, but is a cleaner install. Both work fine, so simply choose what option is easiest for you.

After power is tapped for the Mini Commander, the original electronics is reinstalled if required, and the wiring is completed. It is suggested to tape down the original wires that were from the “shoes” on the frame for operation on the UCS. Tape them to the frame close to where they enter in by coiling them up.

## **INSTALLATION SEQUENCE:**

To remove the shell, remove the door side rails (4 screws) and the 4 large screws in each corner. Note the shell direction when removing. After the shell is removed, carefully remove the frame from the mechanism by removing the 4 smaller screws, 2 on each end.

The Mini Commander will need power from the track, choose one method for the power connection.

## **POWER OPTION 1:**



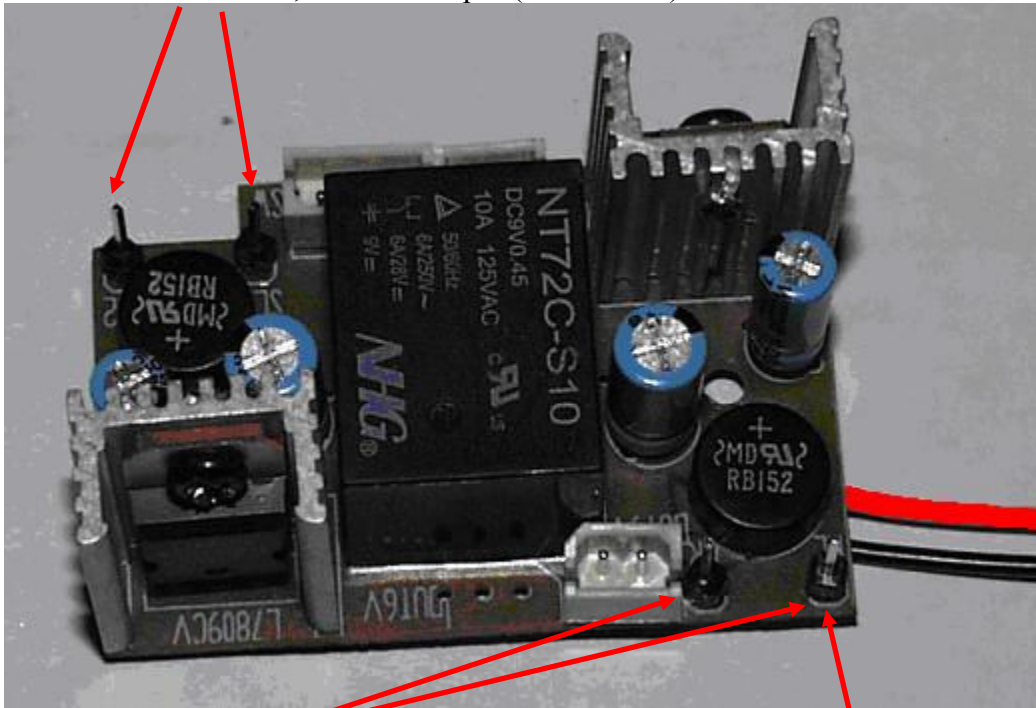
Tap power on these pickup wires. The best way is to cut the wire, slip some heat shrink over one, and splice the three wires, then solder and heat shrink the connection.

## POWER OPTION 2:

Getting power from connecting to the existing electronics. In this case you will need to remove the existing circuit board. **Take time to label and sketch the connections before disassembly.** There are several black wires, one is the 3<sup>rd</sup> rail power wire, and the others are the UCS track shoes. Note: The Red wire is the common (wheels), the black wire is the “hot”, or pickup roller. On re-assembly, be sure to connect the 3<sup>rd</sup> rail collector (a black wire) and common (red wire) back on the original pins!

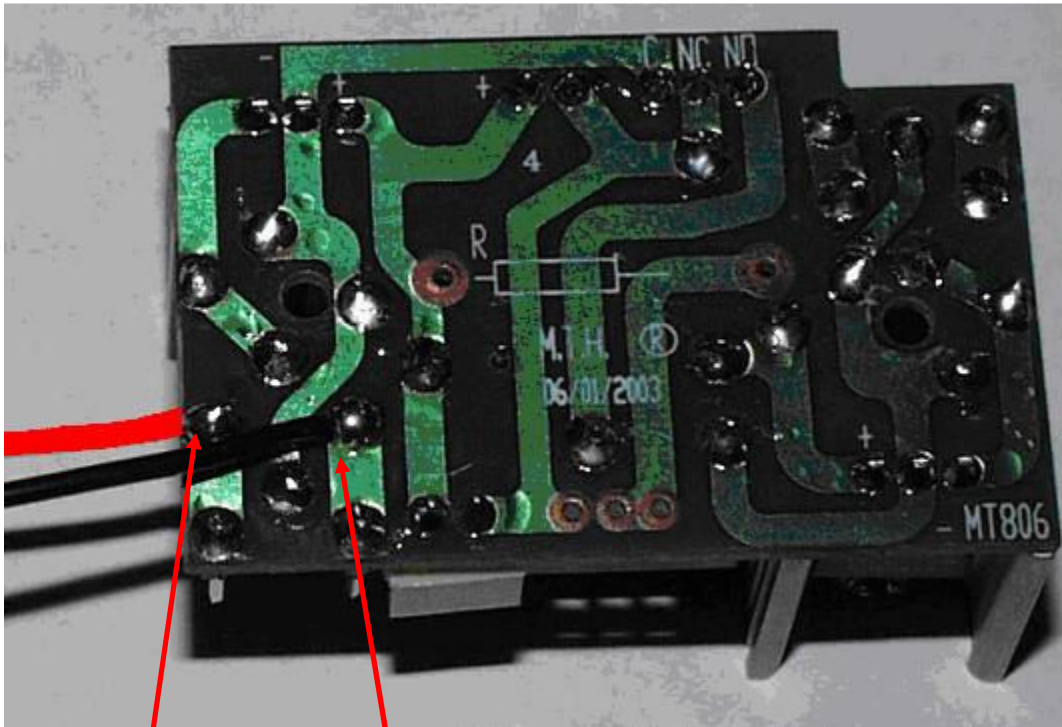
After removing the connections, remove the circuit board by removing the 2 screws that hold in the electronics, one by each heat sink.

UCS shoe connections, one to each pin (black wires)



Power connections, the common (outer rails) is the RED wire

## POWER OPTION 2:

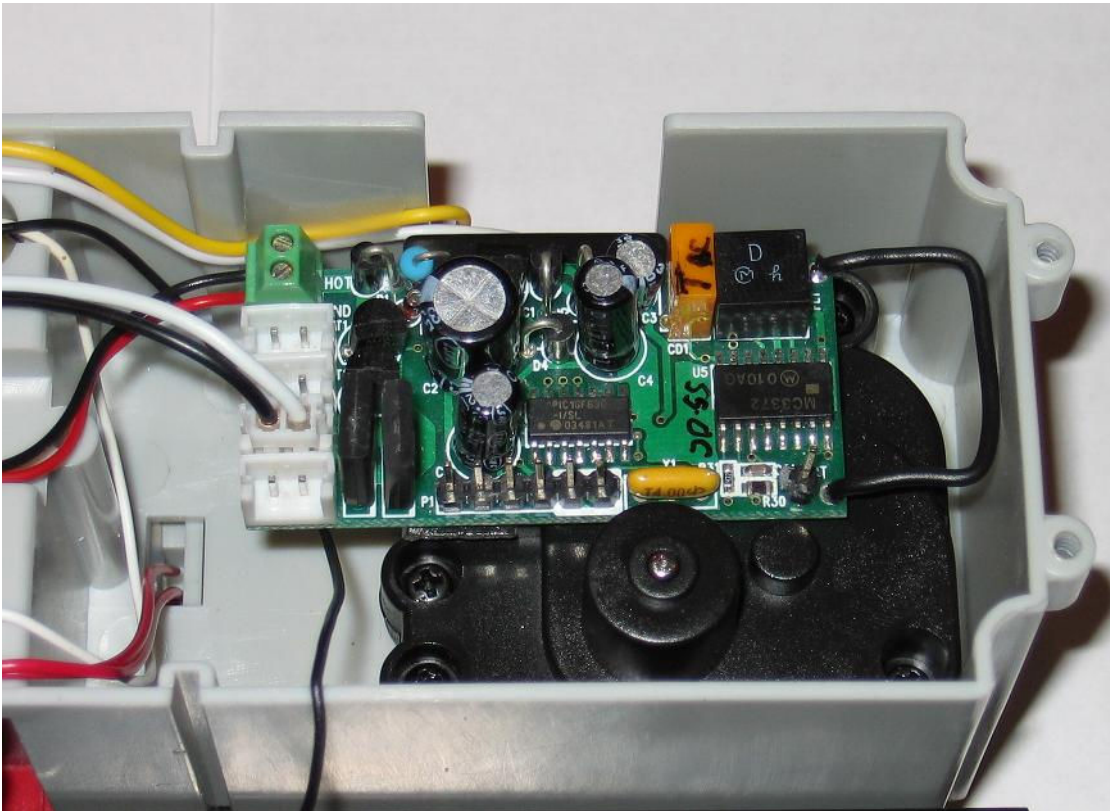


Red post wire    Black post wire

Attach 2 wires about 10" in length as shown above. These will be the power wires to the Mini Commander. Make sure you get the connections to the PCB on the corner *without* the notch. Note the black wire location, this is the 3<sup>rd</sup> rail collector power.

The red wire is the COM, and the Black wire is the HOT. When reconnecting the power leads from the truck, be sure to match the colors to the wires just attached. Follow the above connections, and the RED from the truck will be in the corner pin.

The Mini Commander mounts in the Op-Reefer car near the operating motor. It is a tight fit, so thinner mounting tape is supplied. Test fit the Mini Commander before attaching with the double-stick tape. Position the Mini Commander as shown below, bending the loop antenna 90 degrees so it will have a “clear” signal.



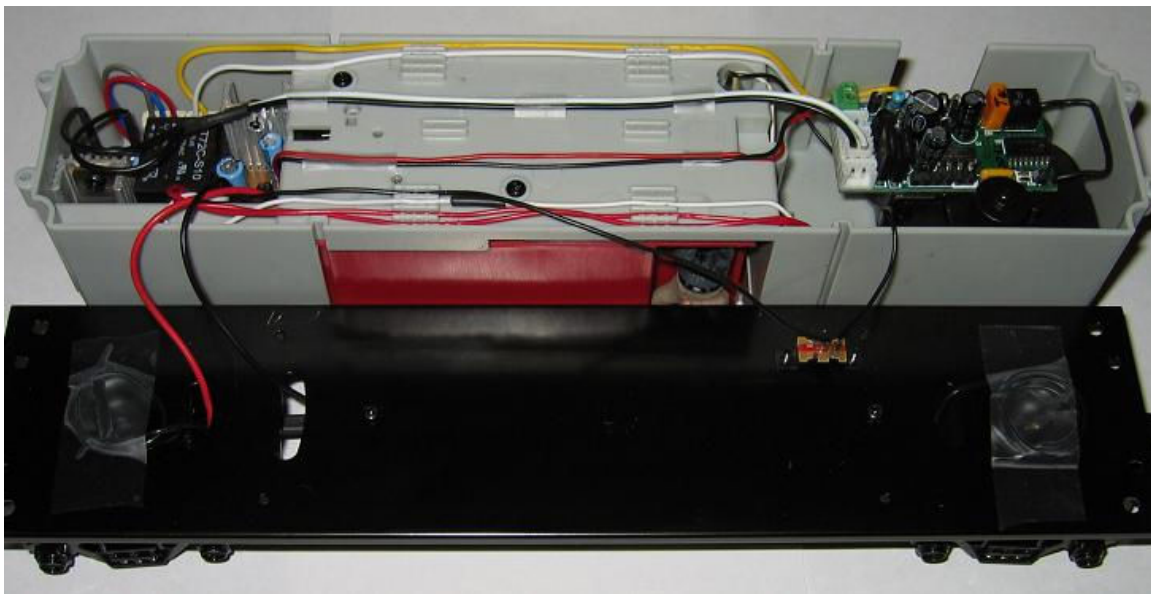
After mounting, connect the red and black power wires to the Mini Commander, remember black is “HOT”, the polarity matters!! The wire length should be cut down to provide the best fit.

Next, locate the wire assembly as shown below. This assembly will connect the original electronics and the Mini Commander for triggering from the remote. The length of the assembly is about 9 inches long. Attach the wire assembly to the HC-1 output on the Mini Commander as shown above.





Dress the wires as shown below and use tape to secure them.



Attach the wire assembly from the HC-1 (or HC-2) output on the Mini Commander, to the UCS shoe connections on the original electronics PCB. The connection to the UCS pins is in the upper left of the car as shown in the above picture. The polarity of the UCS pins connection is not important.

NOTE: In almost all cases, the built in antenna will work fine. If you find the car is not as responsive as you would like, you can enhance the signal reception by using the supplied antenna extension. The extension is a single wire with a connector that plugs over the “ANT” pin. Place the antenna wire in a place that will not be in the way of the operation of the car, it is fine to shorten the wire. However, if you shorten it too much, it will not help the reception.

## **CHECKOUT:**

Assuming you have the wiring reviewed, you can do the checkout while the car is apart as shown in the picture on the previous page. Be sure the smoke unit is set to OFF. The Mini Commander is set to ACC 1 when shipped. And although the configuration is not done yet, you can get the car to operate by selecting ACC + 1, then press AUX1 repeatedly until the car starts to run on its own. If this checks out, proceed to configuration. If not, you will need to verify the connections again, and use a meter to be sure the Mini Commander is getting power.

While it is best to learn Soft Set to do configuration, it is possible to configure the Mini Commander now with a jumper while you have access. Please read configuration to decide what is best for you, and assemble the car as appropriate.

## **CONFIGURATION:**

Since there is not a Configure / Run switch, it is best to use Soft Set to finalize the installation. With the car on the track and power applied, configure the Mini Commander as follows- waiting 1 second between each SET press. Actually a few extra SETs are a good idea. I usually press it 6 to 7 times!

As ACC:

ACC + 1 + SET + SET + SET + SET + SET (Soft Set entry sequence)

ACC + ## + SET (where ## is the ACC number you want)

AUX1 + 7 + BRAKE + 8

AUX2 + 7 + BRAKE + 8

WAIT 10 seconds; do not press any CAB-1 key while waiting.

As ENG:

ACC + 1 + SET + SET + SET + SET + SET (Soft Set entry sequence)

ENG + ## + SET (where ## is the ENG number you want)

AUX1 + 7 + BRAKE + 8

AUX2 + 7 + BRAKE + 8

WAIT 10 seconds; do not press any CAB-1 key while waiting.

Now select the car by ACC (or ENG) + ## (the number you entered above) and then press AUX1 (or AUX2 if HC-2 is used) for about 1 second. After successful configuration, you do not need to repeatedly press AUX1 (or AUX2), since the configuration should take care of the timing needed to operate the car.

If the car is not operating, you will need to redo the configuration sequence. If you decide to use the jumper method, put the jumper on the connector P1 - pins 1 & 2. Then enter the configuration sequence without the “Soft Set entry sequence” line above.

The configuration sequence above shows AUX1 and AUX2 getting configuration settings. This is not an absolute requirement, but until you get more familiar with Soft Set, please follow the sequence above.

**NOTE:** All configuration sequences require the CAB-1.

## **OPERATION:**

### **CAB-1**

Operation with the CAB-1 is as simple as selecting the ACC or ENG and the ID that you assigned. Pressing AUX1 (or AUX2) will start the Op-reefer cycle. It is recommended to hold the AUX1 (or AUX2) key down about 1 second to activate the car.

### **DCS**

Operation under DCS can be initiated by adding the Op-reefer as a TMCC engine. When selected, using any of the soft keys under the LCD will operate the Op-reefer.

If you opted for AUX2 operation, the HDLT key will trigger the operation. Multiple presses may be required depending on the Op-Reefer car micro switch tolerances.

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